brother

W1000Xd1 Series / S300Xd1 Series / S500Xd1 Series
S700Xd1 Series / R450Xd1 Series / R650Xd1 Series
U500Xd1 Series

COMPACT MACHINING CENTER SPEEDIO

CNC-D00
DATA BANK & ALARM MANUAL
(For Installers & Machine Setup Specialists)

Please read this manual carefully before operating the machine.
Be careful not to lose the manuals, and keep them handy at all times.

69A789001(4)

DATA BANK & ALARM MANUAL

Read this manual before performing work.

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Introduction

Thank you for purchasing the SPEEDIO (hereafter referred to as “machine”) made by Brother. Always be sure to read this manual and the machine manual carefully first, in order to use the machine functions properly and safely.

Brother is not responsible or liable for accidents that occur during special machine use or handling that does not follow the general safety usage guidelines.

This machine manual is divided into the following sections.

- Operation Manual
  This manual describes the operation procedure for the machine.
- Installation Manual
  This manual describes the machine’s installation procedure and inspections.
- Programming Manual
  This manual provides a program description.

Keep this manual for future reference.
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This product cannot connect directly to a telecommunication line (including public wireless LAN) for telecommunication carriers (such as mobile communication carriers, fixed-line communication carriers, Internet providers, etc.). Make sure you use a router or firewall when connecting your Brother machine to the Internet to protect it against unauthorized access from the Internet.

How to Read This Manual

This manual is divided into the following sections.

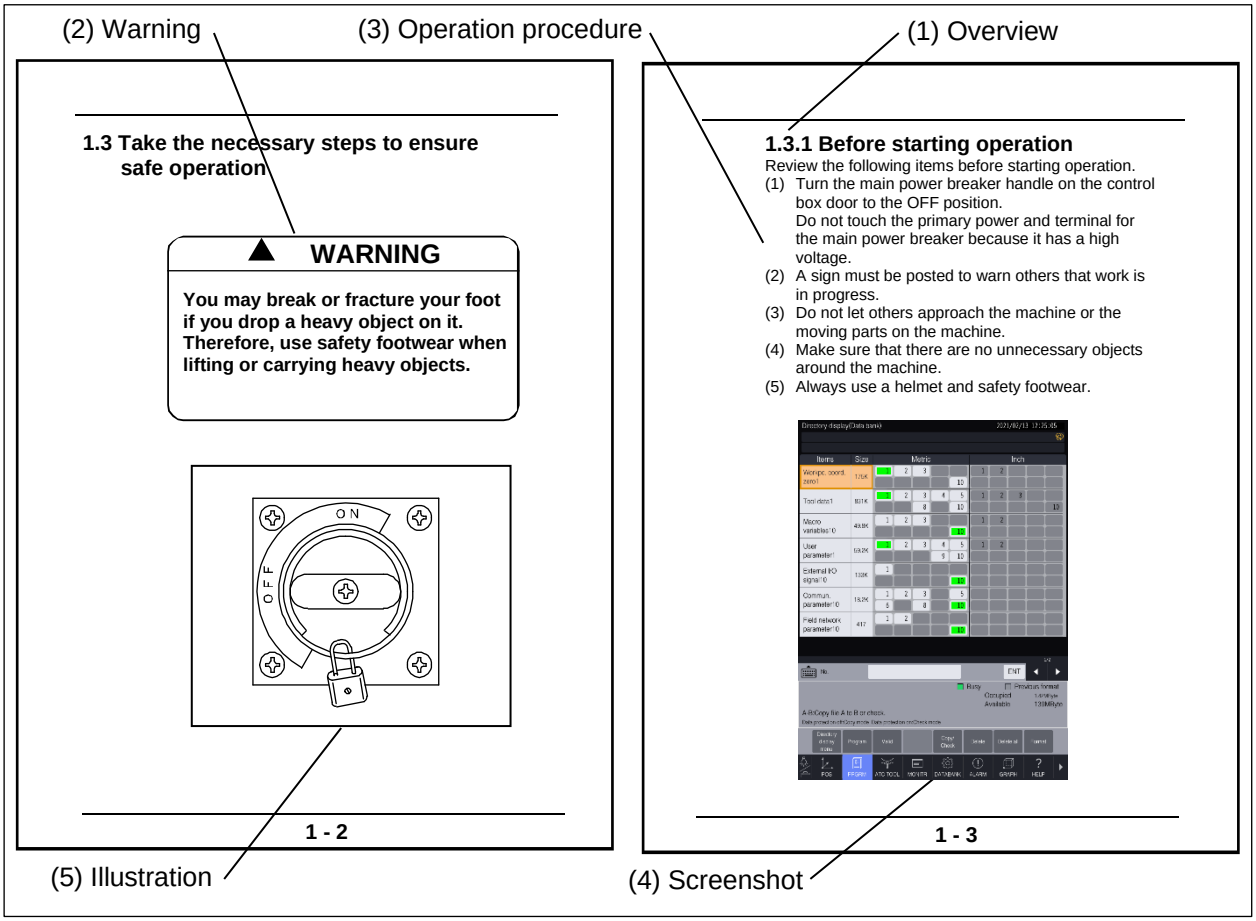
(1) Overview ------ A summary of the content is provided for the corresponding section.

(2) Warning-------- A warning is provided for any hazards that could potentially cause serious bodily injury, death or damage to the machine.
The hazards are described in the following order.
- (2-1) Hazard level
- (2-2) Type of hazard
- (2-3) Potential damage
- (2-4) Safety directions to avoid danger

(3) Operation procedure --- The procedure describes how to operate each function.

(4) Screenshot ---A screenshot is inserted into places to highlight certain points in the operation procedure. The screenshot messages are shown at an approximate position and may differ slightly from the actual position of the line or column. The same applies to the font.

(5) Illustration ---- Illustrations, such as explanatory drawings, diagrams that show the dimensions, positioning, ranges, figures or configurations, are used in certain places where a written explanation alone may be hard to understand.



In this manual, the following symbols are used to differentiate between keys, switches, text displayed on screens and alarm messages.

[ ]	: Keys
[ ]	: Switches
< >	: Text displayed on screens
<< >>	: Alarm messages

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CHAPTER 1

DATA BANK

1.1 Overview of Data Bank
1.2 Workpiece Coordinate Zero Point (NC)
1.3 Tool Data (NC)
1.4 Macro Variables (NC)
1.5 User Parameter
1.6 External I/O Signal
1.7 Communication Parameter
1.8 Field Network Parameters
1.9 Machining Load Monitor Function
1.10 G/M Code Macro Settings
1.11 Tool List (Conversation)
1.12 Tool Pattern (Conversation)
1.13 Tapping Drill Diameter (Conversation)
1.14 Cutting Condition (Conversation)
1.15 Default Value

1.1 Overview of Data Bank

A data bank is a gathering of data necessary for machine running and operation. Kinds of the data bank used for the NC language mode differ from those for the conversational mode.

1.1.1 Outline

1.1.1.1 Data Bank for NC Language Mode

The data necessary for running the NC language mode are as follows:

1. Workpiece coordinate zero position
   To set a zero point of a workpiece coordinate system.

2. Tool data
   To register information like offset amount, life, etc. of a tool.

3. Macro variable
   To set a macro variable

4. G/M code macro
   Set the parameters related to G code and M code macros.

5. User parameter
   To set a parameter for machine operation. This is an important datum for machine operation, so please change it prudently. Keep the parameter list attached on a machine at a safe place.

6. External I/O signal
   To assign an external input/output signal for an input/output terminal and set input/output of an external alarm.

7. Communication parameter
   To set a parameter for external input/output communication. Set this according to connection equipment.

8. Field network parameter
   Set the parameters related to the field network parameter. The user can use this setting to connect various devices such as a CNC, PLC and robot controller.

9. Machine parameter
   To set a parameter for machine operation. Unless this is set correct, the machine may break. So do not change the value set before machine delivery.

10. Special settings
    The parameters can be set to support special cases. Normally no changes are required. Be extremely carefully when changing the settings because machine operation will change.

11. Machining load monitor
    This sets the parameter for the function to measure the machining load, monitor it and assess whether the machining is normal. Refer to “Chapter 3 Machining load monitor function” for further details.

1.1.1.2 Data Bank for Conversational Language Mode

Data necessary for operation of the conversational mode are as follows:

1. Tool list
   This registers information about kinds, sizes, shapes, lives, etc. of tools.
   When memory operation is carried out, tools necessary for machining are automatically selected from the tool list.

2. Tool pattern
   To set kinds and order of tools used for each machining process
   Example: For tapping, necessary tools and order are automatically selected by specifying a tapping process.

Tapping	1	Center drill
	2	Drill
	3	Tap

3. Setting primary hole drilling diameter for tapping
   To set a pilot hole size per kind of thread for tapping
   Example: When you want to tap, a necessary pilot hole size is sought and a corresponding drilling tool is automatically selected only by specifying the kind and size of a thread.

Metric unified thread M3.0×0.5	→	Setting primary hole drilling diameter for tapping 2.500	→	Tool List 2.500-diameter drill

4. Cutting conditions
   To set cutting conditions other than peripheral speed, feed, and tool conditions per material or tool used.
   Example: When you want to drill, the peripheral speed and feed corresponding to the material and kind of drill are automatically selected.

S45C ϕ2.5 drill	→	Cutting condition 1 (drill) Peripheral speed 10 m/min Feed rate 0.05 mm/rev

5. User parameters
   Refer to “1.1.1.1. Data Bank for NC Language Mode”.

6. External I/O signals
   Refer to “1.1.1.1. Data Bank for NC Language Mode”.

7. Communication parameters
   Refer to “1.1.1.1. Data Bank for NC Language Mode”.

8. Field network parameter
   Refer to “1.1.1.1. Data Bank for NC Language Mode”.

9. Machine parameters
   Refer to “1.1.1.1. Data Bank for NC Language Mode”.

10. Special settings
    Refer to “1.1.1.1. Data Bank for NC Language Mode”.

11. Machining load monitor
    Refer to “1.1.1.1 Data Bank for NC Language Mode”.

* The data is the same and used in both NC language mode and conversation mode for user parameters, external I/O signals, communication parameters, field network parameters, machine parameters, special settings and the machining load monitor.

* The user can set tool patterns and cutting conditions to the machining data in program edit mode. Refer to “Programming Manual (Conversational)”.

1

1.1.2 How to Edit

1.1.2.1 To Start Editing (NC language mode)

We are going to explain how to start editing the data bank.

1. Press the <DATABANK> key to call the <Data bank menu> screen.

<Data bank menu> screen (NC language mode)

Description of screen display

Position	Name	Description
1	Data bank menu	Displays the data bank menu.

Description of screen operation

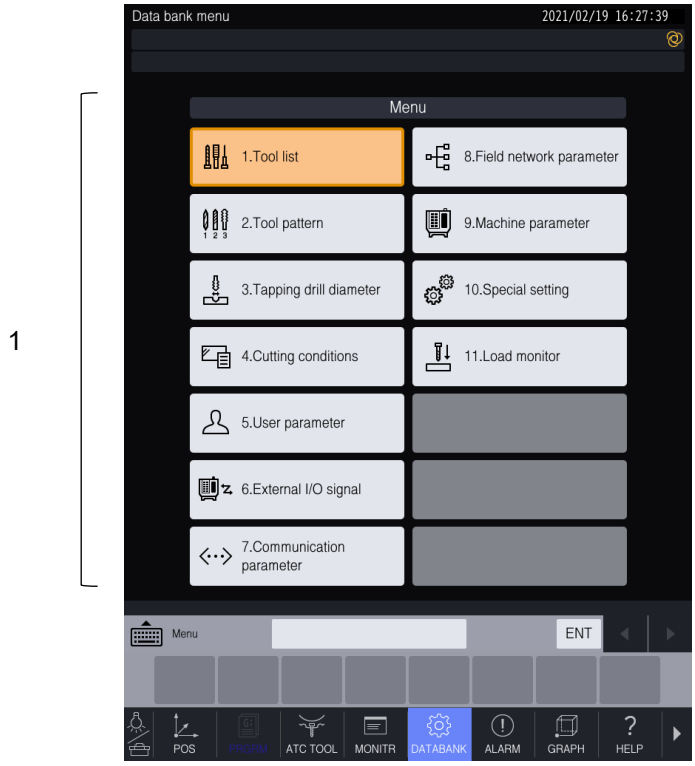
1. Description of data bank menu operations
   - Tap on an item to change to the screen for that item.
   - Press the **[ENT]** key to change to the screen for an item selected with the cursor.
   - An item can be selected with the **[CURSOR]** keys (up, down, left and right).
   - After entering a number for an item, press the **[ENT]** key to change to the screen for that number.

1.1.2.2 To Start Editing (Conversation mode)

We are going to explain how to start editing the data bank.

1. Press the <DATABANK> key to call the <Data bank menu> screen.

<Data bank menu> screen (Conversational mode)



Description of screen display

Position	Name	Description
1	Data bank menu	Displays the data bank menu.

Description of screen operation

1. Description of data bank menu operations
   - Tap on an item to change to the screen for that item.
   - Press the **[ENT]** key to change to the screen for an item selected with the cursor.
   - An item can be selected with the **[CURSOR]** keys (up, down, left and right).
   - After entering a number for an item, press the **[ENT]** key to change to the screen for that number.

1

1.1.2.3 To Finish Editing

We are going to explain how to finish editing of the data bank.

1. The user can press the <Completion mode> key on the data edit screen.
   The Edit completion mode screen appears.

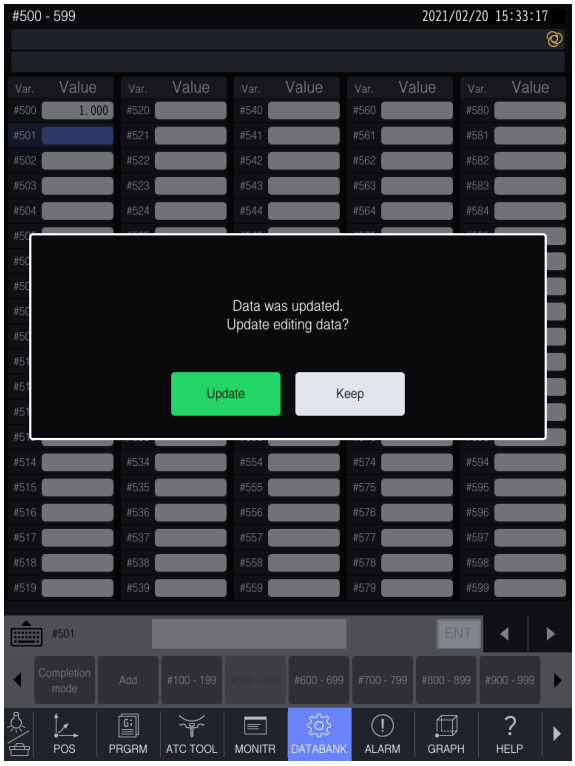
Description of function key operations

Column	Position	Label	Description
1	(1)	<Save and end>	Saves the edited content and exits data bank editing. Goes back to the menu screen.
	(2)		
	(3)		
	(4)	<Cancel w/o saving changes>	Discards the edited content and exits data bank editing. However, the overwritten content is still valid.
	(5)		
	(6)		
	(7)	<Overwrite save>	Saves the edited content and continues with data bank editing. Goes back to the edit screen.
	(8)	<Edit mode>	Does not save the edited content and continues with data bank editing. Goes back to the edit screen.

1.1.3 Data Changed From External Source During Data Bank Editing

When the edit screen is displayed and the data is changed using the following functions, the values on the edit screen are updated in real time.

1. Programmable data input
2. Macro (system variable) change
3. Data writing when using communication protocol type 2 for NC communication device
   When the edit screen is displayed and the data is changed using a function not listed above, if the user has finished editing, a message indicating a data change will appear outside of that edit window. If the user has not finished editing, the values on the edit screen are updated in real time.

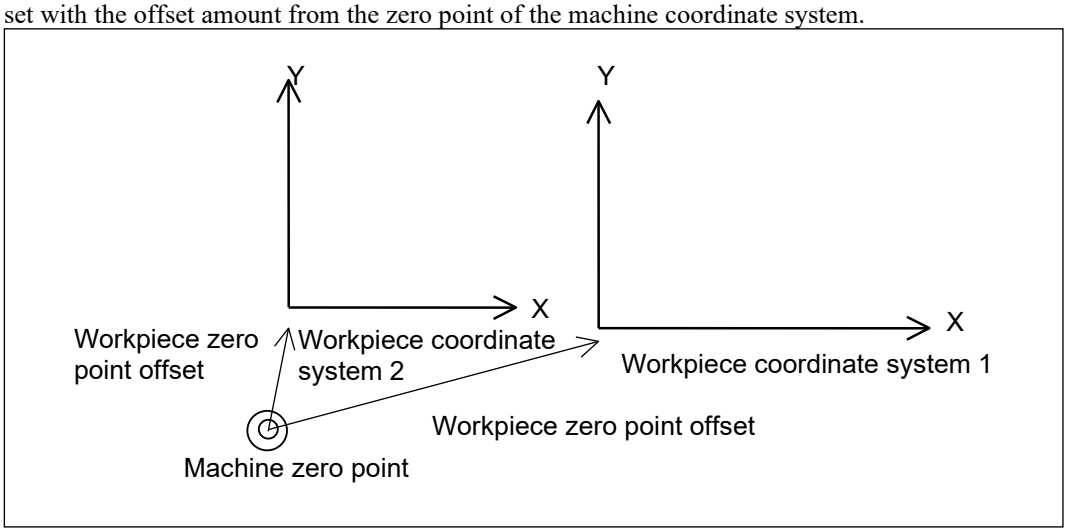


1

1.2 Workpiece Coordinate Zero Point (NC)

1.2.1 Outline

Workpiece coordinate system zero points of six G codes (G54-G59), one external, and 300 extended workpiece coordinates 1-300 are set. The workpiece coordinate system zero points are set with the offset amount from the zero point of the machine coordinate system.

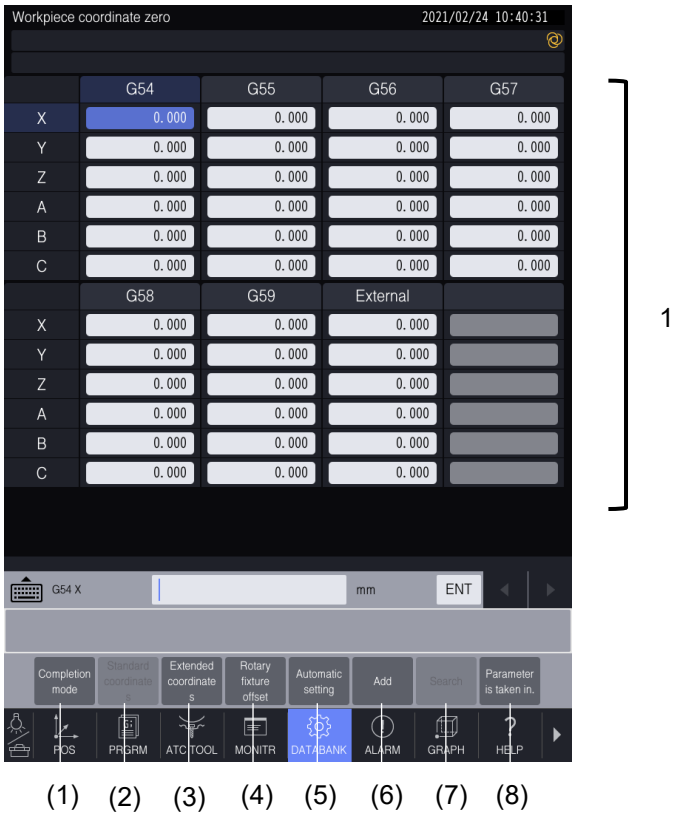


In addition, set the G54.2 reference rotary fixture offset.

1.2.2 Edit Screen

After selecting <Workpiece coordinate zero> on the <Data bank menu> screen, the edit screen displays for the workpiece coordinate zero, extended workpiece coordinate and reference rotary fixture offset.
Refer to “Chapter 9 (17) Rotary fixture offset function” in Operation Manual I for further details on each setting item in the reference rotary fixture offset.

Workpiece coordinate zero screen



Workpiece coordinate zero (extended) screen

2

Reference rotary fixture offset screen

3

1.2.2.1 Description of screen display

Position	Name	Description
1	Workpiece coordinate zero (G54 to G59 and external)	The user can set the workpiece coordinate zero and the external workpiece coordinate zero for modals G54 to G59.
2	Extended workpiece coordinate zero	The user can set the extended workpiece coordinate zero for modal G54.1.
3	Reference rotary fixture offset	The user can set the reference rotary fixture offset for the modal G54.2.

1.2.2.2 Description of screen operation

The function keys are the same as the keys on the workpiece coordinate zero screen, the workpiece coordinate zero (extended) screen and the reference rotary fixture offset screen.

Description of function key operations

Column	Position	Label	Description
1	(1)	Completion mode	Ends and exits editing.
	(2)	Standard coordinates	Opens the workpiece coordinate zero screen. The key grays out when at the same screen.
	(3)	Extended coordinates	Opens the workpiece coordinate zero screen (extended). The key grays out when at the same screen.
	(4)	Rotary fixture offset	Opens the reference rotary fixture offset screen. The key grays out when at the same screen.
	(5)	Automatic setting	Changes to the <Automatic setting> screen. The user can set the current machine status as data on the automatic setting screen. Refer to “Chapter 1.2.3” for further details.
	(6)	Add	The user can add a value to the current value. Refer to “Chapter 1.2.4” for further details.
	(7)	Search	The user can use this key on the extended workpiece coordinate screen. This key grays out on all other screens. After the extended workpiece coordinate number is entered into the data input field, press this key. The cursor moves to the extended workpiece coordinate that is specified.
	(8)	Parameter is taken in.	The user can set the value for the user parameter <Workpiece coordinate zero point *axis (for capture)> to a given workpiece coordinate. The key grays out on the reference rotary fixture offset screen. Refer to “Chapter 1.2.5” for further details.

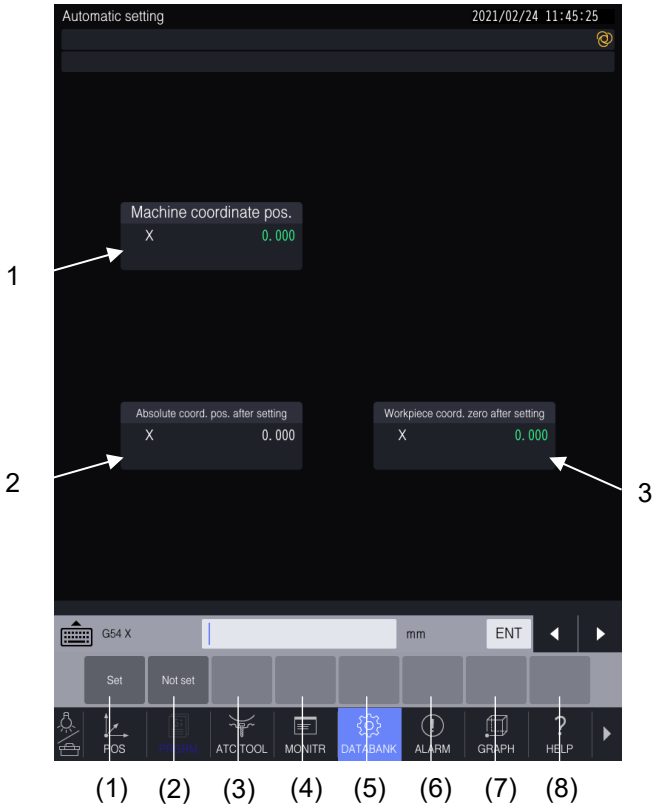
1.2.2.3 Direct Input of Data

1. Move the cursor to the item you want to change.
2. Input a value in the input area and press the **[ENT]** key.
   The value is input at the cursor position and the cursor moves to the next item.

1.2.3 Automatic Setting of Data

1.2.3.1 Automatic setting for workpiece coordinate zero

When the current machine coordinate position is set to a new absolute coordinate position, for the axis selected on the workpiece coordinate zero screen, the offset for the workpiece coordinate zero is automatically calculated.
The display and operation procedure are described in the example when X axes is selected. (The Y axes are the same.)



Description of screen display for automatic setting

Position	Name	Description
1	Machine coordinate position	Displays the current machine coordinate position.
2	Absolute coordinate position after setting	Displays the absolute coordinate position after the automatic setting.
3	Workpiece coordinate zero after setting	Displays the workpiece coordinate zero after the automatic setting. When setting additional axes, two axes may be displayed.

Description of function keys for automatic setting

Column	Position	Label	Description
1	(1)	Set	Sets the value in the <Workpiece coord. zero after setting> for a selected axis, and then goes back to the previous screen.
	(2)	Not set	Cancels the automatic setting and goes back to the previous screen.
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

1. Move the cursor to the axis you wish to change on the workpiece coordinate zero screen.
2. Press the <Automatic setting> key.
   The <Automatic setting> screen appears according to the axis at the cursor position.

* When the cursor is on an axis where the axis option is not set and the <Automatic setting> key is pressed, the alarm <<No *-axis option>> is triggered and the <Automatic setting> screen does not display.
* When the alarm <<Machine param. setting error (SYS 2)>> is triggered, the <Automatic setting> key grays out and operation is not possible.

Input a value in the input area and press the **[ENT]** key. A new workpiece coordinate zero point offset amount (Workpiece coordinate zero point after setting) is automatically calculated and displayed so that the input value becomes a new absolute coordinate position (Absolute coordinate position after setting) for the current machine coordinate position.

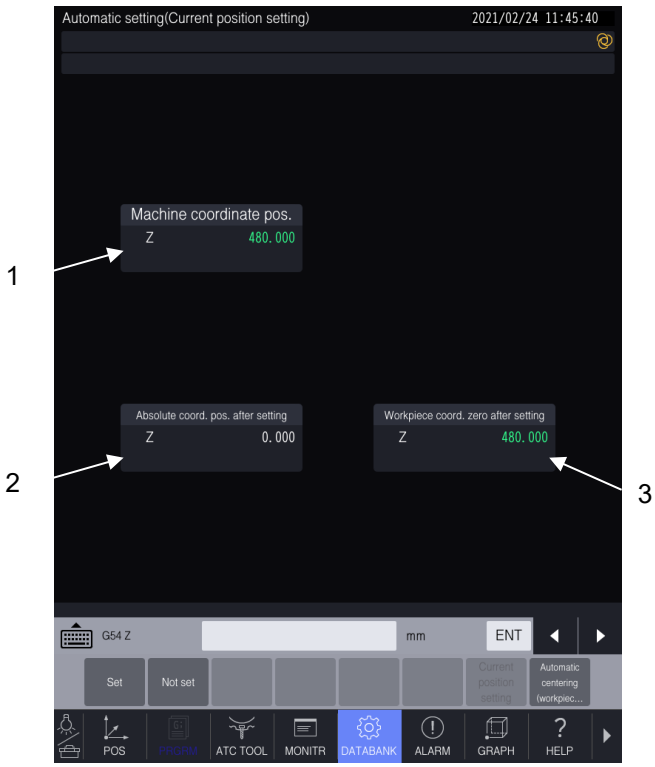
If the **[DEL]** key is pressed, the value in the <Absolute coord. pos. after setting> is deleted to become a value currently set in the <Workpiece coord. zero after setting>

After pressing the <Set> key to set the value for <Workpiece coord. zero after setting> to the X-axis, it goes back to the previous screen.
If the <Set> key is pressed and the <Absolute coord. pos. after setting> value is deleted, it goes back to the previous screen without setting the value.

Press the <Not set> key to cancel the setting operation and return to the previous screen.

After pressing the <Set> key and the screen goes back to the previous screen, the cursor will move to the next item.

- When the cursor is on the Z-axis



Description of screen display for automatic setting (current position setting)

Position	Name	Description
1	Machine coordinate position	Displays the current machine coordinate position.
2	Absolute coordinate position after setting	Displays the absolute coordinate position after being automatically set.
3	Workpiece coordinate zero after setting	Displays the workpiece coordinate zero after the automatic setting.

Description of function keys for automatic setting (current position setting)

Column	Position	Label	Description
1	(1)	Set	Sets the value in the <Workpiece coord. zero after setting> for a selected axis, and then goes back to the previous screen.
	(2)	Not set	Cancels the automatic setting and goes back to the previous screen.
	(3)		
	(4)		
	(5)		
	(6)		
	(7)	Current position setting	The key is grayed out.
	(8)	Automatic centering (workpiece top surface) coordinate setting	Displays the automatic setting (automatic centering (workpiece top surface) coordinate setting) screen.

1. Move the cursor to the Z-axis on the workpiece coordinate zero screen.
2. Press the <Automatic setting> key.
   The <Automatic setting (Current position setting)> screen is displayed.

* When the alarm <<Machine param. setting error (SYS 2)>> is triggered, the <Automatic setting> key grays out and operation is not possible.
* If there are no measurement results for automatic centering (workpiece top surface) in MDI operation, then the <Automatic centering (workpiece top surface) coordinate setting> key is grayed out and operation is not possible.

Enter the value into the data input field, and press the **[ENT]** key. A new offset amount for the workpiece coordinate zero (workpiece coordinate zero after setting) is automatically calculated and displayed, using the entered value to offset the current machine coordinate position and creating a new absolute coordinate position (absolute coordinate position after setting).

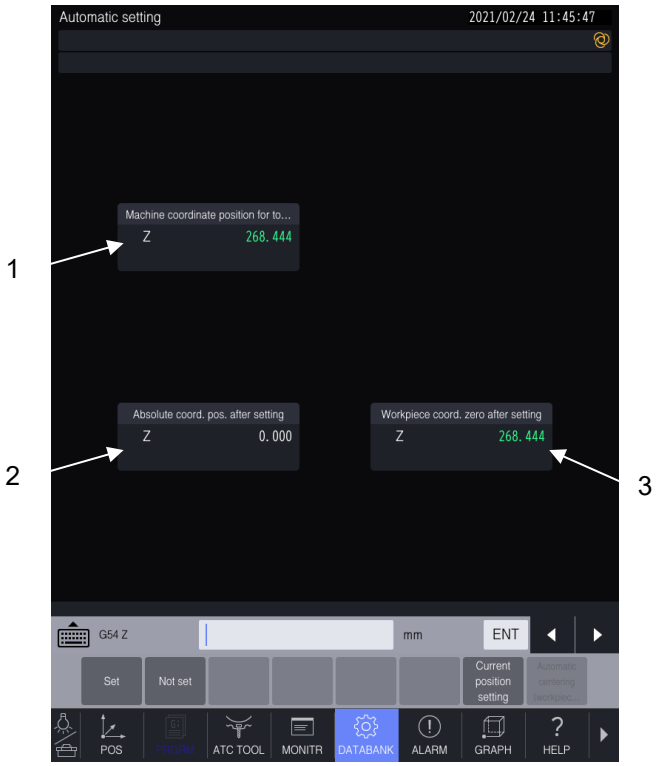
When the **[DEL]** key is pressed, the value for <Absolute coord. pos. after setting> is deleted and the <Workpiece coord. zero after setting> becomes the current set value.

After pressing the <Set> key to set the value for <Workpiece coord. zero after setting> to the Z-axis, it goes back to the previous screen.
If the <Set> key is pressed and the <Absolute coord. pos. after setting> value is deleted, it goes back to the previous screen without setting the value.

Press the <Not set> key to cancel the setting operation and return to the previous screen.

After pressing the <Set> key and the screen goes back to the previous screen, the cursor will move to the next item.

When the <Automatic centering (workpiece top surface) coordinate setting> is pressed, the <Automatic setting (automatic centering (workpiece top surface) coordinate setting)> screen is displayed.



Description of screen display for automatic setting (automatic centering (workpiece top surface) coordinate setting)

Position	Name	Description
1	Machine coordinate position for top surface of workpiece	Displays the machine coordinate for the top surface of the workpiece that is measured in the automatic centering (workpiece top surface) in MDI operation.
2	Absolute coordinate position after setting	Displays the absolute coordinate position after being automatically set.
3	Workpiece coordinate zero after setting	Displays the workpiece coordinate zero after the automatic setting.

Description of function keys for automatic setting

Column	Position	Label	Description
1	(1)	Set	Sets the value in the <Workpiece coord. zero after setting> for a selected axis, and then goes back to the workpiece coordinate zero screen.
	(2)	Not set	Cancels the automatic setting and goes back to the workpiece coordinate zero screen.
	(3)		
	(4)		
	(5)		
	(6)		
	(7)	Current position setting	Displays the automatic setting (current position setting) screen.
	(8)	Automatic centering (workpiece top surface) coordinate setting	The key is grayed out.

Enter the value into the data input field, and press the **[ENT]** key. A new offset amount for the workpiece coordinate zero (workpiece coordinate zero after setting) is automatically calculated and displayed, using the entered value to offset the machine coordinate position for the top surface of the workpiece and creating a new absolute coordinate position (absolute coordinate position after setting).

When the **[DEL]** key is pressed, the value for <Absolute coord. pos. after setting> is deleted and the <Workpiece coord. zero after setting> becomes the current set value.

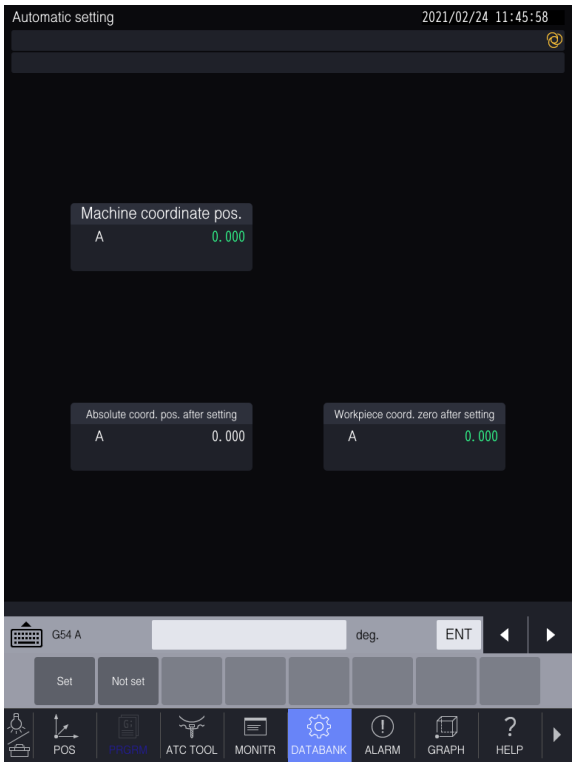
After pressing the <Set> key to set the value for <Workpiece coord. zero after setting> to the Z-axis, it goes back to the workpiece coordinate zero screen.
If the <Set> key is pressed and the <Absolute coord. pos. after setting> value is deleted, it goes back to the workpiece coordinate zero screen without setting the value.

Press the <Not set> key to cancel the setting operation and return to the workpiece coordinate zero screen.

After pressing the <Set> key and the screen goes back to the workpiece coordinate zero screen, the cursor will move to the next item.

Press the <Current position setting> key to return to the <Automatic setting (Current position setting)> screen.

- If the cursor is at the A-axis (when one axis is used) (same as at the B or C axis),



Input a value in the input area and press the **[ENT]** key. A new workpiece coordinate zero point offset amount (Workpiece coordinate zero point after setting) is automatically calculated and displayed so that the input value becomes the value for the new absolute coordinate position (Absolute coordinate position after setting) for the current machine coordinate position.

If the **[DEL]** key is pressed, the value in the <Absolute coord. pos. after setting> is deleted and the value in the <Workpiece coord. zero after setting> become the currently set value.

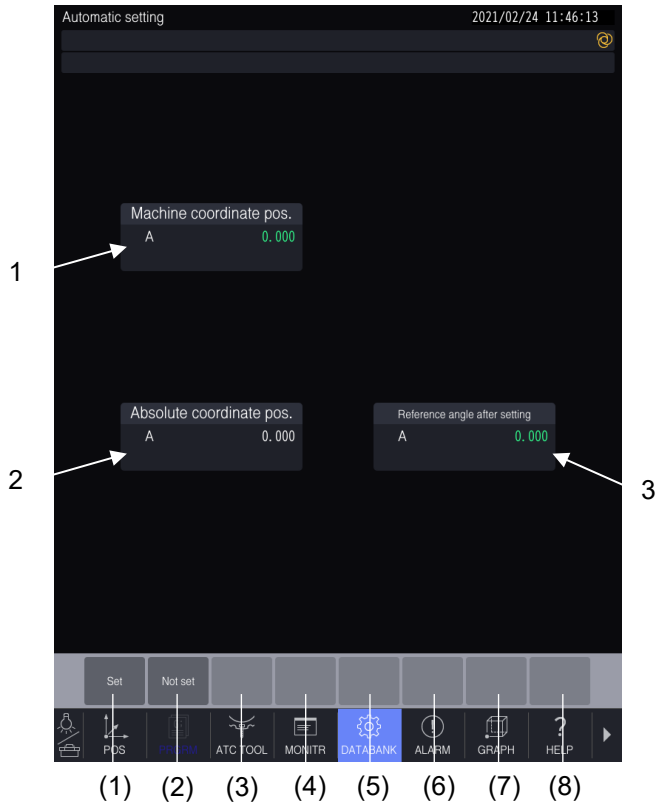
After pressing the <Set> key to set the value for <Workpiece coord. zero after setting> to the A-axis, it goes back to the previous screen.
If the <Set> key is pressed and the <Absolute coord. pos. after setting> value is deleted, it goes back to the previous screen without setting the value.

Press the <Not set> key to cancel the setting operation and return to the previous screen.

After pressing the <Set> key and the screen goes back to the previous screen, the cursor will move to the next item.

1.2.3.2 Automatic setting for reference angle in reference rotary fixture offset

The current absolute coordinate position is integrated in the <Reference angle>.
The display and operation procedure are described in the example when <Reference angle A> is selected. (When 1st-axis is used) (Same as B- and C-axes)



Description of screen display for automatic setting

Position	Name	Description
1	Machine coordinate position	Displays the current machine coordinate position.
2	Absolute coordinate position	Displays the absolute coordinate position after being automatically set.
3	Reference angle after setting	Displays the reference angle for the reference rotary fixture offset after being automatically set. When setting additional axes, two axes may be displayed.

Description of function keys for automatic setting

Column	Position	Label	Description
1	(1)	Set	Sets the value in the <Reference angle after setting> to an additional axis, and then goes back to the previous screen.
	(2)	Not set	Cancels the automatic setting and goes back to the previous screen.
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

1. Move the cursor to reference angle A (B or C).
2. Press the <Automatic setting> key.
   The automatic setting screen, which corresponds to the axis where the cursor is, is displayed.

* When the cursor is on an axis where the axis option is not set and the<Automatic setting> key is pressed, the alarm <<No *-axis option>> is triggered and the automatic setting screen does not display.

Press the <Set> key to set the <Reference angle after setting> as the <Reference angle>, and then it will return to the previous screen.
Press the <Not set> key to cancel the setting operation and return to the previous screen.

1.2.3.3 Automatic setting for reference offset in reference rotary fixture offset

The <Reference offset> is automatically calculated from the current machine coordinates, or from the input machine coordinates and the workpiece coodinate zero selection (G54 to G59 and G54.1) for the current selection. The display and operation procedure are described in the example when <Reference offset X> is selected using modal G54.

(NOTE) This function can only be used when the rotation center coordinate for the index table is set to one of the workpiece coordinate zero point options. This function cannot be used when the rotation center coordinate is set in G92, G52 and the external workpiece coordinate system shift.

Description of screen display for automatic setting (current position setting)

Position	Name	Description
1	Machine coordinate position	Displays the current machine coordinate position.
2	Rotation center coordinate	Displays the offset from the zero point in the workpiece coordinate system that is currently selected.
3	Reference offset adjustment value	Enter a value to offset from the machine coordinate position and rotation center coordinate.
4	Reference offset after setting	Displays the reference offset adjustment value that is added to the difference between the machine coordinate position and rotation center coordinate.

Description of function keys for automatic setting (current position setting)

Column	Position	Label	Description
1	(1)	Set	Sets the value in the <Reference offset after setting> as the <Reference offset>, and then it will return to the previous screen.
	(2)	Not set	Cancels the automatic setting and goes back to the previous screen.
	(3)	-	-
	(4)	-	-
	(5)	-	-
	(6)	-	-
	(7)	Current position setting	The key is grayed out.
	(8)	Machine coordinate setting	Displays the machine coordinate setting screen.

Set the reference offset from the current machine coordinates

1. In memory or MDI operation, select the workpiece coordinate zero that is set as the rotation center coordinate on the index table.
2. Move the cursor to reference offset X, Y or Z.
3. Press the <Automatic setting> key.
4. Press the <Current position setting> key.
   The automatic setting screen, which corresponds to the axis where the cursor is, is displayed.

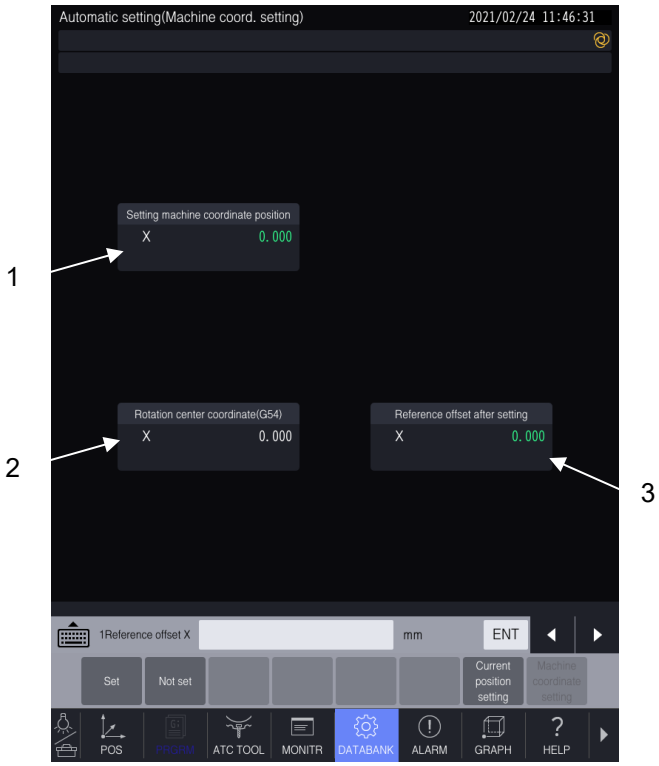
   Enter the value for the reference offset adjustment value and press the **[ENT]** key. Then, the value entered for “machine coordinate position – rotation center coordinate” are automatically calculated and displayed in the <Reference offset after setting>.

   When the **[DEL]** key is pressed, the <Reference offset adjustment value> becomes 0. The value for “machine coordinate position – rotation center coordinate” is displayed in the <Reference offset after setting>.

   Press the <Set> key to set the value in the <Reference offset after setting> as the <Reference offset>, and then it will return to the previous screen.

   Press the <Not set> key to cancel the setting operation and return to the previous screen.

Set the reference offset from the machine coordinates entered



Description of screen display for automatic setting (machine coordinate setting)

Position	Name	Description
1	Setting machine coordinate position	Enter the machine coordinate for setting the <Reference offset>.
2	Rotation center coordinate	Displays the offset from the zero point in the workpiece coordinate system that is currently selected.
3	Reference offset after setting	Displays the difference between the set machine coordinate position and the rotation center coordinate.

Description of function keys for automatic setting (machine coordinate setting)

Column	Position	Label	Description
1	(1)	Set	Sets the value in the <Reference offset after setting> as the <Reference offset>, and then it will return to the previous screen.
	(2)	Not set	Cancels the automatic setting and goes back to the previous screen.
	(3)	-	-
	(4)	-	-
	(5)	-	-
	(6)	-	-
	(7)	Current position setting	Displays the current position setting screen.
	(8)	Machine coordinate setting	The key is grayed out.

1. In memory or MDI operation, select the workpiece coordinate zero that is set as the rotation center coordinate on the index table.
2. Move the cursor to reference offset X, Y or Z.
3. Press the <Automatic setting> key.
4. Press the <Machine coordinate setting> key.
   The automatic setting screen, which corresponds to the axis where the cursor is, is displayed.

Enter the machine coordinate you wish to set for the reference offset used in the setting machine coordinte position and press the **[ENT]** key. Then, the “setting machine coordinate position – rotation center coordinate” is automatically calculated and displayed in the <Reference offset after setting>.

Press the <Set> key to set the value in the <Reference offset after setting> as the <Reference offset>, and then it will return to the previous screen.

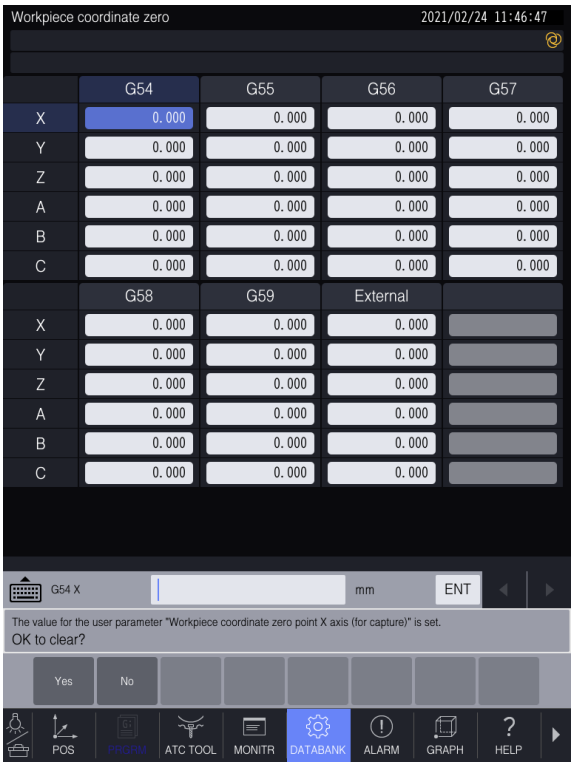
Press the <Not set> key to cancel the setting operation and return to the previous screen.

1.2.4 To Add Data

1. Move the cursor to the axis you want to change.
2. Enter the add value into the data input field, and press the <Add> key.
   The value input to the value set at the cursor position is added and the cursor moves the next item.

1.2.5 Data Set by Reading a Parameter

1. Move the cursor to the X-/Y-/Z-axis you want to change.
2. Press the <Parameter is taken in.> key.



After pressing the <Yes> key, the machine coordinate that is set in the user parameter <Workpiece coordinate zero point * axis (for capture)> is applied.
Press <No> key to cancel the operation.

1.2.6 To Finish Editing

After the setting is completed, press the <Completion mode> key to end and exit editing.
Refer to “1.2.3.14 Edit Finish” in Operation Manual II for further details on how to exit editing.

The workpiece coordinate system currently being used cannot be changed while in tilt plane machining mode.
The alarm << Feature coordinate manufacturing mode engaged >> is triggered when an attempt is made to exit editing.

1.2.7 Editing during Operation

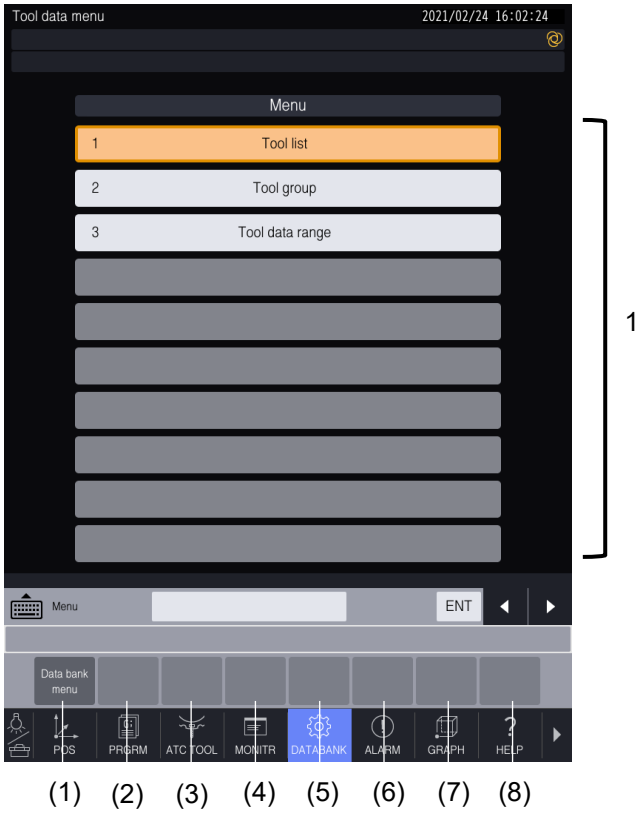
The workpiece coordinate zero point is used for calculation of a path commanded by a program in operation. The referenced timing is not by the execution pointer but is at the timing when the interpretation pointer is moved. So if a workpiece coordinate zero point is changed during operation, be cautious of the position of the interpretation pointer.

1.3 Tool Data (NC)

1.3.1 Tool Data Menu

1.3.1.1 Tool data menu screen

The user can set the information for the tool used in machining under <Tool list>, <Tool group> and <Tool data range>.
If the <Tool data> is selected from the <Data bank menu> screen, the <Tool data menu> screen appears.



Description of screen display

Position	Name	Description
1	Tool data menu	Displays the menu for setting the tool data.

Description of screen operation

1. Description of function key operations

Column	Position	Label	Description
1	(1)	<Data bank menu>	Changes to the <Data bank menu> screen.
	(2)		
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

2. Description of data bank menu operations
   - Tap on an item to change to the screen for that item.
   - Press the **[ENT]** key to change to the screen for an item selected with the cursor.
   - An item can be selected with the **[CURSOR]** keys (up and down).
   - After entering a number for an item, press the **[ENT]** key to change to the screen for that number.

1.3.2 Tool List

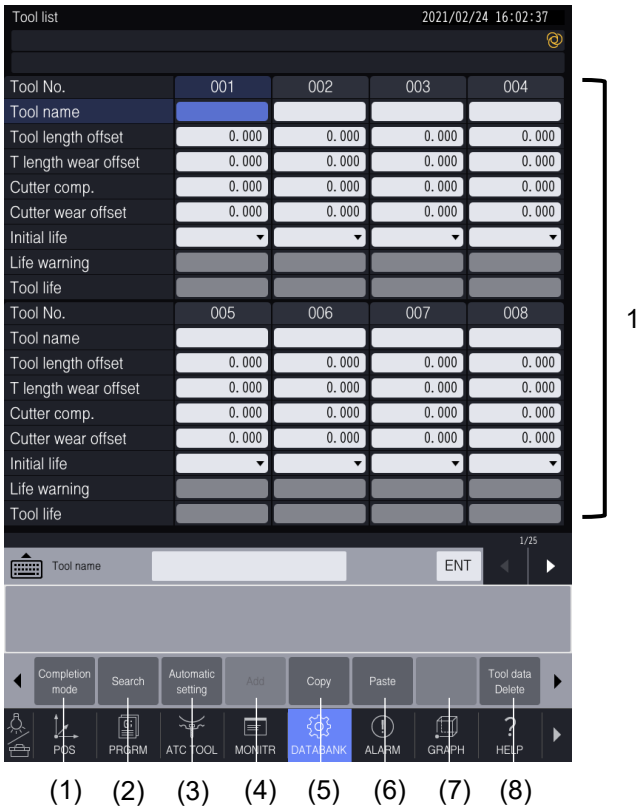
The user can register tools used for machining.
Information about tool length offset, tool diameter offset, life and the like which vary depending on the kinds of tools is registered.
Up to 198 tools can be registered.

(NOTE) The data that is set in the tool list during operation can be referenced when the interpretation pointer moves, not the execution pointer. Pay attention to the position of the interpretation pointer when changing data during operation and exiting or ending the editing.

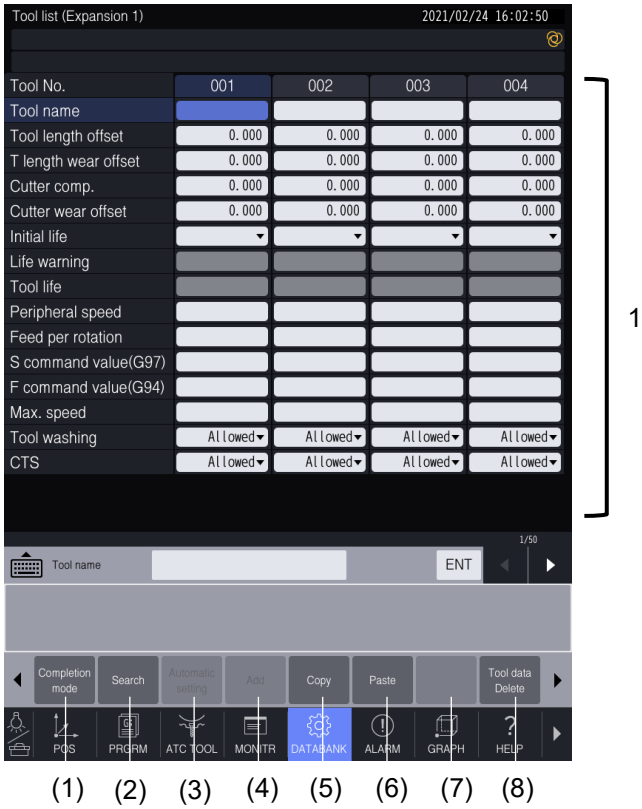
1.3.2.1 Tool data edit screen

When <Tool list> is selected from the <Tool data menu> screen, the tool data edit screen is displayed.
Under the tool data edit screen, there are the following screens: <Tool list>, <Tool list (Expansion 1)> and <Tool list (Expansion 2)>.

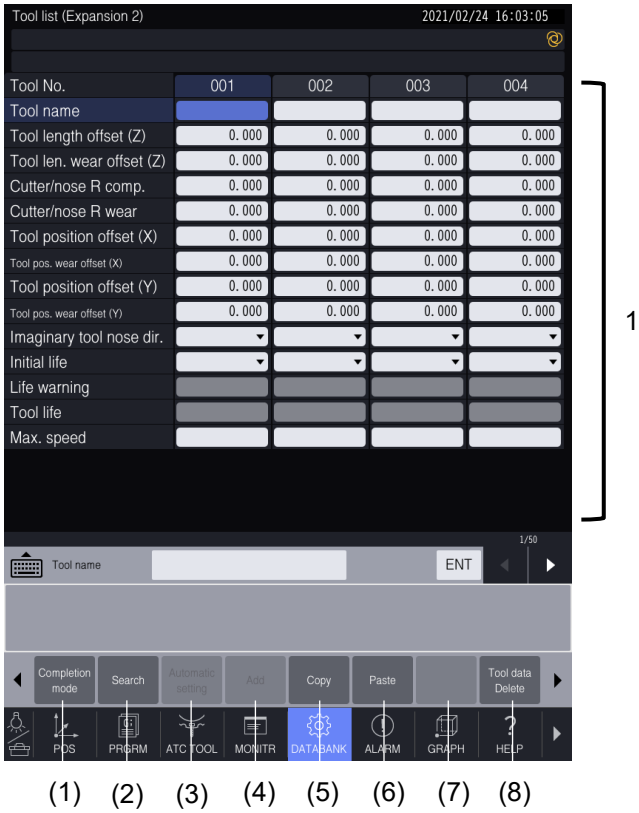
<Tool list> screen



<Tool list (Expansion 1)> screen



<Tool list (Expansion 2)> screen



Description of screen display

<Tool list> screen

Position	Name	Description
1	Tool list	• Displays the information for registered tools. • Refer to “Description of tool data items” below for further details on each item.

Description of tool data items

Item name	Description
<Tool No.>	• Displays the tool number. • Displays the registered pot numbers and highlights tools in green that are registered as ATC tools. Ex: Tool display for tool No. 5 that is registered to pot No. 3 005(P:03)
<Tool name>	Displays the tool name.
<Tool length offset>	Displays the value for tool length offset.
<T length wear offset>	Displays the value for tool length wear offset.
<Cutter comp.>	Displays the value for cutter compensation.
<Cutter wear offset>	Displays the value for cutter wear offset.
<Initial life> <End-of-life>	The item name switches between <Initial life> and <End-of-life> depending on the user parameter setting for the <Tool life counting method>. Displays the value for the initial life or end-of-life.
<Life warning>	Displays the value for the tool life warning.
<Tool life>	Displays the current value of the tool life.

<Tool list (Expansion 1)> screen

Position	Name	Description
1	Tool list (Expansion 1)	• Displays the information for registered tools. • Displays a screen for items that can be set, such as the <Tool list> items, the peripheral speed and the feed per rotation. • Refer to “Description of tool data items” below for further details on each item.

Description of tool data items

Item name	Description
<Tool No.>	Same as the <Tool list> screen.
<Tool name>	
<Tool length offset>	
<T length wear offset>	
<Cutter comp.>	
<Cutter wear offset>	
<Initial life>	
<Life warning>	
<Tool life>	
<Peripheral speed>	Displays the set value for the tool’s peripheral speed.
<Feed per rotation>	Displays the set value for the tool feed per rotation.
<S command value (G97)>	• Displays the S command value for a tool change when its constant peripheral speed control is being cancelled (G97). • Refer to section “5.7 Canned cycle for tool change (non-stop ATC) (G100)” in the Programming Manual (NC) for further details.
<F command value (G94)>	• Displays the F command value for a tool change during a feedrate per minute command (G94). • Refer to section “5.7 Canned cycle for tool change (non-stop ATC) (G100)” in the Programming Manual (NC) for further details.
<Max. speed>	• Displays the maximum speed for a tool mounted onto the spindle. • Refer to “10.1 S function” and “10.2 M function (spindle control)” in the Programming Manual (NC) for further details.

Item name	Description
<Tool washing>	Displays whether tool wash is used or not. Allowed: Tool wash is used. Not allowed: Tool wash is not used.
<CTS>	Displays whether CTS coolant is used or not. Allowed: CTS coolant is used. Not allowed: CTS coolant is not used.

<Tool list (Expansion 2)> screen

Position	Name	Description
1	Tool list (Expansion 2)	• Displays the information for registered tools. • Displays a screen that includes the <Tool list> items and setting items for the lathe tool. • Refer to “Description of tool data items” below for further details on each item.

Description of tool data items

Item name	Description
<Tool No.>	Same as the <Tool list> screen.
<Tool name>	
<Tool length offset (Z)>	Displays the set value for tool length offset (Z).
<Tool len. wear offset (Z)>	Displays the set value for tool length wear offset (Z).
<Cutter/nose R com.>	Displays the set value for cutter/nose R compensation.
<Cutter/nose R wear>	Displays the set value for cutter/nose R wear offset.
<Tool position offset (X)>	Displays the set value for tool position offset (X).
<Tool pos. wear offset (X)>	Displays the set value for tool position wear offset (X).
<Tool position offset (Y)>	Displays the set value for tool position offset (Y).
<Tool pos. wear offset (Y)>	Displays the set value for tool position wear offset (Y).
<Imaginary tool nose dir.>	• Displays the tool nose direction using a scale (0 to 9), when looking from the center of nose R on the lathe tool. Refer to “4.3.2 Virtual teeth” in the Programming Manual (NC) for further details.
<Initial life>	Same as the <Tool list> screen.
<Life warning>	
<Tool life>	
<Max. speed>	Same as the <Tool list (Expansion 1)> screen.

Description of screen operation

1. Description of function key operations
   The functions are the same on the following screens: <Tool list>, <Tool list (Expansion 1)> and <Tool list (Expansion 2)>.

Column	Position	Label	Description
1	(1)	<Completion mode>	Changes to the confirmation screen to end editing.
	(2)	<Search>	• The user can move to the specified tool number. • The user can enter a tool number (1 to 99 and 201 to 299) and press the <Search> key to move to the specified tool number. When doing a search, the cursor moves to the specified tool number.
	(3)	<Automatic setting>	Changes to the <Automatic setting> screen. The user can automatically set the data input value.
	(4)	<Add>	• The user can enter and add a value to the set value where the cursor is. • Enter the desired add value, and press the <Add> key. The user can enter and add a value to the set value where the cursor is. The <Add> key can be used with the following. <Tool length offset>, <T length wear offset>, <Cutter comp.> and <Cutter wear offset>.
	(5)	<Copy>	• The user can copy the tool data where the cursor is. Refer to “Copy tool data” below for further details.
	(6)	<Paste>	• The user can copy the tool data where the cursor is. Refer to “Copy tool data” below for further details.
	(7)		
	(8)	<Tool data Delete>	• Changes to the confirmation screen to delete tool data. • The user can delete the data at the tool number where the cursor is.
2	(1)	<Completion mode>	Changes to the confirmation screen to end editing.
	(2)	<List]	Displays the <Tool list> screen.
	(3)	<Expansion 1>	Displays the <Tool list (Expansion 1)> screen.
	(4)	<Expansion 2>	Displays the <Tool list (Expansion 2)> screen.
	(5)		
	(6)		
	(7)		
	(8)		

2. Copy tool data
   - The user can copy the tool data and apply it to another tool number.
   - The <Copy> key and <Paste> key are used to copy tool data.
   - Move the cursor to <Tool name> to copy the tool data. Thereafter, the <Copy> key and <Paste> key are enabled.
   - Copy procedure
     (1) Move the cursor to the <Tool name> of the tool that has the data you wish to import. The cursor can be moved by using the **[CURSOR]** keys or by tapping on the <Tool name>.
     (2) Press the <Copy> key.
     Import the data for the tool where the cursor is. The imported data is saved until other data is imported or until the power is turned OFF.
     (3) Move the cursor to the <Tool name> of the tool that has the data you wish to paste.
     (4) Press the <Paste> key.
     The data, for the tool where the cursor is, changes to the imported data.
3. Description of edit operations for tool data items
   - Tap on an item to move the cursor to that item and edit it.
   - Press the **[ENT]** key to edit an item where the cursor is.
   - The user can use the **[CURSOR]** keys to select an item to edit.

<Tool list> screen

Item name	Description
<Tool name>	Sets the tool name.
<Tool length offset> <T length wear offset>	• These functions set the Z-axis offset when the commands for tool length offset are issued. "Z-axis offset" = <Tool length offset> + <T length wear offset> • When the tool data range is set, if there is a value that is outside that range, the <Tool data setting range error> screen appears and the value cannot be set. Refer to "1.3.4. Tool data range" for details about setting the tool data range.
<Cutter comp.> <Cutter wear offset>	• Sets the offset when a cutter compensation command is issued. "Tool radius offset" = <Cutter comp.> + <Cutter wear offset> • When the tool data range is set, if there is a value that is outside that range, the <Tool data setting range error> screen appears and the value cannot be set. Refer to "1.3.4. Tool data range" for details about setting the tool data range.
<Initial life> <Life warning> <Tool life>	• Sets the tool life. Refer to the "Tool life settings and operation" for further details.

<Tool list (Expansion 1)> screen

Item name	Description
<Tool name> <Tool length offset> <T length wear offset> <Cutter comp.> <Cutter wear offset> <Initial life> <Life warning> <Tool life>	Same as the <Tool list> screen.
<Peripheral speed>	• Sets the peripheral speed for the tool. • When meters and inches are used for the unit, the display is "m/min" or "feet/min", respectively.
<Feed per rotation>	• Sets the feed per rotation for the tool. • When meters and inches are used for the unit, the display is "mm/rev." or "inch/rev.", respectively.
<S command value (G97)>	• Sets the S command value for a tool change when its constant peripheral speed control is being cancelled (G97). • The user parameter <Automatically use S command when changing tool> needs to be set to <1:Yes> beforehand. • Refer to section "5.7 Canned cycle for tool change (non-stop ATC) (G100)" in the Programming Manual (NC) for further details.
<F command value (G94)>	• Sets the F command value for a tool change during a feedrate per minute command (G94). • The user parameter <Automatically use F command when changing tool> needs to be set to <1:Yes> beforehand. • Refer to section "5.7 Canned cycle for tool change (non-stop ATC) (G100)" in the Programming Manual (NC) for further details.
<Max. speed>	• Sets the maximum speed for a tool mounted onto the spindle. • If the value is set to "0", rotation is not possible. Configure the setting to "0" for tools that cannot rotate, such as measurement tools and lathe tools. • Refer to "10.1 S function" and "10.2 M function (spindle control)" in the Programming Manual (NC) for further details.

Item name	Description
<Tool washing>	• Sets whether to use tool wash or not. • Set to <Not allowed> when not using coolant on a tool for tool washing. Tool washing is not used for tools that are set to <Not allowed>. • The spindle air blow is not carried out even when the machine parameter <Spindle air blow / tool wash> is set to <0: Spindle air blow type 1> or to <2: Spindle air blow type 2>. • The discharge conditions can be changed in the user parameter (switch 1: ATC/Magazine) <Tool wash discharge conditions for tool data>. (NOTE) When using a measuring instrument or similar item in memory operation mode or MDI operation mode, this function suppresses the amount of coolant applied to the tool during the tool change right before use. However, apart from suppressing the coolant amount as described above, this function does not prevent coolant from being applied to the tool. In addition, when the **[ATC]** key is pressed in manual mode, the tool washing is carried out regardless of this setting. Turn the **[CLT.P]** key OFF to stop the tool wash in manual mode.
<CTS>	• Sets whether CTS coolant is used out or not. • Set to <Not allowed> when using a tool that is not compatible with center-through-coolant. When a CTS coolant command is issued for a tool that is set to <Not allowed>, the alarm <<CTS unable tool>> is triggered and the CTS coolant does not discharge.

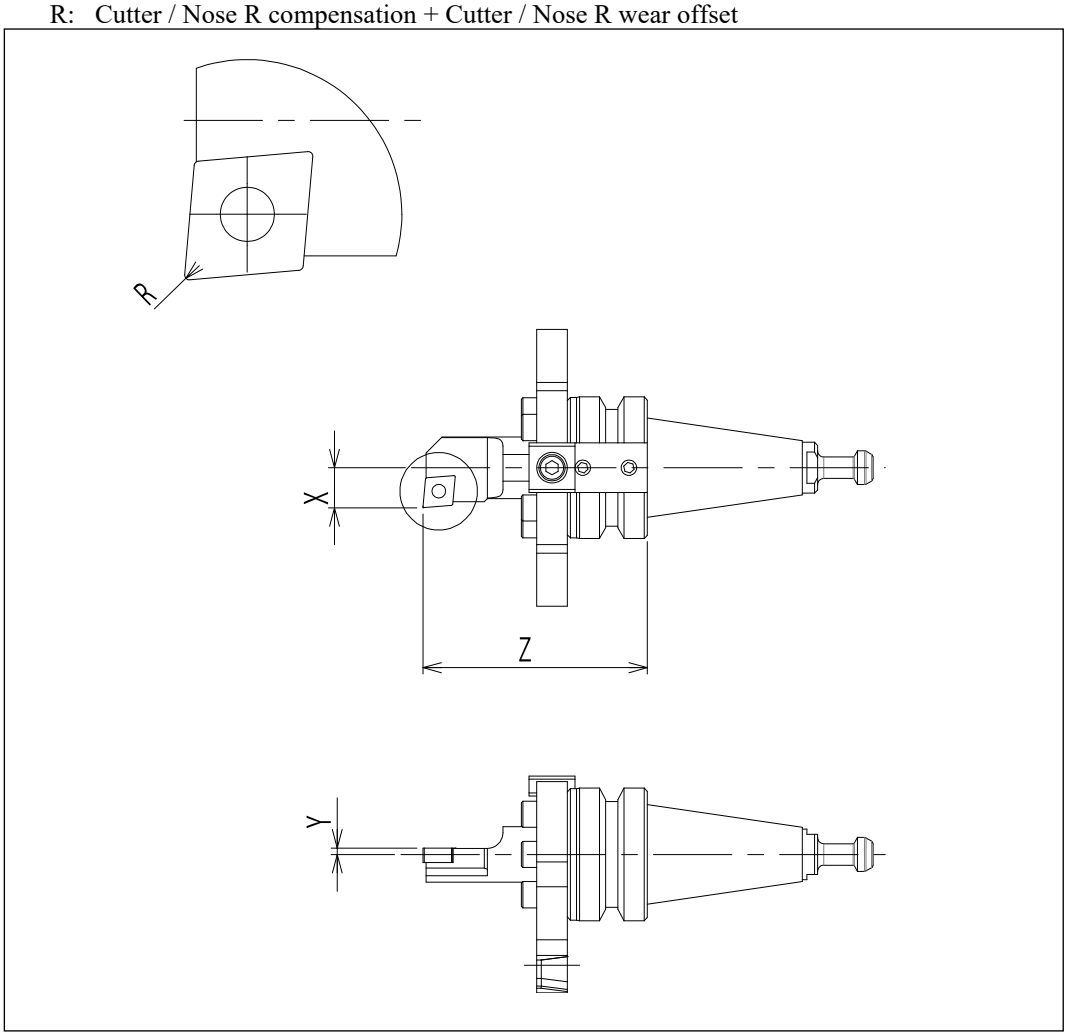
<Tool list (Expansion 2)> screen

Item name	Description
<Tool name>	Same as the <Tool list> screen.
<Tool length offset (Z)> <Tool len. wear offset (Z)>	• These functions set the Z-axis offset when the commands for tool length offset (G43/G44) and tool position compensation (G143/G144) are issued. "Z-axis offset" = <Tool length offset (Z)> + <Tool len. wear offset (Z)> • When the tool data range is set, if there is a value that is outside that range, the <Tool data setting range error> screen appears and the value cannot be set. Refer to "1.3.4. Tool data range" for details about setting the tool data range.
<Cutter/nose R com.> <Cutter/nose R wear>	• These functions set the offset when the commands for cutter compensation (G41/G42) and nose R compensation (G141/G142) are issued. "Tool radius offset" = <Cutter comp.> + <Cutter wear offset> "Nose R offset" = <Nose R compensation> + <Nose R wear> • When the tool data range is set, if there is a value that is outside that range, the <Tool data setting range error> screen appears and the value cannot be set. Refer to "1.3.4. Tool data range" for details about setting the tool data range.

Item name	Description
<Tool position offset (X)>	• These functions set the X-axis offset when the commands for tool position compensation (G143/G144) are issued. "X-axis tool position offset" = <Tool position offset (X)> + <Tool pos. wear offset (X)> • When the tool data range is set, if there is a value that is outside that range, the <Tool data setting range error> screen appears and the value cannot be set. Refer to "1.3.4. Tool data range" for details about setting the tool data range.
<Tool pos. wear offset (X)>	
<Tool position offset (Y)>	• These functions set the Y-axis offset when the commands for tool position compensation (G143/G144) are issued. "Y-axis tool position offset" = <Tool position offset (Y)> + <Tool pos. wear offset (Y)> • When the tool data range is set, if there is a value that is outside that range, the <Tool data setting range error> screen appears and the value cannot be set. Refer to "1.3.4. Tool data range" for details about setting the tool data range.
<Tool pos. wear offset (Y)>	
<Imaginary tool nose dir.>	• Displays the tool nose direction using a scale (0 to 9), when looking from the center of nose R on the lathe tool. Refer to "4.3.2 Virtual teeth" in the Programming Manual (NC) for further details.
<Initial life>	Same as the <Tool list> screen.
<Life warning>	
<Tool life>	
<Max. speed>	Same as the <Tool list (Expansion 1)> screen.

Figures of tool offset values for a lathe tool

Z: Tool length offset (Z) + Tool length wear offset (Z)
X: Tool position offset (X) + Tool position wear offset (X)
Y: Tool position offset (Y) + Tool position wear offset (Y)
R: Cutter / Nose R compensation + Cutter / Nose R wear offset



4. Tool life settings and operation
   <Initial life>/<End-of-life>
   - The item names on the tool data edit screen change depending on the user parameter <Tool life counting method>.

Item name	Set value for <Tool life counting method>	Tool life counting method
<Initial life>	<0: Type 1>	Counting down
<End-of-life>	<1: Type 2>	Counting up

- The user can move the cursor to items <Initial life> and <End-of-life> and set the counting unit, the initial tool life as well as the end-of-life of the tool.
  First, the tool life unit is set.
  The user can select the counting units for the tool life from the following 5 options.

Set value	Unit	Description
<1.Not counted>	None	Does not record or manage the tool life. When this setting is used, the display shows "******" in the fields for <Initial life>/<End-of-life>, <Life warning> and <Tool life>.
<2.Time(min.)>	min.	Records and manages the tool life based on the elapsed time (minutes). When the tool moves during cutting, the tool life (count) decreases or increases.
<3.Drilling(Holes)>	Holes	Records and manages the tool life based on the number of holes drilled. When performing drilling 1 using G81 in a drilling canned cycle, the tool life (count) decreases or increases. When using G392 or G376 in a canned cycle that is not for drilling, the tool life does not decrease or increase.
<4.Program(cycles)>	cycles	Records and manages the tool life based on the number of program cycles The user can select in the user parameter <Tool life unit (program)> whether to decrease or increase the tool life when a new tool is mounted on the spindle during a tool change. Or, the user can also select whether to decrease or increase the tool life when a new tool is mounted on the spindle during a M02 or M30 command.
<5.Time(Seconds)>	Seconds	Records and manages the tool life based on the elapsed time (seconds). When the tool moves during cutting, the tool life (count) decreases or increases.

When the count unit for the tool life is set, the screen changes to the initial life or end-of-life setting.
When <Initial life> is selected and used, the same value is also set to the <Tool life>.
When <End-of-life> is selected and used, the value zero (0) is set to the <Tool life>.

<Life warning>

- <Life warning> sets a value in the tool life to prompt or warn the user that the tool is close to the end of life.
- If the <Tool life> and the <Life warning> are the same value, the alarm <<Tool life ending (****)>> (asterisks in the parentheses indicate the tool number) is triggered.
  Even if an alarm is triggered, memory operation can be started.
  When using the count up method and the value zero (0) is set for the <Life warning>, the alarm does not trigger.

<Tool life>

- The current value is set for the tool life. When the count decreases or increases during machining and the tool life expires, the alarm <<Tool life ending (****)>> (asterisks in the parentheses indicate the tool number) is triggered. In addition, memory operation can be no longer be started.
- "Tool life has expired" means that the <Tool life> has reached zero (0) when using the count down method. Or, it means that the <Tool life> has reached the same value as <End-of-life> when using the count up method.
- <Tool life> is not subtracted or added in MDI operation.
- Subtraction/addition and check of tool life are done only to the tool commanded in memory operation. Accordingly, if tools are changed by interruption of MDI in memory operation, subtraction/addition and check of tool life are not done to the tool even if the memory operation is restored thereafter.
- The user can initialize or reset a tool life that has expired from the <ATC tool> screen.

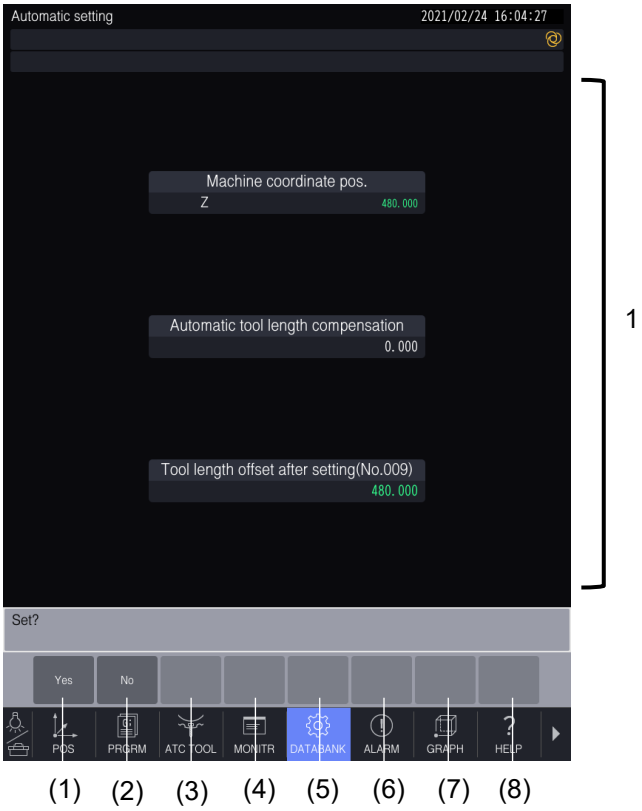
(NOTE) To save the edited content, press <Completion mode> and then select either <Save and end> or <Overwrite save>.

1.3.2.2 Automatic setting screen

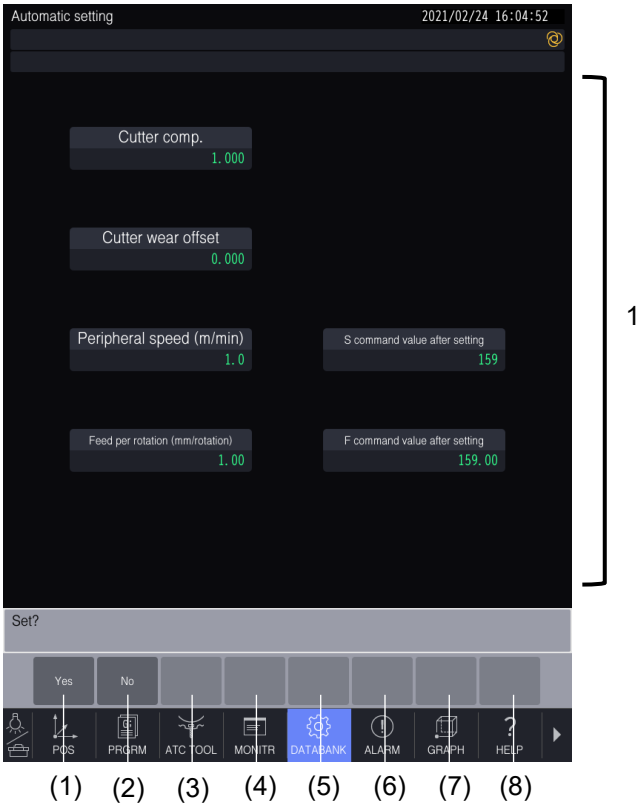
- The automatic setting can be used for the following items in the tool data.
  <Tool length offset>
  <Tool length offset (Z)>
  <S command value (G97)>
  <F command value (G94)>
- Move the cursor to the corresponding item and press the <Automatic setting> key.
  The <Automatic setting> screen appears for that tool data item.
- For <S command value (G97)> and <F command value (G94)>, the screen does not change to the <Automatic setting> screen in the following situations. In addition, the corresponding alarm is triggered.

Conditions	Triggered alarm
At least one of the following is not set: <Cutter compensation>, <Peripheral speed (m/min)> and <Feed per rotation (mm/rotation)>	<<Automatic setting items lack.>>
<Cutter compensation> + <Cutter wear offset> is 0 or less	<<Automatic setting calculation is unable.>>

- <Automatic setting> for <Tool length offset>



- <Automatic setting> for <S command value (G97)> and <F command value (G94)>



Description of screen display and screen operation
<Automatic setting> screen for <Tool length offset>

Description of screen display

Position	Name	Description
1	Automatic setting for tool length offset	• <Machine coord.> Displays the current machine coordinate position. • <Automatic tool length compensation> Displays the user parameter <Automatic tool length compensation>. • <Tool length offset after setting (No.***)> Displays the value that is automatically set for <Tool length offset>. This value is the difference when <Automatic tool length compensation> is subtracted from <Machine coordinate pos.>.

Description of screen operation
Description of function key operations

Column	Position	Label	Description
1	(1)	<Yes>	Sets the value in the <Tool length offset after setting (No.***)> as the <Tool length offset> and then goes back to the previous screen.
	(2)	<No>	Cancels the setting and goes back to the previous screen.
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

<Automatic setting> screen for <S command value (G97)> and <F command value (G94)>

Description of screen display

Position	Name	Description
1	Automatic setting for S command value and F command value	• <Cutter comp.> Displays the set value for <Cutter comp.>. • <Cutter wear offset> Displays the set value for <Cutter wear offset>. • <Peripheral speed (m/min)> Displays the set value for <Peripheral speed (m/min)>. • <Feed per rotation (mm/rotation)> Displays the set value for <Feed per rotation (mm/rotation)>. • <S command value after setting> Displays the S command value that is calculated from the <Cutter comp.>, <Cutter wear offset>, Peripheral speed (m/min)> and <Feed per rotation (mm/rotation)>. • <F command value after setting> Displays the F command value that is calculated from the <Cutter comp.>, <Cutter wear offset>, Peripheral speed (m/min)> and <Feed per rotation (mm/rotation)>.

Description of screen operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Yes>	Sets the <S command value after setting> and <F command value after setting> to the <S command value (G97)> and <F command value (G94)>, and then goes back to the previous screen.
	(2)	<No>	Cancels the setting and goes back to the previous screen.
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

1.3.2.3 Tool data setting range error screen

When the tool data range is set and an attempt is made to set a value that is outside that range, the <Tool data setting range error> screen appears. Refer to “1.3.4. Tool data range” for details about setting the tool data range.

The tool data items are as follows.

Tool data edit screen	Tool data item
<Tool list> screen <Tool list (Expansion 1)> screen	<Tool length offset> <T length wear offset> <Cutter comp.> <Cutter wear offset>
<Tool list (Expansion 2)> screen	<Tool length offset (Z)> <Tool len. wear offset (Z)> <Cutter/nose R com.> <Cutter/nose R wear> <Tool position offset (X)> <Tool pos. wear offset (X)> <Tool position offset (Y)> <Tool pos. wear offset (Y)>

Ex: <Tool data setting range error> screen for the <Tool length offset (Z)>

Description of screen display

Position	Name	Description
1	Tool data setting range error	Displays information about the set value range error. Refer to “Data items for set value range error” below for further details.

Data items for set value range error

Item	Description
Tool No.	Displays the tool number where there was a set value range error.
Type	Displays the tool data item where there was a set value range error.
Setting range	Displays the data setting range.
Set value	Displays the value entered.

Description of screen operation

Description of function key operations

Column	Position	Label	Description
1	(1)		
	(2)		
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)	<Back>	Goes back to the previous screen.

1.3.2.4 Confirmation screen for tool data deletion

Move the cursor to the <Tool name> to delete the tool data. The <Tool data Delete> key is enabled.
When the <Tool data Delete> key is selected, a confirmation screen appears asking whether to delete the tool data or not as shown below, for the tool data where the cursor is.

Description of screen display

Position	Name	Description
1	Tool numbers for deleting tool data	Displays the tool data to be deleted. The tool data is deleted at the tool number where the cursor is.
2	Confirmation whether to delete tool data	Displays a message to confirm deletion.

Description of screen operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Yes>	Deletes the tool data at the tool number where the cursor is, and then goes back to the previous screen. The deleted tool data is imported. The imported data is saved until other data is imported or until the power is turned OFF.
	(2)	<No>	Cancels the deletion and goes back to the previous screen.
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

1.3.2.5 Confirmation screen to end editing

The user selects whether to save or discard the tool data that was changed.
When the <Completion mode> key is selected from the tool data edit screen, the following screen appears.

(1) (2) (3) (4) (5) (6) (7) (8)

Description of screen display
Description of function key operations

Column	Position	Label	Description
1	(1)	<Save and end>	Saves the edited content up until now and then exits. Goes back to the <Tool data menu> screen.
	(2)		
	(3)		
	(4)	<Cancel w/o saving changes>	Discards the edited content up until now. Goes back to the <Tool data menu> screen.
	(5)		
	(6)		
	(7)	<Overwrite save>	Overwrites and saves the edited content up until now to a file, and then goes back to the previous screen.
	(8)	<Edit mode>	Returns to editing.

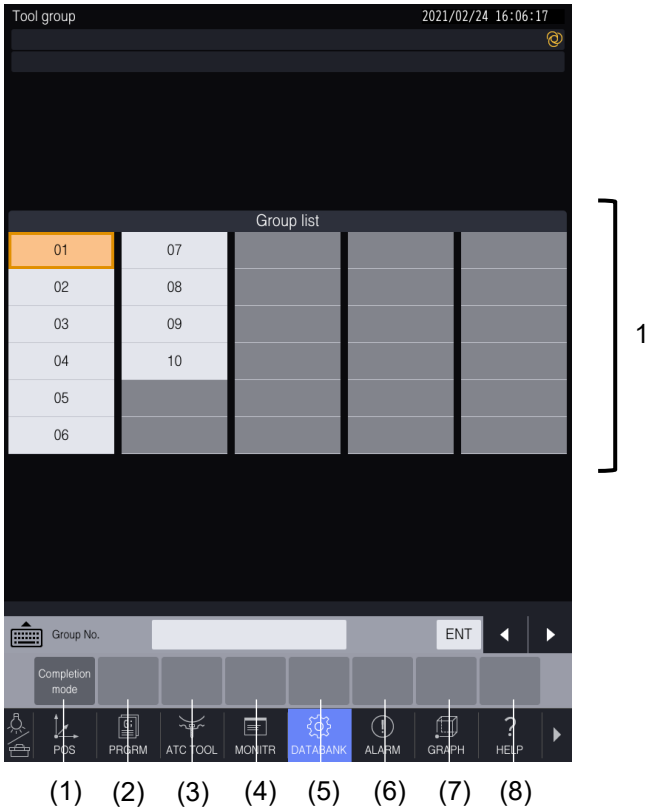
1.3.3 Tool Group

By registering multiple tools in a tool group, you can have the next tool selected from the group for machining when the tool life expires. You can register up to 30 groups.
In addition, the user can register up to 30 tools in one group.

(NOTE) The data that is set in the tool group during operation can be referenced when the interpretation pointer moves, not the execution pointer. Pay attention to the position of the intepretation pointer when changing data during operation and exiting or ending the editing.

1.3.3.1 Tool group list screen

When <Tool group> is selected from the <Tool data menu> screen, the tool group list screen is displayed.



Description of screen display

Position	Name	Description
1	Tool group list	Displays a list of group numbers that tools are registered to. The tool group numbers that are registered (01 to 30) are displayed in ascending order starting from the top left.

Description of screen operation

1. Description of function key operations

Column	Position	Label	Description
1	(1)	<Completion mode>	Changes to the confirmation screen to end editing.
	(2)		
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

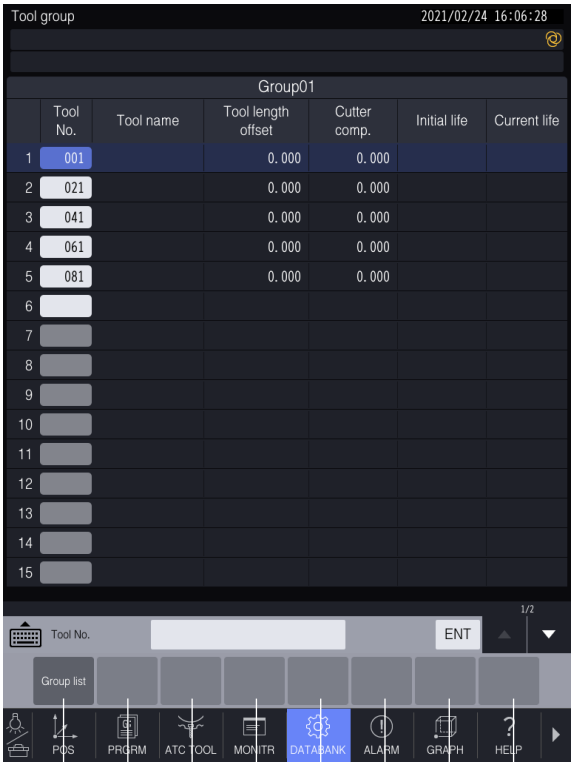
2. Description of operations for tool group list
   The user can create new groups as well as edit and delete the registered groups.
   Create a new group
   - Enter a group number (1 to 30) that is not registered and press the **[ENT]** key.
     The tool group edit screen appears for the tool group number that is entered.

   Edit a registered group
   - When the **[ENT]** key is pressed, the screen changes to the tool group edit screen for the tool group number where the cursor is.
     The cursor can be moved with the **[CURSOR]** keys.
   - When a registered group number is entered and the **[ENT]** key is pressed, the screen changes to the tool group edit screen for that tool group number.
   - After tapping on a tool group number that is displayed, the screen changes to the tool group edit screen for that tool group number.

   Delete a registered group
   - When the cursor is moved to a tool group number and the **[Delete]** key is pressed, the tool group number is deleted where the cursor is.
   - When a tool group number is deleted, the remaining data moves up one position accordingly.

1.3.3.2 Tool group edit screen

The user can register an available tool to a tool group number.



Description of screen display

Position	Name	Description
1	Registered tool list	Displays a list of tools that are resgistered to a group.

Description of screen operation

1. Description of function key operations

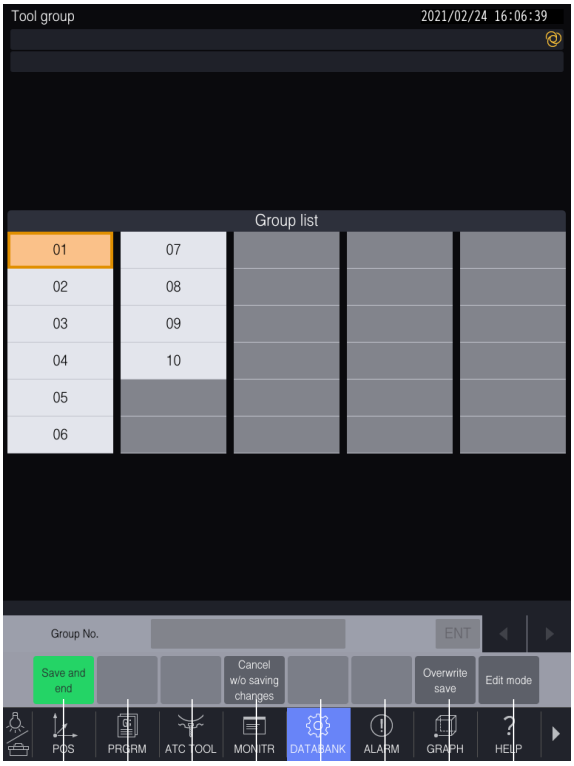
Column	Position	Label	Description
1	(1)	<Group list>	Changes to the tool group list screen.
	(2)		
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

2. Description of operations for registered tool list
   The user can register tools and delete registered tools.
   Register a tool
   - Move the cursor to a tool position to register a tool.
     The user can use the **[CURSOR]** keys or tap on a tool number to move the cursor.
   - Enter a tool number that is not registered and press the **[ENT]** key.
     A tool is added to the cursor position.
     When a tool is added, the remaining data moves down one position accordingly.

   Delete a registered tool number
   - When the cursor is moved to a tool number and the **[Delete]** key is pressed, the tool number is deleted where the cursor is.
   - When a tool is deleted, the remaining data moves up one position accordingly.

1.3.3.3 Edit end confirmation screen

The user selects whether to save or discard the tool data that was changed.
When the <Completion mode> key is selected from the tool group list screen, the following screen appears.



(1) (2) (3) (4) (5) (6) (7) (8)

Description of screen operation
Description of function key operations

Column	Position	Label	Description
1	(1)	<Save and end>	Saves the edited content up until now and then exits. Goes back to the <Tool data menu> screen.
	(2)		
	(3)		
	(4)	<Cancel w/o saving changes>	Discards the edited content up until now. Goes back to the <Tool data menu> screen.
	(5)		
	(6)		
	(7)	<Overwrite save>	Overwrites and saves the edited content up until now to a file, and then goes back to the previous screen.
	(8)	<Edit mode>	Returns to editing.

1.3.4 Tool Data Range

The user can set the value range for each tool data item on the tool data edit screen.
Setting this range helps prevent accidental mistakes when entering data.
For example, when a value outside the set range is entered, a warning screen appears.
Refer to “1.3.2.3 Tool data setting range error screen” for details about the displayed warnings.

The tool data items on the tool data edit screen are as follows.

Tool data edit screen	Tool data item
<Tool list> screen <Tool list (Expansion 1)> screen	<Tool length offset> <T length wear offset> <Cutter comp.> <Cutter wear offset>
<Tool list (Expansion 2)> screen	<Tool length offset (Z)> <Tool len. wear offset (Z)> <Cutter/nose R com.> <Cutter/nose R wear> <Tool position offset (X)> <Tool pos. wear offset (X)> <Tool position offset (Y)> <Tool pos. wear offset (Y)>

(NOTE) The data that is set in the tool data range during operation can be referenced when the intepretation pointer moves, not the execution pointer. Pay attention to the position of the interpretation pointer when changing data during operation and exiting or ending the editing.

1.3.4.1 Tool data range edit screen

When <Tool data range> is selected from the <Tool data menu> screen, the tool data range edit screen is displayed.

Ex: <Tool data range (tool length)> screen

Description of screen display

Position	Name	Description
1	Tool No.	Same as “1.3.2.1 Tool data edit screen”.
2	Tool name	Same as “1.3.2.1 Tool data edit screen”.
3	Tool data item	Displays the tool data items for setting the data range. Refer to “Tool data items on tool data range edit screen” for details about the tool data items.
4	Tool data range	Displays the data range that is set.

Tool data items on tool data range edit screen

There are 5 types of screens related to the tool data range edit screen.

The data entry range can be restricted or set for the following tool data items on the tool data edit screen.

Tool data range edit screen		Tool data items on too data edit screen	
Screen type	Tool data item	Tool list Tool list (Expansion 1)	Tool list (Extension 2)
Tool data range (tool length)	Tool length offset T length wear offset	Tool length offset T length wear offset	Tool length offset (Z) Tool len. wear offset (Z)
Tool data range (tool radius)	Cutter compensation Cutter wear offset	Cutter compensation Cutter wear offset	Cutter/nose R comp. Cutter/nose R wear
Tool data range (cutter/nose R)	Cutter/nose R comp. Cutter/nose R wear	Cutter comp. Cutter wear offset	Cutter/nose R comp. Cutter/nose R wear
Tool data range (tool position X)	Tool position offset (X) Tool pos. wear offset (X)		Tool position offset (X) Tool pos. wear offset (X)
Tool data range (tool position Y)	Tool position offset (Y) Tool pos. wear offset (Y)		Tool position offset (Y) Tool pos. wear offset (Y)

Description of screen operation

1. Description of function key operation

Column	Position	Label	Description
1	(1)	<Completion mode>	Changes to the confirmation screen to end editing.
	(2)	<Search>	Same as “1.3.2.1 Tool data edit screen”.
	(3)	<Copy>	
	(4)	<Paste>	
	(5)	<Tool length>	Displays the <Tool data range (tool length)> screen.
	(6)	<Tool radius> <Cutter/Nose R>	<Tool radius> is shown when the tool data edit screen is currently displaying for the <Tool list> screen or <Tool list (Expansion 1)> screen. <Cutter/Nose R> is shown for the <Tool list (Expansion 2)> screen. When the <Tool radius> is shown, the <Tool data range (tool radius)> is displayed. When the <Cutter/Nose R> is shown, the <Tool data range (Cutter/Nose R)> is displayed.
	(7)	<Tool position X>	Displays the <Tool data range (tool position X)> screen.
	(8)	<Tool position Y>	Displays the <Tool data range (tool position Y)> screen.

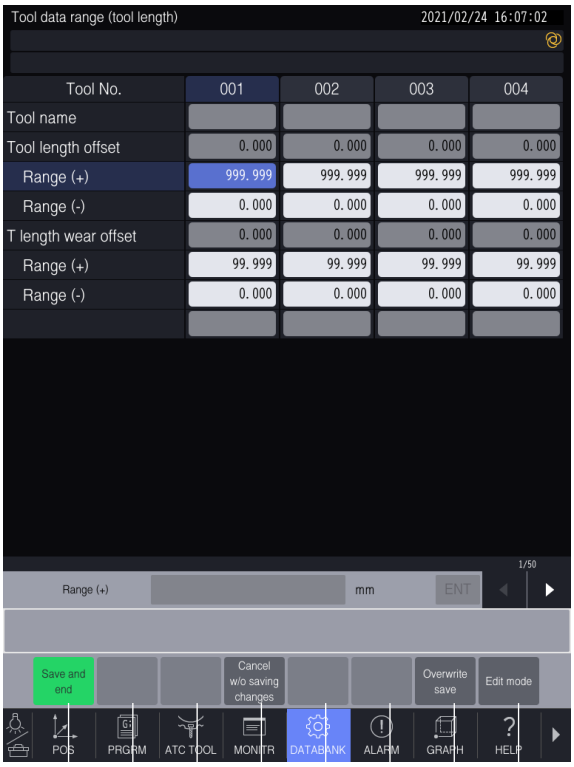
2. Description of input operations for tool data range
   - The user can tap on the items <Range (+)> and <Range (-)> to move the cursor and perform editing operations.
   - Press the **[ENT]** key to edit an item where the cursor is.
   - The user can use the **[CURSOR]** keys to select an item to edit.
   - When setting the tool data range, if the “Range (-)” value is greater than the “Range (+)” value, then the values cannot be set.

Description of check operations for tool data range

- If either the <Range (+)> or <Range (-)> is not set, the range will not set and will not be checked.
- When using the automatic setting or the adding setting, the range check is also carried out, and a warning screen is displayed.
- When the tool data is set using memory operation, such as a macro or G10, a range check is also carried out.
- The range is also checked when executing tool length offset / cutter compensation (G41-44) and tool position compensation / nose R compensation (G141 – G144) during memory operation. The alarm <<Comm. issued to area other than (tool) data area>> is triggered when the command area is outside of the range.

1.3.4.2 Edit end confirmation screen

The user selects whether to save or discard the tool data range that was changed.
When the <Completion mode> key is selected from the tool data range edit screen, the following screen appears.



(1) (2) (3) (4) (5) (6) (7) (8)

Description of screen operation
Description of function key operations

Column	Position	Label	Description
1	(1)	<Save and end>	Saves the edited content up until now and then exits. Goes back to the <Tool data menu> screen.
	(2)		
	(3)		
	(4)	<Cancel w/o saving changes>	Discards the edited content up until now. Goes back to the <Tool data menu> screen.
	(5)		
	(6)		
	(7)	<Overwrite save>	Overwrites and saves the edited content up until now to a file, and then goes back to the previous screen.
	(8)	<Edit mode>	Returns to editing.

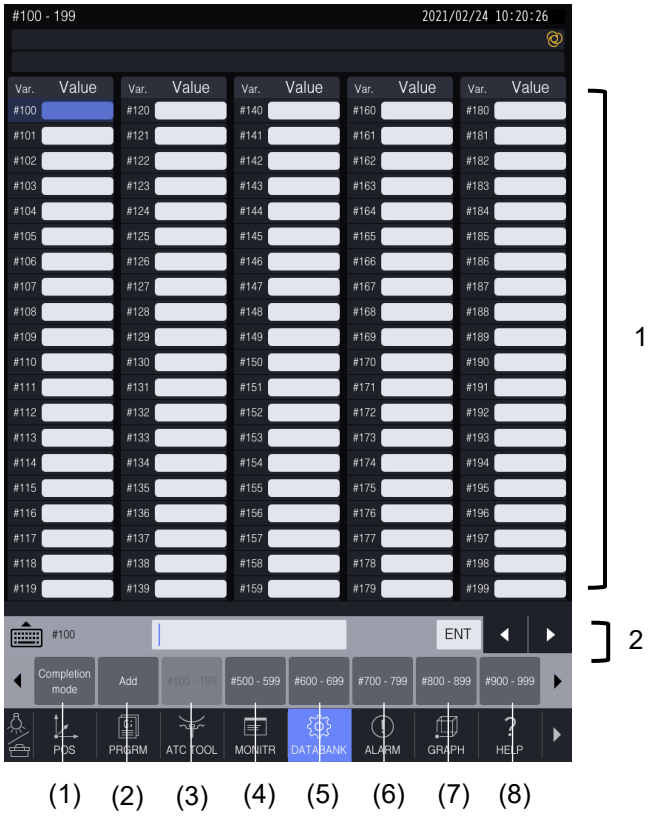
1.4 Macro Variables (NC)

1.4.1 Outline

Macro variables in #100s, #500s, #600s, #700s, #800s, and #900s are set. The local variables (#001 to #33) are available only for reference.

1.4.2 Macro Variable Screen

The macro variable edit screen is displayed when <Macro variables>is selected from the <Data bank menu> screen.



1.4.2.1 Description of screen display

Position	Name	Description
1	Macro variable list	Displays a list of macro variable values. When a value exceeds the displayable range for a macro variable, asterisks (“**********”) are displayed. If the number of digits after the decimal point exceeds the range that can be displayed, then it is rounded off to a value that can be displayed.
2	Data input field/ Instructions area	Displays the data input field for changing a macro variable.

1.4.2.2 Description of screen operation

1. Description of function key operations

Column	Position	Label	Description
1	(1)	<Completion mode>	Ends and exits the macro variable editing.
	(2)	<Add>	Adds the entered value to the selected macro variable, and then the cursor moves to the next macro variable. (NOTE 1) The add function cannot be used with macro variables where asterisks (“**********”) are displayed for the value (when the set value exceeds the displayable range). (NOTE 2) When an addition operation is carried out for macro variables #100 to #199, it performs an addition operation for a value that can be displayed on the screen (value is rounded off to a value that can be displayed).
	(3)	<#100 - 199>	Displays the values of the macro variables (#100 – 199).
	(4)	<#500 - 599>	Displays the values of the macro variables (#500 – 599).
	(5)	<#600 - 699>	Displays the values of the macro variables (#600 – 699).
	(6)	<#700 - 799>	Displays the values of the macro variables (#700 – 799).
	(7)	<#800 - 899>	Displays the values of the macro variables (#800 – 899).
	(8)	<#900 - 999>	Displays the values of the macro variables (#900 – 999).
2	(1)	<Completion mode>	Same as the first column.
	(2)	<Local variable>	Displays the values of the local variables (#1 – 33).
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

2. Description of macro variable operations
   - Local variables can only be referenced. The variables cannot be selected with the tap operation or with the **[CURSOR]** keys.
   - When a given value is entered and the **[ENT]** key is pressed, the selected macro variable is changed and then the cursor moves to the next macro variable.
     * The macro variables #100 to #199 are enabled while the power is ON.
     When the power is turned OFF, the values become an empty field.
   - To delete a value, select the desired macro variable and then press the **[Delete]** key. The value for the selected macro variable becomes “blank”.
   - The macro variables in the program are updated during operation when the interpretation pointer moves, not the execution pointer. Therefore, when a macro variable is updated during operation, pay attention to the position of the interpretation pointer.

1.5 User Parameter

1.5.1 Outline

Parameters for machine operation are set. They are important data for operation of the machine. So change them prudently. Keep the parameter list attached on the machine in safe.

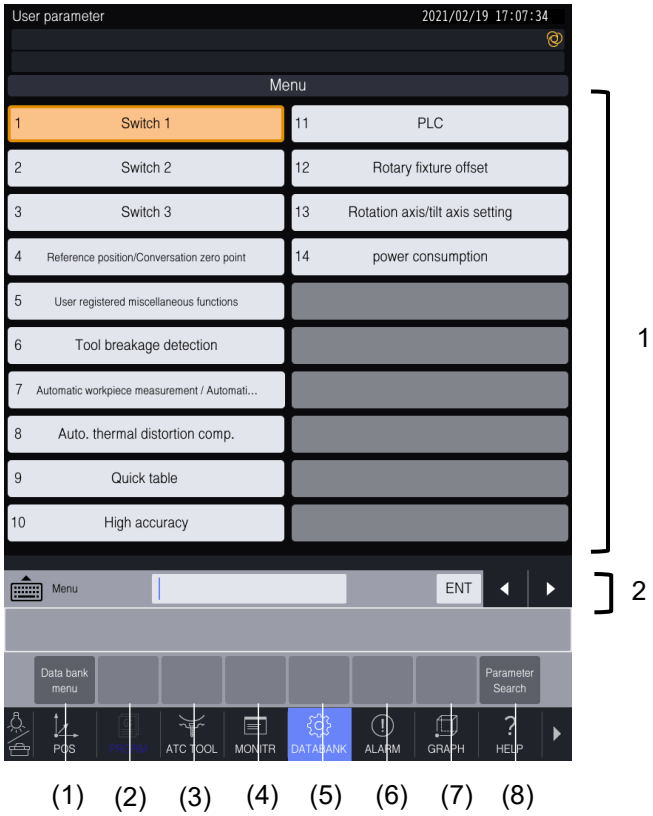
The user parameters are divided into the following categories in the menu.

<table>
<tr><th>Menu item</th><th>Explanation</th></tr>
<tr><td>Switch 1</td><td>Sets the parameters for screen displays and motion types.
The parameters are divided into the following categories, and the function keys can be used to change to each category.
<table>
<tr><th>Category name</th></tr>
<tr><td>Common</td></tr>
<tr><td>Operation</td></tr>
<tr><td>Programming</td></tr>
<tr><td>Compensation function</td></tr>
<tr><td>Canned cycle</td></tr>
<tr><td>Data</td></tr>
<tr><td>Manual operation</td></tr>
<tr><td>Conv Ex</td></tr>
<tr><td>ATC/Magazine</td></tr>
<tr><td>Installation</td></tr>
<tr><td>Brake load test</td></tr>
<tr><td>Door</td></tr>
<tr><td>System</td></tr>
</table>
The parameter <Conv Ex> is displayed only when the conversation language is used.</td></tr>
<tr><td>Switch 2</td><td>Sets the parameters for axial motions.
The parameters are divided into the following categories, and the function keys can be used to change to each category.
<table>
<tr><th>Category name</th></tr>
<tr><td>Stroke</td></tr>
<tr><td>Override speed</td></tr>
<tr><td>Output signal range for position signal</td></tr>
<tr><td>Excess travel amount for single direction positioning</td></tr>
<tr><td>External index</td></tr>
</table></td></tr>
<tr><td>Switch 3</td><td>Sets the G code and M code used for checking if the positioning is finished, for displaying alarm numbers with lower priority and for displaying modals.
The parameters are divided into the following categories, and the function keys can be used to change to each category.
<table>
<tr><th>Category name</th></tr>
<tr><td>Positioning end check distance</td></tr>
<tr><td>Low priority indication alarm No.</td></tr>
<tr><td>Modal display setting</td></tr>
</table></td></tr>
<tr><td>Reference position/ Conversation zero point</td><td>Sets the parameters for reference points and conversational zero points.</td></tr>
<tr><td>User registered auxiliary function</td><td>Sets the user registered auxiliary function.</td></tr>
<tr><td>Tool breakage detection</td><td>Sets the parameters for tool breakage detectors.</td></tr>
<tr><td>Automatic workpiece measurement</td><td>Sets the parameters for automatic workpiece measurement.</td></tr>
<tr><td>Automatic thermal distortion compensation</td><td>Sets the parameters for automatic thermal distortion offset.</td></tr>
<tr><td>Quick table</td><td>Sets the parameters for quick tables. The machine which has no quick table is neglected.</td></tr>
</table>

<table>
<tr><th>Menu item</th><th>Explanation</th></tr>
<tr><td>High accuracy</td><td>Sets the parameters for high accuracy mode.
The parameters are divided into the following categories, and the function keys can be used to change to each category.<table><tr><th>Category name</th></tr><tr><td>Common</td></tr><tr><td>High accuracy A</td></tr><tr><td>High accuracy B</td></tr><tr><td>Machining mode</td></tr><tr><td>Accuracy spec. mode</td></tr></table></td></tr>
<tr><td>PLC</td><td>Sets the parameters for PLC.</td></tr>
<tr><td>Rotary fixture offset</td><td>Set the parameters related to rotary fixture offset.</td></tr>
<tr><td>Rotation axis/tilt axis setting</td><td>Set the parameters related to the rotation axis and tilt axis.</td></tr>
<tr><td>Power consumption</td><td>Sets the parameters related to power consumption.
The parameters are divided into the following categories, and the function keys can be used to change to each category.<table><tr><th>Category name</th></tr><tr><td>Power consumption setting</td></tr><tr><td>User device setting</td></tr><tr><td>Display setting</td></tr></table></td></tr>
</table>

1.5.2 User Parameter Menu Screen

The user parameter screen is displayed when <User parameter> is selected from the <Data bank menu> screen.



Position	Name	Description
1	Menu	Displays the user parameter menu screen.
2	Data input field	This field is for entering and selecting a menu number.

Function key display area

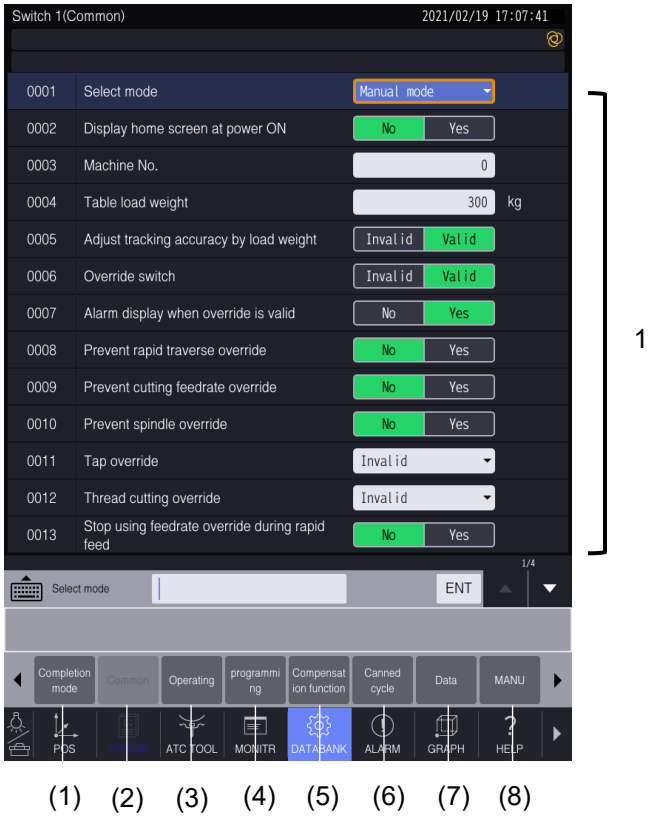
Column	Position	Label	Description
1	(1)	<Data bank menu>	Changes to the <Data bank menu> screen.
	(2)		
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)	<Parameter Search>	When a parameter number (6 digits) is entered into the data input field and the <Parameter Search> key is pressed, the edit screen is displayed for the specified parameter number and the cursor moves to the specified parameter number.

When a menu item is selected from the <User parameter menu> screen, the edit screen for that item is displayed.

(NOTE) In conversation language, <Rotary fixture offset> and <Feature coordinate setting> are grayed out and cannot be selected.

1.5.3 Edit Screen

1.5.3.1 <Switch 1> screen



Description of screen display

Position	Name	Description
1	Parameter list	Displays each parameter item and the corresponding value.

Description of screen operation

1. Description of function key operations

The cursor can be moved to the header of the category.

Column	Position	Label	Description
1	(1)	<Completion mode>	Ends and exits the switch 1 editing.
	(2)	<Common>	Moves the cursor to the <Common> header.
	(3)	<Operation>	Moves the cursor to the <Operation> header.
	(4)	<Programming>	Moves the cursor to the <Programming> header.
	(5)	<Compensation function>	Moves the cursor to the <Compensation function> header.
	(6)	<Canned cycle>	Moves the cursor to the <Canned cycle> header.
	(7)	<Data>	Moves the cursor to the <Data> header.
	(8)	<MANU>	Moves the cursor to the <MANU> header.
2	(1)	<Completion mode>	Ends and exits the switch 1 editing.
	(2)	<Conv Ex>	Moves the cursor to the <Conv Ex> header. This key grays out in the NC language.
	(3)	<ATC/Magazine>	Moves the cursor to the <ATC/Magazine> header.
	(4)	<Installation>	Moves the cursor to the <Installation> header.
	(5)	<Brake load test>	Moves the cursor to the <Brake load test> header.
	(6)	<Door>	Moves the cursor to the <Door> header.
	(7)	<System>	Moves the cursor to the <System> header.
	(8)		

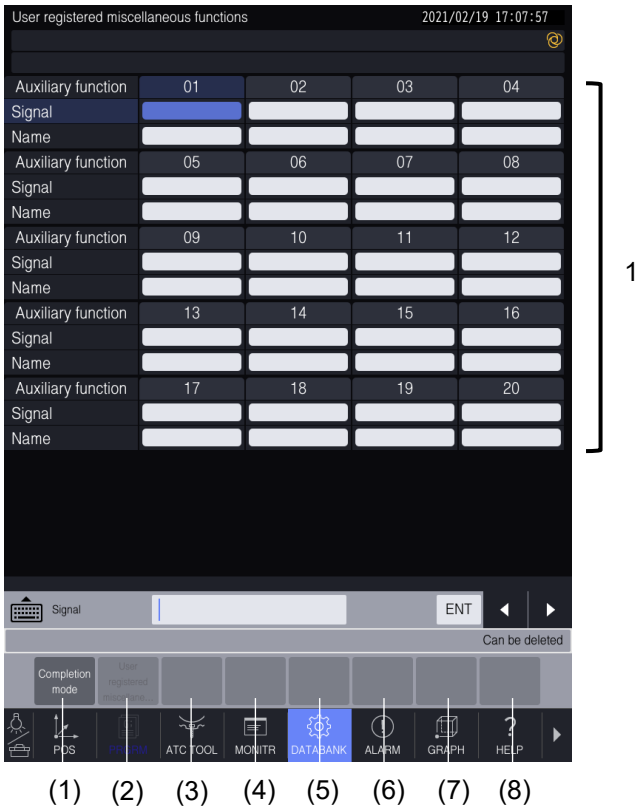
2. Description of parameter list operations
   - Tap on an item to change to the screen for that item.
   - Press the **[ENT]** key to edit the corresponding item.
   - An item can be selected with the **[CURSOR]** keys (up and down).
3. Description of completion mode operations

(1) (2) (3) (4) (5) (6) (7) (8)

Description of function key operations

Column	Position	Label	Description
1	(1)	<Save and end>	Saves the edited content and exits user parameter editing. Goes back to the menu screen.
	(2)		
	(3)		
	(4)	<Cancel w/o saving changes>	Discards the edited content and exits user parameter editing. However, the overwritten content is still valid.
	(5)		
	(6)		
	(7)	<Overwrite save>	Saves the edited content and continues with user parameter editing. Goes back to the edit screen.
	(8)	<Edit mode>	Continues with user parameter editing without saving the edited content. Goes back to the edit screen.

1.5.3.2 <User registered miscellaneous functions> screen



Description of screen display

Position	Name	Description
1	Parameter list	Displays each parameter item and the corresponding value.

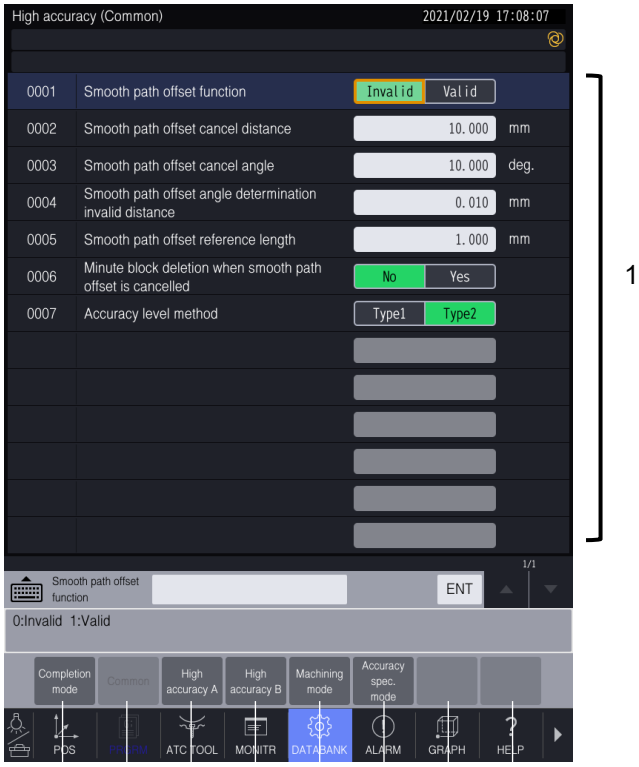
Description of screen operation

1. Description of function key operations

Column	Position	Label	Description
1	(1)	<Completion mode>	Ends and exits the editing for user registered miscellaneous functions.
	(2)		
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

2. Description of parameter list operations
   - Tap on an item to change to the screen for that item.
   - Press the **[ENT]** key to edit the corresponding item.
   - An item can be selected with the **[CURSOR]** keys (up, down, left and right).

1.5.3.3 <High accuracy> screen



Description of screen display

Position	Name	Description
1	Parameter list	Displays each parameter item and the corresponding value.

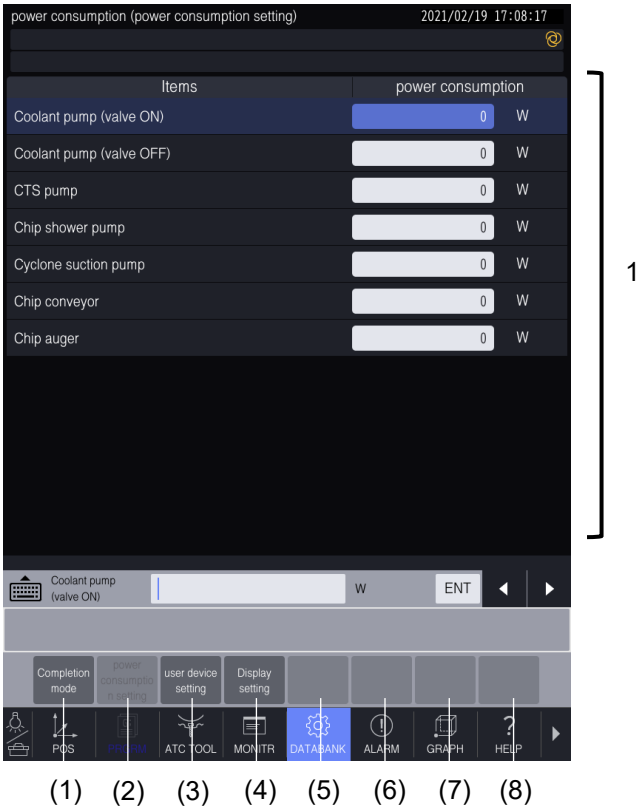
Description of screen operation

1. Description of function key operations

Column	Position	Label	Description
1	(1)	<Completion mode>	Ends and exits high accuracy editing.
	(2)	<Common>	Moves the cursor to the <Common> header.
	(3)	<High accuracy A>	Moves the cursor to the <High accuracy A> header.
	(4)	<High accuracy B>	Moves the cursor to the <High accuracy B> header.
	(5)	<Machining mode>	Moves the cursor to the <Machining mode> header.
	(6)	<Accuracy spec. mode>	Moves the cursor to the <Accuracy spec. mode> header.
	(7)		
	(8)		

2. Description of parameter list operation
   - Tap on an item to change to the screen for that item.
   - Press the **[ENT]** key to edit the corresponding item.
   - An item can be selected with the **[CURSOR]** keys (up, down, left and right).

1.5.3.4 <Power consumption> screen



Description of screen display

Position	Name	Description
1	Parameter list	Displays each parameter item and the corresponding value.

Description of screen operation

1. Description of function key operations

Column	Position	Label	Description
1	(1)	<Completion mode>	Ends and exits power consumption editing.
	(2)	<Power consumption setting>	Moves the cursor to the <Power consumption setting> header.
	(3)	<User device setting>	Moves the cursor to the <User device setting> header.
	(4)	<Display setting>	Moves the cursor to the <Display setting> header.
	(5)		
	(6)		
	(7)		
	(8)		

2. Description of parameter list operations
   - Tap on an item to change to the screen for that item.
   - Press the **[ENT]** key to edit the corresponding item.
   - An item can be selected with the cursor keys (up, down, left and right).

1.5.3.5 Edit screen for other menu items

- The display and the operations are the same as the <Switch 1> screen.
- Refer to “6.2.5 Machining mode settings” in Operation Manual II for details on the high accuracy <Machining mode> and <Accuracy spec. mode>.

1.5.4 User Parameter 1 (Switch 1)

1.5.4.1 Common

Common			
No.	**Item name**	**Setting range**	**Description**
010001	Select mode	0: Manual mode 1: Memory operation mode	Specify mode at the time of power input either by manual operation or memory operation.
010002	Display home screen at power ON	0: No 1: Yes	Set whether or not to display the home screen when the power is turned ON. When set to “0”, it follows user parameter (switch 1: common) <Select mode> and displays the screen.
010003	Machine No.	0~999999	Set numbers to machines to identify them when multiple machines are installed.
010004	Table load weight	0~999 kg	Set load weight on the table. Switching rapid traverse time constant by this setting value, speed-up is achieved by the shortened positioning time. Rapid traverse time costants are switched on the axes below: • Table movement model: XY axes; and Since input of false mass may cause some damage on the machine, <<load weight setting error>> is generated if any abnormality exists after checking whether the switched time constant is correct. However, if the user parameter (switch 1: programming) <Positioning method> is set to <0: Non-linear interpol.pos.>, when the rapid feed time constant changes, the rapid feed tool path changes. After this parameter is changed, check the tool path while idling, etc., and then resume the operation. (NOTE) Load weight estimate On machine models equipped with a moving table, the NC automatically estimates the load weight during rapid feed and displays it in the “Estimated results” on the <Machining parameter adjustment (load weight settings)> screen for the support application (machining parameter adjustment). When the estimate is calculated, the estimated results are displayed in **[kg]**. When there is no estimate, “*” is displayed. If there is an asterisk (*) that is displayed, or if the <Estimate date and time> comes before the table load was changed out, then follow the screen instructions and perform the <Weight estimate>. There is no function to estimate the load weight on machine models equipped with column travel.
010005	Adjust tracking accuracy by load weight	0: Disable 1: Enable	Adjust the tracking accuracy to the optimal level depending on the table load weight. When set to <0: Disable>, the accuracy is adjusted according to the parameter that is based on the standard load weight. When set to <1: Enable>, the load weight is automatically estimated and carries out the ideal parameter adjustment. The user can confirm the load weight estimate using the support application (adjust machining parameter) <Load weight settings> function.
010006	Override switch	0: Invalid 1: Valid	Set valid/invalid for override.
010007	Alarm display when override is valid	0: No 1: Yes	Set whether or not to display the alarm when the override is not set to 100%.
010008	Prevent rapid traverse override	0: No 1: Yes	Set whether or not to prevent rapid traverse override. This parameter is valid only when the user parameter (switch 1: common) <Override switch> is set to <1:Valid>. When <1: Yes> is set, 100 % of the rapid traverse override is always applied.
010009	Prevent cutting feedrate override	0: No 1: Yes	Set whether or not to prevent cutting feederate override. It is valid only when <1: Valid> is set for <Override switch>. When <1: Yes> is set, 100% of cutting feedrate override is alwys applied.
010010	Prevent spindle override	0: No 1: Yes	Set whether or not to prevent spindle override. This parameter is valid only when the user parameter (switch 1: common) <Override switch> is set to <1:Valid>. When <1: Yes> is set, 100 % of the spindle override is always applied.

Common			
No.	**Item name**	**Setting range**	**Description**
010011	Tap override	0: Invalid 1: Spindle override 2: Cutting feedrate override	When set to <1: Spindle override>, the spindle override is applied to the cutting feedrate and spindle speed during the tapping infeed and when pulling out. If the spindle override is greater than 100%, the motion is carried out at 100%. When set to <2: Cutting feedrate override>, the cutting feedrate override is applied to the cutting feedrate and spindle speed during the tapping infeed and when pulling out. If the cutting feedrate override is greater than 100%, the motion is carried out at 100%.
010012	Thread cutting override (NC language only)	0: Invalid 1: Spindle override	When set to <1: Spindle override>, the spindle override is applied to the cutting feedrate and spindle speed during the thread cutting operation. If the spindle override is greater than 100%, the motion is carried out at 100%.
010013	Stop using feedrate override during rapid feed	0: Disabled 1: Enabled	Setting to <1: Enabled> stops operation when the feedrate override is at <0%> during rapid feed. This parameter stops operation during rapid feed only when the following conditions are met. Feedrate override is enabled Rapid traverse override is enabled **[FEEDRATE OVERRIDE]** switch is “0%”
010014	Pallet select key change	0: Invalid 1: Valid	Enable or disable the <PALLET> key. When set to invalid, the <PALLET> key setting cannot be changed.
010015	Lock shift key	0: No 1: Yes	When 1: Yes> is set, on-state and off-state is switched back and forth and the state is maintained each time when **[SHIFT]** key is pressed. When <0: No> is set, on-state is maintained only when **[SHIFT]** key is pressed.
010016 ~ 010024	4th row display axis 5th row display axis 6th row display axis 7th row display axis 8th row display axis 9th row display axis 10th row display axis 11th row display axis 12th row display axis	0: Unset 1: 4th axis 2: 5th axis 3: 6th axis 4: 7th axis 5: 8th axis 6: P1st axis 7: P2nd axis 8: P3ird axis 9: P4th axis	Specify respective additional axes to be displayed on additional axis display part(4th to 12th-row) on coordinate display. Axes with numbers corresponding to the row numbers are assigned if they haven't been set. (NOTE) 4th row:4th axis, 5th row:5th axis, 6th row:6th axis, 7th row:7th axis, 8th row:8th axis, 9th row: P1st axis, 10th row: P2nd axis, 11th row: P3rd axis, 12th row: P4th axis
010025	XYZ-axis absolute coord. display (NC language only)	0: Display 1 1: Display 2 2: Display 3	Concerning the display on the position screen for X-, Y- and Z-axes absolute coordinate positions Display 1: Length/Tool position compensation is not added. Display 2: Length/Tool position compensation is added when tool length offset/tool position offset is executing. Display 3: Length/Tool position compensation is added when the next operation to be executed is tool compensation mode.
010026	Display coordinates during rotational transformation	0: After 1: Before	Displays absolute coordinate position by coordinate value after rotation if <0: After conversion> is set while coordinate rotation is performed.
010027 ~ 010031	Macro variable 1 for position screen display Macro variable 2 for position screen display Macro variable 3 for position screen display Macro variable 4 for position screen display Macro variable 5 for position screen display (NC language only)	1~33 100~199 500~999	Set the macro variables displayed on <Modal info 2> screen for the position screen. Screen turns into blank display by deleting the setting.
010032	Automatic screen dimming time	0~999min	Automatically clears the screen when entry operation using switches are not performed within the time preset here. 0: Does not dim automatically

Common			
No.	**Item name**	**Setting range**	**Description**
010033	Alarm display when screen is dimmed	0: Alarm screen 1: Dimming only	Set whether to change the screen when an alarm occurs while the screen is dimmed. 0: Alarm screen The alarm screen appears when an alarm occurs. 1: Dimming only The screen remains dimmed even if an alarm occurs.
010034	Automatic machine light off time	0~999min (0:Does not turn off automatically)	Set the time after the machine light turns on until it turns off. When <1> or more (minute) is set, the machine light turns off when the preset time has elapsed after the machine light turned on.
010035	Standby mode time	0~999min (0:Does not turn off automatically)	Set the time after the servo motor is turned off until standby mode is entered when the machine is not operated. When no machine operation is performed even after the preset time has elapsed, the servo motors for all axes turn off and standby mode is entered, and the alarm message <<*STANDBY MODE>> is displayed. (Note that this alarm is not registered in the alarm log.) Perform any of the following operations, and the servo controller turns on and operation is enabled. • All of operations on the operation panel • Operation activation from outside (activation, external activation, remote command for communication, etc.) operation
010036	Auto power off	0: No 1: Yes	Set active/inactive for automatic power off function. When "1: Yes" is set, power is automatically turned off when automatic power off time arrived. Power is also turned off during operation if the following conditions are satisfied: • Program end (Program is regarded to be ended even by restart, and external activation reservation) • Temporary suspension of operation or block stop
010037	Auto power off time	000000~235959 (00:00:00~23:59:59)	Set the time until power automatically turns off when "1: Yes" is set for "Auto power off". When "1: Yes" is set, "Auto off is on" is displayed on the screen.
010038	Cycle time calculation method	0: Cutting time + Non cutting time 1: Cutting time + Non cutting time + Other	One of the following two cycle time methods can be selected for the set value in <Cycle time calculation method>. 0: Cycle time = Cutting time + Non cutting time 1: Cycle time = Cutting time + Non cutting time + Other The power consumption calculation method changes depending on this parameter setting. 0: Power consumption for a device during the “other” time is not included in the 1 cycle measurement 1: Power consumption for a device during the “other” time is included in the 1 cycle measurement The other time shows the time when the machine is not operating (during the period from when the **[START]** switch is pressed until the operation is complete).
010039	Screenshot	0: Disable 1: Save to memory card 2: Save to NC	Enable or disable the screenshot function. Press the **[SHIFT]** + **[RELSE]** keys to take a screenshot of the current screen and save it. When set to <1: Save to memory card>, the screenshot is saved to the memory card that is connected. When set to <2: Save to NC>, the screenshot is saved internally in the NC.
010040	Motor insulation resistance measurement interval	0~999 days	Set the interval to display the operator message in order to prompt the user to measure the motor insulation resistance. The operator message <<Measure the motor insulation resistance.>> is displayed when the power is turned ON if the preset number of days has passed since the previous measurement. When "0" is set, the operator message does not display.
010041	Motor insulation resistance monitoring acceptable value (abnormal)	0.0~99.9 megohm	Set the tolerance when monitoring the insulation resistance for measuring a single axis in the motor insulation resistance measurement. <<Motor insulation resist. monit. value is abnormal.>> is displayed when the value monitored for the insulation resistance is lower than preset value.

Common			
No.	Item name	Setting range	Description
010042	Motor insulation resistance monitoring acceptable value (alarm)	0.0~99.9 megohm	Set the tolerance when monitoring the insulation resistance for measuring a single axis in the motor insulation resistance measurement. <<Motor insulation resist. monitor value is warned.>> is displayed when the value monitored for the insulation resistance is lower than preset value.
010043	Notice of light load weight	0: Disable 1: Enable	If set to <1: Enable>, the alarm <<Load weight setting error>> is triggered when the load weight estimate during memory operation is less than the set value and exceeds the tolerance. Use this as a reminder to update the setting after changing out the table load. (NOTE) If the load weight estimate is greater than the set value and exceeds the tolerance, then the alarm <<Load weight setting error>> is triggered regardless of this parameter (<Notice of light load weight>) setting.
010044	Alarm stop level for shifted stop on ext. add. Axis	0: Level 5 or Level 4 1: Level 2	Set the alarm stop level when the alarm <<*-axis position shifted>> is triggered on the external additional axis during operation. Only valid when using a machine model equipped with a QT.

1.5.4.2 Operation

Operation			
No.	Item name	Setting range	Description
010501	Select memory operation (NC language only)	0: Internal memory operation 1: Tape operation	Set whether to perform memory operation or tape operation. When tape operation is selected, the function varies depending on the connection destination of the external I/O unit. When “0: General COMM device” is selected for “Connected to”, a single program input from the communication port is run. When the connecting destination is set to a memory card, select and run the program from the recording device connected to the USB port.
010502	Dry run offset amount	0~999.999mm	Offset amount for the Z-axis absolute command during dry run in the memory operation is set.
010503	Dry run offset amount lower limit	0~999.999mm	Generates an operator message <<Dry run offset amount: xxxx>> by turning the dry run on, when setting value of "Dry run offset amount" is lower than that of the parameter.
010504	Repeat	0: Stop 1: Repeat	Set whether to stop or continue operation after the program has ended in memory operation mode.
010505	Workpiece counter when program is repeated	0: Invalid 1: Valid	Set whether to reset the workpiece counter when the program is repeated.
010506	Tool life management when program is repeated	0: No 1: Yes	Set whether to decrement the remaining tool life counter when the program is repeated.
010507	Program restart (NC language only)	0: Type1 1: Type2	Select a motion at the time of resuming automatic operation from a block in a middle of program. 0: Type1 Resumes a program in a state that blocks from the top to just before the specified operation start point have been executed. 1: Type2 Available to select either restart in which blocks from the top to just before the specified operation start point have been executed, or sequence search in which those blocks have been skipped. Performs sequence search when operation start point is specified by execution pointer.
010508	S.T.M. return (NC language only)	0: No 1: Yes	Designate whether or not to automatically restore final S, T command value and M code when resuming program.
010509	Prevent restart from middle of program	0: No 1: Yes	Available to restrict program resumption (NC) in memory operation and start point setting(dialogue) function. Unavailable to set program resumption or start point by cursor key, page key and function key on the program screen, in case of "1: Restrict". Error message of <<Resuming operation from the middle of program is restricted>> is generated if the program is activated by changing the operation start point at the top using cursor key, etc.

Operation			
No.	Item name	Setting range	Description
010510	Spindle return method for program stop (NC language only)	0: Method 1 1: Method 2	Set the spindle return method when pressing the **[START]** switch in M141 modal after the spindle stops when issuing a program stop command in memory operation. 0: Method 1 Automatically returns when operation resumes. 1: Method 2 Returns with M03/M04 command.
010511	Lathe spindle return method for program stop (NC language only)	0: Method 1 1: Method 2	Set the lathe spindle return method when pressing the **[START]** switch in M142 modal after the lathe spindle stops when issuing a program stop command in memory operation. 0: Method 1 Automatically returns when operation resumes. 1: Method 2 Returns with M03/M04 command.
010512	Coolant return method for program stop (NC language only)	0: Method 1 1: Method 2	Set the coolant return method when pressing the **[START]** switch after the coolant stops when issuing a program stop command in memory operation. 0: Method 1 Automatically returns when operation resumes. 1: Method 2 Returns with M08/M494 command. This parameter setting is for the return method of the coolant valve and the center-through-coolant.
010513	Spindle rotation return during restart	0: Do not return 1: Return	When pressing the **[START]** switch after returning to memory/MDI operation mode (after having changed the mode to manual mode during memory operation while the spindle (or lathe spindle) was rotating or being orientated (Note)), this setting configures whether or not to return to the spindle (lathe spindle) speed/peripheral speed/orientation prior to manual operation. (NOTE) Excluding when operation is stopped or during tapping.
010514	Block No. display color (NC language only)	0: W 1: BLU 2: PP 3: GRN 4: LBLU	Specify display color for block number on program screen in memory operation mode.
010515	Pointer display color (NC language only)	0: W 1: BLU 2: PP 3: GRN 4: LBLU	Specify display color for execution pointer on program screen in memory operation mode.
010516	Spare tool change	0: At operation start 1: At tool change	Set the timing for replacing a tool to be used for program by spare tool when the tool life was expired. 0: Replaces with spare tool only at the first tool replacement after checking the life. (Don't be replaced with spare tool from the second time for replacement of the same tool.) 1: Replaces with spare tool every time when tool is replaced after the life was checked.
010517	Check tool life on first use (NC language only)	0: No 1: Yes	Set whether to check the life of the tool initially used after tape operation or extended memory operation has started. (Life is not checked when it is used for the second time and after.) This setting is valid during tool changes initiated by a T code co.
010518	Check before coolant pump start	0: Disable 1: Enable	Set whether or not to check the status of the **[CLT.P]** key at the memory operation start and at the memory operation re-start. When set to <1: Enable> and the **[CLT.P]** key is OFF, then the alarm <<Coolant pump is OFF>> is triggered.
010519	Check before chip shower start	0: Disable 1: Enable	Set whether or not to check the status of the **[CHP.F]** key at the memory operation start and at the memory operation re-start. When set to <1: Enable> and the **[CHP.F]** key is OFF, then the alarm <<Chip shower is OFF>> is triggered.
010520	Shift method used in external workpiece coordinate system (NC language only)	0: Method 1 1: Method 2	When set to <0: Method 1>, this setting uses a shift enable signal for the external workpiece coordinate system to enable or disable the shift amount for that system. When set to <1: Method 2>, this setting does not use a shift enable signal for the external workpiece coordinate system and the shift amount for that system is always enabled.

1.5.4.3 Programming

Programming			
No.	**Item name**	**Setting range**	**Description**
011001	Program unit (NC language only)	0: Base 1: Least	Set the position of the decimal point when it is not included in the program.
011002	Program feed rate unit (NC language only)	0: Base 1: Least	Set the position of a decimal point, when a decimal point is omitted in the program.
011003	Positioning method (NC language only)	0: Non-linear interpolation type positioning 1: Linear interpolation type - Positioning method 1 2: Linear interpolation type - Positioning method 2	Select the positioning interpolation method. When set to <0: Non-linear interpolation type positioning>, the positioning operation for the X-, Y- and Z-axes and the additional axes is non-linear interpolation. When set to <1: Linear interpolation type - Positioning method 1>, the positioning operation for the X-, Y- and Z-axes and the additional axes is linear interpolation. However, there are some machines that have a restriction that only allows up to 1 additional axis to be used for simultaneous interpolation commands. In this situation, if a command is issued for two additional axes on the same block, the alarm <<Positioning command error for linear interpolation type>> is triggered. When set to <2: Linear interpolation type - Positioning method 2>, the positioning operation for the X-, Y- and Z-axes is linear interpolation, and the positioning operation for the additional axes is non-linear interpolation. Note that when the <Positioning method> is changed, the tool path during rapid feed changes. Check the path while idling, etc., and then start operation.
011004	Max. actual cutting travel speed (Linear axis)	1~999999 mm/min	Set the maximum cutting travel speed on a linear axis used for normal machining. As the setting decreases, the cutting time constant decreases, so the cycle time is also shorter. Note that alarm occurred the setting here applies even when a feed rate exceeding.
011005	Max. actual cutting travel speed (Rotation axis)	0.1~9999.9 min^{-1}	Set the maximum cutting travel speed used on a rotation axis for normal machining. When this value is smaller, the cutting time constant becomes shorter and the cycle time becomes shorter. When a feed rate command is issued that is higher than this set value, an alarm is triggered.
011006	Rotation axis speed command type (NC language only)	0: Type 1 1: Type 2	Set the type of speed command for the rotation axis when a rotation axis command is issued. <Type 1>: The unit is set to deg./min. for an F command value on the rotation axis. If a linear axis and rotation axis are used for linear interpolation, 1 degree on the rotation axis = 1 mm on the linear axis when the machine unit system is set to meters, and 1 degree on the rotation axis = 1 inch on the linear axis when the machine unit system is set to inches. These ratios are applied and used for the speed. <Type 2>: The F command value on the rotation axis uses the peripheral speed set in the user parameter (switch 1: programming) <Standard circle radius>. The peripheral speed unit is: mm/min when the machine unit system is set to meters and inch/min when the machine unit system is set to inches. If a linear axis and rotation axis are used for linear interpolation, 1 mm on the circumference for a <Standard circle radius> = 1 mm on the linear axis when the machine unit system is set to meters, and 1 inch on the circumference for a <Standard circle radius> = 1 inch on the linear axis when the machine unit system is set to inches. These ratios are applied and used for the speed. (NOTE) For the feedrate per rotation and inverse time feed, the F command value in a statement is the actual F command value converted to a feed quantity per minute.

Programming			
No.	Item name	Setting range	Description
011007	Standard circle radius (NC language only)	0~9999.999 mm	Set the standard circle radius for calculating the rotation axis speed when the user parameter (switch 1: programming) <Rotation axis speed command type> is set to <1: Type 2>. The larger this value is relative to the F command value, the slower the rotation axis speed (deg./min.) becomes, and the smaller this value is, the faster the rotation axis speed (deg./min.) becomes. If 0 is set to the parameter, the error <<User param. setting error (switch 1)>> is triggered.
011008	Arc radius error limit	0~9999.999mm	Valid when an arc command is issued for I, J and K. Set an acceptable margin of error between the end position of a normal arc (obtained from the start position and center during a circular arc command) and the programmed end position. When the margin of error exceeds this set value, operation is stopped due to an error. Operation is stopped due to an error if the difference between the end point radius specified in the program and the end point radius that is calculated exceeds the set value. A check is performed for a spiral arc only when the radius incremental value (Q) is specified. When set to “0”, it does not check.
011009	Arc radius R command error limit (NC language only)	0~9999.999 mm	Valid when an arc command is issued for radius R. When the radius R value is less than a value that is half of the distance between the arc start point position and the end point position, this difference represents a margin of error. When the margin of error is greater than the set value for this parameter, operation is stopped due to this error. When set to “0”, this parameter uses the minimum value in accordance with the minimum unit setting.
011010	Scaling (NC language only)	0: Common scaling factor 1: Scaling factor for each axis	Set the scaling type applied. The machine will stop and an error will be output if the specified scaling type is different from the setting here.
011011	X-axis scaling (NC language only)	0: Invalid 1: Valid	Set whether X-axis scaling is valid. The machine will stop and an error will be output if X-axis scaling is validated in the program even when "Invalid" is set for the parameter.
011012	Y-axis scaling (NC language only)	0: Invalid 1: Valid	Set whether Y-axis scaling is valid. The machine will stop and an error will be output if X-axis scaling is validated in the program even when "Invalid" is set for the parameter.
011013	Z-axis scaling (NC language only)	0: Invalid 1: Valid	Set whether Z-axis scaling is valid. The machine will stop and an error will be output if X-axis scaling is validated in the program even when “Invalid” is set for the parameter.
011014	Scaling unit (NC language only)	0:0.001 1:0.00001	Set the minimum scaling unit. 0:0.001 Set 2000 for “Scaling” to double the scaling. 1:0.00001 Set 200000 for “Scaling” to double the scaling.
011015	Common scaling factor (NC language only)	-999999~-1, 1~999999	The scaling factor set here is applied when a program command does not include a scaling factor.
011016	X-axis scaling factor(I) (NC language only)	-999999~-1, 1~999999	The scaling factor set here is applied when a program command does not include a scaling factor.
011017	Y-axis scaling factor(J) (NC language only)	-999999~-1, 1~999999	The scaling factor set here is applied when a program command does not include a scaling factor.
011018	Z-axis scaling factor(K) (NC language only)	-999999~-1, 1~999999	The scaling factor set here is applied when a program command does not include a scaling factor.
011019	Macro command single stop (NC language only)	0: No 1: Yes	Set whether or not to make a single stop in the block with only calculation commands or control commands (GOTO, DO, END, etc.). When “0” is set, macro command blocks are not regarded as movement blocks in cutter compensation mode.

Programming			
No.	Item name	Setting range	Description
011020	Interrupt macro interrupt type (NC language only)	0: Type1 1: Type2	Set how to interrupt a block currently being executed when interruption signal is detected. Type1: Interrupt by suspending the execution Type2: Interrupt without suspending the execution
011021	Interrupt macro call type (NC language only)	0: Type1 1: Type2	Set a way to call interruption program by interruption type macro. Type1: Subprogram type interruption Type2: Macro type interruption
011022	Interrupt macro acceptance type (NC language only)	0: Type1 1: Type2	Set how to receive interruption signal. Type1: Status trigger system Type2: Edge trigger system
011023	Multiple M codes in one block (NC language only)	0: No 1: Yes	When "1: Yes" is set, commands of up to three M codes are simultaneously available for a block.
011024	Unregistered M-code	0: Error 1: Invalid	Set whether to stop operation by generating an error or to continue the operation by ignoring M code, when a 3-digit M code without definition by the machine is commanded in memory opertion.
011025	One shot signal M450 output time	0~99×0.1s	When signal 450 is output, it stays ON during the time set here. The next operation is performed after the set time has elapsed.
011026	One shot signal M451 output time	0~99×0.1s	When signal 451 is output, it stays ON during the time set here. The next operation is performed after the set time has elapsed.
011027	One shot signal M455 output time	0~99×0.1s	When signal 455 is output, it stays ON during the time set here. The next operation is performed before the set time has elapsed.
011028	One shot signal M456 output time	0~99×0.1s	When signal 456 is output, it stays ON during the time set here. The next operation is performed before the set time has elapsed.
011029	External signal reading time limit	0~9999s	Set acceptable time by second from output of external signal to reception of end signal from outside. If the machine does not receive the completion signal within the time set here, a signal output timeout error will occur. When “0” is set, the machine does not proceed to the next operation until it receives the completion signal from the external device.
011030	External signal output time when MFIN is invalid (NC language only)	0~9999×0.1s	Set the time an M function (M00 - M99) is output when 'Does not wait for MFIN signal input' is set for macro #3003.
011031	M function signal output delay time	1 to 9×0.01 sec.	The delay time is set for the M function signal output. • When the BCD signal turns ON, the MF turns ON after the delay time has elapsed. • When the MF turns OFF, the BCD signal turns OFF after the delay time has elapsed. (NOTE) This parameter is invalid for the M function signal on the built-in PLC.
011032	Finish axis travel during external signal output	0: Wait 1: Do not wait	This setting configures whether to wait or not for the axis travel to finish during the external signal output.
011033	Tool data spindle rotation exceeded (NC language only)	0: Alarm 1: Clamp at max. speed	Set an operation to be performed when a rotational frequency of spindle beyond "Maximum rotational frequency" in tool data is commanded.
011034	Macro call method (Address L) (NC language only)	0: Method 1 1: Method 2	Set the motion when an address L command is issued for a macro call or G/M code macro. 0: Method 1 Motion is carried out based on the repeat count. 1: Method 2 Motion is carried out based on the argument.
011035	Sub program folder selection 1 (NC language only)	0: Specified folder 1: Current folder	Select the folder to call a sub program or macro program using a sub program call, macro call, macro modal call or interrupt type macro. 0: Specified folder Call from the folder that is set in <Sub program folder designation 1>. 1: Current folder Call from the same folder as the main program.

Programming			
No.	**Item name**	**Setting range**	**Description**
011036	Sub program folder designation 1 (NC language only)	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for calling a sub program or macro program using a sub program call, macro call, macro modal call or interrupt type macro. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE) When the path from the root folder is specified and the folder name is not set, the root folder is specified. The relative path cannot be specified.
011037	Sub program folder selection 2 (NC language only)	0: Specified folder 1: Current folder	Select the folder to call a sub program or macro program using a sub program call, macro call, macro modal call or interrupt type macro. 0: Specified folder Call from the folder that is set in <Sub program folder designation 2>. 1: Current folder Call from the same folder as the main program.
011038	Sub program folder designation 2 (NC language only)	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for calling a sub program or macro program using a sub program call, macro call, macro modal call or interrupt type macro. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE) When the path from the root folder is specified and the folder name is not set, the root folder is specified. The relative path cannot be specified.
011039	Sub program folder selection 3 (NC language only)	0: Specified folder 1: Current folder	Select the folder to call a sub program or macro program using a sub program call, macro call, macro modal call or interrupt type macro. 0: Specified folder Call from the folder that is set in <Sub program folder designation 3>. 1: Current folder Call from the same folder as the main program.
011040	Sub program folder designation 3 (NC language only)	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for calling a sub program or macro program using a sub program call, macro call, macro modal call or interrupt type macro. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE) When the path from the root folder is specified and the folder name is not set, the root folder is specified. The relative path cannot be specified.
011041	Measurement setting 1	0~7	Set the measuring instrument detection signal that is enabled when the following command or function is used. - G31(/131/132) - G31(/131/132) P1 - G04 Q1 - G121~G129 - Automatic workpiece measurement - Automatic centering function When set, the measuring instrument detection signal is as follows.

Set value	Measuring instrument detection signal 3	Measuring instrument detection signal 2	Measuring instrument detection signal 1
0	-	-	-
1	-	-	Enabled
2	-	Enabled	-
3	-	Enabled	Enabled
4	Enabled	-	-
5	Enabled	-	Enabled
6	Enabled	Enabled	-
7	Enabled	Enabled	Enabled

<table>
<tr><th colspan="4">Programming</th></tr>
<tr><th>No.</th><th>Item name</th><th>Setting range</th><th>Description</th></tr>
<tr><td>011042</td><td>Measurement setting 2</td><td>0~7</td><td>Set the measuring instrument detection signal to enable when the following command is executing.
- G31(/131/132) P2
- G04 Q2

When set, the measuring instrument detection signal is as follows.
<table>
<tr><th>Set value</th><th>Measuring instrument detection signal 3</th><th>Measuring instrument detection signal 2</th><th>Measuring instrument detection signal 1</th></tr>
<tr><td>0</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>Enabled</td></tr>
<tr><td>2</td><td>-</td><td>Enabled</td><td>-</td></tr>
<tr><td>3</td><td>-</td><td>Enabled</td><td>Enabled</td></tr>
<tr><td>4</td><td>Enabled</td><td>-</td><td>-</td></tr>
<tr><td>5</td><td>Enabled</td><td>-</td><td>Enabled</td></tr>
<tr><td>6</td><td>Enabled</td><td>Enabled</td><td>-</td></tr>
<tr><td>7</td><td>Enabled</td><td>Enabled</td><td>Enabled</td></tr>
</table></td></tr>
<tr><td>011043</td><td>Measurement setting 3</td><td>0~7</td><td>Set the measuring instrument detection signal to enable when the following command is executing.
- G31(/131/132) P3
- G04 Q3

When set, the measuring instrument detection signal is as follows.
<table>
<tr><th>Set value</th><th>Measuring instrument detection signal 3</th><th>Measuring instrument detection signal 2</th><th>Measuring instrument detection signal 1</th></tr>
<tr><td>0</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>Enabled</td></tr>
<tr><td>2</td><td>-</td><td>Enabled</td><td>-</td></tr>
<tr><td>3</td><td>-</td><td>Enabled</td><td>Enabled</td></tr>
<tr><td>4</td><td>Enabled</td><td>-</td><td>-</td></tr>
<tr><td>5</td><td>Enabled</td><td>-</td><td>Enabled</td></tr>
<tr><td>6</td><td>Enabled</td><td>Enabled</td><td>-</td></tr>
<tr><td>7</td><td>Enabled</td><td>Enabled</td><td>Enabled</td></tr>
</table></td></tr>
<tr><td>011044</td><td>Measurement setting 4</td><td>0~7</td><td>Set the measuring instrument detection signal to enable when the following command is executing.
- G31(/131/132) P4
- G04 Q4

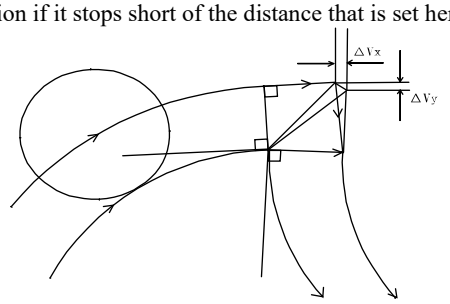
When set, the measuring instrument detection signal is as follows.
<table>
<tr><th>Set value</th><th>Measuring instrument detection signal 3</th><th>Measuring instrument detection signal 2</th><th>Measuring instrument detection signal 1</th></tr>
<tr><td>0</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>Enabled</td></tr>
<tr><td>2</td><td>-</td><td>Enabled</td><td>-</td></tr>
<tr><td>3</td><td>-</td><td>Enabled</td><td>Enabled</td></tr>
<tr><td>4</td><td>Enabled</td><td>-</td><td>-</td></tr>
<tr><td>5</td><td>Enabled</td><td>-</td><td>Enabled</td></tr>
<tr><td>6</td><td>Enabled</td><td>Enabled</td><td>-</td></tr>
<tr><td>7</td><td>Enabled</td><td>Enabled</td><td>Enabled</td></tr>
</table></td></tr>
</table>

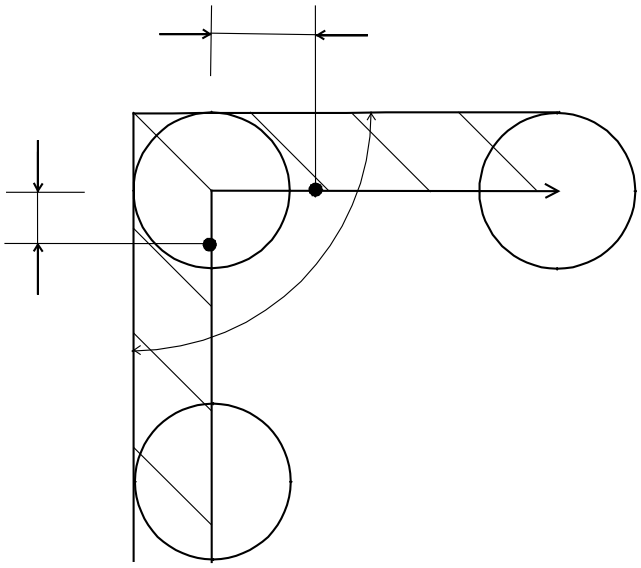
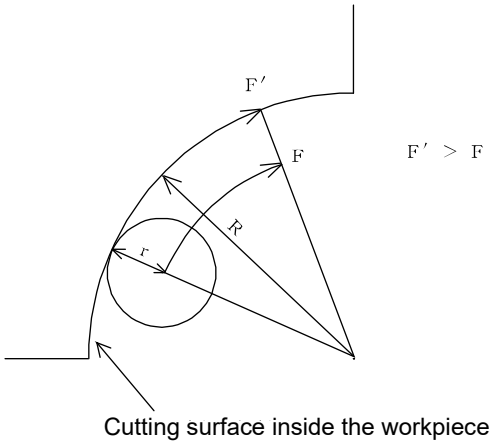
<table>
<tr><th colspan="4">Programming</th></tr>
<tr><th>No.</th><th>Item name</th><th>Setting range</th><th>Description</th></tr>
<tr><td>011045</td><td>Measurement setting 90</td><td>0~7</td><td>Set the measuring instrument detection signal to enable when the following command is executing.
- G31 P90

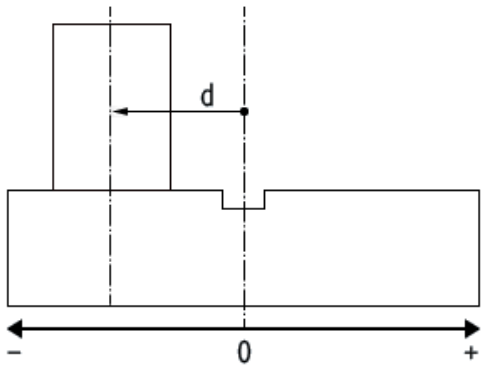
When set, the measuring instrument detection signal is as follows.
<table>
<tr><th>Set value</th><th>Measuring instrument detection signal 3</th><th>Measuring instrument detection signal 2</th><th>Measuring instrument detection signal 1</th></tr>
<tr><td>0</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>Enabled</td></tr>
<tr><td>2</td><td>-</td><td>Enabled</td><td>-</td></tr>
<tr><td>3</td><td>-</td><td>Enabled</td><td>Enabled</td></tr>
<tr><td>4</td><td>Enabled</td><td>-</td><td>-</td></tr>
<tr><td>5</td><td>Enabled</td><td>-</td><td>Enabled</td></tr>
<tr><td>6</td><td>Enabled</td><td>Enabled</td><td>-</td></tr>
<tr><td>7</td><td>Enabled</td><td>Enabled</td><td>Enabled</td></tr>
</table></td></tr>
<tr><td>011046</td><td>Measurement setting (Q omitted)</td><td>0~7</td><td>Set the measuring instrument detection signal to enable when the following command is executing.
- G04(Q address omitted)
- Dwell
(NOTE) Excluding dwell from the P address in the canned cycle.

When set, the measuring instrument detection signal is as follows.
<table>
<tr><th>Set value</th><th>Measuring instrument detection signal 3</th><th>Measuring instrument detection signal 2</th><th>Measuring instrument detection signal 1</th></tr>
<tr><td>0</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>Enabled</td></tr>
<tr><td>2</td><td>-</td><td>Enabled</td><td>-</td></tr>
<tr><td>3</td><td>-</td><td>Enabled</td><td>Enabled</td></tr>
<tr><td>4</td><td>Enabled</td><td>-</td><td>-</td></tr>
<tr><td>5</td><td>Enabled</td><td>-</td><td>Enabled</td></tr>
<tr><td>6</td><td>Enabled</td><td>Enabled</td><td>-</td></tr>
<tr><td>7</td><td>Enabled</td><td>Enabled</td><td>Enabled</td></tr>
</table></td></tr>
<tr><td>011047</td><td>Cutting speed exceeded for inverse time feed
(NC language only)</td><td>0: Alarm
1: Clamp at maximum cutting speed</td><td>The cutting speed is calculated in the inverse time feed (G93). Set the operation when the speed in the following parameter is exceeded.
- User parameter (switch 1: programming)
<Max. actual cutting travel speed (linear axis / rotation axis)>
- Machine parameter (system 1: X-, Y- and Z-axes) <Maximum cutting feedrate> (X- to Z-axis)
- Machine parameter (system 2: additional axis) <Maximum cutting rotation speed> (5th to 8th-axes)
0: Alarm
<<Max. speed exceeded>> or <<Feedrate error>> is triggered.
1: Clamp at maximum cutting speed
Clamps at the minimum cutting speed set in the above parameter.</td></tr>
<tr><td>011048</td><td>Z-axis perimeter function</td><td>0: M301 (OFF)
1: M300 (ON)</td><td>Set the modal for the Z-axis perimeter function.
This parameter initializes the set modal when the power is turned ON, when the [RST] key is pressed, when M02 or M30 is executed and when operation is reset.</td></tr>
<tr><td>011049</td><td>Upper limit for Z-axis perimeter coasting distance</td><td>0 to 99.999 mm</td><td>Set the upper limit value for the coasting distance when the Z-axis perimeter motion is carried out for the M300 modal. The perimeter motion is not carried out when the value set in this parameter is exceeded.</td></tr>
</table>

1.5.4.4 Compensation function

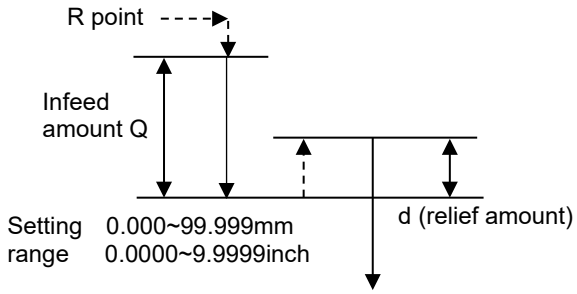
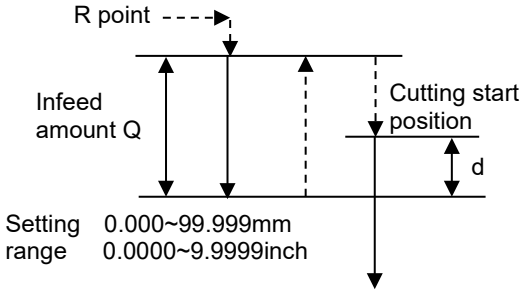
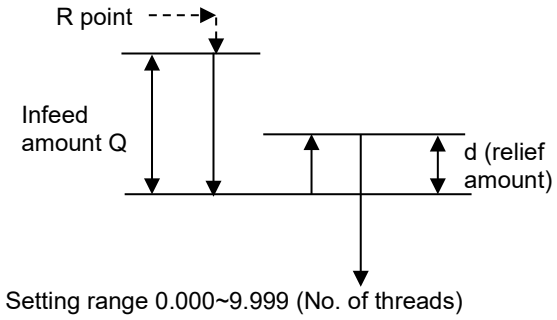
Compensation function			
No.	**Item name**	**Setting range**	**Description**
011501	X/Y/Z-axis travel at tool length/tool pos. offset change	0: Type1 1: Type2	Specify the operation when there is a tool length offset command without a Z-axis command, or when there is a tool position compensation command without a X-, Y- and Z-axes command. Type 1: Performs compensation operation. Type 2: Does not perform compensation operation, and carries out operation with compensation starting from the next axis travel command. (NOTE 1) Do not use G91 modal when set to type 2. (NOTE 2) When using type 2, do not perform the following commands before a compensation operation. - Scaling (G51) - Programmable mirror image (G51.1) - Rotational transformation (G68/G168) - Feature coordinate setting (G68.2) - Shift amount setting (G92)
011502	Error check when traveling during tool length/tool position offset cancel (NC language only)	0: ON 1: OFF	Set whether to check for errors or not when traveling occurs for a tool length offset cancel based on an H0 command, or a G49 command without a Z-axis command while in tool length offset mode. Set whether to check for errors or not when traveling occurs for a tool position offset cancel based on an H0 command, or a G49 command without an X-, Y- and Z-axes command while in tool position offset mode.
011503	Start up/cancel	0:Type1 (shortcut) 1:Type2 (detour)	Set the tool travel type to type 1 or type 2 when starting up or cancelling the tool diameter/nose R compensation mode during an operation program.
011504	Corner travel limit	0~99.999mm	When cutting outside an acute angle that is close to 90° while in tool diameter/nose R compensation mode, cancel the travel operation if it stops short of the distance that is set here.  Travel is canceled when dVx <= Setting and dVy <= Setting.

Compensation function			
No.	**Item name**	**Setting range**	**Description**
011505	Automatic corner override(angle)	0~179.999deg	Use the feed override for before and after a corner when the tool travels inside a corner so that the angle is smaller than the angle specified here while engaged in tool diameter/nose R compensation mode.  length 1 : Corner end point deceleration distance length 2 : Corner start point deceleration distance Ratio : Deceleration ratio
011506	Automatic corner override(length 1)	0~999.999mm	
011507	Automatic corner override(length 2)	0~999.999mm	
011508	Automatic corner override(ratio)	1~100%	
011509	Inner arc override limit	1~100%	When performing circular cutting on the inner side of a workpiece while engaged in tool diameter/nose R compensation mode, the cutting surface speed on the inner side of the workpiece becomes faster than the speed of the tool center. To avoid this type of situation, set the automatic override value for the inner side of the arc relative to the feed that corresponds to the ratio between the command radius R and the tool radius/nose R radius r. 
011510	Cutter compensation interference check (NC language only)	0:No 1:Type 1 2:Type 2	0: No interference check. 1: Checks for interference in the direction and arc angle 2: Checks for interference only in the arc angle
011511	Number of blocks to check cutter compensation interference (NC language only)	3 to 8	Specify the number of blocks for the interference check. (NOTE) A value cannot be set that is larger than the <Maximum blocks to check cutter compensation interference> in the machine parameter (system 1).

Compensation function			
No.	**Item name**	**Setting range**	**Description**
011512	Involute interpolation override limit (NC language only)	0 to 100%	Set the minimum override value for the involute interpolation function when carrying out an involute interpolation while in cutter/nose R compensation mode. When setting this parameter to 0, the override value is fixed at 100% and operation is always carried out at the command speed.
011513	Involute interpolation error limit (NC language only)	0 to 9999.999 mm	When carrying out an involute interpolation command, if there is no end point on the involute curve that passes through the start point, set an allowable margin of error between the involute curve that passes through the start point and the end position of the involute curve that passes through the end point. If the margin of error exceeds the set value for this parameter, the alarm <<Involute interpolation error limit exceeded>> is triggered. There is no check carried out when this parameter is set to 0.
011514	Table deflection compensation function	0: Disable 1: Enable	When this parameter is set to <1: Enable>, compensate or offset X-axis positioning accuracy for a heavy load on the table that causes table deflection and adversely affects the positioning. When set to <1: Enable>, set the appropriate values for the parameters <Standard weight for table deflection compensation> and <Standard height for table deflection compensation>. This parameter may not be available depending on the machine specification.
011515	Standard weight for table deflection compensation	0 to 999Kg	Use this parameter with the table deflection compensation function. Set the load weight on the table. The NC automatically estimates the load weight and that value is displayed in the <Estimated results> on the <Machining parameter adjustment (load weight settings)> screen for the support application (machining parameter adjustment). Set while referencing the value displayed in the <Estimated results>.
011516	Standard height for table deflection compensation	0 to 9999.999mm	Use this parameter with the table deflection compensation function. Set a typical value for the height from the table where it will be machined. The amount of compensation is adjusted so that the accuracy is optimal for the machining height that is set.
011517	Center gravity correction in table deflection compen.	-9999.999 to 9999.999mm	Use this parameter with the table deflection compensation function. Set this parameter when the center of gravity of the load on the table is quite far off from the table's center. Set a distance that measures from the approximate center position for the load on the table to the table's center. Set a positive value to move the load center in a plus direction from the table center, and set a negative value to move it in a minus direction.  d: Center compensation amount
011518	Overwrite table deflection compensation	1 to 999%	Use this parameter with the table deflection compensation function. This value is normally set to 100%. Use this parameter for fine tuning the compensation amount. The larger this value is, the greater then compensation amount is in the table deflection compensation function.

Compensation function			
No.	**Item name**	**Setting range**	**Description**
011519	Error detect if no intersect for inner dia. compens.	0: Disable 1: Enable	Change the operation if there is no intersection with the next block when cutting the inner side during cutter/nose R compensation. When set to <0: Disable>, the cutting uses a point or position correction that is set at a perpendicular vector to the start point of the next block. When set to <1: Enable>, the alarm <<No intersection>> is triggered and the machine stops at the previous block.

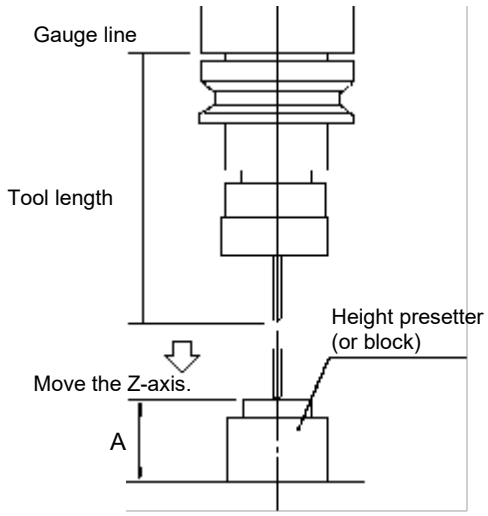
1.5.4.5 Canned cycle

Canned cycle			
No.	**Item name**	**Setting range**	**Description**
012001	G73 relief amount (NC language only)	0~99.999mm	Set the relief amount (d) for G73 cycle. 
012002	G83 cutting start position (NC language only)	0~99.999mm	Set the cutting start position (d) for G83 cycle. 
012003	G77,G78 relief amount (NC language only)	0~9.999Threads	Set the relief amount (d) for G77 and G78 cycles. 
012004	G76,G87 shift direction (NC language only)	0:+X dir. 1:-X dir. 2:+Y dir. 3:-Y dir.	Set the shift direction after spindle orientation for G76 and G87.
012005	Tapping cycle return speed (NC language only)	0:S address command value 1:Max. speed	To select the spindle returning rotational frequency when an L address is omitted in G77, G78, G277, or G278 (tapping cycle) 0: S address command value The spindle returns at the rotational frequency specified by an S address. 1: Top rotational frequency The return motion uses the machine parameter (system 1: common) <Max. tapping speed>.

Canned cycle			
No.	Item name	Setting range	Description
012006	Tapping sync. error too big - alarm stop level	0: Level 4 1: Level 5	Set the stop level for the alarm <<The tapping synchronous error is too big>>. Level 4: Operation stops temporarily Level 5: Servo is turned OFF
012007	Tap acceleration setting	0: M252 (high speed) 1: M253 (medium speed) 2: M254 (low speed)	Set the modal for tap operation. 0: M252 (high speed) 1: M253 (medium speed) 2: M254 (low speed) This parameter initializes the set modal when the power is turned ON, when the **[RST]** key is pressed, when M02 or M30 is executed and when operation is reset.
012008	Automatically use S command when changing tool (NC language only)	0: No 1: Yes	Set whether or not to automatically give S command by a value registered in tool data "S command value" at tool replacement.
012009	Automatically use F command when changing tool (NC language only)	0: No 1: Yes	Set whether or not to automatically give F command by a value registered in tool data "F command value" at tool replacement.
012010	Lathe machining infeed direction when power is turned ON (NC language only)	0: X-axis (G321) 1: Y-axis (G322) 2: Z-axis (G323)	Sets the modal for the lathe machining infeed direction when the power is turned ON. 0: X-axis (G321) 1: Y-axis (G322) 2: Z-axis (G323)
012011	Cutting amount in thread cutting cycle (NC language only)	0~99.9	Sets the finishing amount in the thread cutting cycle. The finishing amount is the product when the lead of the thread (F command value) is multiplied by the set value. When 0 is set, the finishing is not carried out on the thread.
012012	Cutting angle in thread cutting cycle (NC language only)	0~89.999 degrees	Sets the finishing angle in the thread cutting cycle. When 0 is set, the finishing is not carried out on the thread.
012013	Thread angle in complex thread cutting cycle (NC language only)	0~120.000 degrees	Sets the thread angle in the complex thread cutting cycle.
012014	Minimum infeed amount in complex thread cutting cycle (NC language only)	0~999.999 mm	Sets the minimum infeed amount in the complex thread cutting cycle.
012015	Finishing count in complex thread cutting cycle (NC language only)	1~9999	Sets the finishing count in the complex thread cutting cycle.
012016	Finishing allowance in complex thread cutting cycle (NC language only)	0~999.999 mm	Sets the finishing allowance in the complex thread cutting cycle.

1.5.4.6 Data

Data			
No.	Item name	Setting range	Description
012501	ALM2 signal stop level	0: Level 2 1: Level 3 2: Level 4 3: Level 5	Set the stop level of alarm that turns ON external output signal <ALM2>. Stop levels are defined as follows. Level 2: Operation stops after 1 cycle Level 3: Operation stops at the block Level 4: Operation stops temporarily Level 5: Servo is turned OFF The ALM2 signal turns ON when an alarm that exceeds the preset stop level is triggered. However, the following alarms are excluded. <<*Door open>> <<*Standby mode>> <<*Enter your password.>> <<***[ENABLE]** switch was turned OFF.>> <<***[MASTER ON]** was turned OFF.>>

Data			
No.	**Item name**	**Setting range**	**Description**
012502	Cancel editing when resetting	0: No 1: Yes	Set whether to cancel editing when the **[RST]** key is pressed.
012503	Save when mode of current program is changed (NC language only)	0: No 1: Overwrite save	Performs overwrite save of editing contents which have been made until then, if <1: Perform overwrite save> was set when mode was switched during editing a program in operation.
012504	Program edit start position during operation (NC language only)	0: Program top 1: Pointer	Displays cursor at the position of current operation pointer, if <1: Operation pointer> was set when editing of a program in operation started.
012505	Automatic sequence insertion increment (NC language only)	1~999	Set the sequence number increment when editing a program in automatic sequence number insertion mode.
012506	Set the same program for edit/memory operation programs	0: No 1: Yes	Set whether or not to specify the edit program and memory operation program as the same. If set to <0: No>, the edit and memory operation programs are specified independently of each other. If set to <1: Yes>, when either the edit program or memory operation program is specified, then that same program number is applied to the other program. The same applies when switching between the edit and memory operation mode. (NOTE 1) When the user parameter (switch1: operation) <Select memory operation> is set to tape operation, this function is disabled (same as the <0: No> setting). (NOTE 2) When the <Operation program> in the advanced settings is disabled for the current operation level, this function is disabled (same as the <0: No> setting).
012507	Automatic tool length compensation	0~999.999mm	The tool length is measured by moving the Z-axis as shown in the diagram below, and can be registered as tool list data. In this situation, set the height (A in diagram) for the height presetter or block to be used as compensation. 
012508	Tool life counting method	0: Method 1 1: Method 2	Set the tool life counting method. <0: Type1> uses a counting down method. The tool life decreases (or counts down) and when it reaches 0, the tool life is considered expired. <1: Type2> uses a counting up method. The tool life increases (or counts up) and when it reaches the end of life, the tool life is considered expired.
012509	Change tool life display (Type2)	0: Display 1 1: Display 2	Set the display method for the tool life on the ATC tool screen. This parameter is valid when the user parameter (switch 1: data) <Tool life counting method> is set to <1: Type2>. When <0: Display1> is set, the tool life value is displayed directly When <1: Display2> is set, the remaining tool life value is displayed. (Life end minus life)

Data			
No.	Item name	Setting range	Description
012510	Tool life unit (program) (NC language only)	0: At operation end 1: At tool change	Set the timing for increasing and decreasing the tool life value when memory operation is carried out with a tool that uses <Program> for the tool life unit. 0: At operation end Increase and decrease the life of the tool mounted on the spindle at the end when issuing an M02 or M30 command. 1: At tool change Increase and decrease the tool life when a new tool is attached to the spindle each time a tool change command is issued.
012511	Execute automatic data backup	0: No 1: When power is OFF 2: When power is ON (after specified number of days has elapsed)	Set the timing of the automatic data backup. To set the backup after a specified number of days has elapsed when the power is turned ON, use the user parameter (switch 1: common) <Automatic data backup interval> and <Automatic data backup time> together to set it.
012512	Save location for automatic data backup	0: NC 1: Memory card for backup	Set the location to save the backup data. The scope of the backup data varies depending on the save location. If set to “0”, the program (NC/conversation language), the PLC program and the certificate/key are not backed up.
012513	Automatic data backup interval	0 to 999 days 0: Do not execute	To automatically back up the data after a specified number of days has elapsed when the power is turned ON, set the interval to carry out the data backup operation. The data does not automatically back up when set to 0 days.
012514	Automatic data backup time	0000~2359 (00:00~23:59)	To automatically back up the data after a specified number of days has elapsed when the power is turned ON, set the time to back up the data after the <Automatic data backup interval> setting.
012515	Manual output	0: No 1: Yes	Set the manual to be output at the same time during the all data output.

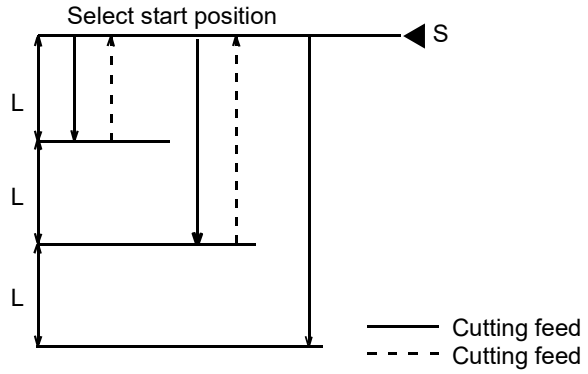
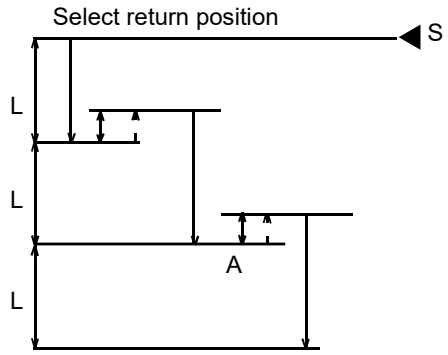
1.5.4.7 Manual operation

Manual operation			
No.	Item name	Setting range	Description
013001	Initial mode	0: High-speed travel 1: Low-speed travel 2: Step travel	Specify movement mode by manual operation mode at the time of power input.
013002	Change handle magnification	0: ×1 1: ×10	When <1: ×10> is set, scaling magnification rate of handle is multiplied tenfold. This parameter is valid only when the least input increment is Type 2.
013003	Auto screen change at additional/PLC axis handle operation	0: No 1: Yes	When <1: Yes> is set, display of screen is automatically switched into a screen with manual condition if the switch of handle (axis selection) is turned to "4" in manual mode.
013004	Z-axis height to prohibit travel of additional axes	0~9999.999mm	Restricts rotation of additional axis (including QT axis, but additional axis on the side of pallet1 alone in case of QT machine) by jog operation in manual mode or handle operation when the following conditional equation is met. In this case, alarm of <<additional axis operation restriction area error>> is generated. Current Z axis machine coordinate value <Z axis height for additional axis travel restriction>
013005	Z-axis height to prohibit travel of additional axes (pallet 2)	0~9999.999mm	Restricts rotation of additional axis (including QT axis) on the side of pallet 2 by jog operation in manual mode or handle operation when the following conditional equation is met. In this case, alarm of <<additional axis operation restriction area error>> is generated. Current Z axis machine coordinate value <Z axis height for additional axis on the side of pallet 2 travel restriction>
013006	Prevent external operation for additional axes	0: No 1: Yes	When <1: Yes> is set, restricts rotation of additional axis of external pallet by jog operation in manual mode or handle operation. In this case, an operator message of <<external additional axis operation restriction is set>> is generated.
013007	Max. tapping speed (when returning tap)	1~999999min^{-1}	Set maximum rotational frequency for tap operation when tap return operation is performed.

Manual operation			
No.	Item name	Setting range	Description
013008	XY axes movement when changing tool in manual mode	0: Invalid 1: Valid	X-/Y-axes movement is valid only on machine models where the magazine uses column movement in conjunction with X-/Y-axes. Set invalid/valid for the function to change tools at specified X-/Y-axes positions for a single tool change operation.
013009	X-axis position when changing tool in manual mode	-9999.999~ 9999.999mm	X-/Y-axes movement is valid only on machine models where the magazine uses column movement in conjunction with X-/Y-axes. Set the X-axis position to change tools in a single tool change operation.
013010	Y-axis position when changing tool in manual mode	-9999.999~ 9999.999mm	X-/Y-axes movement is valid only on machine models where the magazine uses column movement in conjunction with X-/Y-axes. Set the Y-axis position to change tools in a single tool change operation.

1.5.4.8 For conversation language

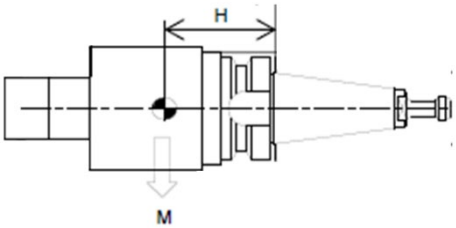
For conversation language			
No.	Item name	Setting range	Description
013501	Schedule program reset start position (Conversation only)	0: Program top 1: Schedule program top	Set a position to activate next time when reset key was pressed during schedule program operation.
013502	Program end stop in schedule program (Conversation only)	0: No 1: Yes	Set whether to stop the machine each time a machining program is completed or proceed to the next machining program when running a schedule program.
013503	Tool assignment at memory operation start	0: No 1: Yes	Performs tool reallocation automatically at the start of memory operation when <1: Yes> is set. It is available for a program in which tool rellocation has been performed once.
013504	Check tools used at automatic tool assignment	0: No 1: Yes	When tool reallocation was automatically performed at the start of memory operation by setting to <1: Yes>, alarm is generated without starting operation, if a tool different from the tool which had been used until previous time is allocated.
013505	Workpiece zero conversion code	0: G54, 1: G55, 2: G56, 3: G57, 4: G58, 5: G59	Set the G code applied when externally converting a conversation program to a G-code program.
013506	Convert tool data (Conversation only)	0: No 1: Yes	Set whether to convert the tool list to the tool data using the G10 code when externally converting a conversation program to a G-code program. If set to <1:Yes>, the cutter compensation data is output during cutter compensation at the beginning of the program.

For conversation language			
No.	**Item name**	**Setting range**	**Description**
013507	Tap step return position (Conversation only)	0: Return pos. 1: Start pos.	Select the return position from the two selections below in tap step mode. 0: Return pos. The tool returns the distance set for “Tap step return” from the end position of each step. 1: Start pos. The tool always returns to the position that the fir   S: Tap Step starting position L: Cutting amount at a time * It is determined based on the method and proportion of tap step. A: Returned amount of tap step. 2.0 fixed thread Converts like below when converting conversation program to G code program externally: 0: Return position - G77 or G78; 1: Recovery position - G277 or G278

1.5.4.9 ATC/Magazine

ATC/Magazine			
No.	**Item name**	**Setting range**	**Description**
014001	Tool wash discharge conditions for tool data	0: Method 1 1: Method 2	Set the discharge conditions for the <Tool wash> in the tool data. <0: Method 1> Discharge only when it is <Possible> on the current tool setting and the tool setting for the next tool. <1: Method 2> Discharge when the tool setting for the next tool is <Allowed>. (NOTE) In the setting <1: Method 2>, the tool wash may not discharge on a tool where it is <Not possible> due to the timing.

ATC/Magazine			
No.	**Item name**	**Setting range**	**Description**
014002	No tool detection function	0: Disable 1: Method 1 2: Method 2	Set the no tool detection function. When set to <1: Method 1>, if a tool is not fitted during the tool clamp or unclamp for the ATC operation, the alarm <<No spindle tool during ATC (when ATC rises)>> or <<No spindle tool during ATC (when ATC falls)>> is triggered and operation stops at the Z-axis zero point after the ATC operation. When set to <2: Method 2>, the detection method is the same as <1: Method 1>, but operation does not stop after detection. In addition, the alarm <<No spindle tool during ATC>> does not trigger. The detection signal turns ON when detecting regardless of being set to <1. Method 1> or <2. Method 2>. On an arm type ATC machine model, if another setting besides <0:Invalid> is used, the error <<User param. setting error (switch 1)>> is triggered.
014003	Tool over key detection function	0: Disable 1: Method 1 2: Method 2	Set the tool over key detection function. When set to <1. Method 1>, if a tool goes over the spindle drive key during the tool clamp operation for the ATC operation, the alarm <<Spindle tool misaligned during ATC>> is triggered and operation stops at the Z-axis zero point after the ATC operation. When set to <2. Method 2>, the detection method is the same as <1. Method 1>, but operation does not stop after detection. In addition, the alarm <<Spindle tool misaligned during ATC>> does not trigger. The detection signal turns ON when detecting regardless of being set to <1. Method 1> or <2. Method 2>. On an arm type ATC machine model, if another setting besides <0:Invalid> is used, the error <<User param. setting error (switch 1)>> is triggered.
014004	Tool missing detection function	0: Disable 1: Method 1 2: Method 2	Set the tool missing detection function. When set to <1. Method 1>, if a tool is missing or is about to come off when the Z-axis raises, the alarm <<Spindle tool missing>> is triggered and operation stops. When set to <2. Method 2>, the detection method is the same as <1. Method 1>, but operation does not stop after detection. In addition, the alarm <<Spindle tool missing>> does not trigger. The detection signal turns ON when detecting regardless of being set to <1. Method 1> or <2. Method 2>. On an arm type ATC machine model, if another setting besides <0:Invalid> is used, the error <<User param. setting error (switch 1)>> is triggered.

ATC/Magazine			
No.	**Item name**	**Setting range**	**Description**
014005	Maximum tool specification settings	0: Standard tool 1: Heavy tool	Set the maximum specification for the tool to be used. When attaching at least one heavy tool, always set this parameter to <1: Heavy tool>. If the tool being used exceeds the specified limits, the tool may fall down during a tool change and/or damage the machine. In addition, the user may be unable to use the <1: Heavy tool> setting depending on the machine model. Standard tool: M is equal to or less than 3 kg and M×H is equal to or less than 180 kg/mm Heavy tool: M is equal to or less than 4 kg and M×H is equal to or less than 360 kg/mm M: Total tool weight (kg) H: Distance from the gauge line to the center of gravity of the whole tool (mm) 
014006	Z-axis travel method during tool change	0: Type 1 1: Type 2	Select the Z-axis travel method during a tool change. If this parameter is set to <1: Type 2>, the tool change time will take longer. However, the noise during the tool change can be decreased. (Air consumption during the tool change increases.) <1: Type 2> cannot be set depending on the model.
014007	Turret type magazine low-speed turn mode	0: Invalid 1: Valid	Set valid/invalid for turret type magazine low speed rotating mode. When set to valid, the magazine turns at the speed set in the user parameter (switch 1: ATC/magazine) <Speed turret type magazine turns at low speed>.
014008	Speed turret type magazine turns at low speed	0.1~500.0min^{-1}	Set the magazine turn speed when the user parameter (switch 1: ATC/magazine) <Turret type magazine low-speed turn mode> is set to <1: Valid>.
014009	Z-axis lowering speed 1 when changing tool	1 to 999999 mm/min	Specify the Z-axis speed during a tool change for the M291 modal. This operation speed refers to when the Z-axis lowers from the ATC zero point up until the “Distance to Z-axis zero point”. This parameter is used to extend the tool wash time. This parameter is not used on machines with an arm type ATC.
014010	Z-axis lowering speed 2 when changing tool	1 to 999999 mm/min	Specify the Z-axis speed during a tool change for the M292 modal. This operation speed refers to when the Z-axis lowers from the ATC zero point up until the “Distance to Z-axis zero point”. This parameter is used to extend the tool wash time. This parameter is not used on machines with an arm type ATC.
014011	Z-axis lowering speed 3 when changing tool	1 to 999999 mm/min	Specify the Z-axis speed during a tool change for the M293 modal. This operation speed refers to when the Z-axis lowers from the ATC zero point up until the “Distance to Z-axis zero point”. This parameter is used to extend the tool wash time. This parameter is not used on machines with an arm type ATC.
014012	ATC arm turn speed ratio 1 (M422)	1 to 100%	After an M422 command, set the ATC arm turn speed for the next tool change command using the standard tool speed ratio. When there is a turret type ATC mechanism, this parameter is not used. (NOTE) The setting cannot be used when the value is smaller than the machine parameter (system 3) <Lower limit for ATC arm turn speed ratio>.

ATC/Magazine			
No.	**Item name**	**Setting range**	**Description**
014013	ATC arm turn speed ratio 2 (M423)	1 to 100%	After an M423 command, set the ATC arm turn speed for the next tool change command using the standard tool speed ratio. When there is a turret type ATC mechanism, this parameter is not used. (NOTE) The setting cannot be used when the value is smaller than the machine parameter (system 3) <Lower limit for ATC arm turn speed ratio>.
014014	ATC simultaneous operation start position (NC language only)	0 to 9999.999 mm	When there is no R command in G100 and M6 block, the machine operates using the value set here for the R command. The value is set as a machine coordinate value. This parameter is not used on machines with a turret type ATC.
014015	ATC reference tool length (NC language only)	-999.999 to 999.999 mm	When there is no tool length offset command in G100 and M6 block, the machine operates using the value set here for the tool length offset command. This parameter is not used on machines with a turret type ATC.
014016	Tool wash when changing a different size tool	0: Discharge when attaching tool to spindle 1: Discharge when returning tool to empty pot	Select whether to discharge the tool wash or not when returning the spindle's large or standard tool to an empty pot on a magazine after all the conditions below are met. - When changing a different size tool on an arm ATC mechanism - When the user parameter (switch 1) <Tool wash discharge conditions for tool data> is set to <0: Type 1> - When the <Tool wash> is set to <0: Possible> in the tool data for a spindle tool that is returned to an empty pot on a magazine <0: Discharge when attaching tool to spindle> Discharge is not carried out when returning the first large or standard spindle tool back to an empty pot on a magazine. Discharge is carried out when attaching the second standard or large tool from the magazine to the spindle. <1: Discharge when returning tool to empty pot> Discharge is carried out when returning the first large or standard spindle tool back to an empty pot on a magazine. Discharge is also carried out when attaching the standard or large tool in the second magazine to the spindle. (NOTE) - This parameter only applies to an arm type ATC mechanism. - When <1: Discharge when returning tool to empty pot> is selected, the discharge interval becomes shorter. Therefore, the coolant inside the chamber becomes empty and may discharge mist.
014017	Magazine turn speed ratio 1(M436)	1 to 100%	Set the magazine turn speed for the M436 command hereafter using the maximum speed ratio. This parameter is not used for ATC turret type machine.
014018	Magazine turn speed ratio 2(M437)	1 to 100%	Set the magazine turn speed for the M437 command hereafter using the maximum speed ratio. This parameter is not used for ATC turret type machine.
014019	Magazine index when changing tools of different sizes	0: Type 1 1: Type 2	Set the magazine index type for memory / MDI operation when changing to a different size tool (changing from a large tool to a standard or the reverse). (Medium tools are handled in the same way as a standard size.) Type 1: Indexes to the closest empty pot using the shortest access from the current standby pot to the next change point. The tool change time becomes shorter in this index method when the machining time of the current spindle tool is shorter than the magazine index time. Type 2: Indexes to the empty pot that is closest to the next changing pot. The tool change time becomes shorter in this index method when the machining time of the current spindle tool is longer than the magazine index time. (NOTE) This parameter is not used when the machine has a turret type ATC or when there is no change to a different size tool.
014020	Pot lowering start position	-999.999 to 999.999mm	Set the position where a pot starts to tilt in a tool change using the distance from the return position during the tool change. (It is only available on machine models with magazines that move in synch with the Z axis travel.)

1.5.4.10 Installation

Installation			
No.	**Item name**	**Setting range**	**Description**
014501	Chip shower retention time	0~99s	Set the time that the chip shower remains ON after M401 is executed. The chip shower turns off when the time preset here has elapsed. (NOTE) The setting value is transmitted to built-in PLC and the function is implemented on a circuit in the built-in PLC. If the default PLC program is changed, the function may not operate as intended following this set value.
014502	Automatic coolant off time	0~999min (0:Does not turn off automatically)	Set the time until coolant pump is turned off, when coolant pump operates in a state that the machine isn't operating (LEDs of both activation and stop are OFF). Auto-recovery is achieved by subsequent activation, external activation. Since it takes time from when pump is turned on until coolant is actually served in such a case, activation is delayed by the coolant delay time in case of auto-recovery. Coolant pump LED blinks when coolant pump was automatically turned OFF.
014503	Coolant delay time	0~99×0.1s	Set the time for waiting activation in case of coolant pump auto-recovery (activation, external activation). Activation LED is blinking even during waiting for preset time.
014504	Back washing at end of program	0: No 1: Yes	Set whether the back washing cycle is performed when the program is completed. When <1: Yes> is selected with a CTS command included in the program, the back washing cycle is performed at the end of the program.
014505	CTS pressurize check delay time	0.0~9.9s	Set the time after the center-through-coolant is turned on by output signal M494 until the pump pressure check starts. When "0" is set, pressure check is not performed. (NOTE) The setting value is transmitted to built-in PLC and the function is implemented on a circuit of the built-in PLC. If the default PLC program is changed, the function may not operate as intended following this set value.
014506	CTS depressurize check delay time	0.0~9.9s	Set the time until pump pressure check is started after turning center-through coolant off. When "0" is set, check is not performed. (NOTE) The setting value is transmitted to built-in PLC and the function is implemented on a circuit of the built-in PLC. If the default PLC program is changed, the function may not operate as intended following this set value.
014507	CTS pressure bleed time	0.0~9.9s	Set the time to bleed the pressure in the pump when the center-through-coolant is turned off. (NOTE) The setting value is transmitted to built-in PLC and the function is implemented on a circuit of the built-in PLC. If the default PLC program is changed, the function may not operate as intended following this set value.
014508	CTS line filter alarm stop level	0: Level 2 1: Level 3 2: Level 4	Set the stop level of the alarm when clogging on CTS line filter is detected. Level 2: Operation stops after 1 cycle Level 3: Operation stops at the block Level 4: Operation stops temporarily
014509	Tool wash filter alarm stop level	0: Level 1 1: Level 2	This parameter cannot be used.
014510	Tool wash filter check interval	1~999times	This parameter cannot be used.
014511	Display tool wash filter check result	0: No 1: Yes	This parameter cannot be used.

Installation			
No.	**Item name**	**Setting range**	**Description**
014512	Stop level for low tool wash level alarm (Type 4)	0: Level 1 1: Level 2	Set alarm stop level for abnormal tool wash fluid surface. When "0" is set, tool wash is not turned off after alarm for abnormal tool wash fluid surface was generated. Operation is not stopped. When "1" is set, tool wash is turned off after alarm for abnormal tool wash fluid surface was generated. Operation is immediately stopped. (NOTE) The setting is valid only when all of the following conditions are met: <Spindle air blow/Tool wash> is set to <1: Tool wash type 1> or <3: Tool wash type 2> <Spindle air blow/Tool wash control method> is set to <3: Type 4>.
014513	Tool wash filter clogging warning alarm stop level(Type4)	0: Level 1 1: Level 2	Set the alarm stop level for the tool wash filter clogging warning. Level 1: Operation does not stop Level 2: Operation stops after 1 cycle (NOTE) The setting is valid only when all of the following conditions are met. <Spindle air blow/Tool wash> is set to <1: Tool wash type 1> or <3: Tool wash type 2>; <Spindle air blow/Tool wash control method> is set to <3: Type 4>
014514	No. of tool wash filter clogging warning checks(Type4)	0~999times	Set frequencies of confirmation for tool wash filter clogging notice. Notice alarm is generated if abnormality was concecutively confirmed by the preset frequencies. When "0" is set, clogging notice is not checked. (NOTE) The setting is valid only when all of the following conditions are met: <Spindle air blow/Tool wash> is set to <1: Tool wash type 1> or <3: Tool wash type 2> <Spindle air blow/Tool wash control method> is set to <3: Type 4>.
014515	Faulty tool wash coolant level sensor check interval(Type4)	0-999times	Set the interval to check for errors on the tool wash coolant level sensor using the M295 command. If the parameter is set to “0”, it does not check for an error or fault on the tool wash level sensor using the M295 command during memory operation. (NOTE) The setting is valid only when all of the following conditions are met: <Spindle air blow/Tool wash> is set to <1: Tool wash type 1> or <3: Tool wash type 2> <Spindle air blow/Tool wash control method> is set to <3: Type 4>.
014516	Lamp status when count ends	0: No 1: Yellow 2: Red	Specify whether or not to light the pilot lamp when the workpiece counter ends is specified. (lamp lit: yellow or red) (NOTE) The setting value is transmitted to built-in PLC and the function is implemented on a circuit of the built-in PLC. If the default PLC program is changed, the function may not operate as intended following this set value.
014517	Oiling/greasing when power is turned on	0: Method 1 1: Method 2	Set the method for oil feed or grease feed during power input, when automatic oil feed or grease feed function is valid. Method 1: Oil or grease feed is performed during power input when preset downtime has elapsed since the last oil feed or grease feed. Method 2: Oil feed or grease feed is performed during power input.If the power is turned OFF while the message <<Execute the automatic oiling / greasing cycle ON command>> is triggered, the oiling or greasing is carried out the next time the power is turned ON regardless of the setting noted above.

Installation			
No.	**Item name**	**Setting range**	**Description**
014518	Chip conveyor relay adhering check	0: OFF 1: ON	Set whether to check if the chip conveyor relay is sticking/adhering or not. If set to “1,” it triggers the alarm <<Chip conveyor relay error> when the chip conveyor relay sticks or adheres. (NOTE) The set value is transmitted to the built-in PLC and the function is implemented on a circuit in the built-in PLC. If the default PLC program is changed, the function may not operate as intended following this set value.
014519	Internal light key display	0: Hide 1: Show	Show or hide the <LIGHT> key in the subtools.
014520	Table light key display	0: Hide 1: Show	Show or hide the <TABLE LIGHT> key in the subtools when using a machine model equipped with a QT.
014521	PLC rapid traverse override function	0: Disable 1: Enable	Set whether to control the rapid traverse override from the PLC signal. The **[RAPID TRAVERSE OVERRIDE]** switch is used for control when set to <0: Disable>. Control is performed based on the values from the PLC BY378/BY379/BY37A when set to <1: Enable>. In the factory set PLC program, the PLC BY378/BY379/BY37A is controlled in the same way as the **[RAPID TRAVERSE OVERRIDE]** switch for standard control program 1. (However, when the version of the factory set standard ladder program is earlier than IC00.09.B00, it is not installed.) (NOTE) When the user parameter (switch 1) <Prevent rapid traverse override> is set to <1: Yes>, or when the <Override switch> is set to <0: Invalid>, then the setting is fixed to 100% regardless of this parameter.
014522	PLC feedrate override function	0: Disable 1: Enable	Set whether to control the cutting feedrate override from the PLC signal. The **[FEEDRATE OVERRIDE]** switch is used for control when set to <0: Disable>. Control is performed based on the values from the PLC BDY116 when set to <1: Enable>. In the factory set PLC program, the PLC BDY116 is controlled in the same way as the **[FEEDRATE OVERRIDE]** switch for standard control program 1. (However, when the version of the factory set standard ladder program is earlier than IC00.09.B00, it is not installed.) (NOTE) When the user parameter (switch 1) <Prevent cutting feedrate override> is set to <1: Yes>, or when the <Override switch> is set to <0: Invalid>, then the setting is fixed to 100% regardless of this parameter.
014523	PLC spindle override function	0: Disable 1: Enable	Set whether to control the spindle override from the PLC signal. The **[SPINDLE OVERRIDE]** switch is used for control when set to <0: Disable>. Control is performed based on the values from the PLC BDY117 when set to <1: Enable>. In the factory set PLC program, the PLC BDY117 is controlled in the same way as the **[SPINDLE OVERRIDE]** switch for standard control program 1. (NOTE) When the user parameter (switch 1) <Prevent spindle override> is set to <1: Yes>, or when the <Override switch> is set to <0: Invalid>, then the setting is fixed to 100% regardless of this parameter.
014524	**[MASTER ON]** function	0: Disable 1: Enable	Disable or enable the **[MASTER ON]** function.
014525	Reset when **[MASTER ON]** is ON	0: No 1: Yes	Specify whether or not to execute a reset operation when **[MASTER ON]** is set to ON.

Installation			
No.	Item name	Setting range	Description
014526	**[MASTER ON]** circuit selection	0: NC circuit 1: Safety relay	Set the circuit used with the **[MASTER ON]** function. This parameter is valid only when the user parameter (switch 1: installation) <**[MASTER ON]** function> is set to <1: Enable>.
014527	**[MASTER ON]** external emergency stop alarm (in NC)	0: Enable 1: Disable	Set whether to trigger an alarm or not when the external emergency stop signal is open. This parameter is valid only when the user parameter (switch 1: installation) <**[MASTER ON]** circuit selection> is set to <0: NC circuit>.
014528	Time extension when coolant level has dropped	0: Disable 1: Enable	Set the time extension to valid or invalid for the alarm <<The coolant level has dropped>> to trigger during operation. If set to <1: Valid>, a time extension (10 minutes) will delay the alarm <<The coolant level has dropped>> from triggering, allowing operation during that time period. While the time extension is being used, the message <<Coolant level has dropped>> is triggered. Once the time extension has elapsed, the alarm <<The coolant level has dropped>> is triggered and operation stops at the block.

1.5.4.11 Brake load test

Brake load test			
No.	Item name	Setting range	Description
015001	Auto execution of brake load test at mem. op start	0: No 1: Yes	Set whether to automatically execute or not execute the brake load test at start of memory operation. When set to <1: Yes>, the brake load test is executed on axes that have not been tested according to the <Brake load test start time 1 to 4> that is set.
015002	Brake load test start time 1	0000 to 2359 (00:00 to 23:59) hour: minutes	Set the start time for the brake load test.
015003~ 015005	Brake load test start time 2 Brake load test start time 3 Brake load test start time 4	0000 to 2359 (00:00 to 23:59) hour: minutes	Set the start time for the brake load test. When not set, the test is not executed.
015006	Adjust start time for brake load test	0: No 1: Yes	Set to <1: Yes> when loading or unloading a workpiece automatically. When set to <1: Yes>, the brake load test is executed every other day. (The start times set in <Brake load test start time 2 to 4> are ignored, and the test is executed according to <Brake load test start time 1>.)
015007	Time extension for brake load test execution	0 to 480minutes	Starting from the time set in <Brake load test notification time 1 to 4>, when the time extension set here has elapsed, the alarm <<Brake load test is not complete>> is triggered and the door is locked until the test is executed.
015008	Brake load test start position on Z-axis	0: Current pos. 1: Zero point 2: User specified 3: ATC zero pt.	Set the start position for the brake load test on the Z-axis.
015009	Specified position for brake load test on Z-axis	-9999.999 to 9999.999mm	Use the machine coordinate position to set the position to start the brake load test when the <Brake load test start position on Z-axis> is set to <2: User specified>.
015010	Brake load test start position on 5th-axis	0: Current pos. 1: Zero point 2: User specified	Set the start position for the brake load test on the 5th-axis.
015011	Brake load test start position on 6th-axis	0: Current pos. 1: Zero point 2: User specified	Set the start position for the brake load test on the 6th-axis.
015012	Brake load test start position on 7th-axis	0: Current pos. 1: Zero point 2: User specified	Set the start position for the brake load test on the 7th-axis.
015013	Brake load test start position on 8th-axis	0: Current pos. 1: Zero point 2: User specified	Set the start position for the brake load test on the 8th-axis.
015014	Specified angle for brake load test on 5th-axis	-9999.999 to 9999.999deg.	Use the machine coordinate angle to set the position to start the brake load test when the <Brake load test start position on 5th-axis> is set to <2: User specified>.

Brake load test			
No.	Item name	Setting range	Description
015015	Specified angle for brake load test on 6th-axis	-9999.999 to 9999.999 deg.	Use the machine coordinate angle to set the position to start the brake load test when the <Brake load test start position on 6th-axis> is set to <2: User specified>.
015016	Specified angle for brake load test on 7th-axis	-9999.999 to 9999.999deg.	Use the machine coordinate angle to set the position to start the brake load test when the <Brake load test start position on 7th-axis> is set to <2: User specified>.
015017	Specified angle for brake load test on 8th-axis	-9999.999 to 9999.999deg.	Use the machine coordinate angle to set the position to start the brake load test when the <Brake load test start position on 8th-axis> is set to <2: User specified>.
015018	Order for brake load test execution on 5th-axis	0 to 4: First to fifth	Set the order for brake load test execution on the 5th-axis. If set to <0: First> and the <Brake load test start position on Z-axis> is not set to <1: Zero point> or <3: ATC zero pt.>, the error <<User param. setting error (switch 2)>> is triggered.
015019	Order for brake load test execution on 6th-axis	0 to 4: First to fifth	Set the order for brake load test execution on the 6th-axis. If set to <0: First> and the <Brake load test start position on Z-axis> is not set to <1: Zero point> or <3: ATC zero pt.>, the error <<User param. setting error (switch 2)>> is triggered.
015020	Order for brake load test execution on 7th-axis	0 to 4: First to fifth	Set the order for brake load test execution on the 7th-axis. If set to <0: First> and the <Brake load test start position on Z-axis> is not set to <1: Zero point> or <3: ATC zero pt.>, the error <<User param. setting error (switch 2)>> is triggered.
015021	Order for brake load test execution on 8th-axis	0 to 4: First to fifth	Set the order for brake load test execution on the 8th-axis. If set to <0: First> and the <Brake load test start position on Z-axis> is not set to <1: Zero point> or <3: ATC zero pt.>, the error <<User param. setting error (switch 2)>> is triggered.
015022	Move XY-ax. to safe pos. for brake load test on addt'l. ax.	0: No 1: Yes	Set whether or not to move the X- and Y-axes to a safe position before executing the brake load test on the additional axis.
015023	Safe pos. for X-ax. during brake load test on addt'l. axis	-9999.999 to 9999.999mm	When the <Move XY-ax. to safe pos. for brake load test on addt'l. ax.> is set to <1: Yes>, use the machine coordinates to set the X-axis to a safe position before executing the brake load test on the additional axis.
015024	Safe pos. for Y-ax. during brake load test on addt'l. axis	-9999.999 to 9999.999mm	When the <Move XY-ax. to safe pos. for brake load test on addt'l. ax.> is set to <1: Yes>, use the machine coordinates to set the Y-axis to a safe position before executing the brake load test on the additional axis.
015025~ 015028	Order for brake load test execution on P1-axis Order for brake load test execution on P2-axis Order for brake load test execution on P3-axis Order for brake load test execution on P4-axis	0 to 4: First to fifth	Set the order for brake load test execution on the P1 to P4-axes. If set to <0: First> and the <Brake load test start position on Z-axis> is not set to <1: Zero point> or <3: ATC zero pt.>, the error <<User param. setting error (switch 1)>> is triggered.

1.5.4.12 Door

System			
No.	Item name	Setting range	Description
015501	Area sensor pattern	0: Pattern 1 1: Pattern 2	Set the area sensor pattern to stop the automatic door immediately when the beam of area sensor is obstructed during automatic door operation. Pattern 1: The area sensor becomes active when the door is closing. Pattern 2: The area sensor becomes active when the door is opening or closing.

System			
No.	**Item name**	**Setting range**	**Description**
015502	Automatic door error level	0: Level 5 1: Level 4 2: Level 3 3: Level 2	Set alarm stop level for the alarm when the following errors are detected on the automatic door. • When it takes more than the time set (parameter value) for the automatic door open and close operations. Level 5: Servo is turned OFF Level 4: Operation stops temporarily Level 3: Operation stops at the block Level 2: Operation stops after 1 cycle The settings <2: Level 3> and <3: Level 2> are only available on machine models equipped with a QT. If these settings are used on any other machine model, the error <<User param. setting error (switch 1)>> is triggered.
015503	START lamp status when operating automatic door manually	0: Off 1: On	Set whether to turn the START lamp ON during door operation when the automatic door **[MANUAL-AUTO]** switch is set to “MANUAL”.
015504	Display alarm when door is open – Front door/Outer door	0: No 1: Yes	Set whether or not to display the alarm on the screen while the door is open. If <1: Yes> is set on a machine that is not equipped with a door, the alarm does not appear.
015505	Display alarm when door is open – Left side door		
015506	Display alarm when door is open – Right side door		
015507	Display alarm when door is open – Inner door		
015508	Display alarm when door is open – Setup chamber left door		
015509	Display alarm when door is open – Setup chamber right door		
015510	Display alarm when door is open – Outside door 1		
015511	Display alarm when door is open – Outside door 2		
015512	Display alarm when door is open – Magazine door		
015513	Display alarm when door is open – Magazine shutter		
015514	Door lock method	0: Automatic lock when door closes 1: Lock only when needed	Set either to automatically lock when the door closes or to automatically lock only when needed. When set to <0: Automatic lock when door closes>, the door always locks except when the user unlocks door after being closed. At this time, the DRLOCK signal is disabled. When set to <1: Lock only when needed>, the door unlocks except during machine operation when the door needs to be locked. At this time, the DRUL1/DRUL2 signal is disabled.
015515	Door to replace workpiece - Front door/outer door	0: Do not set 1: Set	Specify the door for replacing the workpiece.
015516	Door to replace workpiece - Left side door		
015517	Door to replace workpiece - Right side door		
015518	Door to replace workpiece - Inner door		
015519	Door to replace workpiece - Setup chamber left door		
015520	Door to replace workpiece - Setup chamber right door		
015521	Door to replace workpiece - Outside door 1		
015522	Door to replace workpiece - Outside door 2		
015523	Door to replace workpiece - Magazine door		

System			
No.	Item name	Setting range	Description
015524	Tool change door settings	0: Do not set 1: Front door/outer door 2: Left side door 3: Right side door 4: Inner door 5: Setup chamber left door 6: Setup chamber right door 7: Outside door 1 8: Outside door 2 9: Magazine door	Specify the door for replacing the tool.
015525	Door unlock 1 key display	0: Hide 1: Show	Show or hide the <Door unlock 1> key in the subtools.
015526	Door unlock 2 key display	0: Hide 1: Show	Show or hide the <Door unlock 2> key in the subtools.
015527	Door unlock key setting - Front door/outer door	0: No 1: Door unlock 1 2: Door unlock 2 3: Both	Set the key(s) to lock and unlock the door. <1: Door unlock 1> Locks and unlocks the door with the <Door unlock 1> key. <2: Door unlock 2> Locks and unlocks the door with the <Door unlock 2> key. <3: Both> Locks and unlocks the door with either one of the <Door unlock 1> and <Door unlock 2> keys.
015528	Door unlock key setting - Left side door		
015529	Door unlock key setting - Right side door		
015530	Door unlock key setting - Inner door		
015531	Door unlock key setting - Setup chamber left door		
015532	Door unlock key setting - Setup chamber right door		
015533	Door unlock key setting - Outside door 1		
015534	Door unlock key setting - Outside door 2		
015535	Door unlock key setting - Magazine door		
015536	Door unlock signal setting - Front door/outer door	0: No 1: External input 1 2: External input 2 3: Both	Set the signal to lock and unlock the door. <1: External input 1> Locks and unlocks the door with the door unlock 1 input signal. <2: External input 2> Locks and unlocks the door with the door unlock 2 input signal. <3: Both> Locks and unlocks the door with either one of the input signals for door unlock 1 and door unlock 2.
015537	Door unlock signal setting - Left side door		
015538	Door unlock signal setting - Right side door		
015539	Door unlock signal setting - Inner door		
015540	Door unlock signal setting - Setup chamber left door		
015541	Door unlock signal setting - Setup chamber right door		
015542	Door unlock signal setting - Outside door 1		
015543	Door unlock signal setting - Outside door 2		
015544	Door unlock signal setting - Magazine door		
015545	Operation mode with door unlock key enabled	0: All operation modes 1: Manual operation mode only	Set the <Door unlock 1> key, the <Door unlock 2> key, the door unlock 1 input signal and the door unlock 2 input signal so that they enable in a particular operation mode(s).
015546	Door unlocks when power turns ON	0: No 1: All doors 2: Door to replace workpiece	Specify to unlock the door at power ON when the <Door lock method> is set to <0: Automatic lock when door closes>.

System			
No.	Item name	Setting range	Description
015547	Door unlocks when program stops	0: No 1: All doors 2: Door to replace workpiece	Specify to unlock the door with the program stop command when <Door lock method> is set to <0: Automatic lock when door closes>. However, if the <PALLET> key is set to <1↔2> on a machine equipped with a quick table, this parameter does not apply to the outer door after the pallet start has been reserved.
015548	Door unlocks at end of operation	0: No 1: All doors 2: Door to replace workpiece	Specify to unlock the door at the end of operation when the <Door lock method> is set to <0: Automatic lock when door closes>. However, if the <PALLET> key is set to <1↔2> on a machine equipped with a quick table, this parameter does not apply to the side door and magazine door after the pallet start has been reserved.
015549	Door unlocks when single operation stops	0: No 1: All doors 2: Door to replace workpiece	Specify to unlock the door at a block stop during single operation (excluding block stops during tapping and ATC and block stops during spindle / lathe spindle rotation).
015550	Door unlocks at an alarm stop	0: No 1: All doors 2: Door to replace workpiece	Specify to unlock the door at an operation stop, due to a stop level 3 or greater alarm, when the <Door lock method> is set to <0: Automatic lock when door closes>.
015551	Door unlocks after magazine turn	0: No 1: All doors 2: Door to replace workpiece 3: Door to replace tool	Specify to unlock the door after turning the magazine in manual mode when the <Door lock method> is set to <0: Automatic lock when door closes>. Turning the magazine also includes the magazine turn operation when using the **[ATC]** key.

1.5.4.13 System

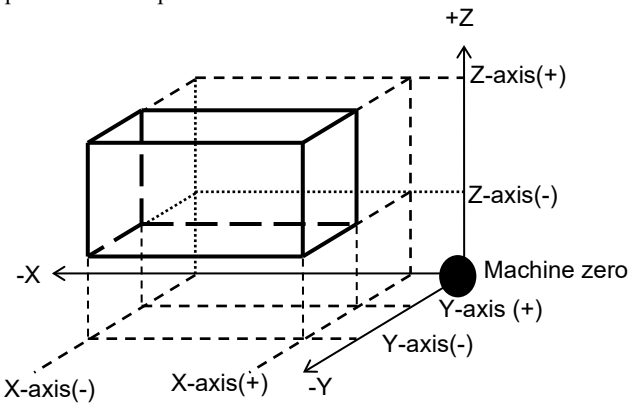
System			
No.	Item name	Setting range	Description
019901	Conversation/NC language change	0: Conversation 1: NC	Set whether to use in conversation mode or in NC language mode.
019902	Operation time	0000:00:00~ 9999:59:59	Set initial value of automatic operation time (integration of hours of memory operation).
019903	Current date	2020/01/01~ 2099/12/31	Set the current date. Once it is set, the data is automatically updated.
019904	Current time	00:00:00~ 23:59:59	Set the current time. Once set, the data is automatically updated.
019905	Machine unit system	0: Metric 1: Inch	Set metric or imperial (inch) as the unit of length used for machining data.
019906	PLC program protection	0: Invalid 1: Valid	0: Invalid The PLC program can be written. If the communication parameter <Restrict Ethernet access> is set to <1:Yes>, communication with the PLC programming software is possible. 1: Valid The PLC program is write-protected. If the communication parameter <Restrict Ethernet access> is set to <1:Yes>, communication with the PLC programming software is not possible. Once the power is turned OFF, this parameter is automatically set to <1: Valid>.

1.5.5 User Parameter 2 (Switch 2)

1.5.5.1 Stroke

Stroke			
No.	**Item name**	**Setting range**	**Description**
020001	5th-axis stroke control	0: No 1: Yes	When the 5th-axis stroke is available, 1 is specified. When it is not available, 0 is specified. When <1: Yes> is specified, the values of 5th-axis stroke (-)/(+) and stroke limit for 5th-axis (-)/(+) are valid. In the following situations, the error <<User param. setting error (switch 2)>> is triggered. • When this parameter is set to <1: Yes> and the machine parameter (system 2: additional axis) <Optional axis> (5th-axis) is set to <Yes (lathe spindle)>. • <0: No> and <Additional axis stroke *> is set to <2: 5th axis> (NOTICE) If this parameter is set to <1:Yes> and the machine parameter (system 2: additional axis) <Gear ratio> (5th-axis) is set to “1”, when the power is turned OFF after the 5th-axis has been moved to somewhere outside the stroke or when the 5th-axis is moved to somewhere outside of the stroke while the power is OFF, the coordinates for the 5th-axis may be out of position at power ON.
020002	6th-axis stroke control	0: No 1: Yes	When the 6th-axis stroke is available, 1 is specified. When it is not available, 0 is specified. When <1: Yes> is specified, the values of 6th-axis stroke (-)/(+) and stroke limit for 6th-axis (-)/(+) are valid. In the following case, the error <<User param. setting error (switch 2)>> is triggered. • When this parameter is set to <1: Yes> and the machine parameter (system 2: additional axis) <Optional axis> (6th-axis) is set to <Yes (lathe spindle)>. • <0: No> and <Additional axis stroke *> is set to <3: 6th axis> (NOTICE) If this parameter is set to <1:Yes> and the machine parameter (system 2: additional axis) <Gear ratio> (6th-axis) is set to “1”, when the power is turned OFF after the 6th-axis has been moved to somewhere outside the stroke or when the 6th-axis is moved to somewhere outside of the stroke while the power is OFF, the coordinates for the 6th-axis may be out of position at power ON.
020003	7th-axis stroke control	0: No 1: Yes	When the 7th-axis stroke is available, 1 is specified. When it is not available, 0 is specified. When <1: Yes> is specified, the values of 7th-axis stroke (-)/(+) and stroke limit for 7th-axis (-)/(+) are valid. In the following case, the error <<User param. setting error (switch 2)>> is triggered. • When this parameter is set to <1: Yes> and the machine parameter (system 2: additional axis) <Optional axis> (7th-axis) is set to <Yes (lathe spindle)>. • <0: No> and <Additional axis stroke *> is set to <4: 7th axis> (NOTICE) If this parameter is set to <1:Yes> and the machine parameter (system 2: additional axis) <Gear ratio> (7th-axis) is set to “1”, when the power is turned OFF after the 7th-axis has been moved to somewhere outside the stroke or when the 7th-axis is moved to somewhere outside of the stroke while the power is OFF, the coordinates for the 7th-axis may be out of position at power ON.

Stroke			
No.	**Item name**	**Setting range**	**Description**
020004	8th-axis stroke control	0: No 1: Yes	When the 8th-axis stroke is available, 1 is specified. When it is not available, 0 is specified. When <1: Yes> is specified, the values of 8th-axis stroke (-)/(+) and stroke limit for 8th-axis (-)/(+) are valid. In the following case, the error <<User param. setting error (switch 2)>> is triggered. • When this parameter is set to <1: Yes> and the machine parameter (system 2: additional axis) <Optional axis> (8th-axis) is set to <Yes (lathe spindle)>. • <0: No> and <Additional axis stroke *> is set to <5: 8th axis> (NOTICE) If this parameter is set to <1:Yes> and the machine parameter (system 2: additional axis) <Gear ratio> (8th-axis) is set to "1", when the power is turned OFF after the 8th-axis has been moved to somewhere outside the stroke or when the 8th-axis is moved to somewhere outside of the stroke while the power is OFF, the coordinates for the 8th-axis may be out of position at power ON.
020005~ 020006	5th-axis stroke(-) 5th-axis(+)	-9999.999 ~9999.999deg	Enter the stroke value in the machine coordinate angle when the user parameter (switch 2: stroke) <5th-axis stroke control> is set to <1: Yes>. (NOTE) In the following situations, the error <<User param. setting error (switch 2)>> is triggered. - When the machine parameter (system 2: additional axis) <Optional axis> (5th-axis) is configured to another setting besides <No> and the machine parameter (system 2: additional axis) <Gear ratio> (5th-axis) is set to "1", the user parameter (switch 2: stroke) <5th-axis stroke control> is set to <1:Yes> and the <5th-axis stroke(+)> to <5th-axis stroke(-)> are set to a value larger than 350 degrees
020007~ 020008	6th-axis stroke(-) 6th-axis(+)	-9999.999 ~9999.999deg	Enter the stroke value in the machine coordinate angle when the user parameter (switch 2: stroke) <6th-axis stroke control> is set to <1: Yes>. (NOTE) In the following situations, the error <<User param. setting error (switch 2)>> is triggered. - When the machine parameter (system 2: additional axis) <Optional axis> (6th-axis) is configured to another setting besides <No> and the machine parameter (system 2: additional axis) <Gear ratio> (6th-axis) is set to "1", the user parameter (switch 2: stroke) <6th-axis stroke control> is set to <1:Yes> and the <6th-axis stroke(+)> to <6th-axis stroke(-)> are set to a value larger than 350 degrees
020009~ 020010	7th-axis stroke(-) 7th-axis(+)	-9999.999 ~9999.999deg	Enter the stroke value in the machine coordinate angle when the user parameter (switch 2: stroke) <7th-axis stroke control> is set to <1: Yes>. (NOTE) In the following situations, the error <<User param. setting error (switch 2)>> is triggered. - When the machine parameter (system 2: additional axis) <Optional axis> (7th-axis) is configured to another setting besides <No> and the machine parameter (system 2: additional axis) <Gear ratio> (7th-axis) is set to "1", the user parameter (switch 2: stroke) <7th-axis stroke control> is set to <1:Yes> and the <7th-axis stroke(+)> to <7th-axis stroke(-)> are set to a value larger than 350 degrees

Stroke			
No.	**Item name**	**Setting range**	**Description**
020011~ 020012	8th-axis stroke(-) 8th-axis(+)	-9999.999 ~9999.999deg	Enter the stroke value in the machine coordinate angle when the user parameter (switch 2: stroke) <8th-axis stroke control> is set to <1: Yes>. (NOTE) In the following situations, the error <<User param. setting error (switch 2)>> is triggered. - When the machine parameter (system 2: additional axis) <Optional axis> (8th-axis) is configured to another setting besides <No> and the machine parameter (system 2: additional axis) <Gear ratio> (8th-axis) is set to "1", the user parameter (switch 2: stroke) <8th-axis stroke control> is set to <1:Yes> and the <8th-axis stroke(+)> to <8th-axis stroke(-)> are set to a value larger than 350 degrees
020013~ 020015 020020~ 020022	Stroke limit 1 for X-axis(-) Y-axis(-) Z-axis(-) X-axis(+) Y-axis(+) Z-axis(+)	X, Y, Z Axis -9999.999 ~9999.999mm	Set the XY-axes travel range in machine coordinates. Z-axis setting differs between conversation program and NC language program. For conversation program, set the travel range of the tool top in machine coordinates. For NC language program, set the travel range of the spindle end face in machine coordinates. (-) and (+) indicate a negative and positive setting value respectively.
020016 020023	Stroke limit 1 for 5th-axis(-) 5th-axis(+)	-9999.999 ~9999.999deg	Enter the stroke limit value in the machine coordinate angle when the user parameter (switch 2: stroke) <5th-axis stroke control> is set to <1: Yes>.
020017 020024	Stroke limit 1 for 6th-axis(-) 6th-axis(+)	-9999.999 ~9999.999deg	Enter the stroke limit value in the machine coordinate angle when the user parameter (switch 2: stroke) <6th-axis stroke control> is set to <1: Yes>.
020018 020025	Stroke limit 1 for 7th-axis(-) 7th-axis(+)	-9999.999 ~9999.999deg	Enter the stroke limit value in the machine coordinate angle when the user parameter (switch 2: stroke) <7th-axis stroke control> is set to <1: Yes>.
020019 020026	Stroke limit 1 for 8th-axis(-) 8th-axis(+)	-9999.999 ~9999.999deg	Enter the stroke limit value in the machine coordinate angle when the user parameter (switch 2: stroke) <8th-axis stroke control> is set to <1: Yes>.
020027~ 020032	Stroke limit 2 for X-axis(-) Y-axis(-) Z-axis(-) X-axis(+) Y-axis(+) Z-axis(+)	-9999.999 ~9999.999mm	Set the travel restricted range. • Restricted area is not checked when the negative value is larger than, or equal to, the positive value. When XYZ-axes settings are all valid, the range defined by these settings is the restricted range. Conversation: The Z-axis travel restricted range is set by the tool tip position. NC language: The Z-axis travel restricted range is set by the spindle end face position. 

1.5.5.2 Override speed

Override speed			
No.	Item name	Setting range	Description
020501	Rapid traverse override speed 1	0~999999mm/min	Specify the feedrate of the Rapid traverse override switch on the operation panel. It becomes valid only during rapid traverse operation(XYZ axes).
020502	Rapid traverse override speed 2	0~999999mm/min	
020503	Rapid traverse override speed 3	0~999999mm/min	
020504	Rapid traverse override speed 4	0~999999mm/min	
020505	4th-axis override rotation speed 1	0.0~9999.9/min	Set the rotation speed when Speed 1 of Overdrive switch is selected.
020506	4th-axis override rotation speed 2	0.0~9999.9/min	Set the rotation speed when Speed 2 of Overdrive switch is selected.
020507	4th-axis override rotation speed 3	0.0~9999.9/min	Set the rotation speed when Speed 3 of Overdrive switch is selected.
020508	4th-axis override rotation speed 4	0.0~9999.9/min	Set the rotation speed when Speed 4 of Overdrive switch is selected.
020509~ 020512	5th-axis override rotation speed 1 5th-axis override rotation speed 2 5th-axis override rotation speed 3 5th-axis override rotation speed 4	0.0~9999.9/min	Set the rotation speed when the override switch speed 1, 2, 3 or 4 is selected.
020513~ 020516	6th-axis override rotation speed 1 6th-axis override rotation speed 2 6th-axis override rotation speed 3 6th-axis override rotation speed 4	0.0~9999.9/min	Set the rotation speed when the override switch speed 1, 2, 3 or 4 is selected.
020517~ 020520	7th-axis override rotation speed 1 7th-axis override rotation speed 2 7th-axis override rotation speed 3 7th-axis override rotation speed 4	0.0~9999.9/min	Set the rotation speed when the override switch speed 1, 2, 3 or 4 is selected.
020521~ 020524	8th-axis override rotation speed 1 8th-axis override rotation speed 2 8th-axis override rotation speed 3 8th-axis override rotation speed 4	0.0~9999.9/min	Set the rotation speed when the override switch speed 1, 2, 3 or 4 is selected.

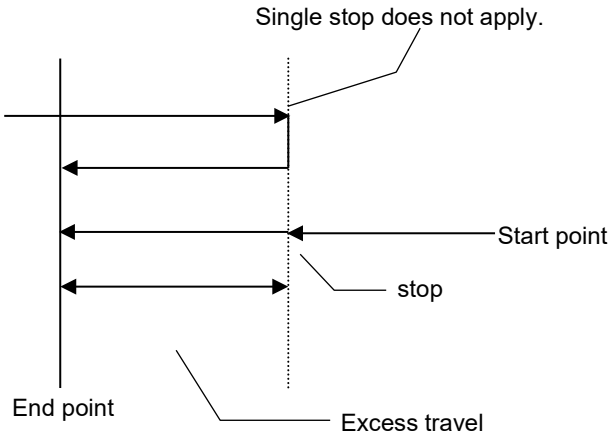
1.5.5.3 Output signal range for position signal

Output signal range for position signal			
No.	Item name	Setting range	Description
021001 021002	X-axis position signal output range (-) (+)	-9999.999 ~9999.999mm	External output signal XPOSSW turns on when the machine coordinate of the X-axis is within the range set for this parameter (including the boundary value) and turns off when it is not within the range. This signal does not turn on when dog zero return is completed.
021003 021004	Y-axis position signal output range (-) (+)	-9999.999 ~9999.999mm	External output signal YPOSSW turns on when the machine coordinate of the Y-axis is within the range set for this parameter (including the boundary value) and turns off when it is not within the range. This signal does not turn on when dog zero return is completed.

Output signal range for position signal			
No.	Item name	Setting range	Description
021005 021006	Z-axis position signal output range (-) (+)	-9999.999 ~9999.999mm	External output signal ZPOSSW turns on when the machine coordinate of the Z-axis is within the range set for this parameter (including the boundary value) and turns off when it is not within the range. This signal does not turn on when dog zero return is completed.
021007 021008	4th-axis position signal output range (-) (+)	-9999.999 ~9999.999deg	External output signal 4POSSW turns on when the machine coordinate of the 4th-axis is within the range set for this parameter (including the boundary value) and turns off when it is not within the range. This signal does not turn on when dog zero return is completed.
021009 021010	5th-axis position signal output range (-) (+)	-9999.999 ~9999.999deg	External output signal 5POSSW turns on when the machine coordinate of the 5th-axis is within the range set for this parameter (including the boundary value) and turns off when it is not within the range. This signal does not turn on when dog zero return is completed.
021011 021012	6th-axis position signal output range (-) (+)	-9999.999 ~9999.999deg	External output signal 6POSSW turns on when the machine coordinate of the 6th-axis is within the range set for this parameter (including the boundary value) and turns off when it is not within the range. This signal does not turn on when dog zero return is completed.
021013 021014	7th-axis position signal output range (-) (+)	-9999.999 ~9999.999deg	External output signal 7POSSW turns on when the machine coordinate of the 7th-axis is within the range set for this parameter (including the boundary value) and turns off when it is not within the range. This signal does not turn on when dog zero return is completed.
021015 021016	8th-axis position signal output range (-) (+)	-9999.999 ~9999.999deg	External output signal 8POSSW turns on when the machine coordinate of the 8th-axis is within the range set for this parameter (including the boundary value) and turns off when it is not within the range. This signal does not turn on when dog zero return is completed.
021017 021018	X-axis position signal output range 2 (-) (+)	-9999.999 ~9999.999mm	PLC signal XPOSSW2 turns OFF when the X-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021019 021020	Y-axis position signal output range 2 (-) (+)	-9999.999 ~9999.999mm	PLC signal YPOSSW2 turns OFF when the Y-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021021 021022	Z-axis position signal output range 2 (-) (+)	-9999.999 ~9999.999mm	PLC signal ZPOSSW2 turns OFF when the Z-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021023 021024	4th-axis position signal output range 2 (-) (+)	-9999.999 ~9999.999 deg	PLC signal 4POSSW2 turns OFF when the 4th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021025 021026	5th-axis position signal output range 2 (-) (+)	-9999.999 ~9999.999 deg	PLC signal 5POSSW2 turns OFF when the 5th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021027 021028	6th-axis position signal output range 2 (-) (+)	-9999.999 ~9999.999 deg	PLC signal 6POSSW2 turns OFF when the 6th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021029 021030	7th-axis position signal output range 2 (-) (+)	-9999.999 ~9999.999 deg	PLC signal 7POSSW2 turns OFF when the 7th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021031 021032	8th-axis position signal output range 2 (-) (+)	-9999.999 ~9999.999 deg	PLC signal 8POSSW2 turns OFF when the 8th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021033 021034	X-axis position signal output range 3 (-) (+)	-9999.999 ~9999.999mm	PLC signal XPOSSW turns OFF when the X-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021035 021036	Y-axis position signal output range 3 (-) (+)	-9999.999 ~9999.999mm	PLC signal YPOSSW turns OFF when the Y-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021037 021038	Z-axis position signal output range 3 (-) (+)	-9999.999 ~9999.999mm	PLC signal ZPOSSW turns OFF when the Z-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021039 021040	4th-axis position signal output range 3 (-) (+)	-9999.999 ~9999.999deg	PLC signal 4POSSW turns OFF when the 4th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.

Output signal range for position signal			
No.	Item name	Setting range	Description
021041 021042	5th-axis position signal output range 3 (-) (+)	-9999.999 ~9999.999deg	PLC signal 5POSSW turns OFF when the 5th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021043 021044	6th-axis position signal output range 3 (-) (+)	-9999.999 ~9999.999deg	PLC signal 6POSSW turns OFF when the 6th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021045 021046	7th-axis position signal output range 3 (-) (+)	-9999.999 ~9999.999deg	PLC signal 7POSSW turns OFF when the 7th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021047 021048	8th-axis position signal output range 3 (-) (+)	-9999.999 ~9999.999deg	PLC signal 8POSSW turns OFF when the 8th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021049 021050	X-axis position signal output range 4 (-) (+)	-9999.999 ~9999.999mm	PLC signal XPOSSW2 turns OFF when the X-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021051 021052	Y-axis position signal output range 4 (-) (+)	-9999.999 ~9999.999mm	PLC signal YPOSSW2 turns OFF when the Y-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021053 021054	Z-axis position signal output range 4 (-) (+)	-9999.999 ~9999.999mm	PLC signal ZPOSSW2 turns OFF when the Z-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021055 021056	4th-axis position signal output range 4 (-) (+)	-9999.999 ~9999.999deg	PLC signal 4POSSW2 turns OFF when the 4th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021057 021058	5th-axis position signal output range 4 (-) (+)	-9999.999 ~9999.999deg	PLC signal 5POSSW2 turns OFF when the 5th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021059 021060	6th-axis position signal output range 4 (-) (+)	-9999.999 ~9999.999deg	PLC signal 6POSSW2 turns OFF when the 6th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021061 021062	7th-axis position signal output range 4 (-) (+)	-9999.999 ~9999.999deg	PLC signal 7POSSW2 turns OFF when the 7th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.
021063 021064	8th-axis position signal output range 4 (-) (+)	-9999.999 ~9999.999deg	PLC signal 8POSSW2 turns OFF when the 8th-axis machine coordinate is within the range set for this parameter (including the boundary value) and turns OFF when it is not within the range.

1.5.5.4 Excess travel amount for single direction positioning

Excess travel amount for single direction positioning			
No.	Item name	Setting range	Description
021501~ 021507	single direction positioning excess travel amount X-axis Y-axis Z-axis 4th-axis 5th-axis 6th-axis 7th-axis 8th-axis (NC language only)	X, Y, Z-Axis -99.999~99.999mm 4~8Axis -99.999~99.999deg	Set the single direction positioning travel amount for each axis. 

1.5.5.5 External index

External index			
No.	**Item name**	**Setting range**	**Description**
022001	Outer rotary table 1 switch address	0: A 1: B 2: C	Set the rotation axis address with the **[OUTER ROTARY TABLE 1]** switch.
022002	Outer rotary table 1 indexing (+)	0~999.999 deg	Set the travel amount on the (+) side of the **[OUTER ROTARY TABLE 1]** switch.
022003	Outer rotary table 1 indexing (-)	-999.999~0 deg	Set the travel amount on the (-) side of the **[OUTER ROTARY TABLE 1]** switch.
022004	Outer rotary table 2 switch address	0: A 1: B 2: C	Set the rotation axis address with the **[OUTER ROTARY TABLE 2]** switch.
022005	Outer rotary table 2 indexing (+)	0~999.999 deg	Set the travel amount on the (+) side of the **[OUTER ROTARY TABLE 2]** switch.
022006	Outer rotary table 2 indexing (-)	-999.999~0 deg	Set the travel amount on the (-) side of the **[OUTER ROTARY TABLE 2]** switch.

1.5.6 User Parameter 3 (Switch 3)

1.5.6.1 In-position check distance

In-position check distance			
No.	**Item name**	**Setting range**	**Description**
030001	M271 positioning end check distance	0~99.999mm	Set the positioning end check distance during M271 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively). This parameter is valid for XYZ-axes (linear axes) movement.
030002	M271 positioning end check angle	0~9.999deg	Set the positioning end check angle during M271 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively).
030003	M271 in-position width (X-, Y- and Z-axes)	0~99.999 mm	Set the in-position width during the M271 modal. This setting is applied when the positioning operation and cutting operation is performed consecutively. This parameter is valid for travel on the X-, Y- and Z-axes (linear axes).
030004	M272 positioning end check distance	0~99.999mm	Set the positioning end check distance during M272 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively). This parameter is valid for XYZ-axes (linear axes) movement.
030005	M272 positioning end check angle	0~9.999deg	Set the positioning end check distance during M272 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively).
030006	M272 in-position width (X-, Y- and Z-axes)	0~99.999 mm	Set the in-position width during the M272 modal. This setting is applied when the positioning operation and cutting operation is performed consecutively. This parameter is valid for travel on the X-, Y- and Z-axes (linear axes).
030007	M273 positioning end check distance	0~99.999mm	Set the positioning end check distance during M273 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively). This parameter is valid for XYZ-axes (linear axes) movement.
030008	M273 positioning end check angle	0~9.999deg	Set the positioning end check angle during M273 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively).
030009	M273 in-position width (X-, Y- and Z-axes)	0~99.999 mm	Set the in-position width during the M273 modal. This setting is applied when the positioning operation and cutting operation is performed consecutively. This parameter is valid for travel on the X-, Y- and Z-axes (linear axes).
030010	M274 positioning end check distance	0~99.999mm	Set the positioning end check distance during M274 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively). This parameter is valid for XYZ-axes (linear axes) movement.
030011	M274 positioning end check angle	0~9.999deg	Set the positioning end check angle during M274 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively).
030012	M274 in-position width (X-, Y- and Z-axes)	0~99.999 mm	Set the in-position width during the M274 modal. This setting is applied when the positioning operation and cutting operation is performed consecutively. This parameter is valid for travel on the X-, Y- and Z-axes (linear axes).

In-position check distance			
No.	Item name	Setting range	Description
030013	M275 positioning end check distance	0~99.999mm	Set the positioning end check distance during M275 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively). This parameter is valid for XYZ-axes (linear axes) movement.
030014	M275 positioning end check angle	0~9.999deg	Set the positioning end check angle during M275 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively).
030015	M275 in-position width (X-, Y- and Z-axes)	0~99.999 mm	Set the in-position width during the M275 modal. This setting is applied when the positioning operation and cutting operation is performed consecutively. This parameter is valid for travel on the X-, Y- and Z-axes (linear axes).
030016	M276 positioning end check distance	0~99.999mm	Set the positioning end check angle during M276 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively). This parameter is valid for XYZ-axes (linear axes) movement.
030017	M276 positioning end check angle	0~9.999deg	Set the positioning end check angle during M276 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively).
030018	M276 in-position width (X-, Y- and Z-axes)	0~99.999 mm	Set the in-position width during the M276 modal. This setting is applied when the positioning operation and cutting operation is performed consecutively. This parameter is valid for travel on the X-, Y- and Z-axes (linear axes).
030019	M277 positioning end check distance	0~99.999mm	Set the positioning end check angle during M277 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively). This parameter is valid for XYZ-axes (linear axes) movement.
030020	M277 positioning end check angle	0~9.999deg	Set the positioning end check angle during M277 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively).
030021	M277 in-position width (X-, Y- and Z-axes)	0~99.999 mm	Set the in-position width during the M277 modal. This setting is applied when the positioning operation and cutting operation is performed consecutively. This parameter is valid for travel on the X-, Y- and Z-axes (linear axes).
030022	M278 positioning end check distance	0~99.999mm	Set the positioning end check angle during M278 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively). This parameter is valid for XYZ-axes (linear axes) movement.
030023	M278 positioning end check angle	0~9.999deg	Set the positioning end check angle during M278 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively).
030024	M278 in-position width (X-, Y- and Z-axes)	0~99.999 mm	Set the in-position width during the M278 modal. This setting is applied when the positioning operation and cutting operation is performed consecutively. This parameter is valid for travel on the X-, Y- and Z-axes (linear axes).
030025	M279 positioning end check distance	0~99.999mm	Set the positioning end check distance during M279 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively). This parameter is valid for XYZ-axes (linear axes) movement.
030026	M279 positioning end check angle	0~9.999deg	Set the positioning end check angle during M279 modal. This setting is applied when the next operation is also positioning (when positioning is performed consecutively).
030027	M279 in-position width (X-, Y- and Z-axes)	0~99.999 mm	Set the in-position width during the M279 modal. This setting is applied when the positioning operation and cutting operation is performed consecutively. This parameter is valid for travel on the X-, Y- and Z-axes (linear axes).
030028	Angle setting to check when additional axis for positioning is finished	0: Invalid 1: Error	When issuing an M code (M271 - M279) that sets the angle to check if the positioning operation is finished on the additional axis, use this setting to ignore the M code and continue operation or to trigger an alarm and stop operation.

In-position check distance			
No.	**Item name**	**Setting range**	**Description**
030029	Initial modal for in-position check distance	0:M270 1:M271 2:M272 3:M273 4:M274 5:M275 6:M276 7:M277 8:M278 9:M279	Set the modal for the in-position check distance. This parameter initializes the set modal when the power is turned ON, when the **[RST]** key is pressed, when M02 or M30 is executed and when operation is reset.

1.5.6.2 Low priority indication alarm number

Low priority indication alarm number			
No.	**Item name**	**Setting range**	**Description**
030501~ 030510	Low priority indication alarm No. 1 Low priority indication alarm No. 2 Low priority indication alarm No. 3 Low priority indication alarm No. 4 Low priority indication alarm No. 5 Low priority indication alarm No. 6 Low priority indication alarm No. 7 Low priority indication alarm No. 8 Low priority indication alarm No. 9 Low priority indication alarm No. 10	0000 - 9999 : Operator message 010000 - 119999 : Alarm Top 2 digits:Category number (*1) 01:EX 02:EC 03:SV 04:NC 05:IO 06:SP 07:SM 08:SL 09:CM 10:ES 11:FC Last 4 digits: Alarm number	Set the alarm number not to flash when multiple alarms occur. The alarm message flashes in the instruction area of the screen. When multiple alarms are current, alarms with high priority flash. Although the priority is determined according to the importance of the alarm and time of occurrence, the lowest priority applies to the alarm number set for this parameter. However, this setting is invalid for alarms of release level 3. (*1) Preset value is displayed by category name. Input value: 041234 → Preset value display: NC1234

1.5.6.3 Modal display setting

Modal display setting			
No.	**Item name**	**Setting range**	**Description**
031001~ 031016	G code for modal display 1 G code for modal display 2 G code for modal display 3 G code for modal display 4 G code for modal display 5 G code for modal display 6 G code for modal display 7 G code for modal display 8 G code for modal display 9 G code for modal display 10 G code for modal display 11 G code for modal display 12 G code for modal display 13 G code for modal display 14 G code for modal display 15 G code for modal display 16 (NC language only)	0:No 1-18:G code for modal display	Sets the G code modal that is displayed in the <Modal info 1> screen and <MDI operation> screen. The setting value and displayable modal are as follows: 0: Hide 1: (G00,G01,G02,G03,G02.2,G03.2,G102,G103,G202,G203,G33, G392) 2: (G17,G18,G19) 3: (G22,G23) 4: (G40,G41,G42,G141,G142) 5: (G43,G44,G143,G144,G49) 6: (G50,G51) 7: (G50.1,G51.1) 8: (G54,G55,G56,G57,G58,G59,G54.1) 9: (G54.2Pn) 10: (G61,G64) 11: (G66,G67) 12: (G68,G69,G168) 13: (G73,G74,G76,G77,G78,G80,G81,G82,G83,G84,G85,G86, G87,G89,G177,G178,G181,G182,G185,G186,G189,G277, G278) 14: (G90,G91) 15: (G94,G95) 16: (G96,G97) 17: (G98,G99) 18: (G321,G322,G323)

Modal display setting			
No.	Item name	Setting range	Description
031017~ 031032	M code for modal display 1 M code for modal display 2 M code for modal display 3 M code for modal display 4 M code for modal display 5 M code for modal display 6 M code for modal display 7 M code for modal display 8 M code for modal display 9 M code for modal display 10 M code for modal display 11 M code for modal display 12 M code for modal display 13 M code for modal display 14 M code for modal display 15 M code for modal display 16 (NC language only)	0:No 1-36:M code for modal display	Sets the M code modal that is displayed in the <Modal info 1> screen and <MDI operation> screen. The setting value and displayable modal are as follows: 0: Hide 1:(M03,M04,M05,M19,M111) 2:(M08,M09) 3:(M96,M97) 4:(M141,M142) 5:(M211,M221) 6:(M212,M222) 7:(M213,M223) 8:(M214,M224) 9:(M230,M231) 10:(M241,M242,M243,M244,M245,M246,M247,M248,M249, M250,M251,M252,M253,M254) 11:(M260,M261,M262,M263,M264,M265,M266,M267,M269, M280,M281,M282,M283,M284,M285,M286,M287,M289) 12:(M270,M271,M272,M273,M274,M275,M276,M277,M278, M279) 13:(M290,M291,M292,M293) 14:(M303,M304,M305) 15:(M322,M323) 16:(M400,M401) 17:(M402,M403) 18:(M404,M405) 19:(M406,M407) 20:(M408,M409) 21:(M418,M419) 22:(M430,M431) 23:(M435,M436,M437) 24:(M440,M441) 25:(M442,M443) 26:(M444,M445) 27:(M480,M481) 28:(M482,M483) 29:(M484,M485) 30:(M486,M487) 31:(M494,M495) 32:(M298,M299) 33:(M474,M475) 34:(M420,M421,M422,M423) 35:(M340,M341,M342,M343) 36:(M300,M301)

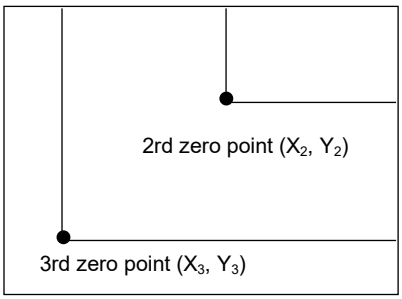
1.5.6.4 Specified alarm signal setting

Specified alarm signal setting			
No.	Item name	Setting range	Description
031501	Specified alarm signal 2	0000 to 9999: Operator message 010000 to 119999: Alarm First two digits: Category number (NOTE) 01:EX 02:EC 03:SV 04:NC 05:IO 06:SP 07:SM 08:SL 09:CM 10:PN 11:FN Last four digits: Alarm number	PLC signal BX371 turns ON when the alarm/operator message specified in this parameter is triggered. (NOTE) The set value is shown in the category name. Input value: 041234 → Set value display: NC1234

Specified alarm signal setting			
No.	**Item name**	**Setting range**	**Description**
031502	Specified alarm signal 3	0000 to 9999: Operator message 010000 to 119999: Alarm First two digits: Category number (NOTE) 01:EX 02:EC 03:SV 04:NC 05:IO 06:SP 07:SM 08:SL 09:CM 10:PN 11:FN Last four digits: Alarm number	PLC signal BX372 turns ON when the alarm/operator message specified in this parameter is triggered. (NOTE) The set value is shown in the category name. Input value: 041234 → Set value display: NC1234
031503	Specified alarm signal 4	0000 to 9999: Operator message 010000 to 119999: Alarm First two digits: Category number (NOTE) 01:EX 02:EC 03:SV 04:NC 05:IO 06:SP 07:SM 08:SL 09:CM 10:PN 11:FN Last four digits: Alarm number	PLC signal BX373 turns ON when the alarm/operator message specified in this parameter is triggered. (NOTE) The set value is shown in the category name. Input value: 041234 → Set value display: NC1234
031504	Specified alarm signal 5	0000 to 9999: Operator message 010000 to 119999: Alarm First two digits: Category number (NOTE) 01:EX 02:EC 03:SV 04:NC 05:IO 06:SP 07:SM 08:SL 09:CM 10:PN 11:FN Last four digits: Alarm number	PLC signal BX374 turns ON when the alarm/operator message specified in this parameter is triggered. (NOTE) The set value is shown in the category name. Input value: 041234 → Set value display: NC1234

1.5.7 User Parameter 4 (Ref. Position/Conversation Zero Point)

No.	Item name	Setting range	Description
040001	Reference position X-axis (NC language only)	-9999.999 ~9999.999 mm	Set the position that the X axis should return after G28 command in the machine coordinates.
040002	Reference position Y-axis (NC language only)	-9999.999 ~9999.999 mm	Set the position that the Y axis should return after G28 command in the machine coordinates.
040003	Reference position Z-axis (NC language only)	-9999.999 ~9999.999 mm	Set the position that the Z axis should return after G28 command in the machine coordinates.
040004	Reference position 5th-axis (NC language only)	-9999.999 ~9999.999 deg	Set the position that the 5 axis should return after G28 command in the machine coordinates.
040005	Reference position 6th-axis (NC language only)	-9999.999 ~9999.999 deg	Set the position that the 6 axis should return after G28 command in the machine coordinates.
040006	Reference position 7th-axis (NC language only)	-9999.999 ~9999.999 deg	Set the position that the 7 axis should return after G28 command in the machine coordinates.
040007	Reference position 8th-axis (NC language only)	-9999.999 ~9999.999 deg	Set the position that the 8 axis should return after G28 command in the machine coordinates.
040008 040015 040022 040029 040036	2nd reference position X-axis 3rd reference position X-axis 4th reference position X-axis 5th reference position X-axis 6th reference position X-axis (NC language only)	-9999.999 ~9999.999 mm	Set the position that the X axis should return after G30 command in the machine coordinates.
040009 040016 040023 040030 040037	2nd reference position Y-axis 3rd reference position Y-axis 4th reference position Y-axis 5th reference position Y-axis 6th reference position Y-axis (NC language only)	-9999.999 ~9999.999 mm	Set the position that the Y axis should return after G30 command in the machine coordinates.
040010 040017 040024 040031 040038	2nd reference position Z-axis 3rd reference position Z-axis 4th reference position Z-axis 5th reference position Z-axis 6th reference position Z-axis (NC language only)	-9999.999 ~9999.999 mm	Set the position that the Z axis should return after G30 command in the machine coordinates.
040011 040018 040025 040032 040039	2nd reference position 5th-axis 3rd reference position 5th-axis 4th reference position 5th-axis 5th reference position 5th-axis 6th reference position 5th-axis (NC language only)	-9999.999 ~9999.999 deg	Set the position that the 5 axis should return after G30 command in the machine coordinates.
040012 040019 040026 040033 040040	2nd reference position 6th-axis 3rd reference position 6th-axis 4th reference position 6th-axis 5th reference position 6th-axis 6th reference position 6th-axis (NC language only)	-9999.999 ~9999.999 deg	Set the position that the 6 axis should return after G30 command in the machine coordinates.
040013 040020 040027 040034 040041	2nd reference position 7th-axis 3rd reference position 7th-axis 4th reference position 7th-axis 5th reference position 7th-axis 6th reference position 7th-axis (NC language only)	-9999.999 ~9999.999 deg	Set the position that the 7 axis should return after G30 command in the machine coordinates.
040014 040021 040028 040035 040042	2nd reference position 8th-axis 3rd reference position 8th-axis 4th reference position 8th-axis 5th reference position 8th-axis 6th reference position 8th-axis (NC language only)	-9999.999 ~9999.999 deg	Set the position that the 8 axis should return after G30 command in the machine coordinates.

No.	Item name	Setting range	Description
040043	Reference point return complete signal output at servo off (NC language only)	0: No 1: Yes	When <Reference point return complete signal output at servo off> is set to <1:Yes> and distance from the reference point is within the range preset by <Reference point acceptable range at servo off>, reference point return complete signal is continuously turned on even at servo off.
040044	Reference point allowable range at servo off (for XYZ axes) (NC language only)	0~9.999mm 0~0.9999inch	
040045	Reference point allowable range at servo off (for additional axes) (NC language only)	0~9.999deg	
040046	X-axis zero return pos.(No.2) (Conversation only)	-9999.999 ~9999.999 mm (X2 in the righe figure)	Set the second and third zero point return positions in machine coordinates. 
040047	Y-axis zero return pos.(No.2) (Conversation only)	-9999.999 ~9999.999 mm (Y2 in the righe figure)	
040048	X-axis zero return pos.(No.3) (Conversation only)	-9999.999 ~9999.999 mm (X3 in the righe figure)	
040049	Y-axis zero return pos.(No.3) (Conversation only)	-9999.999 ~9999.999 mm (Y3 in the righe figure)	
040050	5th-axis zero return pos. (No.2) (Conversation only)	-9999.999 ~9999.999 deg or ? (No return)	Set the second zero return position in machine coordinates for the 5th, 6th, 7th, and 8th axes. When “?” is set, the axis does not return to the zero point.
040051	6th-axis zero return pos. (No.2) (Conversation only)	-9999.999 ~9999.999 deg or ? (No return)	
040052	7th-axis zero return pos. (No.2) (Conversation only)	-9999.999 ~9999.999 deg or ? (No return)	
040053	8th-axis zero return pos. (No.2) (Conversation only)	-9999.999 ~9999.999 deg or ? (No return)	
040054	5th-axis zero return pos. (No.3) (Conversation only)	-9999.999 ~9999.999 deg or ? (No return)	Set the third zero return position in machine coordinates for the 5th, 6th, 7th, and 8th axes. When “?” is set, the axis does not return to the zero point.
040055	6th-axis zero return pos. (No.3) (Conversation only)	-9999.999 ~9999.999 deg or ? (No return)	
040056	7th-axis zero return pos. (No.3) (Conversation only)	-9999.999 ~9999.999 deg or ? (No return)	
040057	8th-axis zero return pos. (No.3) (Conversation only)	-9999.999 ~9999.999 deg or ? (No return)	
040058	Zero point return complete signal output at servo off (Conversation only)	0: No 1: Yes	When <Zero point return complete signal output at servo off> is set to "1: Yes" and distance from zero point return potition is within the range preset by "Zero point return acceptable range at servo off", zero point return complete signal is continuously turned on even at servo off.
040059	Zero point allowable range at servo off (for XYZ axes) (Conversation only)	0~9.999mm 0~0.9999inch	
040060	Zero point allowable range at servo off (for additional axes) (Conversation only)	0~9.999deg	
040061	Workpiece coordinate zero point X axsis (for capture) (NC language only)	-9999.999 ~9999.999mm	Set machine coordinate to be input when the function key “Parameter extraction” on the workpiece coordinate zero point screen is pressed.
040062	Workpiece coordinate zero point Y axsis (for capture) (NC language only)	-9999.999 ~9999.999mm	
040063	Workpiece coordinate zero point Z axsis (for capture) (NC language only)	-9999.999 ~9999.999mm	

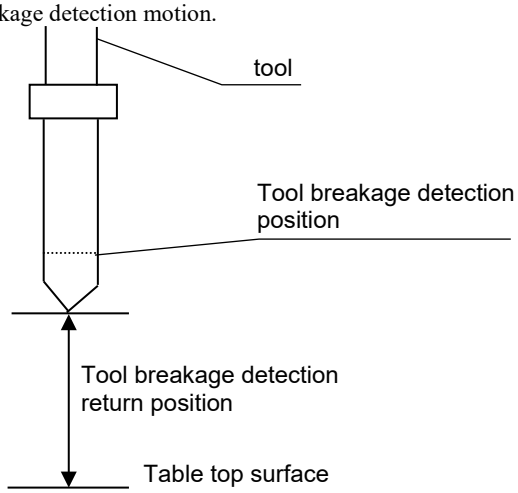
1.5.8 User Parameter 5 (User Registered Auxiliary Functions)

Setting items for option 01 to 20

No.	Item name	Setting range	Description
01~20	Signal	10 - 95, 800 - 899, 900 – 999 (19 and 30 are excluded.)	Set a signal to be displayed on <M code list (user defined)> screen for the monitor screen.
01~20	Name	Characters that can be input from the panel: Max. 14	Register displaying name of the signal set in the above item. Display part includes operation displaying part for conversation operation in addition to monitor screen. Up to 14 characters to be input from the panel are available for registration.

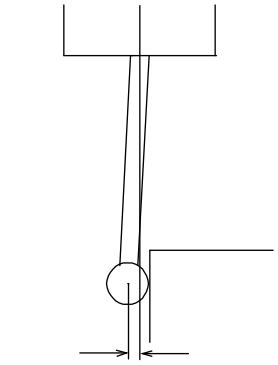
1.5.9 User Parameter 6 (Tool Breakage Detection)

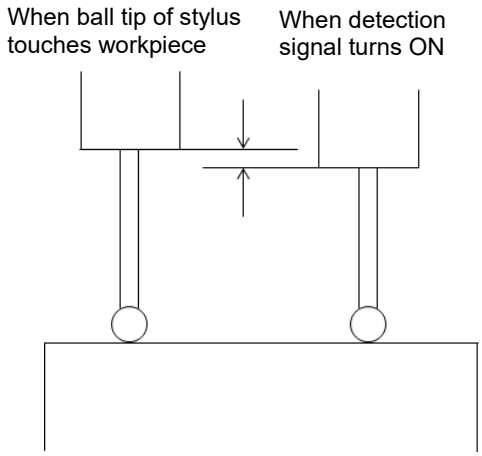
No.	Item name	Setting range	Description
060001	Tool breakage detection option	0: Not equipped 1: Type1 2: Type2 3: Type3 4: Type4	0: No 1: Type1 Tool breakage is detected by the Z-axis travel and the detection arm swing. 2: Type2 Set “Type2” when detecting tool breakage inside the magazine for arm-turn type ATC. 3: Type3 Set “Type3” when detecting tool breakage by touch signal with the table fixed. For QT installed machine, set pallet to be equipped with tool breakage detector for "Pallet 1 tool breakage detector" and "Pallet 2 tool breakage detector". "4: Type4" is set for the type of machine to perform tool breakage detection within the magazine in case of ATC with arm turning system. (Tool breakage detection is performed based on fixed tool length.) (NOTE) Setting is only possible for <0: Not equipped> and <3: Type 3>
060002	Pallet 1 tool breakage detector	0: No 1: Yes	For QT installed machine, when the tool breakage detector is equipped to pallet 1, set <1: Yes>. This number is not used for the machine without QT.
060003	Pallet 2 tool breakage detector	0: No 1: Yes	For QT installed machine, when the tool breakage detector is equipped to pallet 2, set <1: Yes>. This number is not used for the machine without QT.
060004	Tool breakage detection execution interval(No. of operations) (Conversation only)	1~999times	Set the program operation interval to execute tool breakage detection (number of times the program is run). For example, when “5” is set, tool breakage detection is executed each time the program has been run five times. When “1” is set, tool breakage detection is executed each time the program has been run once.
060005	Reference tool length offset No. (NC language only)	0~99 201~299	When the program has been created using the reference tool, set the tool length data number containing the preset reference tool length. (When not using the reference tool, set "0") This parameter is valid only during the tool breakage detection. Tool detect operation is performed by adding tool length that set the tool number here and tool length that commanded tool number by length offset (H).

No.	Item name	Setting range	Description
060006	Tool breakage detection return position (Type1)	-9999.999 ~9999.999mm	Set tool end return position in machine coordinate before tool breakage detection motion. 
060007	Tool breakage detection position X-axis (Type1)	-9999.999 ~9999.999mm	Set the tool breakage detection position on the machine coordinate.
060008	Tool breakage detection position Y-axis (Type1)	-9999.999 ~9999.999mm	Set the tool breakage detection position on the machine coordinate.
060009	Tool breakage detection offset (Type2)	0~99.999mm	Set the distance from the tool tip to the detection position when “2: Type2” is set for “Tool breakage detection option”.
060010	Tool breakage detection position X-axis (Type3)	-9999.999 ~9999.999mm	Set the position that tool breakage detection signal is turned ON on the machine coordinate. For QT installed machine, the set value is applied on pallet 1.
060011	Tool breakage detection position Y-axis (Type3)	-9999.999 ~9999.999mm	Set the position that tool breakage detection signal is turned ON on the machine coordinate. For QT installed machine, the set value is applied on pallet 1.
060012	Tool breakage detection position Z-axis (Type3)	-9999.999 ~9999.999mm	Set the position that tool breakage detection signal is turned ON on the machine coordinate. For QT installed machine, the set value is applied on pallet 1.
060013	Tool breakage detection start distance (Type3) (Conversation only)	0~99.999mm	Set the cutting feed start position for the tool breakage detection using the distance in the user parameter (tool breakage detection) <Tool breakage detection position Z-axis (Type3)>. For QT installed machine, the set value is applied on pallet 1.
060014	Tool breakage detection stop distance (Type3) (Conversation only)	0~99.999mm	Set the cutting feed end position for the tool breakage detection using the distance in the user parameter (tool breakage detection) <Tool breakage detection position Z-axis (Type3)>. For QT installed machine, the set value is applied on pallet 1.
060015	Tool breakage detection speed (Type3) (Conversation only)	1~5000mm/min	Set the cutting feed speed of tool breakage detection movement. For QT installed machine, the set value is applied on pallet 1.
060016	Tool breakage detection coolant OFF (Type3) (Conversation only)	0: No 1: Yes	Set whether the coolant and CT coolant is automatically performed during tool breakage detection movement. When <1: Yes> is set, coolant operation stops at the start of tool breakage detection movement and then it starts again after the detection movement is finished. However, CT coolant operation is not performed after the detection movement For QT installed machine, the set value is applied on pallet 1.
060017	Pallet 2 tool breakage detection pos. X-axis (Type3)	-9999.999 ~9999.999mm (-999.9999~ 999.9999inch)	Set the position that tool breakage detection signal is turned ON on the machine coordinate. For QT installed machine, the set value is applied on pallet 2. This number is not used for the machine without QT.
060018	Pallet 2 tool breakage detection pos. Y-axis (Type3)	-9999.999 ~9999.999mm (-999.9999~ 999.9999inch)	Set the position that tool breakage detection signal is turned ON on the machine coordinate. For QT installed machine, the set value is applied on pallet 2. This number is not used for the machine without QT.

No.	Item name	Setting range	Description
060019	Pallet 2 tool breakage detection pos. Z-axis (Type3)	-9999.999 ~9999.999mm (-999.9999 ~999.9999inch)	Set the position that tool breakage detection signal is turned ON on the machine coordinate. For QT installed machine, the set value is applied on pallet 2. This number is not used for the machine without QT.
060020	Pallet 2 tool breakage detection start distance (Type3) (Conversation only)	0~99.999mm (0~9.9999inch)	Set the cutting feed start position for the tool breakage detection using the distance in the user parameter (tool breakage detection) <Tool breakage detection position Z-axis (Type3)>. For QT installed machine, the set value is applied on pallet 2. This number is not used for the machine without QT.
060021	Pallet 2 tool breakage detection stop distance (Type3) (Conversation only)	0~99.999mm (0~9.9999inch)	Set the cutting feed end position for the tool breakage detection using the distance in the user parameter (tool breakage detection) <Tool breakage detection position Z-axis (Type3)>. For QT installed machine, the set value is applied on pallet 2. This number is not used for the machine without QT.
060022	Pallet 2 tool breakage detection speed (Type3) (Conversation only)	1~5000mm/min (0.1~196.8inch/min)	Set the cutting feed speed of tool breakage detection movement. For QT installed machine, the set value is applied on pallet 2. This number is not used for the machine without QT.
060023	Pallet 2 tool breakage detection coolant OFF (Type3) (Conversation only)	0: No 1: Yes	Set whether the coolant and CT coolant is automatically performed during tool breakage detection movement. When <1: Yes> is set, coolant operation stops at the start of tool breakage detection movement and then it starts again after the detection movement is finished. However, CT coolant operation is not performed after the detection movement. For QT installed machine, the set value is applied on pallet 2. This number is not used for the machine without QT.
060024	Check location measurement setting for tool breakage detection	0: Measurement setting 1 1: Measurement setting 2 2: Measurement setting 3 3: Measurement setting 4	Select from the user parameter (switch 1: programming) settings <Measurement setting 1> to <Measurement setting 4> in order to set the measurement used when executing one of the commands below related to the tool breakage detection. (When using the NC language) M120/M121 (Conversation language) Tool breakage detection activated by the signal output 203

1.5.10 User Parameter 7 (Automatic Workpiece Measurement / Automatic Centering)

No.	Item name	Setting range	Description
070001 070002	Probe compensation X (corner) Probe compensation Y (corner)	-9.999~9.999mm	Set the difference between the stylus tip ball center and the spindle when the detection signal is turned on while the touch probe is attached to the spindle. The X value of the difference corresponds to the automatic workpiece measurement compensation X (corner) and the Y value corresponds to the automatic workpiece measurement compensation Y (corner). We recommend performing the automatic setting on the automatic centering - <Automatic workpiece measurement compensation (corner)> screen in MDI mode.  Automatic workpiece measurement compensation

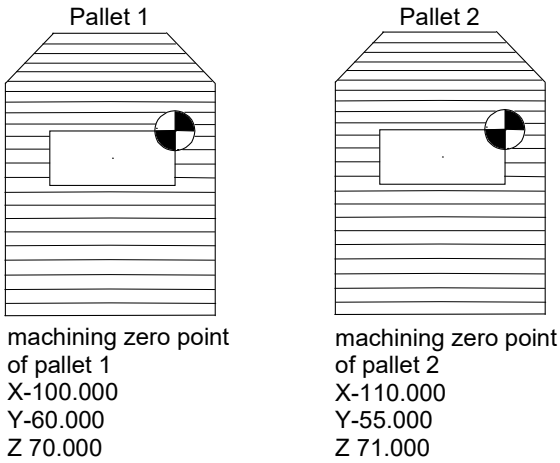
No.	Item name	Setting range	Description
070003 070004	Probe compensation X (3-point circle) Probe compensation Y (3-point circle)	-9.999~9.999mm	Set the difference between center of circle obtained by three point measurement and that of actual circle. The X value of the difference corresponds to the automatic workpiece measurement compensation X (3-point circle) and the Y value corresponds to the automatic workpiece measurement compensation Y (3-point circle). We recommend performing the automatic setting on the automatic centering - <Automatic workpiece measurement compensation (3-point circle)> screen in MDI mode.
070005	Probe compensation Z (Workpiece top surface)	-9.999~9.999 mm	Set the difference between the spindle end when the detection signal turns ON and the spindle end when the stylus tip ball touches the workpiece, with the touch probe attached to the spindle. We recommend performing the automatic setting on the automatic centering - <Automatic workpiece measurement compensation (workpiece top surface)> screen in MDI mode. 
070006	Automatic workpiece measurement motion	0: Type1 1: Type2	0: Type1 Executes a measurement using automatic workpiece measurement speed 1 and a measurement using automatic workpiece measurement speed 2. 1: Type2 Executes a measurement using automatic workpiece measurement speed 2.
070007	Automatic workpiece measurement speed 1	1~5000mm/min	Set the first measurement speed for the automatic workpiece measurement motion (Type 1). This setting is also used for the measurement in the automatic centering - <Automatic workpiece measurement compensation (corner)>, <Automatic workpiece measurement compensation (3-point circle)> and <Automatic workpiece measurement compensation (workpiece top surface)> in MDI mode.
070008	Automatic workpiece measurement speed 2	1~5000mm/min	Set the second measurement speed for the automatic workpiece measurement motion (Type 1) and the measurement speed for automatic workpiece measurement motion (Type 2). This setting is also used for the measurement in the automatic centering - <Automatic workpiece measurement compensation (corner)>, <Automatic workpiece measurement compensation (3-point circle)> and <Automatic workpiece measurement compensation (workpiece top surface)> in MDI mode.
070009	Stop point before automatic workpiece measurement	0.000~99.999mm	Set the distance between the measurement probe end face and the workpiece surface before starting measurement skip.
070010	Travel limit distance in automatic workpiece measurement	0.000~99.999mm	Set the overtravel when the measurement skip operation exceeds the predicted value (programmed value).
070011	Tolerance 1 for automatic workpiece measurement	0.000~99.999mm	When the difference between the measurement result and the predicted value (programmed value) exceeds this setting, the <<Large error in measured value (1)>> alarm occurs. When “0” is set, error checking is not performed.
070012	Tolerance 2 for automatic workpiece measurement	0.000~99.999mm	When the difference between the current measurement result and the previous measurement result exceeds this setting, the <<Large error in measured value (2)>> alarm occurs. When “0” is set, error checking is not performed.

No.	Item name	Setting range	Description
070013	Return stroke after automatic workpiece measurement	0.000~99.999mm	Set the return distance from the position the measurement probe contacted the workpiece during automatic measurement.
070014 070015	Automatic centering compensation X (corner) Automatic centering compensation Y (corner)	-9.999~9.999 mm	Set the difference between the center of the stylus tip ball and the center of the spindle when the detection signal turns ON with the touch probe attached to the spindle. The X value of the difference corresponds to the automatic centering compensation X (corner) and the Y value corresponds to the automatic centering compensation Y (corner). We recommend performing the automatic setting on the automatic centering - <Automatic centering compensation (corner)> screen in MDI mode.
070016	Automatic centering compensation Z (workpiece top surface)	-9.999~9.999 mm	Set the difference between the spindle end when the detection signal turns ON and the spindle end when the stylus tip ball touches the workpiece, with the touch probe attached to the spindle. We recommend performing the automatic setting on the automatic centering - <Automatic centering compensation (workpiece top surface)> screen in MDI mode.
070017	Automatic centering speed 1	1~5000mm/min	Specify the rapid feedrate during automatic centering.
070018	Automatic centering speed 2	1~5000mm/min	Specify the measuring speed during automatic centering.
070019	Automatic centering return	0.000~99.999mm	Specify the return stroke after detection during the automatic centering measurement cycle.
070020	Tool number used for automatic centering (NC language only)	1~99 and 201~299	Set the tool data number used for automatic centering. The tool length offset and the cutter compensation for the tool data number set in this parameter are used to measure. A tool change is not carried out automatically.

1.5.11 User Parameter 8 (Automatic Thermal Distortion Compensation)

No.	Item name	Setting range	Description
080001	Z-axis compensation	-999~999(%)	Adjust the Z-axis compensation within the range of -999% to 999%.
080002	Spindle compensation (Z-axis)	-999~999(%)	Adjust the spindle compensation for Z-axis within the range of -999% to 999%.
080003	X-axis compensation	-999~999(%)	Adjust the X-axis compensation within the range of -999% to 999%.
080004	Spindle compensation (X-axis)	-999~999(%)	Adjust the spindle compensation for X-axis within the range of -999% to 999%.
080005	Y-axis compensation	-999~999(%)	Adjust the Y-axis compensation within the range of -999% to 999%.
080006	Spindle compensation (Y-axis)	-999~999(%)	Adjust the spindle compensation for Y-axis within the range of -999% to 999%.
080007	Auto thermal distortion compen. at memory operation start	0: No 1: Yes	Set whether or not to perform thermal distortion compensation automatically at the start of memory operation. When <1: Yes> is set, thermal distortion compensation for XYZ axes is performed automatically on start-up of memory operation. This parameter is valid only for the machine installed with thermal distortion compensation software. Even if <1: Yes> is set to machine without the software, no operation is performed.
080008	Lathe spindle compensation(Z-axis)	-999~999(%)	Adjust the compensation value amount for the Z-axis spindle. This parameter is only valid for M type models.
080009	Lathe spindle compensation(X-axis)	-999~999(%)	Adjust the compensation value amount for the X-axis spindle. This parameter is only valid for M type models.
080010	Lathe spindle compensation(Y-axis)	-999~999(%)	Adjust the compensation value amount for the Y-axis spindle. This parameter is only valid for M type models.

1.5.12 User Parameter 9 (Quick Table)

No.	Item name	Setting range	Description
090001	Pallet program folder (NC)	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for the program used for machining on pallet 1 and pallet 2. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE 1) When setting has not been performed, it is designated to be root folder. (NOTE 2) When the external program selection input signal is turned on, external selection is effective.
090002 090003	Pallet 1 program No.(NC) Pallet 2 program No.(NC)	1 to 8999 or a character string using no more than 32 characters	Set program number for machining by using pallet 1 and pallet 2. (NOTE) External program selection is valid when external program selection input signal is turned on.
090004	Pallet program folder (Conversation.)	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for the program number used for machining on pallet 1 and pallet 2. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE 1) When setting has not been performed, it is designated to be root folder. (NOTE 2) When the external program selection input signal is turned on, external selection is effective.
090005 090006	Pallet 1 program No. (Conversation.) Pallet 2 program No. (Conversation.)	1~8999 9900~9999	Set program number for machining by using pallet 1 and pallet 2. (NOTE) External program selection is valid when external program selection input signal is turned on.
090007 090008 090009	Pallet 2 shift(X-axis) (Conversation only) Pallet 2 shift(Y-axis) (Conversation only) Pallet 2 shift(Z-axis) (Conversation only)	-99.999~99.999	Set this parameter when machining the same workpiece on pallets 1 and 2 using the same program. The shift amount set here is applied to the machining zero point of pallet 1 when machining using pallet 2.  Program creation procedure is as below. 1. Create a program with the workpiece placed on pallet 1. 2. Set a workpiece on pallet 2 and measure the workpiece zero point to calculate the pallet 2 zero point. 3. Set the pallet 1 program and pallet 2 program. (Normally, the user should set the same program.)

No.	Item name	Setting range	Description
090010 090011	Pallet 1 loading Pallet 2 loading	0:At operation start 1:At 1st tool change	Set whether to load the pallet at the start of memory operation when the first tool change is performed. This can be set for pallet 1 and pallet 2 respectively. 0:At operation start The pallet is loaded immediately after memory operation starts. After the pallet is loaded, machining starts from the top process. 1: At first tool change After memory operation starts, the pallet is loaded when the first tool change command is specified, leading to reduction of non-machining time. However, commands specified before the first tool change command are executed without the pallet loaded. The pallet is loaded at the start of operation in the following situations regardless of the settings above. - When using the NC language and the user parameter (switch 1: operation) <Select memory operation> is set to <1:Tape> - When using the NC language and operating in extended memory operation mode - When there is no tool change command in the program (NOTE) When an arm type ATC model is equipped with an option to extend the turning diameter and the <Move to safe position when turning pallet> (machine parameter (system 1: common)) is set to <1: Type 2>, the parameter cannot be set to <1:At 1st tool change>. If this setting is used, the alarm <<User parameter setting error (Quick table)>> is triggered.
090012	Additional axis for return operation	0: Both pallets 1: Inner pallet only	Perform a recovery operation on the additional axis for the set pallet when conducting the following. • Machine zero return • External machine zero return If a pallet is not indexed, the recovery operation is carried out in the same way as the <0: Both pallets> setting.

1.5.13 User Parameter 10 (High Accuracy)

1.5.13.1 Common

Common			
No.	**Item name**	**Setting range**	**Description**
100001	Smooth path offset function	0: Invalid 1: Valid	Set Smooth path offset function to valid/invalid.
100002	Smooth path offset cancel distance	0.000~99.999 mm	Use when <Smooth path offset function> is set to <Valid>. If the travel distance of one block is larger than the set value, smooth path offset is cancelled. Making the set value larger may cause a significant deviation from the program path. Be extra careful when changing the value.
100003	Smooth path offset cancel angle	0.000~120.000 deg	Use when <Smooth path offset function> is set to <Valid>. If the angle difference between blocks is larger than the set value, smooth path offset is cancelled. Making the set value larger may cause a significant deviation from the program path. Be extra careful when changing the value.
100004	Smooth path offset angle determination invalid distance	0.000~9.999 mm	Use when <Smooth path offset function> is set to <Valid>. Even if a block is cancelled smooth path offset by the determination of <Smooth path offset cancel angle>, if the travel distance of the block is equal to the set value or less, smooth path offset is not cancelled.
100005	Smooth path offset reference length	0.000~9.999 mm	Use when <Smooth path offset function> is set to < Valid >. If the travel distance of one block is longer than the set value, the path is offset using the set value.
100006	Minute block deletion when smooth path offset is cancelled	0: No 1: Yes	Used when the <Smooth path offset function> is set to <Valid>. When this parameter is set to <1: Yes>, depending on the settings for <Smooth path offset cancel distance> and the <Smooth path offset cancel angle>, the <Minute block deletion distance> applies the deletion even if the smooth path offset is cancelled for the block.
100007	Accuracy level method	0: Type1 1: Type2	Set the deceleration method when the accuracy level is specified in high accuracy mode A.

1.5.13.2 High accuracy A

High accuracy A			
No.	**Item name**	**Setting range**	**Description**
101*01 *:0~7(M260~ M267)	Corner deceleration override	0, 10~9999 %	Used for automatic corner deceleration function. Automatic corner deceleration is performed at 100 based on the machine's unique deceleration rate. When a value larger than “100” is set, the deceleration rate is smaller, making machining time shorter. When a value smaller than “100” is set, the deceleration rate is larger, resulting in more accurate machining. When “0” is set, automatic corner deceleration is not performed. When the <Accuracy level> is set to another value besides 0, this parameter is invalid.
101*02	Arc deceleration override	0, 10~9999 %	Used for automatic arc deceleration. When “100” is set, automatic arc deceleration is performed based on the machine's unique deceleration rate. When a value larger than “100” is set, the deceleration rate is smaller, making machining time shorter. When a value smaller than “100” is set, the deceleration rate is larger, resulting in more accurate machining. When “0” is set, automatic arc deceleration is not performed. When the <Accuracy level> is set to another value besides 0, this parameter is invalid.
101*03	Curve approximation deceleration override	0, 10~9999 %	Used for automatic curve approximation deceleration. When “100” is set, automatic curve approximation deceleration is performed based on the machine's unique deceleration rate. When a value larger than “100” is set, the deceleration rate is smaller, making machining time shorter. When a value smaller than “100” is set, the deceleration rate is larger, resulting in more accurate machining. When “0” is set, automatic curve approximation deceleration is not performed. When the <Accuracy level> is set to another value besides 0, this parameter is invalid.
101*04	Smooth path offset level	1~5	Used when <Smooth path offset function> (described later) is set to <Valid>. The larger the value is, the smoother the path becomes. Making the set value larger may cause a significant deviation from the program path. Be extra careful when changing the value.
101*05	Smooth override	10~9999 %	When 100, it uses the cutting feed time constant that is selected in the <Cutting feed time constant selection>. Setting to a value larger than 100 results in smoother machining, and one that is smaller than 100 leads to highly accurate machining.
101*06	Cutting feed time constant selection	0: Group 1 1: Group 2 2: Group 3	Selects the cutting feed time constant for high accuracy mode A. 0: Group 1 Uses <High accuracy A cutting feed time const. 1-3 (Group 1)> in the machine parameter (high accuracy). 1: Group 2 Uses <High accuracy A cutting feed time const. 1-3 (Group 2)> in the machine parameter (high accuracy). 2: Group 3 Uses <High accuracy A cutting feed time const. 1-3 (Group 3)> in the machine parameter (high accuracy).
101*07	Minute block deletion distance	0.000~2.000 mm	If the travel distance of one block is less than the parameter value, the block is deleted. If <Smooth path offset function> is set to <Valid>, it is executed at a programmed point after path approximation.
101*08	Accuracy level	0.000~5.000 mm	Used with the fully automatic deceleration function. When a value other than 0 is set, automatic deceleration is carried out so that the margin of error from the command path is less than the set value. In this situation, the following are disabled: <Corner deceleration override>, <Arc deceleration override> and <Curve approximation deceleration override>. When set to 0, the fully automatic deceleration function is disabled and the following are enabled: <Corner deceleration override>, <Arc deceleration override> and <Curve approximation deceleration override>.

1.5.13.3 High accuracy B

High accuracy B			
No.	**Item name**	**Setting range**	**Description**
102*01 *:0~7 (M280 ~M287)	Corner deceleration override	0, 10~9999 %	Used with the automatic corner deceleration function. Automatic corner deceleration is performed at 100 based on the machine's unique deceleration rate. When a value larger than 100 is set, it decelerates less, making the machining time shorter. When a value smaller than 100 is set, it decelerates more, resulting in more accurate machining. In addition, when 0 is set, automatic corner deceleration is not performed. This parameter is disabled when the smooth override type is set to <1: Type 2>.
102*02	Arc deceleration override	0, 10~9999 %	Used with the automatic arc deceleration. When 100 is set, automatic arc deceleration is performed based on the machine's unique deceleration rate. When a value larger than 100 is set, it decelerates less, making the machining time shorter. When a value smaller than 100 is set, it decelerates more, resulting in more accurate machining. In addition, when 0 is set, automatic arc deceleration is not performed.
102*03	Curve approximation deceleration override	0, 10~9999 %	Used with the automatic curve approximation deceleration. When 100 is set, automatic curve approximation deceleration is performed based on the machine's unique deceleration rate. When a value larger than 100 is set, it decelerates less, making the machining time shorter. When a value smaller than 100 is set, it decelerates more, resulting in more accurate machining. In addition, when 0 is set, automatic curve approximation deceleration is not performed.
102*04	Smooth path offset level	1~5	The operation is the same as high accuracy mode A.
102*05	Smooth override	100~9999 %	Use machine parameter(high accuracy) "High accuracy B cutting feed time constant" at a value of 100. Setting of value larger than 100 results in smoother machining.
102*06	Minute block deletion distance	0~2.000 mm	The operation is the same as high accuracy mode A.
102*07	Smooth override type	0: Type 1 1: Type 2	Change the smooth override type. 0: Type 1 Even if the smooth override setting is changed, the speed difference that is permitted between blocks does not change. 1: Type 2 The speed difference that is permitted between blocks is equal to: machine parameter (high accuracy) “speed difference” × “smooth override value”/100. When type 2 is selected, increasing the set value for the smooth override makes it more difficult to decelerate at corners. Therefore, the machining time ca be reduced.

1.5.13.4 Machining mode

Machining mode			
No.	**Item name**	**Setting range**	**Description**
105001	Machining mode	0: High accuracy mode off 1: Standard 2: Rough 3: Medium rough 4: Medium rough S 5: Finishing 6: Finishing S 7: Adjustment A 8: Adjustment B 9: Adjustment C	Set the machining mode for high accuracy mode. When cutting and travelling, it operates in the mode set here. Set the desired value to support the machining content. 0: High accuracy mode off 1: Standard (standard setting that balances accuracy and smoothness) 2: Rough (setting with shorter machining time) 3: Medium rough (setting between rough and finishing) 4: Medium rough S (setting focused on machining surface quality) 5: Finishing (setting focused on true accuracy for program command) 6: Finishing S (setting focused on machining surface quality and true accuracy of program commands, machining time is longer) 7: Adjustment A (machining mode A set by customer) 8: Adjustment B (machining mode B set by customer) 9: Adjustment C (machining mode C set by customer)

Machining mode			
No.	Item name	Setting range	Description
105*01 *:1~3	Standard mode	0: None 1: Standard 2: Rough 3: Medium rough 4: Medium rough S 5: Finishing 6: Finishing S	Adjust according to the mode set here when adjusting the machining mode. Set from <1> to <6> when using the machining mode adjustment. 0: None 1: Standard 2: Rough 3: Medium rough 4: Medium rough S 5: Finishing 6: Finishing S
105*02 *:1~3	Accuracy adjustment value	-5~5	Set the accuracy level when adjusting the machining mode. The larger the value is, the higher the machining accuracy becomes. The smaller the value, the faster the machining becomes.
105*03 *:1~3	Smoothness adjustment value	-5~5	Set the smoothness level on the machining surface when adjusting the machining mode. The larger the value is, the smoother the machining becomes.

1.5.13.5 Accuracy specification mode

Accuracy specification mode			
No.	Item name	Setting range	Description
106001	Accuracy spec. mode	0: OFF 1: Accuracy spec. A 2: Accuracy spec. B 3: Accuracy spec. C	The machining automatically decelerates so that if a margin of error, between the actual path and the programmed path, occurs when performing linear or circular interpolation, the difference becomes less than the value specified in the <Accuracy level>. 0: OFF 1: Accuracy spec. A 2: Accuracy spec. B 3: Accuracy spec. C
106*01 *:1~3	Accuracy level	0.000~5.000 mm	Set the accuracy level for accuracy specification mode. When a value other than <0> is set, automatic deceleration is carried out so that the margin of error from the programmed path is less than the set value. When set to <0>, it does not decelerate.
106*02 *:1~3	Smoothness	-5~5	Set the smoothness level on the machining surface for the accuracy specification mode. The larger the value is, the smoother the machining becomes.

1.5.14 User Parameter 11 (PLC)

No.	Item name	Setting range	Description
110001~ 110004	P1-axis stroke P2-axis stroke P3-axis stroke P4-axis stroke	0: No 1: Yes	When stroke is set, designate “1”, and when it is not set, designate “0”, if PLC axis type is set to rotation axis. When <1: Yes> is selected, the values become valid for <P1 to P4-axes stroke (-) and (+)>. (NOTICE) If this parameter is set to <1:Yes> and the machine parameter (PLC: PLC-axis) <Lead/gear ratio> (P1- to P4-axes) is set to “1”, when the power is turned OFF after P1- to P4-axes have been moved to somewhere outside the stroke or when the P1- to P4-axes are moved to somewhere outside of the stroke while the power is OFF, then the coordinates for the P1- to P4-axes may be out of position at power ON.

No.	Item name	Setting range	Description
110005~ 110012	P1-axis stroke(-) P2-axis stroke(-) P3-axis stroke(-) P4-axis stroke(-) P1-axis stroke(+) P2-axis stroke(+) P3-axis stroke(+) P4-axis stroke(+)	-9999999~9999999	Inputs value of stroke by machine coordinate, when PLC axis type is a linear axis or a rotation axis with a setting of "1: Yes". The unit varies depending on the minimum unit setting. When the minimum unit setting is <Type 1 (Micron)> Linear axis (meters): 0.001 mm Linear axis (inches): 0.0001 inches Rotation axis: 0.001 degrees When the minimum unit setting is <Type 2 (Submicron)> Linear axis (meters): 0.0001 mm Linear axis (inches): 0.00001 inches Rotation axis: 0.0001 degrees (NOTE) In the following situations, the error <<User param. setting error (PLC)>> is triggered. - When the machine parameter (PLC: PLC-axis) <Optional axis> (P1- to P4-axes) is configured to another setting besides <No>, when the machine parameter (PLC: PLC-axis) <Type> (P1- to P4-axes) is set to <1: Rotation axis>, when the machine parameter (PLC: PLC-axis) <Lead/gear ratio> (P1- to P4-axes) is set to “1”, when the user parameter (PLC) <P1- to P4-axis stroke control> is set to <1:Yes> and when the <P1- to P4-axis stroke(+)> and <P1- to P4-axis stroke(-)> are set to a value larger than 350 degrees
110013~ 110016	Reference point P1 axis Reference point P2 axis Reference point P3 axis Reference point P4 axis	-9999999~9999999	Set a position to travel for based on reference point return command by using machine coordinate position. The unit varies depending on the minimum unit setting. When the minimum unit setting is <Type 1 (Micron)> Linear axis (meters): 0.001 mm Linear axis (inches): 0.0001 inches Rotation axis: 0.001 degrees When the minimum unit setting is <Type 2 (Submicron)> Linear axis (meters): 0.0001 mm Linear axis (inches): 0.00001 inches Rotation axis: 0.0001 degrees
110017~ 110032	P1-axis override speed 1 P1-axis override speed 2 P1-axis override speed 3 P1-axis override speed 4 P2-axis override speed 1 P2-axis override speed 2 P2-axis override speed 3 P2-axis override speed 4 P3-axis override speed 1 P3-axis override speed 2 P3-axis override speed 3 P3-axis override speed 4 P4-axis override speed 1 P4-axis override speed 2 P4-axis override speed 3 P4-axis override speed 4	0~9999999	Specify override speed. The following units are used regardless of the minimum unit setting. Linear axis (meters): mm/min Linear axis (inches): inch/min Rotation axis: degrees/min
110033~ 110036	Collis. detct.-P1ax stop meth. Collis. detct.-P2ax stop meth. Collis. detct.-P3ax stop meth. Collis. detct.-P4ax stop meth.	0: Method 1 1: Method 2	Select the stop method for the PLC axis when a collision detection alarm is triggered. If <0: Method 1> is selected, it stops at the same time as the rapid feed when a collision detection alarm is triggered. It takes a longer time to stop, but no vibrations occur caused by sudden stopping. If <1: Method 2> is selected, it stops in the shortest time when a collision detection alarm is triggered. Vibrations can occur due to a sudden stop.

1.5.15 User Parameter 12 (PROFIBUS DP)

Refer to “Chapter 9 (15) 1 PROFIBUS DP (slave)” in Operation Manual I for further details.

1.5.16 User Parameter 13 (DeviceNet)

Refer to “Chapter 9 (15) 2 DeviceNet (Slave)” in Operation Manual I for further details.

1.5.17 User Parameter 14 (CC-Link Slave)

Refer to “Chapter 9 (15) 3 CC-Link (Remote device station)” in Operation Manual I for further details.

1.5.18 User Parameter 15 (Rotary Fixture Offset)

Refer to “Chapter 9 (17) Rotary fixture offset function” in Operation Manual I for further details.

1.5.19 User Parameter 17 (Rotation Axis/Tilt Axis Setting)

Refer to “Chapter 9 (19) Feature Coordinate Setting Function” in Operation Manual I for further details.

1.5.20 User Parameter 18 (Power Consumption)

1.5.20.1 Power consumption setting

Power consumption setting			
No.	**Item name**	**Setting range**	**Description**
140001	Coolant pump (valve ON)	0 to 99999 W	Sets the power that is consumed when the device is operating. The power consumption amount is calculated from the set value and the device’s operation time.
140002	Coolant pump (valve OFF)		
140003	CTS pump		
140004	Chip shower pump		
140005	Cyclone suction pump		
140006	Chip conveyor		
140007	Chip auger		

1.5.20.2 User device setting

User device setting			
No.	**Item name**	**Setting range**	**Description**
1410*1 *:1~8	Measurement	0: Disable 1: Enable	Calculate the power consumption amount following the setting in the corresponding column when set to <1: Enable>. When set to disable, the other items are grayed out.
1410*2	Name	Characters that can be input from the panel: Max. 20	Registers the name of a given device. A maximum of 20 characters can be entered from the panel using the available characters.
1410*3	Power consumption	0 to 99999 W	Sets the power that is consumed when the device is operating. The power consumption amount is calculated from the set value and the device’s operation time.
1410*4	Signal address	X000 to X7FF Y000 to Y7FF	Sets the signal address that issues the ON/OFF command for the device. The user can specify the external input relay (X000 to X7FF) and the external output relay (Y000 to Y7FF). The user can set the terminal block assignment for the <External input signal (External input signal)> and the <External I/O signal (External output signal)>.
1410*5	Count conditions	0: Count while ON 1: Count while OFF	Sets whether to start counting when the signal (specified in <Signal address>) turns ON or when it turns OFF.

1.5.20.3 Display setting

Display setting			
No.	**Item name**	**Setting range**	**Description**
145001	Graph display start position – Daily graph	0 to 23 (clock time)	When the <Display unit> is set to <Day> on the <Power consumption log> screen, this item sets the clock time displayed on the left side of the graph. This setting is also reflected in the graph display on the <Power consumption today> screen.
145002	Graph display start position – Weekly graph	0: Monday 1: Tuesday 2: Wednesday 3: Thursday 4: Friday 5: Saturday 6: Sunday	When the <Display unit> is set to <Week> on the <Power consumption log> screen, this item sets the day of the week displayed on the left side of the graph.
145003	Maximum power consumption on gauge	1~99999 W	Sets the maximum power consumption or regenerative power (instantaneous value) on the gauge for the <Power consumption today> screen.

1.5.21 User Parameter 19 (CC-Link Master)

Refer to “Chapter 9 (15) 4 CC-Link (Master station)” in Operation Manual I for further details.

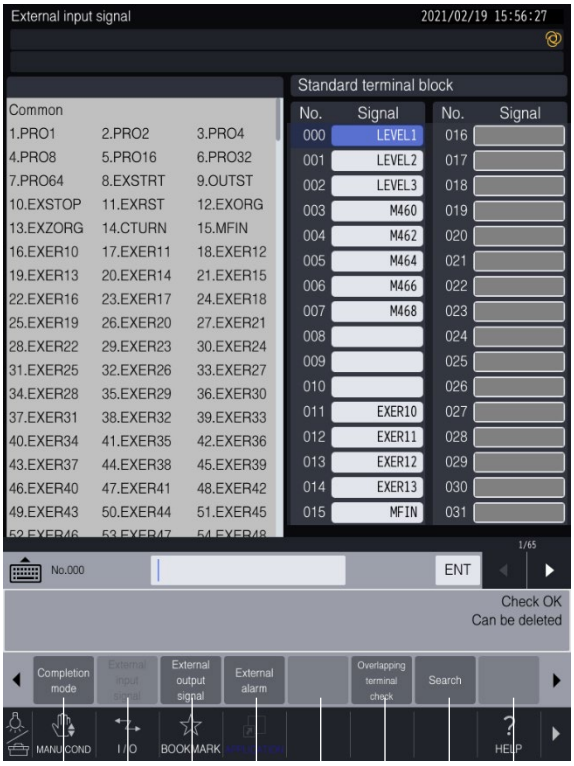
1.6 External I/O Signal

1.6.1 Outline

When assigning external input and output signals for I/O terminals, the user can configure the settings for external alarms and the communication settings for external panels.

1.6.2 Edit Screen

Selecting <External I/O signal> on the <Data bank menu> screen displays the Edit screen for external I/O signals.
The edit screens for external I/O signals are divided into screens for assigning external I/O signals, for external alarms and for external panels. The function keys are the same and shared among all the screens. The external I/O signals are divided into categories and the user can change them using the function keys (2) through (4).
When an edit screen is opened from the <Data bank menu> screen, the category previously displayed is shown.



(1) (2) (3) (4) (5) (6) (7) (8)

Description of common function keys on the edit screens (When displaying another screen besides <CC-Link configuration> screen)
(1) and (6) to (8) are the same on each screen.

Column	Position	Label	Description
1~7	(1)	<Completion mode>	Ends and exits editing.
	(5)		
	(6)	<Overlapping Terminal check>	Conducts a duplicate check of the terminal settings for external input signals. Refer to the “1.6.3.4 Overlapping Input Terminal Check” for further details. The key grays out for categories where it cannot be used.
	(7)	<Search>	Moves the cursor to a given <Terminal block> and <External alarm>. Refer to “1.6.3.1 Locating the Cursor” for further details. The key grays out for categories where it cannot be used.
	(8)		

Description of common function keys on the edit screens (When displaying the <CC-Link configuration> screen)
(1) and (6) to (8) are the same on each screen.

Column	Position	Label	Description
1~7	(1)	<Completion mode>	Ends and exits editing.
	(6)	<Copy>	Copies data set 1 for the slave station at the cursor position.
	(7)	<Paste>	Pastes the (copied) data set 1 to the slave station at the cursor position.
	(8)	<Delete CC-Link data>	Deletes data set 1 for the slave station at the cursor position.

Layout and description of function key categories

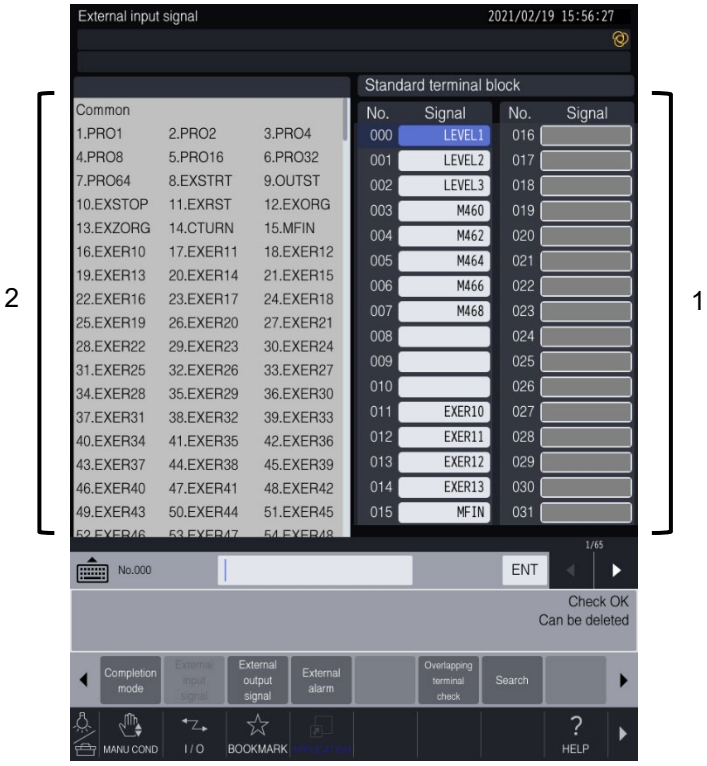
Column	Position	Label/Category name	Description
1	(2)	<External input signal>	Assigns an external input signal for the input terminal (X) to the machine or internal PLC function.
	(3)	<External output signal>	Assigns an external output signal for the output terminal (Y) from the machine or internal PLC function.
	(4)	<External alarm>	Sets an external alarm.
2	(2)	<PROFIBUS DP -> NC>	Assigns an external input signal (or D) for the input terminal to the machine or internal PLC function from the PROFIBUS DP (slave).
	(3)	<NC -> PROFIBUS DP>	Assigns an external input signal (Y or D) for the input terminal to the PROFIBUS DP (slave) from the machine or internal PLC function.
	(4)	<PROFIBUS DP slave status>	Assigns an input location for the machine or internal PLC function (D) about the status information of the PROFIBUS DP (slave).
3	(2)	<DeviceNet -> NC>	Assigns an external input signal (X or D) for the input terminal to the machine or internal PLC function from the DeviceNet (slave).
	(3)	<NC -> DeviceNet>	Assigns an external input signal (Y or D) for the input terminal to DeviceNet (slave) from the machine or internal PLC function.
	(4)	<DeviceNet slave status>	Assigns an input location (D) for the machine or internal PLC function about the status information of DeviceNet (slave).
4	(2)	<CC-Link -> NC(slave)>	Assigns an external input signal for the input terminal (X or D) to the machine or internal PLC function from the CC-Link (slave).
	(3)	<NC(slave) -> CC-Link>	Assigns an external input signal (Y or D) for the input terminal to the CC-Link (slave) from the machine or internal PLC function.
	(4)	<CC-Link status>	Assigns an input location (D) for the machine or internal PLC function about the status information of the CC-Link (slave).
5	(2)	<CC-Link config.>	Sets the parameter for the machine or internal PLC function from the CC-Link (Master).
	(3)	<CC-Link -> NC(Master)> or <CC-Link -> NC(ID station)>	Assigns an external input signal (Y or D) for the input terminal to the CC-Link (master station or intelligent device station) from the machine or internal PLC function. When the fieldbus network parameter (CC-Link master) <Self-station number> is set to <0>, <CC-Link → NC(Master)> is displayed. When the parameter is configured to another setting (besides 0), then <CC-Link → NC(ID station)> is displayed.

Column	Position	Label/Category name	Description
	(4)	<NC(Master) -> CC-Link> or <NC(ID station) -> CC-Link>	Assigns an external input signal for the input terminal (X or D) to the machine or internal PLC function from the CC-Link (master station or intelligent device station). When the fieldbus network parameter (CC-Link master) <Self-station number> is set to <0>, <NC(Master) → CC-Link> is displayed. When the parameter is configured to another setting (besides 0), then <NC(ID station) → CC-Link> is displayed.
	(5)	<CC-Link status>	Assigns an input location (D) for the machine or internal PLC function about the status information of the CC-Link (Master).
6	(2)	<Industrial Ethernet -> NC>	Assigns an external input signal (or D) for the input terminal to the machine or internal PLC function from the industrial ethernet (slave).
	(3)	<NC -> Industrial Ethernet>	Assigns an external input signal (Y or D) for the input terminal to the industrial ethernet (slave) from the machine or internal PLC function.
	(4)	<Industrial Ethernet status>	Assigns an input location for the machine or internal PLC function (D) about the status information of the industrial ethernet (slave).
7	(2)	<External panel 1>	Sets external panel 1. The data range is specified for the input and output between the internal PLC function and external panel 1.
	(3)	<External panel 2>	Sets external panel 2. The data range is specified for the input and output between the internal PLC function and external panel 2.
	(4)		

1.6.2.1 External I/O signal assignment screen

This section provides a description of the external I/O signal assignment screen.

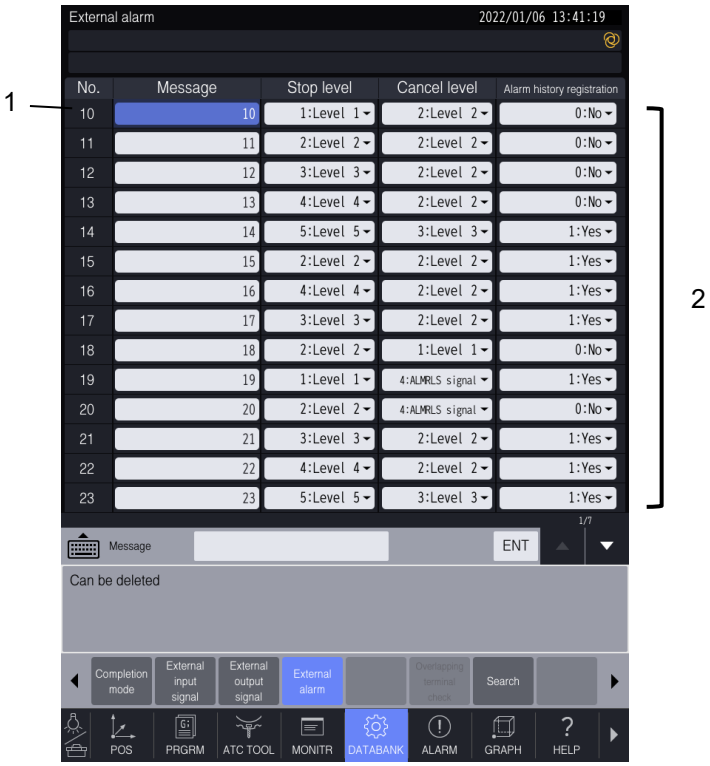
<External input signal> screen



Display description of external I/O signal assignment screen

Position	Name	Description
1	Terminal list	Displays a list of terminals. Press the <Previous page> or <Next page> key to change the display (between the standard terminal block, extended terminal block 01, extended terminal block 02, …).Note that the terminal numbers are grayed out for terminals that are not connected. The user can set signals to those terminals, but note that these signals are not input or output. Signal names displayed in red cannot be used in the current language mode (conversation/NC).
2	Signal list	Displays a list of signals that can be set. The user can swipe up and down to scroll through the signal list.

1.6.2.2 External alarm edit screen



Display description of external alarm edit screen

Position	Name	Description
1	External alarm list	Displays a list of external alarm settings. The external alarms from 10 to 99 can be set.
2	External alarm	The user can set the message, stop level, cancel level and alarm log registration. Refer to the external alarm items in “1.6.3.2 Data input” for further details.

1.6.2.3 External panel edit screen

Display description of external panel edit screen

Position	Name	Description
1	External panel setting list	Displays a list of settings for inputting and outputting signals between the external panel and the NC.

1.6.3 How to Edit

1.6.3.1 Locating the Cursor

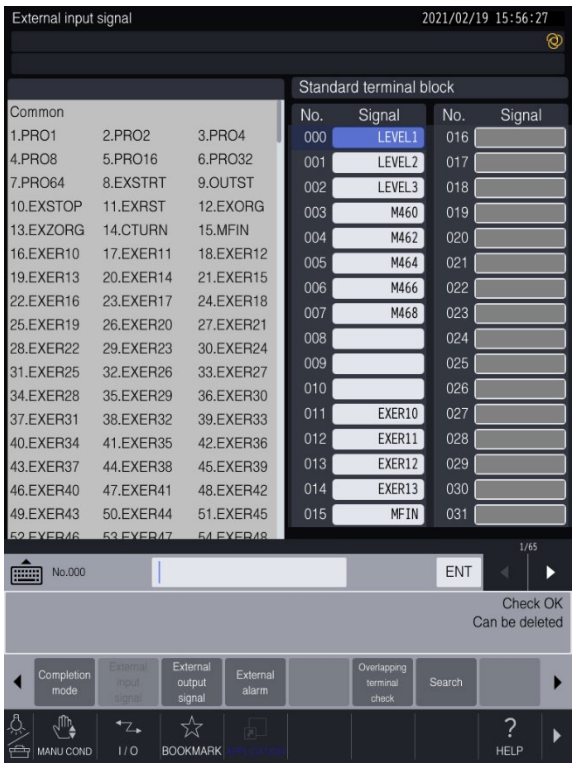
Locate the cursor at the item to be changed using the cursor key.
Search can be used to immediately locate the cursor at a desired “terminal block” or “External alarm.” Enter the terminal block number (0: Standard terminal block, 1-64: Extended terminal block 1 to 64) and external alarm number into the data input field, and press the <Search> key. Then, the cursor moves to the specified number.

1.6.3.2 Data Input

1. Use the function keys to select and display the desired category.
2. Tap on or move the cursor to the item you wish to change.
3. Enter the value into the data input field, and set it.
   When setting a signal to a terminal block, enter the external signal number to be assigned. This inputs the value at the cursor position and moves the cursor to the next item.

   As to <1032:PLCX020-02F> through <1157:PLCX7F0-7FF> in <External input signal> and <1032:PLCY020-02F> through <1157:PLCY7F0-7FF> in <External output signal>, set them for every 16 terminals collectively at a time.
   When setting them, they are set to 16 terminals including the one with the terminal number at the cursor position (NO.**00 to 15 or NO.**16 to 31) collectively at a time. Please note that the preset signals are overwritten.

   When entering the number of other signal in the input area with the cursor located at any of the 16 terminals (NO.*00 to 15 or NO.*16 to 31) to which signals <1032:PLCX020-02F> through <1157:PLCX7F0-7FF> or <1032:PLCY020-02F> through <1157:PLCY7F0-7FF> are set and pressing **[ENT]**, only the signal at the cursor position is set and the settings for the other 15 terminals are deleted.



External input signals

Item name	Settingrange	Description
Terminal number Standard terminal blocks NO.000~031 Extended terinal blocks 1 NO.000~031 Extended terminal blocks 2 NO.000~031 Extended terminal blocks 3 NO.000~031 Extended terminal blocks 4 NO.000~031 : Extended terminal blocks 63 NO.000~031 Extended terminal blocks 64 NO.000~031	1~187 (Common) 501~640 (NC language only) 901~906 (Conversation only) 1000~1157 (PLC input) 999 (RESERV) or no setting For PLC input, set every 16 terminals collectively, excluding PLCX000-01F. 1000~1015:PLCX000-00F 1016~1031:PLCX010-01F 1032: PLCX020-02F 1033: PLCX030-03F : 1156: PLCX7E0-7EF 1157: PLCX7F0-7FF	According to the terminal numbers, exterminal input signals can be set as desired. They can be set to “no setting” using **[DEL]** key. For details of external input signals, refer to “1.6.4 External input signals”.

List of external input signals

Setting No.	Signal	Setting No.	Signal	Setting No.	Signal	Setting No.	Signal
1	PRO1	136	LEVEL1	184	MOSRU	906	CTEDOK
2	PRO2	137	LEVEL2	185	LBBTS1		
3	PRO4	138	LEVEL3	186	LBBTS2	999	RESERV
4	PRO8	139	LEVEL4	187	LBBTS3	1000	PLCX000
5	PRO16	140	WKCLR1			1001	PLCX001
6	PRO32	141	WKCLR2			1002	PLCX002
7	PRO64	142	WKCLR3			1003	PLCX003
8	EXSTRT	143	WKCLR4			1004	PLCX004
9	OUTST	144	DRLOCK			1005	PLCX005
10	EXSTOP	145	ATDROP			1006	PLCX006
11	EXRST	146	ATDRCL			1007	PLCX007
12	EXORG	147	OUT1P			1008	PLCX008
13	EXZORG	148	OUT1M			1009	PLCX009
14	CTURN	149	OUT2P			1010	PLCX00A
15	MFIN	150	OUT2M			1011	PLCX00B
16	EXER10	151	OUTLCK			1012	PLCX00C
:	:	152	UNCLS5			1013	PLCX00D
105	EXER99	153	UNCLS6	501	EXREF	1014	PLCX00E
106	ALMRLS	154	UNCLS7	502	EXREF2	1015	PLCX00F
107	M460	155	UNCLS8	503	EXREF3	1016	PLCX010
108	M462	156	UNCSP1	504	EXREF4	1017	PLCX011
109	M464	157	UNCSP2	505	EXREF5	1018	PLCX012
110	M466	158	UNCSP3	506	EXREF6	1019	PLCX013
111	M468	159	UNCSP4	507	OPSKIP	1020	PLCX014
112	SPLOCK	160	CLPLS5	508	OPSTOP	1021	PLCX015
113	ATCLCK	161	CLPLS6	509	EXWORK	1022	PLCX016
114	XYLOCK	162	CLPLS7	510	WPEDOK	1023	PLCX017
115	ZLOCK	163	CLPLS8	511	MCEDOK	1024	PLCX018
116	4LOCK	164	CLPSP1	512	UINT	1025	PLCX019
117	5LOCK	165	CLPSP2	513	#1000	1026	PLCX01A
118	6LOCK	166	CLPSP3	:	:	1027	PLCX01B
119	7LOCK	167	CLPSP4	544	#1031	1028	PLCX01C
120	8LOCK	168	OVTR5P	545	#1200	1029	PLCX01D
121	MDLOCK	169	OVTR5M	:	:	1030	PLCX01E
122	KYLOCK	170	OVTR6P	640	#1295	1031	PLCX01F
123	PRLOCK	171	OVTR6M			1032	PLCX020-02F
124	EDLOCK	172	OVTR7P			:	:
125	TLEDOK	173	OVTR7M			1157	PLCX7F0-7FF
126	UPEDOK	174	OVTR8P				
127	MPEDOK	175	OVTR8M				
128	WCEDOK	176	BTSTAL				
129	MGEDOK	177	BTST1				
130	MTEDOK	178	BTST2				
131	PREDOK	179	BTST3	901	PR9900		
132	IOEDOK	180	BTST4	902	EXORG2		
133	CPEDOK	181	BTST5	903	EXORG3		
134	DIROK	182	DRUL1	904	TPEDOK		
135	MODEOK	183	DRUL2	905	THEDOK		

External output signals

Item name	Setting range	Description
Terminal number Standard terminal blocks NO.100~131 Extended terminal blocks 1 NO.100~131 Extended terminal blocks 2 NO.100~131 Extended terminal blocks 3 NO.100~131 Extended terminal blocks 4 NO.100~131 : Extended terminal blocks 63 NO.100~131 Extended terminal blocks 64 NO.100~131	1~173 (Common) 501~636 (NC language only) 901~902 (Conversation only) 1000~1157 (PLC output) 999 (RESERV) or no setting For PLC input, set every 16 terminals collectively, excluding PLCY000-01F. 1000~1015:PLCY000-00F 1016~1031:PLCY010-01F 1032: PLCY020-02F 1033: PLCY030-03F : 1156: PLCY7E0-7EF 1157: PLCY7F0-7FF	According to the terminal number, exterminal output signals can be set as desired. They can be set to “no setting” using **[DEL]** key. For details of external output signals, refer to “1.6.5 External input signals”.

List of external output signals

Setting No.	Signal	Setting No.	Signal	Setting No.	Signal	Setting No.	Signal
1	M00	61	BATALM	121	SPIALM	501	REFIN
2	M30/1	62	MNTALM	122	DRHOLD	502	REFIN2
3	M30/2	63	GRN	123	RDBTAL	503	REFIN3
4	M08	64	YEL	124	DIMSW1	504	REFIN4
5	M11	65	RED	125	DIMSW2	505	REFIN5
6	M12	66	CNTUP	126	DIMST1	506	REFIN6
7	M14	67	CNTPRE	127	DIMST2	507	LSTURN
8	M18	68	STPOUT	128	PNLEN	508	LSSLCT
9	M21	69	STPLED	129	PULEN	509	#1100
10	M22	70	DROPEN	130	BTWRN1	:	:
11	M24	71	DRCLS	131	BTWRN2	540	#1131
12	M28	72	INDRCL	132	BTWRN3	541	#1300
13	MF	73	SDDRCL	133	BTWRN4	:	
14	M900	74	XDR1CL	134	BTWRN5	636	#1395
15	M400	75	XDR2CL	135	BTALM1		
16	M402	76	ATDRSL	136	BTALM2	901	ORGFN2
17	M404	77	DRRDY	137	BTALM3	902	ORGFN3
18	M406	78	DROFIN	138	BTALM4		
19	M408	79	DRCFIN	139	BTALM5	999	RESERV
20	M480	80	DRALM	140	BTRUN		
21	M482	81	RDYLED	141	BTLD1	1000	PLCY000
22	M484	82	DRYRUN	142	BTLD2	1001	PLCY001
23	M486	83	SINGL	143	BTLD3	1002	PLCY002
24	M450	84	RESTAT	144	BTLD4	1003	PLCY003
25	M451	85	RPD100	145	BTLD5	1004	PLCY004
26	M455	86	SPN100	146	HWMO	1005	PLCY005
27	M456	87	FED100	147	RYCHK1	1006	PLCY006
28	AUTO	88	RELESE	148	XPSSW2	1007	PLCY007
29	STL	89	COOLSW	149	YPSSW2	1008	PLCY008
30	MEMOK	90	CHIPSW	150	ZPSSW2	1009	PLCY009
31	MEMMOD	91	PULOFF	151	4PSSW2	1010	PLCY00A
32	EXPRUN	92	QTSEL1	152	5PSSW2	1011	PLCY00B
33	NCOK	93	QTSEL2	153	6PSSW2	1012	PLCY00C
34	ALM	94	WAVDSP	154	7PSSW2	1013	PLCY00D
35	ALM2	95	XPOSSW	155	8PSSW2	1014	PLCY00E
36	ALMLV1	96	YPOSSW	156	TLDHI	1015	PLCY00F
37	ALMLV2	97	ZPOSSW	157	TLDLO	1016	PLCY010
38	ASTLV1	98	4POSSW	158	TLDON	1017	PLCY011
39	ASTLV2	99	5POSSW	159	LDRCL	1018	PLCY012

Setting No.	Signal	Setting No.	Signal	Setting No.	Signal	Setting No.	Signal
40	ASTLV3	100	6POSSW	160	RDRCL	1019	PLCY013
41	ASTLV4	101	7POSSW	161	SLDRCL	1020	PLCY014
42	ASTLV5	102	8POSSW	162	SRDRCL	1021	PLCY015
43	TOOL	103	OUT1ON	163	DRULD1	1022	PLCY016
44	TOLPRE	104	OUT2ON	164	DRULD2	1023	PLCY017
45	ORGFIN	105	UNCLP5	165	LBBTW1	1024	PLCY018
46	SPTURN	106	UNCLP6	166	LBBTW2	1025	PLCY019
47	ZPX	107	UNCLP7	167	LBBTW3	1026	PLCY01A
48	ZPY	108	UNCLP8	168	LBBTA1	1027	PLCY01B
49	ZPZ	109	UCLPP1	169	LBBTA2	1028	PLCY01C
50	ZPSP	110	UCLPP2	170	LBBTA3	1029	PLCY01D
51	ZP4	111	UCLPP3	171	LBBTL1	1030	PLCY01E
52	ZP5	112	UCLPP4	172	LBBTL2	1031	PLCY01F
53	ZP6	113	MGZ1	173	LBBTL3	1032	PLCY020-02F
54	ZP7	114	MGZ2			:	:
55	ZP8	115	MGZ4			1157	PLCY7F0-7FF
56	PFIN1	116	MGZ8				
57	PFIN2	117	MGZ16				
58	RSTOUT	118	MGZ32				
59	TLBRKE	119	MGZ64				
60	RUNSTP	120	UNLOCK				

External alarm 10 to 99

Item name		Setting range	Description
01~	Message	Up to 20 characters	Register alarm messages. Up to 20 characters that can be input through the panel can be registered. They can be set to “no setting” using **[DEL]** key. When no alarm message is set, “External alarms 10 to 99” are displayed. When the communication parameter <Extended comment input> is set to <1: Yes>, the external I/O signal file (EXIO*.NC) (* refers to the data bank number) is transferred and input. This enables input for characters that could not be entered using the machine keys. Refer to “3.5 Communication protocol” in Operation Manual II for further details.
02	Stop levels	1: Level 1 2: Level 2 3: Level 3 4: Level 4 5: Level 5	Select the level at which the operation is affected by an alarm (external alarms 10 to 99) that occurs upon input of any of EXER10 to 99 signals, from the five levels below. 1: Operation does not stop. 2: Operation stops upon completion of the current cycle. 3: Operation is stopped upon execution of the current block. 4: Operation is paused. 5: Servo control is turned off. When the field is empty or blank, the default setting is <1: Level 1>.
03	Release levels	1: Level 1 2: Level 2 3: Level 3 4: ALMRLS signal	Select the means for releasing an alarm (external alarms 10 to 99) that occurs upon input of any of EXER signals 10 to 99, from the four levels below. 1: Any key 2: **[RST]** key 3: Power off 4: ALMRLS signal or **[RST]** key When the field is empty or blank, the default setting is <1: Level 1>.
04	Alarm log registration	0: No 1: Yes	Set whether or not an alarm is registered in the alarm log when such an alarm occurs.

* When stop level has been set to any level from 3 to 5, the release level is treated as set to level 2 even if it is set to level 1 or 4.
  In this case, an <<External alarm setting error>> (stop level 1, release level 1) occurs when resetting a changed parameter or displaying the External alarm setting screen.
* When set to stop level 2 through 5, the alarm does not cancel or reset during memory operation (excluding stoppage) even for cancel level 1 alarms.

1.6.3.3 Data Deletion

When the cursor is located at a deletable item, <Can be deleted> is displayed.

1. Display a category which contains the item to be deleted.
2. Locate the cursor at the item to be deleted.
3. Press the **[DEL]** key.
   This deletes the value at the cursor position.

* As to <1032:PLCX020-02F > through <1157:PLCX7F0-7FF > in <External input signal> and <1032:PLCY020-02F > through <1157:PLCY7F0-7FF > in <External output signal>, delete them for every 16 terminals collectively at a time.
  When pressing the **[DEL]** key with the cursor located at any of the 16 terminals (NO.*00 to 15 or NO.*16 to 31) to which signals <1032:PLCX020-02F > through <1157:PLCX7F0-7FF > or <1032:PLCY020-02F > through <1157:PLCY7F0-7FF > are set, the settings for the 16 terminals including the one with the terminal number at the cursor position are deleted collectively.

1.6.3.4 Overlapping Input Terminal Check

The same signal (including the PLC) can be set to multiple terminals, but only the terminal with the highest priority is valid. This applies to the following screens: external input signal (standard terminal block, extended terminal block 1 to 64) screen, the PROFIBUS DP slave (PROFIBUS DP → NC)/status screen, the DeviceNet slave (DeviceNet → NC)/status screen, the CC-Link slave (CC-Link → NC (Slave))/status screen, the CC-Link master (CC-Link → NC (Master))/status screen and the industrial Ethernet (Industrial Ethernet → NC)/status screen. All other terminals are processed as not set.

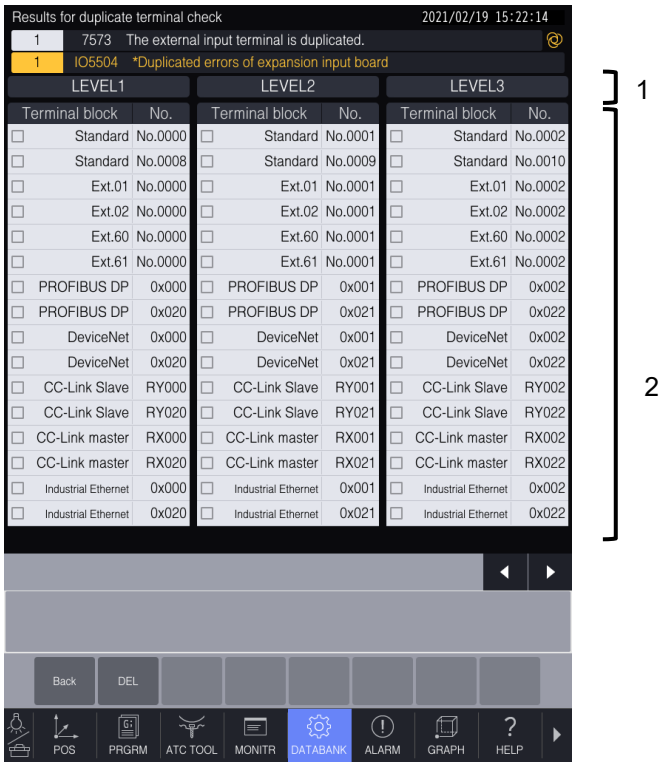
<u>Priority level of input terminals</u>

1. Smaller terminal number of standard terminal blocks
2. Smaller terminal number of extended terminal blocks
3. Terminal that is displayed on top in the PROFIBUS DP slave status
4. Small terminal numbers for the PROFIBUS DP slave (PROFIBUS DP → NC)
5. Terminal that is displayed on top in the DeviceNet slave status
6. Small terminal numbers for the DeviceNet slave (DeviceNet → NC)
7. Terminal that is displayed on top in the CC-Link slave status
8. Small terminal numbers for the CC-Link slave (CC-Link → NC (slave))
9. Terminal that is displayed on top in the CC-Link master status
10. Small terminal numbers for the CC-Link master (CC-Link → NC (master))
11. Terminal that is displayed on top in the industrial ethernet slave status
12. Small terminal numbers for the industrial Ethernet slave (Industrial Ethernet → NC)

Accordingly, when there is terminal with the same number setting (duplicated terminal) on each input signal screen, an unintentional operation may occur. In order to prevent this from occurring, check whether there is a duplicated terminal setting by pressing the <Overlapping terminal check> key.

When the <Overlapping terminal check> key is pressed and there is no duplicate setting, the message <Check OK> is displayed in the instructions area of the input signal screen.
If there is a duplicate setting, the <Results for duplicate terminal check> screen appears.
In addition, the operator message <<The external input terminal is duplicated.>> is displayed.

Results for duplicate terminal check> screen



Display description of <Results for duplicate terminal check> screen

Position	Name	Description
1	Signal name	Displays the number of the duplicate terminal. The setting numbers are shown in order starting from the left.
2	Duplicate terminal list	Displays the duplicate terminals for signals that are displayed in the <Signal name>. Tap on it to tick or untick the checkbox (ON/OFF). If there are more duplicate terminals than can be displayed in the row, those terminals are not displayed. When the CM PCB is an intelligent device station, the terminal name that is duplicated appears as follows. When Rx is duplicated: CC-Link master Rx+*** (*** is between 000 and 3FF) When RWx is duplicated: CC-Link master RWr+*** (*** is between 000 and 07F)

Layout and description of function key categories

Column	Position	Label/Category name	Description
1	(1)	<Back>	Goes back to the <External I/O signal> screen.
	(2)	<Delete>	Deselects all terminal blocks where the checkbox is ticked (ON).

(NOTE 1) The duplicate check is also carried out on terminals that are not connected to the machine.

(NOTE 2) If there is a duplicate terminal, once the editing has ended and the **[RST]** key is pressed, the operator message: <<The external input terminal is duplicated.>> and the error message: <<Duplicated errors of expansion input board>> are displayed.

1.6.3.5 Ending Editing

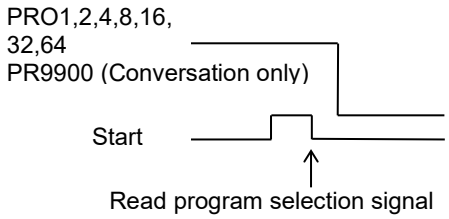
After the setting is completed, press the <Completion mode> key to end and exit editing.
When any change has been made, resetting is promped.

1.6.4 External Input Signals

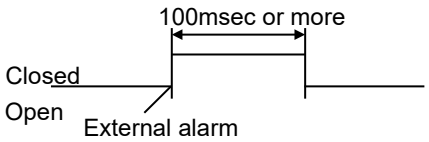
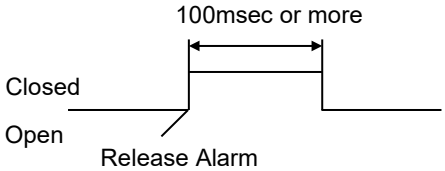
Described in this section is how to use external program selection signals and cautions on it.

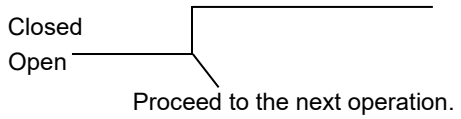
1.6.4.1 List of Input Signals

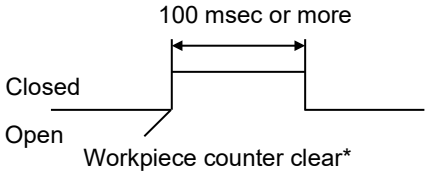
*1 signifies program editing.

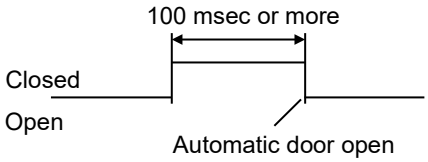
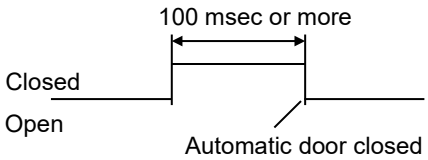
Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
External program selection	PRO1 PRO2 PRO4 PRO8 PRO16 PRO32 PRO64 PR9900 (Conversation only)	○				○		○	To be used when preliminarily created program is specified externally. (NOTE) Refer to “External program selection” in “1.6.4.2 Detailed description about external input signals” for details about usage. 
External start	EXSTRT	○			○	○		×	Same as the **[START]** switch on the operations box.
External pallet start	OUTST	○				○		×	Same as the **[PALLET START]** switch on the operations box.
External stop	EXSTOP	○		○	○	○		×	Same as the **[FEED HOLD]** switch on the operations box.
External reset	EXRST	○		○	○	○	○	×	Same as the **[RST]** key on the operations box.
External zero return	EXORG	○				○		×	The axis moves to the zero point when the contact of signal EXORG has closed and then opened again. (NOTE 1) Axis movement is done at positioning feed. (NOTE 2) Axes move in the following order: Z→XY (simultaneously) (NOTE 3) Axes do not move to the middle point. (NOTE 4) Input the signal for 100 msec or more. (NOTE 5) During external Z-axis zero return, Automatic operation starting (STL) signal is not turned on. (NOTE 6) When the machine is equipped with turning spindle and the turning spindle is currently selected, zero return is not made for the additional axis that serves as the turning spindle. <u>Effective conditions</u> (1) Automatic operation ongoing signal (STL) is off. (2) The **[FEED HOLD]** switch is not pressed. (3) The external stop signal (EXSTOP) is off. (4) An alarm higher than stop level 2 has not occurred. (5) The door is closed. (6) When one of the following applies: • <Door interlock mode> is set to <Maintenance> and the spindle is stopped. • <Door interlock mode> is set to <Auto. operation> or <Machine setup>. (7) Brake load test executing (BTRUN) signal is OFF (8) The screen <Move start position> is not currently displaying.

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
External Z-axis zero return	EXZORG	○				○		×	The axis moves to the zero point when the contact of signal EXZORG has closed and then opened again. (NOTE 1) Axis movement is done at positioning feed. (NOTE 2) Axes do not move to the middle point. (NOTE 3) Input the signal for 100 msec or more. (NOTE 4) During external Z-axis zero return, Automatic operation starting (STL) signal is not turned on. <u>Enabling conditions</u> (1) Automatic operation ongoing signal (STL) is off. (2) The **[FEED HOLD]** switch is not pressed. (3) The external stop signal (EXSTOP) is off. (4) An alarm higher than stop level 2 has not occurred. (5) The door is closed. (6) When one of the following applies: • <Door interlock mode> is set to <Maintenance> and the spindle is stopped. • <Door interlock mode> is set to <Auto. operation> or <Machine setup>. (7) Brake load test executing (BTRUN) signal is OFF (8) The screen <Move start position> is not currently displaying.
External pallet indexing	CTURN	○				○		×	Indexing pallet is performed when the contact of signal CTRUN is closed and then opened again. Operation is the same as when the <P. INDEX> key is pressed. <u>Effective conditions</u> (1) Automatic operation ongoing signal (STL) is off. (2) The **[FEED HOLD]** switch is not pressed. (3) The external stop signal (EXSTOP) is off. (4) An alarm higher than stop level 2 has not occurred. (5) The door is closed. (6) Brake load test executing (BTRUN) signal is OFF (7) The screen <Move start position> is not currently displaying.
M function completion signal	MFIN	○			○	○		×	To the M function output M00 to M99, signal MFIN is input as peripheral equipment operation completion signal. (NOTE) For details including signal timing, refer to “1.6.5 External output signals.”

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
External alarm 10 : External alarm 99	EXER10 : EXER99	○		○	○	○	○	×	When the any of contact of signal from EXER10 to EXER 99 is closed, one of <<External error 10>> to <<External error 99>> is displayed on the screen. Alarm level can be set by the <Stop level> of <External alarm 10> through <External alarm 99> in the <External I/O signal>, and the following levels are available. Stop level 1: Display only Stop level 2: Stops upon completion of the current cycle. Stop level 3: Block stop Stop level 4: Pause Stop level 5: Servo controller off Release level can be set by the <Cancel levels> of <External alarm 10> through <External alarm 99> in the <External I/O signal>, and the following levels are available. Release level 1: Any key operation Release level 2:**[RST]** key. Release level 3: Power-off required Release ALMRLS signal: ALMRLS signal * When <Stop level> has been set to any level from 3 to 5, the <Cancel level> is treated as set to level 2 even if it is set to level 1 or 4. • Signal block 
Release alarms	ALMRLS	○		○	○	○	○	×	When the machine is stopped by the generation of the following alarm, the alarm at stop level 1 or 2 can be released by inputting ALMRLS signal in the external input signals. • In the case of an <<External error**>> (where **:10 to 99) with the <Cancel level> in the external I/O signal setting set to <4: ALMRLS signal> 

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing[*1]		
Wait signals	M460 M462 M464 M466 M468	○		○	○	○	○	×	These are input signals used for signal output functions 460 and are used to halt the next motion during operation. When the contacts of signal M460 are closed, signal output functions 460 proceed to the next motion. Signal output 461 waits for the opening of the contacts of signal M460 and proceeds to the next operation. (The signals M462 through M468 operate in the same manner as that of signal M460.)  (NOTE) Maximum standby time represents the time set in <External signal reading time limit> in the user parameters. Setting it to "0" results in infinite wait.
Prevent spindle operation	SPLOCK	○		○	○	○		×	Prohibit spindle rotation. Spindle stop and orientation are possible. When this signal is turned ON during spindle rotation, the spindle does not stop.
Prevent ATC operation	ATCLCK	○		○	○	○		×	Prohibits ATC operations: magazine swivel, use of **[ATC]** key, tool replacement in MDI or memory mode, and next tool preparation. The automatic setting operation for the ATC monitoring parameter is prohibited. The **[RELSE]** key + **[M]** key are prohibited on the screen used to configure the <Automatic setting for ATC monitoring parameter>.
Prevent XY-axes operation	XYLOCK	○		○	○	○		×	Prohibits XY-axis operation. When the program is created so that other aces operate simultaneously, these axes do not operate either.
Prevent Z-axis operation	ZLOCK	○		○	○	○		×	Prohibits Z-axis operation. When another axis is operating at the same time, the other axis also does not operate.
Prevent 4th axis operation Prevent 5th axis operation Prevent 6th axis operation Prevent 7th axis operation Prevent 8th axis operation	4LOCK 5LOCK 6LOCK 7LOCK 8LOCK	○		○	○	○		×	Prohibits 4 ~ 8th axis operation. When another axis is operating at the same time, the other axis also does not operate. Also prohibits clamping and unclamping operations. (NOTE) Turning on this signal during rotation of the axis that serves as the turning spindle does not stop the turning spindle.
Prevent mode change	MDLOCK	○		○	○	○	○	×	Prohibits mode changeover.
Prevent key operation	KYLOCK	○		○	○	○	○	×	Key operations and (finger) tap operations are restricted (except for the following keys: **[RST]**, **[RELSE]**, **[+X]**, **[-X]**, **[+Y]**, **[-Y]**, **[+Z]**, **[-Z]**, **[+4]**, **[-4]**, **<**Door unlock>, <DATA PROTECTION>, <Subtools> and <Hide subtools>) As long as the **[EMERGENCY]** switch is ON, however, the prevent signal is released. Switch operations using **[OVERRIDE]** (spindle, cutting, positioning), **[EMERGENCY], [START], [FEED HOLD]** and **[PALLET START]** switches are not prevented.

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
Prevent program edit	PRLOCK	○					○	×	Prevents data change operations (insert, delete, set) in edit mode (Program screen). Deleting and copying files in the directory display is also prohibited. As long as the **[EMERGENCY]** switch is ON, however, the prevent signal is released.
Prevent edit	EDLOCK	○		○	○	○	○	○	Prevents program editing. Prevents data bank editing. Also prevents editing of workpiece counter, ATC tools and maintenance notice. As long as the **[EMERGENCY]** switch is ON, however, the prevent signal is released.
Premit etiding Tool data (NC) and Tool list (Conversation)	TLEDOK	○		○	○	○	○	○	As long as this signal is on and even when "EDLOCK" is on, the tool data can be edited.
Permit editing user parameters	UPEDOK	○		○	○	○	○	○	As long as this signal is on and even when "EDLOCK" is on, the user parameter can be edited.
Permit editing machine parameters	MPEDOK	○		○	○	○	○	○	As long as this signal is on and even when "EDLOCK" is on, the machine parameter can be edited.
Permit editing workpiece counter	WCEDOK	○		○	○	○	○	○	As long as this signal is on and even when "EDLOCK" is on, the workpiece counter can be edited.
Permit editing ATC tools	MGEDOK	○		○	○	○	○	○	As long as this signal is on and even when "EDLOCK" is on, the ATC tool can be edited.
Permit editing maintenance notice	MTEDOK	○		○	○	○	○	○	Edition of maintenance notice is enabled as long as this signal is ON, even if Prevent editing (EDLOCK) is ON.
Permit program editing	PREDOK	○		○	○	○	○	○	Edition of program is enabled as long as this signal is ON, even if Prevent editing (EDLOCK) is ON or Prevent program editing (PRLOCK) is ON.
Permit editing external I/O signals	IOEDOK	○		○	○	○	○	○	Edition of external I/O signal screen is enabled as long as this signal is ON, even if Prevent editing (EDLOCK) is ON.
Permit editing communication parameters	CPEDOK	○		○	○	○	○	○	Edition of the Communication parameters screen is enabled as long as this signal is ON, even if Prevent editing (EDLOCK) is ON.
Permit editing directory display	DIROK	○		○	○	○	○	○	Operation of directory display is enabled as long as this signal is ON, even if Prevent editing (EDLOCK) is ON or Prevent program editing (PRLOCK) is ON.
Permit mode change	MODEOK	○		○	○	○	○	○	Mode change is enabled as long as this signal is ON, even if Prevent mode change (MDLOCK) is ON.
Operation level 1 Operation level 2 Operation level 3 Operation level 4	LEVEL1 LEVEL2 LEVEL3 LEVEL4	○		○	○	○	○	○	Set the operation level. When multiple operation level signals are ON, the operation level is set to the highest level enabled. When all the signals are OFF, the operation level is set to level "0."
Workpiece counter clear 1 Workpiece counter clear 2 Workpiece counter clear 3 Workpiece counter clear 4	WKCLR1 WKCLR2 WKCLR3 WKCLR4	○		○	○	○	○	×	Initializes the current value for each workpiece counter. • Signal block 
Door lock	DRLOCK	○		○	○	○	○	×	If the user parameter (switch 1: door) <Door lock method> is set to <1: Lock only when needed>, when the contact is closed for the DRLOCK signal and the door is closed, then the door locks.

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing[*1]		
Automatic door opening	ATDROP	○		○	○	○	○	×	Similar to the opening of **[AUTOMATIC DOOR OPEN/CLOSE]** switch. Opens the door. The operation is available regardless of the status of the **[AUTOMATIC DOOR MANUAL/AUTO]** swtich. • Signal block 
Automatic door closing	ATDRCL	○		○	○	○	○	×	Similar to the opening of **[AUTOMATIC DOOR OPEN/CLOSE]** switch. Closes the automatic door when opened. The operation is available regardless of the status of the **[AUTOMATIC DOOR MANUAL/AUTO]** swtich. • Signal block 
External additional axis 1 (+) index	OUT1P	○				○		×	Signal rotates the additional axis for the outer pallet to the set value in the user parameter <Outer rotary table 1 indexing (+)>, if there is no change in factory-default PLC program settings. The additional axis address is specified in the user parameter (switch 2: outside index) <Outer rotary table 1 switch address>. Starts the operation at the falling edge of the signal. It does not operate when the outer door (setup chamber side door) is open.
External additional axis 1 (-) index	OUT1M	○				○		×	Signal rotates the additional axis for the outer pallet to the set value in the user parameter (switch 2: outer index) <Outer rotary table 1 indexing (-)>, if there is no change in factory-default PLC program settings. The additional axis address is specified in the user parameter (switch 2: outside index) <Outer rotary table 1 switch address>. Starts the operation at the falling edge of the signal. It does not operate when the outer door (setup chamber side door) is open.
External additional axis 2 (+) index	OUT2P	○				○		×	Signal rotates the additional axis for the outer pallet to the set value in the user parameter (switch 2: outer index) <Outer rotary table 2 indexing (+)>, if there is no change in factory-default PLC program settings. The additional axis address is specified in the user parameter (switch 2: outside index) <Outer rotary table 2 switch address>. Starts the operation at the falling edge of the signal. It does not operate when the outer door (setup chamber side door) is open.

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
External additional axis 2 (-) index	OUT2M	○				○		×	Signal rotates the additional axis for the outer pallet to the set value in the user parameter (switch 2: outer index) <Outer rotary table 2 indexing (-)>, if there is no change in factory-default PLC program settings. The additional axis address is specified in the user parameter (switch 2: outside index) <Outer rotary table 2 switch address>. Starts the operation at the falling edge of the signal. It does not operate when the outer door (setup chamber side door) is open.
Prevent outer additional axis indexing	OUTLCK	○		○	○	○	○	×	Prevents the indexing of outer A-,B- and C-axes as long as this signal is ON. Prevents the panel switch as well as the external input signals described above.
5th axis unclamp 6th axis unclamp 7th axis unclamp 8th axis unclamp	UNCLS5 UNCLS6 UNCLS7 UNCLS8	○		○	○	○	○	×	Inputs the unclamping signal status of the 5th to 8th axes respectively. Whether the unclamping signal status is checked by ON or OFF is set by <5th (to 8th) axis unclamp check input signal> in the machine parameters.
P1-axis unclamp P2-axis unclamp P3-axis unclamp P4-axis unclamp	UNCSP1 UNCSP2 UNCSP3 UNCSP4	○		○	○	○	○	×	Inputs the unclamping signal status of the P1 to P4 axes respectively. Whether the unclamping signal status is checked by ON or OFF is set by <P1 (to P4) axis unclamp check input signal> in the machine parameters.
5th axis clamp 6th axis clamp 7th axis clamp 8th axis clamp	CLPLS5 CLPLS6 CLPLS7 CLPLS8	○		○	○	○	○	×	Inputs the clamping signal status of the 5th to 8th axes respectively. This signal sets whether to turn the clamp check ON or OFF in the user parameter (system 2: additional axis) <5th-axis (to 8th-axis) clamp check input signal>.
P1-axis clamp P2-axis clamp P3-axis clamp P4-axis clamp	CLPSP1 CLPSP2 CLPSP3 CLPSP4	○		○	○	○	○	×	Inputs the clamping signal status of the P1 to P4 axes respectively. This signal sets whether to turn the clamp check ON or OFF in the user parameter (PLC) <P1-axis (to P4-axis) clamp confirm. input signal>.
5th axis Overtravel (+)	OVTR5P	○		○	○	○	○	×	Inputs the 5th axis overtravel (+). When this signal turns on, the machine will output the <<*Overtravel (+5)>> error.
5th-axis overtravel (-)	OVTR5M	○		○	○	○	○	×	Inputs the 5th axis overtravel (-). When this signal turns on, the machine will output the <<*Overtravel (-5)>> error.
6th-axis overtravel (+)	OVTR6P	○		○	○	○	○	×	Inputs the 6th axis overtravel (+). When this signal turns on, the machine will output the <<*Overtravel (+6)>> error.
6th-axis overtravel (-)	OVTR6M	○		○	○	○	○	×	Inputs the 6th axis overtravel (-). When this signal turns on, the machine will output the <<*Overtravel (-6)>> error.
7th-axis overtravel (+)	OVTR7P	○		○	○	○	○	×	Inputs the 7th axis overtravel (+). When this signal turns on, the machine will output the <<*Overtravel (+7)>> error.
7th-axis overtravel (-)	OVTR7M	○		○	○	○	○	×	Inputs the 7th axis overtravel (-). When this signal turns on, the machine will output the <<*Overtravel (-7)>> error.
8th-axis overtravel (+)	OVTR8P	○		○	○	○	○	×	Inputs the 8th axis overtravel (+). When this signal turns on, the machine will output the <<*Overtravel (+8)>> error.
8th-axis overtravel (-)	OVTR8M	○		○	○	○	○	×	Inputs the 8th axis overtravel (-). When this signal turns on, the machine will output the <<*Overtravel (-8)>> error.

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
Brake load test (all applicable axes)	BTSTAL	○				○		×	After the contact closes for the signal BTSTAL, when it opens, the brake load test is executed for all axes where the input signal SR_BKIN*_N (*:1 to 5) is assigned. (NOTE 1) Travel occurs at the positioning speed. (NOTE 2) Refer to “Brake load test” for the test execution order. (NOTE 3) The signal input must be faster than 100 msec. (NOTE 4) Automatic operation starting (STL) does not turn ON during the brake load test. (NOTE 5) The test is not executed on an axis where the machine parameter (system 2: additional axis) <Brake load test> (5th to 8th-axis) and the <Brake load test> (P1 to P4-axis) is set to <0: No test>. (NOTE 6) When the lathe spindle is selected and the test is executed for the lathe spindle, the alarm <<The lathe spindle is being selected.>> is triggered and the test cannot be executed. (NOTE 7) If the PLC-axis test is executed when the PLC-axis control signal is ON, the alarm <<The PLC axis control signal is ON.>> is triggered. <u>Enable conditions</u> (1) Automatic operation starting (STL) is OFF (2) Axis travel is not carried out (3) **[FEED HOLD]** switch is not pressed (4) External stop (EXSTOP) is OFF (5) An alarm higher than a stop level 2 has not been triggered (6) Door is closed (7) Screen <Move start position> is not currently displaying (8) Brake load test executing (BTRUN) signal is OFF Execute the brake load test on the J*-axis (*: 1, 2 or 3) in the loading system when the machine is linked with the loading system. Refer to the loading system manual for further details. <u>Conditions to enable loading system</u> (1) LB automatic operation starting (LB_STL) is OFF (2) Axis travel is not carried out (3) **[Stop]** key is not pressed (not paused) (4) LB external stop (BIO_EXSTOP) is OFF (5) An alarm higher than a stop level 2 has not been triggered (6) Door guard is closed Ex: Side door and safety fence that separate the loading system and SPEEDIO are closed (7) No display device or NC operation panel with operation control (8) Brake load test is not in progress In addition, keep the LB brake load test 1 to 3 signals in a 1: ON state for at least 100 ms.

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
Brake load test 1 Brake load test 2 Brake load test 3 Brake load test 4 Brake load test 5	BTST1 BTST2 BTST3 BTST4 BTST5	○				○		×	After the contact closes for the signals BTST1 to 4, when it opens, the brake load test is executed for the axis where the input signal SR_BKIN*_N (*:1 to 5) is assigned. (NOTE 1) Travel occurs at the positioning speed. (NOTE 2) Refer to “Brake load test” for the test execution order. (NOTE 3) The signal input must be faster than 100 msec. (NOTE 4) Automatic operation starting (STL) does not turn ON during the brake load test. (NOTE 5) The test is not executed on an axis where the machine parameter (system 2: additional axis) <Brake load test> (5th to 8th-axis) and the <Brake load test> (P1 to P4-axis) is set to <0: No test>. (NOTE 6) When the lathe spindle is selected and the test is executed for the lathe spindle, the alarm <<The lathe spindle is being selected.>> is triggered and the test cannot be executed. (NOTE 7) If the PLC-axis test is executed when the PLC-axis control signal is ON, the alarm <<The PLC axis control signal is ON.>> is triggered. <u>Enable conditions</u> (1) Automatic operation starting (STL) is OFF (2) Axis travel is not carried out (3) **[FEED HOLD]** switch is not pressed (4) External stop (EXSTOP) is OFF (5) An alarm higher than a stop level 2 has not been triggered (6) Door is closed (7) Screen <Move start position> is not currently displaying (8) Brake load test executing (BTRUN) signal is OFF
Door unlock1	DRUL1	○		○	○	○	○	×	If the user parameter (switch 1: door) <Door lock method> is set to <0: Automatic lock when door closes>, this signal locks or unlocks the door where the user parameter (switch 1: door) <Door unlock signal setting - *> is set to <1: External input 1> or <3: Both>. When this signal is turned ON, it unlocks all the set doors that are locked. However, it locks all the set doors if just one of the doors is unlocked. This signal has no effect on open doors.
Door unlock2	DRUL2	○		○	○	○	○	×	If the user parameter (switch 1: door) <Door lock method> is set to <0: Automatic lock when door closes>, this signal locks or unlocks the door where the user parameter (switch 1: door) <Door unlock signal setting - *> is set to <2: External input 2> or <3: Both>. When this signal is turned ON, it unlocks all the set doors that are locked. However, it locks all the set doors if just one of the doors is unlocked. This signal has no effect on open doors.

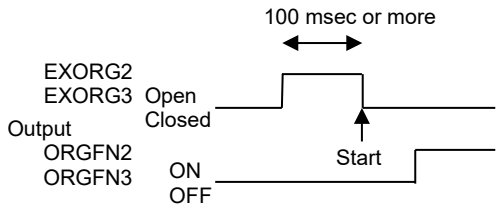
Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
Operation preparation safety relay	MOSRU	○		○	○	○	○	×	When this signal is turned on after satisfying the following conditions, the operation preparation status turns ON. • When the user parameter (switch 1: installation) <Operation preparation function> is set to <1: Enable>. • When the user parameter (switch 1: installation) <Operation preparation circuit selection> is set to <1: Safety relay>.
LB brake load test 1 LB brake load test 2 LB brake load test 3	LBBTS1 LBBTS2 LBBTS3	○				○		×	Execute the brake load test on the J*-axis (*: 1, 2 or 3) in the loading system. Refer to the loading system manual for further details. <u>Conditions to enable loading system</u> (1) LB automatic operation starting (LB_STL) is OFF (2) Axis travel is not carried out (3) **[Stop]** key is not pressed (not paused) (4) LB external stop (BIO_EXSTOP) is OFF (5) An alarm higher than a stop level 2 has not been triggered (6) Door guard is closed Ex: Side door and safety fence that separate the loading system and SPEEDIO are closed (7) No display device or NC operation panel with operation control (8) Brake load test is not in progress In addition, keep the LB brake load test 1 to 3 signals in a 1: ON state for at least 100 ms.
PLC input X000 : PLC input X7FF	PLCX000 : PLCX7FF	○		○	○	○	○	○	Turn this signal on to turn on the PLC input X00~X7FF signal.
Reservation	RESERV								Already set the poart by the machine parameter when left the factory to avoid setting of duplication. (This is not signal, as same as unset.))

1. NC language only

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
External 1st reference point return External 2nd reference point return External 3rd reference point return External 4th reference point return External 5th reference point return External 6th reference point return	EXREF EXREF2 EXREF3 EXREF4 EXREF5 EXREF6	○				○		×	The machine can be returned to the 1st ~6th reference point set by the parameter, by opening and then closing the contact of the EXREF, EXREF2~EXREF6. (NOTE 1) Axis movement is done at positioning feed. (NOTE 2) The movement order of axes is Z and then X and Y (simultaneous). (NOTE 3) Axes do not move to the middle point. (NOTE 4) After normal completion of 1st ~ 6th reference point return, REFIN/REFIN2~REFIN6 signal is output. (NOTE 5) Input signal for 100 msec or more. (NOTE 6) During execution of external 1st to 6th reference point return, Automatic operation starting (STL) signal is not turned on. (NOTE 7) When the machine is equipped with turning spindle and the turning spindle is currently selected, reference point return is not made for the additional axis that serves as the turning spindle. Effective conditions (1) Automatic operation ongoing signal (STL) is off. (2) The **[FEED HOLD]** switch is not pressed. (3) The external stop signal (EXSTOP) is off. (4) An alarm higher than stop level 2 has not occurred. (5) The door is closed. (6) When one of the following applies: • <Door interlock mode> is set to <Maintenance> and the spindle is stopped. • <Door interlock mode> is set to <Auto. operation> or <Machine setup>. (7) Brake load test executing (BTRUN) signal is OFF (8) The screen <Move start position> is not currently displaying.
External optional skip	OPSKIP	○			○	○		×	When this signal is ON, memory operation is skipped at the block which contains slash (/) code.
External optional stop	OPSTOP	○			○	○		×	When this signal is ON, memory operation is temporary stopped at the execution of M01.
Shifting external workpiece coordinates	EXWORK	○			○	○		×	If the user parameter (switch 1: operation) <Shift method in external workpiece coordinate system> is set to <0: Method 1>, the set value for the workpiece coordinate zero (external) becomes valid when this signal is ON. If set to <1: Method 2>, the set value for the workpiece coordinate zero (external) is valid even when this signal is not ON. As long as this signal is on, the workpiece coordinates zero point (external) setting is valid.
Permit editing workpiece coord. zero	WPEDOK	○		○	○	○	○	○	Edition of workpiece coordinate zero is enabled as long as this signal is ON, even if Prevent editing (EDLOCK) is ON.
Permit editing macro data	MCEDOK	○		○	○	○	○	○	Edition of macro data is enabled as long as this signal is ON, even if Prevent editing (EDLOCK) is ON.
Interrupt macro	UINT	○				○		×	When the interrupt type macro (UINT) signal is ON during program execution, it cancels and interrupts the program that is currently executing and executes the specified program operation.

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
Macro variables #1000 : #1031 Macro variables #1200 : #1295	 #1000 : #1031 #1200 : #1295	○			○	○		○	Retains values for macro variables #1000 to #1031 and #1200 to #1295 internally. The ON status is treated as “1” while the OFF status as “0.”

2. Conversation only

Signal name	Symbol	Logic		Enabled mode				External input signal key registration	Function
		Normally open	Normally closed	Manual	MDI	Memory	Editing*1		
External 2nd zero return External 3rd zero return	EXORG2 EXORG3	○				○		×	The machine can be returned to its 2nd or 3rd zero point set with the parameter by opening and then closing the contact of the signal EXORG2 or EXORG3.  Completion of zero return can be checked by signal ORGFN2 or ORGFN3. (NOTE 1) For details, refer to the section of completion of 2nd zero return. (NOTE 2) (1) The signals EXORG2 and EXORG3 are enabled when the signal STL is OFF. (2) The signal STL does not output during a return. (3) If in edit mode while operating, wait longer than 500 msec before inputting. (4) The signals are enabled when the doors are closed. (5) The signals are enabled when one of the following applies. • <Door interlock mode> is set to <Maintenance> and the spindle is stopped. • <Door interlock mode> is set to <Auto. operation> or <Machine setup>. (6) These signals are enabled when the brake load test executing (BTRUN) signal is OFF.
Prevent editing tool pattern	TPEDOK	○		○	○	○	○	○	Even if the edit lock (EDLOCK) is ON, the tool pattern in the data bank can be edited when this signal is turned ON.
Prevent editing tap prepared hole drill diameter	THEDOK	○		○	○	○	○	○	Even if the edit lock (EDLOCK) is ON, the tapping drill diameter in the data bank can be edited when this signal is ON.
Prevent editing cutting conditions	CTEDOK	○		○	○	○	○	○	Even if the edit lock (EDLOCK) is ON, the cutting conditions in the data bank can be edited when this signal is turned ON.

1.6.4.2 Detailed Description of External Input Signals

External program selection

Described in this section is how to use external program selection signals and cautions on it.

1. How to Use
   Under the memory operation mode, input signals to PRO1, PRO2, PRO4, PRO8, PRO16, PRO32, PRO64 and PR9900.
   Then inputting the start signal causes the NC to read the signals and execute the program.

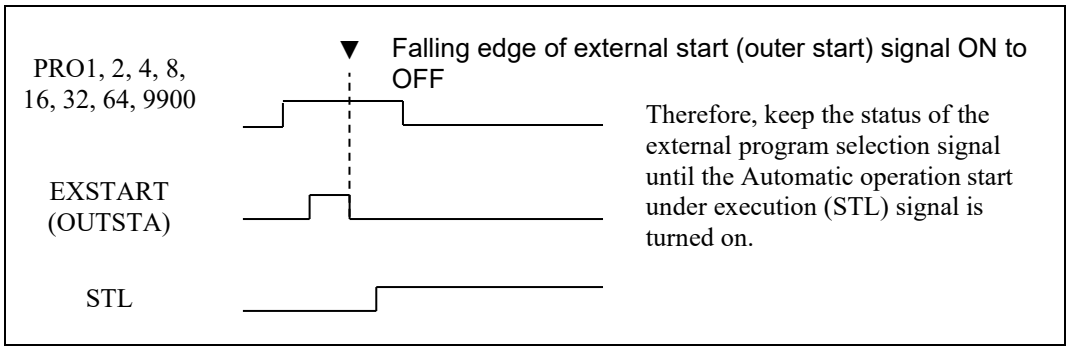
Program number	PR9900	PR064	PR032	PR016	PR008	PR004	PR002	PR001
Program number entered last	×	×	×	×	×	×	×	×
0001	×	×	×	×	×	×	×	○
0002	×	×	×	×	×	×	○	×
0003	×	×	×	×	×	×	○	○
0004	×	×	×	×	×	○	×	×
0005	×	×	×	×	×	○	×	○
0006	×	×	×	×	×	○	○	×
0007	×	×	×	×	×	○	○	○
0008	×	×	×	×	○	×	×	×
0009	×	×	×	×	○	×	×	○
0010	×	×	×	×	○	×	○	×
0011	×	×	×	×	○	×	○	○
0012	×	×	×	×	○	○	×	×
0013	×	×	×	×	○	○	×	○
0014	×	×	×	×	○	○	○	×
0015	×	×	×	×	○	○	○	○
0016	×	×	×	○	×	×	×	×
• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
0032	×	×	○	×	×	×	×	×
• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
0064	×	○	×	×	×	×	×	×
• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
0099	×	○	○	×	×	×	○	○
0100	×	○	○	×	×	○	×	×
• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
0127	×	○	○	○	○	○	○	○

○: Contact closed ×: Contact open

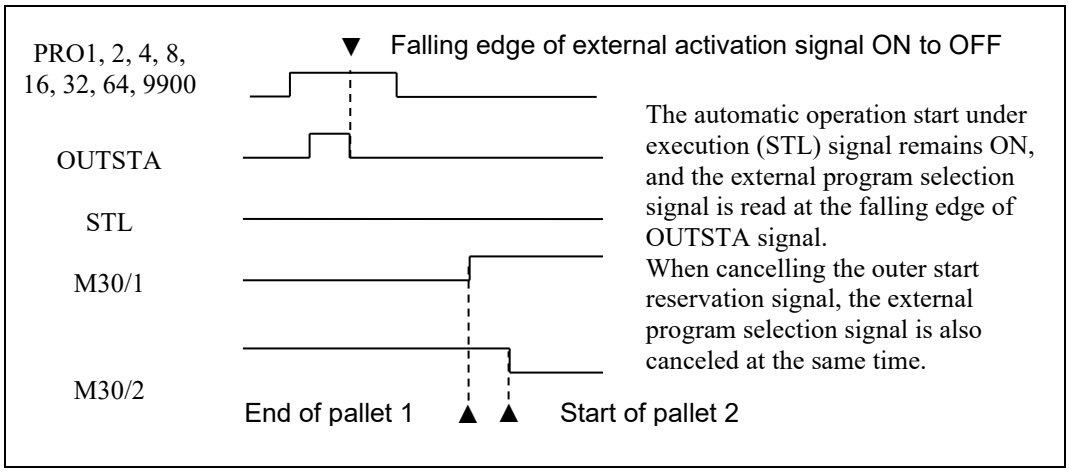
Program number	PR9900	PR064	PR032	PR016	PR008	PR004	PR002	PR001
Program number entered last	○	×	×	×	×	×	×	×
9901	○	×	×	×	×	×	×	○
9902	○	×	×	×	×	×	○	×
9903	○	×	×	×	×	×	○	○
9904	○	×	×	×	×	○	×	×
9905	○	×	×	×	×	○	×	○
9906	○	×	×	×	×	○	○	×
9907	○	×	×	×	×	○	○	○
9908	○	×	×	×	○	×	×	×
9909	○	×	×	×	○	×	×	○
9910	○	×	×	×	○	×	○	×
9911	○	×	×	×	○	×	○	○
9912	○	×	×	×	○	○	×	×
9913	○	×	×	×	○	○	×	○
9914	○	×	×	×	○	○	○	×
9915	○	×	×	×	○	○	○	○
9916	○	×	×	○	×	×	×	×
• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
9932	○	×	○	×	×	×	×	×
• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
9964	○	○	×	×	×	×	×	×
• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
9999	○	○	○	×	×	×	○	○
External program selection number error	○	○	○	×	×	○	×	×
	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
	○	○	○	○	○	○	○	○

○: Contact closed ×: Contact open

2. Cautions
   (1) Reading of signals is started by the start signal in the operation reset status (with neither start lamp nor stop lamp lit) or by the PALLET START signal with the PALLET START reservation lamp not lit.
   (2) External program selection signals (PRO1, PRO2, PRO4, PRO8, PRO16, PRO32, PRO64) are input to the NC according to the following timing chart:
   The same goes at start as well as at external start, PALLET START, and external PALLET START.



3. The external program selection signal is read at the falling edge of OUTSTA signal at PALLET START as well as at external PALLET START reservation.



When the start reservation signal is canceled, the external program selection signal having read is also canceled.

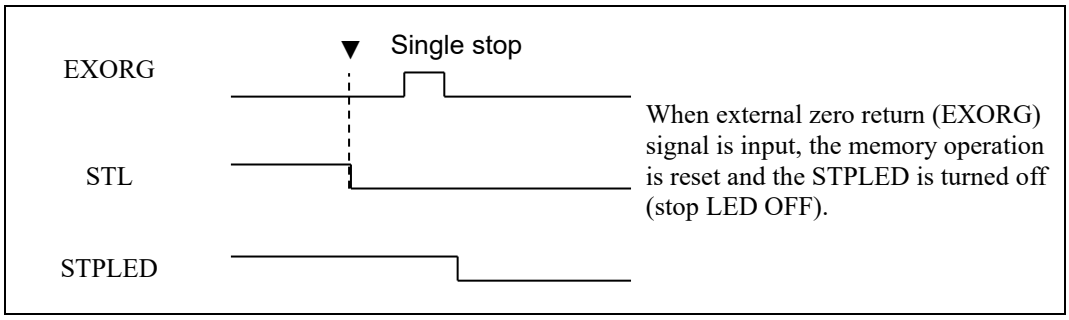
4. Input the external start (EXSTART) signal for 100 msec or more.
   Effective conditions
   Memory operation is in reset status. (Except block stop and halt)

5. When an operating program is issued multiple times, the program is listed as follows: (1)>(2)-1>(2)-2>(2)-3>(3).
   (1) Specifying program using communication
   (2)-1 Program number entered in the external input signal <External program selection>
   -2 Program number entered in the internal PLC output data <External program selection No.>
   -3 Program number entered in the internal PLC output signal <External program selection>
   (3) Program specified using memory operation, or the <Pallet 1 (2) program> in the <User parameter> (quick table)

6. PR9900 signal is valid only in conversation mode.
   (This is for conversation schedule programs.)

7. Programs that can be selected using the <External program selection>, or the <External program selection No.> are only those programs that are located in the root directory for the NC (root directory is located in the memory card for tape operation). When a program number in a sub folder has been commanded, the program of the same program number in the root folder is selected, or an alarm <<No program>> is generated if there is no program of the same program number in the root folder.

Input signals accompanying axis movement
For the following input signals accompanying axis movement, input is accepted only during operation stop or single stop.
When the folowing input signal is input during single stop in memory operation, the memory operation is reset.
EXORG
EXZORG
EXREF
CTURN
EXREF2~6 (NC language only)
EXORG2,3 (Conversation only)
BTSTAL
BTST1~5



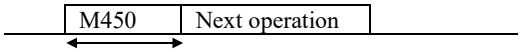
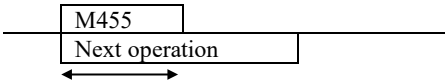
External input signal key registration
Inserting the memory card that has been created as external input signal keys in the USB port, the designated external input signal is turned on.

1.6.5 External Output Signals

1.6.5.1 List of Output Signals

*1 signifies program editing.

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
Program stop	M00			○		This signal is activated when a 'Program stop' is executed during memory operation and is deactivated in response to a start or reset signal.This signal is deactivated in response to the a start or reset signal. (NOTE) The signal undergoes no change in case an alarm occurs.
Program end	M30/1 M30/2			○		This signal is activated when a 'Program end' is executed during memory operation. • M30/1: Turns on upon execution of program end for pallet 1. • M30/2: Tuns on upon execution of program end for pallet 2. Turns off by Start signal or resetting. (NOTE) For the machine not equipped with QT, only M30/1 is output. For the machine equipped with QT, M30/1 is output regardless of the pallet when the <PALLET> key is "OFF."
Coolant operation running	M08		○	○		Indicates that the coolant is being circulated.
M function output	M11 M12 M14 M18 M21 M22 M24 M28 MF M900		○	○		Sends the 2-digit decimal number BCD code to a peripheral by specifying any of signal outputs M01 to M99 (during MDI or memory operation. For M901 to M999, the M900 signal turns on at the same time. The last two digits are the same as the above. (NOTE) Even when the user parameter (switch 1: programming) <Multiple M codes in one block> is set to <1: Yes>, the M function signal output can only issue 1 command per block. It cannot be specified together with PLC output.

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
External signal output	M400 M402 M404 M406 M408 M480 M482 M484 M486		○	○		Can be turned on and off according to the program during MDI or memory operation. Ex Turns on when the output signal 402 is executed in the program and turns off when the signal output 403 is executed. Unlike M11 to M28, this signal does not check the M function complete signal MFIN. <table><tr><th>Signal name</th><th>ON</th><th>OFF</th></tr><tr><td>M400</td><td>M400 is commanded in program.</td><td>“Chip shower retention time” has passed since M401 was commanded in program.</td></tr><tr><td>M402</td><td>M402 is commanded in program.</td><td>M403 is commanded in program.</td></tr><tr><td>M404</td><td>M404 is commanded in program.</td><td>M405 is commanded in program.</td></tr><tr><td>M406</td><td>M406 is commanded in program.</td><td>M407 is commanded in program.</td></tr><tr><td>M408</td><td>M408 is commanded in program.</td><td>M409 is commanded in program.</td></tr><tr><td>M480</td><td>M480 is commanded in program.</td><td>M481 is commanded in program.</td></tr><tr><td>M482</td><td>M482 is commanded in program.</td><td>M483 is commanded in program.</td></tr><tr><td>M484</td><td>M484 is commanded in program.</td><td>M485 is commanded in program.</td></tr><tr><td>M486</td><td>M486 is commanded in program.</td><td>M487 is commanded in program.</td></tr></table>(NOTE 1) Turns OFF at input of reset signal. (NOTE 2) Does not turn OFF at the generation of an alarm.
One shot output M450 M451	M450 M451		○	○		This signal is output by one shot. The output time is set in the user parameter (switch 1: programming) <One shot signal M450 (M451) output time>. Ends the signal output and proceeds to the next operation.  One shot signal M450 output time 1. Turns off upon input of reset signal. 2. Does not turn off on the generation of an alarm.
One shot output M455 M456	M455 M456		○	○		This signal is output by one shot. The output time is set in the user parameter (switch 1: programming) <One shot signal M455 (M456) output time>. As soon as the signal output is started, proceeds to the next operation.  One shot signal M455 output time 1. Turns off upon input of reset signal. 2. Does not turn off on the generation of an alarm.
Automatic operation runnig	AUTO		○	○		In MDI operation or memory operation, Condition for ON: Initial start input Conditions for OFF: 1. Resetting 2. An alarm at stop level 5 (servo OFF). (NOTE) Does not turn on upon external zero return.

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
Automatic operation starting	STL		○	○		During MDI or memory operation: On conditions: During an operation Off conditions: 1. End of a motion 2. Single block stop 3. Stop 4. Reset 5. Alarm (NOTE) Does not turn ON upon external zero return.
Memory operation enabled	MEMOK			○		This signal turns ON when memory operation mode is enabled and is ready to start memory operation. Turns OFF in the following situations. • When **[SINGL]**, **[DRY]** and **[M.LCK]** keys are ON • While reset is processing • When a door is open • When the user parameter (switch 1: door) <Door lock method> is set to <0: Automatic lock when door closes> and the door is unlocked • When one of the following alarms or operator messages are triggered Alarms with a stop level 2 or higher <<Relocation was detected>> <<Reset the relocation detection status>> <<Execute automatic oiling / greasing cycle ON command>> <<Brake load test error on *-axis>> • Travel screen is displayed for start position at program restart • <Door interlock mode> is not set to <Auto. operation> • User parameter (switch 1: operation) <Check before chip shower start> is set to <1: Enable> and the **[CHP.F]** key is OFF • User parameter (switch 1: operation) <Check before coolant pump start> is set to <1: Enable> and the **[CLT.P]** key is OFF
Memory operation mode	MEMMOD			○		This signal turns on when you switch to memory operation mode or edit mode during operation. This signal is turns off in any other mode.
Extension memory running	EXPRUN		○	○		Turns ON when the program that is displayed in memory operation mode is for an extended memory operation. If the program size exceeds 32 MB, it becomes an extended memory operation.
NC ready	NCOK	○	○	○	○	This signal is turned ON when the NC unit is ready for any operation such as axis movement. The signal turns OFF on the occurrence of an alarm that causes the servo control to be turned OFF. Turns ON when the NC preparations are complete and all operations such as axis travel are OK and ready to be received. It turns OFF when an alarm is triggered that turns OFF the servo. (Example of an alarm when the servo is turned OFF) • Stop level 5 alarm (such as <<*-axis servo error>>) • <<Emergency switch (EMS*)>> (When the **[EMERGENCY]** switch is pressed) • <<Door open>> (When the front or side door is open and the door interlock function is enabled (NOTE)) • <<*Standby mode>> (When in standby mode) (NOTE) <Door interlock mode> is set to <Auto. operation> or <Machine setup>, and the **[ENABLE]** switch is OFF.

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
Abnormal output	ALM	○	○	○	○	Outputs when a stop level 5 (servo OFF) or a cancel level 3 (power OFF required) alarm is triggered. However, the following alarms are excluded. • <<*Door open>> • <<*Standby mode>> • <<*Enter your password.>> • <<***[ENABLE]** switch was turned OFF.>> • <<***[MASTER ON]** was turned OFF.>> Remove the cause and reset to restore operation. Note that the ALM signal does not output when the power is OFF because the transistor outputs.
Abnormal output 2	ALM2	○	○	○	○	Turns ON when an alarm is triggered that is higher than a stop level alarm set in the user parameter (switch 1: data) <ALM2 signal stop level>. However, the following alarms are excluded. • <<*Door open>> • <<*Standby mode>> • <<*Enter your password>> • <<***[ENABLE]** switch was turned OFF.>> • <<***[MASTER ON]** was turned OFF.>>
Alarm level	ALMLV1 ALMLV2	○	○	○	○	**ALMLV1** / **ALMLV2** / **Alarm status** OFF / OFF / No error ON / OFF / Level causing stop at the end of the cycle OFF / ON / Level causing stop at the end of the block ON / ON / Level causing pause or higher
Alarm stop level 1 Alarm stop level 2 Alarm stop level 3 Alarm stop level 4 Alarm stop level 5	ASTLV1 ASTLV2 ASTLV3 ASTLV4 ASTLV5	○	○	○	○	The signal at the relevant level turns ON on the generation of an alarm at any level. When alarms are generated at multiple levels, the signals at the relevant levels turn ON.
Tool abnormality output	TOOL			○		This signal turns ON on the occurrence of a <<Tool breakage error>> in tool breakage detection or when the end of the life of the tool used in the current program has been reached and the current program is ended. (It does not turn ON when a spare tool is registered.) To release the signal and restart, perform one of the followings. 1. Register a spare tool then press the **[RST]** key. 2. Reset the tool life then press the **[RST]** key. (NOTE 1) The signal is momentarily deactivated if the **[RST]** key is pressed without registering a spare tool or resetting the tool life. M120(M121) When the measurement signal (TOUCH) is OFF (ON) in the execution of M120 (M121), a <<Tool breakage error>> is generated and the TOOL signal is turned ON. (NOTE 2) The operations noted above apply after the alarm <<Tool breakage error>> is triggered, regardless of the user parameter (tool breakage detection) setting for <Tool breakage detection option>.
Tool life end warning	TOLPRE			○		Turns on if the service life of the tool used for operation has reached the estimated service life.ON timing is the same as for TOOL signal.
Zero point return completion	ORGFIN	○	○	○	○	This signal is always activated.
Spindle rotation	SPTURN	○	○	○	○	This signal is active while the spindle rotates and is inactive while it is in stop.The signal, however, is not active during an oriented spindle stop and a tapping.

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
Zero position output	ZPX ZPY ZPZ ZPSP ZP4 ZP5 ZP6 ZP7 ZP8	○	○	○	○	Upon completion of zero return, the ZPX, ZPY, ZPZ, ZP4, ZP5, ZP6, ZP7, and ZP8 signals turn ON. Independent signals are provided for each axis. Then as the machine moves from the machine zero, these signals turn OFF, and they turn ON again when the machine returns to the machine origin again. The ZPSP signal turns ON upon completion of spindle orientation and turns OFF by spindle rotation, the reset signal, or **[SP.STOP]** key. (NOTE 1) They turn OFF on occurrence of an alarm at stop level 5 (servo off level). (NOTE 2) For the machine equipped with QT, the ZP4 signal turns ON when the 4th axis machine coordinate is “0.000.” It does not turn ON at any indexed position.
Pallet indexing complete	PFIN1 PFIN2	○	○	○	○	This signal turns ON as follows: PFIN1: When the pallet 1 is indexed as outer pallet PFIN2: When the pallet 2 is indexed as outer pallet If you move the pallet from the index point, the corresponding signal will go off. Returning the pallet to the index point will turn the signal on. (NOTE) The signal will be turned off, if the servo control will be off such as an emergency stop.Always output “OFF” for QT uninstalled mashine.
Output during resetting	RSTOUT	○	○	○		Outputs as one shot (300 msec. or while reset lamp is lit, whichever is longer) when the reset LED is lit.
Tool breakage alarm	TLBRKE		○	○		This signal turns ON on the occurrence of a <<Tool breakage error>> and OFF when the error is reset.
Operation stop alarm	RUNSTP	○	○	○	○	Turns ON when an alarm is triggered that stops operation. It turns OFF when the alarm is cleared and reset.
Battery alarm	BATALM	○	○	○	○	Turns ON when the battery for maintaining the backup data is low.
Maintenance request	MNTALM	○	○	○	○	This signal turns on when the status of maintenance notice is alarm.
Green lamp	GRN		○	○		Outputs the signal with the same condition as the green lamp. Condition for ON: STL = ON Condition for OFF: Other than the conditions for ON above
Yellow lamp	YEL	○	○	○	○	Outputs the signal with the same condition as yellow lamp. Condition for ON: Any of the following conditions is satisfied: • M30/1 or M30/2 is ON. • The user parameter (switch 1: installation) <Lamp status when count ends> is set to <Yellow> and the workpiece counter has ended. Condition for OFF: Other than the condition for ON above
Red lamp	RED	○	○	○	○	The signal in the same status as that of the red lamp is output. Condition for ON: Any of the following conditions is satisfied: • ALM signal is ON. • The user parameter (switch 1: installation) <Lamp status when count ends> is set to <Red> and the workpiece counter has ended. Condition for OFF: Other than the condition for ON above
Workpiece counter end	CNTUP	○	○	○	○	Condition for ON: Workpiece counter end status Condition for OFF: Other han the condition for ON above
Workpiece counter end warning	CNTPRE	○	○	○	○	Condition for ON: Workpiece counter end warning status Condition for OFF: Other han the condition for ON above
Stop	STPOUT	○	○	○	○	Equivalent to the **[FEED HOLD]** switch input
Stopping	STPLED	○	○	○	○	Indicates that the operation is currently stopped. Equivalent to the stop LED.
Door (Outside door/front door) opening end	DROPEN	○	○	○	○	Indicates that the outside door (front door) is open.
Door (Outer door/front door) closing end	DRCLS	○	○	○	○	Indicates that the outer door (front door) is closed.

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
Inner door closing end	INDRCL	○	○	○	○	Indicates that the inner door is closed.
Side door closing end	SDDRCL	○	○	○	○	Indicates that the side door is closed. This signal turns ON when the left and right door are closed.
Outside door 1 closing end	XDR1CL	○	○	○	○	Indicates that the outside door 1 is closed.
Outside door 2 closing end	XDR2CL	○	○	○	○	Indicates that the outside door 2 is closed.
Automatic door manual/automatic selector switch	ATDRSL	○	○	○	○	Outputs whether the automatic door is in the automatic status or the manual status is output. This signal turns ON in the automatic status and OFF in the manual status.
Automatic door READY	DRRDY	○	○	○	○	Indicates that the automatic door is READY.
Automatic door opening operation complete	DROFIN	○	○	○	○	Indicates that the opening of the automatic door has completed.
Automatic door closing operation complete	DRCFIN	○	○	○	○	Indicates that the closing of the automatic door has completed.
Automatic door alarm	DRALM	○	○	○	○	Displays the automatic door alarm status (<<Door operation timeout>> and <<Door open timeout>>). OFF: Alarm not triggered ON: Alarm triggered
PALLET START LED	RDYLED			○		Indicates that start is reserved.
Dry run	DRYRUN	○	○	○	○	Indicates that the machine is in dry run mode.
Single operation	SINGL	○	○	○	○	Indicates that the machine is in single operation.
Restart	RESTAT	○	○	○	○	Indicates that the machine is in restart.
Rapid feed override	RPD100	○	○	○	○	Indicates that the machine is in rapid feed override state. ON: 100% OFF: Other than 100%
Spindle override	SPN100	○	○	○	○	Indicates that the machine is in spindle override state. ON: 100% OFF: Other than 100%
Cutting feed override	FED100	○	○	○	○	Indicates that the machine is in cutting feed override state. ON: 100% OFF: Other than 100%
Release key kept pressed	RELESE	○	○	○	○	Indicates that the **[RELSE]** key is kept pressed.
Coolant key	COOLSW	○	○	○	○	Indicates that **[CLT.P]** key is ON.
Chip shower key	CHIPSW	○	○	○	○	Indicates that **[CHP.F]** key is ON.
Handle OFF	PULOFF	○	○	○	○	Signal turns ON when axis operation is not possible using either the handle operation or the teaching pendant. • Signal turns ON when the handle is not connected and when the teaching pendant is not connected. • When the handle or the teaching pendant is connected and the axis selection is OFF, the signal turns ON if the mode is not set to <MANU>. If the mode is set to <Manual operation>, the signal turns ON following the table below. When an alarm is triggered that is stop level 2 or higher. — ON While the **[FEED HOLD]** switch is being pressed down. — ON External stop (EXSTOP) is ON. — ON
PALLET key	QTSEL1 QTSEL2	○	○	○	○	Indicates: **[PALLET]** key. [PALLET] key / QTSEL1 / QTSEL2 OFF / OFF / OFF 1 / ON / OFF 2 / OFF / ON 1←→2 / ON / ON
Waveform display notice signal	WAVDSP	○	○	○	○	This signal turns OFF as soon as the waveform display function is started. The signal turns ON when the condition for triggering the waveform display notice signal is satisfied.

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
X-axis position signal	XPOSSW	○	○	○	○	Signal turns ON when the machine coordinates fall within the range (including the boundary value) indicated in user parameter (switch 2: position signal output range) <*-axis position signal output range (-)/(+)> or <*-axis position signal output range 3 (-)/(+)>. (Regardless of the ON/OFF status for the servo) The signal turns OFF when the machine coordinate is outside the range. BY375 determines which parameter will be used.
Y-axis position signal	YPOSSW	○	○	○	○	
Z-axis position signal	ZPOSSW	○	○	○	○	
4th axis position signal	4POSSW	○	○	○	○	
5th axis position signal	5POSSW	○	○	○	○	
6th axis position signal	6POSSW	○	○	○	○	
7th axis position signal	7POSSW	○	○	○	○	
8h axis position signal	8POSSW	○	○	○	○	
External additional axis 1 indexing	OUT1ON	○	○	○	○	Signal turns ON while the additional axis for the outer pallet is indexing when using the panel switch or input signal. The additional axis address is specified in the user parameter (switch 2: outside index) <Outer rotary table 1 switch address>.
External additional axis 2 indexing	OUT2ON	○	○	○	○	Signal turns ON while the additional axis for the outer pallet is indexing when using the panel switch or input signal. The additional axis address is specified in the user parameter (switch 2: outside index) <Outer rotary table 2 switch address>.
5th axis unclamp 6th axis unclamp 7th axis unclamp 8th axis unclamp	UNCLP5 UNCLP6 UNCLP7 UNCLP8	○	○	○	○	These are unclamp output signals for the 5th to 8th axes. “ON” is output when unclamping and “OFF” is output when clamping.
P1-axis unclamp P2-axis unclamp P3-axis unclamp P4-axis unclamp	UCLPP1 UCLPP2 UCLPP3 UCLPP4	○	○	○	○	These are unclamp output signals for the P1 to P4 axes. “ON” is output when unclamping and “OFF” is output when clamping.
Indexing magazine number 1 Indexing magazine number 2 Indexing magazine number 4 Indexing magazine number 8 Indexing magazine number 16 Indexing magazine number 32	MGZ1 MGZ2 MGZ4 MGZ8 MGZ16 MGZ32	○	○	○	○	These signals output respective indexing magazine numbers (pot numbers). Ex1: When the indexing magazine number is “1” MGZ1 = ON MGZ2 = OFF MGZ4 = OFF MGZ8 = OFF MGZ16 = OFF MGZ32 = OFF Ex2: When the indexing magazine number is “21” MGZ1 = ON MGZ2 = OFF MGZ4 = ON MGZ8 = OFF MGZ16 = ON MGZ32 = OFF Ex3: When no magazine is indexed (=0) MGZ1 = OFF MGZ2 = OFF MGZ4 = OFF MGZ8 = OFF MGZ16 = OFF MGZ32 = OFF
Data protection key	UNLOCK	○	○	○	○	Signal turns ON when the <DATA PROTECTION> key is set to “Disable”.
Spindle run-in operation required to be executed	SPIALM	○	○	○	○	Turns ON when spindle run-in operation is required to be executed.
Automatic door stop detection	DRHOLD	○	○	○	○	Signal turns ON when the automatic door stop is detected. It is OFF for all other situations.
Battery alarm on relocation detection device	RDBTAL	○	○	○	○	The signal turns ON when the battery for the relocation detection device is low.
Door interlock mode switch 1	DIMSW1	○	○	○	○	DIMSW1 — Door interlock mode switch 1 OFF — Machine setup, maintenance ON — Auto. operation
Door interlock mode switch 2	DIMSW2	○	○	○	○	DIMSW2 — Door interlock mode switch 2 OFF — Machine setup ON — Maintenance

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
Door interlock mode status	DIMST1 DIMST2	○	○	○	○	<table><tr><th>DIMST2</th><th>DIMST1</th><th>Door interlock mode status</th></tr><tr><td>OFF</td><td>ON</td><td>Machine setup</td></tr><tr><td>ON</td><td>OFF</td><td>Maintenance</td></tr><tr><td>ON</td><td>ON</td><td>Auto. operation</td></tr></table>
Operation panel enable	PNLEN	○	○	○	○	Turns ON when the **[ENABLE]** switch on the operation panel is being pressed.
Handle enable	PULEN	○	○	○	○	Signal turns ON when the **[ENABLE]** switch on the manual pulse generator is being pressed. • The signal turns OFF when the manual pulse generator is not connected.
Brake load test extension 1 Brake load test extension 2 Brake load test extension 3 Brake load test extension 4 Brake load test extension 5	BTWRN1 BTWRN2 BTWRN3 BTWRN4 BTWRN5	○	○	○	○	Signal urns ON when the timing falls within the range set in the user parameter (switch 1: brake load test) <Time extension for brake load test execution> for the axis where the input signal SR_BKIN*_N (*:1 to 5) is assigned. ON conditions 1. When the execution time set in the user parameter (switch 1: brake load test) <Brake load test start time 1 to 4> applies. OFF conditions 1. Brake load test is executed. 2. Press the **<**Door unlock**>** key on the <Inspection (brake load test)> screen (NOTE) For further details on BTWRN/ BTALM, refer to "1.6.5.4 Brake load test BTWRN, BTALM".
Brake load test pending 1 Brake load test pending 2 Brake load test pending 3 Brake load test pending 4 Brake load test pending 5	BTALM1 BTALM2 BTALM3 BTALM4 BTALM5	○	○	○	○	The axis assigned to the input signal SR_BKIN*_N (*:1~5) shows that the brake load test has not been executed. ON conditions (one of the following conditions) 1. When the user parameter (switch 1: brake load test) <Time extension for brake load test execution> elapses after <Brake load test start time 1 to 4> 2. When the brake load test executed and results in an error OFF conditions 1. Brake load test executed and results in a pass 2. Press the **<**Door unlock**>** key on the <Inspection (brake load test)> screen (NOTE) For further details on BTWRN/ BTALM, refer to "1.6.5.4 Brake load test BTWRN, BTALM".
Brake load test in progress	BTRUN	○	○	○	○	The signal turns ON during the brake load test for the axis where the input signal SR_BKIN*_N (*:1 to 5) is assigned. When the brake load test starts, the signal turns ON, and when the test for all axes ends, the signal turns OFF.
Brake load test - Under load 1 Brake load test - Under load 2 Brake load test - Under load 3 Brake load test - Under load 4 Brake load test - Under load 5	BTLD1 BTLD2 BTLD3 BTLD4 BTLD5	○	○	○	○	The signal turns ON while a load is applied to the brake in the brake load test, on an axis where the input signal SR_BKIN*_N (*:1 to 5) is assigned.
[MASTER ON]	HWMO	○	○	○	○	Indicates the status of operation preparation. OFF: Operation preparation OFF ON: Operation preparation ON Indicates the same status as the LED for the operation preparation switch.
Servo relay 1 contact ON	RYCHK1	○	○	○	○	Indicates the status of the servo relay 1 contact. OFF: Relay contact OFF ON: Relay contact ON

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
X-axis position signal 2	XPSSW2	○	○	○	○	Signal turns ON when the machine coordinates fall within the range (including the boundary value) indicated in user parameter (switch 2: position signal output range) <*-axis position signal output range 2 (-)/(+)> or <*-axis position signal output range 4 (-)/(+)>. (Regardless of the ON/OFF status for the servo) The signal turns OFF when the machine coordinate is outside the range. BY376 determines which parameter will be used.
Y-axis position signal 2	YPSSW2	○	○	○	○	
Z-axis position signal 2	ZPSSW2	○	○	○	○	
4th axis position signal 2	4PSSW2	○	○	○	○	
5th axis position signal 2	5PSSW2	○	○	○	○	
6th axis position signal 2	6PSSW2	○	○	○	○	
7th axis position signal 2	7PSSW2	○	○	○	○	
8h axis position signal 2	8PSSW2	○	○	○	○	
Machining load maximum	TLDHI	○	○	○	○	Turns ON when the machining load monitor function detects the alarm <<Machining load maximum>>. It turns OFF when the alarm is not detected or when the alarm is reset.
Machining load minimum	TLDLO	○	○	○	○	Turns ON when the machining load monitor function detects the alarm <<Machining load minimum>>. It turns OFF when the alarm is not detected or when the alarm is reset.
Machining load monitor ON	TLDON	○		○		Turns ON when the machining load monitor function is currently monitoring the machining load. It turns OFF when the function is not monitoring or when the monitoring has ended.
Left side door closed	LDRCL	○	○	○	○	Indicates that the left side door is closed.
Right side door closed	RDRCL	○	○	○	○	Indicates that the right side door is closed.
Setup chamber left door	SLDRCL	○	○	○	○	Indicates that the setup chamber left door is closed.
Setup chamber right door	SRDRCL	○	○	○	○	Indicates that the setup chamber right door is closed.
Door unlocked 1	DRULD1	○	○	○	○	If the user parameter (switch 1: door) <Door lock method> is set to <0: Automatic lock when door closes>, this signal turns ON when a door is unlocked where the user parameter (switch 1: door) <Door unlock signal setting - *> is set to <1: External input 1> or <3: Both>.
Door unlocked 2	DRULD2	○	○	○	○	If the user parameter (switch 1: door) <Door lock method> is set to <0: Automatic lock when door closes>, this signal turns ON when a door is unlocked where the user parameter (switch 1: door) <Door unlock signal setting - *> is set to <2: External input 2> or <3: Both>.
LB brake load test extension 1 LB brake load test extension 2 LB brake load test extension 3	LBBTW1 LBBTW2 LBBTW3	○	○	○	○	This signal turns ON when the time is within the user parameter (switch 1: brake load test) <Time extension for brake load test execution>. ON conditions 1. When the execution time set in the user parameter (switch 1: brake load test) <Brake load test start time 1 to 4> applies. OFF conditions 1. Execute brake load test 2. Press the <Door unlock> key on the <Inspection (brake load test)> screen (NOTE) For further details on BTWRN/ BTALM, refer to "1.6.5.4 Brake load test BTWRN/ BTALM".

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
LB brake load test pending 1 LB brake load test pending 2 LB brake load test pending 3	LBBTA1 LBBTA2 LBBTA3	○	○	○	○	Display the J*-axis (*: 1, 2 or 3) in the loading system where the brake load test is not executed. ON conditions (one of the following conditions) 1. When the user parameter (switch 1: brake load test) <Time extension for brake load test execution> elapses after <Brake load test start time 1 to 4> 2. When the brake load test executed and results in an error OFF conditions 1. When the brake load test executed and the result is normal 2. Press the <Door unlock> key on the <Inspection (brake load test)> screen (NOTE) For further details on BTWRN/ BTALM, refer to "1.6.5.4 Brake load test BTWRN/ BTALM".
LB brake load test - Under load 1 LB brake load test - Under load 2 LB brake load test - Under load 3	LBBTL1 LBBTL2 LBBTL3	○	○	○	○	This signal turns ON while a load is applied to the brake on the J*-axis (*: 1, 2 or 3) in the loading system for the brake load test.
PLC output Y000 : PLC output Y7FF	PLCY000 : PLCY7FF	○	○	○	○	The values for PLC output Y000 to Y7FF signals are output. (NOTE) Even when the user parameter (switch 1: programming) <Multiple M codes in one block> is set to <1: Yes>, the PLC output can only issue 1 command per block. It cannot be specified together with M function signal output.
Reservation	RESERV					Preset at shipment in order to avoid overlapping setting. (This signal is not treated as a signal but treated as no setting. When this signal is set, avoid using the relevant terminal of the terminal block set.)

1. NC only

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
1st reference point return complete 2nd reference point return complete 3rd reference point return complete 4th reference point return complete 5th reference point return complete 6th reference point return complete	REFIN REFIN2 REFIN3 REFIN4 REFIN5 REFIN6		○	○		These signals turn ON when all the X, Y, Z, 4th, 5th, 6th, 7th, and 8th axes have returned to the 1st to 6th reference points by the execution of G30 command in MDI or memory operation or by external signals (EXREF, EXREF2 to EXREF6). Conditions for OFF: 1. When any one of X, Y, Z, 4th, 5th, 6th, 7th, and 8th axes is moved from the 1st to 6th reference points, or 2. When a stop level 5 alarm is triggered (However, when the user parameter (reference point/conversation language zero point) <Reference point return complete signal output at servo off> is set to <1: Yes> and the distance from the reference point is within the range that is set in the parameter <Reference point allowable range at servo off>, then the signal stays ON even when the servo is OFF.) (NOTE 1) The signal does not turn on when all axes return to their reference position in manual mode. (NOTE 2) When the turning spindle is currently selected, these signals turn ON when all the axes excluding the turning spindle have returned to the 1st to 6th reference points.
Turning spindle is rotating	LSTURN	○	○	○	○	There is a turning spindle and turns ON when turning spindle is rotating. It turns OFF when the turning spindle stops.
Select turning spindle	LSSLCT	○	○	○	○	Turn ON when there is a turning spindle and the turning spindle is selected.
Macro variables #1100 : #1131 Macro variables #1300 : #1395	 #1100 : #1131 #1300 : #1395		○	○		These signals output the values for macro variables #1100 to #1131 and #1300 to #1395. “OFF” is output when set to “0” while “ON” is output when set to “1.”

2. Conversation only

Signal name	Symbol	Output controlled modes				Function
		Manual	MDI	Memory	Edit*1	
2nd zero return complete 3rd zero return complete	ORGFN2 ORGFN3		○	○		This signal is output when 2nd or 3rd zero point return is completed as specified by a program command or external signal. OFF 1. Any one of the axes is not at the 2nd or 3rd zero point. 2. The servo controller turns off due to an emergency stop or similar. (NOTE) The signal is not output when the axis moves after it has been positioned to the 2nd or 3rd zero point in manual mode or after the axis has been positioned to the 2nd or 3rd zero point by a positioning command. The signal is not output when the relevant axis has been positioned at or passed through the 2nd or 3rd zero point by a positioning command. In addition, when the user parameter (reference point/conversation language zero point) <Zero point return complete signal output at servo off> is set to <1: Yes> while the servo is OFF and when it is within the range that is set in the parameter <Zero point allowable range at servo off>, then the signal stays ON.

1.6.5.2 Detailed Description of External Output Signals

M function signal output

Usage of the M function output signals and precautions are described below.

1. How to Use

2-digit number in BCD code is sent to a peripheral by specifying any of signal output 01 to 99 in MDI or memory operation mode.

This signal is output, and the signal MF is output after the <M function signal output delay time> set in the user parameter (switch 1: programming) has elapsed. Read the M function signal output indicated by this signal MF.

Once the peripheral equipment operation finishes (based on the M function signal output), wait at least 20 ms before inputting the M function end signal MFIN.

Signal input in program	High-order digits					Low-order digits			
	Signal name					Signal name			
	M900	M28	M24	M22	M21	M18	M14	M12	M11
Signal output 01	×	×	×	×	×	×	×	×	○
Signal output 02	×	×	×	×	×	×	×	○	×
Signal output 03	×	×	×	×	×	×	×	○	○
Signal output 04	×	×	×	×	×	×	○	×	×
Signal output 05	×	×	×	×	×	×	○	×	○
Signal output 06	×	×	×	×	×	×	○	○	×
Signal output 07	×	×	×	×	×	×	○	○	○
Signal output 08	×	×	×	×	×	○	×	×	×
Signal output 09	×	×	×	×	×	○	×	×	○
Signal output 10	×	×	×	×	○	×	×	×	×
Signal output 11	×	×	×	×	○	×	×	×	○
• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
Signal output 99	×	○	×	×	○	○	×	×	○
Signal output 901	○	×	×	×	×	×	×	×	○
• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
Signal output 909	○	×	×	×	×	○	×	×	○
Signal output 910	○	×	×	×	○	×	×	×	×
Signal output 911	○	×	×	×	○	×	×	×	○
• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
Signal output 999	○	○	×	×	○	○	×	×	○

○: ON ×: OFF

M function signals M00 to M99 and M901 to M999 can be created by the combination of high-order digits and low-order digits.

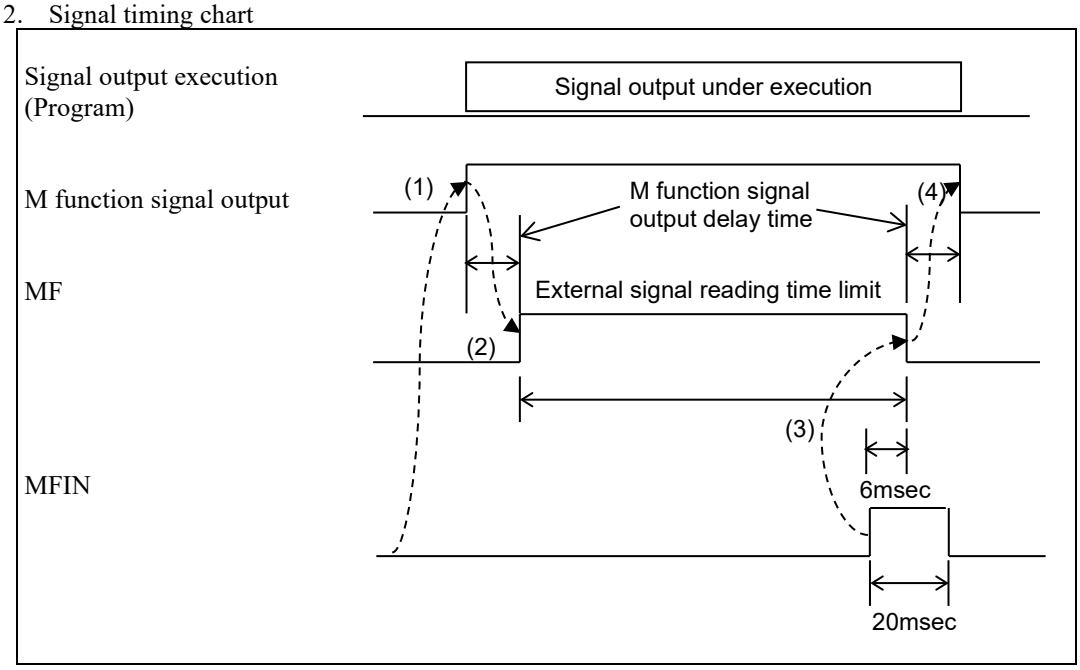
However, the following codes are for internal use and are not output externally.

Conversation: M00, M01, M02, M03, M04, M05, M06, M08, M09, M19, M30

NC language: M00, M01, M02, M03, M04, M05, M06, M08, M09, M19, M30, M96, M97, M98, M99

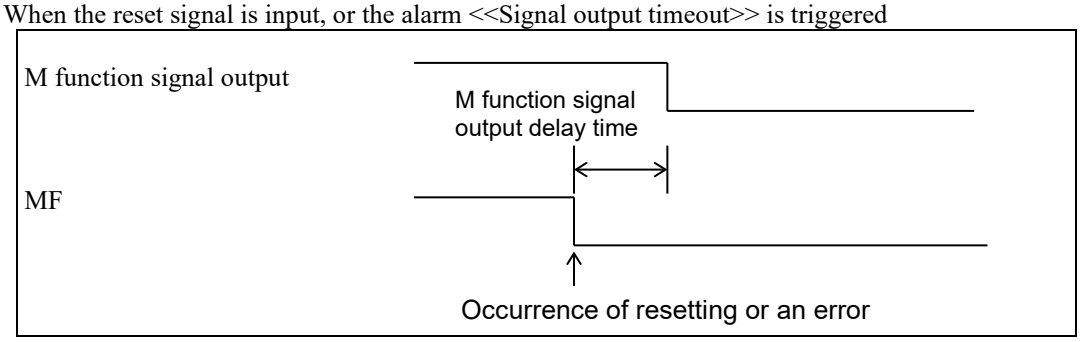
(NOTE) Even when the user parameter (switch 1: programming) <Multiple M codes in one block> is set to <1: Yes>, the M function signal output can only issue 1 command per block. It cannot be specified together with PLC output.

2. Signal timing chart



(1) The M function signal is output.
During this time, if the MFIN is input, the M function signal is output after the MFIN input stops.
(2) The MF is output after the delay time has elapsed for the M function signal output.
(3) If the MFIN signal is input within the setting specified per the <External signal reading time limit> in the user parameter (switch 1: programming), then the MF output stops.
(4) The M function signal output stops after the delay time has elapsed for the M function signal output.

When the reset signal is input, or the alarm <<Signal output timeout>> is triggered



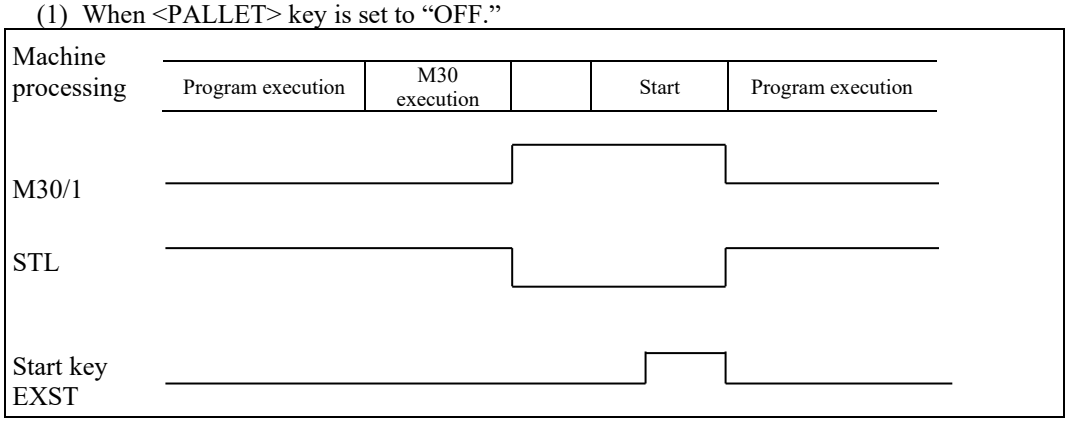
The MF output stops if the reset signal is input, or if the signal output timeout is triggered. The M function signal output stops after the delay time has elapsed for the M function signal output.

<u>Program end, M30/1,M30/2</u>
For the machine not equipped with QT, the program end is treated as the same as the <PALLET> key set to "OFF."

1. When <Program repeat> is set to <0: Stop>

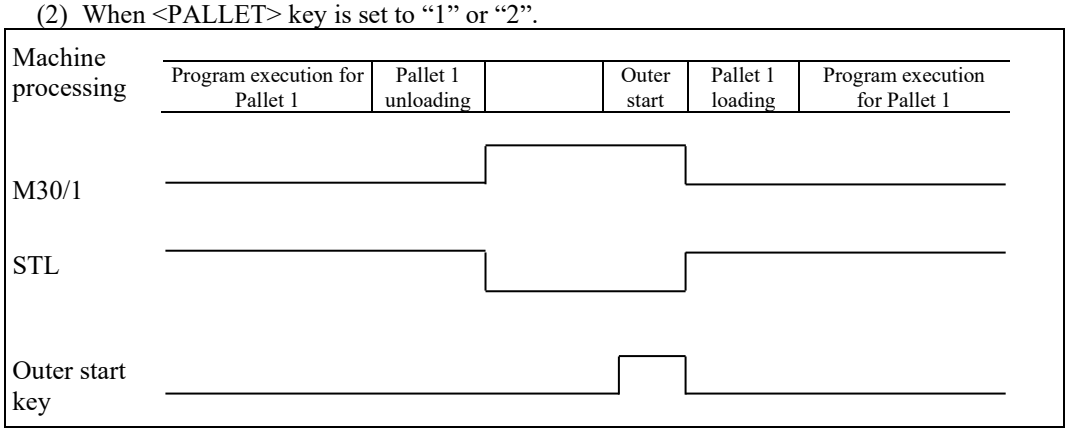
PALLET key	Off	1 or 2	1⇔2
Condition for ON	M30/1 goes on irrespective of the used pallet when you execute the program end.	M30/1 or M30/2 goes on when you execute the program end and take out the pallet.	M30/1 or M30/2 goes on when you execute the program end.
OFF	1. When you input the reset signal. 2. When a start input is accepted.	1. When you input the reset signal. 2. When an outside start input is accepted.	

(1) When <PALLET> key is set to “OFF.”

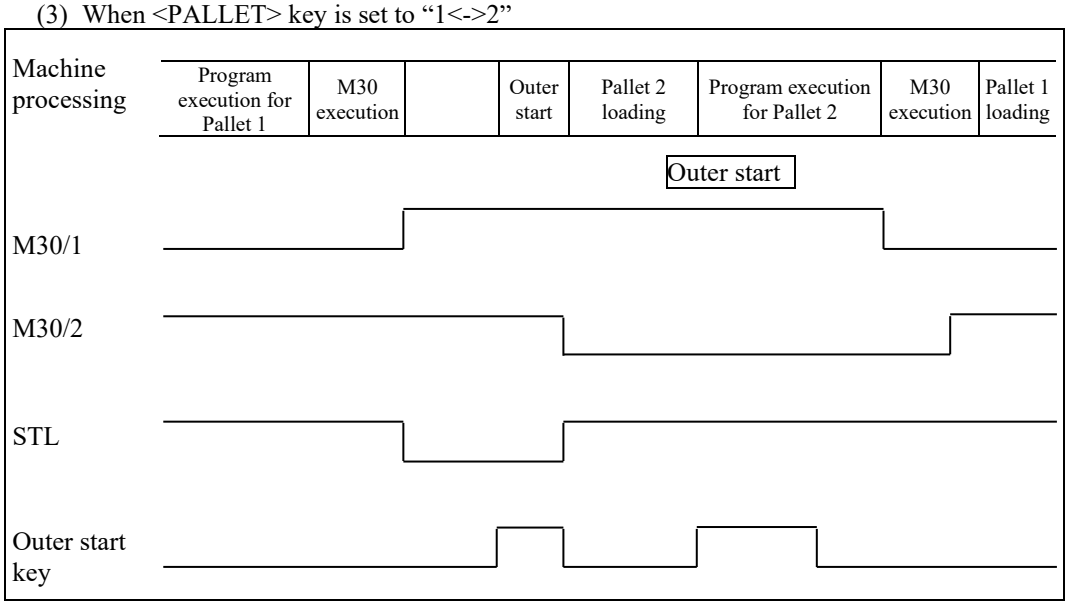


(NOTE) When EXST signal is input from an external unit, check that M30 signal is ON and STL signal OFF.

(2) When <PALLET> key is set to “1” or “2”.

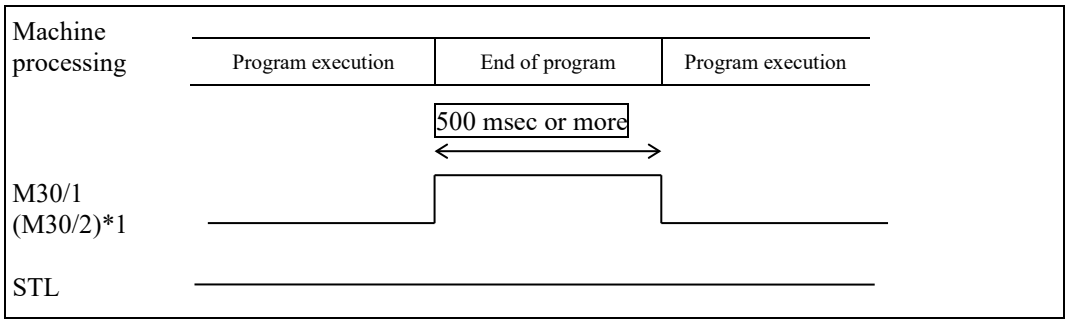


(3) When <PALLET> key is set to “1<->2”



2. When the machine is started by Start signal with the <Program repeat> set to <1: Repeat>
   When the <PALLET> key is set to other than “OFF,” the program for the pallet at the inner position at the start of the machine is repeated.
   When the <PALLET> key is set to “OFF,” the program displayed on the screen is repeated.

   Condition for ON When the end of program is executed during memory operation
   Condition for OFF 1. When the machine is restarted upon completion of the program end processing
   2. When the reset signal is input

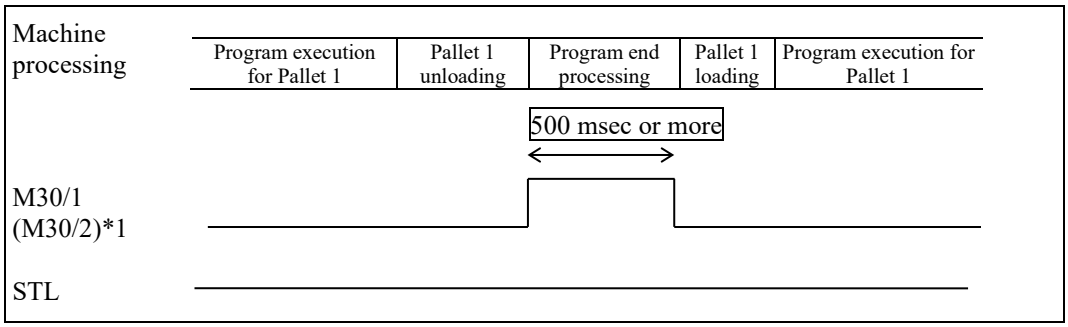


*1 M30/2 turns ON when the <PALLET> key is set to “1<->2” or “2” and the machine is started with the Pallet 2 at the inner position.

(NOTE 1) The signal undergoes no change in case an alarm occurs.
(NOTE 2) The automatic door (optional) works only one time at start. Thereafter it will not work.
(NOTE 3) STL does not turn off even during M30/1 or M30/2 output.

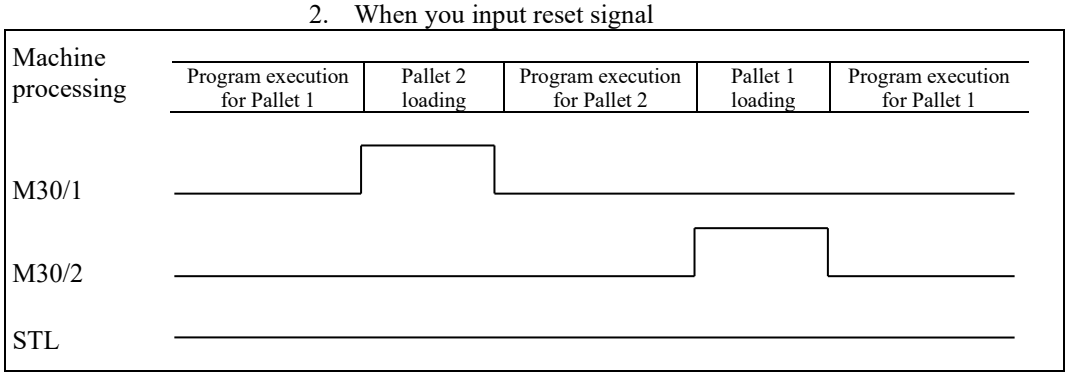
3. When the machine is started by PALLET STARTing with the <Program repeat> set to <1: Repeat>
   (1) When the <PALLET> key is “OFF,” the machine does not operate by PALLET START. When the PALLET START is turned ON, an alarm <<The pallet selection key is OFF>> is generated.

   (2) When <PALLET> key is set to “1” or “2”.
   Condition for ON… When the program end is executed and the pallet unloading has completed during memory operation
   Condition for OFF…1. When the program end processing has completed and the operation is restarted
   2. When you input the reset signal.



(NOTE 1) These signals do not change at the generation of an alarm.
(NOTE 2) The optional automatic door operates just once at start-up and does not operate after that.
(NOTE 3) The STL signal does not turn OFF during output of M30/1 or M30/2.

(3) When the <PALLET> key h is set to “1<->2”
Condition for ON… When the program end is executed during memory operation
Condition for OFF…1. When the pallet on the other side is loaded and the program execution is started
2. When you input reset signal

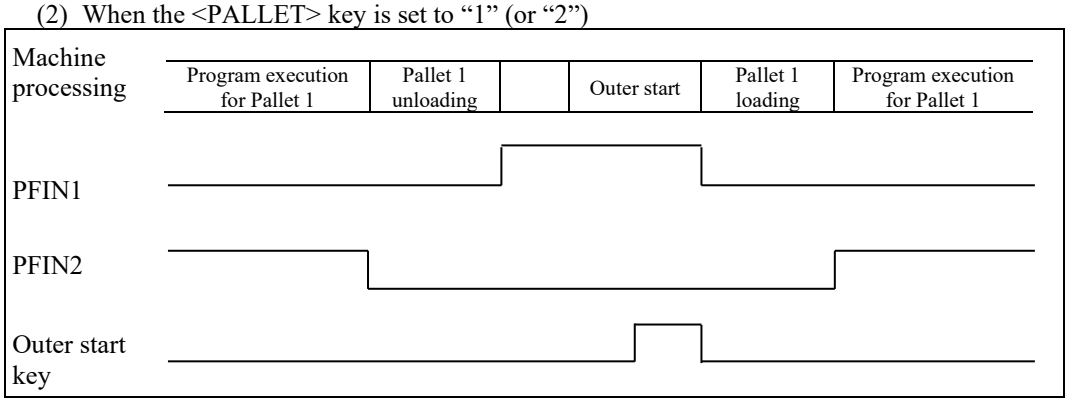


(NOTE 1) These signals do not change at the generation of an alarm.
(NOTE 2) The optional automatic door operates just once at start-up and does not operate after that.
(NOTE 3) The STL signal does not turn OFF during output of M30/1 or M30/2.

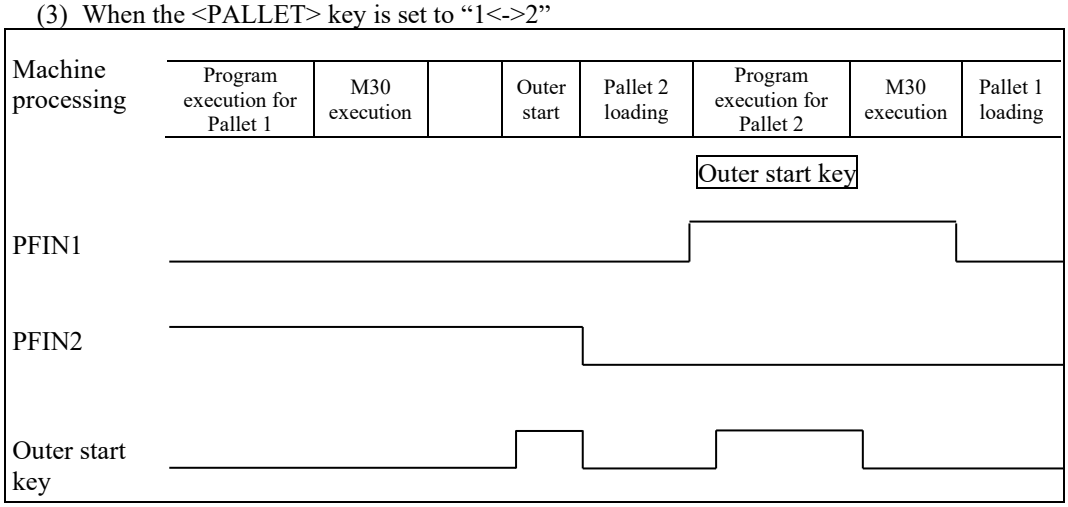
1.6.5.3 Pallet Indexing Complete PFIN1, PFIN2

These signals turn OFF when the pallet has moved from the indexed position and turn OFF when it has returned to the indexed position.
At program end or reset, or when an alarm is generated, they remain ON.

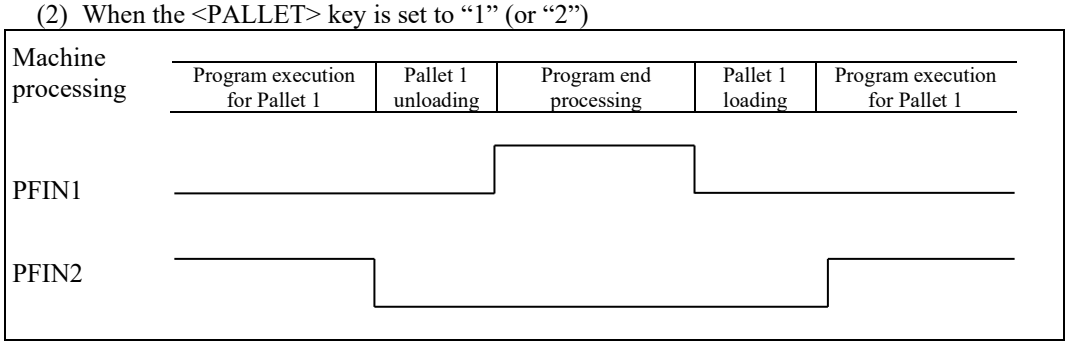
1. When <Program repeat> is set to <0: Stop>
   (1) When the <PALLET> key is “OFF,” the PFIN1/PFIN2 signal for the pallet at the outer position always turns ON.
   (2) When the <PALLET> key is set to “1” (or “2”)



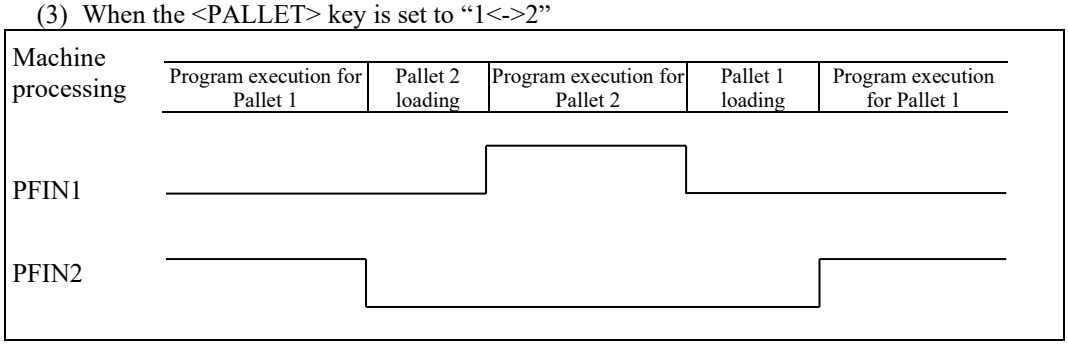
(3) When the <PALLET> key is set to “1<->2”



2. When the machine is started by Start signal with the <Program repeat> set to <1: Repeat>
   The PFIN1/PFIN2 signal for the pallet at the outer position at start-up always turns ON.
3. When the machine has been started by PALLET START with the <Program repeat> set to <1: Repeat>
   (1) When the <PALLET> key is "OFF," the machine does not operate by PALLET START. When the PALLET START is turned ON, an alarm <<The pallet selection key is OFF>> is generated.
   (2) When the <PALLET> key is set to "1" (or "2")



   (3) When the <PALLET> key is set to "1<->2"



1.6.5.4 Brake load test BTWRN, BTALM

The brake load test status can be confirmed by using BTWRN and BTALM.
When the machine is linked with the loading system, the LBBTW and LBBTA combination can be used to confirm the brake load test status in the loading system.

BTWRN (LBBTW)	BTALM (LBBTA)	Status of brake load test
OFF	OFF	When there is a test notification and there is no error in the brake load test. Or, when the door is unlocked after the <Door unlock> key is pressed on the <Inspection (brake load test)> screen.
OFF	ON	When there is no error in the brake load test.
ON	OFF	When the execution time set in the user parameter (switch 1: brake load test) <Brake load test start time 1 to 4> is reached.
ON	ON	When the user parameter (switch 1: brake load test) <Time extension for brake load test execution> has elapsed, starting from the time in the user parameter (switch 1: brake load test) <Brake load test start time 1 to 4>.

1.7 Communication Parameter

1.7.1 Outline

Set parameters for external input/output communication. Make setting in accordance with the connected device.
Communication parameters are divided into the following categories.

Category name	Description
<Serial port>	Sets the communication parameters for serial port.
<Ethernet/FTP>	Sets the communication parameters for Ethernet and FTP.
<Memory card>	Sets the communication parameters for memory card.
<Auto notification function>	Set the parameter for the auto notification function.
<Security>	Set the communication parameter for security.

1.7.1.1 Communication parameter edit screen

When the <Communication parameter> is selected from the <Data bank menu> screen, the communication parameter edit screen (screen that was previously used and displayed (serial port, Ethernet/FTP or memory card))) is displayed.

Ex: Serial port screen

Description of screen display

Position	Name	Description
1	Communication parameter list	Displays each communication parameter and the corresponding value. Refer to the information provided from section “1.7.2 Common” to “1.7.6 Auto notification function” for further details about each item.
2	Data input field/ Instructions area	Displays the data input field for changing the settings in the communication parameters.

Description of screen operation

1. Description of function key operations

Column	Position	Label	Description
1	(1)	<Completion mode>	Ends and exits editing. Refer to "1.1 Data bank overview" for details on how to exit editing mode. (NOTE) When communication is in progress, a reset may be requested when exiting editing depending on the item(s) that was changed.In this situation, press the **[RST]** key after the communication has finished in order to reflect the parameter change.
	(2)	<Serial port>	Displays the <Serial port> screen.
	(3)	<Ethernet/FTP>	Displays the <Ethernet/FTP> screen.
	(4)	<Memory card>	Displays the <Memory card> screen.
	(5)	<Auto notification function>	Displays the <Auto notification function> screen.
	(6)	<Security>	Displays the <Security> screen.
	(7)		
	(8)		

2. Description of edit operations for communication parameters
   - When the user taps to select and edit a communication parameter, the data input field and instructions area are displayed. Or, the cursor keys (up/down) can be used to select a communication parameter. Editing is enabled even if the **[ENT]** key is pressed, and the data input field and instructions area are displayed.
   - When a given value is entered and the **[ENT]** key is pressed, the selected parameter value is changed, and then the cursor moves to the next item.
   - If an item that can be deleted is selected, then the message <Can be deleted> will appear in the data input field and instructions area. At this time, press the **[DEL]** key to delete the parameter value that was selected.

1.7.2 Common

No.	Items	Setting range	Description
0001	Reset (slave station)	0: Invalid 1: Valid	Set whether to terminate communication by the **[RST]** key when the machine is in slave communication mode. When <0:Invalid> is set, communication is not terminated even if the **[RST]** key is pressed.
0002	Data overwriting (slave station)	0: No 1: Yes	Set whether to overwrite the same program or data existing in the machine when the machine is in slave communication mode (input). When <0:No> is set, the data is not overwritten.
0003	Remote operation	0: Invalid 1: Valid	Set whether to enable or disable the remote operation via communication, such as zero return, memory operation start and stop.
0004	Slave station command alarm display	0: No 1: Yes	When <1: Yes> is set, notification alarm is generated when slave station communication has completed.
0005	Method for batch program input	0: Type1 1: Type 2	Designate the method for program division when performing batch input of NC program. type 1: When a program end code (M30, M02, M99) is found out, the part from the top to the block is input as a program. type2: When a program number (O****) is found out, the part from the top to the previous block is input as a program.
0006	File name added as comment	0: No 1: Yes	When <1: Yes> is set, original file name is added to the first block as a comment line if NC program other than that output from the machine (*NC) is input.

No.	Items	Setting range	Description
0007	Comment input extension	0: No 1: Yes	When <1: Yes> is set, characters which are unavailable to the key operation of the machine can be used when inputting comments of program or character string of data bank. Refer to “3.5 Communication protocol” in Operation Manual II for further details.
0008	External output - Output destination (NC language only)	0: Master stat. output destination 1: Memory card 2: FTP(S) server 3: General COMM device	Specify the output destination for the macro (external output function). When set to <3: General COMM device>, the slave station communication (operation from external device to NC) that uses a serial port can no longer be used.

1.7.3 Serial Port

No.	Items	Setting range	Description
0101	Connected device	10 of one-byte characters	Input name of the communication device connected to the serial port.
0102	NC-exclusive communication device communication protocol (master station)	0: Type 1 1: Type 2	Select protocol used for communication. Choose which protocol do you use from the one compatible with the conventional machine or expanded one available for remote control.
0103	Baud rate	0:300 1:600 2:1200 3:2400 4:4800 5:9600 6:19200 7:38400 8:57600	Set the baud rate for data transmission.
0104	Parity	0: None 1: Odd 2: Even	Set the type of parity bit to be added to one-character data.
0105	Stop bit	0: 1 bits 1: 2 bits 0: 1 bits 1: 2 bits	Set the distance, which discriminates the end of one-character data.
0106	Character length	0: 7 bits 1: 8 bits	Set the length of one-character data.
0107	Communication mode	0: Line 1: Code 1 2: Code 2	Select communication type among the followings. 0: Line (Control line system) Communication is controlled by using RS and CS. 1: Code 1 (Control code system 1) Communication is performed by control code system on the master station and controle line system on the slave station. 2: Code 2 (Control code system 2) Communication is performed by control code system on both master and slave stations. Communication is controlled by using DC1 and DC3 codes. The head and end of data are suffixed with DC2 and DC4, respectively.
0108	Response monitoring time	0 to 999 sec	Allowable time interval between the receipt of the one character and the next one. Also allowable time between the sending of one character and the next one. Setting to “0” results in infinite standby state.
0109	Invalid data (For NC language only)	0: Conv 1: Error 2: Ignor	Designate how to process data not supported by NC if it has been read. When <0: Conversion> is set, such data is converted into “?” and the program is displayed as “?” on the edit screen.

No.	Items	Setting range	Description
0110	Sending data code (For NC language only)	0:ISO 1:EIA 2:ASCII	Set the transfer code when transferring the data to the receiving station.
0111	End of block (For NC language only)	0:CR,LF 1:LF	Set the code for the end of one block (EOB). (When “Send data code” is set to <0: ISO code>)
0112	TV check	0: None 1: Odd 2: Even	Set whether to perform a one block parity check.
0113	Output dot character	0: No 1: Yes	Designate whether or not to type out ornate initials during output when connection destination is a general communication device.
0114	Reset recovery time	0 to 99 sec	Turns ER and RS signals of machine OFF for the period of time set here, when any of the following conditions occurs: - When **[RST]** key is pressed during main station communication; - When **[RST]** key is pressed during machine slave station communication, when “Reset (slave station)” is set to “1: Valid”; - When an error occurs when communication has not been normally ended; or - When the operation has shifted to maintenance menu during machine slave station communication.
0115	Checksum	0: Invalid 1: Valid	Set whether or not to detect errors using the checksum in the communication of NC communication device protocol type 2.
0116	EIA character code (#) (For NC language only)	0~255	Set the EIA character code for character ‘#.’ Set a code that is not identical to the existing EIA code.
0117	EIA character code (*) (For NC language only)	0~255	Set the EIA character code for character ‘*.’ Set a code that is not identical to the existing EIA code.
0118	EIA character code (=) (For NC language only)	0~255	Set the EIA character code fr character ‘=.’ Set a code that is not identical to the existing EIA code.
0119	EIA character code ([) (For NC language only)	0~255	Set the EIA character code for '['character. Set a code that is not identical to the existing EIA code.
0120	EIA character code (]) (For NC language only)	0~255	Set the EIA character code for ']'character. Set a code that is not identical to the existing EIA code.
0121	Check DR signal	0: No 1: Yes	When <1: Yes> is set, DR signal is checked during communication. Communication is unavailable when DR signal is OFF. When <0: No> is set, check is not performed.
0122	Communication end DC3 code	0: None 1: Yes	When <1: Yes> is set, waits for transmission or reception of DC3 code at the end of communication in communication methods of codes 1 and 2. (When receiving data) On receiving all the external data, DC3 code is transmitted to external device. (When transmitting data) On transmitting all the data to external device, the system is ready to receive DC3 code. The communication terminates upon receiving DC3 code. When <0: None> is set, this communication end DC3 code is not available.

No.	Items	Setting range	Description
0123 ~ 0126	DC1 code DC2 code DC3 code DC4 code	0~255	Set control codes in communication methods of codes 1 and 2. Make setting by using decimal numbers. DC1: 17=11H (hexadecimal) DC2:18＝12H DC3:147＝93H DC4:20＝14H (Meaning of the DC code) DC1:Start of communication or restart of the communication interrupted by DC3. DC2:Indication of the head of the data. DC3:Temporary interruption of the communication in case of buffer overflow for example. DC4:Indication of the end of the data.
0127	Leading zero suppression (DPRNT) (For NC language only)	0: Type 1 1: Type 2	Set the output method for high-order zero at the time of macro variable output under DPRNT command. Type 1: Outputs space Type 2: Nothing is output

1.7.4 Ethernet/FTP

When the network function is used, please consult with your network manager. In addition, be careful when configuring the IP address and other settings and be sure to test and check the communication settings. If the IP address or other settings are configured incorrectly, the communication failure or error can impact the entire network and cause a malfunction in other equipment. Therefore, take extra care when configuring the settings.

No.	Items	Setting range	Description
0201	Host name	15 of one-byte characters	Set a name for identifying the machine on the network. Usable characters are ‘A’ to ‘Z’ and ‘0’ to ‘9’. Character string consisting only of numeric characters is unavailable. Character string headed or ended with ‘-’ is also unavailable.
0202	Use DHCP	0: No 1: Yes	Set whether or not to use DHCP. When “1: Yes” is set, IP address is automatically acquired from DHCP server.
0203	IP address	0.0.0.0~ 255.255.255.255	Set IP address to be assigned to the machine. When <Use DHCP> is set to <1: Yes>, it becomes invalid (set automatically). Enter the address in 12 figures without using “.” (period). Ex: To set “10.172.83.1”, enter “010172083001”. (NOTE) “0.0.0.0”, “127.*.*.*” and “255.*.*.*” cannot be set.
0204	Mask bit	top 2 bit (192.0.0.0)~ top 30 bit (255.255.255.252)	Set the subnet mask of the network the machine belongs to. When <Use DHCP> is set to <1: Yes>, it becomes invalid (set automatically). Enter the address in 12 figures without using “.” (period). Ex: To set “255.255.0.0”, enter “255255000000”.
0205	Default gateway	0.0.0.0~ 255.255.255.255	Set the IP address of the default gateway of network to which the machine belongs. When 0 is set, there is no default gate way. When <Use DHCP> is set to <1: Yes>, it becomes invalid (set automatically). Enter the address in 12 figures without using “.” (period). Ex: To enter “10.172.83.1”, enter “010172083001”. (NOTE) “0.0.0.0”, “127.*.*.*” and “255.*.*.*” cannot be set.

No.	Items	Setting range	Description
0206	Automatic acquisition of DNS server address	0: No 1: Yes	Automatically acquires an address of DNS server. When <1: Yes> is set, address of DNS server is acquired from DHCP server. When <Use DHCP> is set to <0:No>, this parameter is disabled (<DNS server address 1>/ <DNS server address 2> is used).
0207	DNS server address 1	0.0.0.0~ 255.255.255.255	Set the address of first DNS server. When <Automatic acquisition of DNS server address> is set to <1: Yes>, it becomes invalid. Enter the address in 12 figures without using "." (period). Ex: To set "10.172.83.1", enter "010172083001". (NOTE) "0.0.0.0", "127.*.*.*" and "255.*.*.*" cannot be set.
0208	DNS server address 2	0.0.0.0~ 255.255.255.255	Set the address of second DNS server. When <Automatic acquisition of DNS server address> is set to <1: Yes>, it becomes invalid. Enter the address in 12 figures without using "." (period). Ex: To set "10.172.83.1", enter "010172083001". (NOTE) "0.0.0.0", "127.*.*.*" and "255.*.*.*" cannot be set.
0209	Port number	0 10000~65535	Set a port number to be used for slave station communication by communication protocol type 2 of NC-dedicated communication device. When set <0>, the communication protocol type 2 function for the NC communication device is disabled.
0210	PLC port No.	20000~29999	Set a port number to be used when communicating PLC data in slave station communication based on PLC PROGRAMMING SOFTWARE.
0211	FTP(S) server name (IP address)	255 of one-byte characters	Set the host name or IP address of FTP(S) server to be connected with the machne (FTP(S) client) when connection destination is the FTP(S) server. To designate IP address, enter the address in 12 figures without using "." (period). Ex: To set "10.172.83.1", enter "010172083001". (NOTE) "0.0.0.0", "127.*.*.*" and "255.*.*.*" cannot be set. When specifying using the host name, it takes time for the name to be set.
0212	FTP(S) server port number	0~65535	Set a port number of an FTP(S) server to be connected with the machine (FTP(S) client) when the connection destination is the FTP(S) server.
0213	User name as client	20 of one-byte characters	Set a user name for connecting the machine (FTP(S) client) with an FTP(S) server when connection destinatio is the FTP(S) server. Valid characters include: letters, numbers and symbols (excluding spaces). This parameter is converted to a character string that cannot be read as a file.
0214	Password as client	20 of one-byte characters	Set a password for connecting the machine (FTP(S) client) with an FTP(S) server when connection destinatio is the FTP(S) server. Valid characters include: letters, numbers and symbols (excluding spaces). The password having been set is displayed as "*". This parameter is converted to a character string that cannot be read as a file.

No.	Items	Setting range	Description
0215	Use passive mode	0: No 1: Yes	Set whether or not to use passive mode for data transfer when connection destination is an FTP(S) server. When “0: No” is set, data transfer is performed in active mode.
0216	Restrict Ethernet access	0: No 1: Yes	Set whether to restrict access to use the Ethernet function or not. <0: No>: - The access to this machine using communication protocol type 2 for the NC communication device does not need to be lifted temporarily. - Access to this machine using HTTP(S) is not restricted. - Access to this machine using FTP(S) is not restricted. - Access to this machine using OPC UA is not restricted. <1: Yes>: - The access is restricted to this machine using communication protocol type 2 for the NC communication device. The restriction must be lifted temporarily to access the Ethernet. - Access to this machine using HTTP(S) is restricted. The user must log in using the <Server user name> and <Password as server> to access this machine. - Access to this machine using FTP(S) is restricted. The user must log in using the <Server user name> and <Password as server> to access this machine. - Access to this machine using OPC UA is restricted. The user must log in using the <Server user name> and <Password as server> to access this machine.
0217	Access timeout period	0~999 sec.	Set a time period to temporarily lift the access restriction to this machine using communication protocol type 2 for an NC communication device when the <Restrict Ethernet access> is set to <1: Yes>. When this is set to <0>, the access restriction is lifted temporarily until the connection is released. When this is not set, it functions in the same way as when it is set to <0>. - Set the login time period allowed when accessing this machine using HTTP(S). When set to <0>, the login status will continue until the browser is closed. When this is not set, it functions in the same way as when it is set to <0>.

No.	Items	Setting range	Description
0218	Server user name	20 of one-byte characters	Set a user name that allows the machine to make an FTP(S), HTTP(S) or OPC UA server connection and allows the user name to access this machine using communication protocol type 2 for the NC communication device. Valid characters include: letters, numbers and symbols (excluding spaces). This parameter is converted to a character string that cannot be read as a file. When not set: - When <Restrict Ethernet access> is set to <1: Yes>, the restriction cannot be lifted temporarily to give access using the communication protocol type 2 for an NC communication device. - Connecting from an HTTP(S) client is not allowed when <Restrict Ethernet access> is set to <1: Yes>. - Connecting from an FTP(S) client is not allowed. - Connecting from an OPC UA client is not allowed when <Restrict Ethernet access> is set to <1: Yes>.
0219	Password as server	20 of one-byte characters	Set a password that allows the machine to make an FTP(S), HTTP(S) or OPC UA server connection and allows the password to access this machine using communication protocol type 2 for the NC communication device. Valid characters include: letters, numbers and symbols (excluding spaces). At least two of the following character types must be used: letters, numbers or symbols.The password having been set is displayed as "*". This parameter is converted to a character string that cannot be read as a file. When <Restrict Ethernet access> is set to <0: No> and the <Password as server> is not set, there is no <Server user name> and login is possible only with the username from the FTP(S) client and from the OPC UA client. When <Restrict Ethernet access> is set to <1: Yes>, set a password with 8 or more characters for <Password as server>. When a password with 7 characters or less is set and there is a connection from the FTP(S) client and OPC UA client, the restriction cannot be lifted to give access to this machine using communication protocol type 2 for the NC communication device.
0220	FTP time zone	-12:00~12:00	If the world standard time (GMT) is used for time information in FTP and OPC UA, then enter the difference between the current date and time of the machine and GMT.
0221	Response monitoring time	0~999 sec.	Set allowable time interval between the receipt of one character and that of the next one or between the sending of one character and that of the next one. Furtther, connection is cut off when no command has been sent from a client during the period of time set here when the machine serves as the FTP(S) server. When "0" is set, it becomes infinite standby state.
0222	Invalid data (For NC language only)	0: Conv 1: Error 2: Ignor	Designate how to process data not supported by NC if such data has been read. When <0: Conversion> is set, such data is converted into "?" and the program is displayed as "?" on the edit screen.

No.	Items	Setting range	Description
0223	End of block (For NC language only)	0:CR,LF 1:LF	Set the code for the end of one block (EOB).
0224	TV check (For NC language only)	0: None 1: Odd 2: Even	Set whether to perform a one block parity check. It does not apply to the FTP.
0225	Checksum	0: Invalid 1: Valid	Set whether or not to detect errors using the checksum in the communication by communication protocol type 2 of NC-dedicated communication device.
0226	Header/footer (For NC language only)	0: None 1: Yes	Designate how to treat header and footer when connection destination is FTP(S) server. None: At the time of output, header and footer are not added. At the time of input, data are inputted as they are without checking header and footer. Yes: At the time of output, header and footer are added. At the time of input, header and footer are checked and deleted.
0227	FTP response file size	0: Type 1 1: Type 2	Specified the file size that responds to the LIST and SIZE commands when this machine is used as an FTP(S) server. Type 1: Outputs the larger size, taking into account the conversion of the “End of block” code during output, etc. Type 2: Outputs the NC internal file size. This type is appropriate for communication within the NC.
0228	Leading zero suppression (DPRNT) (NC language only)	0: Type 1 1: Type 2	Set the output method for high-order zeros when macro variables are output via DPRNT commands. Type 1: Outputs spaces. Type 2: Nothing is output.
0229	External output - FTP output destination	255 one-byte characters	Specify the output directory on the FTP(S) server for the macro (external output function). The following characters can be used as a folder delimiter: “A” to “Z”, “0” to “9”, parentheses “(” and “)”, a hyphen “-” as well as the forward slash “/”.
0230	External output - FTP output name	32 one-byte characters	Specify the character string for the output file name on the FTP(S) server for the macro (external output function). The following characters can be used: “A” to “Z”, “0” to “9”, parentheses “(” and “)” and a hyphen “-”.
0231	HTTP server function	0: Disable 1: Enable	Enable/disable the slave station communication using HTTP.
0232	HTTPS server function	0: Disable 1: Enable	Enable/disable the slave station communication using HTTPS.
0233	FTP server function	0: Disable 1: Enable	Enable/disable the slave station communication using FTP.
0234	FTPS server function	0: Disable 1: Enable	Enable/disable the slave station communication using FTPS.
0235	OPC UA server function	0: Disable 1: Enable	Enable/disable the slave station communication using OPC UA.

No.	Items	Setting range	Description
0236	Security communication for client	0: Disable 1: Type 1 2: Type 2	Set whether or not this machine (FTP client) uses security protocol in the communication when connected to an FTP server. When set to <Type 1>, the machine operates as an FTPS client and uses Explicit mode for security protocol communication. When set to <Type 2>, the machine operates as an FTPS client and uses Implicit mode for security protocol communication. When set to <Disable>, the machine operates as an FTP client and does not use security protocol in the communication.
0237	OPC UA security communication	0: None 1:Basic128Rsa15 2:Basic256	Set the security for the slave station communication when using OPC UA. When set to <None>, communication is carried out without security. When using another setting (not <None>), messages are signed and encrypted in the communication.

1.7.5 Memory Card

No.	Items	Setting range	Description
0301	Invalid data (For NC language only)	0: Conv 1: Error 2: Ignor	Designate how to process data not supported by NC if it has been read. When <0: Conversion> is set, such data is converted into “?” and the program is displayed as “?” on the edit screen.
0302	End of block (For C language only)	0:CR, LF 1:LF	Set the code for the end of one block (EOB).
0303	TV check (For NC language only)	0: None 1: Odd 2: Even	Set whether to perform a one block parity check.
0304	Header/footer (For NC language only)	0: None 1: Yes	Designate how to treat header and footer when connection destination is FTP server. None: At the time of output, header and footer are not added. At the time of input, data are inputted as they are without checking header and footer. Yes: At the time of output, header and footer are added. At the time of input, header and footer are checked and deleted.
0305	Leading zero suppression (DPRNT) (For NC language only)	0: Type 1 1: Type 2	Set the output method for high-order zero at the time of macro variable output under DPRNT command. Type 1: Outputs space Type 2: Nothing is output

1.7.6 Auto notification function

No.	Item name	Setting range	Description
0401	Auto notification function	0: Disable 1: Enable	Enable or disable the auto notification function.
0402	Start operation at power ON	0: No 1: Yes	When set to <0: No>, the auto notification function is activated by issuing a slave command. When set to <1: Yes>, the function is activated when the power is turned ON.

No.	Item name	Setting range	Description
0403	Notification host name (IP address)	255 one-byte characters	Set the host name or IP address for the notification destination. When setting using an IP address, enter the address using a 12 digit number without inserting any periods (.). Ex: When setting the address “10.172.83.1”, enter the address number as follows: “010172083001”. (NOTE) “0.0.0.0”, “127.*.*.*” and “255.*.*.*” cannot be set. When specifying using the host name, it takes time for the name to be set.
0404	Notification port number	10000 to 65535	Set the port number for the notification host.
0405	Retry attempts	0 to 99 times	Set the number retry attempts when a connection with the host has failed.
0406	Retry wait time	0 to 999 sec.	Set the wait time before a retry attempt is made.
0407	Control method	0: Standard 1: Simple	Select the control method for the auto notification function.
0408	Response monitoring time	0 to 999 sec.	After sending an auto notification, the timing that is set here is used to sever the connection when a response from the host is not sent. When set to <0>, it waits forever.
0409	Data register address for storing error code	0 to 8191	Set the address for data register (D) in the PLC where the auto notification function stores the error code. This value is invalid when the <Control method> is set to <1: Simple>.
0410	Alarm display for send error	0: No display 1: Display	Select whether to display or not display an alarm when a send error is triggered for the auto notification.
0411	Method to specify sending data	0: Direct 1: Indirect	Select the method to specify the data, and either specify indirectly using the internal output data (BDY) in the PLC, or specify directly in the parameters for <Type of sending data>, <Leading address for sending data> and <Sending data length> in the auto notification.
0412	Stop level for error when sending data is specified indirectly	1 to 5	Specify the stop level for an alarm that is triggered if specifying a ladder program is invalid when the <Method to specify sending data> is set to <1: Indirect>. 1: Operation does not stop 2: Operation stops after 1 cycle 3: Operation stops at the block 4: Operation stops temporarily 5: Servo is turned OFF This value is invalid when set to <0: Direct>.
0413	Cancel level for error when sending data is specified indirectly	1 to 3	Specify the cancel level for an alarm that is triggered if specifying a ladder program is invalid when the <Method to specify sending data> is set to <1: Indirect>. 1: Any key 2: **[RST]** key 3: Power OFF This value is invalid when set to <0: Direct>.
0414	Type of sending data	0: No data 1: Internal relay (M) 2: Data register (D) 16 bit 3: Data register (D) 32 bit	Set the type of data sent in the auto notification when the <Method to specify sending data> is set to <0: Indirect>. No data, PLC internal relay (M) and PLC data register (D) 16 bit/32 bit can be set. This value is invalid when set to <1: Indirect>.

No.	Item name	Setting range	Description
0415	Leading address for sending data	0 to 10239	Set the leading address for the data sent in the auto notification when the <Method to specify sending data> is set to <0: Indirect>. This value is invalid when set to <1: Indirect>. The value that can be set changes depending on the setting for <Type of sending data>. <1: Internal relay (M)> 0 to 10239 <2: Data register (D) 16 bit> 0 to 8191 <3: Data register (D) 32 bit> Even numbers from 0 to 8190
0416	Sending data length	1 to 600 packets	Set the data length sent in the auto notification when the <Method to specify sending data> is set to <0: Indirect>. This value is invalid when set to <1: Indirect>. The value that can be set changes depending on the setting for <Type of sending data>. <1: Internal relay (M)> 1 to 600 packets <2: Data register (D) 16 bit> 1 to 100 packets <3: Data register (D) 32 bit> 1 to 50 packets

1.7.7 Security

No.	Item name	Setting range	Description
0501	Domain name	237 one-byte (half-width) characters	Set the domain name for the common name on the server certificate. Valid characters include: letters, numbers, “-” and “.”. The domain name is used to create a self-signed certificate or CSR. Ex: If the <Host name> is set to “HOSTNAME” and the <Domain name> is set to “EXAMPLE.JP”, then the common name is: “HOSTNAME. EXAMPLE.JP”. If not set, the <IP address> is used as the common name.
0502	Valid period (days)	365 to 7300 days	Set the valid period (days) for the server certificate. This period is used to create a self-signed certificate.
0503	Public key and algorithm	0:RSA(1024bit) 1:RSA(2048bit)	Set the public key and algorithm for the server certificate. The key and algorithm are used to create a self-signed certificate or CSR.
0504	Signature and algorithm	0:SHA1 1:SHA256 2:SHA384	Set the signature and algorithm for the server certificate. The signature and algorithm are used to create a self-signed certificate or CSR.
0505	Private-key password	20 one-byte (half-width) characters	Set the private-key password. Valid characters include: letters, numbers and symbols (excluding spaces). At least two of the following character types must be used: letters, numbers or symbols. Asterisks (*) are displayed for the password that is set. This parameter is converted to a character string that cannot be read as a file. Set the <Private-key password> with a minimum of 8 characters.
0506	Organization	255 one-byte (half-width) characters	Set the name of the organization that runs the site for the certificate. The organization name is used to create the CSR.
0507	Department	255 one-byte (half-width) characters	Set the name of the department that runs the site for the certificate. The department name is used to create the CSR.
0508	City	255 one-byte (half-width) characters	Set the name of the city (or town, etc.) where the organization is located that runs the site for the certificate. The city name is used to create the CSR.
0509	Prefecture/State	255 one-byte (half-width) characters	Set the name of the prefecture or state where the organization is located that runs the site for the certificate. The prefecture/state name is used to create the CSR.

No.	Item name	Setting range	Description
0510	Country	2 one-byte (half-width) characters	Set the code of the country where the organization is located that runs the site for the certificate. Ex: Enter “JP” when the location is in Japan. The country name is used to create the CSR.
0511	Alternative domain name	237 one-byte (half-width) characters	Set the alternative domain name for the subject on the server certificate. Valid characters include: letters, numbers, “-” and “.”. The alternative domain name is used to create the CSR. Ex: If the <Host name> is set to “HOSTNAME” and the <Alternative domain name> is set to “EXAMPLE.COM”, then the alternative subject name is: “HOSTNAME.EXAMPLE.COM”. If a name is not set, the alternative subject name will not be set.
0512	Scheduled notice before server certificate validity end date	0 to 99 days	Set the time period to trigger the <<Notice of server certificate validity end date>> before the server certificate validity end date arrives. When set to <0>, the <<Notice of server certificate validity end date>> does not trigger.
0513	Connecting server certificate warning level	0: Operator message 1: Alarm	Select the operation that is triggered when there is a problem with the server certificate for the connecting server. <0: Operator message> Triggers the operator message <<Connecting server certificate warning>> and continues to keep the connection. <1: Alarm> Triggers the alarm <<Connecting server certificate error>> and cancels the connection.

(NOTE 1) When setting a value from 3 to 5 for the <Stop level for error when sending data is specified indirectly>, even if the <Cancel level for error when sending data is specified indirectly> is set to “1”, it is processed as a cancel level 2.
In this situation, the <<Communication parameter setting error (auto notification function)>> (Stop level 1, cancel level1) is triggered when there is a reset after a parameter change, or when the communication parameter setting screen is displayed.

(NOTE 2) When setting a value from 2 to 5 for the <Stop level for error when sending data is specified indirectly>, even if the <Cancel level for error when sending data is specified indirectly> is set to “1”, the alarm is not cancelled during memory operation (except during a stoppage).

1.8 Field Network Parameters

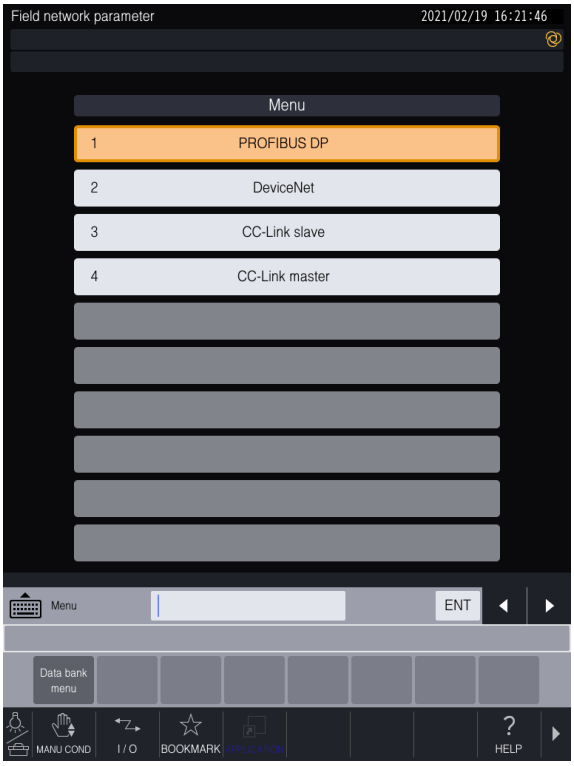
1.8.1 Overview

The user can set the parameters for the fieldbus network.
The user can use a setting for the fieldbus network parameter to connect various devices such as a CNC, PLC and robot controller.
The menu items are divided according to the supporting network.

Menu item	Description
PROFIBUS DP	Sets the parameters related to the PROFIBUS DP (slave).
DeviceNet	Sets the parameters related to the DeviceNet (slave).
CC-Link slave	Sets the parameters related to the CC-Link (slave).
CC-Link master	Sets the parameters related to the CC-Link (master).

1.8.2 Fieldbus Network Parameter Menu Screen

When the <Fieldbus network parameter> is selected from the <Data bank menu> screen, the following <Fieldbus network parameter menu> screen is displayed.
When a menu item is selected from the <Fieldbus network parameter menu selection>, the edit screen for that item is displayed.



1.8.2.1 PROFIBUS DP (slave) editing

Refer to “Chapter 9 (15) 1 PROFIBUS DP (slave)” in Operation Manual I for further details.

1.8.2.2 DeviceNet (slave) editing

Refer to “Chapter 9 (15) 2 DeviceNet (slave)” in Operation Manual I for further details.

1.8.2.3 CC-Link (slave) editing

Refer to “Chapter 9 (15) 3 CC-Link (remote device station)” in Operation Manual I for further details.

1.8.2.4 CC-Link (master) editing

Refer to “Chapter 9 (15) 4 CC-Link (master station)” in Operation Manual I for further details.

1.9 Machining Load Monitor Function

Refer to “Chapter 3 Machining load monitor function” for further details.

1.10 G/M Code Macro Settings

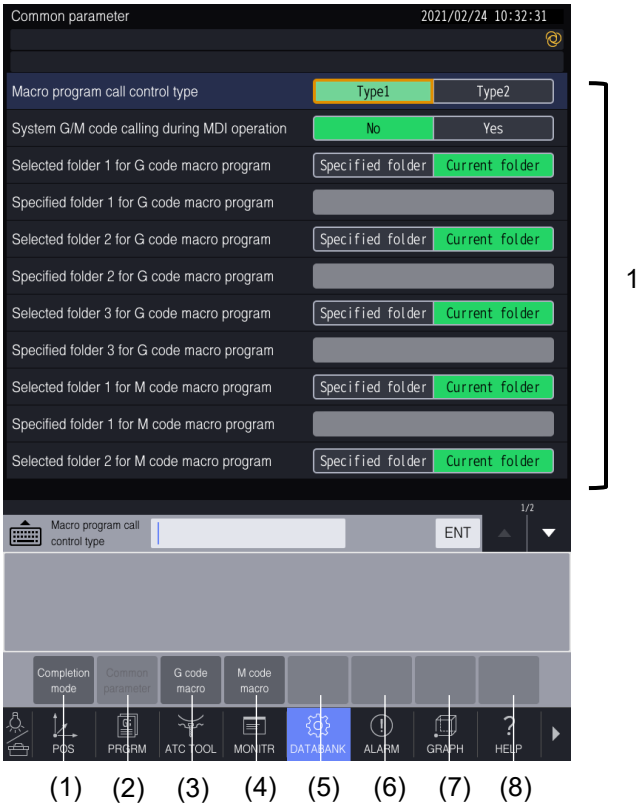
1.10.1 Overview

This section is for setting the parameters related to the G code macro and M code macro functions. Select “G/M code macro” on the data bank menu screen to display the G/M code macro edit screen.
The G/M code macros are divided into the following categories.

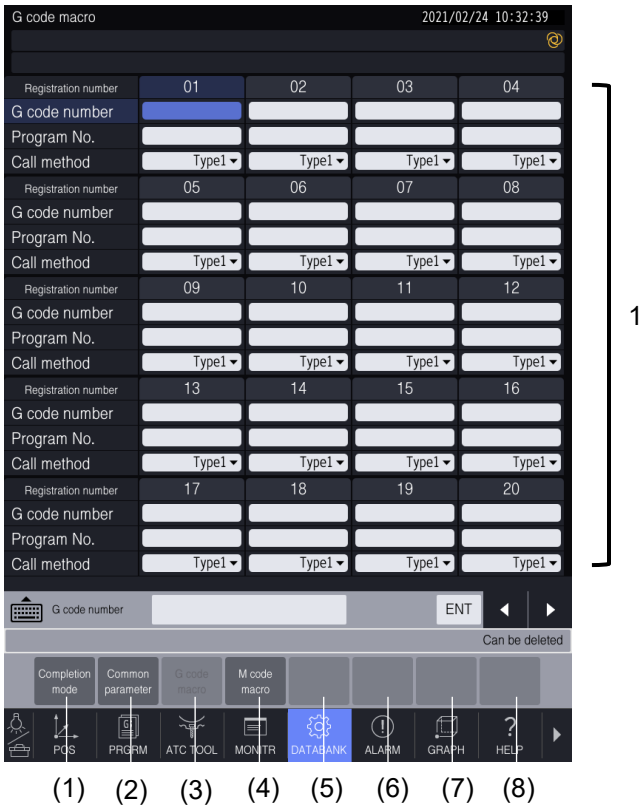
Category name	Description
Common parameter	Sets the parameters that are the same for G and M code macros.
G code macro	Displays the parameters related to G code macros.
M code macro	Displays the parameters related to M code macros.

1.10.2 G/M Code Macro Edit Screen

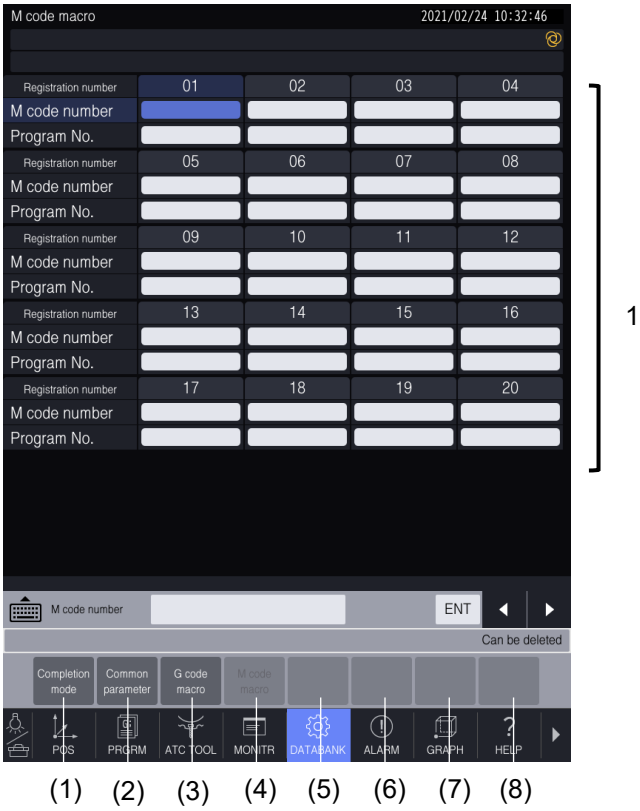
<Common parameter> screen



<G code macro> screen



<M code macro> screen



1.10.2.1 Description of screen display

<Common parameter> screen

Position	Name	Description
1	Common parameter	Displays the set value for the common parameter.

<G code macro> screen

Position	Name	Description
1	G code macro parameter	Displays the set value for the G code macro parameter.

<M code macro> screen

Position	Name	Description
1	M code macro parameter	Displays the set value for the M code macro parameter.

1.10.2.2 Description of screen operation

1. Description of function key operations
   The function key operations are the same for the <Common parameter> screen, <G code macro> screen and <M code macro> screen.

Column	Position	Label	Description
1	(1)	<Completion mode>	Changes to the edit end confirmation screen.
	(2)	<Common parameter>	Displays the <Common parameter> screen.
	(3)	<G code macro>	Displays the <G code macro> screen.
	(4)	<M code macro>	Displays the <M code macro> screen.
	(5)		
	(6)		
	(7)		
	(8)		

2. Description of parameter edit operations
   - Tap on an item to edit it.
   - Press the **[ENT]** key to edit the corresponding item.
   - Press the **[DEL]** key to delete the set value where the cursor is. When the cursor is positioned at an item that can be deleted, then the message <Can be deleted> will appear in the instructions area.
   - An item can be selected with the cursor keys.
   - Refer to “1.10.3 List of G/M code macro parameters” for details on the screen items.

1.10.2.3 End editing confirmation screen

The user can end and exit editing.
Refer to “1.1 Overview of data bank” for further details on the ways to exit editing mode.

1.10.3 List of G/M Code Macro Parameters

1.10.3.1 Common Parameter

No.	Item name	Setting range	Description
01	Macro program call control type	0: Method 1 1: Method 2	Set the control method for the M code in the macro program that is called using G code or for G code in the macro program that is called using M code. Method 1: The G/M code in the macro program runs as a G/M code in the system. Method 2: The macro program can be called using the G/M code in the macro program.
02	System G/M code calling during MDI operation	0: No call 1: Call	If the setting is configured to <1: Call> and a G/M code is registered as a <G code number> or <M code number> for MDI operation mode, when that code is executed, the machine operates using the system G/M code.

No.	Item name	Setting range	Description
03	Selected folder 1 for G code macro program	0: Specified folder 1: Current folder	Select a folder to call a program with a G code macro command. 0: Specified folder Call from the folder that is set in <Specified folder 1 for G code macro program>. 1: Current folder Call from the same folder as the main program.
04	Specified folder 1 for G code macro program	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for the program number that is called using the G code macro command. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE) When the folder name is not set, the root folder is specified.
05	Selected folder 2 for G code macro program	0: Specified folder 1: Current folder	Select a folder to call a program with a G code macro command. 0: Specified folder Call from the folder that is set in <Specified folder 2 for G code macro program>. 1: Current folder Call from the same folder as the main program.
06	Specified folder 2 for G code macro program	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for the program number that is called using the G code macro command. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE) When the folder name is not set, the root folder is specified.
07	Selected folder 3 for G code macro program	0: Specified folder 1: Current folder	Select a folder to call a program with a G code macro command. 0: Specified folder Call from the folder that is set in <Specified folder 3 for G code macro program>. 1: Current folder Call from the same folder as the main program.
08	Specified folder 3 for G code macro program	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for the program number that is called using the G code macro command. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE) When the folder name is not set, the root folder is specified.
09	Selected folder 1 for M code macro program	0: Specified folder 1: Current folder	Select a folder to call a program with a M code macro command. 0: Specified folder Call from the folder that is set in <Specified folder 1 for M code macro program>. 1: Current folder Call from the same folder as the main program.

No.	Item name	Setting range	Description
10	Specified folder 1 for M code macro program	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for the program number that is called using the M code macro command. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE) When the folder name is not set, the root folder is specified.
11	Selected folder 2 for M code macro program	0: Specified folder 1: Current folder	Select a folder to call a program with a M code macro command. 0: Specified folder Call from the folder that is set in <Specified folder 2 for M code macro program>. 1: Current folder Call from the same folder as the main program.
12	Specified folder 2 for M code macro program	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for the program number that is called using the M code macro command. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE) When the folder name is not set, the root folder is specified.
13	Selected folder 3 for M code macro program	0: Specified folder 1: Current folder	Select a folder to call a program with a M code macro command. 0: Specified folder Call from the folder that is set in <Specified folder 3 for M code macro program>. 1: Current folder Call from the same folder as the main program.
14	Specified folder 3 for M code macro program	Alphanumeric characters including periods and slashes that can be entered from the panel	Use a maximum of 16 alphanumeric characters including periods to set the folder name for the program number that is called using the M code macro command. In addition, the user can insert a slash and the folder name to set a second level directory folder (maximum of 33 characters). (NOTE) When the folder name is not set, the root folder is specified.

1.10.3.2 G Code Macro

Setting items for registration numbers 1 to 20

No.	Item name	Setting range	Description
	G code number	1 to 999	Sets the G code when calling the macro program using G code. (However, 65, 66 and 67 cannot be set.) The function is disabled when the field is left blank.
	Program No.	1 to 8999	Sets the program number that is called by the macro.
	Call method	0: Method 1 1: Method 2	Specifies the call type in the macro program. Method 1: A call equivalent to G65 (Simple call) is carried out. Method 2: A call equivalent to G66 (Modal call) is carried out.

(NOTE) When the **[RST]** key is pressed after exiting edit mode, if a G code number has been duplicated or is redundant, the alarm <<G code macro duplicate error>> is triggered.

1.10.3.3 M Code Macro

Setting items for registration numbers 1 to 20

No.	Item name	Setting range	Description
	M code number	1 to 999	Sets the M code when calling the macro program using M code. (However, 1, 2, 30 and 98 ~ 99 cannot be set.) The function is disabled when the field is left blank.
	Program No.	1 to 8999	Sets the program number that is called by the macro.

(NOTE) When the **[RST]** key is pressed after exiting edit mode, if a G code number has been duplicated or is redundant, the alarm <<M code macro duplicate error>> is triggered.

1

1.11 Tool list (Conversation)

Information about type, dimension, shape and life of the tools to be used for machining are registered. 20 types of tools are available and up to 99 tools can be registered.

(NOTICE 1) If the registered dimensions and shape of the tools are different from those of the tools actually mounted on the magazine, collision of tools, workpiece and jigs or an accident may occur. Be sure to register data correctly.

(NOTICE 2) If there is any change in the tool such as in the dimensions or shape, always be sure to correct the tool data accordingly. When there is a change, perform a tool check in order to check the tool assignment in the programs affected by this change, and make sure that the relevant tools can be used.

(NOTICE 3) When storing tools, apply an identification label on them so that the actual tools is identical with registered tool data.

1.11.1 Tool List Screen

The tool list screen is displayed when <Tool list> is selected from the <Data bank menu> screen. There are two tool list screens: <Tool list> and <Tool list (extension information)>.

<Tool list> screen

1.11.1.1 Description of screen display

<Tool list> screen and <Tool list (extension information)> screen

Position	Name	Description
1	Tool list	• Displays the information for registered tools. • Displays an asterisk (*) for items that do not require data input. • Refer to “Description of tool data items” below for further details on each item.
2	Set value list	Displays the set values for setting the tool data.

Description of tool data items

Item name	Description
<Tool No.>	Displays the tool type. Displays the registered pot numbers and highlights tools in green that are registered as ATC tools. Ex: Tool display for tool No. 5 that is registered to pot No. 3 05(P:03)
<Tool>	Displays the tool type. Refer to the “1.11.2 List of items available for input by tool type” for details on the tool types. Tools with an auxiliary code have a number (0 to 9) noted at the end of the tool type. Ex: Center drill 5 Refer to “Register tools with auxiliary code” for details on the auxiliary code.
<Point angle>	Displays the set value for the angle at the end of the tool.
<Minor diameter>	Displays the set value for the diameter at the end of the tool.
<Minor dia. length>	Displays the set value for the tool length.
<Center angle>	Displays the set value for the large diameter angle of the center drill or for the point angle on a chamfering tool and corner rounding cutter.
<Invalid section>	Displays the set value for length of the bevel lead.

Item name	Description
<Major/Nominal D>	Displays the set value for the tool diameter.
<Pitch/Threads>	Displays the set value for the pitch or thread on a tapping tool.
<Length of teeth>	Displays the set value for the length of the teeth.
<Torsion>	Displays the set value for the torsion direction (right screw/left screw) on a tapping tool.
<Number of teeth>	Displays the set value for the number of teeth on an end mill and corner rounding cutter.
<Tool length>	Displays the set value for the length from the gauge line on the tool holder to the end of the tool.
<Initial life> <End-of-life>	The item name switches between <Initial life> and <End-of-life> depending on the user parameter setting for the <Tool life counting method>. Displays the value for initial life or end-of-life.
<Life warning>	Displays the value for the tool life warning.
<Tool life>	Displays the current value for tool life.

These items are only displayed on the <Tool list (extension information)> screen below.

Item name	Description
<Tool washing>	Displays whether tool wash is used or not. Allowed: Tool wash is used. Not allowed: Tool wash is not used.
<CTS>	Displays whether CTS coolant is used or not. Allowed: CTS coolant is used. Not allowed: CTS coolant is not used.

1.11.1.2 Description of screen operation

1. Description of function key operations.
   Only position (7) is different on the <Tool list> screen and <Tool list (extension information)> screen.

Column	Position	Label	Description
1	(1)	<Completion mode>	Changes to the edit end confirmation screen.
	(2)	<Search>	• The user can move to the specified tool number. • The user can enter a tool number (1 to 99) and press the <Search> key to move to the specified tool number. When doing a search, the cursor moves to the specified tool number.
	(3)	<Tool length setting>	• Changes to the <Tool length setting> screen. • The user can automatically set the <Tool length>.
	(4)	<Add>	• The user can enter and add a value to the set value where the cursor is. • Enter the desired add value, and press the <Add> key. The user can enter a value to be added to the set value where the cursor is. • The <Add> key cannot be used when the cursor is positioned at the tool, screw, call, torsion, number of teeth, tool life related items, tool washing or CTS.
	(5)	<Copy>	• The user can copy the tool data where the cursor is. Refer to “Copy tool data” below for further details.
	(6)	<Paste>	• The user can copy the tool data where the cursor is. Refer to “Copy tool data” below for further details.
	(7)	<Display extension information>	Shows or hides the extension information for the tool data items. When the top-left mark on the key turns ON, the extension information is displayed. When it turns OFF, the information is hidden.

Column	Position	Label	Description
	(8)	<Tool data Delete>	• A popup window appears asking confirmation to delete the tool data. • The user can delete the data at the tool number where the cursor is.

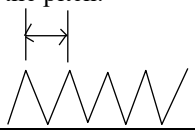
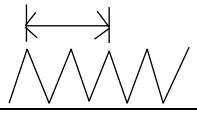
2. Copy tool data
   - The user can copy the tool data and apply it to another tool number.
   - The <Copy> key and <Paste> key are used to copy tool data.
   - Move the cursor to <Tool> to copy the tool data. Thereafter, the <Copy> key and <Paste> key are enabled.
   - Copy procedure
     (1) Move the cursor to the <Tool> that has the data you wish to import.
     The cursor can be moved by using the **[CURSOR]** keys or by tapping on the <Tool>.
     (2) Press the <Copy> key.
     Import the data for the tool where the cursor is.
     The imported data is saved until other data is imported or until the power is turned OFF.
     (3) Move the cursor to the <Tool> that has the data you wish to paste.
     (4) Press the <Paste> key.
     The data, for the tool where the cursor is, changes to the imported data.

3. Description of tool list edit operations
   - Tap on an item to move the cursor to that item and edit it.
   - Press the **[ENT]** key to edit an item where the cursor is.
   - The user can use the **[CURSOR]** keys to select an item to edit.

4. Description of set values and operations of tool data items
   - After setting a <Tool>, any items that do not require data input thereafter are displayed with an asterisk (*).
     Data input is required for any item without an asterisk (*).
     Always be sure to enter a value. If a field is left empty, the normal tool shape will not be recognized.
     Refer to “1.11.2 List of items available for input by tool type” for details on the tool types and items available for input.
     In addition, refer to “1.11.3 Shapes and dimensions of tools registered to tool list” for details about the tool data items and tool dimensions.
   - The user can add an auxiliary code to a tool type that is set to a <Tool>.
     Refer to “Register tools with auxiliary code” for details on how to set an auxiliary code.
   - When a tapping tool type is set to a <Tool>, the setting method is different for the tool data below.

Tool data item	Setting method
<Invalid section>	Specify using pitch or threads.
<Major/Nominal D>	Specify the screw type and size (diameter).

   - The setting method for <Pitch/Threads> is different depending on the screw type (meter or inch screw).

Screw type	Setting method
When using a meter screw	Set the pitch. 
When using an inch screw	Set the number of threads per inch. 

   - Refer to “Tool life settings and operation” below for details on the <Initial life>/<End-of-life>, <Life warning> and <Tool life>.

- Set <Tool washing> to <1: Not allowed> when not using coolant on a tool for tool washing. Tool washing is not used for tools that are set to not allowed.
  The discharge conditions can be changed in the user parameter (switch 1: ATC/Magazine) <Tool wash discharge conditions for tool data>.
- Set <CTS> to <1: Not allowed> when using a tool that is not compatible with center-through-coolant. When a CTS coolant command is issued for a tool that is set to not allowed, the alarm <<CTS unable tool>> is triggered and the CTS coolant does not discharge.

5. Register tools with auxiliary code
   The user can register an auxiliary code (1 to 9) to the <Tool>. When there are tools that are the same, the user can restrict the usable tools by assigning an auxiliary code.
   When specifying tool types, assign an auxiliary code (from **[1]** to **[9]** with a hyphen **[-]**) at the end of the type number. After pressing the **[ENT]** key, the auxiliary code is added to the end of the tool type.

   In the example below, the drill is set to tool No. 11, and auxiliary code 1 is assigned.
   Move the cursor to “Tool” No. 11, enter “2-1” into the data input field, and press the **[ENT]** key.

After an auxiliary code has been set in the tool list, if the same auxiliary code is assigned and set to a tool that is registered for cutting conditions 1/2, the tool that is set with that auxiliary code will be selected for the tool assignment.

6. Tool life settings and operation

(1) <Initial life>/<End-of-life>

- The item names on the tool data edit screen change depending on the user parameter <Tool life counting method>.

Item name	Set value for <Tool life counting method>	Tool life counting method
<Initial life>	<0: Type 1>	Counting down
<End-of-life>	<1: Type 2>	Counting up

- The user can move the cursor to the items <Initial life> and <End-of-life> and set the counting unit, the initial tool life as well as the end-of-life of the tool.
  First, the tool life unit is set.
  Life unit is selectable from the following four units.

Set value	Unit	Description
<1: Not counted>	None	Tool life management is not performed When this setting is used, the display shows "**" in the fields for "Initial life/End-of-life", "Life warning" and "Tool life".
<2: Time>	Min	Tool life management is performed in time (in the unit of minute). As the cutting travel is performed for one minute, the tool life is subtracted/added.
<3: Drilled holes>	Holes	Manages the tool life based on the number of holes drilled. When 1 hole is drilled in a drilling job, or when a motion call is executed for 1 job, the count for the tool life is added or subtracted accordingly.
<4: Workpieces>	Number of workpieces	Tool life management is performed in workpieces. At the end of operation, the tool life of the tool with which cutting travel has been done is subtracted/added.

Setting the tool life unit goes to the setting of the initial life/life end.
For the initial life, setting a initial life sets the same value for the tool life.
For the life end, setting a life end sets "0" for the tool life.

(2) <Life warning>

- <Life warning> sets a value in the tool life to prompt or warn the user that the tool is close to the end of life.
- If the <Tool life> and the <Life warning> are the same value, the alarm <<Tool life ending (****)>> (asterisks in the parentheses indicate the tool number) is triggered.
  Even if an alarm is triggered, memory operation can be started.
  When using the count up method and the value zero (0) is set for the tool life warning, the alarm does not trigger.

(3) <Life>

- Set the current value for the tool life. When the end of life is reached by subtracttion/addition as a result of machining, an alarm <<Tool life end (****)>> (where the parenthesized value is a tool number) is generated. Upon generation of this alarm, starting of memory operation is prevented.
- <Tool life> does not decrease or increase when using MDI operation.
- The tool life count is recorded and the tool life is checked only on tools that are used in memory operation. As a result, if there is a tool change using MDI operation while running in memory operation mode, the tool life count is not recorded and the tool life is not checked even after returning to memory operation.
- "Tool life has expired" means that the <Tool life> has reached zero (0) when using the count down method. Or, it means that the <Tool life> has reached the same value as <End-of-life> when using the count up method.
- The user can initialize or reset a tool life that has expired from the <ATC tool> screen.

1.11.2 List of items available for input by tool type

This list shows the tool data items where data can be input for a tool type that is set to a <Tool>.
Input is not possible for items with an asterisk (*).
The notation used in the table corresponds to the notation used in the figure for "1.11.3 Shapes and dimensions of tools registered to tool list".

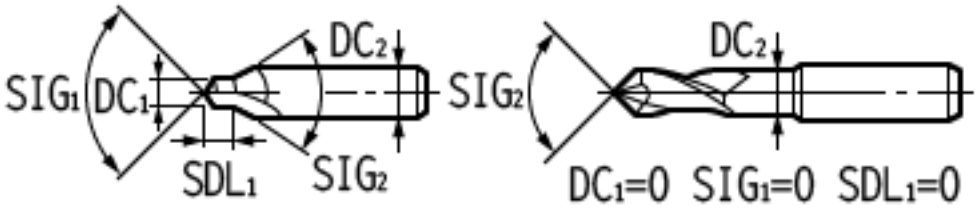
Tool type / Tool data item	1:Center drill	2:Drill	3:Carbide drill	4:Spiral tap	5:Point tap	6:Hand tap	7:Rolled tap	8:Chamfering tool	9:Counter boring tool	10:Drill with chamfering tool
Point angle:α	SIG_1	SIG	SIG	*	*	*	*	*	*	SIG_1
Minor dia.:d	DC_1	*	*	*	*	*	*	DCN	DC_1	DC_1
Minor dia.length:L	SDL_1	*	*	*	*	*	*	*	SDL_1	SDL_1
Center angle:θ	SIG_2	*	*	*	*	*	*	SIG	*	STA_2
Invalid section:Lo	*	*	*	THCHL	THCHL	THCHL	THCHL	PL	*	*
Major/Nominal:D	DC_2	DC	DC	TD	TD	TD	TD	DCX	DC_2	DC_2
Pitch/Treads:P	*	*	*	TP/TPI	TP/TPI	TP/TPI	TP/TPI	*	*	*
Length of teeth:L	*	LU	LU	LU	LU	LU	LU	*	SDL_2	LCF
Torsion	*	*	*	○	○	○	○	*	*	*
Number of teeth	*	*	*	*	*	*	*	*	*	*
Tool length:LL	LTA	LTA	LTA	LTA	LTA	LTA	LTA	LTA	LTA	LTA
Initial life/Life end	○	○	○	○	○	○	○	○	○	○
Life warning	○	○	○	○	○	○	○	○	○	○
Tool life	○	○	○	○	○	○	○	○	○	○
Tool wash	○	○	○	○	○	○	○	○	○	○
CTS	○	○	○	○	○	○	○	○	○	○

Tool type / Tool data item	11:Drill with counter boring tool	12:Drill tap	13:Reamer	14:Drill reamer	15: End mill (rough) (Rough finish tool)	16: End mill (finish) (Finish tool)	17: Carbide end mill (rough)(Rough finish tool)	18: Carbide end mill (finish) (Finish tool)	19:Corner round cutter	20:Centering tool
Point angle:α	SIG_1	SIG_1	*	SIG_1	*	*	*	*	*	*
Minor dia.:d	DC_1	DC_1	*	DC_1	*	*	*	*	DCN	DC
Minor dia.length:L	SDL_1	SDL_1	*	SDL_1	*	*	*	*	*	*
Center angle:θ	*	*	*	*	*	*	*	*	SIG	*
Invalid section:Lo	*	PL_2	PL	PL_2	*	*	*	*	*	*
Major/Nominal:D	DC_2	TD_2	DC	DC_2	DC	DC	DC	DC	DCX	*
Pitch/Treads:P	*	TP/TPI_2	*	*	*	*	*	*	*	*
Length of teeth:L	LCF	LCF	LCF	LCF	APMX	APMX	APMX	APMX	*	*
Torsion	*	○	*	*	*	*	*	*	*	*
Number of teeth	*	*	*	*	○	○	○	○	○	*
Tool length:LL	LTA	LTA	LTA	LTA	LTA	LTA	LTA	LTA	LTA	LTA
Initial life/Life end	○	○	○	○	○	○	○	○	○	*
Life warning	○	○	○	○	○	○	○	○	○	*
Tool life	○	○	○	○	○	○	○	○	○	*
Tool wash	○	○	○	○	○	○	○	○	○	○
CTS	○	○	○	○	○	○	○	○	○	○

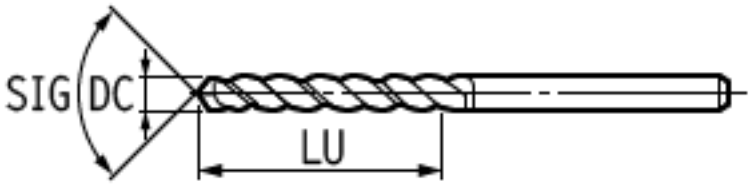
1.11.3 Shapes and dimensions of tools registered to tool list

The notation in the figure correspond to the notation in the table from “1.10.2 List of items available for input by tool type”.

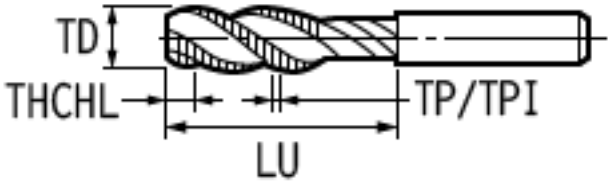
1. Center drill



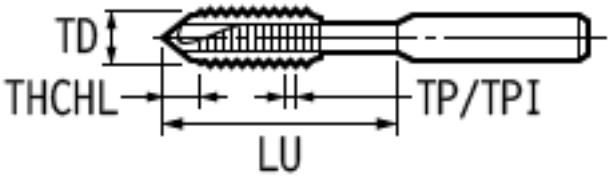
2. Drill
3. Carbide drill



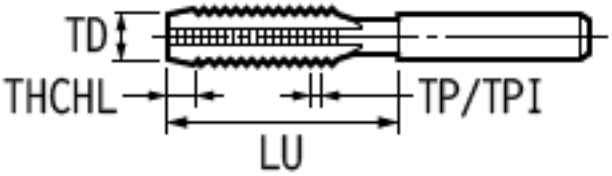
4. Spiral tap



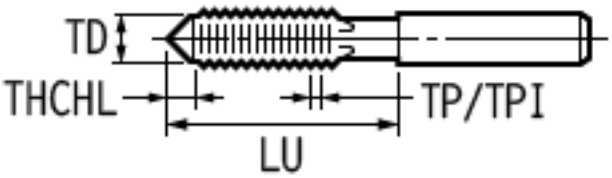
5. Point tap



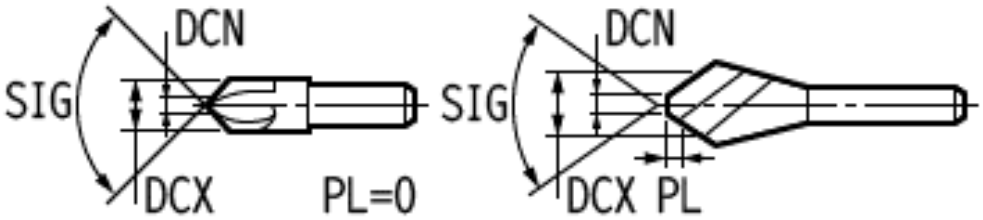
6. Hand tap



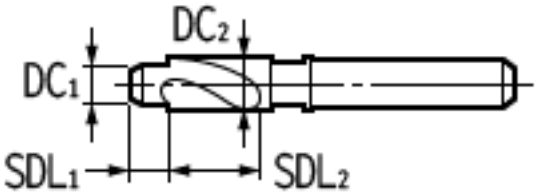
7. Rolled tap



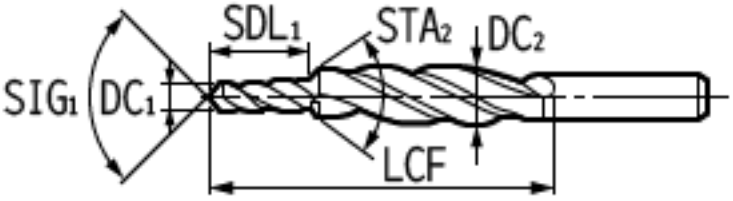
8. Chamfering tool



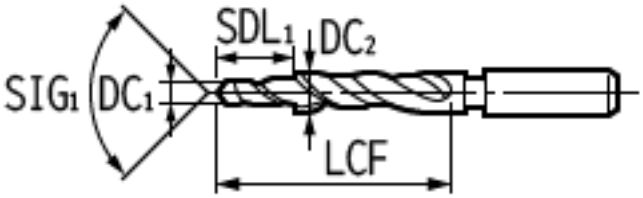
9. Counter boring tool



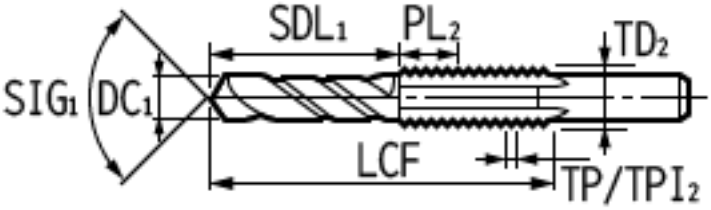
10. Drill with chamfering tool



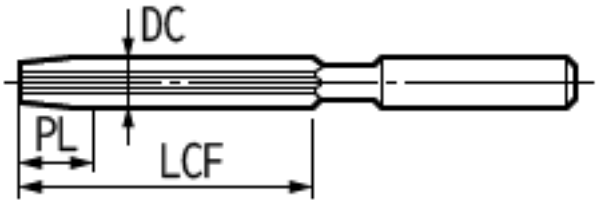
11. Drill with counter boring tool



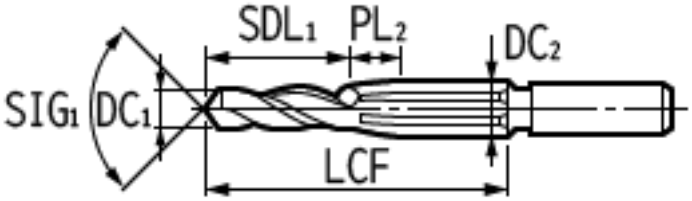
12. drill tap



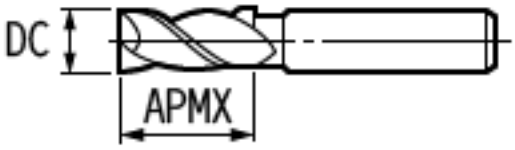
13. Reamer



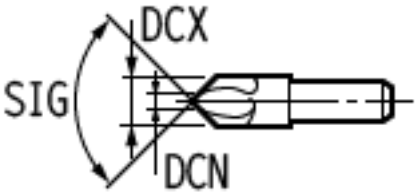
14. Drill reamer



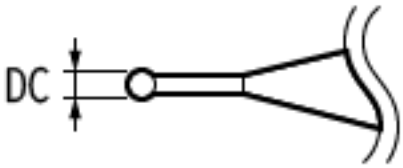
15. End mill (rought) (Rough finishing tool)
16. End mill (finish) (Finishing tool)
17. Carbide end mill (Rough finishing tool)
18. Carbide end mill (finish) (Finishing tool)



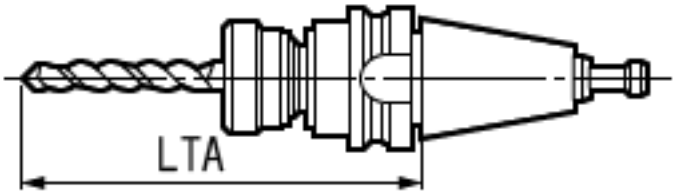
19. Corner round cutter



20. Centering tool

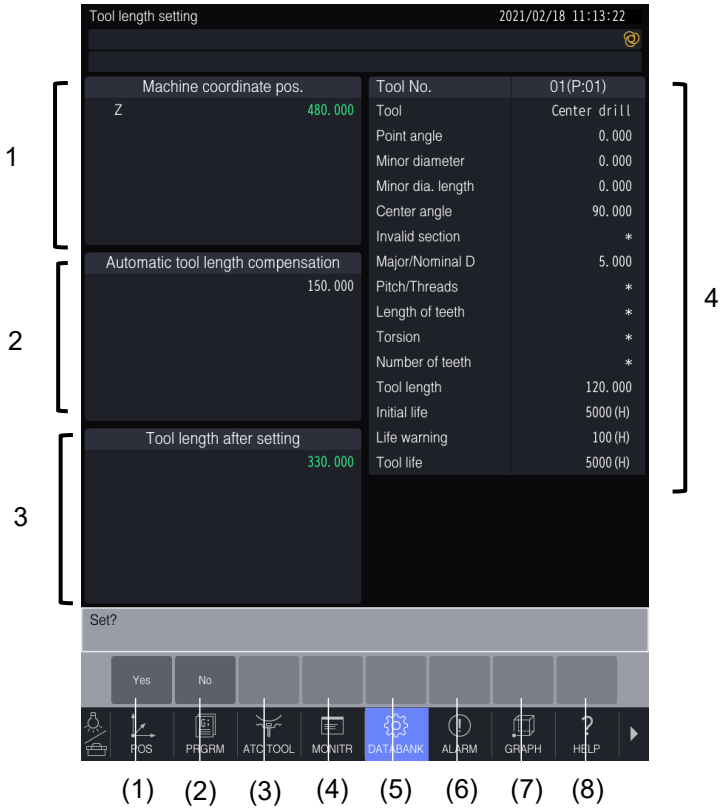


Tool length



1.11.4 Setting of Tool Length

The user can automatically set the “Tool length”.
Calculation is made using the current position and the “Automatic tool length compensation” in the User parameters with the tool whose tool length is to be set attached to the spindle.



1.11.4.1 Description of screen display

Position	Name	Description
1	Machine coordinate pos.	Displays the current machine coordinate position.
2	Automatic tool length compensation	Displays the user parameter <Automatic tool length compensation>.
3	Tool length after setting	Displays the value set to <Tool length>. <Tool length after setting> = <Machine coordinate pos.> - <Automatic tool length compensation>
4	Selected tool	Displays the tool data that is set to the tool length.

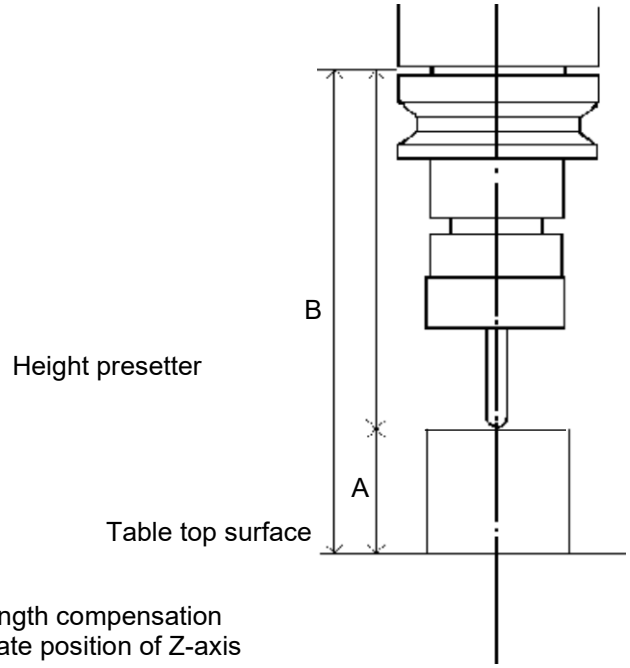
1.11.4.2 Description of screen operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Yes>	Sets the value in <Tool length after setting> to <Tool length>, and then goes back to the previous screen.
	(2)	<No>	Cancels the setting and then goes back to the previous screen.
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

1.11.4.3 Automatic setting procedure for tool length

Set the height (A) of the height presetter in the user parameter <Automatic tool length compensation> beforehand.



A: Automatic tool length compensation
B: Machine coordinate position of Z-axis
B-A: Tool length

1. Attache the tool whose tool length is to be set to the spindle.
   Refer to “4.4 ATC tools” and “6.2.2.3 Changing tools” in Operation Manual I for further details.
2. Operate the machine in manual operation mode and lower the Z-axis to the position where the tool tip slightly touches the surface of the height presetter.
3. Display the edit screen for the tool list, and press the <Tool length setting> key. The <Tool length setting> screen is displayed.
4. Check <Tool length after setting> that is displayed on the <Tool length setting> screen. Subtract the <Automatic tool length compensation> value in the user parameter (switch 1) from the current machine coordinate position, and then use the difference as the value to set the new tool length.
5. Press the <Yes> key to set the value in “Tool length after setting” to the tool length, and then the screen goes back to the previous one.
   Press the <No> key to cancel the setting operation and return to the previous screen.

   (NOTE) Tool length setting is disabled when no tool is set to the spindle.

1.11.5 Confirmation screen for tool data deletion

Move the cursor to a <Tool> to delete the tool data. The <Tool data Delete> key is enabled. When the <Tool data Delete> key is selected, a confirmation screen appears asking whether to delete the tool data or not as shown below, for the tool data where the cursor is.

1.11.5.1 Description of screen display

Position	Name	Description
1	Tool numbers for deleting tool data	Displays the tool data to be deleted. The tool data is deleted at the tool number where the cursor is.
2	Confirmation whether to delete tool data	Displays a message to confirm deletion.

1.11.5.2 Description of screen operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Yes>	Deletes the tool data at the tool number where the cursor is, and then goes back to the previous screen. The deleted tool data is imported. The imported data is saved until other data is imported or until the power is turned OFF.
	(2)	<No>	Cancels the deletion and goes back to the previous screen.
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

1.11.6 Edit end confirmation screen

The user selects whether to save or discard the tool data that was changed.
When the <Completion mode> key is selected from the tool data list screen, the following screen appears.

(1) (2) (3) (4) (5) (6) (7) (8)

1.11.6.1 Description of screen operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Save and end>	Saves the edited content up until now and then exits. Goes back to the <Tool data menu> screen.
	(2)		
	(3)		
	(4)	<Cancel w/o saving changes>	Discards the edited content up until now. Goes back to the <Tool data menu> screen.
	(5)		
	(6)		
	(7)	<Overwrite save>	Overwrites and saves the edited content up until now to a file, and then goes back to the previous screen.
	(8)	<Edit mode>	Returns to editing.

(NOTE) The operator message <<Operating>> appears when operation is in progress, and the “Save and end” or the “Overwrite save” operation is not possible.

1.12 Tool pattern (Conversation)

1.12.1 Outline

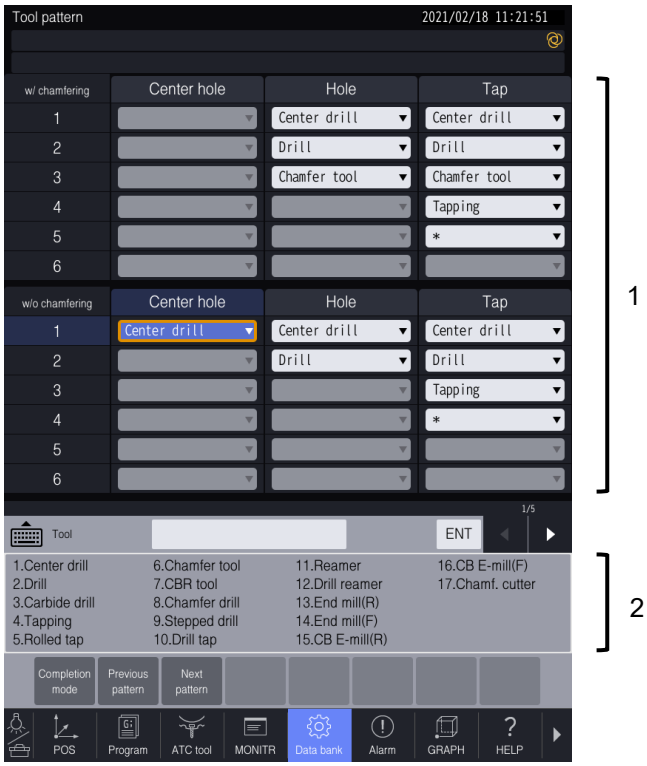
Set the tool type to be used in the machining processes and their order of use. Then, in tool allocation, the tools required for the respective machining processes are automatically selected according to the contents set here.

Two types of tool patterns with or without chamfering can be set for each machining process.

Normally tools are automatically selected according to the default tool pattern set at shipment. However, some machining process may require pattern to be changed.

1.12.2 Tool Pattern

The tool pattern edit screen is displayed when <Tool pattern>is selected from the <Data bank menu> screen.



1.12.2.1 Description of screen display

Position	Name	Description
1	Tool pattern	Displays the tool pattern that is set to the machining job.
2	Setting tool list	Displays the list of tools that can be set to a tool pattern.

1.12.2.2 Description of screen operation

1. Description of function key operations

Column	Position	Label	Description
1	(1)	<Completion mode>	Changes to the edit end confirmation screen.
	(2)	<Previous pattern>	Moves the cursor to the first tool for the previous machining job.
	(3)	<Next pattern>	Moves the cursor to the first tool for the next machining job.
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

2. Description of tool pattern edit operations
   - Tap on a tool for a machining job to move the cursor to that tool and edit it.
   - Press the **[ENT]** key to edit a tool where the cursor is.
   - After entering a tool number for the setting tool list and pressing the **[ENT]** key, the tool (where the cursor is) is overwritten by the tool number that was entered.
   - Press the **[DEL]** key to delete the tool where the cursor is. All the data thereafter moves up accordingly.
     An asterisk is displayed on the last item in the machining job and it changes status to “not set”.
   - Press the **[INS]** key to insert a “not set” asterisk (*) where the cursor is. All the data thereafter moves down accordingly.
     The last tool set in that machining job is deleted.

1.12.3 Edit End Confirmation Screen

The user can end and exit editing.
Refer to “1.1. Data bank overview” for further details on how to exit editing mode.

1.13 Tapping Drill Diameter (Conversation)

1.13.1 Outline

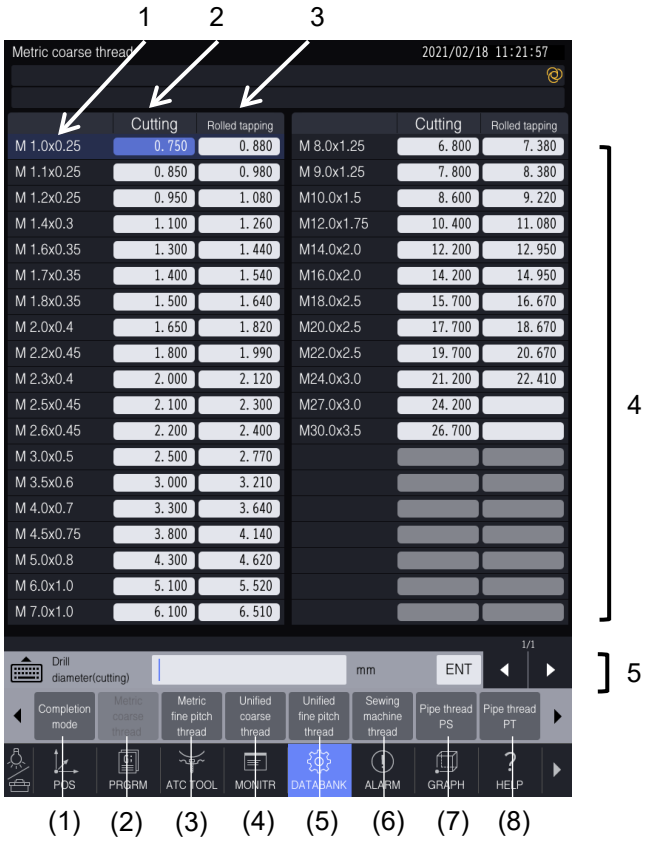
Set the tap prepare hole drill diameters. Set them for each screw type, nominal diameter and pitch/threads. Further set taps separately for cutting and rolling.

* Actually there is allowance for hole extension according to the manner the tool holder is attached, and tool runout and shape. Pefrom thorough management of the tool diameters and prepared holes.

1.13.2 Tapping Drill Diameter Edit Screen

Selecting the “Tap prepared hole drill diameter” on the Data bank menu screen displays the edit screen for tap prepared hole drill diameters.

Ex: Metric coarse thread screen



1.13.2.1 Description of screen display

Position	Name	Description
1	Screw type	Displays the screw type (screw symbol, nominal diameter, pitch/threads).
2	Cutting	Displays the set value for the tapping drill diameter on each cutting tap.
3	Rolled tapping	Displays the set value for the tapping drill diameter on each rolled tap.
4	Screw type list	Displays a list of set values for the tapping drill diameter of each screw.
5	Data input field/ Instructions area	Displays the data input field for setting the tapping drill diameter.

1.13.2.2 Description of screen operation

1. Description of function key operations
   When the machine parameter (system1: common) <Change screw type> is set to <0:Language set> and the <Display language> is set to <0:Japanese>, or when <Change screw type> is set to <1:For Japan>, the following is displayed.

Column	Position	Label	Description
1	(1)	<Completion mode>	Exits the editing of the tapping drill diameter.
	(2)	<Metric coarse thread>	Displays the <Metric coarse thread> screen.
	(3)	<Metric fine pitch thread>	Displays the <Metric fine pitch thread> screen.
	(4)	<Unified coarse thread>	Displays the <Unified coarse thread> screen.
	(5)	<Unified fine pitch thread>	Displays the <Unified fine pitch thread> screen.
	(6)	<Sewing machine thread>	Displays the <Sewing machine thread> screen.
	(7)	<Pipe thread PS>	Displays the <Pipe thread PS> screen.
	(8)	<Pipe thread PT>	Displays the <Pipe thread PT> screen.
2	(1)	<Completion mode>	Same as the first column.
	(2)	<Pipe thread PF>	Displays the <Pipe thread PF> screen.
	(3)	<Miniature screw thread>	Displays the <Miniature screw thread> screen.
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

   When the machine parameter (system1: common) <Change screw type> is set to <0:Language set> and the <Display language> is configured to another setting besides <0:Japanese>, or when <Change screw type> is set to <2:For other than Japan>, the following is displayed.

Column	Position	Label	Description
1	(1)	<Completion mode>	Exits the editing of the tapping drill diameter.
	(2)	<Metric coarse thread>	Displays the <Metric coarse thread> screen.
	(3)	<Metric fine pitch thread>	Displays the <Metric fine pitch thread> screen.
	(4)	<Unified coarse thread>	Displays the <Unified coarse thread> screen.
	(5)	<Unified fine pitch thread>	Displays the <Unified fine pitch thread> screen.
	(6)	<NPS>	Displays the <NPS> screen.
	(7)	<BSP>	Displays the <BSP> screen.
	(8)	<BSW>	Displays the <BSW> screen.
2	(1)	<Completion mode>	Same as the first column.
	(2)	<BSF>	Displays the <BSF> screen.
	(3)	<BA>	Displays the <BA> screen.
	(4)	<NPT>	Displays the <NPT> screen.
	(5)	<Sewing machine thread>	Displays the <Sewing machine thread> screen.
	(6)	<Miniature screw thread>	Displays the <Miniature screw thread> screen.
	(7)		
	(8)		

2. Description of tapping drill diameter operations
   - When the user taps to select and edit <Cutting> or <Rolled tapping>, the data input field and instructions area are displayed. Or, the **[CURSOR]** keys can be used to select <Cutting> or <Rolled tapping>. Editing is enabled even if the **[ENT]** key is pressed, and the data input field and instructions area are displayed.
   - When a set value is entered and the **[ENT]** key is pressed, the selected value for <Cutting> or <Rolled tapping> is changed, and then the cursor moves to the next item.

1

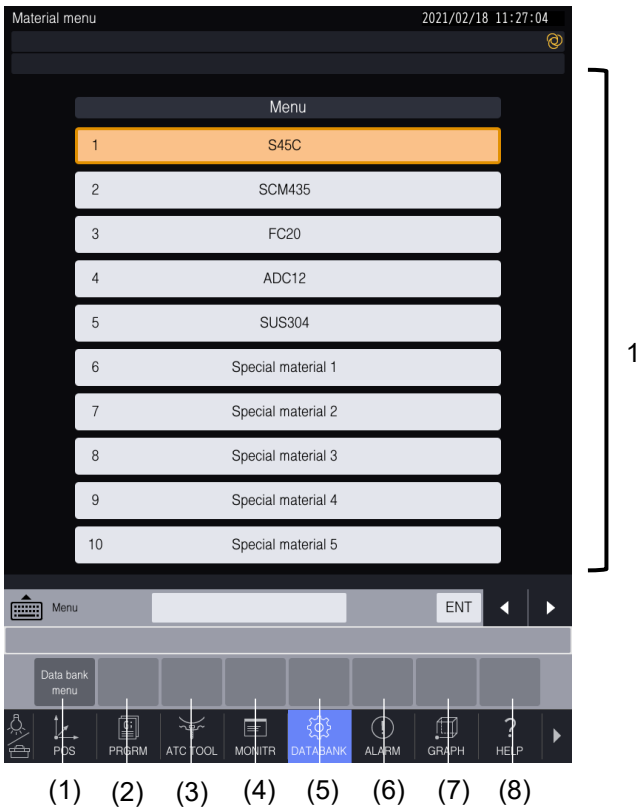
1.14 Cutting Condition (Conversation)

1.14.1 Outline

Set the cutting conditions for the tool according to the material of workpiece. Up to 10 types of workpiece materials can be registered. Make setting for 19 types of tools for each workpiece material.
Workpiece materials Nos. 1 to 5 are preset at shipment, and for workpiece materials Nos. 6 to 10, desired cutting conditions can be set.

1.14.2 Material Menu Screen

The material menu screen is displayed when <Cutting conditions> is selected from the <Data bank menu> screen.



1.14.2.1 Description of screen display

Position	Name	Description
1	Material menu	Displays the menu for setting the cutting conditions.

1.14.2.2 Description of screen operation

1. Description of function key operations

Column	Position	Label	Description
1	(1)	<Data bank menu>	Changes to the <Data bank menu> screen.
	(2)		
	(3)		
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

2. Description of data bank menu operations
   - Tap on an item to change to the screen for that item.
   - Press the **[ENT]** key to change to the screen for the item selected with the cursor.
   - An item can be selected with the cursor keys (up and down).
   - After entering a number for an item, press the **[ENT]** key to change to the screen for that number.

1.14.3 Cutting Conditions Edit Screen

When the workpiece material is selected from the <Material menu> screen, the cutting conditions edit screen for that material is displayed.
There are 3 different screens for editing the cutting conditions.

Screen	Description
<Cutting condition 1(boring tool)>	Sets the tool type and cutting conditions for drilling.
<Cutting condition 2(milling tool)>	Sets the tool type and cutting conditions for milling.
<Cutting condition 3(w/o tools)>	Sets other conditions besides the tool conditions.

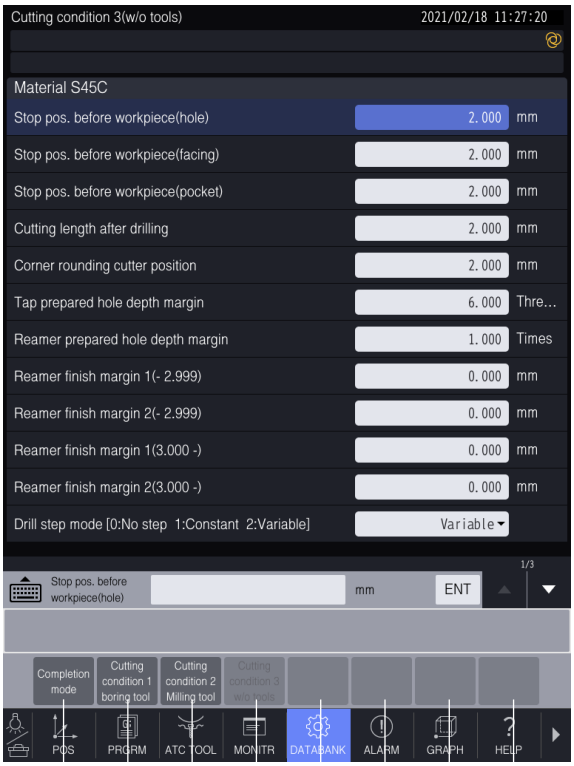
Ex: Material S45C
<Cutting condition 1(boring tool)> screen

<Cutting condition 2(milling tool)> screen

1

(1) (2) (3) (4) (5) (6) (7) (8)

<Cutting condition 3(w/o tools)> screen



1

(1) (2) (3) (4) (5) (6) (7) (8)

1.14.3.1 Description of screen display

<Cutting condition 1(boring tool)> screen

Position	Name	Description
1	Cutting conditions list	Displays the cutting conditions that are set to cutting condition 1 (boring tool).

<Cutting condition 2(milling tool)> screen

Position	Name	Description
1	Cutting conditions list	Displays the cutting conditions that are set to cutting condition 2 (milling tool).

<Cutting condition 3(w/o tools)> screen

Position	Name	Description
1	Cutting conditions list	Displays the cutting conditions that are set to cutting condition 3 (w/o tools).

1.14.3.2 Description of screen operation

1. Description of function key operations
   The <Previous tool> and <Next tool> keys do not display on <Cutting condition 3(w/o tools)>.

Column	Position	Label	Description
1	(1)	<Completion mode>	Changes to the edit end confirmation screen.
	(2)	<Cutting condition 1 boring tool>	Displays the <Cutting condition 1(boring tool)> screen.
	(3)	<Cutting condition 2 Milling tool>	Displays the <Cutting condition 2(milling tool)> screen.
	(4)	<Cutting condition 3 w/o tools>	Displays the <Cutting condition 3(w/o tools)> screen.
	(5)	<Previous tool>	Moves the cursor to the previous tool that was set.
	(6)	<Next tool>	Moves the cursor to the next tool that was set.
	(7)		
	(8)		

2. Description of edit operations for cutting conditions
   - Refer to “1.15.5 List of settings and default values for cutting conditions” for details on the editing items.
   - Tap on an editing item to move the cursor to that item and edit it.
   - Press the **[ENT]** key to edit an item where the cursor is.
   - When a set value is entered and the **[ENT]** key is pressed, the item is overwritten where the cursor is.
   - Press the **[DEL]** key to delete the set value where the cursor is.

3. Register tools with auxiliary code
   The user can assign an auxiliary code (1 to 9) to a tool that is registered on the <Cutting condition 1(boring tool)> and <Cutting condition 2(milling tool)> screens.
   When there are tools that are the same, the user can restrict the tools that are used by assigning an auxiliary code beforehand.
   When specifying tool types, assign an auxiliary code (from **[1]** to **[9]** with a hyphen **[-]**) at the end of the type number. After pressing the **[ENT]** key, the auxiliary code is added to the end of the tool type.

   Any tool with an auxiliary code can be linked to other tools with an auxiliary code that are set on the tool list screen.
   Refer to “1.11 Tool list (conversation)” for further details.

1.14.4 Edit End Confirmation Screen

The user selects whether to save or discard the cutting conditions that were changed.
When the <Completion mode> key is selected from the cutting conditions edit screen, the following screen appears.
Ex: Edit end confirmation screen for <Cutting condition 1(boring tool)>

1.14.4.1 Description of screen operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Save and end>	Saves the edited content up until now and then exits. Goes back to the <Material menu> screen.
	(2)		
	(3)		
	(4)	<Cancel w/o saving changes>	Discards the edited content up until now. Goes back to the <Material menu> screen.
	(5)		
	(6)		
	(7)	<Overwrite save>	Overwrites and saves the edited content up until now to a file, and then goes back to the previous screen.
	(8)	<Edit mode>	Returns to editing.

1.15 Default Value

1.15.1 List of Default Values for User Parameter

1.15.1.1 Metric (W1000Xd1,R450Xd1,R650Xd1,R650Xd1_40MG)

User Parameter 1 (Switch 1): Common

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
010001	Select mode	0			
010002	Display home screen at power ON	0			
010003	Machine No.	0			
010004	Table load weight	300	240	400	400
010005	Adjust tracking accuracy by load weight	1			
010006	Override switch	1			
010007	Alarm display when override is valid	1			
010008	Prevent rapid traverse override	0			
010009	Prevent cutting feedrate override	0			
010010	Prevent spindle override	0			
010011	Tap override	0			
010012	Thread cutting override	0			
010013	Stop using feedrate override during rapid feed	0			
010014	Pallet select key change	1			
010015	Lock shift key	0			
010016	4th row display axis	1			
010017	5th row display axis	2			
010018	6th row display axis	3			
010019	7th row display axis	4			
010020	8th row display axis	5			
010021	9th row display axis	6			
010022	10th row display axis	7			
010023	11th row display axis	8			
010024	12th row display axis	9			
010025	XYZ-axis absolute coord. display	2			
010026	Display coordinates during rotational transformation	0			
010027	Macro variable 1 for position screen display				
010028	Macro variable 2 for position screen display				
010029	Macro variable 3 for position screen display				
010030	Macro variable 4 for position screen display				
010031	Macro variable 5 for position screen display				
010032	Automatic screen dimming time	0			
010033	Alarm display when screen is dimmed	0			
010034	Automatic machine light off time	0			
010035	Standby mode time	0			
010036	Auto power off	0			
010037	Auto power off time	0			
010038	Cycle time calculation method	0			
010039	Screenshot	2			
010040	Motor insulation resistance measurement interval	0			
010041	Motor insulation resistance monitoring acceptable value (abnormal)	1.1			
010042	Motor insulation resistance monitoring acceptable value (alarm)	5.0			
010043	Notice of light load weight	0			
010044	Alarm stop level for shifted stop on ext. add. Axis	0			
010045	Specified function restriction	0			

User Parameter 1 (Switch 1): Operating

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
010501	Select memory operation	0			
010502	Dry run offset amount	0.0			
010503	Dry run offset amount lower limit	0.0			
010504	Repeat	0			
010505	Workpiece counter when program is repeated	0			
010506	Tool life management when program is repeated	0			
010507	Program restart	0			
010508	S.T.M. return	1			
010509	Prevent restart from middle of program	0			
010510	Spindle return method for program stop	0			
010511	Lathe spindle return method for program stop	0			
010512	Coolant return method for program stop	0			
010513	Spindle rotation return during restart	1			
010514	Block No. display color	4			
010515	Pointer display color	3			
010516	Spare tool change	0			
010517	Check tool life on first use	1			
010518	Check before coolant pump start	1			
010519	Check before chip shower start	0			
010520	Shift method used in external workpiece coordinate system	0			

User Parameter 1 (Switch 1): programming

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
011001	Program unit	0			
011002	Program feed rate unit	0			
011003	Positioning method	0			
011004	Max. actual cutting travel speed (linear axis)	20000.0			
011005	Max. actual cutting travel speed (rotation axis)	33.3			
011006	Rotation axis speed command type	0			
011007	Standard circle radius	0.0			
011008	Arc radius error limit	0.0			
011009	Arc radius R command error limit	0.001			
011010	Scaling	0			
011011	X-axis scaling	0			
011012	Y-axis scaling	0			
011013	Z-axis scaling	0			
011014	Scaling unit	0			
011015	Common scaling factor	1000			
011016	X-axis scaling factor(I)	1000			
011017	Y-axis scaling factor(J)	1000			
011018	Z-axis scaling factor(K)	1000			
011019	Macro command single stop	0			
011020	Interrupt macro interrupt type	0			
011021	Interrupt macro call type	0			
011022	Interrupt macro acceptance type	0			
011023	Multiple M codes in one block	1			
011024	Unregistered M-code	0			
011025	One shot signal M450 output time	5			
011026	One shot signal M451 output time	5			
011027	One shot signal M455 output time	5			
011028	One shot signal M456 output time	5			
011029	External signal reading time limit	0			
011030	External signal output time when MFIN is invalid	5			
011031	M function signal output delay time	1			
011032	Finish axis travel during external signal output	0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
011033	Tool data spindle rotation exceeded	0			
011034	Macro call method (Address L)	0			
011035	Sub program folder selection 1	1			
011036	Sub program folder designation 1				
011037	Sub program folder selection 2	1			
011038	Sub program folder designation 2				
011039	Sub program folder selection 3	1			
011040	Sub program folder designation 3				
011041	Measurement setting 1	1	3	3	3
011042	Measurement setting 2	0			
011043	Measurement setting 3	0			
011044	Measurement setting 4	0			
011045	Measurement setting 90	1			
011046	Measurement setting (Q omitted)	0			
011047	Cutting speed exceeded for inverse time feed	0			
011048	Z-axis perimeter function	0			
011049	Upper limit for Z-axis perimeter coasting distance	5.0			

User Parameter 1 (Switch 1): Compensation function

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
011501	X/Y/Z-axis travel at tool length/tool pos. offset change	0			
011502	Error check when traveling during tool length/tool position offset cancel	0			
011503	Start up/Cancel	0			
011504	Corner travel limit	0.0			
011505	Automatic corner override(angle)	0.0			
011506	Automatic corner override(length 1)	0.0			
011507	Automatic corner override(length 2)	0.0			
011508	Automatic corner override(ratio)	100			
011509	Inner arc override limit	100			
011510	Cutter compensation interference check	0			
011511	Number of blocks to check cutter compensation interference	8			
011512	Involute interpolation override limit	0			
011513	Involute interpolation error limit	0.1			
011514	Table deflection compensation function	0			
011515	Standard weight for table deflection compensation	0			
011516	Standard height for table deflection compensation	230.0 (Standard) 380.0 (High column150) 480.0 (High column250) 580.0 (High column350)	252.5 (Standard) 332.5 (Low)	302.5 (Standard) 402.5 (Low)	367.5 (Standard) 467.5 (Low)
011517	Center gravity correction in table deflection compen.	0.0			
011518	Overwrite table deflection compensation	100			
011519	Error detect if no intersect for inner dia. compens.	0	1	1	1

User Parameter 1 (Switch 1): Canned cycle

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
012001	G73 relief amount	0.5			
012002	G83 cutting start position	0.5			
012003	G77,G78 relief amount	1.0			
012004	G76,G87 shift direction	0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
012005	Tapping cycle return speed	0			
012006	Tapping sync. error too big - alarm stop level	0			
012007	Tap acceleration setting	1 (10K) 1 (10K(High torque)) 1 (16K)	1 (10K) 1 (10K(High torque)) 1 (16K)	1 (10K) 1 (10K(High torque)) 1 (16K)	1 (10K) 1 (10K(High torque)) 1 (16K)
012008	Automatically use S command when changing tool	0			
012009	Automatically use F command when changing tool	0			
012010	Lathe machining infeed direction when power is turned ON	0			
012011	Cutting amount in thread cutting cycle	1.5			
012012	Cutting angle in thread cutting cycle	45.0			
012013	Thread angle in complex thread cutting cycle	60.0			
012014	Minimum infeed amount in complex thread cutting cycle	0.05			
012015	Finishing count in complex thread cutting cycle	1			
012016	Finishing allowance in complex thread cutting cycle	0.025			

User Parameter 1 (Switch 1): Data

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
012501	ALM2 signal stop level	0			
012502	Cancel editing when resetting	1			
012503	Save when mode of current program is changed	0			
012504	Program edit start position during operation	0			
012505	Automatic sequence insertion increment	10			
012506	Set the same program for edit/memory operation programs	0			
012507	Automatic tool length compensation	0.0			
012508	Tool life counting method	0			
012509	Change tool life display(Type2)	0			
012510	Tool life unit (program)	0			
012511	Execute automatic data backup	1			
012512	Save location for automatic data backup	0			
012513	Automatic data backup interval	0			
012514	Automatic data backup time	0			
012515	Manual output	0			

User Parameter 1 (Switch 1): MANU

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
013001	Initial mode	0			
013002	Change handle magnification	1			
013003	Auto screen change at additional/PLC axis handle operation	0			
013004	Z-axis height to prohibit travel of additional axes	0.0			
013005	Z-axis height to prohibit travel of additional axes(pallet 2)	0.0			
013006	Prevent external operation for additional axes	0			
013007	Max. tapping speed (when returning tap)	100			
013008	XY axes movement when changing tool in manual mode	0	1	1	0

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
013009	X-axis position when changing tool in manual mode	0.0	-450.0 (14tools) 0.0 (22tools) 0.0 (28tools)	-650.0	0.0
013010	Y-axis position when changing tool in manual mode	0.0	-320.0 (14tools) 0.0 (22tools) -200.0 (28tools)	-200.0 (14tools) -200.0 (22tools) -400.0 (28tools)	0.0

User Parameter 1 (Switch 1): Conv Ex

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
013501	Schedule program reset start position	0			
013502	Program end stop in schedule program	0			
013503	Tool assignment at memory operation start	1			
013504	Check tools used at automatic tool assignment	1			
013505	Workpiece zero conversion code	0			
013506	Convert tool data	1			
013507	Tap step return position	0			

User Parameter 1 (Switch 1): ATC/Magazine

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
014001	Tool wash discharge conditions for tool data	0	0	0	1
014002	No tool detection function	0			
014003	Tool over key detection function	0			
014004	Tool missing detection function	0			
014005	Maximum tool specification settings	0			
014006	Z-axis travel method during tool change	0			
014007	Turret type magazine low-speed turn mode	0			
014008	Speed turret type magazine turns at low speed	20.0			
014009	Z-axis lowering speed 1 when changing tool	35000.0	35000.0	35000.0	50000.0
014010	Z-axis lowering speed 2 when changing tool	35000.0	35000.0	35000.0	50000.0
014011	Z-axis lowering speed 3 when changing tool	35000.0	35000.0	35000.0	50000.0
014012	ATC arm turn speed ratio 1 (M422)	100	100	100	80
014013	ATC arm turn speed ratio 2 (M423)	100	100	100	50
014014	ATC simultaneous operation start position	480.0 (Standard) 630.0 (High column150) 730.0 (High column250) 830.0 (High column350)	505.0 (Standard) 585.0 (Low)	555.0 (Standard) 655.0 (Low)	435.0 (Standard) 535.0 (Low)
014015	ATC reference tool length	200.0	200.0	200.0	250.0
014016	Tool wash when changing a different size tool	0			
014017	Magazine turn speed ratio 1(M436)	80			
014018	Magazine turn speed ratio 2(M437)	50			
014019	Magazine index when changing tools of different sizes	0			
014020	Pot lowering start position	0.0			

User Parameter 1 (Switch 1): installation

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
014501	Chip shower retention time	0			
014502	Automatic coolant off time	10			
014503	Coolant delay time	0			
014504	Back washing at end of program	1			
014505	CTS pressurize check delay time	1.0			
014506	CTS depressurize check delay time	1.0			
014507	CTS pressure bleed time	0.0			
014508	CTS line filter alarm stop level	1			
014509	Tool wash filter alarm stop level	0			
014510	Tool wash filter check interval	1			
014511	Display tool wash filter check result	0			
014512	Stop level for low tool wash level alarm (Type 4)	1			
014513	Tool wash filter clogging warning alarm stop level(Type4)	0			
014514	No. of tool wash filter clogging warning checks(Type4)	1			
014515	Faulty tool wash coolant level sensor check interval(Type4)	200			
014516	Lamp status when count ends	0			
014517	Oiling/greasing when power is turned on	0			
014518	Chip conveyor relay adhering check	0			
014519	Internal light key display	1			
014520	Table light key display	0	1	1	1
014521	PLC rapid traverse override function	0			
014522	PLC feedrate override function	0			
014523	PLC spindle override function	0			
014524	**[MASTER ON]** function	0			
014525	Reset when **[MASTER ON]** is ON	0			
014526	**[MASTER ON]** circuit selection	0			
014527	**[MASTER ON]** external emergency stop alarm (in NC)	0			
014528	Time extension when coolant level has dropped	0			

User Parameter 1 (Switch 1): Brake load test

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
015001	Auto execution of brake load test at mem. op start	0			
015002	Brake load test start time 1	0			
015003	Brake load test start time 2				
015004	Brake load test start time 3				
015005	Brake load test start time 4				
015006	Adjust start time for brake load test	0			
015007	Time extension for brake load test execution	0			
015008	Brake load test start position on Z-axis	1			
015009	Specified position for brake load test on Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250) 830.0 (High column350)	505.0 (Standard) 585.0 (Low)	555.0 (Standard) 655.0 (Low)	685.0 (Standard) 785.0 (Low)
015010	Brake load test start position on 5th-axis	1			
015011	Brake load test start position on 6th-axis	1			
015012	Brake load test start position on 7th-axis	1			
015013	Brake load test start position on 8th-axis	1			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
015014	Specified angle for brake load test on 5th-axis	0.0			
015015	Specified angle for brake load test on 6th-axis	0.0			
015016	Specified angle for brake load test on 7th-axis	0.0			
015017	Specified angle for brake load test on 8th-axis	0.0			
015018	Order for brake load test execution on 5th-axis	0			
015019	Order for brake load test execution on 6th-axis	0			
015020	Order for brake load test execution on 7th-axis	0			
015021	Order for brake load test execution on 8th-axis	0			
015022	Move XY-ax. to safe pos. for brake load test on addt'l. ax.	0			
015023	Safe pos. for X-ax. during brake load test on addt'l. axis	0.0			
015024	Safe pos. for Y-ax. during brake load test on addt'l. axis	0.0			
015025	Order for brake load test execution on P1-axis	0			
015026	Order for brake load test execution on P2-axis	0			
015027	Order for brake load test execution on P3-axis	0			
015028	Order for brake load test execution on P4-axis	0			

User Parameter 1 (Switch 1): Door

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
015501	Area sensor pattern	1			
015502	Automatic door error level	1			
015503	START lamp status when operating automatic door manually	0			
015504	Display alarm when door is open – Front door/Outer door	0			
015505	Display alarm when door is open – Left side door	0			
015506	Display alarm when door is open – Right side door	0			
015507	Display alarm when door is open – Inner door	0			
015508	Display alarm when door is open – Setup chamber left door	0			
015509	Display alarm when door is open – Setup chamber right door	0			
015510	Display alarm when door is open – Outside door 1	0			
015511	Display alarm when door is open – Outside door 2	0			
015512	Display alarm when door is open – Magazine door	0			
015513	Display alarm when door is open – Magazine shutter	0			
015514	Door lock method	1			
015515	Door to replace workpiece - Front door/outer door	1			
015516	Door to replace workpiece - Left side door	0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
015517	Door to replace workpiece - Right side door	0			
015518	Door to replace workpiece - Inner door	0			
015519	Door to replace workpiece - Setup chamber left door	0			
015520	Door to replace workpiece - Setup chamber right door	0			
015521	Door to replace workpiece - Outside door 1	0			
015522	Door to replace workpiece - Outside door 2	0			
015523	Door to replace workpiece - Magazine door	0			
015524	Tool change door settings	0			
015525	Door unlock1 key display	1			
015526	Door unlock2 key display	0	1	1	1
015527	Door unlock key setting - Front door/outer door	1			
015528	Door unlock key setting - Left side door	0	0	2	2
015529	Door unlock key setting - Right side door	0	2	0	0
015530	Door unlock key setting - Inner door	0			
015531	Door unlock key setting - Setup chamber left door	0			
015532	Door unlock key setting - Setup chamber right door	0			
015533	Door unlock key setting - Outside door 1	0			
015534	Door unlock key setting - Outside door 2	0			
015535	Door unlock key setting - Magazine door	0			
015536	Door unlock signal setting - Front door/outer door	0			
015537	Door unlock signal setting - Left side door	0			
015538	Door unlock signal setting - Right side door	0			
015539	Door unlock signal setting - Inner door	0			
015540	Door unlock signal setting - Setup chamber left door	0			
015541	Door unlock signal setting - Setup chamber right door	0			
015542	Door unlock signal setting - Outside door 1	0			
015543	Door unlock signal setting - Outside door 2	0			
015544	Door unlock signal setting - Magazine door	0			
015545	Operation mode with door unlock key enabled	0			
015546	Door unlocks when power turns ON	0			
015547	Door unlocks when program stops	0			
015548	Door unlocks at end of operation	0			
015549	Door unlocks when single operation stops	2			
015550	Door unlocks at an alarm stop	0			
015551	Door unlocks after magazine turn	0			

User Parameter 2 (Switch 2): Stroke

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
020001	5th-axis stroke control	0			
020002	6th-axis stroke control	0			
020003	7th-axis stroke control	0			
020004	8th-axis stroke control	0			
020005	5th-axis stroke(-)	0.0			
020006	6th-axis stroke(-)	0.0			
020007	7th-axis stroke(-)	0.0			
020008	8th-axis stroke(-)	0.0			
020009	5th-axis stroke(+)	0.0			
020010	6th-axis stroke(+)	0.0			
020011	7th-axis stroke(+)	0.0			
020012	8th-axis stroke(+)	0.0			
020013	Stroke limit 1 for X-axis(-)	-1000.0	-450.0	-650.0	-650.0

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
020014	Stroke limit 1 for Y-axis(-)	-500.0	-320.0	-400.0	-400.0
020015	Stroke limit 1 for Z-axis(-)	0.0			
020016	Stroke limit 1 for 5th-axis(-)	0.0			
020017	Stroke limit 1 for 6th-axis(-)	0.0			
020018	Stroke limit 1 for 7th-axis(-)	0.0			
020019	Stroke limit 1 for 8th-axis(-)	0.0			
020020	Stroke limit 1 for X-axis(+)	0.0			
020021	Stroke limit 1 for Y-axis(+)	0.0			
020022	Stroke limit 1 for Z-axis(+)	480.0 (Standard) 630.0 (High column150) 730.0 (High column250) 830.0 (High column350)	505.0 (Standard) 585.0 (Low)	555.0 (Standard) 655.0 (Low)	685.0 (Standard) 785.0 (Low)
020023	Stroke limit 1 for 5th-axis(+)	0.0			
020024	Stroke limit 1 for 6th-axis(+)	0.0			
020025	Stroke limit 1 for 7th-axis(+)	0.0			
020026	Stroke limit 1 for 8th-axis(+)	0.0			
020027	Stroke limit 2 for X-axis(-)	0.0			
020028	Stroke limit 2 for Y-axis(-)	0.0			
020029	Stroke limit 2 for Z-axis(-)	0.0			
020030	Stroke limit 2 for X-axis(+)	0.0			
020031	Stroke limit 2 for Y-axis(+)	0.0			
020032	Stroke limit 2 for Z-axis(+)	0.0			

User Parameter 2 (Switch 2): Override speed

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
020501	Rapid traverse override speed 1	0.0			
020502	Rapid traverse override speed 2	500.0			
020503	Rapid traverse override speed 3	5000.0			
020504	Rapid traverse override speed 4	10000.0			
020505	4th-axis override rotation speed 1	0.0			
020506	4th-axis override rotation speed 2	0.3			
020507	4th-axis override rotation speed 3	2.5			
020508	4th-axis override rotation speed 4	5.0			
020509	5th-axis override rotation speed 1	0.0			
020510	5th-axis override rotation speed 2	0.5			
020511	5th-axis override rotation speed 3	5.0			
020512	5th-axis override rotation speed 4	10.0			
020513	6th-axis override rotation speed 1	0.0			
020514	6th-axis override rotation speed 2	0.5			
020515	6th-axis override rotation speed 3	5.0			
020516	6th-axis override rotation speed 4	10.0			
020517	7th-axis override rotation speed 1	0.0			
020518	7th-axis override rotation speed 2	0.5			
020519	7th-axis override rotation speed 3	5.0			
020520	7th-axis override rotation speed 4	10.0			
020521	8th-axis override rotation speed 1	0.0			
020522	8th-axis override rotation speed 2	0.5			
020523	8th-axis override rotation speed 3	5.0			
020524	8th-axis override rotation speed 4	10.0			

User Parameter 2 (Switch 2): Output signal range for position signal

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
021001	X-axis position signal output range(-)	0.0			
021002	X-axis position signal output range(+)	0.0			
021003	Y-axis position signal output range(-)	0.0			
021004	Y-axis position signal output range(+)	0.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
021005	Z-axis position signal output range(-)	0.0			
021006	Z-axis position signal output range(+)	0.0			
021007	4th-axis position signal output range(-)	0.0			
021008	4th-axis position signal output range(+)	0.0			
021009	5th-axis position signal output range(-)	0.0			
021010	5th-axis position signal output range(+)	0.0			
021011	6th-axis position signal output range(-)	0.0			
021012	6th-axis position signal output range(+)	0.0			
021013	7th-axis position signal output range(-)	0.0			
021014	7th-axis position signal output range(+)	0.0			
021015	8th-axis position signal output range(-)	0.0			
021016	8th-axis position signal output range(+)	0.0			
021017	X-axis position signal output range 2 (-)	0.0			
021018	X-axis position signal output range 2 (+)	0.0			
021019	Y-axis position signal output range 2 (-)	0.0			
021020	Y-axis position signal output range 2 (+)	0.0			
021021	Z-axis position signal output range 2 (-)	0.0			
021022	Z-axis position signal output range 2 (+)	0.0			
021023	4-axis position signal output range 2 (-)	0.0			
021024	4-axis position signal output range 2 (+)	0.0			
021025	5-axis position signal output range 2 (-)	0.0			
021026	5-axis position signal output range 2 (+)	0.0			
021027	6-axis position signal output range 2 (-)	0.0			
021028	6-axis position signal output range 2 (+)	0.0			
021029	7-axis position signal output range 2 (-)	0.0			
021030	7-axis position signal output range 2 (+)	0.0			
021031	8-axis position signal output range 2 (-)	0.0			
021032	8-axis position signal output range 2 (+)	0.0			
021033	X-axis position signal output range 3 (-)	0.0			
021034	X-axis position signal output range 3 (+)	0.0			
021035	Y-axis position signal output range 3 (-)	0.0			
021036	Y-axis position signal output range 3 (+)	0.0			
021037	Z-axis position signal output range 3 (-)	0.0			
021038	Z-axis position signal output range 3 (+)	0.0			
021039	4-axis position signal output range 3 (-)	0.0			
021040	4-axis position signal output range 3 (+)	0.0			
021041	5-axis position signal output range 3 (-)	0.0			
021042	5-axis position signal output range 3 (+)	0.0			
021043	6-axis position signal output range 3 (-)	0.0			
021044	6-axis position signal output range 3 (+)	0.0			
021045	7-axis position signal output range 3 (-)	0.0			
021046	7-axis position signal output range 3 (+)	0.0			
021047	8-axis position signal output range 3 (-)	0.0			
021048	8-axis position signal output range 3 (+)	0.0			
021049	X-axis position signal output range 4 (-)	0.0			
021050	X-axis position signal output range 4 (+)	0.0			
021051	Y-axis position signal output range 4 (-)	0.0			
021052	Y-axis position signal output range 4 (+)	0.0			
021053	Z-axis position signal output range 4 (-)	0.0			
021054	Z-axis position signal output range 4 (+)	0.0			
021055	4-axis position signal output range 4 (-)	0.0			
021056	4-axis position signal output range 4 (+)	0.0			
021057	5-axis position signal output range 4 (-)	0.0			
021058	5-axis position signal output range 4 (+)	0.0			
021059	6-axis position signal output range 4 (-)	0.0			
021060	6-axis position signal output range 4 (+)	0.0			
021061	7-axis position signal output range 4 (-)	0.0			
021062	7-axis position signal output range 4 (+)	0.0			
021063	8-axis position signal output range 4 (-)	0.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
021064	8-axis position signal output range 4 (+)	0.0			

User Parameter 2 (Switch 2): Excess travel amount for single direction positioning

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
021501	X-axis single direction positioning excess travel amount	0.0			
021502	Y-axis single direction positioning excess travel amount	0.0			
021503	Z-axis single direction positioning excess travel amount	0.0			
021504	5th-axis single direction positioning excess travel amount	0.0			
021505	6th-axis single direction positioning excess travel amount	0.0			
021506	7th-axis single direction positioning excess travel amount	0.0			
021507	8th-axis single direction positioning excess travel amount	0.0			

User Parameter 2 (Switch 2): External index

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
022001	Outer rotary table 1 switch address	0			
022002	Outer rotary table 1 indexing (+)	180.0			
022003	Outer rotary table 1 indexing (-)	-180.0			
022004	Outer rotary table 2 switch address	0	1	1	1
022005	Outer rotary table 2 indexing (+)	180.0			
022006	Outer rotary table 2 indexing (-)	-180.0			

User Parameter 3 (Switch 3): In-position check distance

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
030001	M271 positioning end check distance	0.3			
030002	M271 positioning end check angle	0.3			
030003	M271 in-position width (X-, Y- and Z-axes)	0.02			
030004	M272 positioning end check distance	0.3			
030005	M272 positioning end check angle	0.3			
030006	M272 in-position width (X-, Y- and Z-axes)	0.025			
030007	M273 positioning end check distance	0.3			
030008	M273 positioning end check angle	0.3			
030009	M273 in-position width (X-, Y- and Z-axes)	0.03			
030010	M274 positioning end check distance	0.3			
030011	M274 positioning end check angle	0.3			
030012	M274 in-position width (X-, Y- and Z-axes)	0.035			
030013	M275 positioning end check distance	0.3			
030014	M275 positioning end check angle	0.3			
030015	M275 in-position width (X-, Y- and Z-axes)	0.04			
030016	M276 positioning end check distance	0.3			
030017	M276 positioning end check angle	0.3			
030018	M276 in-position width (X-, Y- and Z-axes)	0.045			
030019	M277 positioning end check distance	0.3			
030020	M277 positioning end check angle	0.3			
030021	M277 in-position width (X-, Y- and Z-axes)	0.05			
030022	M278 positioning end check distance	0.3			
030023	M278 positioning end check angle	0.3			
030024	M278 in-position width (X-, Y- and Z-axes)	0.055			
030025	M279 positioning end check distance	0.3			
030026	M279 positioning end check angle	0.3			
030027	M279 in-position width (X-, Y- and Z-axes)	0.06			
030028	Angle setting to check when additional axis for positioning is finished	0			
030029	Initial modal for in-position check distance	0			

User Parameter 3 (Switch 3): Low priority indication alarm No.

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
030501	Low priority indication alarm No. 1				
030502	Low priority indication alarm No. 2				
030503	Low priority indication alarm No. 3				
030504	Low priority indication alarm No. 4				
030505	Low priority indication alarm No. 5				
030506	Low priority indication alarm No. 6				
030507	Low priority indication alarm No. 7				
030508	Low priority indication alarm No. 8				
030509	Low priority indication alarm No. 9				
030510	Low priority indication alarm No. 10				

User Parameter 3 (Switch 3): Modal display setting

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
031001	G code for modal display 1	1			
031002	G code for modal display 2	2			
031003	G code for modal display 3	3			
031004	G code for modal display 4	4			
031005	G code for modal display 5	5			
031006	G code for modal display 6	6			
031007	G code for modal display 7	7			
031008	G code for modal display 8	10			
031009	G code for modal display 9	8			
031010	G code for modal display 10	11			
031011	G code for modal display 11	12			
031012	G code for modal display 12	13			
031013	G code for modal display 13	14			
031014	G code for modal display 14	15			
031015	G code for modal display 15	16			
031016	G code for modal display 16	17			
031017	M code for modal display 1	1			
031018	M code for modal display 2	2			
031019	M code for modal display 3	3			
031020	M code for modal display 4	4			
031021	M code for modal display 5	5			
031022	M code for modal display 6	6			
031023	M code for modal display 7	7			
031024	M code for modal display 8	8			
031025	M code for modal display 9	9			
031026	M code for modal display 10	11			
031027	M code for modal display 11	12			
031028	M code for modal display 12	14			
031029	M code for modal display 13	16			
031030	M code for modal display 14	31			
031031	M code for modal display 15	0			
031032	M code for modal display 16	0			

User Parameter 3 (Switch 3): Specified alarm signal setting

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
031501	Specified alarm signal 2				
031502	Specified alarm signal 3				
031503	Specified alarm signal 4				
031504	Specified alarm signal 5				

User Parameter 4 (Reference position/Conversation zero point)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
040001	Reference position X-axis	0.0			
040002	Reference position Y-axis	0.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
040003	Reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250) 830.0 (High column350)	505.0 (Standard) 585.0 (Low)	555.0 (Standard) 655.0 (Low)	685.0 (Standard) 785.0 (Low)
040004	Reference position 5th-axis	0.0			
040005	Reference position 6th-axis	0.0			
040006	Reference position 7th-axis	0.0			
040007	Reference position 8th-axis	0.0			
040008	2nd reference position X-axis	0.0			
040009	2nd reference position Y-axis	0.0			
040010	2nd reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250) 830.0 (High column350)	505.0 (Standard) 585.0 (Low)	555.0 (Standard) 655.0 (Low)	685.0 (Standard) 785.0 (Low)
040011	2nd reference position 5th-axis	0.0			
040012	2nd reference position 6th-axis	0.0			
040013	2nd reference position 7th-axis	0.0			
040014	2nd reference position 8th-axis	0.0			
040015	3rd reference position X-axis	0.0			
040016	3rd reference position Y-axis	0.0			
040017	3rd reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250) 830.0 (High column350)	505.0 (Standard) 585.0 (Low)	555.0 (Standard) 655.0 (Low)	685.0 (Standard) 785.0 (Low)
040018	3rd reference position 5th-axis	0.0			
040019	3rd reference position 6th-axis	0.0			
040020	3rd reference position 7th-axis	0.0			
040021	3rd reference position 8th-axis	0.0			
040022	4th reference position X-axis	0.0			
040023	4th reference position Y-axis	0.0			
040024	4th reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250) 830.0 (High column350)	505.0 (Standard) 585.0 (Low)	555.0 (Standard) 655.0 (Low)	685.0 (Standard) 785.0 (Low)
040025	4th reference position 5th-axis	0.0			
040026	4th reference position 6th-axis	0.0			
040027	4th reference position 7th-axis	0.0			
040028	4th reference position 8th-axis	0.0			
040029	5th reference position X-axis	0.0			
040030	5th reference position Y-axis	0.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
040031	5th reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250) 830.0 (High column350)	505.0 (Standard) 585.0 (Low)	555.0 (Standard) 655.0 (Low)	685.0 (Standard) 785.0 (Low)
040032	5th reference position 5th-axis	0.0			
040033	5th reference position 6th-axis	0.0			
040034	5th reference position 7th-axis	0.0			
040035	5th reference position 8th-axis	0.0			
040036	6th reference position X-axis	0.0			
040037	6th reference position Y-axis	0.0			
040038	6th reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250) 830.0 (High column350)	505.0 (Standard) 585.0 (Low)	555.0 (Standard) 655.0 (Low)	685.0 (Standard) 785.0 (Low)
040039	6th reference position 5th-axis	0.0			
040040	6th reference position 6th-axis	0.0			
040041	6th reference position 7th-axis	0.0			
040042	6th reference position 8th-axis	0.0			
040043	Reference point return complete signal output at servo off	0			
040044	Reference point allowable range at servo off (for XYZ axes)	0.0			
040045	Reference point allowable range at servo off (for additional axes)	0.0			
040046	X-axis zero return pos.(No.2)	0.0			
040047	Y-axis zero return pos.(No.2)	0.0			
040048	5th-axis zero return pos.(No.2)	0.0			
040049	6th-axis zero return pos.(No.2)	0.0			
040050	7th-axis zero return pos.(No.2)	0.0			
040051	8th-axis zero return pos.(No.2)	0.0			
040052	X-axis zero return pos.(No.3)	0.0			
040053	Y-axis zero return pos.(No.3)	0.0			
040054	5th-axis zero return pos.(No.3)	0.0			
040055	6th-axis zero return pos.(No.3)	0.0			
040056	7th-axis zero return pos.(No.3)	0.0			
040057	8th-axis zero return pos.(No.3)	0.0			
040058	Zero point return complete signal output at servo off	0			
040059	Zero point allowable range at servo off (for XYZ axes)	0.0			
040060	Zero point allowable range at servo off (for additional axes)	0.0			
040061	Workpiece coordinate zero point X axis (for capture)	0.0			
040062	Workpiece coordinate zero point Y axis (for capture)	0.0			
040063	Workpiece coordinate zero point Z axis (for capture)	0.0			

user parameter 5 (User registered miscellaneous functions)

There is not default value.

User Parameter 6 (Tool breakage detection)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
060001	Tool breakage detection option	0			
060002	Pallet 1 tool breakage detector	0			
060003	Pallet 2 tool breakage detector	0			
060004	Tool breakage detection execution interval(No. of operations)	1			
060005	Reference tool length offset No.	0			
060006	Tool breakage detection return position(Type1)	480.0 (Standard) 630.0 (High column150) 730.0 (High column250) 830.0 (High column350)	505.0 (Standard) 585.0 (Low)	555.0 (Standard) 655.0 (Low)	685.0 (Standard) 785.0 (Low)
060007	Tool breakage detection position X-axis(Type1)	0.0			
060008	Tool breakage detection position Y-axis(Type1)	0.0			
060009	Tool breakage detection offset(Type2)	0.0			
060010	Tool breakage detection position X-axis(Type3)	0.0			
060011	Tool breakage detection position Y-axis(Type3)	0.0			
060012	Tool breakage detection position Z-axis(Type3)	0.0			
060013	Tool breakage detection start distance(Type3)	2.0			
060014	Tool breakage detection stop distance(Type3)	1.0			
060015	Tool breakage detection speed(Type3)	500.0			
060016	Tool breakage detection coolant OFF(Type3)	1			
060017	Pallet 2 tool breakage detection pos. X-axis(Type3)	0.0			
060018	Pallet 2 tool breakage detection pos. Y-axis(Type3)	0.0			
060019	Pallet 2 tool breakage detection pos. Z-axis(Type3)	0.0			
060020	Pallet 2 tool breakage detection start distance(Type3)	2.0			
060021	Pallet 2 tool breakage detection stop distance(Type3)	1.0			
060022	Pallet 2 tool breakage detection speed(Type3)	500.0			
060023	Pallet 2 tool breakage detection coolant OFF(Type3)	1			
060024	Check location measurement setting for tool breakage detection	0			

User Parameter 7 (Automatic workpiece measurement)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
070001	Probe compensation X (corner)	0.0			
070002	Probe compensation Y (corner)	0.0			
070003	Probe compensation X (3-point circle)	0.0			
070004	Probe compensation Y (3-point circle)	0.0			
070005	Probe compensation Z (Workpiece top surface)	0.0			
070006	Automatic workpiece measurement motion	0			
070007	Automatic workpiece measurement speed 1	500.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
070008	Automatic workpiece measurement speed 2	100.0			
070009	Stop point before automatic workpiece measurement	5.0			
070010	Travel limit distance in automatic workpiece measurement	2.0			
070011	Tolerance 1 for automatic workpiece measurement	0.0			
070012	Tolerance 2 for automatic workpiece measurement	0.0			
070013	Return stroke after automatic workpiece measurement	1.0			
070014	Automatic centering compensation X (corner)	0.0			
070015	Automatic centering compensation Y (corner)	0.0			
070016	Automatic centering compensation Z (Workpiece top surface)	0.0			
070017	Automatic centering speed 1	500.0			
070018	Automatic centering speed 2	10.0			
070019	Automatic centering return	0.5			
070020	Tool number used for automatic centering	99			

User Parameter 8 (Automatic thermal distortion compensation)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
080001	Z-axis compensation	100			
080002	Spindle compensation(Z-axis)	100			
080003	X-axis compensation	100			
080004	Spindle compensation(X-axis)	100			
080005	Y-axis compensation	100			
080006	Spindle compensation(Y-axis)	100			
080007	Auto. thermal distortion compen. at memory operation start	0			
080008	Lathe spindle compensation(Z-axis)	0			
080009	Lathe spindle compensation(X-axis)	0			
080010	Lathe spindle compensation(Y-axis)	0			

User Parameter 9 (Quick table)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
090001	Pallet program folder				
090002	Pallet 1 program				
090003	Pallet 2 program				
090004	Pallet program folder				
090005	Pallet 1 program				
090006	Pallet 2 program				
090007	Pallet 2 shift(X-axis)	0.0			
090008	Pallet 2 shift(Y-axis)	0.0			
090009	Pallet 2 shift(Z-axis)	0.0			
090010	Pallet 1 loading	0			
090011	Pallet 2 loading	0			
090012	Additional axis for return operation	0			

User Parameter 10 (High accuracy): Common

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
100001	Smooth path offset function	0			
100002	Smooth path offset cancel distance	10.0			
100003	Smooth path offset cancel angle	10.0			
100004	Smooth path offset angle determination invalid distance	0.01			
100005	Smooth path offset reference length	1.0			
100006	Minute block deletion when smooth path offset is cancelled	0			
100007	Accuracy level method	1			

User Parameter 10 (High accuracy): High accuracy A: M260

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101001	Corner deceleration override	120			
101002	Arc deceleration override	200			
101003	Curve approximation deceleration override	200			
101004	Smooth path offset level	1			
101005	Smooth override	100			
101006	Cutting feed time constant selection	0			
101007	Minute block deletion distance	0.0			
101008	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M261

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101101	Corner deceleration override	60			
101102	Arc deceleration override	140			
101103	Curve approximation deceleration override	140			
101104	Smooth path offset level	1			
101105	Smooth override	50			
101106	Cutting feed time constant selection	0			
101107	Minute block deletion distance	0.0			
101108	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M262

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101201	Corner deceleration override	70			
101202	Arc deceleration override	70			
101203	Curve approximation deceleration override	70			
101204	Smooth path offset level	1			
101205	Smooth override	600			
101206	Cutting feed time constant selection	0			
101207	Minute block deletion distance	0.0			
101208	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M263

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101301	Corner deceleration override	120			
101302	Arc deceleration override	200			
101303	Curve approximation deceleration override	200			
101304	Smooth path offset level	1			
101305	Smooth override	900			
101306	Cutting feed time constant selection	0			
101307	Minute block deletion distance	0.0			
101308	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M264

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101401	Corner deceleration override	120			
101402	Arc deceleration override	200			
101403	Curve approximation deceleration override	200			
101404	Smooth path offset level	1			
101405	Smooth override	2500			
101406	Cutting feed time constant selection	0			
101407	Minute block deletion distance	0.0			
101408	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M265

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101501	Corner deceleration override	600			
101502	Arc deceleration override	1000			
101503	Curve approximation deceleration override	1000			
101504	Smooth path offset level	1			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101505	Smooth override	100			
101506	Cutting feed time constant selection	0			
101507	Minute block deletion distance	0.0			
101508	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M266

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101601	Corner deceleration override	100			
101602	Arc deceleration override	100			
101603	Curve approximation deceleration override	100			
101604	Smooth path offset level	1			
101605	Smooth override	100			
101606	Cutting feed time constant selection	0			
101607	Minute block deletion distance	0.0			
101608	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M267

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101701	Corner deceleration override	100			
101702	Arc deceleration override	100			
101703	Curve approximation deceleration override	100			
101704	Smooth path offset level	1			
101705	Smooth override	100			
101706	Cutting feed time constant selection	0			
101707	Minute block deletion distance	0.0			
101708	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy B: M280

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102001	Corner deceleration override	100			
102002	Arc deceleration override	0			
102003	Curve approximation deceleration override	0			
102004	Smooth path offset level	3			
102005	Smooth override	100			
102006	Minute block deletion distance	0.01			
102007	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M281

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102101	Corner deceleration override	100			
102102	Arc deceleration override	100			
102103	Curve approximation deceleration override	100			
102104	Smooth path offset level	1			
102105	Smooth override	100			
102106	Minute block deletion distance	0.0			
102107	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M282

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102201	Corner deceleration override	100			
102202	Arc deceleration override	100			
102203	Curve approximation deceleration override	100			
102204	Smooth path offset level	1			
102205	Smooth override	100			
102206	Minute block deletion distance	0.0			
102207	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M283

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102301	Corner deceleration override	100			
102302	Arc deceleration override	100			
102303	Curve approximation deceleration override	100			
102304	Smooth path offset level	1			
102305	Smooth override	100			
102306	Minute block deletion distance	0.0			
102307	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M284

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102401	Corner deceleration override	100			
102402	Arc deceleration override	100			
102403	Curve approximation deceleration override	100			
102404	Smooth path offset level	1			
102405	Smooth override	100			
102406	Minute block deletion distance	0.0			
102407	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M285

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102501	Corner deceleration override	100			
102502	Arc deceleration override	100			
102503	Curve approximation deceleration override	100			
102504	Smooth path offset level	1			
102505	Smooth override	100			
102506	Minute block deletion distance	0.0			
102507	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M286

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102601	Corner deceleration override	100			
102602	Arc deceleration override	100			
102603	Curve approximation deceleration override	100			
102604	Smooth path offset level	1			
102605	Smooth override	100			
102606	Minute block deletion distance	0.0			
102607	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M287

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102701	Corner deceleration override	100			
102702	Arc deceleration override	100			
102703	Curve approximation deceleration override	100			
102704	Smooth path offset level	1			
102705	Smooth override	100			
102706	Minute block deletion distance	0.0			
102707	Smooth override type	0			

User Parameter 10 (High accuracy): Machining mode

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
105001	Machining mode	0			

User Parameter 10 (High accuracy): Adjustment A

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
105101	Standard mode	0			
105102	Accuracy adjustment value	0			
105103	Smoothness	0			

User Parameter 10 (High accuracy): Adjustment B

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
105201	Standard mode	0			
105202	Accuracy adjustment value	0			
105203	Smoothness	0			

User Parameter 10 (High accuracy): Adjustment C

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
105301	Standard mode	0			
105302	Accuracy adjustment value	0			
105303	Smoothness	0			

User Parameter 10 (High accuracy): Accuracy spec. mode

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
106001	Accuracy spec. mode	0			

User Parameter 10 (High accuracy): Accuracy spec. A

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
106101	Accuracy level	0.1			
106102	Smoothness	0			

User Parameter 10 (High accuracy): Accuracy spec. B

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
106201	Accuracy level	0.03			
106202	Smoothness	0			

User Parameter 10 (High accuracy): Accuracy spec. C

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
106301	Accuracy level	0.01			
106302	Smoothness	0			

User Parameter 11 (PLC)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
110001	P1-axis stroke	0			
110002	P2-axis stroke	0			
110003	P3-axis stroke	0			
110004	P4-axis stroke	0			
110005	P1-axis stroke(-)	0.0			
110006	P2-axis stroke(-)	0.0			
110007	P3-axis stroke(-)	0.0			
110008	P4-axis stroke(-)	0.0			
110009	P1-axis stroke(+)	0.0			
110010	P2-axis stroke(+)	0.0			
110011	P3-axis stroke(+)	0.0			
110012	P4-axis stroke(+)	0.0			
110013	Reference point P1-axis	0.0			
110014	Reference point P2-axis	0.0			
110015	Reference point P3-axis	0.0			
110016	Reference point P4-axis	0.0			
110017	P1-axis override speed 1	0.0			
110018	P1-axis override speed 2	500.0			
110019	P1-axis override speed 3	5000.0			
110020	P1-axis override speed 4	10000.0			
110021	P2-axis override speed 1	0.0			
110022	P2-axis override speed 2	500.0			
110023	P2-axis override speed 3	5000.0			
110024	P2-axis override speed 4	10000.0			
110025	P3-axis override speed 1	0.0			
110026	P3-axis override speed 2	500.0			
110027	P3-axis override speed 3	5000.0			
110028	P3-axis override speed 4	10000.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
110029	P4-axis override speed 1	0.0			
110030	P4-axis override speed 2	500.0			
110031	P4-axis override speed 3	5000.0			
110032	P4-axis override speed 4	10000.0			
110033	Collis. detct.-P1ax stop meth.	0			
110034	Collis. detct.-P2ax stop meth.	0			
110035	Collis. detct.-P3ax stop meth.	0			
110036	Collis. detct.-P4ax stop meth.	0			

User Parameter 12 (Rotary fixture offset)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
120001	XYZ-axes travel during current rotary fixture offset change	0			
120002	Rotary fixture offset reset method	0			
120003	Tilt axis 1	0			
120004	Rotation axis 1	0			
120005	Tilt axis 2	0			
120006	Rotation axis 2	0			
120007	Tilt axis 3	0			
120008	Rotation axis 3	0			
120009	Tilt axis 4	0			
120010	Rotation axis 4	0			
120011	Forward direction for the coordinate system on tilt axis 1	0			
120012	Forward direction for the coordinate system on rotation axis 1	0			
120013	Forward direction for the coordinate system on tilt axis 2	0			
120014	Forward direction for the coordinate system on rotation axis 2	0			
120015	Forward direction for the coordinate system on tilt axis 3	0			
120016	Forward direction for the coordinate system on rotation axis 3	0			
120017	Forward direction for the coordinate system on tilt axis 4	0			
120018	Forward direction for the coordinate system on rotation axis 4	0			

User Parameter 13 (Rotation axis / tilt axis setting)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
130001	Tilt axis 1	0			
130002	Rotation axis 1	0			
130003	Tilt axis 2	0			
130004	Rotation axis 2	0			
130005	Forward direction for the coordinate system on tilt axis 1	0			
130006	Forward direction for the coordinate system on rotation axis 1	0			
130007	Forward direction for the coordinate system on tilt axis 2	0			
130008	Forward direction for the coordinate system on rotation axis 2	0			
130009	Rotation center X coordinate offset for tilt axis 1	0.0			
130010	Rotation center Y coordinate offset for tilt axis 1	0.0			
130011	Rotation center Z coordinate offset for tilt axis 1	0.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
130012	Rotation center X coordinate offset for rotation axis 1	0.0			
130013	Rotation center Y coordinate offset for rotation axis 1	0.0			
130014	Rotation center Z coordinate offset for rotation axis 1	0.0			
130015	Rotation center X coordinate offset for tilt axis 2	0.0			
130016	Rotation center Y coordinate offset for tilt axis 2	0.0			
130017	Rotation center Z coordinate offset for tilt axis 2	0.0			
130018	Rotation center X coordinate offset for rotation axis 2	0.0			
130019	Rotation center Y coordinate offset for rotation axis 2	0.0			
130020	Rotation center Z coordinate offset for rotation axis 2	0.0			
130021	Absolute coordinate display format	0			

User Parameter 14 (power consumption): power consumption setting

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
140001	Coolant pump (valve ON)	0			
140002	Coolant pump (valve OFF)	0			
140003	CTS pump	0			
140004	Chip shower pump	0			
140005	Cyclone suction pump	0			
140006	Chip conveyor	0			
140007	Chip auger	0			

User Parameter 14 (power consumption): user device setting01

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141011	Measurement	0			
141012	Name				
141013	power consumption				
141014	Signal address				
141016	Count conditions				

User Parameter 14 (power consumption): user device setting02

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141021	Measurement	0			
141022	Name				
141023	power consumption				
141024	Signal address				
141026	Count conditions				

User Parameter 14 (power consumption): user device setting03

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141031	Measurement	0			
141032	Name				
141033	power consumption				
141034	Signal address				
141036	Count conditions				

User Parameter 14 (power consumption): user device setting04

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141041	Measurement	0			
141042	Name				
141043	power consumption				
141044	Signal address				
141046	Count conditions				

User Parameter 14 (power consumption): user device setting05

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141051	Measurement	0			
141052	Name				
141053	power consumption				
141054	Signal address				
141056	Count conditions				

User Parameter 14 (power consumption): user device setting06

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141061	Measurement	0			
141062	Name				
141063	power consumption				
141064	Signal address				
141066	Count conditions				

User Parameter 14 (power consumption): user device setting07

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141071	Measurement	0			
141072	Name				
141073	power consumption				
141074	Signal address				
141076	Count conditions				

User Parameter 14 (power consumption): user device setting08

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141081	Measurement	0			
141082	Name				
141083	power consumption				
141084	Signal address				
141086	Count conditions				

User Parameter 14 (power consumption): Display setting

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
145001	Graph display start position – Daily graph	0			
145002	Graph display start position – Weekly graph	0			
145003	Maximum power consumption on gauge	10000			

1.15.1.2 Inch (W1000Xd1,R450Xd1,R650Xd1,R650Xd1_40MG)

User Parameter 1 (Switch 1): Common

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
010001	Select mode	0			
010002	Display home screen at power ON	0			
010003	Machine No.	0			
010004	Table load weight	300	240	400	400
010005	Adjust tracking accuracy by load weight	1			
010006	Override switch	1			
010007	Alarm display when override is valid	1			
010008	Prevent rapid traverse override	0			
010009	Prevent cutting feedrate override	0			
010010	Prevent spindle override	0			
010011	Tap override	0			
010012	Thread cutting override	0			
010013	Stop using feedrate override during rapid feed	0			
010014	Pallet select key change	1			
010015	Lock shift key	0			
010016	4th row display axis	1			
010017	5th row display axis	2			
010018	6th row display axis	3			
010019	7th row display axis	4			
010020	8th row display axis	5			
010021	9th row display axis	6			
010022	10th row display axis	7			
010023	11th row display axis	8			
010024	12th row display axis	9			
010025	XYZ-axis absolute coord. display	2			
010026	Display coordinates during rotational transformation	0			
010027	Macro variable 1 for position screen display				
010028	Macro variable 2 for position screen display				
010029	Macro variable 3 for position screen display				
010030	Macro variable 4 for position screen display				
010031	Macro variable 5 for position screen display				
010032	Automatic screen dimming time	0			
010033	Alarm display when screen is dimmed	0			
010034	Automatic machine light off time	0			
010035	Standby mode time	0			
010036	Auto power off	0			
010037	Auto power off time	0			
010038	Cycle time calculation method	0			
010039	Screenshot	2			
010040	Motor insulation resistance measurement interval	0			
010041	Motor insulation resistance monitoring acceptable value (abnormal)	1.1			
010042	Motor insulation resistance monitoring acceptable value (alarm)	5.0			
010043	Notice of light load weight	0			
010044	Alarm stop level for shifted stop on ext. add. Axis	0			
010045	Specified function restriction	0			

User Parameter 1 (Switch 1): Operating

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
010501	Select memory operation	0			
010502	Dry run offset amount	0.0			
010503	Dry run offset amount lower limit	0.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
010504	Repeat	0			
010505	Workpiece counter when program is repeated	0			
010506	Tool life management when program is repeated	0			
010507	Program restart	0			
010508	S.T.M. return	1			
010509	Prevent restart from middle of program	0			
010510	Spindle return method for program stop	0			
010511	Lathe spindle return method for program stop	0			
010512	Coolant return method for program stop	0			
010513	Spindle rotation return during restart	1			
010514	Block No. display color	4			
010515	Pointer display color	3			
010516	Spare tool change	0			
010517	Check tool life on first use	1			
010518	Check before coolant pump start	1			
010519	Check before chip shower start	0			
010520	Shift method used in external workpiece coordinate system	0			

User Parameter 1 (Switch 1): programming

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
011001	Program unit	0			
011002	Program feed rate unit	0			
011003	Positioning method	0			
011004	Max. actual cutting travel speed (linear axis)	787.4			
011005	Max. actual cutting travel speed (rotation axis)	33.3			
011006	Rotation axis speed command type	0			
011007	Standard circle radius	0.0			
011008	Arc radius error limit	0.0			
011009	Arc radius R command error limit	0.0001			
011010	Scaling	0			
011011	X-axis scaling	0			
011012	Y-axis scaling	0			
011013	Z-axis scaling	0			
011014	Scaling unit	0			
011015	Common scaling factor	1000			
011016	X-axis scaling factor(I)	1000			
011017	Y-axis scaling factor(J)	1000			
011018	Z-axis scaling factor(K)	1000			
011019	Macro command single stop	0			
011020	Interrupt macro interrupt type	0			
011021	Interrupt macro call type	0			
011022	Interrupt macro acceptance type	0			
011023	Multiple M codes in one block	1			
011024	Unregistered M-code	0			
011025	One shot signal M450 output time	5			
011026	One shot signal M451 output time	5			
011027	One shot signal M455 output time	5			
011028	One shot signal M456 output time	5			
011029	External signal reading time limit	0			
011030	External signal output time when MFIN is invalid	5			
011031	M function signal output delay time	1			
011032	Finish axis travel during external signal output	0			
011033	Tool data spindle rotation exceeded	0			
011034	Macro call method (Address L)	0			
011035	Sub program folder selection 1	1			
011036	Sub program folder designation 1				

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
011037	Sub program folder selection 2	1			
011038	Sub program folder designation 2				
011039	Sub program folder selection 3	1			
011040	Sub program folder designation 3				
011041	Measurement setting 1	1	3	3	3
011042	Measurement setting 2	0			
011043	Measurement setting 3	0			
011044	Measurement setting 4	0			
011045	Measurement setting 90	1			
011046	Measurement setting (Q omitted)	0			
011047	Cutting speed exceeded for inverse time feed	0			
011048	Z-axis perimeter function	0			
011049	Upper limit for Z-axis perimeter coasting distance	0.19685			

User Parameter 1 (Switch 1): Compensation function

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
011501	X/Y/Z-axis travel at tool length/tool pos. offset change	0			
011502	Error check when traveling during tool length/tool position offset cancel	0			
011503	Start up/Cancel	0			
011504	Corner travel limit	0.0			
011505	Automatic corner override(angle)	0.0			
011506	Automatic corner override(length 1)	0.0			
011507	Automatic corner override(length 2)	0.0			
011508	Automatic corner override(ratio)	100			
011509	Inner arc override limit	100			
011510	Cutter compensation interference check	0			
011511	Number of blocks to check cutter compensation interference	8			
011512	Involute interpolation override limit	0			
011513	Involute interpolation error limit	0.00393			
011514	Table deflection compensation function	0			
011515	Standard weight for table deflection compensation	0			
011516	Standard height for table deflection compensation	9.05511 (Standard) 14.96062 (High column150) 18.89763 (High column250) 22.83464 (High column350)	9.94094 (Standard) 13.09055 (Low)	11.90944 (Standard) 15.84645 (Low)	14.4685 (Standard) 18.40551 (Low)
011517	Center gravity correction in table deflection compen.	0.0			
011518	Overwrite table deflection compensation	100			
011519	Error detect if no intersect for inner dia. compens.	0	1	1	1

User Parameter 1 (Switch 1): Canned cycle

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
012001	G73 relief amount	0.01968			
012002	G83 cutting start position	0.01968			
012003	G77,G78 relief amount	1.0			
012004	G76,G87 shift direction	0			
012005	Tapping cycle return speed	0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
012006	Tapping sync. error too big - alarm stop level	0			
012007	Tap acceleration setting	1 (10K) 1 (10K(High torque)) 1 (16K)	1 (10K) 1 (10K(High torque)) 1 (16K)	1 (10K) 1 (10K(High torque)) 1 (16K)	1 (10K) 1 (10K(High torque)) 1 (16K)
012008	Automatically use S command when changing tool	0			
012009	Automatically use F command when changing tool	0			
012010	Lathe machining infeed direction when power is turned ON	0			
012011	Cutting amount in thread cutting cycle	1.5			
012012	Cutting angle in thread cutting cycle	45.0			
012013	Thread angle in complex thread cutting cycle	60.0			
012014	Minimum infeed amount in complex thread cutting cycle	0.00196			
012015	Finishing count in complex thread cutting cycle	1			
012016	Finishing allowance in complex thread cutting cycle	0.00098			

User Parameter 1 (Switch 1): Data

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
012501	ALM2 signal stop level	0			
012502	Cancel editing when resetting	1			
012503	Save when mode of current program is changed	0			
012504	Program edit start position during operation	0			
012505	Automatic sequence insertion increment	10			
012506	Set the same program for edit/memory operation programs	0			
012507	Automatic tool length compensation	0.0			
012508	Tool life counting method	0			
012509	Change tool life display(Type2)	0			
012510	Tool life unit (program)	0			
012511	Execute automatic data backup	1			
012512	Save location for automatic data backup	0			
012513	Automatic data backup interval	0			
012514	Automatic data backup time	0			
012515	Manual output	0			

User Parameter 1 (Switch 1): MANU

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
013001	Initial mode	0			
013002	Change handle magnification	1			
013003	Auto screen change at additional/PLC axis handle operation	0			
013004	Z-axis height to prohibit travel of additional axes	0.0			
013005	Z-axis height to prohibit travel of additional axes(pallet 2)	0.0			
013006	Prevent external operation for additional axes	0			
013007	Max. tapping speed (when returning tap)	100			
013008	XY axes movement when changing tool in manual mode	0	1	1	0

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
013009	X-axis position when changing tool in manual mode	0.0	-17.71653 (14tools) 0.0 (22tools) 0.0 (28tools)	-25.59055	0.0
013010	Y-axis position when changing tool in manual mode	0.0	-12.59842 (14tools) 0.0 (22tools) -7.87401 (28tools)	-7.87401 (14tools) -7.87401 (22tools) -15.74803 (28tools)	0.0

User Parameter 1 (Switch 1): Conv Ex

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
013501	Schedule program reset start position	0			
013502	Program end stop in schedule program	0			
013503	Tool assignment at memory operation start	1			
013504	Check tools used at automatic tool assignment	1			
013505	Workpiece zero conversion code	0			
013506	Convert tool data	1			
013507	Tap step return position	0			

User Parameter 1 (Switch 1): ATC/Magazine

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
014001	Tool wash discharge conditions for tool data	0	0	0	1
014002	No tool detection function	0			
014003	Tool over key detection function	0			
014004	Tool missing detection function	0			
014005	Maximum tool specification settings	0			
014006	Z-axis travel method during tool change	0			
014007	Turret type magazine low-speed turn mode	0			
014008	Speed turret type magazine turns at low speed	20.0			
014009	Z-axis lowering speed 1 when changing tool	1377.95	1377.95	1377.95	1968.5
014010	Z-axis lowering speed 2 when changing tool	1377.95	1377.95	1377.95	1968.5
014011	Z-axis lowering speed 3 when changing tool	1377.95	1377.95	1377.95	1968.5
014012	ATC arm turn speed ratio 1 (M422)	100	100	100	80
014013	ATC arm turn speed ratio 2 (M423)	100	100	100	50
014014	ATC simultaneous operation start position	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250) 32.67716 (High column350)	19.88188 (Standard) 23.03149 (Low)	21.85039 (Standard) 25.7874 (Low)	17.12598 (Standard) 21.06299 (Low)
014015	ATC reference tool length	7.87401	7.87401	7.87401	9.84251
014016	Tool wash when changing a different size tool	0			
014017	Magazine turn speed ratio 1(M436)	80			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
014018	Magazine turn speed ratio 2(M437)	50			
014019	Magazine index when changing tools of different sizes	0			
014020	Pot lowering start position	0.0			

User Parameter 1 (Switch 1): installation

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
014501	Chip shower retention time	0			
014502	Automatic coolant off time	10			
014503	Coolant delay time	0			
014504	Back washing at end of program	1			
014505	CTS pressurize check delay time	1.0			
014506	CTS depressurize check delay time	1.0			
014507	CTS pressure bleed time	0.0			
014508	CTS line filter alarm stop level	1			
014509	Tool wash filter alarm stop level	0			
014510	Tool wash filter check interval	1			
014511	Display tool wash filter check result	0			
014512	Stop level for low tool wash level alarm (Type 4)	1			
014513	Tool wash filter clogging warning alarm stop level(Type4)	0			
014514	No. of tool wash filter clogging warning checks(Type4)	1			
014515	Faulty tool wash coolant level sensor check interval(Type4)	200			
014516	Lamp status when count ends	0			
014517	Oiling/greasing when power is turned on	0			
014518	Chip conveyor relay adhering check	0			
014519	Internal light key display	1			
014520	Table light key display	0	1	1	1
014521	PLC rapid traverse override function	0			
014522	PLC feedrate override function	0			
014523	PLC spindle override function	0			
014524	**[MASTER ON]** function	0			
014525	Reset when **[MASTER ON]** is ON	0			
014526	**[MASTER ON]** circuit selection	0			
014527	**[MASTER ON]** external emergency stop alarm (in NC)	0			
014528	Time extension when coolant level has dropped	0			

User Parameter 1 (Switch 1): Brake load test

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
015001	Auto execution of brake load test at mem. op start	0			
015002	Brake load test start time 1	0			
015003	Brake load test start time 2				
015004	Brake load test start time 3				
015005	Brake load test start time 4				
015006	Adjust start time for brake load test	0			
015007	Time extension for brake load test execution	0			
015008	Brake load test start position on Z-axis	1			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
015009	Specified position for brake load test on Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250) 32.67716 (High column350)	19.88188 (Standard) 23.03149 (Low)	21.85039 (Standard) 25.7874 (Low)	26.9685 (Standard) 30.90551 (Low)
015010	Brake load test start position on 5th-axis	1			
015011	Brake load test start position on 6th-axis	1			
015012	Brake load test start position on 7th-axis	1			
015013	Brake load test start position on 8th-axis	1			
015014	Specified angle for brake load test on 5th-axis	0.0			
015015	Specified angle for brake load test on 6th-axis	0.0			
015016	Specified angle for brake load test on 7th-axis	0.0			
015017	Specified angle for brake load test on 8th-axis	0.0			
015018	Order for brake load test execution on 5th-axis	0			
015019	Order for brake load test execution on 6th-axis	0			
015020	Order for brake load test execution on 7th-axis	0			
015021	Order for brake load test execution on 8th-axis	0			
015022	Move XY-ax. to safe pos. for brake load test on addt'l. ax.	0			
015023	Safe pos. for X-ax. during brake load test on addt'l. axis	0.0			
015024	Safe pos. for Y-ax. during brake load test on addt'l. axis	0.0			
015025	Order for brake load test execution on P1-axis	0			
015026	Order for brake load test execution on P2-axis	0			
015027	Order for brake load test execution on P3-axis	0			
015028	Order for brake load test execution on P4-axis	0			

User Parameter 1 (Switch 1): Door

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
015501	Area sensor pattern	1			
015502	Automatic door error level	1			
015503	START lamp status when operating automatic door manually	0			
015504	Display alarm when door is open – Front door/Outer door	0			
015505	Display alarm when door is open – Left side door	0			
015506	Display alarm when door is open – Right side door	0			
015507	Display alarm when door is open – Inner door	0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
015508	Display alarm when door is open – Setup chamber left door	0			
015509	Display alarm when door is open – Setup chamber right door	0			
015510	Display alarm when door is open – Outside door 1	0			
015511	Display alarm when door is open – Outside door 2	0			
015512	Display alarm when door is open – Magazine door	0			
015513	Display alarm when door is open – Magazine shutter	0			
015514	Door lock method	1			
015515	Door to replace workpiece - Front door/outer door	1			
015516	Door to replace workpiece - Left side door	0			
015517	Door to replace workpiece - Right side door	0			
015518	Door to replace workpiece - Inner door	0			
015519	Door to replace workpiece - Setup chamber left door	0			
015520	Door to replace workpiece - Setup chamber right door	0			
015521	Door to replace workpiece - Outside door 1	0			
015522	Door to replace workpiece - Outside door 2	0			
015523	Door to replace workpiece - Magazine door	0			
015524	Tool change door settings	0			
015525	Door unlock1 key display	1			
015526	Door unlock2 key display	0	1	1	1
015527	Door unlock key setting - Front door/outer door	1			
015528	Door unlock key setting - Left side door	0	0	2	2
015529	Door unlock key setting - Right side door	0	2	0	0
015530	Door unlock key setting - Inner door	0			
015531	Door unlock key setting - Setup chamber left door	0			
015532	Door unlock key setting - Setup chamber right door	0			
015533	Door unlock key setting - Outside door 1	0			
015534	Door unlock key setting - Outside door 2	0			
015535	Door unlock key setting - Magazine door	0			
015536	Door unlock signal setting - Front door/outer door	0			
015537	Door unlock signal setting - Left side door	0			
015538	Door unlock signal setting - Right side door	0			
015539	Door unlock signal setting - Inner door	0			
015540	Door unlock signal setting - Setup chamber left door	0			
015541	Door unlock signal setting - Setup chamber right door	0			
015542	Door unlock signal setting - Outside door 1	0			
015543	Door unlock signal setting - Outside door 2	0			
015544	Door unlock signal setting - Magazine door	0			
015545	Operation mode with door unlock key enabled	0			
015546	Door unlocks when power turns ON	0			
015547	Door unlocks when program stops	0			
015548	Door unlocks at end of operation	0			
015549	Door unlocks when single operation stops	2			
015550	Door unlocks at an alarm stop	0			
015551	Door unlocks after magazine turn	0			

User Parameter 2 (Switch 2): Stroke

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
020001	5th-axis stroke control	0			
020002	6th-axis stroke control	0			
020003	7th-axis stroke control	0			
020004	8th-axis stroke control	0			
020005	5th-axis stroke(-)	0.0			
020006	6th-axis stroke(-)	0.0			
020007	7th-axis stroke(-)	0.0			
020008	8th-axis stroke(-)	0.0			
020009	5th-axis stroke(+)	0.0			
020010	6th-axis stroke(+)	0.0			
020011	7th-axis stroke(+)	0.0			
020012	8th-axis stroke(+)	0.0			
020013	Stroke limit 1 for X-axis(-)	-39.37007	-17.71653	-25.59055	-25.59055
020014	Stroke limit 1 for Y-axis(-)	-19.68503	-12.59842	-15.74803	-15.74803
020015	Stroke limit 1 for Z-axis(-)	0.0			
020016	Stroke limit 1 for 5th-axis(-)	0.0			
020017	Stroke limit 1 for 6th-axis(-)	0.0			
020018	Stroke limit 1 for 7th-axis(-)	0.0			
020019	Stroke limit 1 for 8th-axis(-)	0.0			
020020	Stroke limit 1 for X-axis(+)	0.0			
020021	Stroke limit 1 for Y-axis(+)	0.0			
020022	Stroke limit 1 for Z-axis(+)	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250) 32.67716 (High column350)	19.88188 (Standard) 23.03149 (Low)	21.85039 (Standard) 25.7874 (Low)	26.9685 (Standard) 30.90551 (Low)
020023	Stroke limit 1 for 5th-axis(+)	0.0			
020024	Stroke limit 1 for 6th-axis(+)	0.0			
020025	Stroke limit 1 for 7th-axis(+)	0.0			
020026	Stroke limit 1 for 8th-axis(+)	0.0			
020027	Stroke limit 2 for X-axis(-)	0.0			
020028	Stroke limit 2 for Y-axis(-)	0.0			
020029	Stroke limit 2 for Z-axis(-)	0.0			
020030	Stroke limit 2 for X-axis(+)	0.0			
020031	Stroke limit 2 for Y-axis(+)	0.0			
020032	Stroke limit 2 for Z-axis(+)	0.0			

User Parameter 2 (Switch 2): Override speed

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
020501	Rapid traverse override speed 1	0.0			
020502	Rapid traverse override speed 2	19.68			
020503	Rapid traverse override speed 3	196.85			
020504	Rapid traverse override speed 4	393.7			
020505	4th-axis override rotation speed 1	0.0			
020506	4th-axis override rotation speed 2	0.3			
020507	4th-axis override rotation speed 3	2.5			
020508	4th-axis override rotation speed 4	5.0			
020509	5th-axis override rotation speed 1	0.0			
020510	5th-axis override rotation speed 2	0.5			
020511	5th-axis override rotation speed 3	5.0			
020512	5th-axis override rotation speed 4	10.0			
020513	6th-axis override rotation speed 1	0.0			
020514	6th-axis override rotation speed 2	0.5			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
020515	6th-axis override rotation speed 3	5.0			
020516	6th-axis override rotation speed 4	10.0			
020517	7th-axis override rotation speed 1	0.0			
020518	7th-axis override rotation speed 2	0.5			
020519	7th-axis override rotation speed 3	5.0			
020520	7th-axis override rotation speed 4	10.0			
020521	8th-axis override rotation speed 1	0.0			
020522	8th-axis override rotation speed 2	0.5			
020523	8th-axis override rotation speed 3	5.0			
020524	8th-axis override rotation speed 4	10.0			

User Parameter 2 (Switch 2): Output signal range for position signal

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
021001	X-axis position signal output range(-)	0.0			
021002	X-axis position signal output range(+)	0.0			
021003	Y-axis position signal output range(-)	0.0			
021004	Y-axis position signal output range(+)	0.0			
021005	Z-axis position signal output range(-)	0.0			
021006	Z-axis position signal output range(+)	0.0			
021007	4th-axis position signal output range(-)	0.0			
021008	4th-axis position signal output range(+)	0.0			
021009	5th-axis position signal output range(-)	0.0			
021010	5th-axis position signal output range(+)	0.0			
021011	6th-axis position signal output range(-)	0.0			
021012	6th-axis position signal output range(+)	0.0			
021013	7th-axis position signal output range(-)	0.0			
021014	7th-axis position signal output range(+)	0.0			
021015	8th-axis position signal output range(-)	0.0			
021016	8th-axis position signal output range(+)	0.0			
021017	X-axis position signal output range 2 (-)	0.0			
021018	X-axis position signal output range 2 (+)	0.0			
021019	Y-axis position signal output range 2 (-)	0.0			
021020	Y-axis position signal output range 2 (+)	0.0			
021021	Z-axis position signal output range 2 (-)	0.0			
021022	Z-axis position signal output range 2 (+)	0.0			
021023	4-axis position signal output range 2 (-)	0.0			
021024	4-axis position signal output range 2 (+)	0.0			
021025	5-axis position signal output range 2 (-)	0.0			
021026	5-axis position signal output range 2 (+)	0.0			
021027	6-axis position signal output range 2 (-)	0.0			
021028	6-axis position signal output range 2 (+)	0.0			
021029	7-axis position signal output range 2 (-)	0.0			
021030	7-axis position signal output range 2 (+)	0.0			
021031	8-axis position signal output range 2 (-)	0.0			
021032	8-axis position signal output range 2 (+)	0.0			
021033	X-axis position signal output range 3 (-)	0.0			
021034	X-axis position signal output range 3 (+)	0.0			
021035	Y-axis position signal output range 3 (-)	0.0			
021036	Y-axis position signal output range 3 (+)	0.0			
021037	Z-axis position signal output range 3 (-)	0.0			
021038	Z-axis position signal output range 3 (+)	0.0			
021039	4-axis position signal output range 3 (-)	0.0			
021040	4-axis position signal output range 3 (+)	0.0			
021041	5-axis position signal output range 3 (-)	0.0			
021042	5-axis position signal output range 3 (+)	0.0			
021043	6-axis position signal output range 3 (-)	0.0			
021044	6-axis position signal output range 3 (+)	0.0			
021045	7-axis position signal output range 3 (-)	0.0			
021046	7-axis position signal output range 3 (+)	0.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
021047	8-axis position signal output range 3 (-)	0.0			
021048	8-axis position signal output range 3 (+)	0.0			
021049	X-axis position signal output range 4 (-)	0.0			
021050	X-axis position signal output range 4 (+)	0.0			
021051	Y-axis position signal output range 4 (-)	0.0			
021052	Y-axis position signal output range 4 (+)	0.0			
021053	Z-axis position signal output range 4 (-)	0.0			
021054	Z-axis position signal output range 4 (+)	0.0			
021055	4-axis position signal output range 4 (-)	0.0			
021056	4-axis position signal output range 4 (+)	0.0			
021057	5-axis position signal output range 4 (-)	0.0			
021058	5-axis position signal output range 4 (+)	0.0			
021059	6-axis position signal output range 4 (-)	0.0			
021060	6-axis position signal output range 4 (+)	0.0			
021061	7-axis position signal output range 4 (-)	0.0			
021062	7-axis position signal output range 4 (+)	0.0			
021063	8-axis position signal output range 4 (-)	0.0			
021064	8-axis position signal output range 4 (+)	0.0			

User Parameter 2 (Switch 2): Excess travel amount for single direction positioning

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
021501	X-axis single direction positioning excess travel amount	0.0			
021502	Y-axis single direction positioning excess travel amount	0.0			
021503	Z-axis single direction positioning excess travel amount	0.0			
021504	5th-axis single direction positioning excess travel amount	0.0			
021505	6th-axis single direction positioning excess travel amount	0.0			
021506	7th-axis single direction positioning excess travel amount	0.0			
021507	8th-axis single direction positioning excess travel amount	0.0			

User Parameter 2 (Switch 2): External index

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
022001	Outer rotary table 1 switch address	0			
022002	Outer rotary table 1 indexing (+)	180.0			
022003	Outer rotary table 1 indexing (-)	-180.0			
022004	Outer rotary table 2 switch address	0	1	1	1
022005	Outer rotary table 2 indexing (+)	180.0			
022006	Outer rotary table 2 indexing (-)	-180.0			

User Parameter 3 (Switch 3): In-position check distance

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
030001	M271 positioning end check distance	0.01181			
030002	M271 positioning end check angle	0.3			
030003	M271 in-position width (X-, Y- and Z-axes)	0.00059			
030004	M272 positioning end check distance	0.01181			
030005	M272 positioning end check angle	0.3			
030006	M272 in-position width (X-, Y- and Z-axes)	0.00059			
030007	M273 positioning end check distance	0.01181			
030008	M273 positioning end check angle	0.3			
030009	M273 in-position width (X-, Y- and Z-axes)	0.00059			
030010	M274 positioning end check distance	0.01181			
030011	M274 positioning end check angle	0.3			
030012	M274 in-position width (X-, Y- and Z-axes)	0.00059			
030013	M275 positioning end check distance	0.01181			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
030014	M275 positioning end check angle	0.3			
030015	M275 in-position width (X-, Y- and Z-axes)	0.00059			
030016	M276 positioning end check distance	0.01181			
030017	M276 positioning end check angle	0.3			
030018	M276 in-position width (X-, Y- and Z-axes)	0.00059			
030019	M277 positioning end check distance	0.01181			
030020	M277 positioning end check angle	0.3			
030021	M277 in-position width (X-, Y- and Z-axes)	0.00059			
030022	M278 positioning end check distance	0.01181			
030023	M278 positioning end check angle	0.3			
030024	M278 in-position width (X-, Y- and Z-axes)	0.00059			
030025	M279 positioning end check distance	0.01181			
030026	M279 positioning end check angle	0.3			
030027	M279 in-position width (X-, Y- and Z-axes)	0.00059			
030028	Angle setting to check when additional axis for positioning is finished	0			
030029	Initial modal for in-position check distance	0			

User Parameter 3 (Switch 3): Low priority indication alarm No.

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
030501	Low priority indication alarm No. 1				
030502	Low priority indication alarm No. 2				
030503	Low priority indication alarm No. 3				
030504	Low priority indication alarm No. 4				
030505	Low priority indication alarm No. 5				
030506	Low priority indication alarm No. 6				
030507	Low priority indication alarm No. 7				
030508	Low priority indication alarm No. 8				
030509	Low priority indication alarm No. 9				
030510	Low priority indication alarm No. 10				

User Parameter 3 (Switch 3): Modal display setting

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
031001	G code for modal display 1	1			
031002	G code for modal display 2	2			
031003	G code for modal display 3	3			
031004	G code for modal display 4	4			
031005	G code for modal display 5	5			
031006	G code for modal display 6	6			
031007	G code for modal display 7	7			
031008	G code for modal display 8	10			
031009	G code for modal display 9	8			
031010	G code for modal display 10	11			
031011	G code for modal display 11	12			
031012	G code for modal display 12	13			
031013	G code for modal display 13	14			
031014	G code for modal display 14	15			
031015	G code for modal display 15	16			
031016	G code for modal display 16	17			
031017	M code for modal display 1	1			
031018	M code for modal display 2	2			
031019	M code for modal display 3	3			
031020	M code for modal display 4	4			
031021	M code for modal display 5	5			
031022	M code for modal display 6	6			
031023	M code for modal display 7	7			
031024	M code for modal display 8	8			
031025	M code for modal display 9	9			
031026	M code for modal display 10	11			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
031027	M code for modal display 11	12			
031028	M code for modal display 12	14			
031029	M code for modal display 13	16			
031030	M code for modal display 14	31			
031031	M code for modal display 15	0			
031032	M code for modal display 16	0			

User Parameter 3 (Switch 3): Specified alarm signal setting

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
031501	Specified alarm signal 2				
031502	Specified alarm signal 3				
031503	Specified alarm signal 4				
031504	Specified alarm signal 5				

User Parameter 4 (Reference position/Conversation zero point)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
040001	Reference position X-axis	0.0			
040002	Reference position Y-axis	0.0			
040003	Reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250) 32.67716 (High column350)	19.88188 (Standard) 23.03149 (Low)	21.85039 (Standard) 25.7874 (Low)	26.9685 (Standard) 30.90551 (Low)
040004	Reference position 5th-axis	0.0			
040005	Reference position 6th-axis	0.0			
040006	Reference position 7th-axis	0.0			
040007	Reference position 8th-axis	0.0			
040008	2nd reference position X-axis	0.0			
040009	2nd reference position Y-axis	0.0			
040010	2nd reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250) 32.67716 (High column350)	19.88188 (Standard) 23.03149 (Low)	21.85039 (Standard) 25.7874 (Low)	26.9685 (Standard) 30.90551 (Low)
040011	2nd reference position 5th-axis	0.0			
040012	2nd reference position 6th-axis	0.0			
040013	2nd reference position 7th-axis	0.0			
040014	2nd reference position 8th-axis	0.0			
040015	3rd reference position X-axis	0.0			
040016	3rd reference position Y-axis	0.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
040017	3rd reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250) 32.67716 (High column350)	19.88188 (Standard) 23.03149 (Low)	21.85039 (Standard) 25.7874 (Low)	26.9685 (Standard) 30.90551 (Low)
040018	3rd reference position 5th-axis	0.0			
040019	3rd reference position 6th-axis	0.0			
040020	3rd reference position 7th-axis	0.0			
040021	3rd reference position 8th-axis	0.0			
040022	4th reference position X-axis	0.0			
040023	4th reference position Y-axis	0.0			
040024	4th reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250) 32.67716 (High column350)	19.88188 (Standard) 23.03149 (Low)	21.85039 (Standard) 25.7874 (Low)	26.9685 (Standard) 30.90551 (Low)
040025	4th reference position 5th-axis	0.0			
040026	4th reference position 6th-axis	0.0			
040027	4th reference position 7th-axis	0.0			
040028	4th reference position 8th-axis	0.0			
040029	5th reference position X-axis	0.0			
040030	5th reference position Y-axis	0.0			
040031	5th reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250) 32.67716 (High column350)	19.88188 (Standard) 23.03149 (Low)	21.85039 (Standard) 25.7874 (Low)	26.9685 (Standard) 30.90551 (Low)
040032	5th reference position 5th-axis	0.0			
040033	5th reference position 6th-axis	0.0			
040034	5th reference position 7th-axis	0.0			
040035	5th reference position 8th-axis	0.0			
040036	6th reference position X-axis	0.0			
040037	6th reference position Y-axis	0.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
040038	6th reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250) 32.67716 (High column350)	19.88188 (Standard) 23.03149 (Low)	21.85039 (Standard) 25.7874 (Low)	26.9685 (Standard) 30.90551 (Low)
040039	6th reference position 5th-axis	0.0			
040040	6th reference position 6th-axis	0.0			
040041	6th reference position 7th-axis	0.0			
040042	6th reference position 8th-axis	0.0			
040043	Reference point return complete signal output at servo off	0			
040044	Reference point allowable range at servo off (for XYZ axes)	0.0			
040045	Reference point allowable range at servo off (for additional axes)	0.0			
040046	X-axis zero return pos.(No.2)	0.0			
040047	Y-axis zero return pos.(No.2)	0.0			
040048	5th-axis zero return pos.(No.2)	0.0			
040049	6th-axis zero return pos.(No.2)	0.0			
040050	7th-axis zero return pos.(No.2)	0.0			
040051	8th-axis zero return pos.(No.2)	0.0			
040052	X-axis zero return pos.(No.3)	0.0			
040053	Y-axis zero return pos.(No.3)	0.0			
040054	5th-axis zero return pos.(No.3)	0.0			
040055	6th-axis zero return pos.(No.3)	0.0			
040056	7th-axis zero return pos.(No.3)	0.0			
040057	8th-axis zero return pos.(No.3)	0.0			
040058	Zero point return complete signal output at servo off	0			
040059	Zero point allowable range at servo off (for XYZ axes)	0.0			
040060	Zero point allowable range at servo off (for additional axes)	0.0			
040061	Workpiece coordinate zero point X axis (for capture)	0.0			
040062	Workpiece coordinate zero point Y axis (for capture)	0.0			
040063	Workpiece coordinate zero point Z axis (for capture)	0.0			

user parameter 5 (User registered miscellaneous functions)

There is not default value.

User Parameter 6 (Tool breakage detection)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
060001	Tool breakage detection option	0			
060002	Pallet 1 tool breakage detector	0			
060003	Pallet 2 tool breakage detector	0			
060004	Tool breakage detection execution interval(No. of operations)	1			
060005	Reference tool length offset No.	0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
060006	Tool breakage detection return position(Type1)	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250) 32.67716 (High column350)	19.88188 (Standard) 23.03149 (Low)	21.85039 (Standard) 25.7874 (Low)	26.9685 (Standard) 30.90551 (Low)
060007	Tool breakage detection position X-axis(Type1)	0.0			
060008	Tool breakage detection position Y-axis(Type1)	0.0			
060009	Tool breakage detection offset(Type2)	0.0			
060010	Tool breakage detection position X-axis(Type3)	0.0			
060011	Tool breakage detection position Y-axis(Type3)	0.0			
060012	Tool breakage detection position Z-axis(Type3)	0.0			
060013	Tool breakage detection start distance(Type3)	0.0787			
060014	Tool breakage detection stop distance(Type3)	0.0393			
060015	Tool breakage detection speed(Type3)	19.6			
060016	Tool breakage detection coolant OFF(Type3)	1			
060017	Pallet 2 tool breakage detection pos. X-axis(Type3)	0.0			
060018	Pallet 2 tool breakage detection pos. Y-axis(Type3)	0.0			
060019	Pallet 2 tool breakage detection pos. Z-axis(Type3)	0.0			
060020	Pallet 2 tool breakage detection start distance(Type3)	0.0787			
060021	Pallet 2 tool breakage detection stop distance(Type3)	0.0393			
060022	Pallet 2 tool breakage detection speed(Type3)	19.6			
060023	Pallet 2 tool breakage detection coolant OFF(Type3)	1			
060024	Check location measurement setting for tool breakage detection	0			

User Parameter 7 (Automatic workpiece measurement)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
070001	Probe compensation X (corner)	0.0			
070002	Probe compensation Y (corner)	0.0			
070003	Probe compensation X (3-point circle)	0.0			
070004	Probe compensation Y (3-point circle)	0.0			
070005	Probe compensation Z (Workpiece top surface)	0.0			
070006	Automatic workpiece measurement motion	0			
070007	Automatic workpiece measurement speed 1	19.68			
070008	Automatic workpiece measurement speed 2	3.93			
070009	Stop point before automatic workpiece measurement	0.19685			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
070010	Travel limit distance in automatic workpiece measurement	0.07874			
070011	Tolerance 1 for automatic workpiece measurement	0.0			
070012	Tolerance 2 for automatic workpiece measurement	0.0			
070013	Return stroke after automatic workpiece measurement	0.03937			
070014	Automatic centering compensation X (corner)	0.0			
070015	Automatic centering compensation Y (corner)	0.0			
070016	Automatic centering compensation Z (Workpiece top surface)	0.0			
070017	Automatic centering speed 1	19.68			
070018	Automatic centering speed 2	0.39			
070019	Automatic centering return	0.01968			
070020	Tool number used for automatic centering	99			

User Parameter 8 (Automatic thermal distortion compensation)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
080001	Z-axis compensation	100			
080002	Spindle compensation(Z-axis)	100			
080003	X-axis compensation	100			
080004	Spindle compensation(X-axis)	100			
080005	Y-axis compensation	100			
080006	Spindle compensation(Y-axis)	100			
080007	Auto. thermal distortion compen. at memory operation start	0			
080008	Lathe spindle compensation(Z-axis)	0			
080009	Lathe spindle compensation(X-axis)	0			
080010	Lathe spindle compensation(Y-axis)	0			

User Parameter 9 (Quick table)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
090001	Pallet program folder				
090002	Pallet 1 program				
090003	Pallet 2 program				
090004	Pallet program folder				
090005	Pallet 1 program				
090006	Pallet 2 program				
090007	Pallet 2 shift(X-axis)	0.0			
090008	Pallet 2 shift(Y-axis)	0.0			
090009	Pallet 2 shift(Z-axis)	0.0			
090010	Pallet 1 loading	0			
090011	Pallet 2 loading	0			
090012	Additional axis for return operation	0			

User Parameter 10 (High accuracy): Common

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
100001	Smooth path offset function	0			
100002	Smooth path offset cancel distance	0.3937			
100003	Smooth path offset cancel angle	10.0			
100004	Smooth path offset angle determination invalid distance	0.00039			
100005	Smooth path offset reference length	0.03937			
100006	Minute block deletion when smooth path offset is cancelled	0			
100007	Accuracy level method	1			

User Parameter 10 (High accuracy): High accuracy A: M260

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101001	Corner deceleration override	120			
101002	Arc deceleration override	200			
101003	Curve approximation deceleration override	200			
101004	Smooth path offset level	1			
101005	Smooth override	100			
101006	Cutting feed time constant selection	0			
101007	Minute block deletion distance	0.0			
101008	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M261

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101101	Corner deceleration override	60			
101102	Arc deceleration override	140			
101103	Curve approximation deceleration override	140			
101104	Smooth path offset level	1			
101105	Smooth override	50			
101106	Cutting feed time constant selection	0			
101107	Minute block deletion distance	0.0			
101108	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M262

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101201	Corner deceleration override	70			
101202	Arc deceleration override	70			
101203	Curve approximation deceleration override	70			
101204	Smooth path offset level	1			
101205	Smooth override	600			
101206	Cutting feed time constant selection	0			
101207	Minute block deletion distance	0.0			
101208	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M263

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101301	Corner deceleration override	120			
101302	Arc deceleration override	200			
101303	Curve approximation deceleration override	200			
101304	Smooth path offset level	1			
101305	Smooth override	900			
101306	Cutting feed time constant selection	0			
101307	Minute block deletion distance	0.0			
101308	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M264

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101401	Corner deceleration override	120			
101402	Arc deceleration override	200			
101403	Curve approximation deceleration override	200			
101404	Smooth path offset level	1			
101405	Smooth override	2500			
101406	Cutting feed time constant selection	0			
101407	Minute block deletion distance	0.0			
101408	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M265

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101501	Corner deceleration override	600			
101502	Arc deceleration override	1000			
101503	Curve approximation deceleration override	1000			
101504	Smooth path offset level	1			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101505	Smooth override	100			
101506	Cutting feed time constant selection	0			
101507	Minute block deletion distance	0.0			
101508	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M266

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101601	Corner deceleration override	100			
101602	Arc deceleration override	100			
101603	Curve approximation deceleration override	100			
101604	Smooth path offset level	1			
101605	Smooth override	100			
101606	Cutting feed time constant selection	0			
101607	Minute block deletion distance	0.0			
101608	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy A: M267

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
101701	Corner deceleration override	100			
101702	Arc deceleration override	100			
101703	Curve approximation deceleration override	100			
101704	Smooth path offset level	1			
101705	Smooth override	100			
101706	Cutting feed time constant selection	0			
101707	Minute block deletion distance	0.0			
101708	Accuracy level	0.0			

User Parameter 10 (High accuracy): High accuracy B: M280

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102001	Corner deceleration override	100			
102002	Arc deceleration override	0			
102003	Curve approximation deceleration override	0			
102004	Smooth path offset level	3			
102005	Smooth override	100			
102006	Minute block deletion distance	0.00039			
102007	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M281

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102101	Corner deceleration override	100			
102102	Arc deceleration override	100			
102103	Curve approximation deceleration override	100			
102104	Smooth path offset level	1			
102105	Smooth override	100			
102106	Minute block deletion distance	0.0			
102107	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M282

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102201	Corner deceleration override	100			
102202	Arc deceleration override	100			
102203	Curve approximation deceleration override	100			
102204	Smooth path offset level	1			
102205	Smooth override	100			
102206	Minute block deletion distance	0.0			
102207	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M283

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102301	Corner deceleration override	100			
102302	Arc deceleration override	100			
102303	Curve approximation deceleration override	100			
102304	Smooth path offset level	1			
102305	Smooth override	100			
102306	Minute block deletion distance	0.0			
102307	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M284

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102401	Corner deceleration override	100			
102402	Arc deceleration override	100			
102403	Curve approximation deceleration override	100			
102404	Smooth path offset level	1			
102405	Smooth override	100			
102406	Minute block deletion distance	0.0			
102407	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M285

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102501	Corner deceleration override	100			
102502	Arc deceleration override	100			
102503	Curve approximation deceleration override	100			
102504	Smooth path offset level	1			
102505	Smooth override	100			
102506	Minute block deletion distance	0.0			
102507	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M286

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102601	Corner deceleration override	100			
102602	Arc deceleration override	100			
102603	Curve approximation deceleration override	100			
102604	Smooth path offset level	1			
102605	Smooth override	100			
102606	Minute block deletion distance	0.0			
102607	Smooth override type	0			

User Parameter 10 (High accuracy): High accuracy B: M287

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
102701	Corner deceleration override	100			
102702	Arc deceleration override	100			
102703	Curve approximation deceleration override	100			
102704	Smooth path offset level	1			
102705	Smooth override	100			
102706	Minute block deletion distance	0.0			
102707	Smooth override type	0			

User Parameter 10 (High accuracy): Machining mode

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
105001	Machining mode	0			

User Parameter 10 (High accuracy): Adjustment A

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
105101	Standard mode	0			
105102	Accuracy adjustment value	0			
105103	Smoothness	0			

User Parameter 10 (High accuracy): Adjustment B

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
105201	Standard mode	0			
105202	Accuracy adjustment value	0			
105203	Smoothness	0			

User Parameter 10 (High accuracy): Adjustment C

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
105301	Standard mode	0			
105302	Accuracy adjustment value	0			
105303	Smoothness	0			

User Parameter 10 (High accuracy): Accuracy spec. mode

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
106001	Accuracy spec. mode	0			

User Parameter 10 (High accuracy): Accuracy spec. A

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
106101	Accuracy level	0.00393			
106102	Smoothness	0			

User Parameter 10 (High accuracy): Accuracy spec. B

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
106201	Accuracy level	0.00118			
106202	Smoothness	0			

User Parameter 10 (High accuracy): Accuracy spec. C

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
106301	Accuracy level	0.00039			
106302	Smoothness	0			

User Parameter 11 (PLC)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
110001	P1-axis stroke	0			
110002	P2-axis stroke	0			
110003	P3-axis stroke	0			
110004	P4-axis stroke	0			
110005	P1-axis stroke(-)	0.0			
110006	P2-axis stroke(-)	0.0			
110007	P3-axis stroke(-)	0.0			
110008	P4-axis stroke(-)	0.0			
110009	P1-axis stroke(+)	0.0			
110010	P2-axis stroke(+)	0.0			
110011	P3-axis stroke(+)	0.0			
110012	P4-axis stroke(+)	0.0			
110013	Reference point P1-axis	0.0			
110014	Reference point P2-axis	0.0			
110015	Reference point P3-axis	0.0			
110016	Reference point P4-axis	0.0			
110017	P1-axis override speed 1	0.0			
110018	P1-axis override speed 2	20.0			
110019	P1-axis override speed 3	200.0			
110020	P1-axis override speed 4	400.0			
110021	P2-axis override speed 1	0.0			
110022	P2-axis override speed 2	20.0			
110023	P2-axis override speed 3	200.0			
110024	P2-axis override speed 4	400.0			
110025	P3-axis override speed 1	0.0			
110026	P3-axis override speed 2	20.0			
110027	P3-axis override speed 3	200.0			
110028	P3-axis override speed 4	400.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
110029	P4-axis override speed 1	0.0			
110030	P4-axis override speed 2	20.0			
110031	P4-axis override speed 3	200.0			
110032	P4-axis override speed 4	400.0			
110033	Collis. detct.-P1ax stop meth.	0			
110034	Collis. detct.-P2ax stop meth.	0			
110035	Collis. detct.-P3ax stop meth.	0			
110036	Collis. detct.-P4ax stop meth.	0			

User Parameter 12 (Rotary fixture offset)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
120001	XYZ-axes travel during current rotary fixture offset change	0			
120002	Rotary fixture offset reset method	0			
120003	Tilt axis 1	0			
120004	Rotation axis 1	0			
120005	Tilt axis 2	0			
120006	Rotation axis 2	0			
120007	Tilt axis 3	0			
120008	Rotation axis 3	0			
120009	Tilt axis 4	0			
120010	Rotation axis 4	0			
120011	Forward direction for the coordinate system on tilt axis 1	0			
120012	Forward direction for the coordinate system on rotation axis 1	0			
120013	Forward direction for the coordinate system on tilt axis 2	0			
120014	Forward direction for the coordinate system on rotation axis 2	0			
120015	Forward direction for the coordinate system on tilt axis 3	0			
120016	Forward direction for the coordinate system on rotation axis 3	0			
120017	Forward direction for the coordinate system on tilt axis 4	0			
120018	Forward direction for the coordinate system on rotation axis 4	0			

User Parameter 13 (Rotation axis / tilt axis setting)

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
130001	Tilt axis 1	0			
130002	Rotation axis 1	0			
130003	Tilt axis 2	0			
130004	Rotation axis 2	0			
130005	Forward direction for the coordinate system on tilt axis 1	0			
130006	Forward direction for the coordinate system on rotation axis 1	0			
130007	Forward direction for the coordinate system on tilt axis 2	0			
130008	Forward direction for the coordinate system on rotation axis 2	0			
130009	Rotation center X coordinate offset for tilt axis 1	0.0			
130010	Rotation center Y coordinate offset for tilt axis 1	0.0			
130011	Rotation center Z coordinate offset for tilt axis 1	0.0			

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
130012	Rotation center X coordinate offset for rotation axis 1	0.0			
130013	Rotation center Y coordinate offset for rotation axis 1	0.0			
130014	Rotation center Z coordinate offset for rotation axis 1	0.0			
130015	Rotation center X coordinate offset for tilt axis 2	0.0			
130016	Rotation center Y coordinate offset for tilt axis 2	0.0			
130017	Rotation center Z coordinate offset for tilt axis 2	0.0			
130018	Rotation center X coordinate offset for rotation axis 2	0.0			
130019	Rotation center Y coordinate offset for rotation axis 2	0.0			
130020	Rotation center Z coordinate offset for rotation axis 2	0.0			
130021	Absolute coordinate display format	0			

User Parameter 14 (power consumption): power consumption setting

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
140001	Coolant pump (valve ON)	0			
140002	Coolant pump (valve OFF)	0			
140003	CTS pump	0			
140004	Chip shower pump	0			
140005	Cyclone suction pump	0			
140006	Chip conveyor	0			
140007	Chip auger	0			

User Parameter 14 (power consumption): user device setting01

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141011	Measurement	0			
141012	Name				
141013	power consumption				
141014	Signal address				
141016	Count conditions				

User Parameter 14 (power consumption): user device setting02

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141021	Measurement	0			
141022	Name				
141023	power consumption				
141024	Signal address				
141026	Count conditions				

User Parameter 14 (power consumption): user device setting03

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141031	Measurement	0			
141032	Name				
141033	power consumption				
141034	Signal address				
141036	Count conditions				

User Parameter 14 (power consumption): user device setting04

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141041	Measurement	0			
141042	Name				
141043	power consumption				
141044	Signal address				
141046	Count conditions				

User Parameter 14 (power consumption): user device setting05

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141051	Measurement	0			
141052	Name				
141053	power consumption				
141054	Signal address				
141056	Count conditions				

User Parameter 14 (power consumption): user device setting06

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141061	Measurement	0			
141062	Name				
141063	power consumption				
141064	Signal address				
141066	Count conditions				

User Parameter 14 (power consumption): user device setting07

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141071	Measurement	0			
141072	Name				
141073	power consumption				
141074	Signal address				
141076	Count conditions				

User Parameter 14 (power consumption): user device setting08

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
141081	Measurement	0			
141082	Name				
141083	power consumption				
141084	Signal address				
141086	Count conditions				

User Parameter 14 (power consumption): Display setting

No.	Item	W1000Xd1	R450Xd1	R650Xd1	R650Xd1_40MG
145001	Graph display start position – Daily graph	0			
145002	Graph display start position – Weekly graph	0			
145003	Maximum power consumption on gauge	10000			

1

1.15.1.3 Metric (S500Xd1,S700Xd1,S300Xd1,U500Xd1)

User Parameter 1 (Switch 1): Common

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
010001	Select mode	0	
010002	Display home screen at power ON	0	
010003	Machine No.	0	
010004	Table load weight	250	100
010005	Adjust tracking accuracy by load weight	1	
010006	Override switch	1	
010007	Alarm display when override is valid	1	
010008	Prevent rapid traverse override	0	
010009	Prevent cutting feedrate override	0	
010010	Prevent spindle override	0	
010011	Tap override	0	
010012	Thread cutting override	0	
010013	Stop using feedrate override during rapid feed	0	
010014	Pallet select key change	1	
010015	Lock shift key	0	
010016	4th row display axis	1	
010017	5th row display axis	2	
010018	6th row display axis	3	
010019	7th row display axis	4	
010020	8th row display axis	5	
010021	9th row display axis	6	
010022	10th row display axis	7	
010023	11th row display axis	8	
010024	12th row display axis	9	
010025	XYZ-axis absolute coord. display	2	
010026	Display coordinates during rotational transformation	0	
010027	Macro variable 1 for position screen display		
010028	Macro variable 2 for position screen display		
010029	Macro variable 3 for position screen display		
010030	Macro variable 4 for position screen display		
010031	Macro variable 5 for position screen display		
010032	Automatic screen dimming time	0	
010033	Alarm display when screen is dimmed	0	
010034	Automatic machine light off time	0	
010035	Standby mode time	0	
010036	Auto power off	0	
010037	Auto power off time	0	
010038	Cycle time calculation method	0	
010039	Screenshot	2	
010040	Motor insulation resistance measurement interval	0	
010041	Motor insulation resistance monitoring acceptable value (abnormal)	1.1	
010042	Motor insulation resistance monitoring acceptable value (alarm)	5.0	
010043	Notice of light load weight	0	
010044	Alarm stop level for shifted stop on ext. add. Axis	0	
010045	Specified function restriction	0	

User Parameter 1 (Switch 1): Operating

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
010501	Select memory operation	0	
010502	Dry run offset amount	0.0	
010503	Dry run offset amount lower limit	0.0	
010504	Repeat	0	
010505	Workpiece counter when program is repeated	0	
010506	Tool life management when program is repeated	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
010507	Program restart	0	
010508	S.T.M. return	1	
010509	Prevent restart from middle of program	0	
010510	Spindle return method for program stop	0	
010511	Lathe spindle return method for program stop	0	
010512	Coolant return method for program stop	0	
010513	Spindle rotation return during restart	1	
010514	Block No. display color	4	
010515	Pointer display color	3	
010516	Spare tool change	0	
010517	Check tool life on first use	1	
010518	Check before coolant pump start	1	
010519	Check before chip shower start	0	
010520	Shift method used in external workpiece coordinate system	0	

User Parameter 1 (Switch 1): programming

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
011001	Program unit	0	
011002	Program feed rate unit	0	
011003	Positioning method	0	
011004	Max. actual cutting travel speed (linear axis)	20000.0	
011005	Max. actual cutting travel speed (rotation axis)	33.3	7.9
011006	Rotation axis speed command type	0	
011007	Standard circle radius	0.0	
011008	Arc radius error limit	0.0	
011009	Arc radius R command error limit	0.001	
011010	Scaling	0	
011011	X-axis scaling	0	
011012	Y-axis scaling	0	
011013	Z-axis scaling	0	
011014	Scaling unit	0	
011015	Common scaling factor	1000	
011016	X-axis scaling factor(I)	1000	
011017	Y-axis scaling factor(J)	1000	
011018	Z-axis scaling factor(K)	1000	
011019	Macro command single stop	0	
011020	Interrupt macro interrupt type	0	
011021	Interrupt macro call type	0	
011022	Interrupt macro acceptance type	0	
011023	Multiple M codes in one block	1	
011024	Unregistered M-code	0	
011025	One shot signal M450 output time	5	
011026	One shot signal M451 output time	5	
011027	One shot signal M455 output time	5	
011028	One shot signal M456 output time	5	
011029	External signal reading time limit	0	
011030	External signal output time when MFIN is invalid	5	
011031	M function signal output delay time	1	
011032	Finish axis travel during external signal output	0	
011033	Tool data spindle rotation exceeded	0	
011034	Macro call method (Address L)	0	
011035	Sub program folder selection 1	1	
011036	Sub program folder designation 1		
011037	Sub program folder selection 2	1	
011038	Sub program folder designation 2		
011039	Sub program folder selection 3	1	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
011040	Sub program folder designation 3		
011041	Measurement setting 1	1	
011042	Measurement setting 2	0	
011043	Measurement setting 3	0	
011044	Measurement setting 4	0	
011045	Measurement setting 90	1	
011046	Measurement setting (Q omitted)	0	
011047	Cutting speed exceeded for inverse time feed	0	
011048	Z-axis perimeter function	0	
011049	Upper limit for Z-axis perimeter coasting distance	5.0	

User Parameter 1 (Switch 1): Compensation function

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
011501	X/Y/Z-axis travel at tool length/tool pos. offset change	0	
011502	Error check when traveling during tool length/tool position offset cancel	0	
011503	Start up/Cancel	0	
011504	Corner travel limit	0.0	
011505	Automatic corner override(angle)	0.0	
011506	Automatic corner override(length 1)	0.0	
011507	Automatic corner override(length 2)	0.0	
011508	Automatic corner override(ratio)	100	
011509	Inner arc override limit	100	
011510	Cutter compensation interference check	0	
011511	Number of blocks to check cutter compensation interference	8	
011512	Involute interpolation override limit	0	
011513	Involute interpolation error limit	0.1	
011514	Table deflection compensation function	0	
011515	Standard weight for table deflection compensation	0	
011516	Standard height for table deflection compensation	230.0 (Standard) 380.0 (High column150) 480.0 (High column250)	195.0
011517	Center gravity correction in table deflection compen.	0.0	
011518	Overwrite table deflection compensation	100	
011519	Error detect if no intersect for inner dia. compens.	1	

User Parameter 1 (Switch 1): Canned cycle

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
012001	G73 relief amount	0.5	
012002	G83 cutting start position	0.5	
012003	G77,G78 relief amount	1.0	
012004	G76,G87 shift direction	0	
012005	Tapping cycle return speed	0	
012006	Tapping sync. error too big - alarm stop level	0	
012007	Tap acceleration setting	1 (10K) 1 (10K(High torque)) 1 (16K) 0 (27K)	1 (10K) 1 (16K)
012008	Automatically use S command when changing tool	0	
012009	Automatically use F command when changing tool	0	
012010	Lathe machining infeed direction when power is turned ON	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
012011	Cutting amount in thread cutting cycle	1.5	
012012	Cutting angle in thread cutting cycle	45.0	
012013	Thread angle in complex thread cutting cycle	60.0	
012014	Minimum infeed amount in complex thread cutting cycle	0.05	
012015	Finishing count in complex thread cutting cycle	1	
012016	Finishing allowance in complex thread cutting cycle	0.025	

User Parameter 1 (Switch 1): Data

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
012501	ALM2 signal stop level	0	
012502	Cancel editing when resetting	1	
012503	Save when mode of current program is changed	0	
012504	Program edit start position during operation	0	
012505	Automatic sequence insertion increment	10	
012506	Set the same program for edit/memory operation programs	0	
012507	Automatic tool length compensation	0.0	
012508	Tool life counting method	0	
012509	Change tool life display(Type2)	0	
012510	Tool life unit (program)	0	
012511	Execute automatic data backup	1	
012512	Save location for automatic data backup	0	
012513	Automatic data backup interval	0	
012514	Automatic data backup time	0	
012515	Manual output	0	

User Parameter 1 (Switch 1): MANU

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
013001	Initial mode	0	
013002	Change handle magnification	1	
013003	Auto screen change at additional/PLC axis handle operation	0	
013004	Z-axis height to prohibit travel of additional axes	0.0	
013005	Z-axis height to prohibit travel of additional axes(pallet 2)	0.0	
013006	Prevent external operation for additional axes	0	
013007	Max. tapping speed (when returning tap)	100	
013008	XY axes movement when changing tool in manual mode	0	
013009	X-axis position when changing tool in manual mode	0.0	
013010	Y-axis position when changing tool in manual mode	0.0	

User Parameter 1 (Switch 1): Conv Ex

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
013501	Schedule program reset start position	0	
013502	Program end stop in schedule program	0	
013503	Tool assignment at memory operation start	1	
013504	Check tools used at automatic tool assignment	1	
013505	Workpiece zero conversion code	0	
013506	Convert tool data	1	
013507	Tap step return position	0	

User Parameter 1 (Switch 1): ATC/Magazine

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
014001	Tool wash discharge conditions for tool data	0	
014002	No tool detection function	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
014003	Tool over key detection function	0	
014004	Tool missing detection function	0	
014005	Maximum tool specification settings	0	
014006	Z-axis travel method during tool change	0	
014007	Turret type magazine low-speed turn mode	0	
014008	Speed turret type magazine turns at low speed	20.0	
014009	Z-axis lowering speed 1 when changing tool	35000.0	
014010	Z-axis lowering speed 2 when changing tool	35000.0	
014011	Z-axis lowering speed 3 when changing tool	35000.0	
014012	ATC arm turn speed ratio 1 (M422)	100	
014013	ATC arm turn speed ratio 2 (M423)	100	
014014	ATC simultaneous operation start position	480.0 (Standard) 630.0 (High column150) 730.0 (High column250)	445.0
014015	ATC reference tool length	200.0	
014016	Tool wash when changing a different size tool	0	
014017	Magazine turn speed ratio 1(M436)	80	
014018	Magazine turn speed ratio 2(M437)	50	
014019	Magazine index when changing tools of different sizes	0	
014020	Pot lowering start position	0.0	

User Parameter 1 (Switch 1): installation

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
014501	Chip shower retention time	0	
014502	Automatic coolant off time	10	
014503	Coolant delay time	0	
014504	Back washing at end of program	1	
014505	CTS pressurize check delay time	1.0	
014506	CTS depressurize check delay time	1.0	
014507	CTS pressure bleed time	0.0	
014508	CTS line filter alarm stop level	1	
014509	Tool wash filter alarm stop level	0	
014510	Tool wash filter check interval	1	
014511	Display tool wash filter check result	0	
014512	Stop level for low tool wash level alarm (Type 4)	1	
014513	Tool wash filter clogging warning alarm stop level(Type4)	0	
014514	No. of tool wash filter clogging warning checks(Type4)	1	
014515	Faulty tool wash coolant level sensor check interval(Type4)	200	
014516	Lamp status when count ends	0	
014517	Oiling/greasing when power is turned on	0	
014518	Chip conveyor relay adhering check	0	
014519	Internal light key display	1	
014520	Table light key display	0	
014521	PLC rapid traverse override function	0	
014522	PLC feedrate override function	0	
014523	PLC spindle override function	0	
014524	**[MASTER ON]** function	0	
014525	Reset when **[MASTER ON]** is ON	0	
014526	**[MASTER ON]** circuit selection	0	
014527	**[MASTER ON]** external emergency stop alarm (in NC)	0	
014528	Time extension when coolant level has dropped	0	

User Parameter 1 (Switch 1): Brake load test

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
015001	Auto execution of brake load test at mem. op start	0	
015002	Brake load test start time 1	0	
015003	Brake load test start time 2		
015004	Brake load test start time 3		
015005	Brake load test start time 4		
015006	Adjust start time for brake load test	0	
015007	Time extension for brake load test execution	0	
015008	Brake load test start position on Z-axis	1	
015009	Specified position for brake load test on Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250)	445.0
015010	Brake load test start position on 5th-axis	1	
015011	Brake load test start position on 6th-axis	1	
015012	Brake load test start position on 7th-axis	1	
015013	Brake load test start position on 8th-axis	1	
015014	Specified angle for brake load test on 5th-axis	0.0	
015015	Specified angle for brake load test on 6th-axis	0.0	
015016	Specified angle for brake load test on 7th-axis	0.0	
015017	Specified angle for brake load test on 8th-axis	0.0	
015018	Order for brake load test execution on 5th-axis	0	
015019	Order for brake load test execution on 6th-axis	0	
015020	Order for brake load test execution on 7th-axis	0	
015021	Order for brake load test execution on 8th-axis	0	
015022	Move XY-ax. to safe pos. for brake load test on addt'l. ax.	0	
015023	Safe pos. for X-ax. during brake load test on addt'l. axis	0.0	
015024	Safe pos. for Y-ax. during brake load test on addt'l. axis	0.0	
015025	Order for brake load test execution on P1-axis	0	
015026	Order for brake load test execution on P2-axis	0	
015027	Order for brake load test execution on P3-axis	0	
015028	Order for brake load test execution on P4-axis	0	

User Parameter 1 (Switch 1): Door

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
015501	Area sensor pattern	1	
015502	Automatic door error level	1	
015503	START lamp status when operating automatic door manually	0	
015504	Display alarm when door is open – Front door/Outer door	0	
015505	Display alarm when door is open – Left side door	0	
015506	Display alarm when door is open – Right side door	0	
015507	Display alarm when door is open – Inner door	0	
015508	Display alarm when door is open – Setup chamber left door	0	
015509	Display alarm when door is open – Setup chamber right door	0	
015510	Display alarm when door is open – Outside door 1	0	
015511	Display alarm when door is open – Outside door 2	0	
015512	Display alarm when door is open – Magazine door	0	
015513	Display alarm when door is open – Magazine shutter	0	
015514	Door lock method	1	
015515	Door to replace workpiece - Front door/outer door	1	
015516	Door to replace workpiece - Left side door	0	
015517	Door to replace workpiece - Right side door	0	
015518	Door to replace workpiece - Inner door	0	
015519	Door to replace workpiece - Setup chamber left door	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
015520	Door to replace workpiece - Setup chamber right door	0	
015521	Door to replace workpiece - Outside door 1	0	
015522	Door to replace workpiece - Outside door 2	0	
015523	Door to replace workpiece - Magazine door	0	
015524	Tool change door settings	0	
015525	Door unlock1 key display	1	
015526	Door unlock2 key display	0	1
015527	Door unlock key setting - Front door/outer door	1	
015528	Door unlock key setting - Left side door	0	
015529	Door unlock key setting - Right side door	0	2
015530	Door unlock key setting - Inner door	0	
015531	Door unlock key setting - Setup chamber left door	0	
015532	Door unlock key setting - Setup chamber right door	0	
015533	Door unlock key setting - Outside door 1	0	
015534	Door unlock key setting - Outside door 2	0	
015535	Door unlock key setting - Magazine door	0	
015536	Door unlock signal setting - Front door/outer door	0	
015537	Door unlock signal setting - Left side door	0	
015538	Door unlock signal setting - Right side door	0	
015539	Door unlock signal setting - Inner door	0	
015540	Door unlock signal setting - Setup chamber left door	0	
015541	Door unlock signal setting - Setup chamber right door	0	
015542	Door unlock signal setting - Outside door 1	0	
015543	Door unlock signal setting - Outside door 2	0	
015544	Door unlock signal setting - Magazine door	0	
015545	Operation mode with door unlock key enabled	0	
015546	Door unlocks when power turns ON	0	
015547	Door unlocks when program stops	0	
015548	Door unlocks at end of operation	0	
015549	Door unlocks when single operation stops	2	
015550	Door unlocks at an alarm stop	0	
015551	Door unlocks after magazine turn	0	

User Parameter 2 (Switch 2): Stroke

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
020001	5th-axis stroke control	0	1
020002	6th-axis stroke control	0	
020003	7th-axis stroke control	0	
020004	8th-axis stroke control	0	
020005	5th-axis stroke(-)	0.0	-30.0
020006	6th-axis stroke(-)	0.0	
020007	7th-axis stroke(-)	0.0	
020008	8th-axis stroke(-)	0.0	
020009	5th-axis stroke(+)	0.0	120.0
020010	6th-axis stroke(+)	0.0	
020011	7th-axis stroke(+)	0.0	
020012	8th-axis stroke(+)	0.0	
020013	Stroke limit 1 for X-axis(-)	-500.0 (Standard) -700.0 (Long) -300.0 (Short)	-500.0
020014	Stroke limit 1 for Y-axis(-)	-400.0	
020015	Stroke limit 1 for Z-axis(-)	0.0	
020016	Stroke limit 1 for 5th-axis(-)	0.0	-30.0

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
020017	Stroke limit 1 for 6th-axis(-)	0.0	
020018	Stroke limit 1 for 7th-axis(-)	0.0	
020019	Stroke limit 1 for 8th-axis(-)	0.0	
020020	Stroke limit 1 for X-axis(+)	0.0	
020021	Stroke limit 1 for Y-axis(+)	0.0	
020022	Stroke limit 1 for Z-axis(+)	480.0 (Standard) 630.0 (High column150) 730.0 (High column250)	445.0
020023	Stroke limit 1 for 5th-axis(+)	0.0	120.0
020024	Stroke limit 1 for 6th-axis(+)	0.0	
020025	Stroke limit 1 for 7th-axis(+)	0.0	
020026	Stroke limit 1 for 8th-axis(+)	0.0	
020027	Stroke limit 2 for X-axis(-)	0.0	
020028	Stroke limit 2 for Y-axis(-)	0.0	
020029	Stroke limit 2 for Z-axis(-)	0.0	
020030	Stroke limit 2 for X-axis(+)	0.0	
020031	Stroke limit 2 for Y-axis(+)	0.0	
020032	Stroke limit 2 for Z-axis(+)	0.0	

User Parameter 2 (Switch 2): Override speed

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
020501	Rapid traverse override speed 1	0.0	
020502	Rapid traverse override speed 2	500.0	
020503	Rapid traverse override speed 3	5000.0	
020504	Rapid traverse override speed 4	10000.0	
020505	4th-axis override rotation speed 1	0.0	
020506	4th-axis override rotation speed 2	0.3	
020507	4th-axis override rotation speed 3	2.5	
020508	4th-axis override rotation speed 4	5.0	
020509	5th-axis override rotation speed 1	0.0	
020510	5th-axis override rotation speed 2	0.5	
020511	5th-axis override rotation speed 3	5.0	
020512	5th-axis override rotation speed 4	10.0	
020513	6th-axis override rotation speed 1	0.0	
020514	6th-axis override rotation speed 2	0.5	
020515	6th-axis override rotation speed 3	5.0	
020516	6th-axis override rotation speed 4	10.0	
020517	7th-axis override rotation speed 1	0.0	
020518	7th-axis override rotation speed 2	0.5	
020519	7th-axis override rotation speed 3	5.0	
020520	7th-axis override rotation speed 4	10.0	
020521	8th-axis override rotation speed 1	0.0	
020522	8th-axis override rotation speed 2	0.5	
020523	8th-axis override rotation speed 3	5.0	
020524	8th-axis override rotation speed 4	10.0	

User Parameter 2 (Switch 2): Output signal range for position signal

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
021001	X-axis position signal output range(-)	0.0	
021002	X-axis position signal output range(+)	0.0	
021003	Y-axis position signal output range(-)	0.0	
021004	Y-axis position signal output range(+)	0.0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
021005	Z-axis position signal output range(-)	0.0	
021006	Z-axis position signal output range(+)	0.0	
021007	4th-axis position signal output range(-)	0.0	
021008	4th-axis position signal output range(+)	0.0	
021009	5th-axis position signal output range(-)	0.0	
021010	5th-axis position signal output range(+)	0.0	
021011	6th-axis position signal output range(-)	0.0	
021012	6th-axis position signal output range(+)	0.0	
021013	7th-axis position signal output range(-)	0.0	
021014	7th-axis position signal output range(+)	0.0	
021015	8th-axis position signal output range(-)	0.0	
021016	8th-axis position signal output range(+)	0.0	
021017	X-axis position signal output range 2 (-)	0.0	
021018	X-axis position signal output range 2 (+)	0.0	
021019	Y-axis position signal output range 2 (-)	0.0	
021020	Y-axis position signal output range 2 (+)	0.0	
021021	Z-axis position signal output range 2 (-)	0.0	
021022	Z-axis position signal output range 2 (+)	0.0	
021023	4-axis position signal output range 2 (-)	0.0	
021024	4-axis position signal output range 2 (+)	0.0	
021025	5-axis position signal output range 2 (-)	0.0	
021026	5-axis position signal output range 2 (+)	0.0	
021027	6-axis position signal output range 2 (-)	0.0	
021028	6-axis position signal output range 2 (+)	0.0	
021029	7-axis position signal output range 2 (-)	0.0	
021030	7-axis position signal output range 2 (+)	0.0	
021031	8-axis position signal output range 2 (-)	0.0	
021032	8-axis position signal output range 2 (+)	0.0	
021033	X-axis position signal output range 3 (-)	0.0	
021034	X-axis position signal output range 3 (+)	0.0	
021035	Y-axis position signal output range 3 (-)	0.0	
021036	Y-axis position signal output range 3 (+)	0.0	
021037	Z-axis position signal output range 3 (-)	0.0	
021038	Z-axis position signal output range 3 (+)	0.0	
021039	4-axis position signal output range 3 (-)	0.0	
021040	4-axis position signal output range 3 (+)	0.0	
021041	5-axis position signal output range 3 (-)	0.0	
021042	5-axis position signal output range 3 (+)	0.0	
021043	6-axis position signal output range 3 (-)	0.0	
021044	6-axis position signal output range 3 (+)	0.0	
021045	7-axis position signal output range 3 (-)	0.0	
021046	7-axis position signal output range 3 (+)	0.0	
021047	8-axis position signal output range 3 (-)	0.0	
021048	8-axis position signal output range 3 (+)	0.0	
021049	X-axis position signal output range 4 (-)	0.0	
021050	X-axis position signal output range 4 (+)	0.0	
021051	Y-axis position signal output range 4 (-)	0.0	
021052	Y-axis position signal output range 4 (+)	0.0	
021053	Z-axis position signal output range 4 (-)	0.0	
021054	Z-axis position signal output range 4 (+)	0.0	
021055	4-axis position signal output range 4 (-)	0.0	
021056	4-axis position signal output range 4 (+)	0.0	
021057	5-axis position signal output range 4 (-)	0.0	
021058	5-axis position signal output range 4 (+)	0.0	
021059	6-axis position signal output range 4 (-)	0.0	
021060	6-axis position signal output range 4 (+)	0.0	
021061	7-axis position signal output range 4 (-)	0.0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
021062	7-axis position signal output range 4 (+)	0.0	
021063	8-axis position signal output range 4 (-)	0.0	
021064	8-axis position signal output range 4 (+)	0.0	

User Parameter 2 (Switch 2): Excess travel amount for single direction positioning

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
021501	X-axis single direction positioning excess travel amount	0.0	
021502	Y-axis single direction positioning excess travel amount	0.0	
021503	Z-axis single direction positioning excess travel amount	0.0	
021504	5th-axis single direction positioning excess travel amount	0.0	
021505	6th-axis single direction positioning excess travel amount	0.0	
021506	7th-axis single direction positioning excess travel amount	0.0	
021507	8th-axis single direction positioning excess travel amount	0.0	

User Parameter 2 (Switch 2): External index

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
022001	Outer rotary table 1 switch address	0	
022002	Outer rotary table 1 indexing (+)	180.0	
022003	Outer rotary table 1 indexing (-)	-180.0	
022004	Outer rotary table 2 switch address	0	
022005	Outer rotary table 2 indexing (+)	180.0	
022006	Outer rotary table 2 indexing (-)	-180.0	

User Parameter 3 (Switch 3): In-position check distance

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
030001	M271 positioning end check distance	0.3	
030002	M271 positioning end check angle	0.3	
030003	M271 in-position width (X-, Y- and Z-axes)	0.02	
030004	M272 positioning end check distance	0.3	
030005	M272 positioning end check angle	0.3	
030006	M272 in-position width (X-, Y- and Z-axes)	0.025	
030007	M273 positioning end check distance	0.3	
030008	M273 positioning end check angle	0.3	
030009	M273 in-position width (X-, Y- and Z-axes)	0.03	
030010	M274 positioning end check distance	0.3	
030011	M274 positioning end check angle	0.3	
030012	M274 in-position width (X-, Y- and Z-axes)	0.035	
030013	M275 positioning end check distance	0.3	
030014	M275 positioning end check angle	0.3	
030015	M275 in-position width (X-, Y- and Z-axes)	0.04	
030016	M276 positioning end check distance	0.3	
030017	M276 positioning end check angle	0.3	
030018	M276 in-position width (X-, Y- and Z-axes)	0.045	
030019	M277 positioning end check distance	0.3	
030020	M277 positioning end check angle	0.3	
030021	M277 in-position width (X-, Y- and Z-axes)	0.05	
030022	M278 positioning end check distance	0.3	
030023	M278 positioning end check angle	0.3	
030024	M278 in-position width (X-, Y- and Z-axes)	0.055	
030025	M279 positioning end check distance	0.3	
030026	M279 positioning end check angle	0.3	
030027	M279 in-position width (X-, Y- and Z-axes)	0.06	
030028	Angle setting to check when additional axis for positioning is finished	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
030029	Initial modal for in-position check distance	0	

User Parameter 3 (Switch 3): Low priority indication alarm No.

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
030501	Low priority indication alarm No. 1		
030502	Low priority indication alarm No. 2		
030503	Low priority indication alarm No. 3		
030504	Low priority indication alarm No. 4		
030505	Low priority indication alarm No. 5		
030506	Low priority indication alarm No. 6		
030507	Low priority indication alarm No. 7		
030508	Low priority indication alarm No. 8		
030509	Low priority indication alarm No. 9		
030510	Low priority indication alarm No. 10		

User Parameter 3 (Switch 3): Modal display setting

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
031001	G code for modal display 1	1	
031002	G code for modal display 2	2	
031003	G code for modal display 3	3	
031004	G code for modal display 4	4	
031005	G code for modal display 5	5	
031006	G code for modal display 6	6	
031007	G code for modal display 7	7	
031008	G code for modal display 8	10	
031009	G code for modal display 9	8	
031010	G code for modal display 10	11	
031011	G code for modal display 11	12	
031012	G code for modal display 12	13	
031013	G code for modal display 13	14	
031014	G code for modal display 14	15	
031015	G code for modal display 15	16	
031016	G code for modal display 16	17	
031017	M code for modal display 1	1	
031018	M code for modal display 2	2	
031019	M code for modal display 3	3	
031020	M code for modal display 4	4	
031021	M code for modal display 5	5	
031022	M code for modal display 6	6	
031023	M code for modal display 7	7	
031024	M code for modal display 8	8	
031025	M code for modal display 9	9	
031026	M code for modal display 10	11	
031027	M code for modal display 11	12	
031028	M code for modal display 12	14	
031029	M code for modal display 13	16	
031030	M code for modal display 14	31	
031031	M code for modal display 15	0	
031032	M code for modal display 16	0	

User Parameter 3 (Switch 3): Specified alarm signal setting

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
031501	Specified alarm signal 2		
031502	Specified alarm signal 3		
031503	Specified alarm signal 4		
031504	Specified alarm signal 5		

User Parameter 4 (Reference position/Conversation zero point)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
040001	Reference position X-axis	0.0	
040002	Reference position Y-axis	0.0	
040003	Reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250)	445.0
040004	Reference position 5th-axis	0.0	
040005	Reference position 6th-axis	0.0	
040006	Reference position 7th-axis	0.0	
040007	Reference position 8th-axis	0.0	
040008	2nd reference position X-axis	0.0	
040009	2nd reference position Y-axis	0.0	
040010	2nd reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250)	445.0
040011	2nd reference position 5th-axis	0.0	
040012	2nd reference position 6th-axis	0.0	
040013	2nd reference position 7th-axis	0.0	
040014	2nd reference position 8th-axis	0.0	
040015	3rd reference position X-axis	0.0	
040016	3rd reference position Y-axis	0.0	
040017	3rd reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250)	445.0
040018	3rd reference position 5th-axis	0.0	
040019	3rd reference position 6th-axis	0.0	
040020	3rd reference position 7th-axis	0.0	
040021	3rd reference position 8th-axis	0.0	
040022	4th reference position X-axis	0.0	
040023	4th reference position Y-axis	0.0	
040024	4th reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250)	445.0
040025	4th reference position 5th-axis	0.0	
040026	4th reference position 6th-axis	0.0	
040027	4th reference position 7th-axis	0.0	
040028	4th reference position 8th-axis	0.0	
040029	5th reference position X-axis	0.0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
040030	5th reference position Y-axis	0.0	
040031	5th reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250)	445.0
040032	5th reference position 5th-axis	0.0	
040033	5th reference position 6th-axis	0.0	
040034	5th reference position 7th-axis	0.0	
040035	5th reference position 8th-axis	0.0	
040036	6th reference position X-axis	0.0	
040037	6th reference position Y-axis	0.0	
040038	6th reference position Z-axis	480.0 (Standard) 630.0 (High column150) 730.0 (High column250)	445.0
040039	6th reference position 5th-axis	0.0	
040040	6th reference position 6th-axis	0.0	
040041	6th reference position 7th-axis	0.0	
040042	6th reference position 8th-axis	0.0	
040043	Reference point return complete signal output at servo off	0	
040044	Reference point allowable range at servo off (for XYZ axes)	0.0	
040045	Reference point allowable range at servo off (for additional axes)	0.0	
040046	X-axis zero return pos.(No.2)	0.0	
040047	Y-axis zero return pos.(No.2)	0.0	
040048	5th-axis zero return pos.(No.2)	0.0	
040049	6th-axis zero return pos.(No.2)	0.0	
040050	7th-axis zero return pos.(No.2)	0.0	
040051	8th-axis zero return pos.(No.2)	0.0	
040052	X-axis zero return pos.(No.3)	0.0	
040053	Y-axis zero return pos.(No.3)	0.0	
040054	5th-axis zero return pos.(No.3)	0.0	
040055	6th-axis zero return pos.(No.3)	0.0	
040056	7th-axis zero return pos.(No.3)	0.0	
040057	8th-axis zero return pos.(No.3)	0.0	
040058	Zero point return complete signal output at servo off	0	
040059	Zero point allowable range at servo off (for XYZ axes)	0.0	
040060	Zero point allowable range at servo off (for additional axes)	0.0	
040061	Workpiece coordinate zero point X axis (for capture)	0.0	
040062	Workpiece coordinate zero point Y axis (for capture)	0.0	
040063	Workpiece coordinate zero point Z axis (for capture)	0.0	

user parameter 5 (User registered miscellaneous functions)

There is not default value.

User Parameter 6 (Tool breakage detection)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
060001	Tool breakage detection option	0	
060002	Pallet 1 tool breakage detector	0	
060003	Pallet 2 tool breakage detector	0	
060004	Tool breakage detection execution interval(No. of operations)	1	
060005	Reference tool length offset No.	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
060006	Tool breakage detection return position(Type1)	480.0 (Standard) 630.0 (High column150) 730.0 (High column250)	445.0
060007	Tool breakage detection position X-axis(Type1)	0.0	
060008	Tool breakage detection position Y-axis(Type1)	0.0	
060009	Tool breakage detection offset(Type2)	0.0	
060010	Tool breakage detection position X-axis(Type3)	0.0	
060011	Tool breakage detection position Y-axis(Type3)	0.0	
060012	Tool breakage detection position Z-axis(Type3)	0.0	
060013	Tool breakage detection start distance(Type3)	2.0	
060014	Tool breakage detection stop distance(Type3)	1.0	
060015	Tool breakage detection speed(Type3)	500.0	
060016	Tool breakage detection coolant OFF(Type3)	1	
060017	Pallet 2 tool breakage detection pos. X-axis(Type3)	0.0	
060018	Pallet 2 tool breakage detection pos. Y-axis(Type3)	0.0	
060019	Pallet 2 tool breakage detection pos. Z-axis(Type3)	0.0	
060020	Pallet 2 tool breakage detection start distance(Type3)	2.0	
060021	Pallet 2 tool breakage detection stop distance(Type3)	1.0	
060022	Pallet 2 tool breakage detection speed(Type3)	500.0	
060023	Pallet 2 tool breakage detection coolant OFF(Type3)	1	
060024	Check location measurement setting for tool breakage detection	0	

User Parameter 7 (Automatic workpiece measurement)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
070001	Probe compensation X (corner)	0.0	
070002	Probe compensation Y (corner)	0.0	
070003	Probe compensation X (3-point circle)	0.0	
070004	Probe compensation Y (3-point circle)	0.0	
070005	Probe compensation Z (Workpiece top surface)	0.0	
070006	Automatic workpiece measurement motion	0	
070007	Automatic workpiece measurement speed 1	500.0	
070008	Automatic workpiece measurement speed 2	100.0	
070009	Stop point before automatic workpiece measurement	5.0	
070010	Travel limit distance in automatic workpiece measurement	2.0	
070011	Tolerance 1 for automatic workpiece measurement	0.0	
070012	Tolerance 2 for automatic workpiece measurement	0.0	
070013	Return stroke after automatic workpiece measurement	1.0	
070014	Automatic centering compensation X (corner)	0.0	
070015	Automatic centering compensation Y (corner)	0.0	
070016	Automatic centering compensation Z (Workpiece top surface)	0.0	
070017	Automatic centering speed 1	500.0	
070018	Automatic centering speed 2	10.0	
070019	Automatic centering return	0.5	
070020	Tool number used for automatic centering	99	

User Parameter 8 (Automatic thermal distortion compensation)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
080001	Z-axis compensation	100	
080002	Spindle compensation(Z-axis)	100	
080003	X-axis compensation	100	
080004	Spindle compensation(X-axis)	100	
080005	Y-axis compensation	100	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
080006	Spindle compensation(Y-axis)	100	
080007	Auto. thermal distortion compen. at memory operation start	0	
080008	Lathe spindle compensation(Z-axis)	0	
080009	Lathe spindle compensation(X-axis)	0	
080010	Lathe spindle compensation(Y-axis)	0	

User Parameter 9 (Quick table)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
090001	Pallet program folder		
090002	Pallet 1 program		
090003	Pallet 2 program		
090004	Pallet program folder		
090005	Pallet 1 program		
090006	Pallet 2 program		
090007	Pallet 2 shift(X-axis)	0.0	
090008	Pallet 2 shift(Y-axis)	0.0	
090009	Pallet 2 shift(Z-axis)	0.0	
090010	Pallet 1 loading	0	
090011	Pallet 2 loading	0	
090012	Additional axis for return operation	0	

User Parameter 10 (High accuracy): Common

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
100001	Smooth path offset function	0	
100002	Smooth path offset cancel distance	10.0	
100003	Smooth path offset cancel angle	10.0	
100004	Smooth path offset angle determination invalid distance	0.01	
100005	Smooth path offset reference length	1.0	
100006	Minute block deletion when smooth path offset is cancelled	0	
100007	Accuracy level method	1	

User Parameter 10 (High accuracy): High accuracy A: M260

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101001	Corner deceleration override	120	
101002	Arc deceleration override	200	
101003	Curve approximation deceleration override	200	
101004	Smooth path offset level	1	
101005	Smooth override	100	
101006	Cutting feed time constant selection	0	
101007	Minute block deletion distance	0.0	
101008	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M261

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101101	Corner deceleration override	60	
101102	Arc deceleration override	140	
101103	Curve approximation deceleration override	140	
101104	Smooth path offset level	1	
101105	Smooth override	50	
101106	Cutting feed time constant selection	0	
101107	Minute block deletion distance	0.0	
101108	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M262

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101201	Corner deceleration override	70	
101202	Arc deceleration override	70	
101203	Curve approximation deceleration override	70	
101204	Smooth path offset level	1	
101205	Smooth override	600	
101206	Cutting feed time constant selection	0	
101207	Minute block deletion distance	0.0	
101208	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M263

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101301	Corner deceleration override	120	
101302	Arc deceleration override	200	
101303	Curve approximation deceleration override	200	
101304	Smooth path offset level	1	
101305	Smooth override	900	
101306	Cutting feed time constant selection	0	
101307	Minute block deletion distance	0.0	
101308	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M264

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101401	Corner deceleration override	120	
101402	Arc deceleration override	200	
101403	Curve approximation deceleration override	200	
101404	Smooth path offset level	1	
101405	Smooth override	2500	
101406	Cutting feed time constant selection	0	
101407	Minute block deletion distance	0.0	
101408	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M265

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101501	Corner deceleration override	600	
101502	Arc deceleration override	1000	
101503	Curve approximation deceleration override	1000	
101504	Smooth path offset level	1	
101505	Smooth override	100	
101506	Cutting feed time constant selection	0	
101507	Minute block deletion distance	0.0	
101508	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M266

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101601	Corner deceleration override	100	
101602	Arc deceleration override	100	
101603	Curve approximation deceleration override	100	
101604	Smooth path offset level	1	
101605	Smooth override	100	
101606	Cutting feed time constant selection	0	
101607	Minute block deletion distance	0.0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101608	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M267

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101701	Corner deceleration override	100	
101702	Arc deceleration override	100	
101703	Curve approximation deceleration override	100	
101704	Smooth path offset level	1	
101705	Smooth override	100	
101706	Cutting feed time constant selection	0	
101707	Minute block deletion distance	0.0	
101708	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy B: M280

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102001	Corner deceleration override	100	
102002	Arc deceleration override	0	
102003	Curve approximation deceleration override	0	
102004	Smooth path offset level	3	
102005	Smooth override	100	
102006	Minute block deletion distance	0.01	
102007	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M281

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102101	Corner deceleration override	100	
102102	Arc deceleration override	100	
102103	Curve approximation deceleration override	100	
102104	Smooth path offset level	1	
102105	Smooth override	100	
102106	Minute block deletion distance	0.0	
102107	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M282

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102201	Corner deceleration override	100	
102202	Arc deceleration override	100	
102203	Curve approximation deceleration override	100	
102204	Smooth path offset level	1	
102205	Smooth override	100	
102206	Minute block deletion distance	0.0	
102207	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M283

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102301	Corner deceleration override	100	
102302	Arc deceleration override	100	
102303	Curve approximation deceleration override	100	
102304	Smooth path offset level	1	
102305	Smooth override	100	
102306	Minute block deletion distance	0.0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102307	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M284

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102401	Corner deceleration override	100	
102402	Arc deceleration override	100	
102403	Curve approximation deceleration override	100	
102404	Smooth path offset level	1	
102405	Smooth override	100	
102406	Minute block deletion distance	0.0	
102407	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M285

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102501	Corner deceleration override	100	
102502	Arc deceleration override	100	
102503	Curve approximation deceleration override	100	
102504	Smooth path offset level	1	
102505	Smooth override	100	
102506	Minute block deletion distance	0.0	
102507	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M286

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102601	Corner deceleration override	100	
102602	Arc deceleration override	100	
102603	Curve approximation deceleration override	100	
102604	Smooth path offset level	1	
102605	Smooth override	100	
102606	Minute block deletion distance	0.0	
102607	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M287

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102701	Corner deceleration override	100	
102702	Arc deceleration override	100	
102703	Curve approximation deceleration override	100	
102704	Smooth path offset level	1	
102705	Smooth override	100	
102706	Minute block deletion distance	0.0	
102707	Smooth override type	0	

User Parameter 10 (High accuracy): Machining mode

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
105001	Machining mode	0	

User Parameter 10 (High accuracy): Adjustment A

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
105101	Standard mode	0	
105102	Accuracy adjustment value	0	
105103	Smoothness	0	

User Parameter 10 (High accuracy): Adjustment B

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
105201	Standard mode	0	
105202	Accuracy adjustment value	0	
105203	Smoothness	0	

User Parameter 10 (High accuracy): Adjustment C

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
105301	Standard mode	0	
105302	Accuracy adjustment value	0	
105303	Smoothness	0	

User Parameter 10 (High accuracy): Accuracy spec. mode

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
106001	Accuracy spec. mode	0	

User Parameter 10 (High accuracy): Accuracy spec. A

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
106101	Accuracy level	0.1	
106102	Smoothness	0	

User Parameter 10 (High accuracy): Accuracy spec. B

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
106201	Accuracy level	0.03	
106202	Smoothness	0	

User Parameter 10 (High accuracy): Accuracy spec. C

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
106301	Accuracy level	0.01	
106302	Smoothness	0	

User Parameter 11 (PLC)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
110001	P1-axis stroke	0	
110002	P2-axis stroke	0	
110003	P3-axis stroke	0	
110004	P4-axis stroke	0	
110005	P1-axis stroke(-)	0.0	
110006	P2-axis stroke(-)	0.0	
110007	P3-axis stroke(-)	0.0	
110008	P4-axis stroke(-)	0.0	
110009	P1-axis stroke(+)	0.0	
110010	P2-axis stroke(+)	0.0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
110011	P3-axis stroke(+)	0.0	
110012	P4-axis stroke(+)	0.0	
110013	Reference point P1-axis	0.0	
110014	Reference point P2-axis	0.0	
110015	Reference point P3-axis	0.0	
110016	Reference point P4-axis	0.0	
110017	P1-axis override speed 1	0.0	
110018	P1-axis override speed 2	500.0	
110019	P1-axis override speed 3	5000.0	
110020	P1-axis override speed 4	10000.0	
110021	P2-axis override speed 1	0.0	
110022	P2-axis override speed 2	500.0	
110023	P2-axis override speed 3	5000.0	
110024	P2-axis override speed 4	10000.0	
110025	P3-axis override speed 1	0.0	
110026	P3-axis override speed 2	500.0	
110027	P3-axis override speed 3	5000.0	
110028	P3-axis override speed 4	10000.0	
110029	P4-axis override speed 1	0.0	
110030	P4-axis override speed 2	500.0	
110031	P4-axis override speed 3	5000.0	
110032	P4-axis override speed 4	10000.0	
110033	Collis. detct.-P1ax stop meth.	0	
110034	Collis. detct.-P2ax stop meth.	0	
110035	Collis. detct.-P3ax stop meth.	0	
110036	Collis. detct.-P4ax stop meth.	0	

User Parameter 12 (Rotary fixture offset)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
120001	XYZ-axes travel during current rotary fixture offset change	0	
120002	Rotary fixture offset reset method	0	
120003	Tilt axis 1	0	
120004	Rotation axis 1	0	
120005	Tilt axis 2	0	
120006	Rotation axis 2	0	
120007	Tilt axis 3	0	
120008	Rotation axis 3	0	
120009	Tilt axis 4	0	
120010	Rotation axis 4	0	
120011	Forward direction for the coordinate system on tilt axis 1	0	
120012	Forward direction for the coordinate system on rotation axis 1	0	
120013	Forward direction for the coordinate system on tilt axis 2	0	
120014	Forward direction for the coordinate system on rotation axis 2	0	
120015	Forward direction for the coordinate system on tilt axis 3	0	
120016	Forward direction for the coordinate system on rotation axis 3	0	
120017	Forward direction for the coordinate system on tilt axis 4	0	
120018	Forward direction for the coordinate system on rotation axis 4	0	

User Parameter 13 (Rotation axis / tilt axis setting)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
130001	Tilt axis 1	0	
130002	Rotation axis 1	0	
130003	Tilt axis 2	0	
130004	Rotation axis 2	0	
130005	Forward direction for the coordinate system on tilt axis 1	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
130006	Forward direction for the coordinate system on rotation axis 1	0	
130007	Forward direction for the coordinate system on tilt axis 2	0	
130008	Forward direction for the coordinate system on rotation axis 2	0	
130009	Rotation center X coordinate offset for tilt axis 1	0.0	
130010	Rotation center Y coordinate offset for tilt axis 1	0.0	
130011	Rotation center Z coordinate offset for tilt axis 1	0.0	
130012	Rotation center X coordinate offset for rotation axis 1	0.0	
130013	Rotation center Y coordinate offset for rotation axis 1	0.0	
130014	Rotation center Z coordinate offset for rotation axis 1	0.0	
130015	Rotation center X coordinate offset for tilt axis 2	0.0	
130016	Rotation center Y coordinate offset for tilt axis 2	0.0	
130017	Rotation center Z coordinate offset for tilt axis 2	0.0	
130018	Rotation center X coordinate offset for rotation axis 2	0.0	
130019	Rotation center Y coordinate offset for rotation axis 2	0.0	
130020	Rotation center Z coordinate offset for rotation axis 2	0.0	
130021	Absolute coordinate display format	0	

User Parameter 14 (power consumption): power consumption setting

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
140001	Coolant pump (valve ON)	0	
140002	Coolant pump (valve OFF)	0	
140003	CTS pump	0	
140004	Chip shower pump	0	
140005	Cyclone suction pump	0	
140006	Chip conveyor	0	
140007	Chip auger	0	

User Parameter 14 (power consumption): user device setting01

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141011	Measurement	0	
141012	Name		
141013	power consumption		
141014	Signal address		
141016	Count conditions		

User Parameter 14 (power consumption): user device setting02

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141021	Measurement	0	
141022	Name		
141023	power consumption		
141024	Signal address		
141026	Count conditions		

User Parameter 14 (power consumption): user device setting03

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141031	Measurement	0	
141032	Name		
141033	power consumption		
141034	Signal address		
141036	Count conditions		

User Parameter 14 (power consumption): user device setting04

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141041	Measurement	0	
141042	Name		
141043	power consumption		
141044	Signal address		
141046	Count conditions		

User Parameter 14 (power consumption): user device setting05

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141051	Measurement	0	
141052	Name		
141053	power consumption		
141054	Signal address		
141056	Count conditions		

User Parameter 14 (power consumption): user device setting06

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141061	Measurement	0	
141062	Name		
141063	power consumption		
141064	Signal address		
141066	Count conditions		

User Parameter 14 (power consumption): user device setting07

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141071	Measurement	0	
141072	Name		
141073	power consumption		
141074	Signal address		
141076	Count conditions		

User Parameter 14 (power consumption): user device setting08

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141081	Measurement	0	
141082	Name		
141083	power consumption		
141084	Signal address		
141086	Count conditions		

User Parameter 14 (power consumption): Display setting

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
145001	Graph display start position – Daily graph	0	
145002	Graph display start position – Weekly graph	0	
145003	Maximum power consumption on gauge	10000	

1

1.15.1.4 Inch (S500Xd1,S700Xd1,S300Xd1,U500Xd1)

User Parameter 1 (Switch 1): Common

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
010001	Select mode	0	
010002	Display home screen at power ON	0	
010003	Machine No.	0	
010004	Table load weight	250	100
010005	Adjust tracking accuracy by load weight	1	
010006	Override switch	1	
010007	Alarm display when override is valid	1	
010008	Prevent rapid traverse override	0	
010009	Prevent cutting feedrate override	0	
010010	Prevent spindle override	0	
010011	Tap override	0	
010012	Thread cutting override	0	
010013	Stop using feedrate override during rapid feed	0	
010014	Pallet select key change	1	
010015	Lock shift key	0	
010016	4th row display axis	1	
010017	5th row display axis	2	
010018	6th row display axis	3	
010019	7th row display axis	4	
010020	8th row display axis	5	
010021	9th row display axis	6	
010022	10th row display axis	7	
010023	11th row display axis	8	
010024	12th row display axis	9	
010025	XYZ-axis absolute coord. display	2	
010026	Display coordinates during rotational transformation	0	
010027	Macro variable 1 for position screen display		
010028	Macro variable 2 for position screen display		
010029	Macro variable 3 for position screen display		
010030	Macro variable 4 for position screen display		
010031	Macro variable 5 for position screen display		
010032	Automatic screen dimming time	0	
010033	Alarm display when screen is dimmed	0	
010034	Automatic machine light off time	0	
010035	Standby mode time	0	
010036	Auto power off	0	
010037	Auto power off time	0	
010038	Cycle time calculation method	0	
010039	Screenshot	2	
010040	Motor insulation resistance measurement interval	0	
010041	Motor insulation resistance monitoring acceptable value (abnormal)	1.1	
010042	Motor insulation resistance monitoring acceptable value (alarm)	5.0	
010043	Notice of light load weight	0	
010044	Alarm stop level for shifted stop on ext. add. Axis	0	
010045	Specified function restriction	0	

User Parameter 1 (Switch 1): Operating

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
010501	Select memory operation	0	
010502	Dry run offset amount	0.0	
010503	Dry run offset amount lower limit	0.0	
010504	Repeat	0	
010505	Workpiece counter when program is repeated	0	
010506	Tool life management when program is repeated	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
010507	Program restart	0	
010508	S.T.M. return	1	
010509	Prevent restart from middle of program	0	
010510	Spindle return method for program stop	0	
010511	Lathe spindle return method for program stop	0	
010512	Coolant return method for program stop	0	
010513	Spindle rotation return during restart	1	
010514	Block No. display color	4	
010515	Pointer display color	3	
010516	Spare tool change	0	
010517	Check tool life on first use	1	
010518	Check before coolant pump start	1	
010519	Check before chip shower start	0	
010520	Shift method used in external workpiece coordinate system	0	

User Parameter 1 (Switch 1): programming

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
011001	Program unit	0	
011002	Program feed rate unit	0	
011003	Positioning method	0	
011004	Max. actual cutting travel speed (linear axis)	787.4	
011005	Max. actual cutting travel speed (rotation axis)	33.3	7.9
011006	Rotation axis speed command type	0	
011007	Standard circle radius	0.0	
011008	Arc radius error limit	0.0	
011009	Arc radius R command error limit	0.0001	
011010	Scaling	0	
011011	X-axis scaling	0	
011012	Y-axis scaling	0	
011013	Z-axis scaling	0	
011014	Scaling unit	0	
011015	Common scaling factor	1000	
011016	X-axis scaling factor(I)	1000	
011017	Y-axis scaling factor(J)	1000	
011018	Z-axis scaling factor(K)	1000	
011019	Macro command single stop	0	
011020	Interrupt macro interrupt type	0	
011021	Interrupt macro call type	0	
011022	Interrupt macro acceptance type	0	
011023	Multiple M codes in one block	1	
011024	Unregistered M-code	0	
011025	One shot signal M450 output time	5	
011026	One shot signal M451 output time	5	
011027	One shot signal M455 output time	5	
011028	One shot signal M456 output time	5	
011029	External signal reading time limit	0	
011030	External signal output time when MFIN is invalid	5	
011031	M function signal output delay time	1	
011032	Finish axis travel during external signal output	0	
011033	Tool data spindle rotation exceeded	0	
011034	Macro call method (Address L)	0	
011035	Sub program folder selection 1	1	
011036	Sub program folder designation 1		
011037	Sub program folder selection 2	1	
011038	Sub program folder designation 2		
011039	Sub program folder selection 3	1	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
011040	Sub program folder designation 3		
011041	Measurement setting 1	1	
011042	Measurement setting 2	0	
011043	Measurement setting 3	0	
011044	Measurement setting 4	0	
011045	Measurement setting 90	1	
011046	Measurement setting (Q omitted)	0	
011047	Cutting speed exceeded for inverse time feed	0	
011048	Z-axis perimeter function	0	
011049	Upper limit for Z-axis perimeter coasting distance	0.19685	

User Parameter 1 (Switch 1): Compensation function

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
011501	X/Y/Z-axis travel at tool length/tool pos. offset change	0	
011502	Error check when traveling during tool length/tool position offset cancel	0	
011503	Start up/Cancel	0	
011504	Corner travel limit	0.0	
011505	Automatic corner override(angle)	0.0	
011506	Automatic corner override(length 1)	0.0	
011507	Automatic corner override(length 2)	0.0	
011508	Automatic corner override(ratio)	100	
011509	Inner arc override limit	100	
011510	Cutter compensation interference check	0	
011511	Number of blocks to check cutter compensation interference	8	
011512	Involute interpolation override limit	0	
011513	Involute interpolation error limit	0.00393	
011514	Table deflection compensation function	0	
011515	Standard weight for table deflection compensation	0	
011516	Standard height for table deflection compensation	9.05511 (Standard) 14.96062 (High column150) 18.89763 (High column250)	7.67717
011517	Center gravity correction in table deflection compen.	0.0	
011518	Overwrite table deflection compensation	100	
011519	Error detect if no intersect for inner dia. compens.	1	

User Parameter 1 (Switch 1): Canned cycle

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
012001	G73 relief amount	0.01968	
012002	G83 cutting start position	0.01968	
012003	G77,G78 relief amount	1.0	
012004	G76,G87 shift direction	0	
012005	Tapping cycle return speed	0	
012006	Tapping sync. error too big - alarm stop level	0	
012007	Tap acceleration setting	1 (10K) 1 (10K(High torque)) 1 (16K) 0 (27K)	1 (10K) 1 (16K)
012008	Automatically use S command when changing tool	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
012009	Automatically use F command when changing tool	0	
012010	Lathe machining infeed direction when power is turned ON	0	
012011	Cutting amount in thread cutting cycle	1.5	
012012	Cutting angle in thread cutting cycle	45.0	
012013	Thread angle in complex thread cutting cycle	60.0	
012014	Minimum infeed amount in complex thread cutting cycle	0.00196	
012015	Finishing count in complex thread cutting cycle	1	
012016	Finishing allowance in complex thread cutting cycle	0.00098	

User Parameter 1 (Switch 1): Data

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
012501	ALM2 signal stop level	0	
012502	Cancel editing when resetting	1	
012503	Save when mode of current program is changed	0	
012504	Program edit start position during operation	0	
012505	Automatic sequence insertion increment	10	
012506	Set the same program for edit/memory operation programs	0	
012507	Automatic tool length compensation	0.0	
012508	Tool life counting method	0	
012509	Change tool life display(Type2)	0	
012510	Tool life unit (program)	0	
012511	Execute automatic data backup	1	
012512	Save location for automatic data backup	0	
012513	Automatic data backup interval	0	
012514	Automatic data backup time	0	
012515	Manual output	0	

User Parameter 1 (Switch 1): MANU

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
013001	Initial mode	0	
013002	Change handle magnification	1	
013003	Auto screen change at additional/PLC axis handle operation	0	
013004	Z-axis height to prohibit travel of additional axes	0.0	
013005	Z-axis height to prohibit travel of additional axes(pallet 2)	0.0	
013006	Prevent external operation for additional axes	0	
013007	Max. tapping speed (when returning tap)	100	
013008	XY axes movement when changing tool in manual mode	0	
013009	X-axis position when changing tool in manual mode	0.0	
013010	Y-axis position when changing tool in manual mode	0.0	

User Parameter 1 (Switch 1): Conv Ex

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
013501	Schedule program reset start position	0	
013502	Program end stop in schedule program	0	
013503	Tool assignment at memory operation start	1	
013504	Check tools used at automatic tool assignment	1	
013505	Workpiece zero conversion code	0	
013506	Convert tool data	1	
013507	Tap step return position	0	

User Parameter 1 (Switch 1): ATC/Magazine

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
014001	Tool wash discharge conditions for tool data	0	
014002	No tool detection function	0	
014003	Tool over key detection function	0	
014004	Tool missing detection function	0	
014005	Maximum tool specification settings	0	
014006	Z-axis travel method during tool change	0	
014007	Turret type magazine low-speed turn mode	0	
014008	Speed turret type magazine turns at low speed	20.0	
014009	Z-axis lowering speed 1 when changing tool	1377.95	
014010	Z-axis lowering speed 2 when changing tool	1377.95	
014011	Z-axis lowering speed 3 when changing tool	1377.95	
014012	ATC arm turn speed ratio 1 (M422)	100	
014013	ATC arm turn speed ratio 2 (M423)	100	
014014	ATC simultaneous operation start position	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250)	17.51969
014015	ATC reference tool length	7.87401	
014016	Tool wash when changing a different size tool	0	
014017	Magazine turn speed ratio 1(M436)	80	
014018	Magazine turn speed ratio 2(M437)	50	
014019	Magazine index when changing tools of different sizes	0	
014020	Pot lowering start position	0.0	

User Parameter 1 (Switch 1): installation

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
014501	Chip shower retention time	0	
014502	Automatic coolant off time	10	
014503	Coolant delay time	0	
014504	Back washing at end of program	1	
014505	CTS pressurize check delay time	1.0	
014506	CTS depressurize check delay time	1.0	
014507	CTS pressure bleed time	0.0	
014508	CTS line filter alarm stop level	1	
014509	Tool wash filter alarm stop level	0	
014510	Tool wash filter check interval	1	
014511	Display tool wash filter check result	0	
014512	Stop level for low tool wash level alarm (Type 4)	1	
014513	Tool wash filter clogging warning alarm stop level(Type4)	0	
014514	No. of tool wash filter clogging warning checks(Type4)	1	
014515	Faulty tool wash coolant level sensor check interval(Type4)	200	
014516	Lamp status when count ends	0	
014517	Oiling/greasing when power is turned on	0	
014518	Chip conveyor relay adhering check	0	
014519	Internal light key display	1	
014520	Table light key display	0	
014521	PLC rapid traverse override function	0	
014522	PLC feedrate override function	0	
014523	PLC spindle override function	0	
014524	**[MASTER ON]** function	0	
014525	Reset when **[MASTER ON]** is ON	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
014526	**[MASTER ON]** circuit selection	0	
014527	**[MASTER ON]** external emergency stop alarm (in NC)	0	
014528	Time extension when coolant level has dropped	0	

User Parameter 1 (Switch 1): Brake load test

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
015001	Auto execution of brake load test at mem. op start	0	
015002	Brake load test start time 1	0	
015003	Brake load test start time 2		
015004	Brake load test start time 3		
015005	Brake load test start time 4		
015006	Adjust start time for brake load test	0	
015007	Time extension for brake load test execution	0	
015008	Brake load test start position on Z-axis	1	
015009	Specified position for brake load test on Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250)	17.51969
015010	Brake load test start position on 5th-axis	1	
015011	Brake load test start position on 6th-axis	1	
015012	Brake load test start position on 7th-axis	1	
015013	Brake load test start position on 8th-axis	1	
015014	Specified angle for brake load test on 5th-axis	0.0	
015015	Specified angle for brake load test on 6th-axis	0.0	
015016	Specified angle for brake load test on 7th-axis	0.0	
015017	Specified angle for brake load test on 8th-axis	0.0	
015018	Order for brake load test execution on 5th-axis	0	
015019	Order for brake load test execution on 6th-axis	0	
015020	Order for brake load test execution on 7th-axis	0	
015021	Order for brake load test execution on 8th-axis	0	
015022	Move XY-ax. to safe pos. for brake load test on addt'l. ax.	0	
015023	Safe pos. for X-ax. during brake load test on addt'l. axis	0.0	
015024	Safe pos. for Y-ax. during brake load test on addt'l. axis	0.0	
015025	Order for brake load test execution on P1-axis	0	
015026	Order for brake load test execution on P2-axis	0	
015027	Order for brake load test execution on P3-axis	0	
015028	Order for brake load test execution on P4-axis	0	

User Parameter 1 (Switch 1): Door

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
015501	Area sensor pattern	1	
015502	Automatic door error level	1	
015503	START lamp status when operating automatic door manually	0	
015504	Display alarm when door is open – Front door/Outer door	0	
015505	Display alarm when door is open – Left side door	0	
015506	Display alarm when door is open – Right side door	0	
015507	Display alarm when door is open – Inner door	0	
015508	Display alarm when door is open – Setup chamber left door	0	
015509	Display alarm when door is open – Setup chamber right door	0	
015510	Display alarm when door is open – Outside door 1	0	
015511	Display alarm when door is open – Outside door 2	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
015512	Display alarm when door is open – Magazine door	0	
015513	Display alarm when door is open – Magazine shutter	0	
015514	Door lock method	1	
015515	Door to replace workpiece - Front door/outer door	1	
015516	Door to replace workpiece - Left side door	0	
015517	Door to replace workpiece - Right side door	0	
015518	Door to replace workpiece - Inner door	0	
015519	Door to replace workpiece - Setup chamber left door	0	
015520	Door to replace workpiece - Setup chamber right door	0	
015521	Door to replace workpiece - Outside door 1	0	
015522	Door to replace workpiece - Outside door 2	0	
015523	Door to replace workpiece - Magazine door	0	
015524	Tool change door settings	0	
015525	Door unlock1 key display	1	
015526	Door unlock2 key display	0	1
015527	Door unlock key setting - Front door/outer door	1	
015528	Door unlock key setting - Left side door	0	
015529	Door unlock key setting - Right side door	0	2
015530	Door unlock key setting - Inner door	0	
015531	Door unlock key setting - Setup chamber left door	0	
015532	Door unlock key setting - Setup chamber right door	0	
015533	Door unlock key setting - Outside door 1	0	
015534	Door unlock key setting - Outside door 2	0	
015535	Door unlock key setting - Magazine door	0	
015536	Door unlock signal setting - Front door/outer door	0	
015537	Door unlock signal setting - Left side door	0	
015538	Door unlock signal setting - Right side door	0	
015539	Door unlock signal setting - Inner door	0	
015540	Door unlock signal setting - Setup chamber left door	0	
015541	Door unlock signal setting - Setup chamber right door	0	
015542	Door unlock signal setting - Outside door 1	0	
015543	Door unlock signal setting - Outside door 2	0	
015544	Door unlock signal setting - Magazine door	0	
015545	Operation mode with door unlock key enabled	0	
015546	Door unlocks when power turns ON	0	
015547	Door unlocks when program stops	0	
015548	Door unlocks at end of operation	0	
015549	Door unlocks when single operation stops	2	
015550	Door unlocks at an alarm stop	0	
015551	Door unlocks after magazine turn	0	

User Parameter 2 (Switch 2): Stroke

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
020001	5th-axis stroke control	0	1
020002	6th-axis stroke control	0	
020003	7th-axis stroke control	0	
020004	8th-axis stroke control	0	
020005	5th-axis stroke(-)	0.0	-30.0
020006	6th-axis stroke(-)	0.0	
020007	7th-axis stroke(-)	0.0	
020008	8th-axis stroke(-)	0.0	
020009	5th-axis stroke(+)	0.0	120.0
020010	6th-axis stroke(+)	0.0	
020011	7th-axis stroke(+)	0.0	
020012	8th-axis stroke(+)	0.0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
020013	Stroke limit 1 for X-axis(-)	-19.68503 (Standard) -27.55905 (Long) -11.81102 (Short)	- 19.68503
020014	Stroke limit 1 for Y-axis(-)	-15.74803	
020015	Stroke limit 1 for Z-axis(-)	0.0	
020016	Stroke limit 1 for 5th-axis(-)	0.0	-30.0
020017	Stroke limit 1 for 6th-axis(-)	0.0	
020018	Stroke limit 1 for 7th-axis(-)	0.0	
020019	Stroke limit 1 for 8th-axis(-)	0.0	
020020	Stroke limit 1 for X-axis(+)	0.0	
020021	Stroke limit 1 for Y-axis(+)	0.0	
020022	Stroke limit 1 for Z-axis(+)	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250)	17.51969
020023	Stroke limit 1 for 5th-axis(+)	0.0	120.0
020024	Stroke limit 1 for 6th-axis(+)	0.0	
020025	Stroke limit 1 for 7th-axis(+)	0.0	
020026	Stroke limit 1 for 8th-axis(+)	0.0	
020027	Stroke limit 2 for X-axis(-)	0.0	
020028	Stroke limit 2 for Y-axis(-)	0.0	
020029	Stroke limit 2 for Z-axis(-)	0.0	
020030	Stroke limit 2 for X-axis(+)	0.0	
020031	Stroke limit 2 for Y-axis(+)	0.0	
020032	Stroke limit 2 for Z-axis(+)	0.0	

User Parameter 2 (Switch 2): Override speed

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
020501	Rapid traverse override speed 1	0.0	
020502	Rapid traverse override speed 2	19.68	
020503	Rapid traverse override speed 3	196.85	
020504	Rapid traverse override speed 4	393.7	
020505	4th-axis override rotation speed 1	0.0	
020506	4th-axis override rotation speed 2	0.3	
020507	4th-axis override rotation speed 3	2.5	
020508	4th-axis override rotation speed 4	5.0	
020509	5th-axis override rotation speed 1	0.0	
020510	5th-axis override rotation speed 2	0.5	
020511	5th-axis override rotation speed 3	5.0	
020512	5th-axis override rotation speed 4	10.0	
020513	6th-axis override rotation speed 1	0.0	
020514	6th-axis override rotation speed 2	0.5	
020515	6th-axis override rotation speed 3	5.0	
020516	6th-axis override rotation speed 4	10.0	
020517	7th-axis override rotation speed 1	0.0	
020518	7th-axis override rotation speed 2	0.5	
020519	7th-axis override rotation speed 3	5.0	
020520	7th-axis override rotation speed 4	10.0	
020521	8th-axis override rotation speed 1	0.0	
020522	8th-axis override rotation speed 2	0.5	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
020523	8th-axis override rotation speed 3	5.0	
020524	8th-axis override rotation speed 4	10.0	

User Parameter 2 (Switch 2): Output signal range for position signal

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
021001	X-axis position signal output range(-)	0.0	
021002	X-axis position signal output range(+)	0.0	
021003	Y-axis position signal output range(-)	0.0	
021004	Y-axis position signal output range(+)	0.0	
021005	Z-axis position signal output range(-)	0.0	
021006	Z-axis position signal output range(+)	0.0	
021007	4th-axis position signal output range(-)	0.0	
021008	4th-axis position signal output range(+)	0.0	
021009	5th-axis position signal output range(-)	0.0	
021010	5th-axis position signal output range(+)	0.0	
021011	6th-axis position signal output range(-)	0.0	
021012	6th-axis position signal output range(+)	0.0	
021013	7th-axis position signal output range(-)	0.0	
021014	7th-axis position signal output range(+)	0.0	
021015	8th-axis position signal output range(-)	0.0	
021016	8th-axis position signal output range(+)	0.0	
021017	X-axis position signal output range 2 (-)	0.0	
021018	X-axis position signal output range 2 (+)	0.0	
021019	Y-axis position signal output range 2 (-)	0.0	
021020	Y-axis position signal output range 2 (+)	0.0	
021021	Z-axis position signal output range 2 (-)	0.0	
021022	Z-axis position signal output range 2 (+)	0.0	
021023	4-axis position signal output range 2 (-)	0.0	
021024	4-axis position signal output range 2 (+)	0.0	
021025	5-axis position signal output range 2 (-)	0.0	
021026	5-axis position signal output range 2 (+)	0.0	
021027	6-axis position signal output range 2 (-)	0.0	
021028	6-axis position signal output range 2 (+)	0.0	
021029	7-axis position signal output range 2 (-)	0.0	
021030	7-axis position signal output range 2 (+)	0.0	
021031	8-axis position signal output range 2 (-)	0.0	
021032	8-axis position signal output range 2 (+)	0.0	
021033	X-axis position signal output range 3 (-)	0.0	
021034	X-axis position signal output range 3 (+)	0.0	
021035	Y-axis position signal output range 3 (-)	0.0	
021036	Y-axis position signal output range 3 (+)	0.0	
021037	Z-axis position signal output range 3 (-)	0.0	
021038	Z-axis position signal output range 3 (+)	0.0	
021039	4-axis position signal output range 3 (-)	0.0	
021040	4-axis position signal output range 3 (+)	0.0	
021041	5-axis position signal output range 3 (-)	0.0	
021042	5-axis position signal output range 3 (+)	0.0	
021043	6-axis position signal output range 3 (-)	0.0	
021044	6-axis position signal output range 3 (+)	0.0	
021045	7-axis position signal output range 3 (-)	0.0	
021046	7-axis position signal output range 3 (+)	0.0	
021047	8-axis position signal output range 3 (-)	0.0	
021048	8-axis position signal output range 3 (+)	0.0	
021049	X-axis position signal output range 4 (-)	0.0	
021050	X-axis position signal output range 4 (+)	0.0	
021051	Y-axis position signal output range 4 (-)	0.0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
021052	Y-axis position signal output range 4 (+)	0.0	
021053	Z-axis position signal output range 4 (-)	0.0	
021054	Z-axis position signal output range 4 (+)	0.0	
021055	4-axis position signal output range 4 (-)	0.0	
021056	4-axis position signal output range 4 (+)	0.0	
021057	5-axis position signal output range 4 (-)	0.0	
021058	5-axis position signal output range 4 (+)	0.0	
021059	6-axis position signal output range 4 (-)	0.0	
021060	6-axis position signal output range 4 (+)	0.0	
021061	7-axis position signal output range 4 (-)	0.0	
021062	7-axis position signal output range 4 (+)	0.0	
021063	8-axis position signal output range 4 (-)	0.0	
021064	8-axis position signal output range 4 (+)	0.0	

User Parameter 2 (Switch 2): Excess travel amount for single direction positioning

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
021501	X-axis single direction positioning excess travel amount	0.0	
021502	Y-axis single direction positioning excess travel amount	0.0	
021503	Z-axis single direction positioning excess travel amount	0.0	
021504	5th-axis single direction positioning excess travel amount	0.0	
021505	6th-axis single direction positioning excess travel amount	0.0	
021506	7th-axis single direction positioning excess travel amount	0.0	
021507	8th-axis single direction positioning excess travel amount	0.0	

User Parameter 2 (Switch 2): External index

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
022001	Outer rotary table 1 switch address	0	
022002	Outer rotary table 1 indexing (+)	180.0	
022003	Outer rotary table 1 indexing (-)	-180.0	
022004	Outer rotary table 2 switch address	0	
022005	Outer rotary table 2 indexing (+)	180.0	
022006	Outer rotary table 2 indexing (-)	-180.0	

User Parameter 3 (Switch 3): In-position check distance

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
030001	M271 positioning end check distance	0.01181	
030002	M271 positioning end check angle	0.3	
030003	M271 in-position width (X-, Y- and Z-axes)	0.00059	
030004	M272 positioning end check distance	0.01181	
030005	M272 positioning end check angle	0.3	
030006	M272 in-position width (X-, Y- and Z-axes)	0.00059	
030007	M273 positioning end check distance	0.01181	
030008	M273 positioning end check angle	0.3	
030009	M273 in-position width (X-, Y- and Z-axes)	0.00059	
030010	M274 positioning end check distance	0.01181	
030011	M274 positioning end check angle	0.3	
030012	M274 in-position width (X-, Y- and Z-axes)	0.00059	
030013	M275 positioning end check distance	0.01181	
030014	M275 positioning end check angle	0.3	
030015	M275 in-position width (X-, Y- and Z-axes)	0.00059	
030016	M276 positioning end check distance	0.01181	
030017	M276 positioning end check angle	0.3	
030018	M276 in-position width (X-, Y- and Z-axes)	0.00059	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
030019	M277 positioning end check distance	0.01181	
030020	M277 positioning end check angle	0.3	
030021	M277 in-position width (X-, Y- and Z-axes)	0.00059	
030022	M278 positioning end check distance	0.01181	
030023	M278 positioning end check angle	0.3	
030024	M278 in-position width (X-, Y- and Z-axes)	0.00059	
030025	M279 positioning end check distance	0.01181	
030026	M279 positioning end check angle	0.3	
030027	M279 in-position width (X-, Y- and Z-axes)	0.00059	
030028	Angle setting to check when additional axis for positioning is finished	0	
030029	Initial modal for in-position check distance	0	

User Parameter 3 (Switch 3): Low priority indication alarm No.

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
030501	Low priority indication alarm No. 1		
030502	Low priority indication alarm No. 2		
030503	Low priority indication alarm No. 3		
030504	Low priority indication alarm No. 4		
030505	Low priority indication alarm No. 5		
030506	Low priority indication alarm No. 6		
030507	Low priority indication alarm No. 7		
030508	Low priority indication alarm No. 8		
030509	Low priority indication alarm No. 9		
030510	Low priority indication alarm No. 10		

User Parameter 3 (Switch 3): Modal display setting

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
031001	G code for modal display 1	1	
031002	G code for modal display 2	2	
031003	G code for modal display 3	3	
031004	G code for modal display 4	4	
031005	G code for modal display 5	5	
031006	G code for modal display 6	6	
031007	G code for modal display 7	7	
031008	G code for modal display 8	10	
031009	G code for modal display 9	8	
031010	G code for modal display 10	11	
031011	G code for modal display 11	12	
031012	G code for modal display 12	13	
031013	G code for modal display 13	14	
031014	G code for modal display 14	15	
031015	G code for modal display 15	16	
031016	G code for modal display 16	17	
031017	M code for modal display 1	1	
031018	M code for modal display 2	2	
031019	M code for modal display 3	3	
031020	M code for modal display 4	4	
031021	M code for modal display 5	5	
031022	M code for modal display 6	6	
031023	M code for modal display 7	7	
031024	M code for modal display 8	8	
031025	M code for modal display 9	9	
031026	M code for modal display 10	11	
031027	M code for modal display 11	12	
031028	M code for modal display 12	14	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
031029	M code for modal display 13	16	
031030	M code for modal display 14	31	
031031	M code for modal display 15	0	
031032	M code for modal display 16	0	

User Parameter 3 (Switch 3): Specified alarm signal setting

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
031501	Specified alarm signal 2		
031502	Specified alarm signal 3		
031503	Specified alarm signal 4		
031504	Specified alarm signal 5		

User Parameter 4 (Reference position/Conversation zero point)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
040001	Reference position X-axis	0.0	
040002	Reference position Y-axis	0.0	
040003	Reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250)	17.51969
040004	Reference position 5th-axis	0.0	
040005	Reference position 6th-axis	0.0	
040006	Reference position 7th-axis	0.0	
040007	Reference position 8th-axis	0.0	
040008	2nd reference position X-axis	0.0	
040009	2nd reference position Y-axis	0.0	
040010	2nd reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250)	17.51969
040011	2nd reference position 5th-axis	0.0	
040012	2nd reference position 6th-axis	0.0	
040013	2nd reference position 7th-axis	0.0	
040014	2nd reference position 8th-axis	0.0	
040015	3rd reference position X-axis	0.0	
040016	3rd reference position Y-axis	0.0	
040017	3rd reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250)	17.51969
040018	3rd reference position 5th-axis	0.0	
040019	3rd reference position 6th-axis	0.0	
040020	3rd reference position 7th-axis	0.0	
040021	3rd reference position 8th-axis	0.0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
040022	4th reference position X-axis	0.0	
040023	4th reference position Y-axis	0.0	
040024	4th reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250)	17.51969
040025	4th reference position 5th-axis	0.0	
040026	4th reference position 6th-axis	0.0	
040027	4th reference position 7th-axis	0.0	
040028	4th reference position 8th-axis	0.0	
040029	5th reference position X-axis	0.0	
040030	5th reference position Y-axis	0.0	
040031	5th reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250)	17.51969
040032	5th reference position 5th-axis	0.0	
040033	5th reference position 6th-axis	0.0	
040034	5th reference position 7th-axis	0.0	
040035	5th reference position 8th-axis	0.0	
040036	6th reference position X-axis	0.0	
040037	6th reference position Y-axis	0.0	
040038	6th reference position Z-axis	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250)	17.51969
040039	6th reference position 5th-axis	0.0	
040040	6th reference position 6th-axis	0.0	
040041	6th reference position 7th-axis	0.0	
040042	6th reference position 8th-axis	0.0	
040043	Reference point return complete signal output at servo off	0	
040044	Reference point allowable range at servo off (for XYZ axes)	0.0	
040045	Reference point allowable range at servo off (for additional axes)	0.0	
040046	X-axis zero return pos.(No.2)	0.0	
040047	Y-axis zero return pos.(No.2)	0.0	
040048	5th-axis zero return pos.(No.2)	0.0	
040049	6th-axis zero return pos.(No.2)	0.0	
040050	7th-axis zero return pos.(No.2)	0.0	
040051	8th-axis zero return pos.(No.2)	0.0	
040052	X-axis zero return pos.(No.3)	0.0	
040053	Y-axis zero return pos.(No.3)	0.0	
040054	5th-axis zero return pos.(No.3)	0.0	
040055	6th-axis zero return pos.(No.3)	0.0	
040056	7th-axis zero return pos.(No.3)	0.0	
040057	8th-axis zero return pos.(No.3)	0.0	
040058	Zero point return complete signal output at servo off	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
040059	Zero point allowable range at servo off (for XYZ axes)	0.0	
040060	Zero point allowable range at servo off (for additional axes)	0.0	
040061	Workpiece coordinate zero point X axis (for capture)	0.0	
040062	Workpiece coordinate zero point Y axis (for capture)	0.0	
040063	Workpiece coordinate zero point Z axis (for capture)	0.0	

user parameter 5 (User registered miscellaneous functions)

There is not default value.

User Parameter 6 (Tool breakage detection)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
060001	Tool breakage detection option	0	
060002	Pallet 1 tool breakage detector	0	
060003	Pallet 2 tool breakage detector	0	
060004	Tool breakage detection execution interval(No. of operations)	1	
060005	Reference tool length offset No.	0	
060006	Tool breakage detection return position(Type1)	18.89763 (Standard) 24.80314 (High column150) 28.74015 (High column250)	17.51969
060007	Tool breakage detection position X-axis(Type1)	0.0	
060008	Tool breakage detection position Y-axis(Type1)	0.0	
060009	Tool breakage detection offset(Type2)	0.0	
060010	Tool breakage detection position X-axis(Type3)	0.0	
060011	Tool breakage detection position Y-axis(Type3)	0.0	
060012	Tool breakage detection position Z-axis(Type3)	0.0	
060013	Tool breakage detection start distance(Type3)	0.0787	
060014	Tool breakage detection stop distance(Type3)	0.0393	
060015	Tool breakage detection speed(Type3)	19.6	
060016	Tool breakage detection coolant OFF(Type3)	1	
060017	Pallet 2 tool breakage detection pos. X-axis(Type3)	0.0	
060018	Pallet 2 tool breakage detection pos. Y-axis(Type3)	0.0	
060019	Pallet 2 tool breakage detection pos. Z-axis(Type3)	0.0	
060020	Pallet 2 tool breakage detection start distance(Type3)	0.0787	
060021	Pallet 2 tool breakage detection stop distance(Type3)	0.0393	
060022	Pallet 2 tool breakage detection speed(Type3)	19.6	
060023	Pallet 2 tool breakage detection coolant OFF(Type3)	1	
060024	Check location measurement setting for tool breakage detection	0	

User Parameter 7 (Automatic workpiece measurement)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
070001	Probe compensation X (corner)	0.0	
070002	Probe compensation Y (corner)	0.0	
070003	Probe compensation X (3-point circle)	0.0	
070004	Probe compensation Y (3-point circle)	0.0	
070005	Probe compensation Z (Workpiece top surface)	0.0	
070006	Automatic workpiece measurement motion	0	
070007	Automatic workpiece measurement speed 1	19.68	
070008	Automatic workpiece measurement speed 2	3.93	
070009	Stop point before automatic workpiece measurement	0.19685	
070010	Travel limit distance in automatic workpiece measurement	0.07874	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
070011	Tolerance 1 for automatic workpiece measurement	0.0	
070012	Tolerance 2 for automatic workpiece measurement	0.0	
070013	Return stroke after automatic workpiece measurement	0.03937	
070014	Automatic centering compensation X (corner)	0.0	
070015	Automatic centering compensation Y (corner)	0.0	
070016	Automatic centering compensation Z (Workpiece top surface)	0.0	
070017	Automatic centering speed 1	19.68	
070018	Automatic centering speed 2	0.39	
070019	Automatic centering return	0.01968	
070020	Tool number used for automatic centering	99	

User Parameter 8 (Automatic thermal distortion compensation)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
080001	Z-axis compensation	100	
080002	Spindle compensation(Z-axis)	100	
080003	X-axis compensation	100	
080004	Spindle compensation(X-axis)	100	
080005	Y-axis compensation	100	
080006	Spindle compensation(Y-axis)	100	
080007	Auto. thermal distortion compen. at memory operation start	0	
080008	Lathe spindle compensation(Z-axis)	0	
080009	Lathe spindle compensation(X-axis)	0	
080010	Lathe spindle compensation(Y-axis)	0	

User Parameter 9 (Quick table)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
090001	Pallet program folder		
090002	Pallet 1 program		
090003	Pallet 2 program		
090004	Pallet program folder		
090005	Pallet 1 program		
090006	Pallet 2 program		
090007	Pallet 2 shift(X-axis)	0.0	
090008	Pallet 2 shift(Y-axis)	0.0	
090009	Pallet 2 shift(Z-axis)	0.0	
090010	Pallet 1 loading	0	
090011	Pallet 2 loading	0	
090012	Additional axis for return operation	0	

User Parameter 10 (High accuracy): Common

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
100001	Smooth path offset function	0	
100002	Smooth path offset cancel distance	0.3937	
100003	Smooth path offset cancel angle	10.0	
100004	Smooth path offset angle determination invalid distance	0.00039	
100005	Smooth path offset reference length	0.03937	
100006	Minute block deletion when smooth path offset is cancelled	0	
100007	Accuracy level method	1	

User Parameter 10 (High accuracy): High accuracy A: M260

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101001	Corner deceleration override	120	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101002	Arc deceleration override	200	
101003	Curve approximation deceleration override	200	
101004	Smooth path offset level	1	
101005	Smooth override	100	
101006	Cutting feed time constant selection	0	
101007	Minute block deletion distance	0.0	
101008	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M261

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101101	Corner deceleration override	60	
101102	Arc deceleration override	140	
101103	Curve approximation deceleration override	140	
101104	Smooth path offset level	1	
101105	Smooth override	50	
101106	Cutting feed time constant selection	0	
101107	Minute block deletion distance	0.0	
101108	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M262

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101201	Corner deceleration override	70	
101202	Arc deceleration override	70	
101203	Curve approximation deceleration override	70	
101204	Smooth path offset level	1	
101205	Smooth override	600	
101206	Cutting feed time constant selection	0	
101207	Minute block deletion distance	0.0	
101208	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M263

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101301	Corner deceleration override	120	
101302	Arc deceleration override	200	
101303	Curve approximation deceleration override	200	
101304	Smooth path offset level	1	
101305	Smooth override	900	
101306	Cutting feed time constant selection	0	
101307	Minute block deletion distance	0.0	
101308	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M264

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101401	Corner deceleration override	120	
101402	Arc deceleration override	200	
101403	Curve approximation deceleration override	200	
101404	Smooth path offset level	1	
101405	Smooth override	2500	
101406	Cutting feed time constant selection	0	
101407	Minute block deletion distance	0.0	
101408	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M265

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101501	Corner deceleration override	600	
101502	Arc deceleration override	1000	
101503	Curve approximation deceleration override	1000	
101504	Smooth path offset level	1	
101505	Smooth override	100	
101506	Cutting feed time constant selection	0	
101507	Minute block deletion distance	0.0	
101508	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M266

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101601	Corner deceleration override	100	
101602	Arc deceleration override	100	
101603	Curve approximation deceleration override	100	
101604	Smooth path offset level	1	
101605	Smooth override	100	
101606	Cutting feed time constant selection	0	
101607	Minute block deletion distance	0.0	
101608	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy A: M267

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
101701	Corner deceleration override	100	
101702	Arc deceleration override	100	
101703	Curve approximation deceleration override	100	
101704	Smooth path offset level	1	
101705	Smooth override	100	
101706	Cutting feed time constant selection	0	
101707	Minute block deletion distance	0.0	
101708	Accuracy level	0.0	

User Parameter 10 (High accuracy): High accuracy B: M280

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102001	Corner deceleration override	100	
102002	Arc deceleration override	0	
102003	Curve approximation deceleration override	0	
102004	Smooth path offset level	3	
102005	Smooth override	100	
102006	Minute block deletion distance	0.00039	
102007	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M281

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102101	Corner deceleration override	100	
102102	Arc deceleration override	100	
102103	Curve approximation deceleration override	100	
102104	Smooth path offset level	1	
102105	Smooth override	100	
102106	Minute block deletion distance	0.0	
102107	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M282

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102201	Corner deceleration override	100	
102202	Arc deceleration override	100	
102203	Curve approximation deceleration override	100	
102204	Smooth path offset level	1	
102205	Smooth override	100	
102206	Minute block deletion distance	0.0	
102207	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M283

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102301	Corner deceleration override	100	
102302	Arc deceleration override	100	
102303	Curve approximation deceleration override	100	
102304	Smooth path offset level	1	
102305	Smooth override	100	
102306	Minute block deletion distance	0.0	
102307	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M284

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102401	Corner deceleration override	100	
102402	Arc deceleration override	100	
102403	Curve approximation deceleration override	100	
102404	Smooth path offset level	1	
102405	Smooth override	100	
102406	Minute block deletion distance	0.0	
102407	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M285

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102501	Corner deceleration override	100	
102502	Arc deceleration override	100	
102503	Curve approximation deceleration override	100	
102504	Smooth path offset level	1	
102505	Smooth override	100	
102506	Minute block deletion distance	0.0	
102507	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M286

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102601	Corner deceleration override	100	
102602	Arc deceleration override	100	
102603	Curve approximation deceleration override	100	
102604	Smooth path offset level	1	
102605	Smooth override	100	
102606	Minute block deletion distance	0.0	
102607	Smooth override type	0	

User Parameter 10 (High accuracy): High accuracy B: M287

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
102701	Corner deceleration override	100	
102702	Arc deceleration override	100	
102703	Curve approximation deceleration override	100	
102704	Smooth path offset level	1	
102705	Smooth override	100	
102706	Minute block deletion distance	0.0	
102707	Smooth override type	0	

User Parameter 10 (High accuracy): Machining mode

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
105001	Machining mode	0	

User Parameter 10 (High accuracy): Adjustment A

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
105101	Standard mode	0	
105102	Accuracy adjustment value	0	
105103	Smoothness	0	

User Parameter 10 (High accuracy): Adjustment B

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
105201	Standard mode	0	
105202	Accuracy adjustment value	0	
105203	Smoothness	0	

User Parameter 10 (High accuracy): Adjustment C

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
105301	Standard mode	0	
105302	Accuracy adjustment value	0	
105303	Smoothness	0	

User Parameter 10 (High accuracy): Accuracy spec. mode

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
106001	Accuracy spec. mode	0	

User Parameter 10 (High accuracy): Accuracy spec. A

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
106101	Accuracy level	0.00393	
106102	Smoothness	0	

User Parameter 10 (High accuracy): Accuracy spec. B

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
106201	Accuracy level	0.00118	
106202	Smoothness	0	

User Parameter 10 (High accuracy): Accuracy spec. C

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
106301	Accuracy level	0.00039	
106302	Smoothness	0	

User Parameter 11 (PLC)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
110001	P1-axis stroke	0	
110002	P2-axis stroke	0	
110003	P3-axis stroke	0	
110004	P4-axis stroke	0	
110005	P1-axis stroke(-)	0.0	
110006	P2-axis stroke(-)	0.0	
110007	P3-axis stroke(-)	0.0	
110008	P4-axis stroke(-)	0.0	
110009	P1-axis stroke(+)	0.0	
110010	P2-axis stroke(+)	0.0	
110011	P3-axis stroke(+)	0.0	
110012	P4-axis stroke(+)	0.0	
110013	Reference point P1-axis	0.0	
110014	Reference point P2-axis	0.0	
110015	Reference point P3-axis	0.0	
110016	Reference point P4-axis	0.0	
110017	P1-axis override speed 1	0.0	
110018	P1-axis override speed 2	20.0	
110019	P1-axis override speed 3	200.0	
110020	P1-axis override speed 4	400.0	
110021	P2-axis override speed 1	0.0	
110022	P2-axis override speed 2	20.0	
110023	P2-axis override speed 3	200.0	
110024	P2-axis override speed 4	400.0	
110025	P3-axis override speed 1	0.0	
110026	P3-axis override speed 2	20.0	
110027	P3-axis override speed 3	200.0	
110028	P3-axis override speed 4	400.0	
110029	P4-axis override speed 1	0.0	
110030	P4-axis override speed 2	20.0	
110031	P4-axis override speed 3	200.0	
110032	P4-axis override speed 4	400.0	
110033	Collis. detct.-P1ax stop meth.	0	
110034	Collis. detct.-P2ax stop meth.	0	
110035	Collis. detct.-P3ax stop meth.	0	
110036	Collis. detct.-P4ax stop meth.	0	

User Parameter 12 (Rotary fixture offset)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
120001	XYZ-axes travel during current rotary fixture offset change	0	
120002	Rotary fixture offset reset method	0	
120003	Tilt axis 1	0	
120004	Rotation axis 1	0	
120005	Tilt axis 2	0	
120006	Rotation axis 2	0	
120007	Tilt axis 3	0	
120008	Rotation axis 3	0	
120009	Tilt axis 4	0	
120010	Rotation axis 4	0	

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
120011	Forward direction for the coordinate system on tilt axis 1	0	
120012	Forward direction for the coordinate system on rotation axis 1	0	
120013	Forward direction for the coordinate system on tilt axis 2	0	
120014	Forward direction for the coordinate system on rotation axis 2	0	
120015	Forward direction for the coordinate system on tilt axis 3	0	
120016	Forward direction for the coordinate system on rotation axis 3	0	
120017	Forward direction for the coordinate system on tilt axis 4	0	
120018	Forward direction for the coordinate system on rotation axis 4	0	

User Parameter 13 (Rotation axis / tilt axis setting)

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
130001	Tilt axis 1	0	
130002	Rotation axis 1	0	
130003	Tilt axis 2	0	
130004	Rotation axis 2	0	
130005	Forward direction for the coordinate system on tilt axis 1	0	
130006	Forward direction for the coordinate system on rotation axis 1	0	
130007	Forward direction for the coordinate system on tilt axis 2	0	
130008	Forward direction for the coordinate system on rotation axis 2	0	
130009	Rotation center X coordinate offset for tilt axis 1	0.0	
130010	Rotation center Y coordinate offset for tilt axis 1	0.0	
130011	Rotation center Z coordinate offset for tilt axis 1	0.0	
130012	Rotation center X coordinate offset for rotation axis 1	0.0	
130013	Rotation center Y coordinate offset for rotation axis 1	0.0	
130014	Rotation center Z coordinate offset for rotation axis 1	0.0	
130015	Rotation center X coordinate offset for tilt axis 2	0.0	
130016	Rotation center Y coordinate offset for tilt axis 2	0.0	
130017	Rotation center Z coordinate offset for tilt axis 2	0.0	
130018	Rotation center X coordinate offset for rotation axis 2	0.0	
130019	Rotation center Y coordinate offset for rotation axis 2	0.0	
130020	Rotation center Z coordinate offset for rotation axis 2	0.0	
130021	Absolute coordinate display format	0	

User Parameter 14 (power consumption): power consumption setting

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
140001	Coolant pump (valve ON)	0	
140002	Coolant pump (valve OFF)	0	
140003	CTS pump	0	
140004	Chip shower pump	0	
140005	Cyclone suction pump	0	
140006	Chip conveyor	0	
140007	Chip auger	0	

User Parameter 14 (power consumption): user device setting01

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141011	Measurement	0	
141012	Name		
141013	power consumption		
141014	Signal address		
141016	Count conditions		

User Parameter 14 (power consumption): user device setting02

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141021	Measurement	0	
141022	Name		
141023	power consumption		
141024	Signal address		
141026	Count conditions		

User Parameter 14 (power consumption): user device setting03

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141031	Measurement	0	
141032	Name		
141033	power consumption		
141034	Signal address		
141036	Count conditions		

User Parameter 14 (power consumption): user device setting04

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141041	Measurement	0	
141042	Name		
141043	power consumption		
141044	Signal address		
141046	Count conditions		

User Parameter 14 (power consumption): user device setting05

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141051	Measurement	0	
141052	Name		
141053	power consumption		
141054	Signal address		
141056	Count conditions		

User Parameter 14 (power consumption): user device setting06

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141061	Measurement	0	
141062	Name		
141063	power consumption		
141064	Signal address		
141066	Count conditions		

User Parameter 14 (power consumption): user device setting07

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141071	Measurement	0	
141072	Name		
141073	power consumption		
141074	Signal address		
141076	Count conditions		

User Parameter 14 (power consumption): user device setting08

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
141081	Measurement	0	
141082	Name		
141083	power consumption		
141084	Signal address		
141086	Count conditions		

User Parameter 14 (power consumption): Display setting

No.	Item	S500Xd1 S700Xd1 S300Xd1	U500Xd1
145001	Graph display start position – Daily graph	0	
145002	Graph display start position – Weekly graph	0	
145003	Maximum power consumption on gauge	10000	

1.15.2 List of Communication Parameter Default Values

Common

No.	Items	Same for all models
0001	Reset (slave station)	1
0002	Data overwriting (slave station)	0
0003	Remote operation	0
0004	Slave station command alarm display	1
0005	Method for batch program input	0
0006	File name added as comment	0
0007	Comment input extension	1
0008	External output - Output destination (NC language only)	0

Serial Port

No.	Items	Same for all models
0101	Connected device	
0102	NC-exclusive communication device communication protocol (master station)	0
0103	Baud rate	5
0104	Parity	0
0105	Stop bit	0
0106	Character length	0
0107	Communication mode	0
0108	Response monitoring time	60
0109	Invalid data (For NC language only)	1
0110	Sending data code (For NC language only)	0
0111	End of block (For NC language only)	0
0112	TV check	0
0113	Output dot character	0
0114	Reset recovery time	1
0115	Checksum	0
0116	EIA character code (#) (For NC language only)	173
0117	EIA character code (*) (For NC language only)	186
0118	EIA character code (=) (For NC language only)	194
0119	EIA character code ([) (For NC language only)	161
0120	EIA character code (]) (For NC language only)	162
0121	Check DR signal	1
0122	Communication end DC3 code	0
0123	DC1 code	17
0124	DC2 code	18
0125	DC3 code	147
0126	DC4 code	20
0127	Leading zero suppression (DPRNT) (For NC language only)	0

Ethernet/FTP

No.	Items	Same for all models
0201	Host name	
0202	Use DHCP	0
0203	IP address	1.1.1.1
0204	Mask bit	255.255.255.0
0205	Default gateway	
0206	Automatic acquisition of DNS server address	0
0207	DNS server address 1	
0208	DNS server address 2	
0209	Port number	10000
0210	PLC port No.	20000
0211	FTP(S) server name (IP address)	
0212	FTP(S) server port number	21
0213	User name as client	
0214	Password as client	
0215	Use passive mode	1
0216	Restrict Ethernet access	1
0217	Access timeout period	120
0218	Server user name	
0219	Password as server	
0220	FTP time zone	0
0221	Response monitoring time	60
0222	Invalid data (For NC language only)	1
0223	End of block (For NC language only)	0
0224	TV check (For NC language only)	0
0225	Checksum	0
0226	Header/footer (For NC language only)	0
0227	FTP response file size	0
0228	Leading zero suppression (DPRNT) (NC language only)	0
0229	External output - FTP output destination	
0230	External output - FTP output name	
0231	HTTP server function	1
0232	HTTPS server function	0
0233	FTP server function	1
0234	FTPS server function	0
0235	OPC UA server function	1
0236	Security communication for client	0
0237	OPC UA security communication	0

Memory Card

No.	Items	Same for all models
0301	Invalid data (For NC language only)	1
0302	End of block (For C language only)	0
0303	TV check (For NC language only)	0
0304	Header/footer (For NC language only)	0
0305	Leading zero suppression (DPRNT) (For NC language only)	0

Auto notification function

No.	Item name	Same for all models
0401	Auto notification function	0
0402	Start operation at power ON	0
0403	Notification host name (IP address)	
0404	Notification port number	30000
0405	Retry attempts	3
0406	Retry wait time	3
0407	Control method	0
0408	Response monitoring time	60
0409	Data register address for storing error code	300
0410	Alarm display for send error	1
0411	Method to specify sending data	0
0412	Stop level for error when sending data is specified indirectly	4
0413	Cancel level for error when sending data is specified indirectly	2
0414	Type of sending data	0
0415	Leading address for sending data	100
0416	Sending data length	10

Security

No.	Item name	Same for all models
0501	Domain name	
0502	Valid period (days)	398
0503	Public key and algorithm	1
0504	Signature and algorithm	1
0505	Private-key password	
0506	Organization	
0507	Department	
0508	City	
0509	Prefecture/State	
0510	Country	
0511	Alternative domain name	
0512	Scheduled notice before server certificate validity end date	0
0513	Connecting server certificate warning level	0

1.15.3 Default Value List for Machining Job Tool Patterns

The tool pattern as shown below is initially set for each machining process before shipment.Modify the tool pattern as required according to the tools, workpiece materials to be used.

Machining process	With chamfer	Without chamfer
Center hole drilling	-	■1 Center drill
Drilling	■1 Center drill ■2 Drill ■3 Chamfering tool	■1 Center drill ■2 Drill
Tapping	■1 Center drill ■2 Drill ■3 Chamfering tool ■4 Tap ■5	■1 Center drill ■2 Drill ■3 Tap ■4
Rolled tap	■1 Center drill ■2 Drill ■3 Chamfering tool ■4 Rolled tap ■5	■1 Center drill ■2 Drill ■3 Rolled tap ■4
Reamer	■1 Center drill ■2 Drill ■3 Chamfering tool ■4 End mill R ■5 Reamer	■1 Center drill ■2 Drill ■3 End mill R ■4 Reamer
Counterboring	■1 Center drill ■2 Drill ■3 Counterboring tool ■4 Chamfering tool	■1 Center drill ■2 Drill ■3 Counterboring tool
Counterbore tapping	■1 Center drill ■2 Drill ■3 Counterboring tool ■4 Chamfering tool ■5 Tap ■6	■1 Center drill ■2 Drill ■3 Counterboring tool ■4 Tap ■5
Counterbore tapping by rolled tap	■1 Center drill ■2 Drill ■3 Counterboring tool ■4 Chamfering tool ■5 Rolled tap ■6	■1 Center drill ■2 Drill ■3 Counterboring tool ■4 Rolled tap ■5
Counterbore reamer	■1 Center drill ■2 Drill ■3 Counterboring tool ■4 Chamfering tool ■5 End mill R ■6 Reamer	■1 Center drill ■2 Drill ■3 Counterboring tool ■4 End mill R ■5 Reamer
Face milling	-	■1 End mill R
Facing	-	■1 End mill R ■2 End mill F
Pocket	■1 End mill R ■2 End mill F ■3 Chamfering mill	■1 End mill R ■2 End mill F
Counterboring	-	■1 End mill R ■2 End mill F
Chamfering	■1 Chamfering mill	-

1.15.4 List of Default Values for Tapping Drill Diameter

1.15.4.1 Drill Diameters for Tapping Primary Hole

The values as shown below are initially set before shipment.Modify the values as required according to the tools and workpiece materials to be used.

1. Metric coarse screw

Nominal pitch	Drill hole dia.
M1.0 × 0.25	0.750(0.0295)
M1.1 × 0.25	0.850(0.0335)
M1.2 × 0.25	0.950(0.0374)
M1.4 × 0.3	1.100(0.0433)
M1.6 × 0.35	1.300(0.0512)
M1.7 × 0.35	1.400(0.0551)
M1.8 × 0.35	1.500(0.0591)
M2.0 × 0.4	1.650(0.0650)
M2.2 × 0.45	1.800(0.0709)
M2.3 × 0.4	2.000(0.0787)
M2.5 × 0.45	2.100(0.0827)
M2.6 × 0.45	2.200(0.0866)
M3.0 × 0.5	2.500(0.0984)
M3.5 × 0.6	3.000(0.1181)
M4.0 × 0.7	3.300(0.1289)
M4.5 × 0.75	3.800(0.1496)
M5.0 × 0.8	4.300(0.1693)
M6.0 × 1.0	5.100(0.2008)
M7.0 × 1.0	6.100(0.2402)
M8.0 × 1.25	6.800(0.2677)
M9.0 × 1.25	7.800(0.3386)
M10.0 × 1.5	8.600(0.3386)
M12.0 × 1.75	10.400(0.4130)
M14.0 × 2.0	12.200(0.4844)
M16.0 × 2.0	14.200(0.5625)
M18.0 × 2.5	15.700(0.6181)
M20.0 × 2.5	17.700(0.6969)
M22.0 × 2.5	19.700(0.7756)
M24.0 × 3.0	21.200(0.8346)
M27.0 × 3.0	24.200(0.9528)
M30.0 × 3.5	26.700(1.0512)

2. Metric fine screw

Nominal pitch	Drill hole dia.
M1.0 × 0.2	0.800(0.0315)
M1.1 × 0.2	0.900(0.0354)
M1.2 × 0.2	1.000(0.0394)
M1.4 × 0.2	1.200(0.0472)
M1.6 × 0.2	1.400(0.0551)
M1.8 × 0.2	1.600(0.0630)
M2.0 × 0.25	1.800(0.0709)
M2.2 × 0.25	2.000(0.0787)
M2.5 × 0.35	2.200(0.0866)
M3.0 × 0.35	2.700(0.1063)
M3.5 × 0.35	3.200(0.1260)
M4.0 × 0.5	3.500(0.1378)
M4.5 × 0.5	4.000(0.1575)
M5.0 × 0.5	4.500(0.1772)
M5.5 × 0.5	5.000(0.1969)
M6.0 × 0.75	5.300(0.2087)
M7.0 × 0.75	6.300(0.2480)
M8.0 × 1.0	7.100(0.2795)
M8.0 × 0.75	7.300(0.2874)
M9.0 × 1.0	8.100(0.3189)
M9.0 × 0.75	8.300(0.3268)
M10.0 × 1.25	8.800(0.3465)
M10.0 × 1.0	9.100(0.3583)
M10.0 × 0.75	9.300(0.3661)
M12.0 × 1.5	10.600(0.4219)
M12.0 × 1.25	10.800(0.4331)
M12.0 × 1.0	11.100(0.4375)
M14.0 × 1.5	12.600(0.5000)
M14.0 × 1.0	13.100(0.5156)
M15.0 × 1.5	13.600(0.5469)
M15.0 × 1.0	14.100(0.5625)
M16.0 × 1.5	14.600(0.5781)
M16.0 × 1.0	15.100(0.5938)
M17.0 × 1.5	15.600(0.6250)
M17.0 × 1.0	16.100(0.6406)
M18.0 × 2.0	16.200(0.6406)
M18.0 × 1.5	16.600(0.6562)
M18.0 × 1.0	17.100(0.6719)
M20.0 × 2.0	18.200(0.7165)
M20.0 × 1.5	18.600(0.7331)
M20.0 × 1.0	19.100(0.7531)
M22.0 × 2.0	20.200(0.7953)
M22.0 × 1.5	20.600(0.8118)
M22.0 × 1.0	21.100(0.8319)
M24.0 × 2.0	22.200(0.8740)
M24.0 × 1.5	22.600(0.8906)

2. Metric fine screw (cont.)

Nominal pitch	Drill hole dia.
M24.0 × 1.0	23.100(0.9106)
M25.0 × 2.0	23.200(0.9134)
M25.0 × 1.5	23.600(0.9299)
M25.0 × 1.0	24.100(0.9500)
M26.0 × 1.5	24.600(0.9693)
M27.0 × 2.0	25.200(0.9921)
M27.0 × 1.5	25.600(1.0087)
M27.0 × 1.0	26.100(1.0287)
M28.0 × 2.0	26.200(1.0315)
M28.0 × 1.5	26.600(1.0480)
M28.0 × 1.0	27.100(1.0681)
M30.0 × 3.0	27.200(1.0709)
M30.0 × 2.0	28.200(1.1102)
M30.0 × 1.5	28.600(1.1268)
M30.0 × 1.0	29.100(1.1469)

3. Unified coarse screw

Number of threads	Primary hole drill diameter
UNC 1-64	1.550(0.0610)
UNC 2-56	1.850(0.0728)
UNC 3-48	2.100(0.0827)
UNC 4-40	2.300(0.0906)
UNC 5-40	2.600(0.1024)
UNC 6-32	2.800(0.1102)
UNC 8-32	3.500(0.1378)
UNC 10-24	3.900(0.1535)
UNC 12-24	4.500(0.1772)
UNC 1/4-20	5.200(0.2047)
UNC 5/16-18	6.700(0.2638)
UNC 3/8-16	8.100(0.3189)
UNC 7/16-14	9.500(0.3740)
UNC 1/2-13	11.000(0.4331)
UNC 9/16-12	12.300(0.4844)
UNC 5/8-11	13.800(0.5469)
UNC 3/4-10	16.800(0.6614)
UNC 7/8-9	19.600(0.7717)

4. Unified fine screw

Number of threads	primary hole drill diameter
UNF 0-80	1.300(0.0512)
UNF 1-72	1.600(0.0630)
UNF 2-64	1.900(0.0748)
UNF 3-56	2.100(0.0827)
UNF 4-48	2.400(0.0945)
UNF 5-44	2.700(0.1063)
UNF 6-40	3.000(0.1181)
UNF 8-36	3.500(0.1378)
UNF 10-32	4.100(0.1614)
UNF 12-28	4.700(0.1850)
UNF 1/4-28	5.500(0.2165)
UNF 5/16-24	7.000(0.2756)
UNF 3/8-24	8.600(0.3386)
UNF 7/16-20	10.100(0.3970)
UNF 1/2-20	11.600(0.4688)
UNF 9/16-18	13.000(0.5118)
UNF 5/8-18	14.600(0.5781)
UNF 3/4-16	17.600(0.6929)
UNF 7/8-14	20.600(0.8110)

- When the machine parameter (system1: common) <Change screw type> is set to <0:Language set> and the <Display language> is set to <0:Japanese>, or when <Change screw type> is set to <1:For Japan>

5. Sewing machine thread

Number of threads	primary hole drill diameter
SM 1/16-80	1.250
SM 5/64-64	1.500
SM 3/32-100	2.100
SM 3/32-56	1.900
SM 1/8-48	2.600
SM 1/8-44	2.500
SM 1/8-40	2.500
SM 9/64-40	2.900
SM 11/64-40	3.700
SM 11/64-32	3.500
SM 3/16-40	4.100
SM 3/16-32	3.900
SM 3/16-28	3.800
SM 3/16-24	3.600
SM 13/64-32	4.300
SM 7/32-32	4.700
SM 15/64-28	5.000
SM 1/4-40	5.600
SM 1/4-28	5.400
SM 1/4-24	5.200
SM 9/32-28	6.200
SM 9/32-20	5.800
SM 5/16-28	7.000
SM 5/16-24	6.800
SM 5/16-18	6.300
SM 11/32-28	7.800
SM 3/8-28	8.500
SM 3/8-18	7.900
SM 7/16-28	10.100
SM 7/16-16	9.300
SM 1/2-28	11.700
SM 1/2-20	11.300
SM 1/2-12	10.300
SM 9/16-20	13.000

6.Standard straight pipe thread PS

Number of threads	primary hole drill diameter
PS 1/16-28	6.500
PS 1/8-28	8.500
PS 1/4-19	11.400
PS 3/8-19	15.000
PS 1/2-14	18.500

7. Standard taper pipe thread PT

Number of threads	primary hole drill diameter
PT 1/16-28	6.400
PT 1/8-28	8.400
○PT 1/4-19	11.200
○PT 3/8-19	14.700
○PT 1/2-14	18.000

The taper pipe thread with circle(○) applies the machining with deeper cuts.
Change the cutting conditions (cutting speed, number of steps etc.) as needed.

8. Standard paralled fastening thread PF

Number of threads	primary hole drill diameter
PF 1/16-28	6.800
PF 1/8-28	8.800
PF 1/4-19	11.900
PF 3/8-19	15.400
PF 1/2-14	19.000

9. Miniature screw thread

Number of threads	primary hole drill diameter
S0.4×0.1	0.310
S0.5×0.125	0.390
S0.6×0.15	0.470
S0.7×0.175	0.550
S0.8×0.2	0.630
S0.9×0.225	0.710

- When the machine parameter (system1: common) <Change screw type> is set to <0:Language set> and the <Display language> is configured to another setting besides <0:Japanese>, or when <Change screw type> is set to <2:For other than Japan>

5. NPS

Number of threads	primary hole drill diameter
NPS 1/16-27	6.630(0.2610)
NPS 1/8-27	8.840(0.3480)
NPS 1/4-18	11.510(0.4531)
NPS 3/8-18	15.080(0.5937)

6. BSP

Number of threads	primary hole drill diameter
BSP 1/16-28	6.700(0.2638)
BSP 1/8-28	8.800(0.3465)
BSP 1/4-19	11.900(0.4688)
BSP 3/8-19	15.400(0.6094)

7. BSW

Number of threads	primary hole drill diameter
BSW 1/8-40	2.600(0.1024)
BSW 3/16-24	3.700(0.1457)
BSW 1/4-20	5.100(0.2008)
BSW 5/16-18	6.600(0.2598)
BSW 3/8-16	8.000(0.3150)
BSW 7/16-14	9.400(0.3701)
BSW 1/2-12	10.600(0.4219)
BSW 9/16-12	12.200(0.4844)
BSW 5/8-11	13.600(0.5469)
BSW 11/16-11	15.100(0.5945)

8. BSF

Number of threads	primary hole drill diameter
BSF 3/16-32	4.000(0.1575)
BSF 7/32-28	4.700(0.1850)
BSF 1/4-26	5.400(0.2126)
BSF 9/32-26	6.200(0.2441)
BSF 5/16-22	6.800(0.2677)
BSF 3/8-20	8.300(0.3268)
BSF 7/16-18	9.800(0.3858)
BSF 1/2-16	11.200(0.4375)
BSF 9/16-16	12.800(0.5118)
BSF 5/8-14	14.100(0.5625)
BSF 11/16-14	15.700(0.6250)

9. BA

Number of threads	primary hole drill diameter
BA 0 × 1.00	5.100(0.2008)
BA 1 × 0.90	4.500(0.1772)
BA 2 × 0.81	4.000(0.1575)
BA 3 × 0.73	3.500(0.1378)
BA 4 × 0.66	3.100(0.1220)
BA 5 × 0.59	2.700(0.1063)
BA 6 × 0.53	2.400(0.0945)
BA 7 × 0.48	2.100(0.0827)
BA 8 × 0.43	1.800(0.0709)
BA 9 × 0.39	1.600(0.0630)
BA 10 × 0.35	1.400(0.0551)
BA 11 × 0.31	1.200(0.0472)
BA 12 × 0.28	1.100(0.0433)
BA 13 × 0.25	1.000(0.0394)
BA 14 × 0.23	0.800(0.0315)

10. NPT

Number of threads	primary hole drill diameter
NPT1 1/16-27	6.400(0.2500)
NPT1 1/8-27	8.600(0.3390)
NPT1 1/4-18	11.400(0.4531)
NPT1 3/8-18	14.700(0.5781)

11. Sewing machine thread

Number of threads	primary hole drill diameter
SM 1/16-80	1.250(0.0492)
SM 5/64-64	1.500(0.0591)
SM 3/32-100	2.100(0.0827)
SM 3/32-56	1.900(0.0748)
SM 1/8-48	2.600(0.1024)
SM 1/8-44	2.500(0.0984)
SM 1/8-40	2.500(0.0984)
SM 9/64-40	2.900(0.1142)
SM 11/64-40	3.700(0.1457)
SM 11/64-32	3.500(0.1378)
SM 3/16-40	4.100(0.1614)
SM 3/16-32	3.900(0.1535)
SM 3/16-28	3.800(0.1496)
SM 3/16-24	3.600(0.1417)
SM 13/64-32	4.300(0.1693)
SM 7/32-32	4.700(0.1850)
SM 15/64-28	5.000(0.1969)
SM 1/4-40	5.600(0.2205)
SM 1/4-28	5.400(0.2126)
SM 1/4-24	5.200(0.2047)
SM 9/32-28	6.200(0.2441)
SM 9/32-20	5.800(0.2283)
SM 5/16-28	7.000(0.2756)
SM 5/16-24	6.800(0.2677)
SM 5/16-18	6.300(0.2480)
SM 11/32-28	7.800(0.3071)
SM 3/8-28	8.500(0.3346)
SM 3/8-18	7.900(0.3110)
SM 7/16-28	10.100(0.3976)
SM 7/16-16	9.300(0.3661)
SM 1/2-28	11.700(0.4606)
SM 1/2-20	11.300(0.4449)
SM 1/2-12	10.300(0.4055)
SM 9/16-20	13.000(0.5118)

12. Miniature screw thread

Number of threads	primary hole drill diameter
S0.4 × 0.1	0.310
S0.5 × 0.125	0.390
S0.6 × 0.1	0.470
S0.7 × 0.1	0.550
S0.8 × 0.1	0.630
S0.9 × 0.1	0.710

1.15.4.2 Drill Diameters for Tapping Primary Hole by Rolled Tap

The values as shown below are initially set before shipment.Modify the values as required according to the tools and workpiece materials to be used.

1. Metric coarse screw

Nominal pitch	primary hole drill diameter
M1.0 × 0.25	0.880
M1.1 × 0.25	0.980
M1.2 × 0.25	1.080
M1.4 × 0.3	1.260
M1.6 × 0.35	1.440
M1.7 × 0.35	1.540
M1.8 × 0.35	1.640
M2.0 × 0.4	1.820
M2.2 × 0.45	1.990
M2.3 × 0.4	2.120
M2.5 × 0.45	2.300
M2.6 × 0.45	2.400
M3.0 × 0.5	2.770
M3.5 × 0.6	3.210
M4.0 × 0.7	3.640
M4.5 × 0.75	4.140
M5.0 × 0.8	4.620
M6.0 × 1.0	5.520
M7.0 × 1.0	6.510
M8.0 × 1.25	7.380
M9.0 × 1.25	8.380
M10.0 × 1.5	9.220
M12.0 × 1.75	11.080
M14.0 × 2.0	12.950
M16.0 × 2.0	14.950
M18.0 × 2.5	16.670
M20.0 × 2.5	18.670
M22.0 × 2.5	20.670
M24.0 × 3.0	22.410

2. Metric fine screw

Nominal pitch	primary hole drill diameter
M1.0 × 0.2	0.900
M1.1 × 0.2	1.000
M1.2 × 0.2	1.100
M1.4 × 0.2	1.300
M1.6 × 0.2	1.500
M1.8 × 0.2	1.700
M2.0 × 0.25	1.890
M2.2 × 0.25	2.090
M2.5 × 0.35	2.340
M3.0 × 0.35	2.840
M3.5 × 0.35	3.340
M4.0 × 0.5	3.770
M4.5 × 0.5	4.270
M5.0 × 0.5	4.770
M5.5 × 0.5	5.270
M6.0 × 0.75	5.640
M7.0 × 0.75	6.640
M8.0 × 1.0	7.510
M8.0 × 0.75	7.640
M9.0 × 1.0	8.510
M9.0 × 0.75	8.640
M10.0 × 1.25	9.380
M10.0 × 1.0	9.520
M10.0 × 0.75	9.660
M12.0 × 1.5	11.220
M12.0 × 1.25	11.380
M12.0 × 1.0	11.520
M14.0 × 1.5	13.220
M14.0 × 1.0	13.520
M15.0 × 1.5	14.220
M15.0 × 1.0	14.520
M16.0 × 1.5	15.220
M16.0 × 1.0	15.520
M17.0 × 1.5	16.270
M17.0 × 1.0	16.520
M18.0 × 2.0	16.950
M18.0 × 1.5	17.230
M18.0 × 1.0	17.520
M20.0 × 2.0	18.950
M20.0 × 1.5	19.230
M20.0 × 1.0	19.520
M22.0 × 2.0	20.950

2. (Metric fine screw) (Continued)

Nominal pitch	Primary hole drill diameter
M22.0 × 1.5	21.230
M22.0 × 1.0	21.520
M24.0 × 2.0	22.950
M24.0 × 1.5	23.230
M24.0 × 1.0	23.520
M25.0 × 2.0	23.950
M25.0 × 1.5	24.230
M25.0 × 1.0	24.520
M26.0 × 1.5	25.230
M27.0 × 2.0	25.950
M27.0 × 1.5	26.770
M27.0 × 1.0	26.520
M28.0 × 2.0	26.950
M28.0 × 1.5	27.230
M28.0 × 1.0	27.520
M30.0 × 3.0	28.390
M30.0 × 2.0	28.950
M30.0 × 1.5	29.230
M30.0 × 1.0	29.520

3. Unified coarse screw

Nominal pitch	Primary hole drill diameter
UNC 1-64	1.710
UNC 2-56	2.020
UNC 3-48	2.320
UNC 4-40	2.590
UNC 5-40	2.920
UNC 6-32	3.170
UNC 8-32	3.830
UNC 10-24	4.350
UNC 12-24	4.980
UNC 1/4-20	5.770
UNC 5/16-18	7.240
UNC 3/8-16	8.730
UNC 7/16-14	10.190
UNC 1/2-13	11.680
UNC 9/16-12	13.240
UNC 5/8-11	14.670
UNC 3/4-10	17.740
UNC 7/8-9	20.750

4. Unified fine screw

Nominal pitch	Primary hole drill diameter
UNF 0-80	1.410
UNF 1-72	1.720
UNF 2-64	2.040
UNF 3-56	2.330
UNF 4-48	2.630
UNF 5-44	2.950
UNF 6-40	3.230
UNF 8-36	3.870
UNF 10-32	4.470
UNF 12-28	5.070
UNF 1/4-28	5.940
UNF 5/16-24	7.430
UNF 3/8-24	9.020
UNF 7/16-20	10.490
UNF 1/2-20	12.050
UNF 9/16-18	13.580
UNF 5/8-18	15.170
UNF 3/4-16	18.250
UNF 7/8-14	21.270

9(12). Miniature screw threads (*)

Nominal pitch	Primary hole drill diameter
S0.4 × 0.1	0.350
S0.5 × 0.125	0.440
S0.6 × 0.15	0.530
S0.7 × 0.175	0.620
S0.8 × 0.2	0.710
S0.9 × 0.225	0.800

* The display number changes depending on the settings for the machine parameters “Display language” and “Change screw type”.

1.15.5 List of Settings and Default Values for Cutting Conditions

A description is provided about the data that is edited on the cutting conditions edit screen.
The set values that are noted are the default values. An asterisk (*) indicates that setting is not required for that item.

1.15.5.1 Cutting Conditions 1 (Drill)

1. S45C

Processing method		Registered tool name	Peripheral speed (m/min)	Feed (mm/ revolution)	Remarks
Center drill	Lengthwise	Center drill Center drill1~9	12	0.05	Lengthwise:For center hole cutting Crosswise:For chamfer milling by forced assignment of center drill
	Crosswise		*	*	
Drill	~2.999	Drill Drill 1~9	10	0.05	~2.999 is the cutting conditions for a drill of not more than 2.999 mm in OD; 3~ is those for a drill of not less than 3 mm in OD.
	3~		18	0.10	
Carbide drill	~2.999	Carbide drill Carbide drill 1~9	20	0.05	~2.999 is the cutting conditions for a drill of not more than 2.999 mm in OD; 3~ is those for a drill with of not less than 3 mm in OD.
	3~		30	0.10	
Tapping (blind)	~2.999	Spiral tap Spiral tap 1~9 Point tap Point tap 1~9 Hand tap Hand tap 1~9	12	*	~2.999 is the cutting conditions for a tap with a of not more than 2.999 mm in nominal dia.; 3~ is those for a tap with of not less than 3 mm in nominal dia.
	3~		12	*	
Tapping (through)	~2.999	Spiral tap Spiral tap 1~9 Point tap Point tap 1~9 Hand tap Hand tap 1~9	15	*	~2.999 is the cutting conditions for a tap of not more than 2.999 mm in nominal dia.; 3~ is those for a tap of not less than 3 mm in nominal dia.
	3~		15	*	
Rolled tap	~2.999	Rolled tap Rolled tap 1~9	10	*	~2.999 is the cutting conditions for a tap of not more than 2.999 mm in nominal dia.; 3~ is those for a tap with of not less than 3 mm in nominal dia.
	3~		10	*	
Drill with chamfering tool	*	Chamfering tool Chamfering tool 1~9	15	0.10	
Drill with counter boring tool	*	Counterboring tool Counterboring tool 1~9	15	0.07	
Chamfered drill	hole	Chamfered drill Chamfered drill 1~9	18	0.10	For drilling, specify the cutting conditions for drilling with a drill using chamfering tool; for chamfering, specify those for chamfering using a drill with chamfering tool.
	Chamfering		15	0.10	
Stepped drill	hole	Stepped drill Stepped drill 1~9	18	0.10	For drilling, specify the cutting conditions for drilling using a drill with counter boring tool; for counter boring, specify those for counter boring using a drill with counter boring tool.
	Chamfering		15	0.07	
Drill tap	hole	Drill tap Drill tap 1~9	18	0.10	For drilling, specify the cutting conditions for drilling using a drill tap; for tapping, specify those for thread cutting using a drill tap.
	TAP		15	*	
Reamer	~2.999	Reamer Reamer 1~9	6	0.10	~2.999 is the cutting conditions for a reamer with a diameter of not more than 2.999 mm; 3~ is those for a reamer with a diameter of not less than 3 mm.
	3~		12	0.20	
Drill reamer	hole	Drill reamer Drill reamer 1~9	18	0.10	For drilling, specify the cutting conditions for drilling using a drill reamer; for reaming, specify those for reaming using a drill reamer.
	Reamer		12	0.20	

2. SCM435

Processing method		Registered tool name	Peripheral speed (mm/min)	Feed (mm/rev)	Remarks
Center drill	Lengthwise	Center drill Center drill 1~9	10	0.05	Lengthwise: For center hole cutting Crosswise: For chamfer milling by forced assignment of center drill
	Crosswise		*	*	
Drill	~2.999	Drill Drill 1~9	7	0.03	~2.999 is the cutting conditions for a drill of not more than 2.999 mm in OD; 3~ is those for a drill of not less than 3 mm in OD.
	3~		14	0.08	
Carbide drill	~2.999	Carbide drill Carbide drill 1~9	15	0.03	~2.999 is the cutting conditions for a drill of not more than 2.999 mm in OD; 3~ is those for a drill with of not less than 3 mm in OD.
	3~		25	0.08	
Tapping (blind)	~2.999	Spiral tap Spiral tap 1~9 Point tap Point tap 1~9 Hand tap Hand tap 1~9	12	*	~2.999 is the cutting conditions for a tap with a of not more than 2.999 mm in nominal dia.; 3~ is those for a tap with of not less than 3 mm in nominal dia.
	3~		12	*	
Tapping (through)	~2.999	Spiral tap Spiral tap 1~9 Point tap Point tap 1~9 Hand tap Hand tap 1~9	12	*	~2.999 is the cutting conditions for a tap of not more than 2.999 mm in nominal dia.; 3~ is those for a tap of not less than 3 mm in nominal dia.
	3~		12	*	
Rolled tap	~2.999	Rolled tap Rolled tap 1~9	10	*	~2.999 is the cutting conditions for a tap of not more than 2.999 mm in nominal dia.; 3~ is those for a tap with of not less than 3 mm in nominal dia.
	3~		10	*	
Chamfering tool	*	Chamfering tool Chamfering tool 1~9	12	0.08	
Counterboring tool	*	Counterboring tool Counterboring tool 1~9	12	0.05	
Drill with chamfering tool	hole	Chamfered drill Chamfered drill 1~9	14	0.08	For drilling, specify the cutting conditions for drilling using a drill with chamfering tool; for chamfering, specify those for chamfering using a drill with chamfering tool.
	Chamfering		12	0.08	
Drill with counter boring tool	hole	Stepped drill Stepped drill 1~9	14	0.08	For drilling, specify the cutting conditions for drilling using a drill with counter boring tool; for counter boring, specify those for counter boring using a drill with counter boring tool.
	Counter boring		12	0.05	
Drill tap	hole	Drill tap Drill tap 1~9	14	0.08	For drilling, specify the cutting conditions for drilling using a drill tap; for tapping, specify those for thread cutting using a drill tap.
	Tap		12	*	
Reamer	~2.999	Reamer Reamer 1~9	5	0.10	~2.999 is the cutting conditions for a reamer with a diameter of not more than 2.999 mm; 3~ is those for a reamer with a diameter of not less than 3 mm.
	3~		10	0.20	
Drill reamer	hole	Drill reamer Drill reamer 1~9	14	0.08	For drilling, specify the cutting conditions for drilling using a drill reamer; for reaming, specify those for reaming using a drill reamer.
	Reamer		10	0.20	

3. FC20

Processing method		Registered tool name	Peripheral speed (mm/min)	Feed (mm/rev)	Remarks
Center drill	Lengthwise	Center drill Center drill 1~9	15	0.08	Lengthwise is the cutting conditions for center hole cutting, and Crosswise is those for chamfer milling by forced assignment of center drill.
	Crosswise		*	*	
Drill	~2.999	Drill Drill 1~9	13	0.06	~2.999 is the cutting conditions for a drill of not more than 2.999 mm in OD; 3~ is those for a drill of not less than 3 mm in OD.
	3~		25	0.15	
Carbide drill	~2.999	Carbide drill Carbide drill 1~9	30	0.06	~2.999 is the cutting conditions for a drill of not more than 2.999 mm in OD; 3~ is those for a drill with of not less than 3 mm in OD.
	3~		50	0.15	
Tapping (blind)	~2.999	Spiral tap Spiral tap 1~9 Point tap Point tap 1~9 Hand tap Hand tap 1~9	15	*	~2.999 is the cutting conditions for a tap with a of not more than 2.999 mm in nominal dia.; 3~ is those for a tap with of not less than 3 mm in nominal dia.
	3~		15	*	
Tapping (through)	~2.999	Spiral tap Spiral tap 1~9 Point tap Point tap 1~9 Hand tap Hand tap 1~9	15	*	~2.999 is the cutting conditions for a tap of not more than 2.999 mm in nominal dia.; 3~ is those for a tap of not less than 3 mm in nominal dia.
	3~		15	*	
Rolled tap	~2.999	Rolled tap Rolled tap 1~9	*	*	~2.999 is the cutting conditions for a tap of not more than 2.999 mm in nominal dia.; 3~ is those for a tap with of not less than 3 mm in nominal dia.
	3~		*	*	
Chamfering tool	*	Chamfering tool Chamfering tool 1~9	15	0.15	
Counterboring tool	*	Counterboring tool Counterboring tool 1~9	15	0.10	
Drill with chamfering tool	hole	Chamfered drill Chamfered drill 1~9	25	0.15	For drilling, specify the cutting conditions for drilling using a drill with chamfering tool; for chamfering, specify those for chamfering using a drill with chamfering tool.
	Chamfering		15	0.15	
Drill with counter boring tool	Drilling	Stepped drill Stepped drill 1~9	25	0.15	For drilling, specify the cutting conditions for drilling using a drill with counter boring tool; for counter boring, specify those for counter boring using a drill with counter boring tool.
	Counter boring		15	0.10	
Drill tap	hole	Drill tap Drill tap 1~9	25	0.15	For drilling, specify the cutting conditions for drilling using a drill tap; for tapping, specify those for thread cutting using a drill tap.
	Tapping		15	*	
Reamer	~2.999	Reamer Reamer 1~9	8	0.10	~2.999 is the cutting conditions for a reamer with a diameter of not more than 2.999 mm; 3~ is those for a reamer with a diameter of not less than 3 mm.
	3~		15	0.20	
Drill reamer	hole	Drill reamer Drill reamer1~9	25	0.15	For drilling, specify the cutting conditions for drilling using a drill reamer; for reaming, specify those for reaming using a drill reamer.
	Reamer		15	0.20	

4. ADC12

Processing method		Registered tool name	Peripheral speed (mm/min)	Feed (mm/rev)	Remarks
Center drill	Lengthwise	Center drill Center drill 1~9	30	0.10	Lengthwise is the cutting conditions for center hole cutting, and Crosswise is those for chamfer milling by forced assignment of center drill.
	Crosswise		*	*	
Drill	~2.999	Drill Drill 1~9	50	0.10	~2.999 is the cutting conditions for a drill of not more than 2.999 mm in OD; 3~ is those for a drill of not less than 3 mm in OD.
	3~		50	0.20	
Carbide drill	~2.999	Carbide drill Carbide drill 1~9	100	0.10	~2.999 is the cutting conditions for a drill of not more than 2.999 mm in OD; 3~ is those for a drill with of not less than 3 mm in OD.
	3~		100	0.20	
Tapping (blind)	~2.999	Spiral tap Spiral tap 1~9 Point tap Point tap 1~9 Hand tap Hand tap 1~9	30	*	~2.999 is the cutting conditions for a tap with a of not more than 2.999 mm in nominal dia.; 3~ is those for a tap with of not less than 3 mm in nominal dia.
	3~		40	*	
Tapping (through)	~2.999	Spiral tap Spiral tap 1~9 Point tap Point tap 1~9 Hand tap Hand tap 1~9	30	*	~2.999 is the cutting conditions for a tap of not more than 2.999 mm in nominal dia.; 3~ is those for a tap of not less than 3 mm in nominal dia.
	3~		40	*	
Rolled tap	~2.999	Rolled tap Rolled tap 1~9	40	*	~2.999 is the cutting conditions for a tap of not more than 2.999 mm in nominal dia.; 3~ is those for a tap with of not less than 3 mm in nominal dia.
	3~		50	*	
Chamfering tool	*	Chamfering tool Chamfering tool 1~9	35	0.30	
Counterboring tool	*	Counterboring tool Counterboring tool 1~9	35	0.15	
Drill with chamfering tool	hole	Chamfered drill Chamfered drill 1~9	50	0.20	For drilling, specify the cutting conditions for drilling using a drill with chamfering tool; for chamfering, specify those for chamfering using a drill with chamfering tool.
	Chamfering		35	0.30	
Drill with counter boring tool	hole	Stepped drill Stepped drill 1~9	50	0.20	For drilling, specify the cutting conditions for drilling using a drill with counter boring tool; for counter boring, specify those for counter boring using a drill with counter boring tool.
	Chamfering		35	0.15	
Drill tap	hole	Drill tap Drill tap 1~9	50	0.20	For drilling, specify the cutting conditions for drilling using a drill tap; for tapping, specify those for thread cutting using a drill tap.
	Tapping		30	*	
Reamer	~2.999	Reamer Reamer 1~9	15	0.10	~2.999 is the cutting conditions for a reamer with a diameter of not more than 2.999 mm; 3~ is those for a reamer with a diameter of not less than 3 mm.
	3~		30	0.20	
Drill reamer	hole	Drill reamer Drill reamer 1~9	50	0.20	For drilling, specify the cutting conditions for drilling using a drill reamer; for reaming, specify those for reaming using a drill reamer.
	Reamer		30	0.20	

5. SUS304

Processing method		Registered tool name	Peripheral speed (m/min)	Feed (mm/Rev.)	Remarks
Center drill	Lengthwise	Center drill Center drill 1~9	8	0.05	Lengthwise is the cutting conditions for center hole cutting, and Crosswise is those for chamfer milling by forced assignment of center drill.
	Crosswise		*	*	
Drill	~2.999	Drill Drill 1~9	6	0.03	~2.999 is the cutting conditions for a drill of not more than 2.999 mm in OD; 3~ is those for a drill of not less than 3 mm in OD.
	3~		10	0.07	
Carbide drill	~2.999	Carbide drill Carbide drills 1~9	10	0.03	~2.999 is the cutting conditions for a drill of not more than 2.999 mm in OD; 3~ is those for a drill with of not less than 3 mm in OD.
	3~		15	0.07	
Tap (blind)	~2.999	S tap S taps1~9 P tap P taps 1~9 H tap H taps 1~9	6	*	~2.999 is the cutting conditions for a tap with a of not more than 2.999 mm in nominal dia.; 3~ is those for a tap with of not less than 3 mm in nominal dia.
	3~		6	*	
Tap (through)	~2.999	S tap S taps 1~9 P tap P taps 1~9 H tap H tap 1~9	6	*	~2.999 is the cutting conditions for a tap of not more than 2.999 mm in nominal dia.; 3~ is those for a tap of not less than 3 mm in nominal dia.
	3~		6	*	
Rolled tap	~2.999	Rolled tap Rolled taps 1~9	6	*	~2.999 is the cutting conditions for a tap of not more than 2.999 mm in nominal dia.; 3~ is those for a tap with of not less than 3 mm in nominal dia.
	3~		6	*	
Chamfering tool	*	Chamfering tool Chamfering tools 1~9	10	0.07	
Counter boring tool	*	Counter boring tool Counter boring tools 1~9	10	0.05	
Drill with chamfering tool	Drilling	Chamfer drilll Chamfer drill 1~9	10	0.07	For drilling, specify the cutting conditions for drilling using a drill with chamfering tool; for chamfering, specify those for chamfering using a drill with chamfering tool.
	Chamfering		10	0.07	
Drill with counter boring tool	Drilling	Stepped drill Stepped drill 1~9	10	0.07	For drilling, specify the cutting conditions for drilling using a drill with counter boring tool; for counter boring, specify those for counter boring using a drill with counter boring tool.
	Counter boring		10	0.05	
Drill tap	Drilling	Drill tap Drill taps 1~9	10	0.07	For drilling, specify the cutting conditions for drilling using a drill tap; for tapping, specify those for thread cutting using a drill tap.
	Tapping		6	*	
Reamer	~2.999	Reamer Reamers 1~9	4	0.10	~2.999 is the cutting conditions for a reamer of not more than 2.999 mm in OD; 3~ is those for a reamer of not less than 3 mm in OD.
	3~		8	0.20	
Drill reamer	Drilling	Drill reamer Drill reamers 1~9	10	0.07	For drilling, specify the cutting conditions for drilling using a drill reamer; for reaming, specify those for reaming using a drill reamer.
	Reaming		8	0.20	

1.15.5.2 Cutting Conditions 2 (Milling Tools)

1. S45C

Processing method			Resistered tool name	Peripheral speed (m/min)	Feed (mm/Rev.)	Remarks
End mill (rough) (Rough finishing end mill)	■ Rough finishing (End mill for drilling/counter boring)	Vertical	End mill (rough) End mills (rough) 1~9	15	0.03	End mills (rough) are used for rough finishing; end mills (finish) are used for finishing. For each tool, set the cutting conditions to "rough finishing" when performing rough finishing in facing, pocketing or contouring, or set to "finishing" when performing finishing. • Vertical and horizontal For vertical, set the cutting conditions for processing with end mill cutter in vertical feed; for horizontal, set those for processing with end mill cutter in hozirontal feed. • Face milling For face milling, the cutting conditions marked with ■ on the left hand are effective.
		Horizontal		15	0.05	
	Finishing	Vertical		20	0.03	
		Horizaontal		20	0.03	
End mill (finish) (Finishing end mill)	Rough finishing	Vertical	End mill (finish) End mills (finish) 1~9	15	0.03	
		Horizontal		15	0.05	
	■ Finishing (End mill for drilling/counter boring)	Vertical		20	0.03	
		Horizontal		20	0.03	
Carbide end mill (rought) (Rough finishing end mill)	■ Rough finishing (End mill for drilling/counter boring)	Vertical	Carbide end mill (rough) Carbide end mills (rough) 1~9	30	0.03	
		Horizontal		30	0.05	
	Finishing	Vertical		40	0.03	
		Horizontal		40	0.03	
Carbide end mill (finishing) (Carbide end mill for finishing)	Rough finishing	Vertical	Carbide end mill (finishing) Carbide end mills (finishing) 1~9	30	0.03	
		Horizontal		30	0.05	
	■ Finishing (End mill for drilling/counter boring)	Vertical		40	0.03	
		Horizontal		40	0.03	
Corner rounding cutter		Vertical	Corner rounding cutter Corner rounding cutters 1~9	15	0.03	For vertical, set the cutting conditions for processing with corner rounding cutter in vertical feed; for horizontal, set those for processing with corner rounding cutter in hozirontal feed.
		Horizontal		15	0.05	

- When performing drilling, finishing or counter boring using an end mill, the cutting conditions marked with ■ are effective as in face milling.
- The unit of feed for milling tool is feed per tooth.

2. SCM435

Processing method			Registered tool name	Peripheral speed (m/min)	Feed (mm/Rev.)	Remarks
End mill (rough) (Rough finishing end mill)	■ Rough finishing (End mill for drilling/counter boring)	Vertical	End mill (rough) End mills (rough) 1~9	12	0.03	• For rough finish ing and finishing End mills (rough) are used for rough finishing; end mills (finish) are used for finishing. Cutting conditions are set for rough finishing when performing a facing, pocketing or contouring and are set for finishing when performing a finishing. Lengthwise/Crosswise: For vertical, set the cutting conditions for processing with end mill cutter in vertical feed; for horizontal, set those for processing with end mill cutter in hozirontal feed. FACE MILL Effective on the cutting condition marked with ■.
		Crosswise		12	0.05	
	Finishing	Vertical		15	0.03	
		Horizontal		15	0.03	
End mill (finish) (Finishing end mill)	Rough finishing	Vertical	End mill (finish) End mills (finish) 1~9	12	0.03	
		Horizontal		12	0.05	
	■ Finishing (End mill for drilling/counter boring)	Vertical		15	0.03	
		Horizontal		15	0.03	
Carbide end mill (rought) (Rough finishing end mill)	■ Rough finishing (End mill for drilling/counter boring)	Vertical	Carbide end mill (rough) Carbide end mills (rough) 1~9	20	0.03	
		Horizontal		20	0.05	
	Finishing	Vertical		25	0.03	
		Horizontal		25	0.03	
Carbide end mill (finishing) (Carbide end mill for finishing)	Rough finishing	Vertical	1~9Carbide end mill (finish) Carbide end mills (finish) 1~9	20	0.03	
		Horizontal		20	0.05	
	■ Finishing (End mill for drilling/counter boring)	Vertical		25	0.03	
		Horizontal		25	0.03	
Corner rounding cutter		Vertical	Corner rounding cutter Corner rounding cutters 1~9	12	0.03	For vertical, set the cutting conditions for processing with corner rounding cutter in vertical feed; for horizontal, set those for processing with corner rounding cutter in hozirontal feed.
		Horizontal		12	0.05	

- In hole-machining, hole-facing or spot-facing by end mill, cutting condition marked with ■ is effective as in milling.
- Feed of a mill is per tooth.

3. FC20

Cutting method			Registered tool	Peripheral speed (mm/min)	Feed (mm/rev)	Remarks
End mill (rough) (Rough finishing end mill)	■ Rough finishing (End mill for drilling/counter boring)	Vertical	End mill (rough) End mills (rough) 1~9			• For rough finish ing and finishing End mills (rough) are used for rough finishing; end mills (finish) are used for finishing.
		Horizontal				
	Finishing	Vertical				
		Horizontal				
End mill (finish) (Finishing end mill)	Rough finishing	Vertical	End mill (finish) End mills (finish) 1~9			Cutting conditions are set for rough finishing when performing a facing, pocketing or contouring and are set for finishing when performing a finishing.
		Horizontal				
	■ Finishing (End mill for drilling/counter boring)	Vertical				
		Horizontal				
Carbide end mill (rought) (Rough finishing end mill)	■ Rough finishing (End mill for drilling/counter boring)	Vertical	Carbide end mill (rough) Carbide end mills (rough) 1~9	25	0.03	• Vertical and horizontal For vertical, set the cutting conditions for processing with end mill cutter in vertical feed; for horizontal, set those for processing with end mill cutter in hozirontal feed.
		Horizontal		25	0.05	
	Finishing	Vertical		30	0.03	
		Horizontal		30	0.03	
Carbide end mill (finishing) (Carbide end mill for finishing)	Rough finishing	Vertical	Carbide end mill (finishing) Carbide end mills (finishing) 1~9	25	0.03	
		Horizontal		25	0.05	
	■ Finishing (End mill for drilling/counter boring)	Vertical		30	0.03	• For face milling, the cutting onditions marked with ■ on the left hand are effective.
		Horizontal		30	0.03	
Corner rounding cutter		Vertial	Corner rounding cutter Corner rounding cutters 1~9	15	0.03	For vertical, set the cutting conditions for processing with corner rounding cutter in vertical feed; for horizontal, set those for processing with corner rounding cutter in hozirontal feed.
		Horizontal		15	0.05	

- In hole-machining, hole-facing or spot-facing by end mill, cutting condition marked with ■ is effective as in milling.
- The unit of feed for milling tool is feed per tooth.

4. ADC12

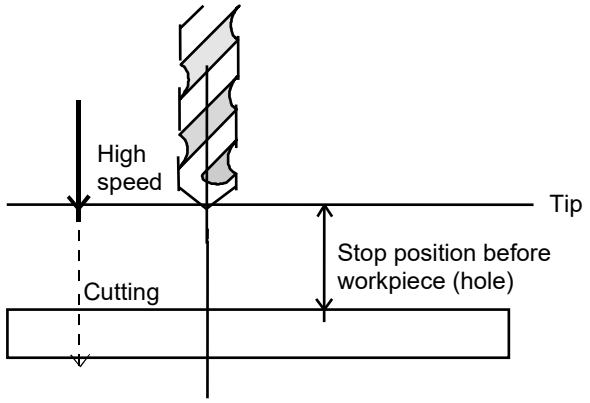
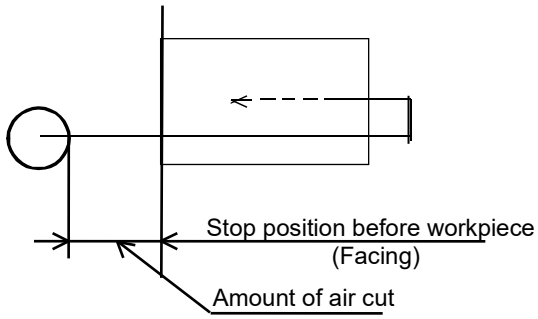
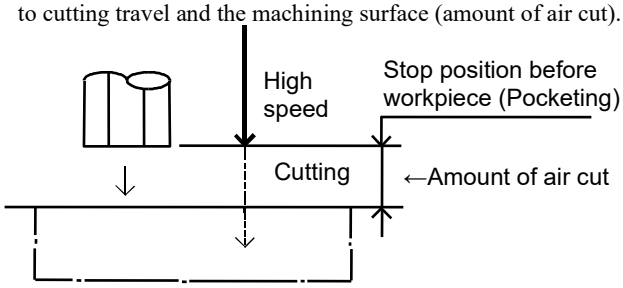
Processing method			Registered tool name	Peripheral speed (m/min)	Feed (mm/Rev.)	Remarks
End mill (rough) (Rough finishing end mill)	■ Rough finishing (End mill for drilling/counter boring)	Vertical	End mill (rough) End mills (rough) 1~9	50	0.05	• For rough finish ing and finishing End mills (rough) are used for rough finishing; end mills (finish) are used for finishing. For each tool, set the cutting conditions to “rough finishing” when performing rough finishing in facing, pocketing or contouring, or set to “finishing” when performing finishing. • Vertical and horizontal For vertical, set the cutting conditions for processing with end mill cutter in vertical feed; for horizontal, set those for processing with end mill cutter in hozirontal feed. • Face milling For face milling, the cutting conditions marked with ■ on the left hand are effective.
		Horizontal		50	0.10	
	Finishing	Vertical		75	0.05	
		Horizontal		75	0.05	
End mill (finish) (Finishing end mill)	Rough finishing	Vertical	End mill (finish) End mills (finish) 1~9	50	0.05	
		Horizontal		50	0.10	
	■ Finishing (End mill for drilling/counter boring)	Vertical		75	0.05	
		Horizontal		75	0.05	
Carbide end mill (rought) (Rough finishing end mill)	■ Rough finishing (End mill for drilling/counter boring)	Vertical	Carbide end mill (rough) Carbide end mills (rough) 1~9	100	0.05	
		Horizontal		100	0.10	
	Finishing	Vertical		150	0.03	
		Horizontal		150	0.03	
Carbide end mill (finishing) (Carbide end mill for finishing)	Rough finishing	Vertical	Carbide end mill (finish) Carbide end mills (finish) 1~9	100	0.05	
		Horizontal		100	0.10	
	■ Finishing (End mill for drilling/counter boring)	Vertical		150	0.03	
		Horizontal		150	0.03	
Corner rounding cutter		Vertical	Corner rounding cutter Corner rounding cutters 1~9	50	0.05	For vertical, set the cutting conditions for processing with corner rounding cutter in vertical feed; for horizontal, set those for processing with corner rounding cutter in hozirontal feed.
		Horizontal		50	0.10	

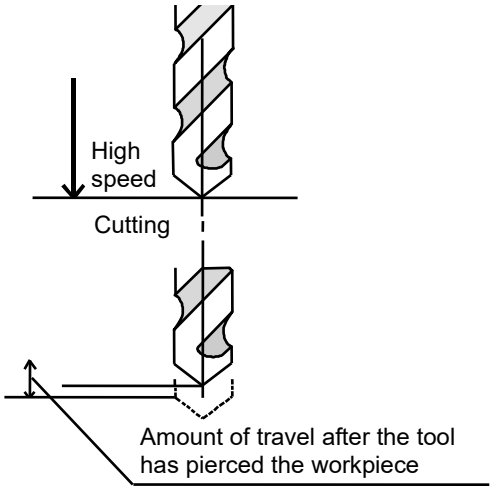
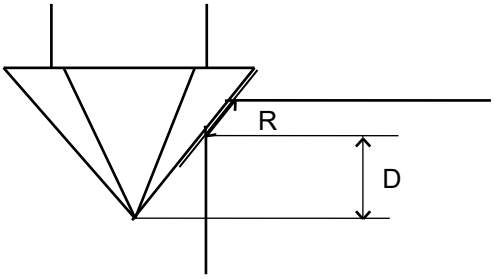
- When performing drilling, finishing or counter boring using an end mill, the cutting conditions marked with ■ are effective as in face milling
- The unit of feed for milling tool is feed per tooth.

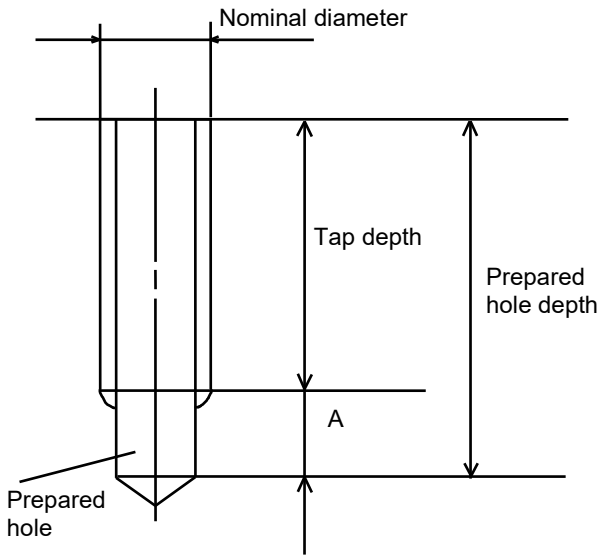
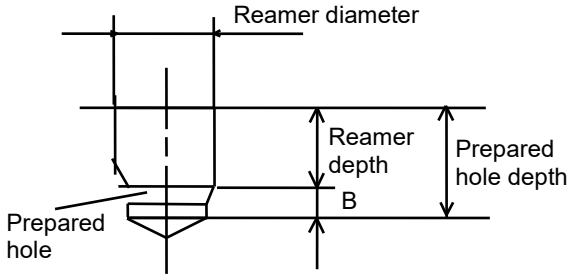
5. SUS304

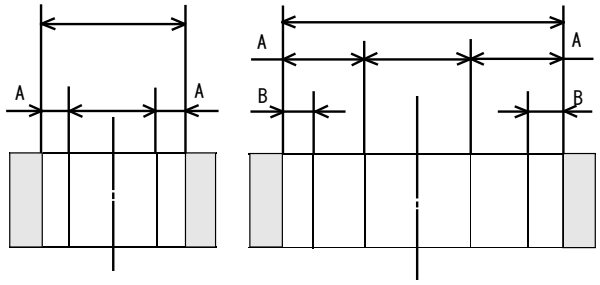
Processing method			Registered tool name	Peripheral speed (m/min)	Feed (mm/Rev.)	Remarks
End mill (rough) (Rough finishing end mill)	■ Rough finishing (End mill for drilling/counter boring)	Vertical	End mill (rough) End mills (rough) 1~9	10	0.03	• For rough finish ing and finishing End mills (rough) are used for rough finishing; end mills (finish) are used for finishing.
		Horizontal		10	0.05	
	Finishing	Vertical		12	0.03	
		Horizontal		12	0.03	
End mill (finish) (Finishing end mill)	Rough finishing	Vertical	End mill (finish) End mills (finish) 1~9	10	0.03	For each tool, set the cutting conditions to “rough finishing” when performing rough finishing in facing, pocketing or contouring, or set to “finishing” when performing finishing.
		Horizontal		10	0.05	
	■ Finishing (End mill for drilling/counter boring)	Vertical		12	0.03	
		Horizontal		12	0.03	
Carbide end mill (rought) (Rough finishing end mill)	■ Rough finishing (End mill for drilling/counter boring)	Vertical	Carbide end mill (rough) Carbide end mills (rough) 1~9	15	0.03	• Vertical and horizontal For vertical, set the cutting conditions for processsing with end mill cutter in vertical feed; for horizontal, set those for processing with end mill cutter in hozirontal feed.
		Horizontal		15	0.05	
	Finishing	Vertical		20	0.03	
		Horizontal		20	0.03	
Carbide end mill (finishing) (Carbide end mill for finishing)	Rough finishing	Vertical	Carbide end mill (finish) Carbide end mills (finish) 1~9	15	0.03	• Face milling For face milling, the cutting conditions marked with ■ on the left hand are effective.
		Horizontal		15	0.05	
	■ Finishing (End mill for drilling/counter boring)	Vertical		20	0.03	
		Horizontal		20	0.03	
Corner rounding cutter		Vertical	Corner rounding cutter Corner rounding cutters 1~9	10	0.03	For vertical, set the cutting conditions for processing with corner rounding cutter in vertical feed; for horizontal, set those for processing with corner rounding cutter in hozirontal feed.
		Horizontal		10	0.05	

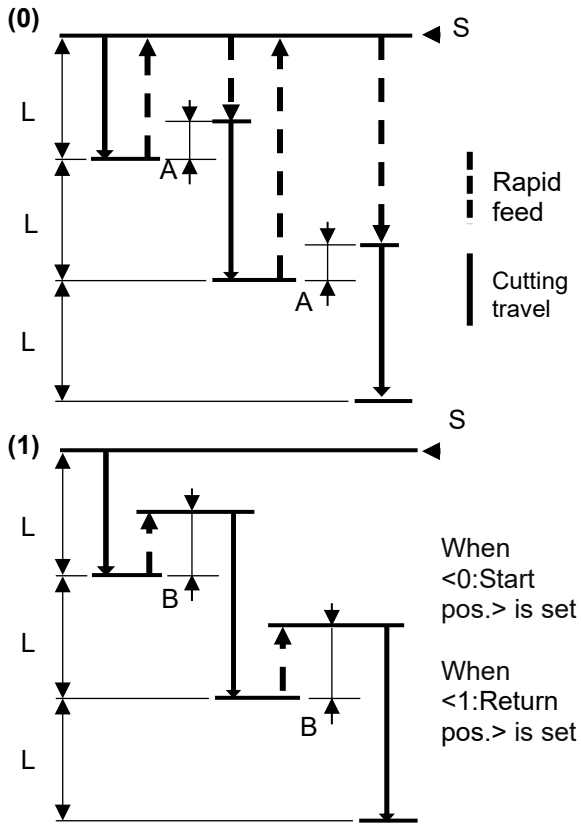
1.15.5.3 Cutting Conditions (Other than Tool Conditions)

Item name	Setting range	Description
Stop pos. before workpiece (hole)	0~99.999mm	• Hole machining Distance (air cut stroke) between the switchover point (from rapid traverse to cutting feed rate) and a machining surface is set.  If workpiece thickness is excessively uneven due to forged surface, set value requires some allowance. Take top surface cutting into account.
Stop position before workpiece (facing)	0~99.999mm	• Facing Distance (air cut stroke) between a workpiece and a cutting start position is set. 
Stop position before workpiece (pocketing)	0~99.999mm	• Pocket milling job Set the distance between the point that high-speed travel changes to cutting travel and the machining surface (amount of air cut). 

Item name	Setting range	Description
Cutting length after drilling	0~99.999mm	Set an amount of travel after the tool has pierced the workpiece when drilling a through hole. 
Chamfering tool position	0~99.999mm	Relative positions of chamfering tool and workpiece in pocketing or chamfering are set.  R: Chamfering section D: Corner rounding cutter position

Item name	Setting range	Description
Tap prepared hole depth margin	0~99.999 thread	Difference in depth between primary hole and tapped hole is set in terms of number of threads If drilled hole is less deep than tapped hole in blind hole cutting, use the parameter. $\text{Tap prepared hole depth margin} = \frac{\text{Prepared hole depth} - \text{Tap}}{\text{Pitch}} = \frac{A}{\text{Pitch}}$  When the value of the prepare hole depth of processing data during tap-related processing is equal to that of tap depth or smaller than that (0 included), processing is executed according to the formula: (Prepare hole depth) = (Tap depth) + (Tap prepared hole depth margin) × (Pitch).
Reamer prepared hole margin depth	0~99.999 times	Difference in depth between primary hole and reamed hole is set by its ratio to reamer diameter If primary hole is less deep than reamed hole in blind hole cutting, use the parameter. $\text{Reamer prepared hole depth margin} = \frac{\text{Prepared hole depth} - \text{Remer}}{\text{Reamer diameter}} = \frac{B}{\text{Reamer diameter}}$  When the value of the prepare hole depth of processing data during reamer-related processing is equal to that of treamer depth or smaller than that (0 included), processing is executed according to the formula: (Prepare hole depth) = (Reamer depth) + (Reamer prepared hole margin depth) x (Pitch).

Item name	Setting range	Description
Reamer finishing margin 1 (~2.999) (3.000~)	0~99.999mm	Finishing allowance for 1-step finish or for the 1st step finish in 2-step finish reaming. Set A+A.  1-step finish 2-step finish (NOTE) 0~2.999(0~0.1180):For reamer diameter less than 2.999mm (3mm.) 3~(0.1181~) :For reamer diameter 3mm(0.1181in.) or over
Reamer finish margin 2 (~2.999) (3.000~)	0 ~ 99.999 mm	Finishing allowance for the 2nd step finish in 2- step finish reaming. Set B+B, referring to the figure above. When using a drill and reamer in this order to prepare a hole in a tap job, use a drill with a diameter of (Prepare hole drill diameter – Reamer finishing margin 2).
Drill step method	0: No step 1: Constant 2: Variable	Select the stepping mode in drilling from among the following 3:
Drill step ratio	0~999%	0: No step Does not step. 1: Constant Depth of cut is constant in all steps. Depth of cut can be calculated in the following formula. $L(mm) = \frac{\text{Drill outer dia. (mm)} \times \text{Drill step ratio (\%)}}{100}$ 2: REDUCING Cut of depth becomes smaller as drilled depth becomes larger.Depth of cut can be calculated in the following formula. $L(mm) = \frac{\alpha \times \text{Drill Outer dia. (mm)} \times \text{Drill step ratio (\%)}}{100}$ Ln : Nth time infeed α : Cutting coefficient N: 1, 2, 3, 4, 5, 6, 7 α: 4.0, 3.3, 2.7, 2.1, 1.7, 1.4, 1.2 N: 8, 9, 10, 11, 12, 13, 14 α: 0.9, 0.7, 0.6, 0.4, 0.4, 0.3, 0.3 (NOTE 1) For the 15th and after, use the step coefficient of the 14th. (NOTE 2) The infeed amount is calculated by dividing the pitch by 10, when the infeed amount is less than the quotient of pitch/10 in step method 1 (constant) or step method 2 (variable).

Item name	Setting range	Description
Drill step return position	0:Start pos. 1:Return pos.	Select a required drill POINT step return position from the following 2 types: 0: Start position The tool returns to the start position of the first drill step. 1: Return position The tools returns to a position obtained by combining the start position of the last drill step and the drill step return amount. The drill step return distance and the corresponding data is valid only when <Drill step return position> is set to <1. Return pos.>.  S:Drill step start position L: Depth of cut for 1 step (NOTE) This stroke is determined by the selected drill step and ratio. A: The stop position before cutting in drill step mode when start position is set is fixed to 0.5 mm. B: Drill step return
Drill step return stroke	0~99.999mm	

<table>
<tr><th>Item name</th><th>Setting range</th><th>Description</th></tr>
<tr><td>Tap step mode</td><td>0: No step
1: Constant
2: Variable</td><td rowspan="2">Select the step method for tapping from the following three methods.

0: No step
Does not step.

1: Constant
Depth of cut is constant in all steps.
Depth of cut can be calculated in the following way:
$L(mm) = \frac{\text{Tap outer dia. (mm)} \times \text{Tap step ratio (\%)}}{100}$

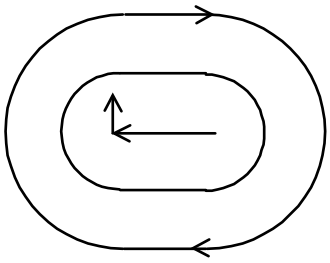
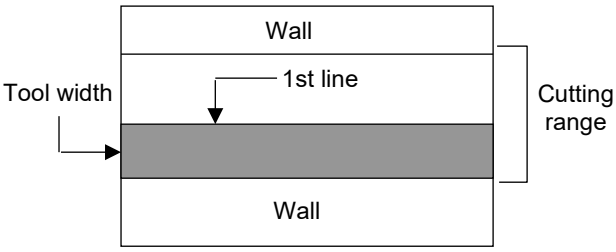
2: REDUCING
Cut of depth becomes smaller as tapped depth comes larger.
Depth of cut can be calculated in the following way:
$L(mm) = \frac{\alpha \times \text{Tap outer dia. (mm)} \times \text{Tap step ratio (\%)}}{100}$

Ln : Nth time infeed
α: Cutting coefficient

<table>
<tr><td>N</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>α</td><td>2.0</td><td>1.7</td><td>1.3</td><td>1.1</td><td>0.8</td><td>0.7</td><td>0.6</td></tr>
</table>

<table>
<tr><td>N</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr>
<tr><td>α</td><td>0.4</td><td>0.4</td><td>0.3</td><td>0.2</td><td>0.2</td><td>0.1</td><td>0.1</td></tr>
</table>

(NOTE 1) For the 15th and after, use the step coefficient of the 14th.
(NOTE 2) The infeed amount is calculated by dividing the pitch by 10, when the infeed amount is less than the quotient of pitch/10 in step method 1 (constant) or step method 2 (variable).</td></tr>
<tr><td>Tap step ratio</td><td>0~999%</td></tr>
<tr><td>Tap return speed (ratio)</td><td>100~999%</td><td>With respect to the one in downward motion.
(NOTE) The feed rate never exceeds the max. tapping revolving speed.</td></tr>
<tr><td>Dwell (chamfering)</td><td>0~99 ×0.1sec</td><td>Specify Z-axis dwell time for a post-chamfering stop for better accuracy.
This setting is effective also for the drill, drill tap, drill reamer and stepped drill forcibly assigned for chamfering and for machining with end mill R and F and carbide end mill R and F.</td></tr>
<tr><td>Dwell (counter boring)</td><td>0~99 ×0.1sec</td><td>Set the stop time for temporarily stopping the Z-axis to increase accuracy after counter boring.
This setting is also valid when machining using an end mill (rough, finish) or carbide end mill (rough, finish).</td></tr>
</table>

Item name	Setting range	Description
Pocket Override	1~100%	During a pocketing, a tool under-goes cutting load. Therefore, apply the override to a feed rate when the tool undergoes the load. Feed rate can be calculated by the following formula. Actual feed (mm/revolution) = F (Feed obtained based on cutting conditions) (mm/revolution) × Pocket override / 100  Pocketing override is effective on the part indicated by the bold arrowed line on the figure on the left side.
Facing Override	1~100%	This setting is valid when the cutting direction in a facing job is in the X-axis or Y-axis direction (wall on both sides). Because the first line cutting is heavy cutting, override is applied on the feed calculated from the machining data. 
ATC simultaneous operation start position	-9999.999 ~9999.999 mm	Indicates the start position of the Z axis in the machine coordinates when the X, Y, and Z axes have moved upon tool replacement. This value is indicated in the machine coordinates. (NOTICE) Considering that the X and Y axes move upon tool replacement, set the start position so that these axes do not make contact with the workpiece.
Bottom hole depth tolerance	0.00~ 0.999mm	Compound tools for drilling blind holes can be assigned in the setting range according to the depth of drill hole bottom and drilling length.
Reamer return speed	0:Rapid feed 1:Cutting feed	Reamer return feed rate is set: rapid feed rate or jog feed rate

List of default values for cutting condition 3

Items	metric	inch
Stop pos. before workpiece (hole)	2.000	0.1000
Stop pos. before workpiece (facing)	2.000	0.1000
Stop pos. before workpiece (pocket)	2.000	0.1000
Cutting length after drilling	2.000	0.1000
Corner rounding cutter position	2.000	0.1000
Tap hole	6.000	6.000
Reamer hole	1.000	1.000
Reamer finish margin 1 (~ 2.999)	0.000	0.0000
Reamer finish margin 2 (~ 2.999)	0.000	0.0000
Reamer finish margin 1 (3,000~)	0.000	0.0000
Reamer finish margin 2 (3,000~)	0.000	0.0000
Drill step mode	2	2
Step ratio		
[S45C]	100	100
[SCM435]	80	80
[FC20]	200	200
[ADC]	300	300
[SUS304]	70	70
Drill step return	0	0
Drill step return	0.500	0.0200
Tap step mode	2	2
Tap step ratio		
[S45C]	100	100
[SCM435]	80	80
[FC20]	200	200
[ADC]	300	300
[SUS304]	70	70
Tap return speed (ratio)	100	100
Dwell (chamfering)	0	0
Dwell (counter boring)	0	0
Pocket override	70	70
Facing override	70	70
ATC simultaneous operation start position		
W1000Xd1/S300Xd1/S500Xd1/S700Xd1 (Standard)	480.000	18.8976
W1000Xd1/S300Xd1/S500Xd1/S700Xd1 (High column 150)	630.000	24.8031
W1000Xd1/S300Xd1/S500Xd1/S700Xd1 (High column 250)	730.000	28.7410
W1000Xd1 (High column 350)	830.000	32.67720
R450Xd1 (Standard)	505.000	19.8818
R450Xd1 (Low base)	585.000	23.0314
R650Xd1 (Standard)	555.000	21.8503
R650Xd1 (Low base)	655.000	25.7874
R650Xd1 40MG (Standard)	435.000	17.1259
R650Xd1 40MG (Low base)	535.000	21.0629
U500Xd1	445.000	17.5196
Bottom hole depth tolerance	0.100	0.100
Reamer return speed	0	0
Z-axis zero return at memory operation start	1	1

CHAPTER 2

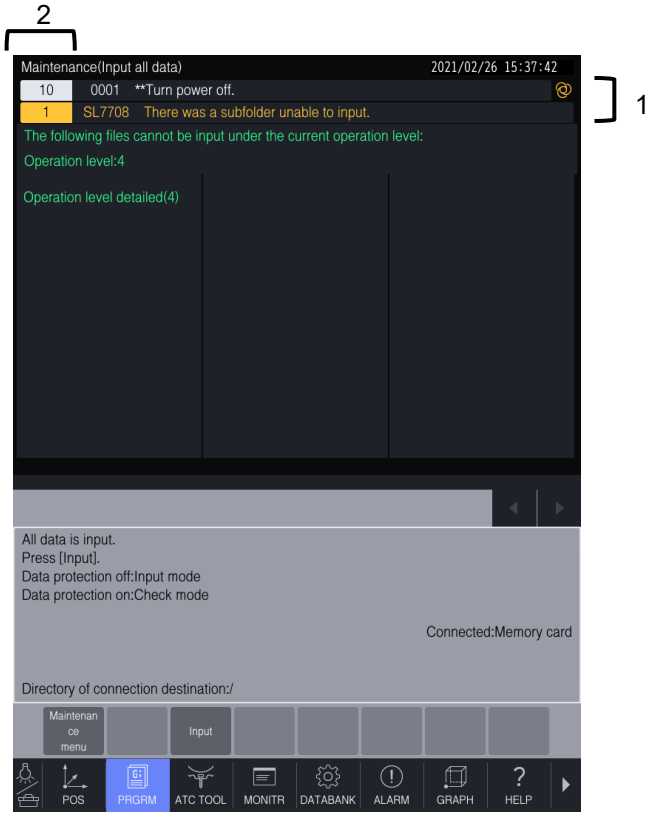
ALARMS

2.1 Overview
2.2 Message Display
2.3 Current Alarm/Operator Message Screen
2.4 Alarm History (List) Screen
2.5 Alarm History (Details) Screen
2.6 List of Alarms and Operator Messages Screen
2.7 Alarm / Operator Message Recovery
2.8 Servo Alarm List Screen
2.9 Loading System Alarm Screen
2.10 Message Format
2.11 Stop Level and Cancel Level for Alarms and Operator Messages
2.12 Display When Message Includes Additional Axis
2.13 Alarm Code List
2.14 List of servo errors

2.1 Overview

There are two major types of CNC messages that that alert the user.
One type is an “alarm” that alerts the user of an error that has been detected by the CNC. The other type is an “operator message” that warns the user or prompts the user to check.

2.2 Message Display



2.2.1 Description of Screen Display

Position	Name	Description
1	Alarm / Operator message	Displays the current alarms and operator messages. The display changes depending on the situation.
2	Total number of alarms and operator messages	Displays the current alarms and operator messages and the total number of each.

The <Alarm/Operator message> is divided into two levels as shown in the figure. The upper level shows the operator message, and the lower one shows the alarm. However, when there are no current operator messages but there are multiple alarms, the alarms are shown on both the upper and lower levels.
In addition, when there are multiple alarms or operator messages, a number is displayed on the left of the message, indicating the total number of current messages. When there is an alarm on the top and bottom lines, only one number is displayed for both lines.
Refer to “2.2.3. Priority status of alarm/operator message” for details on priority status of the message display.

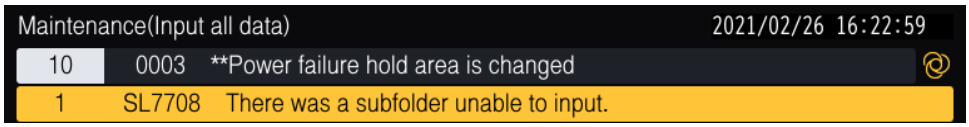
2.2.2 Description of Screen Operation

Tap on the “Alarm/Operator message” to display the <Current Alarm/Operator message> screen.

2.2.3 Priority Status of Alarm/Operator Message

If multiple alarms or operator messages are triggered simultaneously, the ones with the highest priority are displayed.
The priority is based on the importance of the alarm and the time it is triggered.
However, when a new alarm or operator message is triggered, it displays up to three seconds regardless of the priority. In this situation, it is highlighted as shown in the figure below.
Note that the alarms and operator messages which are not displayed can be checked on the <Current Alarm/Operator message> screen. (Refer to “2.3. Current alarms/operator message screen”.)

- New alarm display

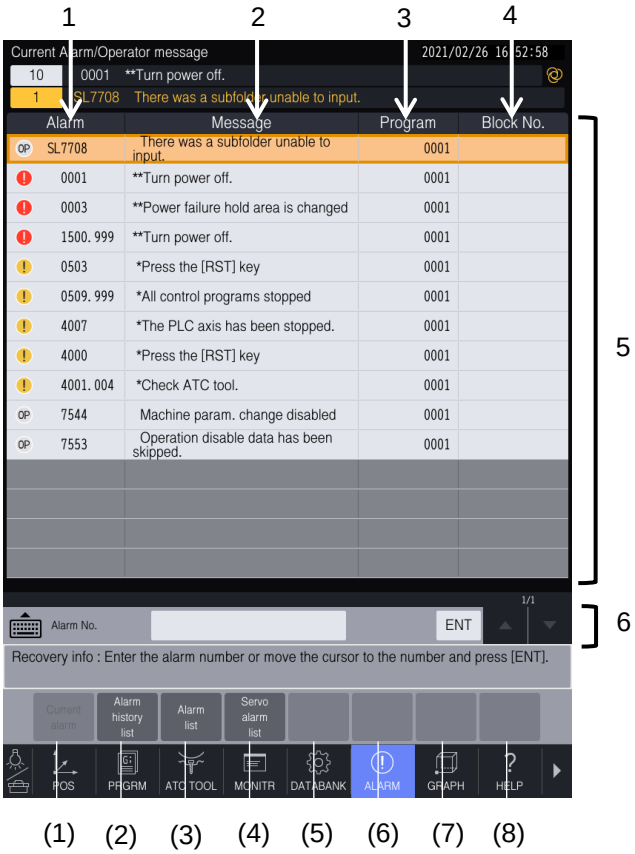


2.2.4 Lowering Priority Status of Alarm/Operator Message

An alarm or an operator message can be set so that it does not display when multiple alarms and/or operator messages are triggered simultaneously.
To lower the priority setting of an alarm or operator message display, register and set the alarm or message number in the user parameter <Low priority indication alarm No.*> (*:1 to 10).
The lowest priority is assigned to alarms and/or operator messages with a priority setting that has been lowered by the user.

(NOTE) The display priority cannot be lowered for alarms and operator messages with a cancel level 3.

2.3 Current Alarm/Operator Message Screen



2.3.1 Description of Screen Display

Position	Name	Description
1	Alarm	Displays the alarm number or the operator message number. An exclamation point (!) is displayed for the alarm, but there is no icon displayed for the operator message.
2	Message	Displays the message. An asterisk (*) or multiple asterisks are displayed at the beginning to indicate the cancel level for an alarm.
3	Program	Displays the operation program when an alarm/operator message is triggered.
4	Block number	Displays the job/block number when an alarm/operator message is triggered.
5	List of alarms and operator messages	Displays a list of current alarms and/or operator messages. Alarms and operator messages are displayed in descending order of importance when multiple alarms and operator messages are triggered simultaneously. Up to 18 alarms can be displayed. In this situation, when alarms and operator messages are triggered simultaneously, up to two operator messages are displayed.
6	Alarm No.	Displays the recovery method of an alarm number that is input.

2.3.2 Description of Screen Operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Current alarm>	This cannot be selected.
	(2)	<Alarm history list>	Displays the <Alarm history(List)> screen.
	(3)	<Alarm list>	Displays the <List of alarms and operator messages> screen.
	(4)	<Servo alarm list>	Displays the <Servo alarm list> screen.
	(5)	<Loading system>	Displays the <Loading system alarm> screen.
	(6)		
	(7)		
	(8)		

Description of <Main display area> operations

- Select an alarm or operator message to reference the recovery procedure. The <Alarm / Operator message recovery> screen is displayed for the selected alarm or operator message. However, if the alarm is a servo alarm (servo error, servo warning, servo communication error, servo status error) with an auxiliary number, the user can select it and display the <Servo alarm list> screen.
- If the number of the messages does not fit on one screen, the user can press the page key to change the pages.

Description of <Instructions area/Data input field> operations

- Press a number key or character key to display the screen for entering data. Enter the alarm number or operator message number and press the **[ENT]** key. Then, the <Alarm / Operator message recovery> screen is displayed for the selected alarm or operator message.

2.4 Alarm History (List) Screen

2.4.1 Description of Screen Display

Position	Name	Description
1	Alarm	Displays the alarm number or the operator message number.
2	Message	Displays the message. An asterisk (*) or multiple asterisks are displayed at the beginning to indicate the cancel level for an alarm.
3	Language	Displays the operation program in the NC or conversation language when an alarm/operator message is triggered.
4	Time	Displays the time when the alarm or the operator message was triggered.
5	Date	Displays the date when the alarm or the operator message was triggered.
6	Category display	Displays the categories for the listed content.
7	List of alarms and operator messages	Displays a list of critical errors, and an alarm log records and stores that alarm or error and has a maximum storage capacity of 2000 errors/alarms.

(NOTE) The alarm numbers and the stop/cancel levels are listed on the <Alarm history(List)> screen and they show the status of the alarm that was triggered. However, if the data bank has been modified after the alarm was triggered, the following information displayed in the list is different from the original information that was recorded when the alarm was triggered.

- External alarm message
- Tool name
- Additional axis address

2.4.2 Description of Screen Operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Current alarm>	Displays the <Current Alarm/Operator message> screen.
	(2)	<Alarm history list>	This cannot be selected.
	(3)	<Sort>	Sorts according to the time, alarm number or number of occurrences.
	(4)	<Filter>	Displays according to each alarm category.
	(5)		
	(6)	<Collision log list>	Displays the <Collision log list> screen. Refer to “5.2 Collision detection function” for further details.
	(7)	<Leading>	Displays the header or leading alarm in the alarm/operator message list.
	(8)		

Description of <Main display area> operations

- Tap on an alarm or operator message to reference the details. The <Alarm history(Details)> screen is displayed for the selected alarm or operator message.
- If the number of the messages does not fit on one screen, the user can press the page key to change the pages.

Description of <Category display> operations

- Tap on the <Time> or <Date> (if not already sorted or sorted according to the time) to sort the current alarms or operator messages in an order starting from the most recent date and time.
- Tap on the <Alarm> (if not already sorted or sorted according to the alarm number) to sort the current alarms or operator messages in an order starting from the smallest alarm number.

2.4.3 Sort Setting

2.4.3.1 Description of Screen Display

Position	Name	Description
1	Alarm	Displays the alarm number or the operator message number.
2	Message	Displays the message. An asterisk (*) or multiple asterisks are displayed at the beginning to indicate the cancel level for an alarm.
3	Language	Displays the operation program in the NC or conversation language when an alarm/operator message is triggered.
4	Time	Displays the time when the alarm or the operator message was triggered.
5	Date	Displays the date when the alarm or the operator message was triggered.
6	Category display	Displays the categories for the listed content.
7	List of alarms and operator messages	Displays a list of critical errors, and an alarm log records and stores that alarm or error and has a maximum storage capacity of 2000 errors/alarms.

2.4.3.2 Description of Screen Operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Back>	Exits the sort settings and displays the <Alarm history(List)>.
	(2)	<Time>	Sorts the alarms or the operator messages according to the date and time when they are triggered.
	(3)	<No.>	Sorts according to the alarm numbers or the operator message numbers.
	(4)	<Total occurrences>	Sorts the alarms or the operator messages according to the total number of occurrences.
	(5)		
	(6)		
	(7)		
	(8)		

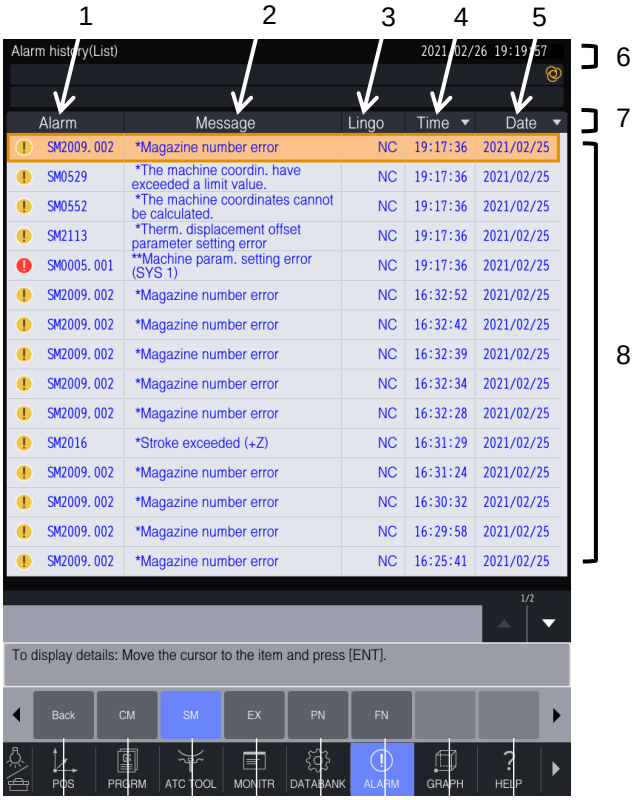
Description of sorting function

- Multiple sorting types cannot be set simultaneously.
- When the current alarm screen is displayed, the default setting is sorted by the time.

Description of <Category display> operations

- Tap on the <Time> or <Date> (if not already sorted or sorted according to the time) to sort the current alarms or operator messages in an order starting from the most recent date and time.
- Tap on the <Alarm> (if not already sorted or sorted according to the alarm number) to sort the current alarms or operator messages in an order starting from the smallest alarm number.

2.4.4 Filter Setting



2.4.4.1 Description of Screen Display

Position	Name	Description
1	Alarm	Displays the alarm number or the operator message number.
2	Message	Displays the message. An asterisk (*) or multiple asterisks are displayed at the beginning to indicate the cancel level for an alarm.
3	Language	Displays the operation program in the NC or conversation language when an alarm/operator message is triggered.
4	Time	Displays the time when the alarm or the operator message was triggered.
5	Date	Displays the date when the alarm or the operator message was triggered.
6	Title display	Displays the title of the current screen.
7	Category display	Displays the categories for the listed content.
8	List of alarms and operator messages	Displays a list of errors and alarms from the 2000 most recent errors/alarms, but only for the category of errors/alarms selected by the user.

2.4.4.2 Description of Screen Operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Back>	Exits the filter settings and displays the <Alarm history(List)>.
	(2)	<Operator message>	Lists and displays only the operator messages.
	(3)	<NC>	Lists and displays only the NC category alarms.
	(4)	<EC>	Lists and displays only the EC category alarms.
	(5)	<IO>	Lists and displays only the IO category alarms.
	(6)	<SV>	Lists and displays only the SV category alarms.
	(7)	<SL>	Lists and displays only the SL category alarms.
	(8)	<SP>	Lists and displays only the SP category alarms.
2	(1)	<Back>	
	(2)	<CM>	Lists and displays only the CM category alarms.
	(3)	<SM>	Lists and displays only the SM category alarms.
	(4)	<EX>	Lists and displays only the EX category alarms.
	(5)	<PN>	Lists and displays only the PN category alarms.
	(6)	<FN>	Lists and displays only the FN category alarms.
	(7)		
	(8)		

Description of filter function

- Multiple filter types cannot be set simultaneously.
- When the current alarm screen is displayed, the filter setting is cancelled.

2.5 Alarm History (Details) Screen

2.5.1 Description of Screen Display

Position	Name	Description
1	Alarm history details	Displays detailed information in the alarm log or history.

2.5.2 Description of Screen Operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Back>	Goes back to the <Alarm history (List)> screen.
	(2)	<Details 1>	Displays the <Alarm history (Detail display 1)> screen.
	(3)	<Details 2>	Displays the <Alarm history (Detail display 2)> screen.
	(4)	<Main>	Displays the <Alarm log (Main)> screen.
	(5)	<Local, Servo>	Displays the <Alarm history (Local, Servo)> screen.
	(6)	<PLC X/Y>	Displays the <Alarm log (PLC X/Y)> screen.
	(7)	<PLC BX/BY>	Displays the <Alarm log (PLC BX/BY)> screen.
	(8)	<PLC BDX /BDY>	Displays the <Alarm log (PLC BDX/BDY)> screen.

(NOTE) When the alarm log shows the operator message <<Basic axis servo data recorded>> and <<PLC axis servo data recorded>>, no signal information is displayed for the screens below.

- <Alarm log (Main)>
- <Alarm history (Local, Servo)>
- < Alarm history (PLC X/Y)>
- < Alarm history (PLC BX/BY)>
- < Alarm history (PLC BDX/BDY)>

2.5.3 Alarm History (Detail Display 1) Screen

The screen is different when displaying in the NC and conversation languages.

For NC language

- Description of Screen Display

Name	Description
Mode	Displays the selected mode.
Edit program	Displays the edited program.
Operation program	Displays the operating program.
Block No.	Displays the operating block number.
Machine coordinate position	Displays the machine coordinate position.
Distance left	Displays the distance left in the travel command for memory operation or MDI operation.
Execution block	Displays the execution block for memory operation or MDI operation.
Tool offset	Displays the offset amount when the tool length offset or tool position compensation is enabled.
Cutter compensation	Displays the compensation amount when the cutter compensation is enabled.
Spindle tool	Displays the number of the tool that is mounted on the spindle.
Spindle speed	Displays the actual spindle speed when a collision is detected.
Override	Displays settings for the **[RAPID TRAVERSE OVERRIDE]**, **[FEEDRATE OVERRIDE]**, and **[SPINDLE OVERRIDE]** switches.
Feedrate	Displays the actual feedrate when a collision is detected for memory operation or MDI operation. <Positioning> is displayed during travel for positioning.

For conversation language

- Description of Screen Display

Name	Description
Mode	Same operation as the NC language mode.
Edit program	Same operation as the NC language mode.
Operation program	Same operation as the NC language mode.
Job number	Displays the operating tool number.
Machine coordinate position	Same operation as the NC language mode.
Distance left	Same operation as the NC language mode.
Machining	Displays the machining information (job, tool, machining position, workpiece number, line number and infeed).
Current motion	Displays the motion when operating.
Tool length offset	Displays the offset amount when the tool length offset is enabled.
Cutter compensation	Same operation as the NC language mode.
Spindle tool	Same operation as the NC language mode.
Spindle speed	Same operation as the NC language mode.

- Description of Screen Operation
  If the operation shown in the <Current motion> cannot be fully displayed in the 7 lines, then the user can press the <Previous page> and <Next page> keys to scroll through the display. The user can select the <Next page> key for the next display, or select the <Previous page> key for the previous display.

2.5.4 Alarm History (Detail Display 2) Screen

The screen is different when displaying in the NC and conversation languages.

For NC language

- Description of Screen Display

Name	Description
Mode	Displays the same description as in detail display 1.
Edit program	Displays the same description as in detail display 1.
Operation program	Displays the same description as in detail display 1.
Block number	Displays the same description as in detail display 1.
Machine coordinate position	Displays the same description as in detail display 1.
Distance left	Displays the same description as in detail display 1.
Door	Displays whether the door is open or closed. The door name varies depending on the machine model.
Door interlock mode	Displays the status (automatic operation, machine setup or maintenance) of the **[DOOR INTERLOCK MODE]** switch.
Enable	Displays the name of the device that is OFF or where the switch is pressed.
Pendant enabled	Displays the status (enabled/disabled) of the **[ENABLE PENDANT]** switch.

For conversation language

- Description of Screen Display

Name	Description
Mode	Displays the same description as in detail display 1.
Edit program	Displays the same description as in detail display 1.
Operation program	Displays the same description as in detail display 1.
Job number	Displays the same description as in detail display 1.
Machine coordinate position	Displays the same description as in detail display 1.
Distance left	Displays the same description as in detail display 1.
Feedrate	Displays the actual feedrate for memory operation or MDI operation. <Positioning> is displayed during travel for positioning.
Door interlock mode	Displays the status (automatic operation, machine setup or maintenance) of the **[DOOR INTERLOCK MODE]** switch.
Enable	Displays the name of the device that is OFF or where the switch is pressed.
Override	Displays settings for the **[RAPID TRAVERSE OVERRIDE]**, **[FEEDRATE OVERRIDE]**, and **[SPINDLE OVERRIDE]** switches
Door	Displays whether the door is open or closed. The door name varies depending on the machine model.
Pendant enabled	Displays the status (enabled/disabled) of the **[ENABLE PENDANT]** switch.

2.5.5 Alarm Log (Main) Screen

Name	Description
Input	Displays the main input signal status.
Output	Displays the main output signal status.

2.5.6 Alarm History (Local, Servo) Screen

Name	Description
Local input	Displays the local input signal status.
Local output	Displays the local output signal status.
Deviation	Displays the amount of deviation.
Current limit / Current command	Displays only when the machine parameter (system 2) <Quick table> is set to <2: Type 2>.

2.5.7 Alarm Log (PLC X/Y) Screen

Name	Description
Input (X***-X***) ***: PLC external input address	Displays the PLC external input signal status.
Output (Y***-Y***) ***: PLC external output address	Displays the PLC external output signal status.

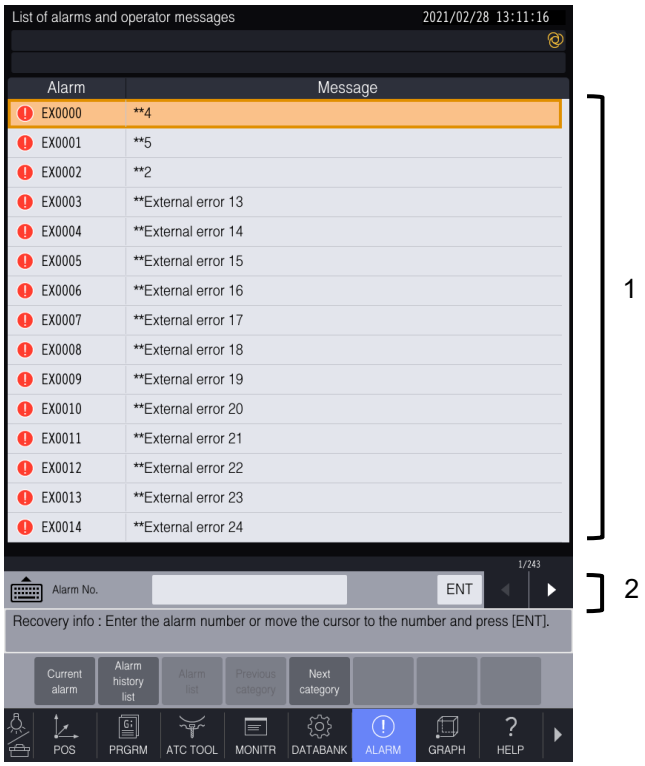
2.5.8 Alarm Log (PLC BX/BY) Screen

Name	Description
Input (BX***-BX***) ***: PLC internal input address	Displays the PLC internal input signal status.
Output (BY***-BY***) ***: PLC internal output address	Displays the PLC internal output signal status.

2.5.9 Alarm Log (PLC BDX/BDY) Screen

Name	Description
Input (BDX****-BDX****) ***: PLC internal input address	Displays the PLC internal input signal status.
Output (BDY****-BDY****) ***: PLC internal output address	Displays the PLC internal output signal status.

2.6 List of Alarms and Operator Messages Screen



2.6.1 Description of Screen Display

Position	Name	Description
1	List of alarms and operator messages	Displays a list of all alarms and operator messages.
2	Alarm No.	Press a number key or character key to display the screen for entering data.

2.6.2 Description of Screen Operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Current alarm>	Displays the <Current Alarm/Operator message> screen.
	(2)	<Alarm history list>	Displays the <Alarm history(List)> screen.
	(3)	<Alarm list>	This cannot be selected.
	(4)	<Previous category>	Moves to the previous category.
	(5)	<Next category>	Moves to the next category.
	(6)		
	(7)		
	(8)		

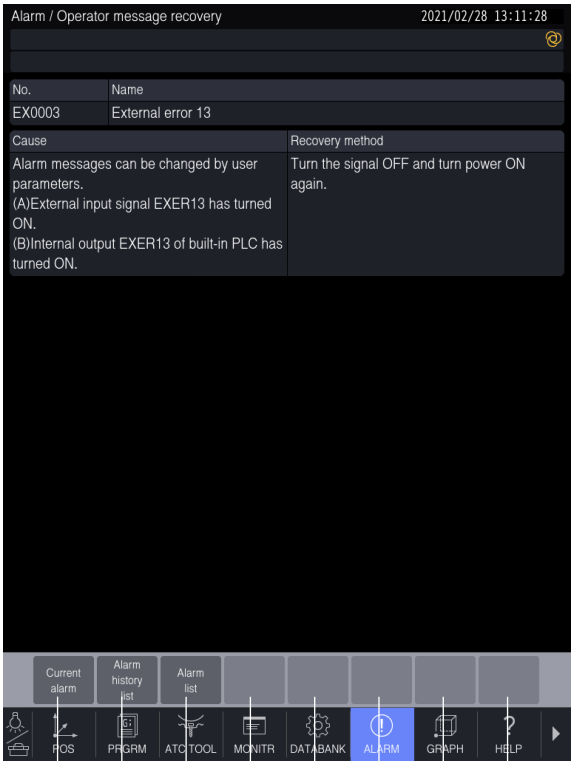
Description of <Main display area> operations

- Tap on an alarm or operator message to reference the recovery procedure. The <Alarm / Operator message recovery> screen is displayed for the selected alarm or operator message.

Description of <Instructions area/Data input field> operations

- Press a number key or character key to display the screen for entering data. Enter the alarm number or operator message number and press the **[ENT]** key. Then, the <Alarm / Operator message recovery> screen is displayed for the selected alarm or operator message.

2.7 Alarm / Operator Message Recovery



2.7.1 Description of Screen Display

Position	Name	Description
1	Alarm / Operator message recovery display	Displays the possible causes and recovery procedure for the selected alarm and/or operator message.

(NOTE) If the power is turned OFF while the <Alarm / Operator message recovery> screen is displayed and there is no particular screen that takes priority over the <Alarm / Operator message recovery> screen when the power is turned ON again, the <Alarm / Operator message recovery> screen will be displayed.

2.7.2 Description of Screen Operation

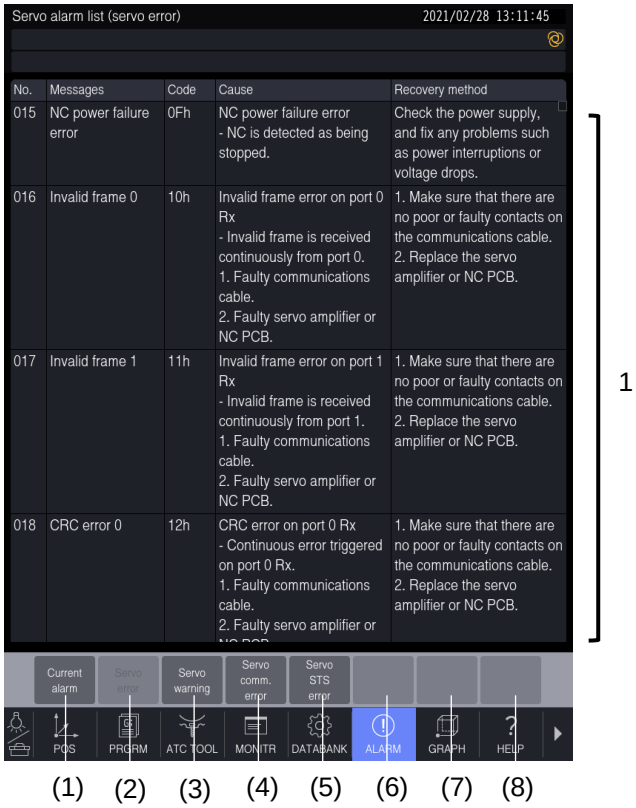
Description of function key operations

Column	Position	Label	Description
1	(1)	<Current alarm>	Displays the <Current Alarm/Operator message> screen.
	(2)	<Alarm history list>	Displays the <Alarm history(List)> screen.
	(3)	<Alarm list>	Displays the <List of alarms and operator messages> screen.
	(4)		
	(5)		
	(6)		
	(7)		
	(8)		

Description of <Main display area> operations

- The user can swipe up and down on the <Main display area> to scroll through and display the messages that don't fit or show on the screen. Or, the user can also slide the scroll bar located on the right side to scroll through those messages.

2.8 Servo Alarm List Screen



2.8.1 Description of Screen Display

Position	Name	Description
1	Servo alarm list	Displays the cause and the recovery procedure for each auxiliary number for servo related alarms (servo error, servo warning, servo communication error, servo status error).

(NOTE) If the power is turned OFF while the <Servo alarm list> screen is displayed and there is no particular screen that takes priority over the <Servo alarm list> screen when the power is turned ON again, the <Servo alarm list> screen will be displayed.

2.8.2 Description of Screen Operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Current alarm>	Displays the <Current Alarm/Operator message> screen.
	(2)	<Servo error>	Displays the servo error list.
	(3)	<Servo warning>	Displays the servo warning list.
	(4)	<Servo comm. error>	Displays the servo communication error list.
	(5)	<Servo STS error>	Displays the servo status error list.
	(6)		
	(7)		
	(8)		

Description of <Main display area> operations

- The user can swipe up and down on the <Main display area> to scroll through and display the messages that don't fit or show on the screen. Or, the user can also slide the scroll bar located on the right side to scroll through those messages.

2.9 Loading System Alarm Screen

2.9.1 Description of Screen Display

Position	Name	Description
1	Alarm	Displays the number of the alarm that triggered in the loading system.

(NOTE) The operator message <<Loading system alarm triggered>> is triggered when a loading system alarm occurs.

2.9.2 Description of Screen Operation

Description of function key operations

Column	Position	Label	Description
1	(1)	<Current alarm>	Displays the <Current Alarm/Operator message> screen.
	(2)	<Alarm history list>	Displays the <Alarm history(List)> screen.
	(3)	<Alarm list>	Displays the <List of alarms and operator messages> screen.
	(4)	<Servo alarm list>	Displays the <Servo alarm list> screen.
	(5)	<Loading system>	This cannot be selected.
	(6)		
	(7)		
	(8)		

Description of <Main display area> operations

- If the number of the messages does not fit on one screen, the user can press the page key to change the pages.

2.10 Message Format

2.10.1 Alarm

XXnnnn **Alarm name or XXnnnn.ddd **Alarm name

XX : These two letters note the cause of the alarm. (Refer to the table below)
nnnn : These four digits are the alarm number.
ddd : These three digits are the auxiliary number.
** : The total number of asterisks (*) identifies the cancel level.
Alarm description : This is the name or description of the alarm.

Potential cause of alarm

Label	Category	Example
NC	NC PCB hardware	Watch dog, ROM/RAM error
EC	IO/Servo communication	IO/servo periodic communication timeout
IO	IO PCB hardware	Emergency stop switch, 100 V power supply error
SV	Servo	Servo error, *-axis position shifted In-position check timeout
SL	System software (local)	Kernel error, memory is not formatted, edit error
SP	PLC	Command code error, and control program is stopped
CM	Local communication	Communication timeout, communication buffer overflow
SM	System software (main)	Kernel error, command error
EX	External signal	External alarm
PN	Panel communication	Teaching pendant communication error, or teaching pendant is removed.
FN	Fieldbus network	Fieldbus network watch dog, FC PCB communication error

2.10.2 Operator Messages

nnnn **Message name or nnnn.ddd **Message name

nnnn : These four digits are the message number.
ddd : These three digits are the auxiliary number.
** : The total number of asterisks (*) identifies the cancel level.
Message description : This is the name or description of the operator message.

2.11 Stop Level and Cancel Level for Alarms and Operator Messages

2.11.1 Stop Levels

NC operation stops as indicated below according to each stop level.

Stop level	Stop method
5	Servo turns OFF.
4	Operation currently being executed stops immediately, and all operations thereafter are disabled.
3 (Block stop)	Operation is executed until the block currently being executed is finished, however operation does not execute thereafter. In addition, the start switch is disabled and the program does not execute.
2 (Stops at M02 and M30 commands)	Operation is executed until the program currently being executed is finished. Thereafter, the start switch is disabled and the program does not execute. When the single block is ON, stop level 3 and stop level 2 are the same.
1	Only a warning is issued and no operations or motions are affected.

2.11.2 Cancel Levels

The total number of asterisks (*) and the color of the exclamation point (!) are used to identify the cancel level of the alarm and operator message.

Cancel level	Total asterisks (*)	Color of !	Cancel method
3	**	Red	Power must be turned OFF to cancel the alarm or message. (Turn the power OFF and then ON to cancel the alarm and operator message.)
2	*	Yellow	Press the **[RST]** key to cancel the alarm or message.
1	None	None	Press any key to cancel the alarm or message.

(NOTE 1) In the alarm/operator message area, the message text for cancel levels 1 through 3 is yellow for alarms and white for operator messages.

(NOTE 2) In the alarm/operator message area, the number display for cancel levels 1 through 3 is highlighted in yellow for alarms and white for operator messages.

(NOTE 3) Exclamation points (!) do not display for cancel level 1.

2.11.3 Cancel Level Using ALMRLS Signal

If the following alarm is triggered, it can be cancelled by inputting the ALMRLS signal as an external input signal.

- The number of asterisks (*) before the alarm message and the color of the exclamation point (!) is shown below when the alarm is an <External error**> (**:10 to 99) and the “Cancel level” for the external I/O signal setting is “4: ALMRLS signal”.
  Exclamation point is pink with an asterisk (*)
  Pressing the **[RST]** key also cancels this alarm.

(NOTE 1) In the alarm/operator message area, the message text is pink when the cancel level is released with an ALMRLS signal.

(NOTE 2) In the alarm/operator message area, the number display (indicating the number of current messages) is in a yellow box when the cancel level is released with an ALMRLS signal.

2.11.4 Notes

The stop level and the cancel level are independent from each other. Therefore, they can be combined in different ways as shown below.

- Stop level 5 and cancel level 2
- Stop level 1 and cancel level 2

2.12 Display When Message Includes Additional Axis

The display for the additional axis in the message changes depending on the setting of the following machine parameters.

5th-axis position (0: No pallet 1: Table 1 2: Table 2)
6th-axis position (0: No pallet 1: Table 1 2: Table 2)
7th-axis position (0: No pallet 1: Table 1 2: Table 2)
8th-axis position (0: No pallet 1: Table 1 2: Table 2)
5th-axis address (0: A 1: B 2: C)
6th-axis address (0: A 1: B 2: C)
7th-axis address (0: A 1: B 2: C)
8th-axis address (0: A 1: B 2: C)

		Installation position		
		0: No pallet	**1: Table 1**	**2: Table 2**
Address	0: A	A-axis	A1-axis	A2-axis
	1: B	B-axis	B1-axis	B2-axis
	2: C	C-axis	C1-axis	C2-axis

2.13 Alarm Code List

The list includes alarms that may occur only in certain models or models with particular specifications.

2.13.1 EX

No.	Stop level	Reset level	Alarm message	Cause	Solution
EX0000 : EX0089	5	3	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF and turn power ON again.
EX0500 : EX0589	5	2	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF and press the **[RST]** key.
EX1500 : EX1589	4	3	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF and turn power ON again.
EX2000 : EX2089	4	2	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF and press the **[RST]** key.
EX3000 : EX3089	4	1	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF.
EX3500 : EX3589	3	3	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF and turn power ON again.
EX4000 : EX4089	3	2	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF and press the **[RST]** key.
EX4500 : EX4589	3	1	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF.
EX5000 : EX5089	2	3	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF and turn power ON again.

No.	Stop level	Reset level	Alarm message	Cause	Solution
EX5500 : EX5589	2	2	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF and press the **[RST]** key.
EX6000 : EX6089	2	1	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF.
EX6500 : EX6589	1	3	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF and turn power ON again.
EX7000 : EX7089	1	2	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF and press the **[RST]** key.
EX7500 : EX7589	1	1	External error **	Alarm messages can be changed by user parameters. (A)External input signal EXER** has turned ON. (B)Internal output EXER** of built-in PLC has turned ON.	Turn the signal OFF.

2.13.2 EC

No.	Stop level	Reset level	Alarm message	Cause	Solution
EC0000	5	3	IO equipment/servo communication error (*)	IO equipment/servo transmission failed. (A)Cable connection is faulty. (B)Cable may be broken or cut. (C)NC PCB is faulty.	(A)Re-connect the cables that are connected to XNC01 and XNC02. (B)Replace the cable. (C)Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0001	5	3	The IO equipment communication output is abnormal	An abnormal output is detected in IO equipment communications.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0002	5	3	The IO equipment communication input is abnormal	An abnormal input is detected in IO equipment communications.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0003	5	3	The servo communication output is abnormal	An abnormal output of servo communication is detected. (A) Cable connection is faulty. (B) Cable may be broken or cut. (C) Servo amplifier is faulty.	(A)Re-connect the cable that is connected to X0 and X1 on the servo amplifier. (B)Replace the cable. (C)Replace the servo amplifier.
EC0004	5	3	The servo communication input is abnormal	An abnormal input of servo communication is detected. (A) Cable connection is faulty. (B) Cable may be broken or cut. (C) Servo amplifier is faulty.	(A)Re-connect the cable that is connected to X0 and X1 on the servo amplifier. (B)Replace the cable. (C)Replace the servo amplifier.
EC0005	5	3	The IO equipment communication is abnormal (*)	An anomaly is detected in IO equipment initial communications. IO equipment is faulty.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0006	5	3	Servo communication is abnormal (*)	An anomaly is detected in the servo initial communications. (A) Cable connection is faulty. (B) Cable may be broken or cut. (C) Servo amplifier is faulty.	(A)Re-connect the cable that is connected to X0 and X1 on the servo amplifier. (B)Replace the cable. (C)Replace the servo amplifier.
EC0007	5	3	Servo periodic communication error (*)	Data frame is lost in servo communication. (A) LAN cable connection is faulty. (B) NC PCB is faulty. (C) Servo amplifier is faulty.	(A) Re-connect the LAN cable. (B) Replace the NC PCB. (C) Replace the servo amplifier.
EC0008	5	3	No response of communication from IO equipment (*)	Non-responding IO equipment was detected.	Check connection of the IO equipment. Contact the maker to describe the failure.
EC0009	5	3	Unusable equipment is connected (*)	Unusable equipment is detected.	Check connection of the IO equipment. Contact the maker to describe the failure.
EC0010	5	3	Servo amplifier connection point is abnormal (*)	Servo amplifier position is not correct.	Check connection of the servo amplifier. Contact the maker to describe the failure.
EC0011	5	3	Servo periodic communication timeout (*)	Failed to receive the data frame of IO/servo communication within the specified time period. NC PCB is faulty.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0012	5	3	Duplicated errors of expansion terminal block numbers (*)	An expansion terminal block or an ID PCB with a duplicated number was detected.	Check the number of the expansion terminal block or for the ID PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
EC0013	5	3	The expansion terminal block number is abnormal (*)	An expansion terminal block or ID PCB number set outside the range was detected.	Check the number of the expansion terminal block.
EC0014	5	3	Duplicated errors of servo amplifier axis number (*)	A servo amplifier of a duplicated axis number is detected.	Check the axis number of the servo amplifier.
EC0015	5	3	The servo amplifier axis number is abnormal (*)	The axis number of a servo amplifier is not within the range.	Check the axis number of the servo amplifier.
EC0016	5	3	IO equipment watch dog (*)	Abnormal IO equipment is detected.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0017	5	3	Servo amplifier watch dog (*)	A servo amplifier error was detected. Servo amplifier is faulty.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0018	5	3	The field bus equipment communication output is abnormal.	An abnormal output is detected in FC PCB communications. FC PCB is faulty.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0019	5	3	The field bus equipment communication input is abnormal	An abnormal input is detected in FC PCB communications. FC PCB is faulty.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0020	5	3	IO equipment/servo initial communication error (*)	IO equipment/servo transmission failed. (A)Cable connection is faulty. (B)Cable may be broken or cut.	(A)Re-connect the cables that are connected to XNC01 and XNC02. (B)Replace the cable.
EC0021	5	3	The detachable panel connecting position is abnormal	Reserved	Reserved
EC0022	5	3	The IO equipment/servo connection is abnormal (*)	Connection of IO equipment/servo amplifiers is wrong.	Check connection of IO equipment/servo amplifiers.
EC0023	5	3	IO equipment/servo periodic communication error (*)	Data frame is lost in IO equipment/servo communication. (A)LAN cable connection is faulty. (B)NC PCB is faulty. (C)IO equipment is faulty. (D)The PLC-axis version was updated.	(A) Re-connect the LAN cable. (B) Contact the nearest BROTHER approved service dealer and report the alarm conditions. (C) Check IO equipment connections. Contact the nearest BROTHER approved service dealer. (D)Turn the power off and then on again.
EC0024	5	3	IO equipment/servo periodic communication timeout (*)	Failed to receive the data frame of IO equipment/servo communication within the specified time period. NC PCB is faulty.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0025	5	3	NC PCB initial communication error (*)	NC PCB is faulty.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
EC0026	5	3	Too many IO device/servo connections (*)	Too many IO equipment/servo amplifiers are connected.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.

No.	Stop level	Reset level	Alarm message	Cause	Solution
EC0027	5	3	Failed to update amplifier version (*)	Failed to update the amplifier version. (A)Cable connection is faulty. (B)Cable may be broken or cut. (C)Servo amplifier is faulty.	(A)Re-connect the cable that is connected to X0 and X1 on the servo amplifier. (B)Replace the cable. (C)Replace the servo amplifier. Contact the nearest BROTHER approved service dealer, telling the auxiliary number (*).

2.13.3 SV

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV0000	5	3	Spindle servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0001	5	3	X-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0002	5	3	Y-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0003	5	3	Z-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0004	5	3	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0005	5	3	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0006	5	3	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0007	5	3	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0008	5	3	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0009	5	3	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0010	5	3	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0011	5	3	P1-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0012	5	3	P2-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0013	5	3	P3-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0014	5	3	P4-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0015	5	3	Spindle servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0016	5	3	X-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0017	5	3	Y-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV0018	5	3	Z-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0019	5	3	*-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0020	5	3	*-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0021	5	3	*-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0022	5	3	*-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0023	5	3	*-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0024	5	3	*-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0025	5	3	*-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0026	5	3	P1-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0027	5	3	P2-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0028	5	3	P3 -axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0029	5	3	P4-axis servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0030	5	3	Spindle servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0031	5	3	X-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0032	5	3	Y-axis servo status error(*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0033	5	3	Z-axis servo status error(*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV0034	5	3	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0035	5	3	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0036	5	3	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0037	5	3	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0038	5	3	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0039	5	3	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0040	5	3	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0041	5	3	P1-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0042	5	3	P2-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0043	5	3	P3-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0044	5	3	P4-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0045	5	3	Spindle servo error (*)		
SV0046	5	3	X-axis servo error (*)		
SV0047	5	3	Y-axis servo error (*)		
SV0048	5	3	Z-axis servo error (*)		
SV0049	5	3	*-axis servo error (*)		
SV0050	5	3	*-axis servo error (*)		
SV0051	5	3	*-axis servo error (*)		
SV0052	5	3	*-axis servo error (*)		
SV0053	5	3	*-axis servo error (*)		
SV0054	5	3	*-axis servo error (*)		
SV0055	5	3	Automatic door servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV0056	5	3	Automatic door servo communication error (*)	The cause differs depending on the auxiliary number (*). See the servo communication error list.	
SV0057	5	3	Automatic door servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0500	5	2	Spindle servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0501	5	2	X-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0502	5	2	Y-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0503	5	2	Z-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0504	5	2	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0505	5	2	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0506	5	2	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0507	5	2	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0508	5	2	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0509	5	2	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0510	5	2	*-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0511	5	2	P1-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0512	5	2	P2-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0513	5	2	P3-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0514	5	2	P4-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0515	5	2	Spindle servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0516	5	2	X-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV0517	5	2	Y-axis servo status error(*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0518	5	2	Z-axis servo status error(*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0519	5	2	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0520	5	2	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0521	5	2	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0522	5	2	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0523	5	2	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0524	5	2	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0525	5	2	*-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0526	5	2	P1-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0527	5	2	P2-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0528	5	2	P3-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0529	5	2	P4-axis servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0530	5	2	Thermal error (spindle motor)	The thermal relay in the spindle motor was tripped due to one of the following reasons. (A)Motor is overloaded or locked. (B)Machining condition has exceeded motor's capacity.	(A)Use your hands to turn the spindle to make sure that it is not heavy or sluggish. (B)Follow the procedure below. 1. Revise the machining conditions and operating pattern. 2. Wait 30 minutes without turning OFF the power before resuming operation. 3. If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV0531	5	2	Thermal error (X-axis motor)	The thermal relay in the X-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0532	5	2	Thermal error (Y-axis motor)	The thermal relay in the Y-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0533	5	2	Thermal error (Z-axis motor)	The thermal relay in the Z-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0534	5	2	Thermal error (*-axis motor)	The thermal relay in the 4th-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0535	5	2	Thermal error (*-axis motor)	The thermal relay in the 5th-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0536	5	2	Thermal error (*-axis motor)	The thermal relay in the 6th-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV0537	5	2	Thermal error (*-axis motor)	The thermal relay in the 7th-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0538	5	2	Thermal error (*-axis motor)	The thermal relay in the 8th-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0539	5	2	Thermal error (*-axis motor)	The thermal relay in the M-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0540	5	2	Thermal error (P1-axis motor)	The thermal relay in the P1-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0541	5	2	Thermal error (P2-axis motor)	The thermal relay in the P2-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0542	5	2	Thermal error (P3-axis motor)	The thermal relay in the P3-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV0543	5	2	Thermal error (P4-axis motor)	The thermal relay in the P4-axis motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The machining condition has exceeded the motor's capacity.	1.Revise the machining conditions or operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0544	5	2	Thermal error (*-axis motor)	The thermal relay in the AT-axis motor was tripped. (A)The motor is overloaded or locked. (B)The operating conditions have exceeded the motor's capacity.	1.Revise the operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.Please contact us about the status of the error.
SV0545	5	2	Automatic door servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV0546	5	2	Automatic door servo status error (*)	The cause differs depending on the auxiliary number (*). See the servo status error list.	
SV0547	5	2	Thermal error (automatic door motor)	The thermal relay in the automatic door motor was tripped due to one of the following reasons. (A)The motor is overloaded or locked. (B)The operating conditions have exceeded the motor's capacity.	1.Revise the operating pattern. 2.Remove the above cause, and then wait 30 minutes without turning OFF the power before resuming operation. 3.If the alarm triggers again, contact the nearest BROTHER approved service dealer and report the alarm conditions.
SV0548	5	2	X-axis position mismatch	X-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0549	5	2	Y-axis position mismatch	Y-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0550	5	2	Z-axis position mismatch	Z-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0551	5	2	*-axis position mismatch	QT-axis motor was replaced.	Use the support application (recovery support) to adjust the zero position.
SV0552	5	2	*-axis position mismatch	5th-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV0553	5	2	*-axis position mismatch	6th-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0554	5	2	*-axis position mismatch	7th-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0555	5	2	*-axis position mismatch	8th-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0556	5	2	*-axis position mismatch	M-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0557	5	2	*-axis position mismatch	AT-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0558	5	2	P1-axis position mismatch	P1-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0559	5	2	P2-axis position mismatch	P2-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0560	5	2	P3-axis position mismatch	P3-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV0561	5	2	P4-axis position mismatch	P4-axis motor was replaced.	Press the **[RST]** key while holding down the **[RELSE]** key. Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV1500	4	3	P1-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV1501	4	3	P2-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV1502	4	3	P3-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV1503	4	3	P4-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV1504	4	3	Automatic door servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV2000	4	2	*-axis position mismatch (for positioning only)	The encoder position cannot be identified correctly.	Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV2001	4	2	*-axis position mismatch (for positioning only)	The encoder position cannot be identified correctly.	Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV2002	4	2	*-axis position mismatch (for positioning only)	The encoder position cannot be identified correctly.	Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV2003	4	2	*-axis position mismatch (for positioning only)	The encoder position cannot be identified correctly.	Configure the automatic settings for the adjusted absolute values on the absolute encoder reset screen. Then, readjust the zero position.
SV2004	4	2	P1-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV2005	4	2	P2-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV2006	4	2	P3-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV2007	4	2	P4-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV2008	4	2	Automatic door servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV3500	3	3	P1-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV3501	3	3	P2-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV3502	3	3	P3-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV3503	3	3	P4-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV3504	3	3	Automatic door servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV4000	3	2	P1-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV4001	3	2	P2-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV4002	3	2	P3-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV4003	3	2	P4-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV4004	3	2	Automatic door servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV5000	2	3	P1-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV5001	2	3	P2-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV5002	2	3	P3-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV5003	2	3	P4-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV5004	2	3	Automatic door servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV5500	2	2	P1-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV5501	2	2	P2-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV5502	2	2	P3-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV5503	2	2	P4-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV5504	2	2	Automatic door servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV6500	1	3	P1-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV6501	1	3	P2-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV6502	1	3	P3-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV6503	1	3	P4-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV6504	1	3	Automatic door servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV7000	1	2	Spindle servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SV7001	1	2	X-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7002	1	2	Y-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7003	1	2	Z-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7004	1	2	*-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7005	1	2	*-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7006	1	2	*-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7007	1	2	*-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7008	1	2	*-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7009	1	2	*-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7010	1	2	*-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7011	1	2	P1-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7012	1	2	P2-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7013	1	2	P3-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7014	1	2	P4-axis servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	
SV7015	1	2	P1-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV7016	1	2	P2-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV7017	1	2	P3-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV7018	1	2	P4-axis servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV7019	1	2	Automatic door servo error (*)	The cause differs depending on the auxiliary number (*). See the servo error list.	
SV7020	1	2	Automatic door servo warning (*)	The cause differs depending on the auxiliary number (*). See the servo warning list.	

2.13.4 NC

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC0000	5	3	Watch dog (main)	There was a circuit abnormality main CPU.	Replace NC PCB.
NC0001	5	3	Watch dog (local)	An error has occurred in the local CPU.	Replace NC PCB.
NC0002	5	3	RAM error (main)	Reading and writing using main CPU RAM is not possible.	Replace NC PCB.
NC0003	5	3	ROM error (main)	The check sum of main CPU ROM does not match.	Replace NC PCB.
NC0004	5	3	RAM error (main-local 1)	Reading and writing using common- RAM for main- local 1 may be not possible.	Replace NC PCB.
NC0005	5	3	RAM error (main-local 2)	Reading and writing using common- RAM for main- local 2 may be not possible.	Replace NC PCB.
NC0006	5	3	RAM error (main-local 3)	Reading and writing using common- RAM for main- local 3 may be not possible.	Replace NC PCB.
NC0007	5	3	Calculation error (local)	Improper calculation is executed (local CPU).	Replace NC PCB.
NC0008	5	3	Main cannot be started	Main CPU has not started.	Replace NC PCB.
NC0009	5	3	Main exception interruption (*)	Main CPU has detected incorrect interruption. The figure in brackets ( ) indicates interruption no.	Replace NC PCB.
NC0010	5	3	Local exception interruption (*)	Local CPU has detected incorrect interruption. The figure in brackets ( ) indicates interruption No.	Replace NC PCB.
NC0011	5	3	Kernel error (main)	An error has occurred in the main CPU operating system.	Replace NC PCB.
NC0012	5	3	Kernel error (local) (*)	An error has occurred in the local CPU operating system.	(a)Turn the power off and then on again. (b)Replace NC PCB.
NC0013	5	3	Command error	Not synchronized witn the command.	Replace NC PCB.
NC0014	5	3	Internal conflict detected (*)	An error occurred in the main CPU's system software.	Replace NC PCB. Contact the nearest BROTHER approved service dealer, telling the auxiliary number (*).
NC0015	5	3	Disk size error	The size data in the current disk does not match the size data in the NC.	(a)Check CFast connections. (b)Replace CFast. (c)Replace NC PCB.
NC0016	5	3	Disk access error	Disk connection has failed.	(a)Check CFast connections. (b)Format the memory. (c)Replace CFast. (d)Replace NC PCB.
NC0017	5	3	There is no servo communication specified axis	Data sent to nonexistent axis (servo communications).	Check servo connections.
NC0018	5	3	There is no servo signal receiving data	Data not received from servo (servo communications).	Check servo connections.
NC0019	5	3	Main system initialization error (*)	An error occurred when the system software started.	Replace NC PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC0020	5	3	KEY PCB not connected	(a)The KEY PCB is not connected. (b)The KEY PCB or the connecting PCB is defective.	(a)Check the XKEYIN connector wiring on the KEY PCB, and make sure that there is no disconnection on the cable or connector. (b)Replace the KEY PCB or the connecting PCB (IO PCB (standard), EXIO PCB, FC PCB or CM PCB (option)).
NC0021	5	3	Version consistency error (main/local)	(A) Version upgrading is suspended. (B) Software version mismatch following replacement of NC PCB or CFast.	Execute version upgrade.
NC0022	5	3	Internal conflict detected 2 (*)	An error occurred in the main CPU's system software.	Replace NC PCB. Contact the nearest BROTHER approved service dealer, telling the auxiliary number (*).
NC0023	5	3	Internal conflict detected 3 (*)	An error occurred in the main CPU's system software.	Replace NC PCB. Contact the nearest BROTHER approved service dealer, telling the auxiliary number (*).
NC0024	5	3	Internal conflict detected 4 (*)	An error occurred in the main CPU's system software.	Replace NC PCB. Contact the nearest BROTHER approved service dealer, telling the auxiliary number (*).
NC0025	5	3	PLC cannot start	PLC program did not start within the prescribed time.	Contact the nearest BROTHER approved service dealer.
NC0026	5	3	Local CPU abnormal stop	The temperature of LOCAL PCB may have increased abnormally. NC PCB may have shut down due to an error.	Replace NC PCB.
NC0027	5	3	System error (Main)	001)A genuine NC PCB part is not installed.	001)Replace NC PCB.
NC0028	5	3	Hardware compatibility error (Local-CF)	NC PCB and CFast combination is wrong.	Check the type of the NC PCB and CFast, and select the correct combination.
NC0029	5	3	Machine information does not match	The machine identification signal does not match the NC's internal information.	(a) If the NC PCB has been replaced and there is an internal data bank change, check the data setting. (b) If the IO PCB has been replaced and this alarm still triggers, make sure that all connectors on the IO PCB have been connected or that the latest IO PCB is being used. If operation does not restore, the PCB may be faulty. Therefore, replace it with the latest IO PCB.
NC0030	5	3	Machine configuration error	(A) Required OPSEL PCB is not detected. (B) There is an OPSEL PCB error. (C) There is an IO PCB error.	(A) Check the connection with the OPSEL PCB. (B) Replace the OPSEL PCB. (C) Replace the IO PCB.
NC0031	5	3	Hardware compatibility error (IO)	The information in the NC and the IO PCB do not match.	If this alarm is triggered after replacing the IO PCB, check whether the IO PCB is the latest version or not. If the IO PCB is the latest version, then the PCB may be faulty. Replace the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC0032	5	3	X-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the X-axis.	Check the type of servo amplifier for the X-axis.
NC0033	5	3	Y-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the Y-axis.	Check the type of servo amplifier for the Y-axis.
NC0034	5	3	Z-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the Z-axis.	Check the type of servo amplifier for the Z-axis.
NC0035	5	3	*-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the 4-axis.	Check the type of servo amplifier for the 4-axis.
NC0036	5	3	*-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the 5-axis.	Check the type of servo amplifier for the 5-axis.
NC0037	5	3	*-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the 6-axis.	Check the type of servo amplifier for the 6-axis.
NC0038	5	3	*-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the 7-axis.	Check the type of servo amplifier for the 7-axis.
NC0039	5	3	*-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the 8-axis.	Check the type of servo amplifier for the 8-axis.
NC0040	5	3	P1-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the P1-axis.	Check the type of servo amplifier for the P1-axis.
NC0041	5	3	P2-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the P2-axis.	Check the type of servo amplifier for the P2-axis.
NC0042	5	3	P3-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the P3-axis.	Check the type of servo amplifier for the P3-axis.
NC0043	5	3	P4-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the P4-axis.	Check the type of servo amplifier for the P4-axis.
NC0044	5	3	X-axis motor does not match	There is a problem with the type of motor connected to the X-axis.	Check the type of motor for the X-axis.
NC0045	5	3	Y-axis motor does not match	There is a problem with the type of motor connected to the Y-axis.	Check the type of motor for the Y-axis.
NC0046	5	3	Z-axis motor does not match	There is a problem with the type of motor connected to the Z-axis.	Check the type of motor for the Z-axis.
NC0047	5	3	*-axis motor does not match	There is a problem with the type of motor connected to the 4-axis.	Check the type of motor for the 4-axis.
NC0048	5	3	*-axis motor does not match	There is a problem with the type of motor connected to the 5-axis.	Check the type of motor for the 5-axis.
NC0049	5	3	*-axis motor does not match	There is a problem with the type of motor connected to the 6-axis.	Check the type of motor for the 6-axis.
NC0050	5	3	*-axis motor does not match	There is a problem with the type of motor connected to the 7-axis.	Check the type of motor for the 7-axis.
NC0051	5	3	*-axis motor does not match	There is a problem with the type of motor connected to the 8-axis.	Check the type of motor for the 8-axis.

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC0052	5	3	P1-axis motor does not match	There is a problem with the type of motor connected to the P1-axis.	Check the type of motor for the P1-axis.
NC0053	5	3	P2-axis motor does not match	There is a problem with the type of motor connected to the P2-axis.	Check the type of motor for the P2-axis.
NC0054	5	3	P3-axis motor does not match	There is a problem with the type of motor connected to the P3-axis.	Check the type of motor for the P3-axis.
NC0055	5	3	P4-axis motor does not match	There is a problem with the type of motor connected to the P4-axis.	Check the type of motor for the P4-axis.
NC0056	5	3	Communication error with relocation detection device	Failed to communicate with relocation detection device.	(A) The cable connection is faulty. (B) The cable may be broken or cut. Replace the cable. (C) Replace the relocation detection device.
NC0057	5	3	Spindle servo amplifier does not match	There is a problem with the type of servo amplifier connected to the spindle.	Check the type of servo amplifier for the spindle.
NC0058	5	3	Magazine servo amplifier does not match	There is a problem with the type of servo amplifier connected to the magazine.	Check the type of servo amplifier for the magazine.
NC0059	5	3	Spindle motor does not match	There is a problem with the type of motor connected to the spindle.	Check the type of motor for the spindle.
NC0060	5	3	Magazine motor does not match	There is a problem with the type of motor connected to the magazine.	Check the type of motor for the magazine.
NC0061	5	3	AT-axis servo amplifier does not match	There is a problem with the type of servo amplifier connected to the AT-axis.	Check the type of servo amplifier for the AT-axis.
NC0062	5	3	AT-axis motor does not match	There is a problem with the type of motor connected to the AT-axis.	Check the type of motor for the AT-axis.
NC0063	5	3	Watch dog (loading system)	Loading system error was detected.	Check the loading system status.
NC0064	5	3	Parameter error	Failed to convert the unit used for the machine parameter <Travel amount under load for brake load test> or <Allowable travel amount for brake load test>.	Turn the power OFF and back ON again. If the alarm continues to trigger, check the machine parameters.
NC0500	5	2	No error number	An alarm not registered in the error number table occurred. The alarm may occur when the version is inconsistent.	(a) Execute version upgrade. (b) Replace NC PCB.
NC0501	5	2	Data error (machine parameter)	Data structure of machine parameter is destroyed.	(a) Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b) Replace NC PCB. (c) Replace CFast.

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC0502	5	2	Safety check error 2	(A)The outer pallet additional axis moved in the following conditions: when the door interlock mode was set to automatic mode, the front door was open, the side door was closed, and the QT-axis was indexed (including when the inner door was closed). (B)The outer pallet additional axis moved in the following conditions: when the door interlock mode was set to setting mode, the **[ENABLE]** switch was turned OFF, the front door was open, the side door was closed, and the QT-axis was indexed (including when the inner door was closed).	Replace NC PCB.
NC0503	5	2	Safety check error 3	(A)The spindle, X-/Y-/Z-axes and/or additional axes moved when the door interlock mode was set to automatic mode and the side door was open (or the door was open and the QT-axis was not indexed). (B)The spindle, X-/Y-/Z-axes and/or additional axes moved in the following conditions: when the door interlock mode was set to setting mode, the **[ENABLE]** switch was turned OFF and the side door was open (or the door was open and the QT-axis was not indexed).	(A)Do not change the **[DOOR INTERLOCK MODE]** switch setting while the axis is operating. (B)Replace the NC PCB.
NC0504	5	2	System monitor M1(*)		
NC0505	5	2	System monitor L1(*)		
NC0506	5	2	Safety check error 5	(A)The outer pallet additional axis failed to stop in the following conditions: when the door interlock mode was set to automatic mode, the front door was open, the side door was closed, and the QT-axis was indexed (including when the inner door was closed). (B)The outer pallet additional axis failed to stop in the following conditions: when the door interlock mode was set to setting mode, the **[ENABLE]** switch was turned OFF, the front door was open, the side door was closed, and the QT-axis was indexed (including when the inner door was closed).	Replace NC PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC0507	5	2	Safety check error 6	(A)The spindle, X-/Y-/Z-axes and/or additional axes failed to stop when the door interlock mode was set to automatic mode and the side door was open (or the door was open and the QT-axis was not indexed). (B)The spindle, X-/Y-/Z-axes and/or additional axes failed to stop in the following conditions: when the door interlock mode was set to setting mode, the **[ENABLE]** switch was turned OFF and the side door was open (or the door was open and the QT-axis was not indexed).	Replace NC PCB.
NC0508	5	2	Safety check error 1	(A)The spindle was rotating when the door interlock mode was set to service mode and the side door was open (or the door was open and the QT-axis was not indexed). (B)The spindle was rotating in the following conditions: when the door interlock mode was set to setting mode, the **[ENABLE]** switch was turned OFF and the side door was open (or the door was open and the QT-axis was not indexed).	Replace NC PCB.
NC0509	5	2	Safety check error 4	(A)The spindle failed to stop when the door interlock mode was set to automatic mode and the side door was open (or the door was open and the C-axis was not indexed). (B)The spindle failed to stop in the following conditions: when the door interlock mode was set to setting mode, the **[ENABLE]** switch was turned OFF and the side door was open (or the door was open and the QT-axis was not indexed).	Replace NC PCB.
NC0510	5	2	Version compatability error (Main/Teaching pendant)	The software version encountered a compatibility error because the NC PCB or the teach pendant was replaced.	Execute version upgrade.
NC2000	4	2	ROM error (main)	The system area in the main CPU is damaged.	(a)Execute version upgrade. (b)Replace NC PCB.
NC2001	4	2	Edit error 1	The data was damaged during editing.	(a)Replace NC PCB. (b)Replace CFast.
NC2002	4	2	Edit error 1	The data was damaged during editing.	(a)Replace NC PCB. (b)Replace CFast.

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC2003	4	2	Edit error 3	The data cannot be edited.	(a)Replace NC PCB. (b)Replace CFast. (c)Decrease the program size when editing the program, or delete other programs to increase memory space, and then retry operation. Press the **[RST]** key.
NC2004	4	2	Parity error (user parameter)	The user parameter data is corrupt.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2005	4	2	Parity error (machine parameter)	The machine parameter data is corrupt.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2006	4	2	Parity error (program)	The program is corrupt.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2007	4	2	Parity error (soft switch)	The soft switch data is damaged.	(a)Can occur when replacing NC PCB. Follow the specified procedure carefully. (b)Replace NC PCB.
NC2008	4	2	Parity error (tool list)	The tool list data structure is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace LOCAL PCB. (c)Replace CFast.
NC2009	4	2	Parity error (tool pattern)	The tool pattern data structure is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2010	4	2	Parity error (tap hole)	The tap hole data structure is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2011	4	2	Parity error (cutting condition)	The cutting condition data structure is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2012	4	2	Parity error (workpc. coord. zero)	The workpiece coordinate zero point data is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2013	4	2	Parity error (tool data)	The tool data is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC2014	4	2	Parity error (macro variables)	The macro variable data is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2015	4	2	Data error (tool list)	(A) Data bank file for the current plane does not exist. (B) Data bank version of the file of current plane is obsolete. (C) Data structure is damaged.	(A) Use another plane or create a new file. (B) Edit the relevant data bank and save. (C) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program
NC2016	4	2	Data error (tool pattern)	(A) Data bank file for the current plane does not exist. (B) Data bank version of the file of current plane is obsolete. (C) Data structure is damaged.	(A) Use another plane or create a new file. (B) Edit the relevant data bank and save. (C) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program
NC2017	4	2	Data error (tap hole)	(A) Data bank file for the current plane does not exist. (B) Data bank version of the file of current plane is obsolete. (C) Data structure is damaged.	(A) Use another plane or create a new file. (B) Edit the relevant data bank and save. (C) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program
NC2018	4	2	Data error (cutting condition)	(A) Data bank file for the current plane does not exist. (B) Data bank version of the file of current plane is obsolete. (C) Data structure is damaged.	(A) Use another plane or create a new file. (B) Edit the relevant data bank and save. (C) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program
NC2019	4	2	Data error (workpc. coord. zero)	(A) Data bank file for the current plane does not exist. (B) Data bank version of the file of current plane is obsolete. (C) Data structure is damaged.	(A) Use another plane or create a new file. (B) Edit the relevant data bank and save. (C) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program
NC2020	4	2	Data error (tool data)	(A) Data bank file for the current plane does not exist. (B) Data bank version of the file of current plane is obsolete. (C) Data structure is damaged.	(A) Use another plane or create a new file. (B) Edit the relevant data bank and save. (C) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC2021	4	2	Data error (macro variables)	(A) Data bank file for the current plane does not exist. (B) Data bank version of the file of current plane is obsolete. (C) Data structure is damaged.	(A) Use another plane or create a new file. (B) Edit the relevant data bank and save. (C) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program
NC2022	4	2	Data error (user parameter)	(A) Data bank file for the current plane does not exist. (B) Data bank version of the file of current plane is obsolete. (C) Data structure is damaged.	(A) Use another plane or create a new file. (B) Edit the relevant data bank and save. (C) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program
NC2023	4	2	Edit error 1	The data was damaged during editing.	(a)Replace NC PCB. (b)Replace CFast.
NC2024	4	2	Check sum error (workpc. coord. zero)	The workpiece coordinate zero point data structure is damaged.	(a)Can occur when replacing NC PCB. Follow the specified procedure carefully. (b)Press the **[EDIT]** key to display the <Directory display> screen. Delete the damaged data, and create new data. (c)Replace NC PCB.
NC2025	4	2	Check sum error (tool data)	The tool data structure is damaged.	(a)Can occur when replacing NC PCB. Follow the specified procedure carefully. (b)Press the **[EDIT]** key to display the <Directory display> screen. Delete the damaged data, and create new data. (c)Replace NC PCB.
NC2026	4	2	Check sum error (macro variables)	The macro variable data structure is damaged.	(a)Can occur when replacing NC PCB. Follow the specified procedure carefully. (b)Press the **[EDIT]** key to display the <Directory display> screen. Delete the damaged data, and create new data. (c)Replace NC PCB.
NC2027	4	2	Check sum error (soft switch)	The soft switch data is damaged.	(a)Can occur when replacing NC PCB. Follow the specified procedure carefully. (b)Replace NC PCB.
NC2028	4	2	Disk error (*)	(A) Disk connection is faulty. (B) Disk capacity is not sufficient.	Check the CFast.
NC2029	4	2	System error (MC)	An error was received but the corresponding error cannot be identified.	Press the **[RST]** key to clear the alarm. Replace NC PCB.
NC2030	4	2	System monitor M2(*)		
NC2031	4	2	System monitor L2(*)		

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC2032	4	2	System error (slave)	An error was received but the corresponding error cannot be identified.	Press the **[RST]** key to clear the alarm. Replace NC PCB.
NC2033	4	2	Parity error (external input/output signal)	External program I/O signal data is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2034	4	2	Parity error (communication parameter)	Communication parameter data is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2035	4	2	Data error (external input/output signal)	(A) Data bank file does not exist. (B) Data bank version of the file is obsolete. (C) Data structure is damaged.	(A) Create a new file. (B) Edit the relevant data bank and save. (C) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program
NC2036	4	2	Data error (communication parameter)	(A) Data bank file does not exist. (B) Data bank version of the file is obsolete. (C) Data structure is damaged.	(A) Create a new file. (B) Edit the relevant data bank and save. (C) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program
NC2037	4	2	Check sum error (machine data 5)	Machine data 5 is damaged.	Enter machine data 5.
NC2038	4	2	Check sum error (SYSD89)	Machine data 11 (SYSD89) is destroyed.	Enter machine data 11 (SYSD89).
NC2039	4	2	Parity error (G/M code macro parameter)	G/M code macro parameter is corrupt.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2040	4	2	Data error (G/M code macro parameter)	(A) Data bank version of the file is obsolete. (B) Data structure is damaged.	(A) Edit the relevant data bank and save. (B) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program
NC2041	4	2	Parity error (Special setting)	The special setting data is corrupt.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2042	4	2	Data error (Special setting)	(A) Data bank version of the file is obsolete. (B) Data structure is damaged.	(A) Edit the relevant data bank and save. (B) Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC2043	4	2	Parity error (Field network parameter)	Field network parameter is corrupt.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2044	4	2	Data error (Field network parameter)	(A) Data bank file for the current plane does not exist. (B) Data bank version for the file of current plane is old. (C)Data structure is damaged.	(A) Enable another plane, or edit the data again and create a new file. (B) Edit the relevant data bank and save. (C)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again.
NC2045	4	2	Parity error (Machining load monitor)	Machining load monitor data is corrupt.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC2046	4	2	Data error (Machining load monitor)	(A)Data bank version of the file is obsolete. (B)Data structure is damaged.	(A)Edit the relevant data bank and save. (B)Press the **[RST]** key, and then press the **[EDIT]** key to display the <Directory display> screen. Delete the corrupt data, and create a new program.
NC5500	2	2	Scheduled replacement of relocat. detect. device batteries	It is time to change the batteries on the relocation detection device.	1. Leave the power switch turned ON, and remove all the batteries from the relocation detection device. 2. Check if the alarm <<Change batteries on relocat. detect. device with power ON>> triggers. 3. Install new batteries for the relocation detection device. 4. Press the **[RST]** key and check if the alarm <<Change batteries on relocat. detect. device with power ON>> resets.
NC7000	1	2	Check sum error (SYSD89)	Machine data 11 (SYSD89) is destroyed.	Contact the nearest BROTHER approved service dealer.
NC7001	1	2	Relocation was detected	The relocation detection device detected that the machine has been relocated.	Check the request code and contact the sales dealer.
NC7002	1	2	Change batteries on relocat. detect. device with power ON	001)The battery voltage dropped on the relocation detection device.	001)While the power switch is turned ON, replace all the batteries in the battery compartment (GB3) on the side of the control box. Note that turning OFF the power switch may activate the relocation detection.
				002)Release code was entered while the battery voltage was low on the relocation detection device.	002)While the power switch is turned ON, replace all the batteries in the battery compartment (GB3) on the side of the control box.
NC7003	1	2	Reset the relocation detection status	The extension granted for the relocation detection status has ended.	Check the request code and contact the sales dealer.
NC7004	1	2	The input operation for the release code is locked	An invalid or incorrect release code has been input repeatedly exceeding the number of allowable attempts.	Check the request code and contact the sales dealer.

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC7005	1	2	System monitor M4(*)		
NC7006	1	2	Relocation detection device was not reset	An attempt was made to update the firmware version even though the relocation detection device was not reset.	Reset (initialize) the relocation detection device.
NC7500	1	1	Check sum error	Data structure is destroyed.	Contact the nearest BROTHER approved service dealer.
NC7501	1	1	Parity error	Data structure is destroyed.	Contact the nearest BROTHER approved service dealer.
NC7502	1	1	Parity error (tool list)	The tool list data is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC7503	1	1	Parity error (cutting condition)	The cutting condition data is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC7504	1	1	Parity error (program)	The program is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC7505	1	1	Data error (data bank)	Data structure in a data bank that is not selected is damaged.	Press the **[EDIT]** key to display the <Directory display> screen. Delete the damaged data, and create new data.
NC7506	1	1	Data error (tool list)	The tool list data structure is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC7507	1	1	Data error (cutting condition)	The cutting condition data structure is damaged.	(a)Press the **[RST]** key, and delete the destroyed data by memory display in edit mode and create new data again. (b)Replace NC PCB. (c)Replace CFast.
NC7508	1	1	Edit error 1	The data was damaged during editing when converting a conversation program to an NC program.	(a)Replace NC PCB. (b)Replace CFast.
NC7509	1	1	Open error (program)	Operation program cannot be analyzed when converting a conversation program to an NC program.	(a)Replace NC PCB. (b)Replace CFast.
NC7510	1	1	Open error (cutting condition)	Cutting conditions used for operation cannot be referred to when converting a conversation program to an NC program.	(a)Replace NC PCB. (b)Replace CFast.
NC7511	1	1	System monitor M3(*)		
NC7512	1	1	System monitor L3(*)		

No.	Stop level	Reset level	Alarm message	Cause	Solution
NC7513	1	1	Release code is invalid	The release code is not correct or invalid.	(a) Make sure that the release code is correct. (b) The request code may have been updated. (c)Make sure that the request code is the same as the code provided to the sales dealer.
NC7514	1	1	Release code expired	The release code has expired.	Check the request code and contact the sales dealer.
NC7515	1	1	CFast connection error	CFast was not connected when the power was turned ON.	Check CFast connections.
NC7516	1	1	Local start error	The local CPU was not started when the power was turned ON.	Replace CFast.

2.13.5 IO

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0000	5	3	Power is turned off.	(A)The power switch was turned off. (B)Or the automatic power off time has elapsed.	(a)Although this alarm is displayed at the moment when the power is turned off, it does not indicate abnormality. (b)If the alarm triggers when the power is ON, contact the nearest Brother approved service dealer.
IO0001	5	3	AC power low	(A)AC input power is less than the acceptable voltage. (B)AC input power dropped instantaneously.	(A)Check the power-supply voltage. - For 400 V region Change the tap connection of transformer 1. Check the voltage source capacity. Check the length and diameter of the power cable. - For 200 V region Check the voltage source capacity. Check the length and diameter of the power cable. (B)Check for momentary power failure on the plant-side power supply.
IO0002	5	3	24VDC power supply error(IO)	(A)There is an overload on the 24 V power supply for TA1. (B)There is a short- circuit/ ground fault on the 24 V power supply for TA1. (C)There is a short- circuit/ ground fault on the 24 V power supply for the IO PCB. (D)There is an IO PCB error.	(A)Reduce the load for the added connection on the 24 V power supply. (B)Follow one of the procedures below. (a)Check for a short- circuit between the 24 V and 0 V, or between the 24 V and the ground. (b)Identify the short by disconnecting the connections sequentially and remove the cause of the problem. (C)Check the following wiring connections. XIOKEY pin3,XACCH pin9 (D)Replace the IO PCB.
IO0003	5	3	AC power phase sequence error	The three- phase power supply's phases are reversed.	Check the primary side connection of the main breaker for the power input. (safe or preventive action) Phases for wiring inside the machine are fixed. Do not change the positions of cords.
IO0005	5	3	The 12-V DC power is overcurrent. (1) (*)	(A)Overcurrent occurred in the KEY PCB. There is a 12 V power short-circuit on the KEY PCB. (B)There is a KEY PCB error.	(A)The signal which caused the alarm is indicated in brackets ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). KEY:XDOOR,XOP,XMOV (KEY PCB ASSY C00#4),XFOV (KEY PCB ASSY C00#4),XKSW,XSPOV (KEY PCB ASSY C00#4),XAB (B)Replace the KEY PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0006	5	3	The 12-V DC power is overcurrent. (2) (*)	(A)Overcurrent occurred in the KEY PCB. There is a 12 V power short-circuit on the KEY PCB. (B)There is a KEY PCB error.	(A)The signal which caused the alarm is indicated in brackets ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). KEY:All of the following points KY_STA_LD :XKSW KY_STP_LD :XKSW KY_OSTA_LD :XQT KY_OUT1_LD :XAB KY_OUT2_LD :XAB (B)Replace the KEY PCB.
IO0007	5	3	The 12-V DC power is overcurrent. (3) (*)	-	-
IO0008	5	3	The 24-V is DC power overcurrent. (1) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). The number inside the quotation marks (" ") is shown in the silkscreen marking on the PCB. IO_LIGHT: XTPW "LT24" IO_HLIGHT: XTQTLT "QTLT24" (B)Replace the IO PCB.
IO0009	5	3	The 24-V DC power is overcurrent. (2) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). The number inside the quotation marks (" ") is shown in the silkscreen marking on the PCB. IO: XTIO_A "19", XTIO24 IO_STOUT: XTIO_B "6","8" IO_EXSTOUT: XTIO_B "10","12" IO_XTO100: XTO "100" IO_XTO101: XTO "101" IO_XTO102: XTO "102" IO_XTO103: XTO "103" IO_XTO104: XTO "104" IO_XTO105: XTO "105" IO_XTO106: XTO "106" IO_XTO107: XTO "107" IO_XTO108: XTO "108" IO_XTO109: XTO "109" IO_XTO110: XTO "110" IO_XTO111: XTO "111" IO_XTO112: XTO "112" IO_XTO113: XTO "113" IO_XTO114: XTO "114" IO_XTO115: XTO "115" (B)Replace the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0010	5	3	The 24-V DC power is overcurrent. (3) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO : XBPCT pin1, XCOC pin4, XCHIP pin2, XCTS1 pin4,8, XCPRO pin1,4,8, XCTS2 pin8,10,14,16,18 IO_CYCVON : XQVD pin1 IO_CO_FW : XCOC pin1 IO_CO_RE : XCOC pin3 IO_CHPCON : XCHIP pin6 IO_CHIPPMP : XCPRO pin10 IO_CTSVON : XCTS2 pin1 IO_CTSBWVON : XCTS2 pin3 IO_CTSDVON : XCTS2 pin5 IO_VSUPON : XCTS2 pin11 (B)Replace the IO PCB.
IO0011	5	3	The 24-V DC power is overcurrent. (4) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XBGU4 pin1,XBPAU pin1, XSLTC pin1,XBPA pin1 IO_Q7VON: XQVU7 pin1 IO_TAVON: XQVA pin1 IO_CVON_M08: XQVC pin1 IO_JIGSHW: XQVJS pin1 IO_QTUNCV_N: XQVU4 pin1 IO_Q5VON: XQVU5 pin1 IO_TBVON: XQVB pin1 IO_TCON: XQVTC pin1 (B)Replace the IO PCB.
IO0012	5	3	The 24-V DC power is overcurrent. (5) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). The number inside the quotation marks (" ") is shown in the silkscreen marking on the PCB. IO: XADR pin2,11,XTIO_A "15","17" IO_DROV: XADR pin7 IO_DRCV: XADR pin10 IO_DRAL_RST: XADR pin9 IO_CTSPMPON: XCTS1 pin2 IO_CTSCYCON: XCTS1 pin6 IO_COLPMP: XCPRO pin6 (B)Replace the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0013	5	3	The 24-V DC power is overcurrent. (6) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XLUB pin1 IO_OILPMP: XLUB pin2 (B)Replace the IO PCB.
IO0014	5	3	The 24-V DC power is overcurrent. (7) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XMAG2 pin6,8,9,11,18,20 IO_POTDWNV: XMAG1 pin2 IO_POTUPV: XMAG1 pin4 IO_POTOPNV: XMAG2 pin1 IO_POTCLSEV: XMAG2 pin3 IO_ATCASOV: XMAG2 pin13 IO_ATCASCV: XMAG2 pin15 (B)Replace the IO PCB.
IO0015	5	3	The 24-V DC power is overcurrent. (8) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XKFS1 pin4,XKFS2 pin4 IO_KSON: XKFS1 pin2,XKFS2 pin2 (B)Replace the IO PCB.
IO0016	5	3	The 24-V is DC power overcurrent. (9) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XMGSW pin1,XPAT pin5 IO_GRN: XPAT pin1 IO_YEL: XPAT pin2 IO_RED: XPAT pin3 (B)Replace the IO PCB.
IO0017	5	3	The 24-V is DC power overcurrent. (10) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XSPKF pin1 IO_SPFON: XSPKF pin2 (B)Replace the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0018	5	3	The 24-V is DC power overcurrent. (11) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO_FAN1ON: XFAN pin1 IO_FAN2ON: XFAN pin4 IO_FAN3ON: XFAN pin7 IO_FAN4ON: XFAN pin10 (B)Replace the IO PCB.
IO0019	5	3	The 24-V is DC power overcurrent. (12) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XWI24 pin1,XSUB2 pin2,4 XSUB1 pin2,4,6,8 IO_SPOUT1: XSUB1 pin9 IO_SPOUT2: XSUB1 pin11 IO_SPOUT3: XSUB1 pin13 IO_SPOUT4: XSUB1 pin15 IO_SPOUT5: XSUB2 pin5 IO_SPOUT6: XSUB2 pin7 IO_SPOUT7: XSUB3 pin5,6 IO_SPOUT8: XSUB3 pin7,8 (B)Replace the IO PCB.
IO0020	5	3	The 24-V is DC power overcurrent. (13) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XIOSR pin13,14 (B)Replace the IO PCB.
IO0021	5	3	The 24-V is DC power overcurrent. (14) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XIOSR pin9 (B)Replace the IO PCB.
IO0022	5	3	The 24-V is DC power overcurrent. (15) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XPTP pin1 (B)Replace the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0023	5	3	The 24-V is DC power overcurrent. (16) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XEX24_1 pin1,XEX24_2 pin1 (B)Replace the IO PCB.
IO0024	5	3	The 24-V is DC power overcurrent. (17) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). The number inside the quotation marks (" ") is shown in the silkscreen marking on the PCB. IO: XTIO_A "1","3" (B)Replace the IO PCB.
IO0025	5	3	The 24-V is DC power overcurrent. (18) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XKFC1 pin1 (B)Replace the IO PCB.
IO0026	5	3	The 24-V DC power is abnormal. (EXIO01)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0027	5	3	The 24-V DC power is abnormal. (EXIO02)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0028	5	3	The 24-V DC power is abnormal. (EXIO03)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0029	5	3	The 24-V DC power is abnormal. (EXIO04)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0030	5	3	The 24-V DC power is abnormal. (EXIO05)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0031	5	3	The 24-V DC power is abnormal. (EXIO06)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0032	5	3	The 24-V DC power is abnormal. (EXIO07)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0033	5	3	The 24-V DC power is abnormal. (EXIO08)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0034	5	3	The 24-V DC power is abnormal. (EXIO09)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0035	5	3	The 24-V DC power is abnormal. (EXIO10)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0036	5	3	The 24-V DC power is abnormal. (EXIO11)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0037	5	3	The 24-V DC power is abnormal. (EXIO12)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0038	5	3	The 24-V DC power is abnormal. (EXIO13)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0039	5	3	The 24-V DC power is abnormal. (EXIO14)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0040	5	3	The 24-V DC power is abnormal. (EXIO15)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0041	5	3	The 24-V DC power is abnormal. (EXIO16)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0042	5	3	The 24-V DC power is abnormal. (EXIO17)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0043	5	3	The 24-V DC power is abnormal. (EXIO18)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0044	5	3	The 24-V DC power is abnormal. (EXIO19)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0045	5	3	The 24-V DC power is abnormal. (EXIO20)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0046	5	3	The 24-V DC power is abnormal. (EXIO21)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0047	5	3	The 24-V DC power is abnormal. (EXIO22)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0048	5	3	The 24-V DC power is abnormal. (EXIO23)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0049	5	3	The 24-V DC power is abnormal. (EXIO24)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0050	5	3	The 24-V DC power is abnormal. (EXIO25)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0051	5	3	The 24-V DC power is abnormal. (EXIO26)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0052	5	3	The 24-V DC power is abnormal. (EXIO27)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0053	5	3	The 24-V DC power is abnormal. (EXIO28)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0054	5	3	The 24-V DC power is abnormal. (EXIO29)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0055	5	3	The 24-V DC power is abnormal. (EXIO30)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0056	5	3	The 24-V DC power is abnormal. (EXIO31)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0057	5	3	The 24-V DC power is abnormal. (EXIO32)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0058	5	3	The 24-V DC power is abnormal. (EXIO33)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0059	5	3	The 24-V DC power is abnormal. (EXIO34)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0060	5	3	The 24-V DC power is abnormal. (EXIO35)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0061	5	3	The 24-V DC power is abnormal. (EXIO36)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0062	5	3	The 24-V DC power is abnormal. (EXIO37)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0063	5	3	The 24-V DC power is abnormal. (EXIO38)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0064	5	3	The 24-V DC power is abnormal. (EXIO39)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0065	5	3	The 24-V DC power is abnormal. (EXIO40)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0066	5	3	The 24-V DC power is abnormal. (EXIO41)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0067	5	3	The 24-V DC power is abnormal. (EXIO42)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0068	5	3	The 24-V DC power is abnormal. (EXIO43)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0069	5	3	The 24-V DC power is abnormal. (EXIO44)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0070	5	3	The 24-V DC power is abnormal. (EXIO45)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0071	5	3	The 24-V DC power is abnormal. (EXIO46)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0072	5	3	The 24-V DC power is abnormal. (EXIO47)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0073	5	3	The 24-V DC power is abnormal. (EXIO48)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0074	5	3	The 24-V DC power is abnormal. (EXIO49)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0075	5	3	The 24-V DC power is abnormal. (EXIO50)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0076	5	3	The 24-V DC power is abnormal. (EXIO51)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0077	5	3	The 24-V DC power is abnormal. (EXIO52)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0078	5	3	The 24-V DC power is abnormal. (EXIO53)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0079	5	3	The 24-V DC power is abnormal. (EXIO54)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0080	5	3	The 24-V DC power is abnormal. (EXIO55)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0081	5	3	The 24-V DC power is abnormal. (EXIO56)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0082	5	3	The 24-V DC power is abnormal. (EXIO57)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0083	5	3	The 24-V DC power is abnormal. (EXIO58)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0084	5	3	The 24-V DC power is abnormal. (EXIO59)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0085	5	3	The 24-V DC power is abnormal. (EXIO60)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0086	5	3	The 24-V DC power is abnormal. (EXIO61)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0087	5	3	The 24-V DC power is abnormal. (EXIO62)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0088	5	3	The 24-V DC power is abnormal. (EXIO63)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0089	5	3	The 24-V DC power is abnormal. (EXIO64)	(A)The 24 V power for the general input and output on the EXIO PCB has dropped. (B)There is a short- circuit/ ground fault on the 24 V power supply for the EXIO PCB. (C)There is an EXIO PCB error.	(A)Check the following. When using an internal power supply: Make sure that there is a short cable connected to pin 2-3 for XTEXPW. When using an external power supply: Check the output and wiring of the external power supply. (B)Check the following wiring connections. XPWEX1, XPWEX2 (C)Replace the EXIO PCB.
IO0090	5	3	The 24-V DC power is overcurrent. (1) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal which caused the alarm is indicated in brackets ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). The number inside the quotation marks (" ") is shown in the silkscreen marking on the PCB. IO_LIGHT: XTPW "LT24" IO_HLIGHT: XTQTLT "QTLT24" (B)Replace the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0091	5	3	The 24-V DC power is overcurrent. (2) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal which caused the alarm is indicated in brackets ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). The number inside the quotation marks (" ") is shown in the silkscreen marking on the PCB. IO: XTIO_A "19", XTIO24 IO_STOUT: XTIO_B "6","8" IO_EXSTOUT: XTIO_B "10","12" IO_XTO100: XTO "100" IO_XTO101: XTO "101" IO_XTO102: XTO "102" IO_XTO103: XTO "103" IO_XTO104: XTO "104" IO_XTO105: XTO "105" IO_XTO106: XTO "106" IO_XTO107: XTO "107" IO_XTO108: XTO "108" IO_XTO109: XTO "109" IO_XTO110: XTO "110" IO_XTO111: XTO "111" IO_XTO112: XTO "112" IO_XTO113: XTO "113" IO_XTO114: XTO "114" IO_XTO115: XTO "115" (B)Replace the IO PCB.
IO0092	5	3	The 24-V DC power is overcurrent. (3) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal which caused the alarm is indicated in brackets ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XBPCT pin1,XCOC pin4, XCHIP pin2,XCTS1 pin4,8, XCPRO pin1,4,8, XCTS2 pin8,10,14,16,18 IO_CYCVON: XQVD pin1 IO_CO_FW: XCOC pin1 IO_CO_RE: XCOC pin3 IO_CHPCON: XCHIP pin6 IO_CTSPMPON: XCTS1 pin2 IO_CTSCYCON: XCTS1 pin6 IO_COLPMP: XCPRO pin6 IO_CHIPPMP: XCPRO pin10 IO_CTSVON: XCTS2 pin1 IO_CTSBWVON: XCTS2 pin3 IO_CTSDVON: XCTS2 pin5 IO_VSUPON: XCTS2 pin11 (B)Replace the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0093	5	3	The 24-V DC power is overcurrent. (4) (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply for the IO PCB. (B)There is an IO PCB error.	(A)The signal which caused the alarm is indicated in brackets ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). IO: XBGU4 pin1,XBPAU pin1, XSLTC pin1,XBPA pin1 IO_Q7VON: XQVU7 pin1 IO_TAVON: XQVA pin1 IO_CVON_M08: XQVC pin1 IO_JIGSHW: XQVJS pin1 IO_QTUNCV_N: XQVU4 pin1 IO_Q5VON: XQVU5 pin1 IO_TBVON: XQVB pin1 IO_TCON: XQVTC pin1 (B)Replace the IO PCB.
IO0094	5	3	AC power not detected	AC input power cannot be detected.	Make sure that the cable is connected to the XACCH connector on the IO PCB.
IO0095	5	3	AC power overvoltage	AC input power exceeded the acceptable voltage.	Check the power-supply voltage. For 400 V region, check that the voltage tap of transformer 1 is connected correctly.
IO0096	5	3	IL PCB unit not connected	IL PCB unit is not connected.	Follow one of the procedures below. (a)Turn OFF the breaker and make sure that the LED on the PCB is turned off. Next, check the XIOSR wiring that connects between the IO and the SR PCBs, and make sure that everything is normal and that there is no disconnected connector, line disconnection or incorrect wiring. (b)SR PCB may not be set correctly in place. Fit and secure it correctly on the IL PCB unit. (c)IO PCB, SR PCB or IL PCB unit may be faulty if the alarm will not reset when the wiring or the SR PCB installation is normal. Replace the IO PCB, the SR PCB or the IL PCB unit assembly.
IO0097	5	3	IO PCB not connected	The IO PCB is not connected.	Follow one of the procedures below. (a)Turn OFF the breaker and make sure that the LED on the IO PCB is turned off. Next, check the wiring between AVR and IO PCBs and the wiring for the "XAVR" connector. Also, check the LAN connection between the NC PCB and IO PCB and the wiring for the "XIOIN" connector. Make sure that everything is normal and that there is no disconnected connector, faulty connection or incorrect wiring. (b)The IO PCB or the IL PCB may be damaged if the alarm will not reset even when the wiring is normal.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0098	5	3	EDM signal not checked 1	There is an EDM1 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO1 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO1, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.
IO0099	5	3	EDM signal not checked 2	There is an EDM2 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO2 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO2, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0100	5	3	EDM signal not checked 3	There is an EDM3 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO3 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO3, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.
IO0101	5	3	EDM signal not checked 4	There is an EDM4 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO4 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO4, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0102	5	3	EDM signal not checked 5	There is an EDM5 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO5 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO5, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.
IO0103	5	3	EDM signal not checked 6	There is an EDM6 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO6 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO6, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0104	5	3	EDM signal not checked 7	There is an EDM7 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO7 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO7, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.
IO0105	5	3	EDM signal not checked 8	There is an EDM8 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO8 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO8, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0106	5	3	EDM signal not checked 9	There is an EDM9 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO9 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO9, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.
IO0107	5	3	EDM signal not checked 10	There is an EDM10 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO10 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO10, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0108	5	3	EDM signal not checked 11	There is an EDM11 signal error. The alarm <<Emergency button activated (EMS*)>> or <<Door open>> may also be triggered at the same time.	Follow one of the procedures below. (a)Check the wiring that connects from the XSTO11 connector on the SR PCB to the motor amplifier or to the motor relay. Make sure that everything is normal and that there is no faulty connection or incorrect wiring. (b)Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that everything is normal and that the wires are not reversed. (c)If there is a loop wire for XSTO11, check the connection and fix any problems to ensure everything is normal. (d)If the instructions in (a) to (c) do not return operation to normal, then the IL PCB unit or amplifier may be damaged. Replace the IL PCB unit or amplifier.
IO0109	5	3	Machine model setting error 1	(A)Connection is faulty or poor on the XTSEL short connector for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Make sure that the short cord (connected to the XTSEL connector on the IL PCB unit) is fitted correctly, and that it is not disconnected, damaged or dirty. If there is a problem, fix it accordingly. (B)Replace the IL PCB unit.
IO0110	5	3	Machine model setting error 2	(A)IL PCB unit signal and the internal NC information do not match. (B)IL PCB unit is faulty.	(A)If the NC PCB has been replaced and there is an internal data bank change, check the data setting. (B)Replace the IL PCB unit.
IO0111	5	3	Machine model setting error 3	(A)The connection is faulty or poor on the short connector that connects to XMSEL on the IO PCB. (B)The IO PCB is defective. (C)IL PCB unit is faulty.	(A)Make sure that there is no problem with the connection between the IO PCB and the MSEL short connector. If there is a problem, fix it accordingly. Or, replace the MSEL short connector with a proper one. (B)Replace the IO PCB. (C)Replace the IL PCB unit.
IO0112	5	3	DC power GND overcurrent 1 (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply GND for the IO PCB. (B)There is an IO PCB error.	(A)The signal which caused the alarm is indicated in brackets ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). The number inside the quotation marks (" ") is shown in the silkscreen marking on the PCB. IO_XTO100: XTO "100" IO_XTO101: XTO "101" IO_XTO102: XTO "102" IO_XTO103: XTO "103" IO_XTO104: XTO "104" IO_XTO105: XTO "105" IO_XTO106: XTO "106" IO_XTO107: XTO "107" (B)Replace the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0113	5	3	DC power GND overcurrent 2 (*)	(A)Overcurrent occurred in the IO PCB. There is a short-circuit or overload on the 24 V power supply GND for the IO PCB. (B)There is an IO PCB error.	(A)The signal which caused the alarm is indicated in brackets ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). The number inside the quotation marks (" ") is shown in the silkscreen marking on the PCB. IO_XTO108: XTO "108" IO_XTO109: XTO "109" IO_XTO110: XTO "110" IO_XTO111: XTO "111" IO_XTO112: XTO "112" IO_XTO113: XTO "113" IO_XTO114: XTO "114" IO_XTO115: XTO "115" (B)Replace the IO PCB.
IO0114	5	3	Spare alarm 1	The software version may be old.	Update the software to the latest version.
IO0115	5	3	IO-IL communication error (CRC)	There is a communication fault between the IO PCB and IL PCB unit.	Follow one of the procedures below. (a)Check the connection with the XIOSR connector on the SR PCB. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, power not connected, etc. (b)Replace the IL PCB unit. (c)Replace the IO PCB.
IO0116	5	3	IO-IL communication error (timestamp)	There is a communication fault between the IO PCB and IL PCB unit.	Follow one of the procedures below. (a)Check the connection with the XIOSR connector on the SR PCB. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, power not connected, etc. (b)Replace the IL PCB unit. (c)Replace the IO PCB.
IO0117	5	3	IO-SR communication error (watchdog)	There is a communication fault between the IO PCB and SR PCB.	Follow one of the procedures below. (a)Check the connection with the XIOSR connector on the SR PCB. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, power not connected, etc. (b)Replace the SR PCB. (c)Replace the IO PCB.
IO0118	5	3	Brake overcurrent 1 (SR)	(A)An overcurrent occurred on brake 1 for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XBKO1 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, etc. (B)Replace the SR PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0119	5	3	Brake overcurrent 2 (SR)	(A)An overcurrent occurred on brake 2 for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XBKO2 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, etc. (B)Replace the SR PCB.
IO0120	5	3	Brake overcurrent 3 (SR)	(A)An overcurrent occurred on brake 3 for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XBKO3 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, etc. (B)Replace the SR PCB.
IO0121	5	3	Brake overcurrent 4 (SR)	(A)An overcurrent occurred on brake 4 for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XBKO4 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, etc. (B)Replace the SR PCB.
IO0122	5	3	Brake overcurrent 5 (SR)	(A)An overcurrent occurred on brake 5 for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XBKO5 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, etc. (B)Replace the SR PCB.
IO0123	5	3	IL 24 V overcurrent 1 (low voltage 1)	(A)Overcurrent occurred on the IL24V1 for the IL PCB unit. IL PCB unit is faulty. (B)Voltage drop occurred on the IL24V1 for the IL PCB unit.	Follow one of the procedures below. (a)Check the XIOSR connection between the IO PCB and the SR PCB. (b)Replace the TA1 (power unit 1) power supply. (c)Replace the IL PCB unit. (d)Replace the SR PCB.
IO0124	5	3	IL 24 V overcurrent 2 (GOFF1)	(A)Overcurrent occurred on the GOFF1 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO1 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.
IO0125	5	3	IL 24 V overcurrent 2 (GOFF2)	(A)Overcurrent occurred on the GOFF2 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO2 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.
IO0126	5	3	IL 24 V overcurrent 2 (GOFF3)	(A)Overcurrent occurred on the GOFF3 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO3 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0127	5	3	IL 24 V overcurrent 2 (GOFF4)	(A)Overcurrent occurred on the GOFF4 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO4 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.
IO0128	5	3	IL 24 V overcurrent 2 (GOFF5)	(A)Overcurrent occurred on the GOFF5 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO5 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.
IO0129	5	3	IL 24 V overcurrent 2 (GOFF6)	(A)Overcurrent occurred on the GOFF6 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO6 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.
IO0130	5	3	IL 24 V overcurrent 2 (GOFF7)	(A)Overcurrent occurred on the GOFF7 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO7 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.
IO0131	5	3	IL 24 V overcurrent 2 (GOFF8)	(A)Overcurrent occurred on the GOFF8 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO8 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.
IO0132	5	3	IL 24 V overcurrent 2 (GOFF9)	(A)Overcurrent occurred on the GOFF9 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO9 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.
IO0133	5	3	IL 24 V overcurrent 2 (GOFF10)	(A)Overcurrent occurred on the GOFF10 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO10 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB assembly.
IO0134	5	3	IL 24 V overcurrent 2 (GOFF11)	(A)Overcurrent occurred on the GOFF11 system for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XSTO11 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0135	5	3	IL 24 V overcurrent 2 (emergency stop output)	Overcurrent occurred on the emergency stop power for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit.	Replace the IL PCB unit.
IO0136	5	3	IL 24 V overcurrent 3	Overcurrent occurred on the emergency stop power for the IL PCB unit. There is a short-circuit on the 24 V power for the IL PCB unit.	Replace the IL PCB unit.
IO0137	5	3	Door lock power overcurrent system 1 (DR1)	(A)An overcurrent occurred on door lock operation circuit (DR1) for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XDR1 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, wrong wiring, sheath damage to the wire, etc. (B)Replace the SR PCB.
IO0138	5	3	Door lock power overcurrent system 1 (DR3)	(A)An overcurrent occurred on door lock operation circuit (DR3) for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XDR3 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, wrong wiring, sheath damage to the wire, etc. (B)Replace the SR PCB.
IO0139	5	3	Door lock power overcurrent system 1 (DR4)	(A)An overcurrent occurred on door lock operation circuit (DR4) for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XDR4 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, wrong wiring, sheath damage to the wire, etc. (B)Replace the SR PCB.
IO0140	5	3	Door lock power overcurrent system 1 (DRMG)	(A)An overcurrent occurred on door lock operation circuit (DRMG) for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XDRMG short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, wrong wiring, sheath damage to the wire, etc. (B)Replace the SR PCB.
IO0141	5	3	Door lock power overcurrent system 2 (DR2)	(A)An overcurrent occurred on door lock operation circuit (DR2) for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XDR2 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, wrong wiring, sheath damage to the wire, etc. (B)Replace the SR PCB.
IO0142	5	3	Door lock power overcurrent system 2 (DR7)	(A)An overcurrent occurred on door lock operation circuit (DR7) for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XDR7 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, wrong wiring, sheath damage to the wire, etc. (B)Replace the SR PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0143	5	3	Door lock power overcurrent system 2 (DR8)	(A)An overcurrent occurred on door lock operation circuit (DR8) for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XDR8 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, wrong wiring, sheath damage to the wire, etc. (B)Replace the SR PCB.
IO0144	5	3	Door lock power overcurrent system 2 (DR5)	(A)An overcurrent occurred on door lock operation circuit (DR5) for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XDR5 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, wrong wiring, sheath damage to the wire, etc. (B)Replace the SR PCB.
IO0145	5	3	Door lock power overcurrent system 2 (DR6)	(A)An overcurrent occurred on door lock operation circuit (DR6) for the SR PCB. (B)The SR PCB is faulty.	(A)Fix the problem that is causing the XDR6 short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, wrong wiring, sheath damage to the wire, etc. (B)Replace the SR PCB.
IO0146	5	3	IL output error 1 (GOFF1)	An error occurred in the GOFF1 system. Potential causes are noted below: - Connection is faulty on XSTO1 connector - XSTO1 wiring connection is faulty - XSTO1 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO1 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit E / line 096 bit 9 on the output screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO1 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO1 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0147	5	3	IL output error 2 (GOFF1)	An error occurred in the GOFF1 system. Potential causes are noted below: - Connection is faulty on XSTO1 connector - XSTO1 wiring connection is faulty - XSTO1 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO1 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit E / line 096 bit 9 on the output screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO1 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO1 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0148	5	3	IL output error 3 (GOFF1)	An error occurred in the GOFF1 system. Potential causes are noted below: - Connection is faulty on XSTO1 connector - XSTO1 wiring connection is faulty - XSTO1 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO1 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit E / line 096 bit 9 on the output screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO1 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO1 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0149	5	3	IL output error 1 (GOFF2)	An error occurred in the GOFF2 system. Potential causes are noted below: - Connection is faulty on XSTO2 connector - XSTO2 wiring connection is faulty - XSTO2 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO2 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit D / line 096 bit 8 on the output screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO2 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO2 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0150	5	3	IL output error 2 (GOFF2)	An error occurred in the GOFF2 system. Potential causes are noted below: - Connection is faulty on XSTO2 connector - XSTO2 wiring connection is faulty - XSTO2 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO2 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit D / line 096 bit 8 on the output screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO2 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO2 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0151	5	3	IL output error 3 (GOFF2)	An error occurred in the GOFF2 system. Potential causes are noted below: - Connection is faulty on XSTO2 connector - XSTO2 wiring connection is faulty - XSTO2 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO2 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit D / line 096 bit 8 on the output screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO2 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO2 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0152	5	3	IL output error 1 (GOFF3)	An error occurred in the GOFF3 system. Potential causes are noted below: - Connection is faulty on XSTO3 connector - XSTO3 wiring connection is faulty - XSTO3 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO3 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit C / line 096 bit 7 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO3 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO3 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0153	5	3	IL output error 2 (GOFF3)	An error occurred in the GOFF3 system. Potential causes are noted below: - Connection is faulty on XSTO3 connector - XSTO3 wiring connection is faulty - XSTO3 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO3 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit C / line 096 bit 7 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO3 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO3 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0154	5	3	IL output error 3 (GOFF3)	An error occurred in the GOFF3 system. Potential causes are noted below: - Connection is faulty on XSTO3 connector - XSTO3 wiring connection is faulty - XSTO3 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO3 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit C / line 096 bit 7 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO3 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO3 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0155	5	3	IL output error 1 (GOFF4)	An error occurred in the GOFF4 system. Potential causes are noted below: - Connection is faulty on XSTO4 connector - XSTO4 wiring connection is faulty - XSTO4 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO4 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit B / line 096 bit 6 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO4 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO4 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0156	5	3	IL output error 2 (GOFF4)	An error occurred in the GOFF4 system. Potential causes are noted below: - Connection is faulty on XSTO4 connector - XSTO4 wiring connection is faulty - XSTO4 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO4 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit B / line 096 bit 6 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO4 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO4 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0157	5	3	IL output error 3 (GOFF4)	An error occurred in the GOFF4 system. Potential causes are noted below: - Connection is faulty on XSTO4 connector - XSTO4 wiring connection is faulty - XSTO4 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO4 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit B / line 096 bit 6 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO4 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO4 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0158	5	3	IL output error 1 (GOFF5)	An error occurred in the GOFF5 system. Potential causes are noted below: - Connection is faulty on XSTO5 connector - XSTO5 wiring connection is faulty - XSTO5 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO5 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit A / line 096 bit 5 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO5 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO5 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0159	5	3	IL output error 2 (GOFF5)	An error occurred in the GOFF5 system. Potential causes are noted below: - Connection is faulty on XSTO5 connector - XSTO5 wiring connection is faulty - XSTO5 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO5 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit A / line 096 bit 5 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO5 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO5 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0160	5	3	IL output error 3 (GOFF5)	An error occurred in the GOFF5 system. Potential causes are noted below: - Connection is faulty on XSTO5 connector - XSTO5 wiring connection is faulty - XSTO5 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO5 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit A / line 096 bit 5 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO5 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO5 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0161	5	3	IL output error 1 (GOFF6)	An error occurred in the GOFF6 system. Potential causes are noted below: - Connection is faulty on XSTO6 connector - XSTO6 wiring connection is faulty - XSTO6 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO6 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 9 / line 096 bit 4 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO6 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO6 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0162	5	3	IL output error 2 (GOFF6)	An error occurred in the GOFF6 system. Potential causes are noted below: - Connection is faulty on XSTO6 connector - XSTO6 wiring connection is faulty - XSTO6 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO6 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 9 / line 096 bit 4 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO6 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO6 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0163	5	3	IL output error 3 (GOFF6)	An error occurred in the GOFF6 system. Potential causes are noted below: - Connection is faulty on XSTO6 connector - XSTO6 wiring connection is faulty - XSTO6 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO6 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 9 / line 096 bit 4 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO6 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO6 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0164	5	3	IL output error 1 (GOFF7)	An error occurred in the GOFF7 system. Potential causes are noted below: - Connection is faulty on XSTO7 connector - XSTO7 wiring connection is faulty - XSTO7 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO7 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 8 / line 096 bit 3 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO7 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO7 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0165	5	3	IL output error 2 (GOFF7)	An error occurred in the GOFF7 system. Potential causes are noted below: - Connection is faulty on XSTO7 connector - XSTO7 wiring connection is faulty - XSTO7 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO7 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 8 / line 096 bit 3 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO7 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO7 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0166	5	3	IL output error 3 (GOFF7)	An error occurred in the GOFF7 system. Potential causes are noted below: - Connection is faulty on XSTO7 connector - XSTO7 wiring connection is faulty - XSTO7 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO7 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 8 / line 096 bit 3 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO7 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO7 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0167	5	3	IL output error 1 (GOFF8)	An error occurred in the GOFF8 system. Potential causes are noted below: - Connection is faulty on XSTO8 connector - XSTO8 wiring connection is faulty - XSTO8 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO8 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 7 / line 096 bit 2 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO8 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO8 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0168	5	3	IL output error 2 (GOFF8)	An error occurred in the GOFF8 system. Potential causes are noted below: - Connection is faulty on XSTO8 connector - XSTO8 wiring connection is faulty - XSTO8 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO8 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 7 / line 096 bit 2 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO8 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO8 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0169	5	3	IL output error 3 (GOFF8)	An error occurred in the GOFF8 system. Potential causes are noted below: - Connection is faulty on XSTO8 connector - XSTO8 wiring connection is faulty - XSTO8 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO8 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 7 / line 096 bit 2 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO8 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO8 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0170	5	3	IL output error 1 (GOFF9)	An error occurred in the GOFF9 system. Potential causes are noted below: - Connection is faulty on XSTO9 connector - XSTO9 wiring connection is faulty - XSTO9 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO9 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 6 / line 096 bit 1 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO9 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO9 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0171	5	3	IL output error 2 (GOFF9)	An error occurred in the GOFF9 system. Potential causes are noted below: - Connection is faulty on XSTO9 connector - XSTO9 wiring connection is faulty - XSTO9 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO9 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 6 / line 096 bit 1 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO9 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO9 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0172	5	3	IL output error 3 (GOFF9)	An error occurred in the GOFF9 system. Potential causes are noted below: - Connection is faulty on XSTO9 connector - XSTO9 wiring connection is faulty - XSTO9 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO9 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 6 / line 096 bit 1 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO9 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO9 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0173	5	3	IL output error 1 (GOFF10)	An error occurred in the GOFF10 system. Potential causes are noted below: - Connection is faulty on XSTO10 connector - XSTO10 wiring connection is faulty - XSTO10 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO10 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 5 / line 096 bit 0 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO10 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO10 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0174	5	3	IL output error 2 (GOFF10)	An error occurred in the GOFF10 system. Potential causes are noted below: - Connection is faulty on XSTO10 connector - XSTO10 wiring connection is faulty - XSTO10 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO10 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 5 / line 096 bit 0 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO10 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO10 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0175	5	3	IL output error 3 (GOFF10)	An error occurred in the GOFF10 system. Potential causes are noted below: - Connection is faulty on XSTO10 connector - XSTO10 wiring connection is faulty - XSTO10 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO10 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 5 / line 096 bit 0 on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO10 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO10 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0176	5	3	IL output error 1 (GOFF11)	An error occurred in the GOFF11 system. Potential causes are noted below: - Connection is faulty on XSTO11 connector - XSTO11 wiring connection is faulty - XSTO11 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO11 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 4 / bit F on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO11 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO11 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0177	5	3	IL output error 2 (GOFF11)	An error occurred in the GOFF11 system. Potential causes are noted below: - Connection is faulty on XSTO11 connector - XSTO11 wiring connection is faulty - XSTO11 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO11 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 4 / bit F on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO11 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO11 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0178	5	3	IL output error 3 (GOFF11)	An error occurred in the GOFF11 system. Potential causes are noted below: - Connection is faulty on XSTO11 connector - XSTO11 wiring connection is faulty - XSTO11 connecting device is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Check for a faulty connection on the XSTO11 connector for the SR PCB, and re-connect properly. (b)If the input line 095 bit 4 / bit F on the I/O screen are both not “11” or “00”, then check for a disconnection or poor connection on the short cord for the XSTO11 connector on the SR PCB. If there is a problem, then replace it. (c)Check the XSTO11 connecting device, and if there is a problem, replace it. (d)Replace the SR PCB. (e)Replace the IL PCB unit.
IO0179	5	3	Emergency stop power error 1	An error occurred on the emergency stop power. IL PCB unit is faulty.	Replace the IL PCB unit.
IO0180	5	3	Emergency stop power error 2	An error occurred on the emergency stop power. IL PCB unit is faulty.	Replace the IL PCB unit.
IO0181	5	3	Emergency stop power error 3	An error occurred on the emergency stop power. IL PCB unit is faulty.	Replace the IL PCB unit.
IO0182	5	3	Emergency stop power error 4	An error occurred on the emergency stop power. IL PCB unit is faulty.	Replace the IL PCB unit.
IO0183	5	3	External emergency stop output error 1	An error occurred with the emergency stop signal reserved for the user. (A)XTEMSIN wiring connection is faulty (B)XTEMSIN connecting device is faulty (C)IL PCB unit is faulty.	(A)Check and fix the wiring connection for the XTEMSIN connector on the SR PCB. (B)Replace the device that connects to the XTEMSIN connector on the SR PCB. (C)Replace the IL PCB unit.
IO0184	5	3	External emergency stop output error 2	An error occurred with the emergency stop signal reserved for the user. (A)XTEMSIN wiring connection is faulty (B)XTEMSIN connecting device is faulty (C)IL PCB unit is faulty.	(A)Check and fix the wiring connection for the XTEMSIN connector on the SR PCB. (B)Replace the device that connects to the XTEMSIN connector on the SR PCB. (C)Replace the IL PCB unit.
IO0185	5	3	External emergency stop output error 3	An error occurred with the emergency stop signal reserved for the user. (A)XTEMSIN wiring connection is faulty (B)XTEMSIN connecting device is faulty (C)IL PCB unit is faulty.	(A)Check and fix the wiring connection for the XTEMSIN connector on the SR PCB. (B)Replace the device that connects to the XTEMSIN connector on the SR PCB. (C)Replace the IL PCB unit.
IO0186	5	3	**[MASTER ON]** alarm linked output overcurrent	(A)Overcurrent occurred on the output circuit linked to operation preparation alarms for the IL PCB unit. (B)IL PCB unit is faulty.	(A)Fix the problem that is causing the XTEMSIN short-circuit on the SR PCB, and then restart the machine. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (B)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0187	5	3	IL 24 V voltage error	(A)Overvoltage occurred on the DC 24 V power for the IL PCB unit. TA1 (power unit 1) is faulty. (B)Overvoltage occurred on the DC 24 V power for the IL PCB unit. IL PCB unit is faulty. (C)Overvoltage occurred on the DC 3.3 V power for the IL PCB unit. IL PCB unit is faulty. (D)IL PCB unit is not connected.	(A)Replace the TA1 (power unit 1) and IL PCB unit. (B)Replace the TA1 (power unit 1) and IL PCB unit. (C)Replace the IL PCB unit. (D)Check the connection on the XIOSR and XILRO connectors. Connect the IL PCB unit.
IO0188	5	3	IL_FPGA internal computation result error	Error occurred in the computation circuit for the IL PCB unit.	Re-start the machine. If the alarm still triggers after restarting the machine, the IL PCB unit is faulty. Replace the IL PCB unit.
IO0189	5	3	IL_FPGA internal computation circuit error	Error occurred in the computation circuit for the IL PCB unit.	Re-start the machine. If the alarm still triggers after restarting the machine, the IL PCB unit is faulty. Replace the IL PCB unit.
IO0190	5	3	IL_FPGA configuration error	Error occurred in the computation circuit for the IL PCB unit.	Re-start the machine. If the alarm still triggers after restarting the machine, the IL PCB unit is faulty. Replace the IL PCB unit.
IO0191	5	3	IL_SW/HDL mismatch	Error occurred in the computation circuit for the IL PCB unit.	Re-start the machine. If the alarm still triggers after restarting the machine, the IL PCB unit is faulty. Replace the IL PCB unit.
IO0192	5	3	IL_FPGA watchdog error	Error occurred in the computation circuit for the IL PCB unit.	Re-start the machine. If the alarm still triggers after restarting the machine, the IL PCB unit is faulty. Replace the IL PCB unit.
IO0193	5	3	IL_FPGA internal state error	Error occurred in the computation circuit for the IL PCB unit.	Re-start the machine. If the alarm still triggers after restarting the machine, the IL PCB unit is faulty. Replace the IL PCB unit.
IO0194	5	3	Outside door 1 – Door setting error	There is a mismatch between the outside door 1 parameter settings and actual connection. (A)The machine parameter (system 1: common) <Outside door 1 settings> is incorrect. (B)XDR5 wiring connection is faulty. (C)IL PCB unit is faulty.	(A)Set the machine parameter (system 1: common) <Outside door 1 settings> to the correct value, and turn the power ON again. (B)Check the XDR5 wiring on the SR PCB. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (C)Replace the IL PCB unit.
IO0195	5	3	Outside door 2 – Door setting error	There is a mismatch between the outside door 2 parameter settings and actual connection. (A)The machine parameter (system 1: common) <Outside door 2 settings> is incorrect. (B)XDR6 wiring connection is faulty. (C)IL PCB unit is faulty.	(A)Set the machine parameter (system 1: common) <Outside door 2 settings> to the correct value, and turn the power ON again. (B)Check the XDR6 wiring on the SR PCB. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (C)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0196	5	3	SR PCB not connected	The SR PCB is not connected.	Follow one of the procedures below. (a)Turn OFF the breaker and make sure that the LED on the PCB is turned off. Next, check the XIOSR wiring that connects between the IO and the SR PCBs, and make sure that everything is normal and that there is no disconnected connector, line disconnection or incorrect wiring. (b)The IO PCB or the SR PCB may be faulty if the alarm will not reset when the wiring is normal. Replace the IO PCB or the SR PCB.
IO0197	5	3	Brake disconnection 1	Brake 1 (Z-axis) disconnection was detected.	Follow one of the procedures below. (a)Check XBKIN1 on the SR PCB. (b)The SR PCB is faulty. Replace the SR PCB. (c)The Z-axis amplifier is faulty. Replace the Z-axis amplifier.
IO0198	5	3	Brake disconnection 2	Brake 2 (magazine axis) disconnection was detected.	Follow one of the procedures below. (a)Check XBKIN2 on the SR PCB. (b)The SR PCB is faulty. Replace the SR PCB. (c)The magazine axis amplifier is faulty. Replace the magazine axis amplifier.
IO0199	5	3	Brake disconnection 3	A connection error on brake 3 was detected.	Follow one of the procedures below. (a)Check XBKIN3 on the SR PCB. (b)The SR PCB is faulty. Replace the SR PCB. (c)The amplifier that is connected to Brake 3, which is set as the machine parameter (system 2: additional axis) <Brake>, or which is set as the machine parameter (PLC: PLC-axis) <Brake>, is faulty. Replace the amplifier.
IO0200	5	3	Brake disconnection 4	A connection error on brake 4 was detected.	Follow one of the procedures below. (a)Check XBKIN4 on the SR PCB. (b)The SR PCB is faulty. Replace the SR PCB. (c)The amplifier that is connected to Brake 4, which is set as the machine parameter (system 2: additional axis) <Brake>, or which is set as the machine parameter (PLC: PLC-axis) <Brake>, is faulty. Replace the amplifier.
IO0201	5	3	Brake disconnection 5	A connection error on brake 5 was detected.	Follow one of the procedures below. (a)Check XBKIN5 on the SR PCB. (b)The SR PCB is faulty. Replace the SR PCB. (c)The amplifier that is connected to Brake 5, which is set as the machine parameter (system 2: additional axis) <Brake>, or which is set as the machine parameter (PLC: PLC-axis) <Brake>, is faulty. Replace the amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0202	5	3	Input signal error (EMS1)	Input from the **[EMERGENCY]** switch (main operation panel) to connector XMAINP on the IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[EMERGENCY]** switch on the main operation panel. - If the input line 098 bit 8 / bit F on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 098 bit 8 / bit F on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0203	5	3	Input signal error (EMS2)	Input from the **[EMERGENCY]** switch (manual pulse generator) to connector XMAINP on the IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[EMERGENCY]** switch on the manual pulse generator. - If the input line 098 bit 7 / bit E on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 098 bit 7 / bit E on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0204	5	3	Input signal error (EMS3)	Input from the **[EMERGENCY]** switch (pendant) to connector XPEN on the IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[EMERGENCY]** switch on the teaching pendant. - If the input line 098 bit 6 / bit D on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 098 bit 6 / bit D on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0205	5	3	Input signal error (EMS4)	Input from the **[EMERGENCY]** switch (magazine operation panel) to connector XMGP on the IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[EMERGENCY]** switch on the magazine operation panel. - If the input line 098 bit 5 / bit C on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 098 bit 5 / bit C on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0206	5	3	Input signal error (EMS5)	Input from the **[EMERGENCY]** switch (front switch panel) to connector XQTP on the IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[ENABLE]** switch on the front switch panel. - If the input line 098 bit 4 / bit B on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 098 bit 4 / bit B on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0207	5	3	Input signal error (EMS6)	Input from the **[EMERGENCY STOP]** switch (chip conveyor) to terminal block XTEMSIN on IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[EMERGENCY STOP]** switch on the chip conveyor operation box. - If the input line 098 bit 3 / bit A on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 098 bit 3 / bit A on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0208	5	3	Input signal error (EMS7)	Input from the **[EMERGENCY]** switch (expansion spare) to terminal block XTEMSIN on IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[EMERGENCY]** switch on the external extension. - If the input line 098 bit 2 / bit 9 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 098 bit 2 / bit 9 on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0209	5	3	Input signal error (QTC)	Input from the QT clamp sensor to connector XQTC on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors and index pallet 1 or pallet 2. Then, check the following for the QT clamp sensor. - If the input line 099 bit A / line 101 bit 5 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 099 bit A / line 101 bit 5 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XQTC connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0210	5	3	Input signal error (PLT1)	Input from the pallet 1 clamp sensor to connector XPLT1 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Follow the recovery procedure in the maintenance manual, and check the following for the pallet 1 sensor while the pallet 1 is indexed. - If the input line 099 bit 9 / line 101 bit 4 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 099 bit 9 / line 101 bit 4 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XPLT1 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0211	5	3	Input signal error (PLT2)	Input from the pallet 2 clamp sensor to connector XPLT2 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Follow the recovery procedure in the maintenance manual, and check the following for the pallet 2 sensor while the pallet 2 is indexed. - If the input line 099 bit 8 / line 101 bit 3 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 099 bit 8 / line 101 bit 3 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XPLT2 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0212	5	3	Input signal error (TCLP)	Input from the tool clamp sensor to connector XSCLP on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and attach a tool to the spindle and move the Z-axis to the tool clamp position. Then, check the following for the tool clamp sensor. - Make sure that there is no attachment problem with XSCLP connector on the SR PCB or with the switch itself. If there is a problem, fix it accordingly. - There may be damage, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is an error, replace the part. - Make sure that there is no switch wiring disconnection, and if there is, replace the wiring. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0213	5	3	Input signal error (EMRST)	Input from the **[MANUAL RESET]** switch to connector XRST on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB is faulty - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[MANUAL RESET]** switch. - If the input line 098 bit 0 / bit 1 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 098 bit 0 / bit 1 on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0214	5	3	Input signal error (ENA1)	Input from the **[ENABLE]** switch (main operation panel) to connector XMAINP on the IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[ENABLE]** switch on the main operation panel. - If the input line 0103 bit 2 / bit 7 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 0103 bit 2 / bit 7 on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0215	5	3	Input signal error (ENA2)	Input from the **[ENABLE]** switch (manual pulse generator) to connector XMAINP on the IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[ENABLE]** switch on the manual pulse generator. - If the input line 102 bit E / line 103 bit 3 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 102 bit E / line 103 bit 3 on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0216	5	3	Input signal error (ENA3)	Input from the **[ENABLE]** switch (pendant) to connector XPEN on the IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[ENABLE]** switch on the teaching pendant. - If the input line 102 bit F / line 103 bit 4 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 102 bit F / line 103 bit 4 on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0217	5	3	Input signal error (ENA4)	Input from the **[ENABLE]** switch (magazine operation panel) to connector XMGP on the IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[ENABLE]** switch on the magazine operation panel. - If the input line 0103 bit 0 / bit 5 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 0103 bit 0 / bit 5 on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0218	5	3	Input signal error (ENA5)	Input from the **[ENABLE]** switch (front switch panel) to connector XQTP on the IL PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the **[ENABLE]** switch on the front switch panel. - If the input line 0103 bit 1 / bit 6 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 0103 bit 1 / bit 6 on the I/O screen are both stable at “10” or “01”, then check for a problem with the connector or switch installation. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0219	5	3	Input signal error (DR1CL)	Input from the front door or inner door switch (door close check contact) to connector XDR1 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the front door or inner door switch. - If the input line 101 bit 1 / line 102 bit C on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 101 bit 1 / line 102 bit C on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR1 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0220	5	3	Input signal error (DR2CL)	Input from the outer door switch (door close check contact) to connector XDR2 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the outer door switch. - If the input line 100 bit 0 / line 101 bit B on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit 0 / line 101 bit B on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR2 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0221	5	3	Input signal error (DR3CL)	Input from the left side door switch (door close check contact) to connector XDR3 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the left side door switch. - If the input line 100 bit F / line 102 bit A on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit F / line 102 bit A on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR3 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0222	5	3	Input signal error (DR4CL)	Input from the right side door switch (door close check contact) to connector XDR4 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the right side door switch. - If the input line 100 bit D / line 102 bit 8 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit D / line 102 bit 8 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR4 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0223	5	3	Input signal error (DR5CL1)	Input from the outside door 1 switch (door close check contact 1) to connector XDR5 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the outside door 1 switch. - If the input line 100 bit 8 / line 102 bit 3 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit 8 / line 102 bit 3 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR5 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0224	5	3	Input signal error (DR5CL2)	Input from the outside door 1 switch (door close check contact 2) to connector XDR5 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the outside door 1 switch. - If the input line 100 bit 7 / line 102 bit 2 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit 7 / line 102 bit 2 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR5 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0225	5	3	Input signal error (DR5CL3)	Input from the outside door 1 switch (door close check contact 3) to connector XDR5 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the outside door 1 switch. - If the input line 100 bit 6 / line 102 bit 1 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit 6 / line 102 bit 1 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR5 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0226	5	3	Input signal error (DR6CL1)	Input from the outside door 2 switch (door close check contact 1) to connector XDR6 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the outside door 2 switch. - If the input line 100 bit 4 / line 101 bit F on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit 4 / line 101 bit F on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR6 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0227	5	3	Input signal error (DR6CL2)	Input from the outside door 2 switch (door close check contact 2) to connector XDR6 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the outside door 2 switch. - If the input line 100 bit 3 / line 101 bit E on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit 3 / line 101 bit E on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR6 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0228	5	3	Input signal error (DR6CL3)	Input from the outside door 2 switch (door close check contact 3) to connector XDR6 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the outside door 2 switch. - If the input line 100 bit 2 / line 101 bit D on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit 2 / line 101 bit D on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR6 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0229	5	3	Input signal error (DR7CL)	Input from the setup chamber left door switch (door close check contact) to connector XDR7 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the setup chamber left door switch. - If the input line 99 bit E / line 101 bit 9 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 99 bit E / line 101 bit 9 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR7 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0230	5	3	Input signal error (DR8CL)	Input from the setup chamber right door switch (door close check contact) to connector XDR8 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the setup chamber right door switch. - If the input line 99 bit C / line 101 bit 7 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 99 bit C / line 101 bit 7 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR8 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0231	5	3	Input signal error (DRMGCL)	Input from the magazine chamber door switch (door close check contact) to connector XDRMG on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the magazine chamber door switch. - If the input line 100 bit B / line 102 bit 6 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit B / line 102 bit 6 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDRMG connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0232	5	3	Input signal error (DRMS)	Input from the magazine chamber shutter switch (close check contact) to connector XDRMS on the SR PCB does not match. - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the magazine chamber shutter switch. - If the input line 100 bit 9 / line 102 bit 4 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit 9 / line 102 bit 4 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDRMS connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0233	5	3	Input signal error (DR1LK)	Input from the front door or inner door switch (lock check contact) to connector XDR1 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the front door or inner door switch. - If the input line 101 bit 0 / line 102 bit B on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 101 bit 0 / line 102 bit B on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR1 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0234	5	3	Input signal error (DR2LK)	Input from the outer door switch (lock check contact) to connector XDR2 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the outer door switch. - If the input line 099 bit F / line 101 bit A on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 099 bit F / line 101 bit A on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR2 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0235	5	3	Input signal error (DR3LK)	Input from the left side door switch (lock check contact) to connector XDR3 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the left side door switch. - If the input line 100 bit E / line 102 bit 9 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit E / line 102 bit 9 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR3 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0236	5	3	Input signal error (DR4LK)	Input from the right side door switch (lock check contact) to connector XDR4 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the right side door switch. - If the input line 100 bit C / line 102 bit 7 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit C / line 102 bit 7 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR4 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0237	5	3	Input signal error (DR5LK)	Input from the outside door 1 switch (lock check contact) to connector XDR5 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the outside door 1 switch. - If the input line 100 bit 5 / line 102 bit 0 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit 5 / line 102 bit 0 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR5 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0238	5	3	Input signal error (DR6LK)	Input from the outside door 2 switch (lock check contact) to connector XDR5 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the outside door 2 switch. - If the input line 100 bit 1 / line 101 bit C on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit 1 / line 101 bit C on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR6 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0239	5	3	Input signal error (DR7LK)	Input from the setup chamber left door switch (lock check contact) to connector XDR7 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the setup chamber left door switch. - If the input line 99 bit D / line 101 bit 8 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 99 bit D / line 101 bit 8 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR7 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0240	5	3	Input signal error (DR8LK)	Input from the setup chamber right door switch (lock check contact) to connector XDR8 on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the setup chamber right door switch. - If the input line 99 bit B / line 101 bit 9 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 99 bit B / line 101 bit 9 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDR8 connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0241	5	3	Input signal error (DRMGLK)	Input from the magazine chamber door switch (lock check contact) to connector XDRMG on the SR PCB does not match. Potential causes are noted below: - Connector connection is faulty - Switch or wiring connection is faulty - SR PCB error - IL PCB unit is faulty	Follow one of the procedures below. (a)Close all the doors, and then check the following for the magazine chamber door switch. - If the input line 100 bit A / line 102 bit 5 on the I/O screen are both stable at “11” or “00”, operate the switch and make sure that “10” or “01” do not appear (in a transitional state) for more than 5 seconds. If they do appear for more than 5 seconds, a switch may be damaged, a contact may be dirty or there may be oil contamination. Make sure that the mechanical motion is not misaligned when there are multiple contacts. If there is a problem, replace the part. - If the input line 100 bit A / line 102 bit 5 on the I/O screen are both stable at “10” or “01”, then check for a problem with the XDRMG connector or switch installation on the SR PCB. If there is a problem, then fix it. In addition, if there is no problem with the switch itself, make sure that there is no disconnection in the switch wiring. If there is a problem, replace the part. (b)Replace the SR PCB. (c)Replace the IL PCB unit.
IO0242	5	3	Door interlock mode setting signal error	Input from the **[DOOR INTERLOCK MODE]** switch to connector XMAINP on the SR PCB does not match. This may be a cause. - Switch or wiring connection is faulty - IL PCB unit is faulty - SR PCB is faulty	Follow one of the procedures below. (a)If there is a disconnection in the **[DOOR INTERLOCK MODE]** switch wiring or if the connector XMAINP on the SR PCB is disconnected or has a poor connection, fix the problem accordingly. (b)Replace the IL PCB unit. (c)Replace the SR PCB.
IO0243	5	3	Pallet simultaneous index	An error occurred in the pallet index monitoring. (A)The pallet SW 1 or SW 2 is installed incorrectly or its wiring connection is faulty. (B)Pallet SW 1 or SW 2 is faulty. (C)IL PCB unit is faulty.	(A)Make sure that there are no problems with the pallet SW 1 or SW 2 installation or wiring. (B)Replace pallet SW 1 or SW 2. (C)Replace the IL PCB unit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0244	5	3	The 12-V DC power is overcurrent. (*)	(A)Overcurrent occurred in the KEY PCB. There is a 12 V power short-circuit on the KEY PCB. (B)There is a KEY PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring points corresponding to the following numbers which will be indicated in brackets ( ). KY_STA_LD:XKSW KY_STP_LD:XKSW KY_OSTA_LD:XQT KY_DRUL1_LD:XDRUL KY_DRUL2_LD:XDRUL KY_SPOUT1:XOP KY_SPOUT2:XOP KEY: One of the connectors above (B)Replace the KEY PCB.
IO0245	5	3	The 5-V DC power is overcurrent. (1) (KEY)	(A)Overcurrent occurred in the KEY PCB. There is a 12 V power short-circuit on the KEY PCB. (B)There is a 5 V power supply short-circuit on the manual pulse generator. (C)The KEY PCB is defective.	(A)Check the wiring for the following connectors. XPUL, XMOV, XSPOV, XFOV (B)Check the wiring for the manual pulse generator. Replace the manual pulse generator and cable. (C)Replace the KEY PCB.
IO0246	5	3	The 5-V DC power is overcurrent. (2) (KEY)	(A)Overcurrent occurred in the KEY PCB. There is a 5 V power short-circuit on the KEY PCB. (B)The TC PCB or KEY PCB is faulty.	(A)Check the wiring for the XTOUCH connector. (B)Replace the TC PCB or the KEY PCB.
IO0247	5	3	The 3.3-V DC power is overcurrent. (KEY)	(A)Overcurrent occurred in the KEY PCB. There is a 3.3 V power short-circuit on the KEY PCB. (B)The LCD or KEY PCB is faulty.	(A)Check the wiring for the following connectors. XLCD (B)Replace the LCD or the KEY PCB.
IO0248	5	3	Command switch short-circuit (*)	(A)Overcurrent occurred in the KEY PCB. There is a short-circuit with the command switch signal for the KEY PCB. (B)The KEY PCB is defective.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring for the connector corresponding to the text in the parentheses below. KY_STA_SHORT :XKSW KY_STP_SHORT :XKSW KY_OSTA_SHORT :XQT KY_DPRT_SHORT :XPRT KY_OUT1_SHORT :XAB KY_OUT2_SHORT :XAB KY_DRMD_SHORT :XDOOR KY_DROP_SHORT :XDOOR KY_DRUL1_SHORT :XDRUL KY_DRUL2_SHORT :XDRUL KY_COILMD_SHORT:XCOIL KY_COILF_SHORT :XCOIL KY_COILR_SHORT :XCOIL KY_XOP1_SHORT :XOP KY_XOP2_SHORT :XOP KY_XOP3_SHORT :XOP KY_XOP4_SHORT :XOP (B)Replace the KEY PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0249	5	3	Chip conveyor connection setting error	There is a mismatch between the chip conveyor connection settings and actual connection. (A)The machine parameter (system 1: common) <Chip conveyor connection setting> is incorrect. (B)Wiring connection for XSTO4, XSTO7 or XSTO8 is faulty. (C)IL PCB unit is faulty.	Follow the manual instructions, and check the parameter settings and wiring. (A)Set the machine parameter (system 1: common) <Chip conveyor connection setting> to the correct value, and turn the power ON again. (B)Check the wiring for XSTO4, XSTO7 and XSTO8 on the SR PCB. Check for: Poor connector connection, incorrect insertion, faulty connector pin, etc. (C)Replace the IL PCB unit.
IO0250	5	3	SR-IO communication error (CRC)	There is a communication fault between the IO PCB and SR PCB.	Follow one of the procedures below. (a)Check the connection with the XIOSR connector on the SR PCB. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, power not connected, etc. (b)Replace the SR PCB. (c)Replace the IO PCB.
IO0251	5	3	IO-SR communication error (CRC)	There is a communication fault between the IO PCB and SR PCB.	Follow one of the procedures below. (a)Check the connection with the XIOSR connector on the SR PCB. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, power not connected, etc. (b)Replace the SR PCB. (c)Replace the IO PCB.
IO0252	5	3	IO-SR communication error (timeout)	There is a communication fault between the IO PCB and SR PCB.	Follow one of the procedures below. (a)Check the connection with the XIOSR connector on the SR PCB. Check for: Poor connector connection, incorrect insertion, faulty connector pin, cable disconnection, power not connected, etc. (b)Replace the SR PCB. (c)Replace the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0253	5	3	The 24-V is DC power overcurrent. (EXIO01_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO01_24VSHORT1 : XTOE"116"~"123" EXIO01_24VSHORT2 : XTOE"124"~"131" EXIO01_24VSHORT3 : XTOE"100"~"107" EXIO01_24VSHORT4 : XTOE"108"~"115" EXIO01_24VSHORT5 : XTEX24 EXIO01_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0254	5	3	The 24-V is DC power overcurrent. (EXIO02_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO02_24VSHORT1 : XTOE"116"~"123" EXIO02_24VSHORT2 : XTOE"124"~"131" EXIO02_24VSHORT3 : XTOE"100"~"107" EXIO02_24VSHORT4 : XTOE"108"~"115" EXIO02_24VSHORT5 : XTEX24 EXIO02_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0255	5	3	The 24-V is DC power overcurrent. (EXIO03_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO03_24VSHORT1 : XTOE"116"~"123" EXIO03_24VSHORT2 : XTOE"124"~"131" EXIO03_24VSHORT3 : XTOE"100"~"107" EXIO03_24VSHORT4 : XTOE"108"~"115" EXIO03_24VSHORT5 : XTEX24 EXIO03_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0256	5	3	The 24-V is DC power overcurrent. (EXIO04_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO04_24VSHORT1 : XTOE"116"~"123" EXIO04_24VSHORT2 : XTOE"124"~"131" EXIO04_24VSHORT3 : XTOE"100"~"107" EXIO04_24VSHORT4 : XTOE"108"~"115" EXIO04_24VSHORT5 : XTEX24 EXIO04_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0257	5	3	The 24-V is DC power overcurrent. (EXIO05_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO05_24VSHORT1 : XTOE"116"~"123" EXIO05_24VSHORT2 : XTOE"124"~"131" EXIO05_24VSHORT3 : XTOE"100"~"107" EXIO05_24VSHORT4 : XTOE"108"~"115" EXIO05_24VSHORT5 : XTEX24 EXIO05_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0258	5	3	The 24-V is DC power overcurrent. (EXIO06_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO06_24VSHORT1 : XTOE"116"~"123" EXIO06_24VSHORT2 : XTOE"124"~"131" EXIO06_24VSHORT3 : XTOE"100"~"107" EXIO06_24VSHORT4 : XTOE"108"~"115" EXIO06_24VSHORT5 : XTEX24 EXIO06_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0259	5	3	The 24-V is DC power overcurrent. (EXIO07_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO07_24VSHORT1 : XTOE"116"~"123" EXIO07_24VSHORT2 : XTOE"124"~"131" EXIO07_24VSHORT3 : XTOE"100"~"107" EXIO07_24VSHORT4 : XTOE"108"~"115" EXIO07_24VSHORT5 : XTEX24 EXIO07_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0260	5	3	The 24-V is DC power overcurrent. (EXIO08_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO08_24VSHORT1 : XTOE"116"~"123" EXIO08_24VSHORT2 : XTOE"124"~"131" EXIO08_24VSHORT3 : XTOE"100"~"107" EXIO08_24VSHORT4 : XTOE"108"~"115" EXIO08_24VSHORT5 : XTEX24 EXIO08_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0261	5	3	The 24-V is DC power overcurrent. (EXIO09_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO09_24VSHORT1 : XTOE"116"~"123" EXIO09_24VSHORT2 : XTOE"124"~"131" EXIO09_24VSHORT3 : XTOE"100"~"107" EXIO09_24VSHORT4 : XTOE"108"~"115" EXIO09_24VSHORT5 : XTEX24 EXIO09_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0262	5	3	The 24-V is DC power overcurrent. (EXIO10_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO10_24VSHORT1 : XTOE"116"~"123" EXIO10_24VSHORT2 : XTOE"124"~"131" EXIO10_24VSHORT3 : XTOE"100"~"107" EXIO10_24VSHORT4 : XTOE"108"~"115" EXIO10_24VSHORT5 : XTEX24 EXIO10_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0263	5	3	The 24-V is DC power overcurrent. (EXIO11_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO11_24VSHORT1 : XTOE"116"~"123" EXIO11_24VSHORT2 : XTOE"124"~"131" EXIO11_24VSHORT3 : XTOE"100"~"107" EXIO11_24VSHORT4 : XTOE"108"~"115" EXIO11_24VSHORT5 : XTEX24 EXIO11_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0264	5	3	The 24-V is DC power overcurrent. (EXIO12_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO12_24VSHORT1 : XTOE"116"~"123" EXIO12_24VSHORT2 : XTOE"124"~"131" EXIO12_24VSHORT3 : XTOE"100"~"107" EXIO12_24VSHORT4 : XTOE"108"~"115" EXIO12_24VSHORT5 : XTEX24 EXIO12_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0265	5	3	The 24-V is DC power overcurrent. (EXIO13_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO13_24VSHORT1 : XTOE"116"~"123" EXIO13_24VSHORT2 : XTOE"124"~"131" EXIO13_24VSHORT3 : XTOE"100"~"107" EXIO13_24VSHORT4 : XTOE"108"~"115" EXIO13_24VSHORT5 : XTEX24 EXIO13_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0266	5	3	The 24-V is DC power overcurrent. (EXIO14_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO14_24VSHORT1 : XTOE"116"~"123" EXIO14_24VSHORT2 : XTOE"124"~"131" EXIO14_24VSHORT3 : XTOE"100"~"107" EXIO14_24VSHORT4 : XTOE"108"~"115" EXIO14_24VSHORT5 : XTEX24 EXIO14_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0267	5	3	The 24-V is DC power overcurrent. (EXIO15_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO15_24VSHORT1 : XTOE"116"~"123" EXIO15_24VSHORT2 : XTOE"124"~"131" EXIO15_24VSHORT3 : XTOE"100"~"107" EXIO15_24VSHORT4 : XTOE"108"~"115" EXIO15_24VSHORT5 : XTEX24 EXIO15_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0268	5	3	The 24-V is DC power overcurrent. (EXIO16_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO16_24VSHORT1 : XTOE"116"~"123" EXIO16_24VSHORT2 : XTOE"124"~"131" EXIO16_24VSHORT3 : XTOE"100"~"107" EXIO16_24VSHORT4 : XTOE"108"~"115" EXIO16_24VSHORT5 : XTEX24 EXIO16_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0269	5	3	The 24-V is DC power overcurrent. (EXIO17_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO17_24VSHORT1 : XTOE"116"~"123" EXIO17_24VSHORT2 : XTOE"124"~"131" EXIO17_24VSHORT3 : XTOE"100"~"107" EXIO17_24VSHORT4 : XTOE"108"~"115" EXIO17_24VSHORT5 : XTEX24 EXIO17_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0270	5	3	The 24-V is DC power overcurrent. (EXIO18_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO18_24VSHORT1 : XTOE"116"~"123" EXIO18_24VSHORT2 : XTOE"124"~"131" EXIO18_24VSHORT3 : XTOE"100"~"107" EXIO18_24VSHORT4 : XTOE"108"~"115" EXIO18_24VSHORT5 : XTEX24 EXIO18_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0271	5	3	The 24-V is DC power overcurrent. (EXIO19_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO19_24VSHORT1 : XTOE"116"~"123" EXIO19_24VSHORT2 : XTOE"124"~"131" EXIO19_24VSHORT3 : XTOE"100"~"107" EXIO19_24VSHORT4 : XTOE"108"~"115" EXIO19_24VSHORT5 : XTEX24 EXIO19_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0272	5	3	The 24-V is DC power overcurrent. (EXIO20_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO20_24VSHORT1 : XTOE"116"~"123" EXIO20_24VSHORT2 : XTOE"124"~"131" EXIO20_24VSHORT3 : XTOE"100"~"107" EXIO20_24VSHORT4 : XTOE"108"~"115" EXIO20_24VSHORT5 : XTEX24 EXIO20_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0273	5	3	The 24-V is DC power overcurrent. (EXIO21_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO21_24VSHORT1 : XTOE"116"~"123" EXIO21_24VSHORT2 : XTOE"124"~"131" EXIO21_24VSHORT3 : XTOE"100"~"107" EXIO21_24VSHORT4 : XTOE"108"~"115" EXIO21_24VSHORT5 : XTEX24 EXIO21_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0274	5	3	The 24-V is DC power overcurrent. (EXIO22_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO22_24VSHORT1 : XTOE"116"~"123" EXIO22_24VSHORT2 : XTOE"124"~"131" EXIO22_24VSHORT3 : XTOE"100"~"107" EXIO22_24VSHORT4 : XTOE"108"~"115" EXIO22_24VSHORT5 : XTEX24 EXIO22_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0275	5	3	The 24-V is DC power overcurrent. (EXIO23_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO23_24VSHORT1 : XTOE"116"~"123" EXIO23_24VSHORT2 : XTOE"124"~"131" EXIO23_24VSHORT3 : XTOE"100"~"107" EXIO23_24VSHORT4 : XTOE"108"~"115" EXIO23_24VSHORT5 : XTEX24 EXIO23_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0276	5	3	The 24-V is DC power overcurrent. (EXIO24_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO24_24VSHORT1 : XTOE"116"~"123" EXIO24_24VSHORT2 : XTOE"124"~"131" EXIO24_24VSHORT3 : XTOE"100"~"107" EXIO24_24VSHORT4 : XTOE"108"~"115" EXIO24_24VSHORT5 : XTEX24 EXIO24_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0277	5	3	The 24-V is DC power overcurrent. (EXIO25_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO25_24VSHORT1 : XTOE"116"~"123" EXIO25_24VSHORT2 : XTOE"124"~"131" EXIO25_24VSHORT3 : XTOE"100"~"107" EXIO25_24VSHORT4 : XTOE"108"~"115" EXIO25_24VSHORT5 : XTEX24 EXIO25_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0278	5	3	The 24-V is DC power overcurrent. (EXIO26_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO26_24VSHORT1 : XTOE"116"~"123" EXIO26_24VSHORT2 : XTOE"124"~"131" EXIO26_24VSHORT3 : XTOE"100"~"107" EXIO26_24VSHORT4 : XTOE"108"~"115" EXIO26_24VSHORT5 : XTEX24 EXIO26_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0279	5	3	The 24-V is DC power overcurrent. (EXIO27_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO27_24VSHORT1 : XTOE"116"~"123" EXIO27_24VSHORT2 : XTOE"124"~"131" EXIO27_24VSHORT3 : XTOE"100"~"107" EXIO27_24VSHORT4 : XTOE"108"~"115" EXIO27_24VSHORT5 : XTEX24 EXIO27_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0280	5	3	The 24-V is DC power overcurrent. (EXIO28_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO28_24VSHORT1 : XTOE"116"~"123" EXIO28_24VSHORT2 : XTOE"124"~"131" EXIO28_24VSHORT3 : XTOE"100"~"107" EXIO28_24VSHORT4 : XTOE"108"~"115" EXIO28_24VSHORT5 : XTEX24 EXIO28_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0281	5	3	The 24-V is DC power overcurrent. (EXIO29_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO29_24VSHORT1 : XTOE"116"~"123" EXIO29_24VSHORT2 : XTOE"124"~"131" EXIO29_24VSHORT3 : XTOE"100"~"107" EXIO29_24VSHORT4 : XTOE"108"~"115" EXIO29_24VSHORT5 : XTEX24 EXIO29_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0282	5	3	The 24-V is DC power overcurrent. (EXIO30_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO30_24VSHORT1 : XTOE"116"~"123" EXIO30_24VSHORT2 : XTOE"124"~"131" EXIO30_24VSHORT3 : XTOE"100"~"107" EXIO30_24VSHORT4 : XTOE"108"~"115" EXIO30_24VSHORT5 : XTEX24 EXIO30_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0283	5	3	The 24-V is DC power overcurrent. (EXIO31_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO31_24VSHORT1 : XTOE"116"~"123" EXIO31_24VSHORT2 : XTOE"124"~"131" EXIO31_24VSHORT3 : XTOE"100"~"107" EXIO31_24VSHORT4 : XTOE"108"~"115" EXIO31_24VSHORT5 : XTEX24 EXIO31_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0284	5	3	The 24-V is DC power overcurrent. (EXIO32_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO32_24VSHORT1 : XTOE"116"~"123" EXIO32_24VSHORT2 : XTOE"124"~"131" EXIO32_24VSHORT3 : XTOE"100"~"107" EXIO32_24VSHORT4 : XTOE"108"~"115" EXIO32_24VSHORT5 : XTEX24 EXIO32_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0285	5	3	The 24-V is DC power overcurrent. (EXIO33_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO33_24VSHORT1 : XTOE"116"~"123" EXIO33_24VSHORT2 : XTOE"124"~"131" EXIO33_24VSHORT3 : XTOE"100"~"107" EXIO33_24VSHORT4 : XTOE"108"~"115" EXIO33_24VSHORT5 : XTEX24 EXIO33_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0286	5	3	The 24-V is DC power overcurrent. (EXIO34_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO34_24VSHORT1 : XTOE"116"~"123" EXIO34_24VSHORT2 : XTOE"124"~"131" EXIO34_24VSHORT3 : XTOE"100"~"107" EXIO34_24VSHORT4 : XTOE"108"~"115" EXIO34_24VSHORT5 : XTEX24 EXIO34_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0287	5	3	The 24-V is DC power overcurrent. (EXIO35_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO35_24VSHORT1 : XTOE"116"~"123" EXIO35_24VSHORT2 : XTOE"124"~"131" EXIO35_24VSHORT3 : XTOE"100"~"107" EXIO35_24VSHORT4 : XTOE"108"~"115" EXIO35_24VSHORT5 : XTEX24 EXIO35_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0288	5	3	The 24-V is DC power overcurrent. (EXIO36_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO36_24VSHORT1 : XTOE"116"~"123" EXIO36_24VSHORT2 : XTOE"124"~"131" EXIO36_24VSHORT3 : XTOE"100"~"107" EXIO36_24VSHORT4 : XTOE"108"~"115" EXIO36_24VSHORT5 : XTEX24 EXIO36_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0289	5	3	The 24-V is DC power overcurrent. (EXIO37_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO37_24VSHORT1 : XTOE"116"~"123" EXIO37_24VSHORT2 : XTOE"124"~"131" EXIO37_24VSHORT3 : XTOE"100"~"107" EXIO37_24VSHORT4 : XTOE"108"~"115" EXIO37_24VSHORT5 : XTEX24 EXIO37_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0290	5	3	The 24-V is DC power overcurrent. (EXIO38_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO38_24VSHORT1 : XTOE"116"~"123" EXIO38_24VSHORT2 : XTOE"124"~"131" EXIO38_24VSHORT3 : XTOE"100"~"107" EXIO38_24VSHORT4 : XTOE"108"~"115" EXIO38_24VSHORT5 : XTEX24 EXIO38_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0291	5	3	The 24-V is DC power overcurrent. (EXIO39_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO39_24VSHORT1 : XTOE"116"~"123" EXIO39_24VSHORT2 : XTOE"124"~"131" EXIO39_24VSHORT3 : XTOE"100"~"107" EXIO39_24VSHORT4 : XTOE"108"~"115" EXIO39_24VSHORT5 : XTEX24 EXIO39_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0292	5	3	The 24-V is DC power overcurrent. (EXIO40_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO40_24VSHORT1 : XTOE"116"~"123" EXIO40_24VSHORT2 : XTOE"124"~"131" EXIO40_24VSHORT3 : XTOE"100"~"107" EXIO40_24VSHORT4 : XTOE"108"~"115" EXIO40_24VSHORT5 : XTEX24 EXIO40_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0293	5	3	The 24-V is DC power overcurrent. (EXIO41_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO41_24VSHORT1 : XTOE"116"~"123" EXIO41_24VSHORT2 : XTOE"124"~"131" EXIO41_24VSHORT3 : XTOE"100"~"107" EXIO41_24VSHORT4 : XTOE"108"~"115" EXIO41_24VSHORT5 : XTEX24 EXIO41_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0294	5	3	The 24-V is DC power overcurrent. (EXIO42_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO42_24VSHORT1 : XTOE"116"~"123" EXIO42_24VSHORT2 : XTOE"124"~"131" EXIO42_24VSHORT3 : XTOE"100"~"107" EXIO42_24VSHORT4 : XTOE"108"~"115" EXIO42_24VSHORT5 : XTEX24 EXIO42_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0295	5	3	The 24-V is DC power overcurrent. (EXIO43_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO43_24VSHORT1 : XTOE"116"~"123" EXIO43_24VSHORT2 : XTOE"124"~"131" EXIO43_24VSHORT3 : XTOE"100"~"107" EXIO43_24VSHORT4 : XTOE"108"~"115" EXIO43_24VSHORT5 : XTEX24 EXIO43_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0296	5	3	The 24-V is DC power overcurrent. (EXIO44_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO44_24VSHORT1 : XTOE"116"~"123" EXIO44_24VSHORT2 : XTOE"124"~"131" EXIO44_24VSHORT3 : XTOE"100"~"107" EXIO44_24VSHORT4 : XTOE"108"~"115" EXIO44_24VSHORT5 : XTEX24 EXIO44_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0297	5	3	The 24-V is DC power overcurrent. (EXIO45_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO45_24VSHORT1 : XTOE"116"~"123" EXIO45_24VSHORT2 : XTOE"124"~"131" EXIO45_24VSHORT3 : XTOE"100"~"107" EXIO45_24VSHORT4 : XTOE"108"~"115" EXIO45_24VSHORT5 : XTEX24 EXIO45_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0298	5	3	The 24-V is DC power overcurrent. (EXIO46_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO46_24VSHORT1 : XTOE"116"~"123" EXIO46_24VSHORT2 : XTOE"124"~"131" EXIO46_24VSHORT3 : XTOE"100"~"107" EXIO46_24VSHORT4 : XTOE"108"~"115" EXIO46_24VSHORT5 : XTEX24 EXIO46_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0299	5	3	The 24-V is DC power overcurrent. (EXIO47_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO47_24VSHORT1 : XTOE"116"~"123" EXIO47_24VSHORT2 : XTOE"124"~"131" EXIO47_24VSHORT3 : XTOE"100"~"107" EXIO47_24VSHORT4 : XTOE"108"~"115" EXIO47_24VSHORT5 : XTEX24 EXIO47_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0300	5	3	The 24-V is DC power overcurrent. (EXIO48_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO48_24VSHORT1 : XTOE"116"~"123" EXIO48_24VSHORT2 : XTOE"124"~"131" EXIO48_24VSHORT3 : XTOE"100"~"107" EXIO48_24VSHORT4 : XTOE"108"~"115" EXIO48_24VSHORT5 : XTEX24 EXIO48_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0301	5	3	The 24-V is DC power overcurrent. (EXIO49_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO49_24VSHORT1 : XTOE"116"~"123" EXIO49_24VSHORT2 : XTOE"124"~"131" EXIO49_24VSHORT3 : XTOE"100"~"107" EXIO49_24VSHORT4 : XTOE"108"~"115" EXIO49_24VSHORT5 : XTEX24 EXIO49_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0302	5	3	The 24-V is DC power overcurrent. (EXIO50_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO50_24VSHORT1 : XTOE"116"~"123" EXIO50_24VSHORT2 : XTOE"124"~"131" EXIO50_24VSHORT3 : XTOE"100"~"107" EXIO50_24VSHORT4 : XTOE"108"~"115" EXIO50_24VSHORT5 : XTEX24 EXIO50_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0303	5	3	The 24-V is DC power overcurrent. (EXIO51_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO51_24VSHORT1 : XTOE"116"~"123" EXIO51_24VSHORT2 : XTOE"124"~"131" EXIO51_24VSHORT3 : XTOE"100"~"107" EXIO51_24VSHORT4 : XTOE"108"~"115" EXIO51_24VSHORT5 : XTEX24 EXIO51_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0304	5	3	The 24-V is DC power overcurrent. (EXIO52_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO52_24VSHORT1 : XTOE"116"~"123" EXIO52_24VSHORT2 : XTOE"124"~"131" EXIO52_24VSHORT3 : XTOE"100"~"107" EXIO52_24VSHORT4 : XTOE"108"~"115" EXIO52_24VSHORT5 : XTEX24 EXIO52_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0305	5	3	The 24-V is DC power overcurrent. (EXIO53_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO53_24VSHORT1 : XTOE"116"~"123" EXIO53_24VSHORT2 : XTOE"124"~"131" EXIO53_24VSHORT3 : XTOE"100"~"107" EXIO53_24VSHORT4 : XTOE"108"~"115" EXIO53_24VSHORT5 : XTEX24 EXIO53_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0306	5	3	The 24-V is DC power overcurrent. (EXIO54_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO54_24VSHORT1 : XTOE"116"~"123" EXIO54_24VSHORT2 : XTOE"124"~"131" EXIO54_24VSHORT3 : XTOE"100"~"107" EXIO54_24VSHORT4 : XTOE"108"~"115" EXIO54_24VSHORT5 : XTEX24 EXIO54_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0307	5	3	The 24-V is DC power overcurrent. (EXIO55_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO55_24VSHORT1 : XTOE"116"~"123" EXIO55_24VSHORT2 : XTOE"124"~"131" EXIO55_24VSHORT3 : XTOE"100"~"107" EXIO55_24VSHORT4 : XTOE"108"~"115" EXIO55_24VSHORT5 : XTEX24 EXIO55_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0308	5	3	The 24-V is DC power overcurrent. (EXIO56_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO56_24VSHORT1 : XTOE"116"~"123" EXIO56_24VSHORT2 : XTOE"124"~"131" EXIO56_24VSHORT3 : XTOE"100"~"107" EXIO56_24VSHORT4 : XTOE"108"~"115" EXIO56_24VSHORT5 : XTEX24 EXIO56_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0309	5	3	The 24-V is DC power overcurrent. (EXIO57_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO57_24VSHORT1 : XTOE"116"~"123" EXIO57_24VSHORT2 : XTOE"124"~"131" EXIO57_24VSHORT3 : XTOE"100"~"107" EXIO57_24VSHORT4 : XTOE"108"~"115" EXIO57_24VSHORT5 : XTEX24 EXIO57_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0310	5	3	The 24-V is DC power overcurrent. (EXIO58_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO58_24VSHORT1 : XTOE"116"~"123" EXIO58_24VSHORT2 : XTOE"124"~"131" EXIO58_24VSHORT3 : XTOE"100"~"107" EXIO58_24VSHORT4 : XTOE"108"~"115" EXIO58_24VSHORT5 : XTEX24 EXIO58_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0311	5	3	The 24-V is DC power overcurrent. (EXIO59_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO59_24VSHORT1 : XTOE"116"~"123" EXIO59_24VSHORT2 : XTOE"124"~"131" EXIO59_24VSHORT3 : XTOE"100"~"107" EXIO59_24VSHORT4 : XTOE"108"~"115" EXIO59_24VSHORT5 : XTEX24 EXIO59_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0312	5	3	The 24-V is DC power overcurrent. (EXIO60_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO60_24VSHORT1 : XTOE"116"~"123" EXIO60_24VSHORT2 : XTOE"124"~"131" EXIO60_24VSHORT3 : XTOE"100"~"107" EXIO60_24VSHORT4 : XTOE"108"~"115" EXIO60_24VSHORT5 : XTEX24 EXIO60_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0313	5	3	The 24-V is DC power overcurrent. (EXIO61_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO61_24VSHORT1 : XTOE"116"~"123" EXIO61_24VSHORT2 : XTOE"124"~"131" EXIO61_24VSHORT3 : XTOE"100"~"107" EXIO61_24VSHORT4 : XTOE"108"~"115" EXIO61_24VSHORT5 : XTEX24 EXIO61_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0314	5	3	The 24-V is DC power overcurrent. (EXIO62_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO62_24VSHORT1 : XTOE"116"~"123" EXIO62_24VSHORT2 : XTOE"124"~"131" EXIO62_24VSHORT3 : XTOE"100"~"107" EXIO62_24VSHORT4 : XTOE"108"~"115" EXIO62_24VSHORT5 : XTEX24 EXIO62_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0315	5	3	The 24-V is DC power overcurrent. (EXIO63_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO63_24VSHORT1 : XTOE"116"~"123" EXIO63_24VSHORT2 : XTOE"124"~"131" EXIO63_24VSHORT3 : XTOE"100"~"107" EXIO63_24VSHORT4 : XTOE"108"~"115" EXIO63_24VSHORT5 : XTEX24 EXIO63_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0316	5	3	The 24-V is DC power overcurrent. (EXIO64_24VSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO: XTEX24 EXIO64_24VSHORT1 : XTOE"116"~"123" EXIO64_24VSHORT2 : XTOE"124"~"131" EXIO64_24VSHORT3 : XTOE"100"~"107" EXIO64_24VSHORT4 : XTOE"108"~"115" EXIO64_24VSHORT5 : XTEX24 EXIO64_24VSHORT6 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0317	5	3	DC power GND overcurrent (EXIO01_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO01_GNDSHORT1 : XTOE"116"~"123" EXIO01_GNDSHORT2 : XTOE"124"~"131" EXIO01_GNDSHORT3 : XTOE"100"~"107" EXIO01_GNDSHORT4 : XTOE"108"~"115" EXIO01_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0318	5	3	DC power GND overcurrent (EXIO02_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO02_GNDSHORT1 : XTOE"116"~"123" EXIO02_GNDSHORT2 : XTOE"124"~"131" EXIO02_GNDSHORT3 : XTOE"100"~"107" EXIO02_GNDSHORT4 : XTOE"108"~"115" EXIO02_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0319	5	3	DC power GND overcurrent (EXIO03_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO03_GNDSHORT1 : XTOE"116"~"123" EXIO03_GNDSHORT2 : XTOE"124"~"131" EXIO03_GNDSHORT3 : XTOE"100"~"107" EXIO03_GNDSHORT4 : XTOE"108"~"115" EXIO03_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0320	5	3	DC power GND overcurrent (EXIO04_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO04_GNDSHORT1 : XTOE"116"~"123" EXIO04_GNDSHORT2 : XTOE"124"~"131" EXIO04_GNDSHORT3 : XTOE"100"~"107" EXIO04_GNDSHORT4 : XTOE"108"~"115" EXIO04_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0321	5	3	DC power GND overcurrent (EXIO05_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO05_GNDSHORT1 : XTOE"116"~"123" EXIO05_GNDSHORT2 : XTOE"124"~"131" EXIO05_GNDSHORT3 : XTOE"100"~"107" EXIO05_GNDSHORT4 : XTOE"108"~"115" EXIO05_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0322	5	3	DC power GND overcurrent (EXIO06_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO06_GNDSHORT1 : XTOE"116"~"123" EXIO06_GNDSHORT2 : XTOE"124"~"131" EXIO06_GNDSHORT3 : XTOE"100"~"107" EXIO06_GNDSHORT4 : XTOE"108"~"115" EXIO06_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0323	5	3	DC power GND overcurrent (EXIO07_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO07_GNDSHORT1 : XTOE"116"~"123" EXIO07_GNDSHORT2 : XTOE"124"~"131" EXIO07_GNDSHORT3 : XTOE"100"~"107" EXIO07_GNDSHORT4 : XTOE"108"~"115" EXIO07_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0324	5	3	DC power GND overcurrent (EXIO08_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO08_GNDSHORT1 : XTOE"116"~"123" EXIO08_GNDSHORT2 : XTOE"124"~"131" EXIO08_GNDSHORT3 : XTOE"100"~"107" EXIO08_GNDSHORT4 : XTOE"108"~"115" EXIO08_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0325	5	3	DC power GND overcurrent (EXIO09_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO09_GNDSHORT1 : XTOE"116"~"123" EXIO09_GNDSHORT2 : XTOE"124"~"131" EXIO09_GNDSHORT3 : XTOE"100"~"107" EXIO09_GNDSHORT4 : XTOE"108"~"115" EXIO09_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0326	5	3	DC power GND overcurrent (EXIO10_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO10_GNDSHORT1 : XTOE"116"~"123" EXIO10_GNDSHORT2 : XTOE"124"~"131" EXIO10_GNDSHORT3 : XTOE"100"~"107" EXIO10_GNDSHORT4 : XTOE"108"~"115" EXIO10_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0327	5	3	DC power GND overcurrent (EXIO11_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO11_GNDSHORT1 : XTOE"116"~"123" EXIO11_GNDSHORT2 : XTOE"124"~"131" EXIO11_GNDSHORT3 : XTOE"100"~"107" EXIO11_GNDSHORT4 : XTOE"108"~"115" EXIO11_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0328	5	3	DC power GND overcurrent (EXIO12_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO12_GNDSHORT1 : XTOE"116"~"123" EXIO12_GNDSHORT2 : XTOE"124"~"131" EXIO12_GNDSHORT3 : XTOE"100"~"107" EXIO12_GNDSHORT4 : XTOE"108"~"115" EXIO12_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0329	5	3	DC power GND overcurrent (EXIO13_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO13_GNDSHORT1 : XTOE"116"~"123" EXIO13_GNDSHORT2 : XTOE"124"~"131" EXIO13_GNDSHORT3 : XTOE"100"~"107" EXIO13_GNDSHORT4 : XTOE"108"~"115" EXIO13_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0330	5	3	DC power GND overcurrent (EXIO14_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO14_GNDSHORT1 : XTOE"116"~"123" EXIO14_GNDSHORT2 : XTOE"124"~"131" EXIO14_GNDSHORT3 : XTOE"100"~"107" EXIO14_GNDSHORT4 : XTOE"108"~"115" EXIO14_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0331	5	3	DC power GND overcurrent (EXIO15_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO15_GNDSHORT1 : XTOE"116"~"123" EXIO15_GNDSHORT2 : XTOE"124"~"131" EXIO15_GNDSHORT3 : XTOE"100"~"107" EXIO15_GNDSHORT4 : XTOE"108"~"115" EXIO15_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0332	5	3	DC power GND overcurrent (EXIO16_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO16_GNDSHORT1 : XTOE"116"~"123" EXIO16_GNDSHORT2 : XTOE"124"~"131" EXIO16_GNDSHORT3 : XTOE"100"~"107" EXIO16_GNDSHORT4 : XTOE"108"~"115" EXIO16_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0333	5	3	DC power GND overcurrent (EXIO17_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO17_GNDSHORT1 : XTOE"116"~"123" EXIO17_GNDSHORT2 : XTOE"124"~"131" EXIO17_GNDSHORT3 : XTOE"100"~"107" EXIO17_GNDSHORT4 : XTOE"108"~"115" EXIO17_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0334	5	3	DC power GND overcurrent (EXIO18_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO18_GNDSHORT1 : XTOE"116"~"123" EXIO18_GNDSHORT2 : XTOE"124"~"131" EXIO18_GNDSHORT3 : XTOE"100"~"107" EXIO18_GNDSHORT4 : XTOE"108"~"115" EXIO18_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0335	5	3	DC power GND overcurrent (EXIO19_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO19_GNDSHORT1 : XTOE"116"~"123" EXIO19_GNDSHORT2 : XTOE"124"~"131" EXIO19_GNDSHORT3 : XTOE"100"~"107" EXIO19_GNDSHORT4 : XTOE"108"~"115" EXIO19_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0336	5	3	DC power GND overcurrent (EXIO20_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO20_GNDSHORT1 : XTOE"116"~"123" EXIO20_GNDSHORT2 : XTOE"124"~"131" EXIO20_GNDSHORT3 : XTOE"100"~"107" EXIO20_GNDSHORT4 : XTOE"108"~"115" EXIO20_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0337	5	3	DC power GND overcurrent (EXIO21_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO21_GNDSHORT1 : XTOE"116"~"123" EXIO21_GNDSHORT2 : XTOE"124"~"131" EXIO21_GNDSHORT3 : XTOE"100"~"107" EXIO21_GNDSHORT4 : XTOE"108"~"115" EXIO21_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0338	5	3	DC power GND overcurrent (EXIO22_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO22_GNDSHORT1 : XTOE"116"~"123" EXIO22_GNDSHORT2 : XTOE"124"~"131" EXIO22_GNDSHORT3 : XTOE"100"~"107" EXIO22_GNDSHORT4 : XTOE"108"~"115" EXIO22_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0339	5	3	DC power GND overcurrent (EXIO23_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO23_GNDSHORT1 : XTOE"116"~"123" EXIO23_GNDSHORT2 : XTOE"124"~"131" EXIO23_GNDSHORT3 : XTOE"100"~"107" EXIO23_GNDSHORT4 : XTOE"108"~"115" EXIO23_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0340	5	3	DC power GND overcurrent (EXIO24_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO24_GNDSHORT1 : XTOE"116"~"123" EXIO24_GNDSHORT2 : XTOE"124"~"131" EXIO24_GNDSHORT3 : XTOE"100"~"107" EXIO24_GNDSHORT4 : XTOE"108"~"115" EXIO24_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0341	5	3	DC power GND overcurrent (EXIO25_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO25_GNDSHORT1 : XTOE"116"~"123" EXIO25_GNDSHORT2 : XTOE"124"~"131" EXIO25_GNDSHORT3 : XTOE"100"~"107" EXIO25_GNDSHORT4 : XTOE"108"~"115" EXIO25_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0342	5	3	DC power GND overcurrent (EXIO26_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO26_GNDSHORT1 : XTOE"116"~"123" EXIO26_GNDSHORT2 : XTOE"124"~"131" EXIO26_GNDSHORT3 : XTOE"100"~"107" EXIO26_GNDSHORT4 : XTOE"108"~"115" EXIO26_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0343	5	3	DC power GND overcurrent (EXIO27_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO27_GNDSHORT1 : XTOE"116"~"123" EXIO27_GNDSHORT2 : XTOE"124"~"131" EXIO27_GNDSHORT3 : XTOE"100"~"107" EXIO27_GNDSHORT4 : XTOE"108"~"115" EXIO27_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0344	5	3	DC power GND overcurrent (EXIO28_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO28_GNDSHORT1 : XTOE"116"~"123" EXIO28_GNDSHORT2 : XTOE"124"~"131" EXIO28_GNDSHORT3 : XTOE"100"~"107" EXIO28_GNDSHORT4 : XTOE"108"~"115" EXIO28_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0345	5	3	DC power GND overcurrent (EXIO29_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO29_GNDSHORT1 : XTOE"116"~"123" EXIO29_GNDSHORT2 : XTOE"124"~"131" EXIO29_GNDSHORT3 : XTOE"100"~"107" EXIO29_GNDSHORT4 : XTOE"108"~"115" EXIO29_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0346	5	3	DC power GND overcurrent (EXIO30_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO30_GNDSHORT1 : XTOE"116"~"123" EXIO30_GNDSHORT2 : XTOE"124"~"131" EXIO30_GNDSHORT3 : XTOE"100"~"107" EXIO30_GNDSHORT4 : XTOE"108"~"115" EXIO30_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0347	5	3	DC power GND overcurrent (EXIO31_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO31_GNDSHORT1 : XTOE"116"~"123" EXIO31_GNDSHORT2 : XTOE"124"~"131" EXIO31_GNDSHORT3 : XTOE"100"~"107" EXIO31_GNDSHORT4 : XTOE"108"~"115" EXIO31_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0348	5	3	DC power GND overcurrent (EXIO32_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO32_GNDSHORT1 : XTOE"116"~"123" EXIO32_GNDSHORT2 : XTOE"124"~"131" EXIO32_GNDSHORT3 : XTOE"100"~"107" EXIO32_GNDSHORT4 : XTOE"108"~"115" EXIO32_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0349	5	3	DC power GND overcurrent (EXIO33_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO33_GNDSHORT1 : XTOE"116"~"123" EXIO33_GNDSHORT2 : XTOE"124"~"131" EXIO33_GNDSHORT3 : XTOE"100"~"107" EXIO33_GNDSHORT4 : XTOE"108"~"115" EXIO33_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0350	5	3	DC power GND overcurrent (EXIO34_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO34_GNDSHORT1 : XTOE"116"~"123" EXIO34_GNDSHORT2 : XTOE"124"~"131" EXIO34_GNDSHORT3 : XTOE"100"~"107" EXIO34_GNDSHORT4 : XTOE"108"~"115" EXIO34_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0351	5	3	DC power GND overcurrent (EXIO35_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO35_GNDSHORT1 : XTOE"116"~"123" EXIO35_GNDSHORT2 : XTOE"124"~"131" EXIO35_GNDSHORT3 : XTOE"100"~"107" EXIO35_GNDSHORT4 : XTOE"108"~"115" EXIO35_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0352	5	3	DC power GND overcurrent (EXIO36_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO36_GNDSHORT1 : XTOE"116"~"123" EXIO36_GNDSHORT2 : XTOE"124"~"131" EXIO36_GNDSHORT3 : XTOE"100"~"107" EXIO36_GNDSHORT4 : XTOE"108"~"115" EXIO36_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0353	5	3	DC power GND overcurrent (EXIO37_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO37_GNDSHORT1 : XTOE"116"~"123" EXIO37_GNDSHORT2 : XTOE"124"~"131" EXIO37_GNDSHORT3 : XTOE"100"~"107" EXIO37_GNDSHORT4 : XTOE"108"~"115" EXIO37_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0354	5	3	DC power GND overcurrent (EXIO38_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO38_GNDSHORT1 : XTOE"116"~"123" EXIO38_GNDSHORT2 : XTOE"124"~"131" EXIO38_GNDSHORT3 : XTOE"100"~"107" EXIO38_GNDSHORT4 : XTOE"108"~"115" EXIO38_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0355	5	3	DC power GND overcurrent (EXIO39_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO39_GNDSHORT1 : XTOE"116"~"123" EXIO39_GNDSHORT2 : XTOE"124"~"131" EXIO39_GNDSHORT3 : XTOE"100"~"107" EXIO39_GNDSHORT4 : XTOE"108"~"115" EXIO39_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0356	5	3	DC power GND overcurrent (EXIO40_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO40_GNDSHORT1 : XTOE"116"~"123" EXIO40_GNDSHORT2 : XTOE"124"~"131" EXIO40_GNDSHORT3 : XTOE"100"~"107" EXIO40_GNDSHORT4 : XTOE"108"~"115" EXIO40_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0357	5	3	DC power GND overcurrent (EXIO41_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO41_GNDSHORT1 : XTOE"116"~"123" EXIO41_GNDSHORT2 : XTOE"124"~"131" EXIO41_GNDSHORT3 : XTOE"100"~"107" EXIO41_GNDSHORT4 : XTOE"108"~"115" EXIO41_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0358	5	3	DC power GND overcurrent (EXIO42_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO42_GNDSHORT1 : XTOE"116"~"123" EXIO42_GNDSHORT2 : XTOE"124"~"131" EXIO42_GNDSHORT3 : XTOE"100"~"107" EXIO42_GNDSHORT4 : XTOE"108"~"115" EXIO42_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0359	5	3	DC power GND overcurrent (EXIO43_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO43_GNDSHORT1 : XTOE"116"~"123" EXIO43_GNDSHORT2 : XTOE"124"~"131" EXIO43_GNDSHORT3 : XTOE"100"~"107" EXIO43_GNDSHORT4 : XTOE"108"~"115" EXIO43_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0360	5	3	DC power GND overcurrent (EXIO44_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO44_GNDSHORT1 : XTOE"116"~"123" EXIO44_GNDSHORT2 : XTOE"124"~"131" EXIO44_GNDSHORT3 : XTOE"100"~"107" EXIO44_GNDSHORT4 : XTOE"108"~"115" EXIO44_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0361	5	3	DC power GND overcurrent (EXIO45_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO45_GNDSHORT1 : XTOE"116"~"123" EXIO45_GNDSHORT2 : XTOE"124"~"131" EXIO45_GNDSHORT3 : XTOE"100"~"107" EXIO45_GNDSHORT4 : XTOE"108"~"115" EXIO45_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0362	5	3	DC power GND overcurrent (EXIO46_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO46_GNDSHORT1 : XTOE"116"~"123" EXIO46_GNDSHORT2 : XTOE"124"~"131" EXIO46_GNDSHORT3 : XTOE"100"~"107" EXIO46_GNDSHORT4 : XTOE"108"~"115" EXIO46_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0363	5	3	DC power GND overcurrent (EXIO47_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO47_GNDSHORT1 : XTOE"116"~"123" EXIO47_GNDSHORT2 : XTOE"124"~"131" EXIO47_GNDSHORT3 : XTOE"100"~"107" EXIO47_GNDSHORT4 : XTOE"108"~"115" EXIO47_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0364	5	3	DC power GND overcurrent (EXIO48_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO48_GNDSHORT1 : XTOE"116"~"123" EXIO48_GNDSHORT2 : XTOE"124"~"131" EXIO48_GNDSHORT3 : XTOE"100"~"107" EXIO48_GNDSHORT4 : XTOE"108"~"115" EXIO48_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0365	5	3	DC power GND overcurrent (EXIO49_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO49_GNDSHORT1 : XTOE"116"~"123" EXIO49_GNDSHORT2 : XTOE"124"~"131" EXIO49_GNDSHORT3 : XTOE"100"~"107" EXIO49_GNDSHORT4 : XTOE"108"~"115" EXIO49_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0366	5	3	DC power GND overcurrent (EXIO50_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO50_GNDSHORT1 : XTOE"116"~"123" EXIO50_GNDSHORT2 : XTOE"124"~"131" EXIO50_GNDSHORT3 : XTOE"100"~"107" EXIO50_GNDSHORT4 : XTOE"108"~"115" EXIO50_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0367	5	3	DC power GND overcurrent (EXIO51_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO51_GNDSHORT1 : XTOE"116"~"123" EXIO51_GNDSHORT2 : XTOE"124"~"131" EXIO51_GNDSHORT3 : XTOE"100"~"107" EXIO51_GNDSHORT4 : XTOE"108"~"115" EXIO51_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0368	5	3	DC power GND overcurrent (EXIO52_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO52_GNDSHORT1 : XTOE"116"~"123" EXIO52_GNDSHORT2 : XTOE"124"~"131" EXIO52_GNDSHORT3 : XTOE"100"~"107" EXIO52_GNDSHORT4 : XTOE"108"~"115" EXIO52_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0369	5	3	DC power GND overcurrent (EXIO53_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO53_GNDSHORT1 : XTOE"116"~"123" EXIO53_GNDSHORT2 : XTOE"124"~"131" EXIO53_GNDSHORT3 : XTOE"100"~"107" EXIO53_GNDSHORT4 : XTOE"108"~"115" EXIO53_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0370	5	3	DC power GND overcurrent (EXIO54_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO54_GNDSHORT1 : XTOE"116"~"123" EXIO54_GNDSHORT2 : XTOE"124"~"131" EXIO54_GNDSHORT3 : XTOE"100"~"107" EXIO54_GNDSHORT4 : XTOE"108"~"115" EXIO54_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0371	5	3	DC power GND overcurrent (EXIO55_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO55_GNDSHORT1 : XTOE"116"~"123" EXIO55_GNDSHORT2 : XTOE"124"~"131" EXIO55_GNDSHORT3 : XTOE"100"~"107" EXIO55_GNDSHORT4 : XTOE"108"~"115" EXIO55_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0372	5	3	DC power GND overcurrent (EXIO56_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO56_GNDSHORT1 : XTOE"116"~"123" EXIO56_GNDSHORT2 : XTOE"124"~"131" EXIO56_GNDSHORT3 : XTOE"100"~"107" EXIO56_GNDSHORT4 : XTOE"108"~"115" EXIO56_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0373	5	3	DC power GND overcurrent (EXIO57_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO57_GNDSHORT1 : XTOE"116"~"123" EXIO57_GNDSHORT2 : XTOE"124"~"131" EXIO57_GNDSHORT3 : XTOE"100"~"107" EXIO57_GNDSHORT4 : XTOE"108"~"115" EXIO57_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0374	5	3	DC power GND overcurrent (EXIO58_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO58_GNDSHORT1 : XTOE"116"~"123" EXIO58_GNDSHORT2 : XTOE"124"~"131" EXIO58_GNDSHORT3 : XTOE"100"~"107" EXIO58_GNDSHORT4 : XTOE"108"~"115" EXIO58_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0375	5	3	DC power GND overcurrent (EXIO59_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO59_GNDSHORT1 : XTOE"116"~"123" EXIO59_GNDSHORT2 : XTOE"124"~"131" EXIO59_GNDSHORT3 : XTOE"100"~"107" EXIO59_GNDSHORT4 : XTOE"108"~"115" EXIO59_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0376	5	3	DC power GND overcurrent (EXIO60_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO60_GNDSHORT1 : XTOE"116"~"123" EXIO60_GNDSHORT2 : XTOE"124"~"131" EXIO60_GNDSHORT3 : XTOE"100"~"107" EXIO60_GNDSHORT4 : XTOE"108"~"115" EXIO60_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0377	5	3	DC power GND overcurrent (EXIO61_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO61_GNDSHORT1 : XTOE"116"~"123" EXIO61_GNDSHORT2 : XTOE"124"~"131" EXIO61_GNDSHORT3 : XTOE"100"~"107" EXIO61_GNDSHORT4 : XTOE"108"~"115" EXIO61_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0378	5	3	DC power GND overcurrent (EXIO62_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO62_GNDSHORT1 : XTOE"116"~"123" EXIO62_GNDSHORT2 : XTOE"124"~"131" EXIO62_GNDSHORT3 : XTOE"100"~"107" EXIO62_GNDSHORT4 : XTOE"108"~"115" EXIO62_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0379	5	3	DC power GND overcurrent (EXIO63_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO63_GNDSHORT1 : XTOE"116"~"123" EXIO63_GNDSHORT2 : XTOE"124"~"131" EXIO63_GNDSHORT3 : XTOE"100"~"107" EXIO63_GNDSHORT4 : XTOE"108"~"115" EXIO63_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0380	5	3	DC power GND overcurrent (EXIO64_GNDSHORT*)	(A)Overcurrent occurred in the EXIO PCB. There is a short-circuit or overload on the 24 V power supply GND for the EXIO PCB. (B)There is an EXIO PCB error.	(A)The signal that is most likely causing the problem is displayed in the parentheses: ( ). Check the wiring that corresponds to the following description in the brackets ( ). The number inside the quotation marks (" ") refers to the tape label on the terminal block. EXIO64_GNDSHORT1 : XTOE"116"~"123" EXIO64_GNDSHORT2 : XTOE"124"~"131" EXIO64_GNDSHORT3 : XTOE"100"~"107" EXIO64_GNDSHORT4 : XTOE"108"~"115" EXIO64_GNDSHORT5 : Update the software to the latest version. (B)Replace the EXIO PCB.
IO0381	5	3	Brake connection error 1	A connection error on brake 1 was detected.	Follow one of the procedures below. (a)Check the amplifier and wiring connected to XBKIN1 on the SR PCB, and fix it if there is a problem. (b)The SR PCB is faulty. Replace the SR PCB.
IO0382	5	3	Brake connection error 2	A connection error on brake 2 was detected.	Follow one of the procedures below. (a)Check the amplifier and wiring connected to XBKIN2 on the SR PCB, and fix it if there is a problem. (b)The SR PCB is faulty. Replace the SR PCB.
IO0383	5	3	Brake connection error 3	Brake 3 disconnection was detected.	Follow one of the procedures below. (a)Check the amplifier and wiring connected to XBKIN3 on the SR PCB, and fix it if there is a problem. (b)The SR PCB is faulty. Replace the SR PCB.
IO0384	5	3	Brake connection error 4	Brake 4 disconnection was detected.	Follow one of the procedures below. (a)Check the amplifier and wiring connected to XBKIN4 on the SR PCB, and fix it if there is a problem. (b)The SR PCB is faulty. Replace the SR PCB.
IO0385	5	3	Brake connection error 5	Brake 5 disconnection was detected.	Follow one of the procedures below. (a)Check the amplifier and wiring connected to XBKIN5 on the SR PCB, and fix it if there is a problem. (b)The SR PCB is faulty. Replace the SR PCB.
IO0386	5	3	Main CPU temperature error	The main CPU temperature exceeded 101 degrees.	Turn power off for thirty minutes before resuming operation. If the alarm still triggers again, then the NC PCB is faulty. Replace the NC PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0387	5	3	DC power 12V overcurrent 1 (TP)	(A)Overcurrent occurred in the ES PCB on the teaching pendant. There is a 12 V power short-circuit on the ES PCB. (B)There is a ES PCB error.	(A)The input signal is short-circuited. (B)Replace the ES PCB.
IO0388	5	3	DC power 12V overcurrent 2 (TP)	(A)Overcurrent occurred in the ES PCB on the teaching pendant. There is a 12 V power short-circuit on the ES PCB. (B)There is a ES PCB error.	(A)The input signal is short-circuited. (B)Replace the ES PCB.
IO0389	5	3	DC power 12V overcurrent 3 (TP)	(A)Overcurrent occurred in the ES PCB on the teaching pendant. There is a 12 V(5 V) power short-circuit on the ES PCB. (B)There is a ES PCB error.	(A)The input signal is short-circuited. (B)Replace the ES PCB.
IO0390	5	3	DC power 12V overcurrent 4 (TP)	(A)Overcurrent occurred in the ES PCB on the teaching pendant. There is a 12 V power short-circuit on the ES PCB. (B)There is a ES PCB error.	(A)The input signal is short-circuited. (B)Replace the ES PCB.
IO0500	5	2	Emergency button activated	The emergency switch ON command (a communication command) is received.	Send the emergency switch OFF command (a communication command) and press the **[RST]** key.
IO0501	5	2	Overtravel (+*)	(A)OVTR5P signal was input. (B)The 5th axis was selected and JOG operation by **[RELSE]**+**[+4]** was executed with OVTR5P signal ON.	Select the manual operation mode and press the **[RST]** key while holding down the **[RELSE]** key. Then, while holding down the **[RELSE]** key, move each axis in the direction opposite to that indicated by the alarm using the axis travel keys so that it goes out of the overtravel area.
IO0502	5	2	Overtravel (-*)	(A)OVTR5M signal was input. (B)The 5th axis was selected and JOG operation by **[RELSE]**+**[-4]** was executed with OVTR5M signal ON.	Select the manual operation mode and press the **[RST]** key while holding down the **[RELSE]** key. Then, while holding down the **[RELSE]** key, move each axis in the direction opposite to that indicated by the alarm using the axis travel keys so that it goes out of the overtravel area.
IO0503	5	2	Overtravel (+*)	(A)OVTR6P signal was input. (B)The 6th axis was selected and JOG operation by **[RELSE]**+**[+4]** was executed with OVTR6P signal ON.	Select the manual operation mode and press the **[RST]** key while holding down the **[RELSE]** key. Then, while holding down the **[RELSE]** key, move each axis in the direction opposite to that indicated by the alarm using the axis travel keys so that it goes out of the overtravel area.
IO0504	5	2	Overtravel (-*)	(A)OVTR6M signal was input. (B)The 6th axis was selected and JOG operation by **[RELSE]**+**[-4]** was executed with OVTR6M signal ON.	Select the manual operation mode and press the **[RST]** key while holding down the **[RELSE]** key. Then, while holding down the **[RELSE]** key, move each axis in the direction opposite to that indicated by the alarm using the axis travel keys so that it goes out of the overtravel area.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0505	5	2	Overtravel (+*)	(A)OVTR7P signal was input. (B)The 7th axis was selected and JOG operation by **[RELSE]**+**[+4]** was executed with OVTR7P signal ON.	Select the manual operation mode and press the **[RST]** key while holding down the **[RELSE]** key. Then, while holding down the **[RELSE]** key, move each axis in the direction opposite to that indicated by the alarm using the axis travel keys so that it goes out of the overtravel area.
IO0506	5	2	Overtravel (-*)	(A)OVTR7M signal was input. (B)The 7th axis was selected and JOG operation by **[RELSE]**+**[-4]** was executed with OVTR7M signal ON.	Select the manual operation mode and press the **[RST]** key while holding down the **[RELSE]** key. Then, while holding down the **[RELSE]** key, move each axis in the direction opposite to that indicated by the alarm using the axis travel keys so that it goes out of the overtravel area.
IO0507	5	2	Overtravel (+*)	(A)OVTR8P signal was input. (B)The 8th axis was selected and JOG operation by **[RELSE]**+**[+4]** was executed with OVTR8P signal ON.	Select the manual operation mode and press the **[RST]** key while holding down the **[RELSE]** key. Then, while holding down the **[RELSE]** key, move each axis in the direction opposite to that indicated by the alarm using the axis travel keys so that it goes out of the overtravel area.
IO0508	5	2	Overtravel (-*)	(A)OVTR8M signal was input. (B)The 8th axis was selected and JOG operation by **[RELSE]**+**[-4]** was executed with OVTR8M signal ON.	Select the manual operation mode and press the **[RST]** key while holding down the **[RELSE]** key. Then, while holding down the **[RELSE]** key, move each axis in the direction opposite to that indicated by the alarm using the axis travel keys so that it goes out of the overtravel area.
IO0509	5	2	Thermal error (transformer)	The thermal sensor of transformer 1 operated. (400 V power supply region)	Follow one of the procedures below. 1.Check that excessive load is not connected. 2.Review the machining condition and operation pattern. 3.Repair and/or remove cause 1 and 2 above, turn OFF the power for 30 minutes and then resume operation. 4.Check the connection for the XCPRO connector on the IO PCB. 5.Check the connection on the relay connector TOH.
IO0510	5	2	Abnormal temperature rise in control box	(A)The temperature sensor on the NC PCB detected abnormality. (B)The NC PCB is faulty.	(A)Follow one of the procedures below. (a)Check that the ambient temperature is 40 degrees or less. (b)Check that the cooling fan does not stop. (c)Check the machine parameter. (B)Replace the NC PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0511	5	2	Thermal error (chip shower)	(A)Chip shower pump is overloaded. (B)The set value of the thermal relay is not correct. (C)Power voltage is high. (D)The power supply of the pump is open phased.	(A)Follow the procedure below. 1.Remove the causes of pump overload. - The viscosity of cutting oil is high. - Clogged piping 2.Press the reset button for thermal relay FCP2 in the chip shower protection unit to reset the trip. 3.Operate after turning off the power for 20 minutes. (B)Set value for thermal relay FCP2 in the chip shower protection unit is not correct. (C)Set the power voltage to the rated value, or set to the rated current value that matches the voltage. (D)Follow the procedure below. 1.Check the wiring to the pump. 2.Press the reset button for thermal relay FCP2 in the chip shower protection unit to reset the trip. When there are two chip shower pumps, be sure to check both FCP2 and FCP6.
IO0512	5	2	Thermal error (coolant)	COOLSM signal (BY: Coolant pump thermal) was detected. In the factory-installed PLC program, (A)The coolant pump is overloaded. (B)The set value of the thermal relay is not correct. (C)Power voltage is high. (D)The power supply of the pump is open phased.	Check the PLC program. In the factory-installed PLC program, (A)Follow the procedure below. 1.Remove the causes of pump overload. - The viscosity of cutting oil is high. - Clogged piping 2.Press the reset button for thermal relay FCP1 in the coolant protection unit to reset the trip. 3.Operate after turning off the power for 20 minutes. (B)Check the set value for thermal relay FCP1 in the coolant protection unit. (C)Set the power voltage to the rated value, or set to the rated current value that matches the voltage. (D)Follow the procedure below. 1.Check the wiring to the pump. 2.Press the reset button for thermal relay FCP1 in the coolant protection unit to reset the trip.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0513	5	2	Servo relay 1 error	(A)The servo relay KFS1 did not operate properly. (B)A signal did not input properly to the XRST on the SR PCB. (C)There is a faulty connection between the IL PCB unit and the SR PCB. (D)IL PCB unit is faulty. (E)The SR PCB is faulty.	(A)Check the servo relay KFS1 connection. If the power is turned OFF and there is conduction on the servo relay KFS1, the contact is sticking or adhering. Replace the servo relay KFS1. If there are operation preparations, check the connections and parameters related to the operation preparations. (B)Check the connection on the short cord that is connected to XRST on the SR PCB. (C)Check the IL PCB unit and SR PCB connection. (D)Replace the IL PCB unit. (E)Replace the SR PCB.
IO0514	5	2	Air pressure low	(A)Air pressure decreased. (B)The air pressure switch settings (for the QT clamp and for the main circuit) are incorrect. (C)The setting is incorrect for the machine parameter (system 1: common) <Air blow / Tool wash control method>. (D)The XBPA connector on the IO PCB is disconnected. (E)The check valve for the QT circuit has failed.	(A)Check the primary air pressure and the air piping. (B)Check the settings for each air pressure switch. (C)Check the value of <Air blow/Tool wash control method> of the machine parameter (system 1: common) . (D)Check the connection for the XBPA connector on the IO PCB. (E)Replace the check valve for the QT circuit.
IO0515	5	2	Chip conveyor error	BY: Chip conveyor error SCRWSMER signal was detected. In the factory-installed PLC program, (A)The conveyor slip sensor FC55 operated. (B)The conveyor motor is overloaded. (C)The set value of the thermal relay is not correct.	Check the PLC program. In the factory-installed PLC program, (A)Follow the procedure below. 1.Remove the causes of the hinge conveyor slip. 2.Press reset on the chip conveyor control box. (B)Follow the procedure below. 1.Remove the causes of the overload. 2.Reset trip on the thermal relay in the chip conveyor control box. Floor conveyor FC61 Filter conveyor FC62 Oil skimmer FC63 (option) Back wash pump FC53 (C)Check the set value for the thermal relay. Reset the thermal relay trip after repair.
IO0516	5	2	The 12-V DC power is overcurrent. (4) (ES)	Reserved	Reserved
IO0517	5	2	Multiple enable switches were operated at the same time	The **[ENABLE]** switch at two or more places is pressed at the same time.	Press the **[RST]** key. Do not operate more than one switch at the same time because it is dangerous.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0518	5	2	Thermal error (Chip auger motor)	The COILCONTMLER signal (BY: Thermal error (Chip auger motor)) was detected. In the factory-installed PLC program, (A)The chip auger motor is overloaded. (B)The installation value for the thermal relay is faulty. (C)Power voltage is high. (D)There is an open-phase on the power source for the chip auger motor.	(A)Follow the procedure below. 1.Remove the cause of the overload on the chip auger motor. - Clogged with chips or shavings 2.Reset the trip for the thermal relay FCW1 and FCW2 located inside the C protection unit. 3.Operate the machine after turning the power supply OFF for 20 minutes. (B)Installation default value is incorrect for the thermal relay FCW1 and FCW2, located inside the C protection unit. (C)Set the power voltage to the rated value, or set to the rated current value that matches the voltage. (D)Check the wiring to the chip auger motor. Reset the trip for the thermal relay FCW1 and FCW2 located inside the C protection unit.
IO0519	5	2	EMERGENCY switch – Main operation panel	The **[EMERGENCY]** switch on the main operation panel was pressed.	Remove the cause that prompted the emergency stop, release the **[EMERGENCY]** switch and then press the **[RST]** key. When equipped with a **[MANUAL RESET]** switch, press it.
IO0520	5	2	EMERGENCY switch – Hand-held pulse generator	(A)The **[EMERGENCY]** switch on the manual pulse generator was pressed. (B)The manual pulse generator was disconnected or removed.	(A)Remove the cause that prompted the emergency stop, release the **[EMERGENCY]** switch and then press the **[RST]** key. When equipped with a **[MANUAL RESET]** switch, press it. (B)Check the short cap attachment after attaching or removing the manual pulse generator, and then press the **[RST]** key. When equipped with a **[MANUAL RESET]** switch, press it.
IO0521	5	2	EMERGENCY switch – Teaching pendant	(A)The **[EMERGENCY]** switch on the teaching pendant was pressed. (B)The teaching pendant was disconnected or removed.	(A)Remove the cause that prompted the emergency stop, release the **[EMERGENCY]** switch and then press the **[RST]** key. When equipped with a **[MANUAL RESET]** switch, press it. (B)Check the short cap attachment after attaching or removing the teaching pendant, and then press the **[RST]** key. When equipped with a **[MANUAL RESET]** switch, press it.
IO0522	5	2	EMERGENCY switch – Magazine operation panel	The **[EMERGENCY]** switch on the magazine operation panel was pressed.	Remove the cause that prompted the emergency stop, release the **[EMERGENCY]** switch and then press the **[RST]** key. When equipped with a **[MANUAL RESET]** switch, press it.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO0523	5	2	EMERGENCY switch – Pallet start panel	The **[EMERGENCY]** switch on the front switch panel was pressed.	Remove the cause that prompted the emergency stop, release the **[EMERGENCY]** switch and then press the **[RST]** key. When equipped with a **[MANUAL RESET]** switch, press it.
IO0524	5	2	EMERGENCY switch – Chip conveyor operation panel	The **[EMERGENCY STOP]** switch on the chip conveyor operation box was pressed.	Remove the cause that prompted the emergency stop, release the **[EMERGENCY]** switch and then press the **[RST]** key. When equipped with a **[MANUAL RESET]** switch, press it.
IO0525	5	2	EMERGENCY switch – External extension	External emergency stop signal became open.	Remove the cause that prompted the emergency stop, release the **[EMERGENCY]** switch and then press the **[RST]** key. When equipped with a **[MANUAL RESET]** switch, press it.
IO0526	5	2	IO IL emergency stop output monitoring error	Signal mismatch occurred between the IO PCB and IL PCB unit. (A)XIOIL wiring connection is faulty (B)The IO PCB is defective. (C)IL PCB unit is faulty.	(A)Check the wiring that connects to the XIOIL connector, and if there is a problem, fix it. (B)Replace the IO PCB. (C)Replace the IL PCB unit.
IO0527	5	2	**[MASTER ON]** turned OFF during machine operation	**[MASTER ON]** conditions were turned OFF during machine operation. - **[EMERGENCY]** switch was pressed. - External emergency stop signal became open. - The emergency switch ON command (a communication command) is received.	Fix the problem that caused the **[MASTER ON]** conditions to turn OFF, and then press the **[RST]** key and **[MANUAL RESET]** switch.
IO2000	4	2	Pot operation timeout	(A)Moving up or moving down of the pot was not completed within the specified time limit. (B)2 The alarm detection time is too short. (C)The pot moves slowly and takes too much time. (D)The pot sensor is not input.	(A)Restore following the procedure below. 1.Select the manual operation mode and press the **[RST]** key while holding down the **[RELSE]** key. 2.Press the **[ATC]** key while holding down the **[RELSE]** key to move the pot to the correct position. (B)Check the machine parameter (system 3: common) setting for <Pot operation monitor time>. (C)The speed controller of the pot cylinder is turned down excessively. (D)Restore following one of the procedures below. (a)Check the connection for the XMAG1 or XMAG2 connector on the IO PCB. (b)Check the connections for XGUP, XGDN and XGPUD inside the relay box. (c)Positioning of pot up sensor and pot down sensor is faulty. (d)The pot up sensor or pot down sensor may be faulty. (e)The IO PCB is faulty.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2001	4	2	Pot sensor error	The pot upper end/lower end/both ends sensor is ON when the power is turned ON, when the **[RST]** key is pressed (except when the **[RELSE]** key is pressed), and when pot operation is monitored.	1.Recover using the **[RST]** key. 2.Check the connection for the XMAG2 connector on the IO PCB. 3.Check the connections for XGUP, XGDN and XGPUD inside the relay box. 4.If the alarm still triggers even after checking, one of the following is faulty. Contact the nearest BROTHER approved service dealer. (a)The position adjustment is faulty for the pot amplifier sensor or the pot down sensor. (b)The pot amplifier sensor or the pot down sensor is faulty. (c)The IO PCB is faulty.
IO2002	4	2	Detection signal off	The detection signal is not ON in measurement operation.	Check the measurement position after pressing the **[RST]** key.
IO2003	4	2	Detection signal on	The detection signal is not OFF in measurement operation.	Check the measurement position after pressing the **[RST]** key.
IO2004	4	2	Signal output timeout	001)After the external signal is output, the completion signal is not turned ON even when the external signal reading time limit has been elapsed.	001)Follow one of the procedures below. (a)Check the completion signal. (b)Change the setting for user parameter (switch 1: programming)<External signal reading time limit>.
				002)After M46X is output, the M46X signal is not turned ON or OFF even when the specified time limit has been elapsed.	002)Follow one of the procedures below. (a)Check the completion signal. (b)Change the setting for user parameter (switch 1: programming)<External signal reading time limit>.
IO2005	4	2	Pot operation time too short	The time required for the pot to move up or down was shorter than the machine parameter (system 3: common) <Minimum pot operation time>.	1.Check the machine parameter (system 3: common) <Minimum pot operation time> setting. 2.If the alarm still triggers even after checking, one of the following is faulty. Contact the nearest BROTHER approved service dealer. (a)The position adjustment may be faulty for the pot amplifier sensor or the pot down sensor. (b)The pot amplifier sensor or the pot down sensor may be faulty. (c)The operation adjustment may be faulty for the pot amplifier down cylinder.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2006	4	2	Tool breakage sensor error	(A)If there is no tool breakage detection option, then the settings are incorrect for the parameters related to the tool breakage detection. (B)If there is a tool breakage detection option, then sensor input is not normal for the tool breakage detector.	(A)Set the user parameter (tool breakage detection) <Tool breakage detection option> to <0: Not equipped>. (B)Follow one of the procedures below. (a)Set the user parameter (tool breakage detection) <Tool breakage detection option> to <2:Type2>. (b)Check for chips entangled with the detection arm. (c)The tool breakage detection device is faulty. (d)The IO PCB is faulty.
IO2007	4	2	Tool breakage detection timeout	(A)If there is no tool breakage detection option, then the settings are incorrect for the parameters related to the tool breakage detection. (B)If there is a tool breakage detection option, then sensor input is not normal for the tool breakage detector.	(A)Set the user parameter (tool breakage detection) <Tool breakage detection option> to <0: Not equipped>. (B)Follow one of the procedures below. (a)Check for chips entangled with the detection arm. (b)The tool breakage detection device is faulty. (c)The IO PCB is faulty.
IO2008	4	2	SP override connector not connected	(A)The XSPOV connector on the KEY PCB is disconnected and/or the connection is faulty. (B)The spindle override switch or the KEY PCB is faulty.	(A)Make sure that the spindle override switch or the special short connector is connected to the XSPOV connector on the KEY PCB. When not using the spindle override, if the user parameter (switch 1: common) <Prevent spindle override> is set to <1: Yes>, then the spindle override can be disabled and this alarm can also be reset with the **[RST]** key. (B)Replace the spindle override switch or the KEY PCB.
IO2009	4	2	Thermal error (Center-through-coolant)	CTOHERR signal (BY: Thermal error (CT coolant)) was detected. In the factory-installed PLC program, (A)The coolant pump is overloaded. (B)The set value of the thermal relay is not correct. (C)Power voltage is high. (D)The power supply of the pump is open phased.	(A)Follow the procedure below. 1.Remove the causes of pump overload. - The viscosity of cutting oil is high. - The piping is clogged. 2.Press the reset button for thermal relay FCP3 in the CTS protection unit to reset the trip. 3.Operate after turning off the power for 20 minutes. (B)Set value for thermal relay FCP3 in the CTS protection unit is not correct. (C)Set the power voltage to the rated value, or set to the rated current value that matches the voltage. (D)Follow the procedure below. 1.Check the wiring to the pump. 2.Press the reset button for thermal relay FCP3 in the CTS protection unit to reset the trip.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2010	4	2	CTS pressure has not increased	CTSUPPER signal (BY: CTS pressurizing error) was detected. In the factory-installed PLC program, the pressure in the piping did not increase when discharging coolant. (A)Coolant is not in the piping. (B)Coolant is leaking from the piping. (C)Oil level of the tank is lowered. (D)The valve is faulty. (E)The pump is faulty or damaged. (F)The pressure switch is abnormal. (G)The wrong value has been set in the machine parameter. (H)The clean tank for the cyclone filter device is empty.	(A)In there is no coolant inside the piping, follow one of the procedures below to support recovery. (a)Immediately after piping, or at the second or third start up after an extended shutdown, coolant may not be in the piping. Repeat the procedure by pressing the **[RST]** key to reset the alarm and turn ON the coolant again. (b)There may be no coolant inside the piping while the back wash cycle is being executed. Check if the center-through-coolant ON command issued immediately after the program ends, or immediately after the back wash cycle command. Repeat the procedure by pressing the **[RST]** key to reset the alarm and turn ON the coolant again. (B)Check the piping for abnormality. (C)Check the coolant level of the tank and supply coolant. If no abnormality is found, also check the user parameter (switch 1: installation) <CTS pressurize check delay time.> (D)If the pump operates, check if the valve is faulty. (E)The pump is abnormal. (F)The pressure switch is abnormal. (G)Make sure that the machine parameter (system 1: common) <Center-through-coolant> or <Cyclone filter> is set correctly. (H)The cyclone filter device setting is different. (a)When the cyclone filter device is equipped with the tool wash system and CTS device options, make sure that the machine parameter (system 1: common) <Air blow/Tool wash control method> is set to <3:Type 4>. (b)Make sure that the pump wiring is correct.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2011	4	2	CTS pressure has not lowered	CTSUNPER signal (BY: CTS depressurizing error) was detected. In the factory-installed PLC program, (A)The pressure in the piping did not decrease. (B)The tool and tool holder are abnormal. (C)The piping is clogged. (D)The pressure switch is abnormal. (E)The valve is faulty.	(A)Press the manual buttons on the discharge valve and drain valve of the CTS unit to lead coolant in the piping to the drain. (B)Follow one of the procedures below. (a)Make sure that the tool and tool holder are for the CTS. If the tool and tool holder are not for the CTS, then set the user parameter (switch 1: installation) <CTS depressurize check delay time> to <0>, perform the M479 command in MDI operation mode and make sure that no alarm is triggered. If the problem is not resolved, contact the nearest Brother approved service dealer. (b)Check the hole for CTS is not clogged. (C)Check the piping for abnormality. If no abnormality is found, also check the user parameter (switch 1: installation) <CTS depressurize check delay time>. (D)The pressure switch is abnormal. (E)If the alarm occurs during back washing, check that the valve is not faulty.
IO2012	4	2	Pot shutter timeout	The pot shutter did not finish opening or closing within the machine parameter (system 3: common) <Pot shutter timeout period>.	1.Recover using the **[RST]** key. 2.Check the connection for the XMAG1 or XMAG2 connector on the IO PCB. 3.Check the connections for XGOP, XGCL and XGSOC inside the relay box. 4.Check the adjustment position on the open end or close end sensor for the pot shutter. 5.Check the machine parameter (system 3: common) setting for <Pot shutter timeout period>. 6.If the alarm still triggers even after checking, one of the following is faulty. Contact the nearest BROTHER approved service dealer. (a)The open end or close end sensor for the pot shutter is faulty. (b)The IO PCB is faulty.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2013	4	2	Pot shutter is not open.	The pot shutter did not open when pot operation started.	1.Recover using the **[RST]** key. 2.Check the connection for the XMAG1 or XMAG2 connector on the IO PCB. 3.Check the connections for XGOP and XGSOC inside the relay box. 4.Check the adjustment position on the open end sensor for the pot shutter. 5.If the alarm still triggers even after checking, one of the following is faulty. Contact the nearest BROTHER approved service dealer. (a)The open end sensor for the pot shutter is faulty. (b)The IO PCB is faulty.
IO2014	4	2	Pot shutter sensor error	Both of the pot shutter open end sensor and close end sensor were ON when the power was ON and the **[RST]** key was pressed.	1.Check the connection for the XMAG1 or XMAG2 connector on the IO PCB. 2.Check the connections for XGOP and XGCL inside the relay box. 3.If the alarm still triggers even after checking, one of the following is faulty. Contact the nearest BROTHER approved service dealer. (a)The open end or close end sensor for the pot shutter is faulty. (b)The cable is short-circuited. (c)The IO PCB is faulty.
IO2015	4	2	ATC arm shutter timeout	ATC arm shutter open/close was not completed within 5 seconds.	1.Recover using the **[RST]** key. 2.Check the connection for the XMAG1 or XMAG2 connector on the IO PCB. 3.Check the adjustment position on the open end or close end sensor for the ATC arm shutter. 4.If the alarm still triggers even after checking, one of the following is faulty. Contact the nearest BROTHER approved service dealer. (a)The open end or close end sensor for the ATC arm shutter is faulty. (b)The IO PCB is faulty.
IO2016	4	2	ATC arm shutter is not open.	The ATC arm shutter did not open when arm turn operation started.	1.Recover using the **[RST]** key. 2.Check the connection for the XMAG1 or XMAG2 connector on the IO PCB. 3.Check the adjustment position on the open end sensor for the ATC arm shutter. 4.If the alarm still triggers even after checking, one of the following is faulty. Contact the nearest BROTHER approved service dealer. (a)The open end sensor for the ATC arm shutter is faulty. (b)The IO PCB is faulty.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2017	4	2	ATC arm shutter sensor error	Both of the ATC arm shutter open end sensor and close end sensor were ON when the power was ON and the **[RST]** key was pressed.	1.Check the connection for the XMAG1 or XMAG2 connector on the IO PCB. 2.If the alarm still triggers even after checking, one of the following is faulty. Contact the nearest BROTHER approved service dealer. (a)The open end or close end sensor for the ATC arm shutter is faulty. (b)The cable is short-circuited. (c)The IO PCB is faulty.
IO2018	4	2	*-axis not clamped	The QT (4th axis) clamp confirmation input signal is not turned on even after 3 seconds have elapsed.	Check following the procedure below. 1.Check the air pressure. 2.Check that the solenoid YV4 is operating. If it occurs repeatedly, contact the nearest BROTHER approved service dealer.
IO2019	4	2	*-axis not unclamped	The QT (4th axis) unclamp confirmation input signal is not turned ON even after 3 seconds have elapsed.	Check following the procedure below. 1.Check the connection of the relay connector XGJU4. 2.Unclamp sensor positioning and the sensor body are faulty. 3.Check the connection for the XQVU4 or XBGU4 connector on the IO PCB. If it occurs repeatedly, contact the nearest BROTHER approved service dealer.
IO2020	4	2	*-axis clamped	(A)The unclamp confirmation input signal was turned off or the clamp confirmation input signal was turned on while QT (4th axis) was turning. (B)The unclamp confirmation input signal was turned off or the clamp confirmation input signal was turned on without QT (4th axis) indexed.	(A)The unclamp confirmation signal or clamp confirmation signal may be faulty. If it occurs repeatedly, contact the nearest BROTHER approved service dealer. (B)Check the connection for the XQVU4 or XBGU4 connector on the IO PCB. If it occurs repeatedly, contact the nearest BROTHER approved service dealer.
IO2021	4	2	*-axis unclamped	(A)The clamp confirmation input signal was turned off or the unclamp confirmation input signal was turned on while QT (4th axis) stopped. (B)The clamp confirmation input signal was turned off or the unclamp confirmation input signal was turned on with QT (4th axis) indexed.	(A)The clamp confirmation signal or unclamp confirmation signal may be faulty. If it occurs repeatedly, contact the nearest BROTHER approved service dealer. (B)Check the connection for the XQVU4 or XBGU4 connector on the IO PCB. If it occurs repeatedly, contact the nearest BROTHER approved service dealer.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2022	4	2	*-axis not clamped	The 5th-axis cannot be clamped even after 3 seconds has elapsed. (A)The output target or destination of the unclamp output signal is wrong. (B)The logic of the unclamp output signal is inverse. (C)The input target and destination of the unclamp confirmation signal or clamp confirmation signal are wrong. (D)The logic of the unclamp confirmation signal or the clamp confirmation signal is inverse. (E)Use dry contacts or two-wire proximity sensors for the unclamp confirmation signal and the clamp confirmation signal.	(A)Check the following. (a)Check the output setting target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (B)Check the machine parameter (system 2: additional axis) <unclamp output signal>(5th-axis). (C)Check the following. (a)Check the input target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (D)Check the machine parameters (system 2: additional axis) <unclamp check input signal>(5th-axis) and <clamp check input signal>(5th-axis). (E)Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (system 2: additional axis) <clamp check input signal>(5th-axis)
IO2023	4	2	*-axis not unclamped	The 5th axis cannot be unclamped even after 3 seconds has elapsed. (A)The unclamp valve does not operate. (B)The unclamp confirmation signal is not input. (C)There may be an error or problem on the connection with the IO PCB.	(A)The unclamping portion is faulty. (B)The unclamp confirmation signal is faulty. (C)Check the connection for the XBPAU or XQVU5 connector on the IO PCB.
IO2024	4	2	*-axis clamped	The unclamp confirmation signal was turned off while the 5th axis was turning.	The unclamp confirmation signal is faulty.
IO2025	4	2	*-axis unclamped	The clamp confirmation signal was turned off or the unclamp confirmation signal was turned on while the 5th axis stopped.	(a)The unclamping portion is faulty. (b)The unclamp confirmation signal or clamp confirmation signal is faulty. Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (system 2: additional axis) <clamp check input signal>(5th-axis) (c)Check the connection for the XBPAU or XQVU5 connector on the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2026	4	2	*-axis not clamped	The 6th-axis cannot be clamped even after 3 seconds has elapsed. (A)The output target or destination of the unclamp output signal is wrong. (B)The logic of the unclamp output signal is inverse. (C)The input target and destination of the unclamp confirmation signal or clamp confirmation signal are wrong. (D)The logic of the unclamp confirmation signal or the clamp confirmation signal is inverse. (E)Use dry contacts or two-wire proximity sensors for the unclamp confirmation signal and the clamp confirmation signal.	(A)Check the following. (a)Check the output setting target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (B)Check the machine parameter (system 2: additional axis) <unclamp output signal>(6th-axis). (C)Check the following. (a)Check the input target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (D)Check the machine parameters (system 2: additional axis) <unclamp check input signal>(6th-axis) and <clamp check input signal>(6th-axis). (E)Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (system 2: additional axis) <clamp check input signal>(6th-axis)
IO2027	4	2	*-axis not unclamped	The 6th axis cannot be unclamped even after 3 seconds has elapsed. (A)The unclamp valve does not operate. (B)The unclamp confirmation signal is not input.	(A)The unclamping portion is faulty. (B)The unclamp confirmation signal is faulty.
IO2028	4	2	*-axis clamped	The unclamp confirmation signal was turned off while the 6th axis was turning.	The unclamp confirmation signal is faulty.
IO2029	4	2	*-axis unclamped	The clamp confirmation signal was turned off or the unclamp confirmation signal was turned on while the 6th axis stopped.	(a)The unclamping portion is faulty. (b)The unclamp confirmation signal or clamp confirmation signal is faulty. Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (system 2: additional axis) <clamp check input signal>(6th-axis)

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2030	4	2	*-axis not clamped	The 7th-axis cannot be clamped even after 3 seconds has elapsed. (A)The output target or destination of the unclamp output signal is wrong. (B)The logic of the unclamp output signal is inverse. (C)The input target and destination of the unclamp confirmation signal or clamp confirmation signal are wrong. (D)The logic of the unclamp confirmation signal or the clamp confirmation signal is inverse. (E)Use dry contacts or two-wire proximity sensors for the unclamp confirmation signal and the clamp confirmation signal.	(A)Check the following. (a)Check the output setting target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (B)Check the machine parameter (system 2: additional axis) <unclamp output signal>(7th-axis). (C)Check the following. (a)Check the input target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (D)Check the machine parameters (system 2: additional axis) <unclamp check input signal>(7th-axis) and <clamp check input signal>(7th-axis). (E)Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (system 2: additional axis) <clamp check input signal>(7th-axis)
IO2031	4	2	*-axis not unclamped	The 7th axis cannot be unclamped even after 3 seconds has elapsed. (A)The unclamp valve does not operate. (B)The unclamp confirmation signal is not input.	(A)The unclamping portion is faulty. (B)The unclamp confirmation signal is faulty.
IO2032	4	2	*-axis clamped	The unclamp confirmation signal was turned off while the 7th axis was turning.	The unclamp confirmation signal is faulty.
IO2033	4	2	*-axis unclamped	The clamp confirmation signal was turned off or the unclamp confirmation signal was turned on while the 7th axis stopped.	(a)The unclamping portion is faulty. (b)The unclamp confirmation signal or clamp confirmation signal is faulty. Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (system 2: additional axis) <clamp check input signal>(7th-axis)

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2034	4	2	*-axis not clamped	The 8th-axis cannot be clamped even after 3 seconds has elapsed. (A)The output target or destination of the unclamp output signal is wrong. (B)The logic of the unclamp output signal is inverse. (C)The input target and destination of the unclamp confirmation signal or clamp confirmation signal are wrong. (D)The logic of the unclamp confirmation signal or the clamp confirmation signal is inverse. (E)Use dry contacts or two-wire proximity sensors for the unclamp confirmation signal and the clamp confirmation signal.	(A)Check the following. (a)Check the output setting target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (B)Check the machine parameter (system 2: additional axis) <unclamp output signal>(8th-axis). (C)Check the following. (a)Check the input target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (D)Check the machine parameters (system 2: additional axis) <unclamp check input signal>(8th-axis) and <clamp check input signal>(8th-axis). (E)Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (system 2: additional axis) <clamp check input signal>(8th-axis)
IO2035	4	2	*-axis not unclamped	The 8th axis cannot be unclamped even after 3 seconds has elapsed. (A)The unclamp valve does not operate. (B)The unclamp confirmation signal is not input.	(A)The unclamping portion is faulty. (B)The unclamp confirmation signal is faulty.
IO2036	4	2	*-axis clamped	The unclamp confirmation signal was turned off while the 8th axis was turning.	The unclamp confirmation signal is faulty.
IO2037	4	2	*-axis unclamped	The clamp confirmation signal was turned off or the unclamp confirmation signal was turned on while the 8th axis stopped.	(a)The unclamping portion is faulty. (b)The unclamp confirmation signal or clamp confirmation signal is faulty. Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (system 2: additional axis) <clamp check input signal>(8th-axis)
IO2038	4	2	The tool washing liquid surface is abnormal.	(A)TW_LQLVERR signal (BY: Tool wash coolant level error) was detected. In the factory-installed PLC program, the coolant level was under the minimum dischargeable level in the accumulator when tool wash was turned ON. (B)The wrong value has been set in the machine parameter.	Check the PLC program. In the factory-installed PLC program, (A)Follow one of the procedures below. (a)The tool washing filter must be replaced or cleaned. (b)The tool wash coolant level sensor is faulty. Replace it. (B)Make sure that the machine parameter (system 1: common) <Cyclone filter> is set correctly.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2039	4	2	Tool washing liquid surface sensor is abnormal.	The tool wash coolant level sensor is faulty.	Follow the procedure below. 1.Replace the tool wash coolant level sensor. 2.Press the **[CLT.P]** key.
IO2040	4	2	*-axis clamp sensor error	The clamp confirmation input signal is not input correctly during QT (4th axis) unclamp operation.	Check the clamp confirmation input signal. If it occurs repeatedly, contact the nearest BROTHER approved service dealer.
IO2041	4	2	*-axis unclamp sensor error	The unclamp confirmation input signal is not input correctly during QT (4th axis) clamp operation.	Check the unclamp confirmation input signal. If it occurs repeatedly, contact the nearest BROTHER approved service dealer.
IO2042	4	2	Line filter error	CTSLFER signal (BY: Line filter error) was detected. In the factory-installed PLC program, Line filter differential pressure SW was turned ON while CTS is ON.	Follow the procedure below. 1.Recover using the **[RST]** key. 2.Replace the line filter element. 3.Replace the pressure sensor for the line filter.
IO2043	4	2	The automatic door operated when it was locked.	The automatic door opened when an attempt was made to lock it.	Press the **[RST]** key to clear the alarm. Do not open the automatic door just before operating the machine.
IO2044	4	2	Rapid traverse override connection error	(A)The XFOV connector on the KEY PCB is disconnected and/or the connection is faulty. (B)The rapid traverse override switch or the KEY PCB is faulty.	(A)Check the XFOV connector. When not using the rapid traverse override, if the user parameter (switch 1: common) <Prevent rapid traverse override> is set to <1: Yes>, then the rapid traverse override can be disabled and this alarm can also be reset with the **[RST]** key. (B)Replace the **[RAPID TRAVERSE OVERRIDE]** switch or the KEY PCB.
IO2045	4	2	Cutting feedrate override connection error	(A)The XMOV connector on the KEY PCB is disconnected and/or the connection is faulty. (B)The feedrate override switch or the KEY PCB is faulty.	(A)Check the XMOV connector. When not using the feedrate override, if the user parameter (switch 1: common) <Prevent cutting feedrate override> is set to <1: Yes>, then the feedrate override can be disabled and this alarm can also be reset with the **[RST]** key. (B)Replace the **[FEEDRATE OVERRIDE]** switch or the KEY PCB.
IO2046	4	2	Spindle override connection error	(A)The XSPOV connector on the KEY PCB is disconnected and/or the connection is faulty. (B)The spindle override switch or the KEY PCB is faulty.	(A)Make sure that the spindle override switch or the special short connector is connected to the When not using the spindle override, if the user parameter (switch 1: common) <Prevent spindle override> is set to <1: Yes>, then the spindle override can be disabled and this alarm can also be reset with the **[RST]** key. (B)Replace the **[SPINDLE OVERRIDE]** switch or the KEY PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO2047	4	2	Rapid traverse override not connected	(A)The XFOV connector on the KEY PCB is disconnected and/or the connection is faulty. (B)The rapid traverse override switch or the KEY PCB is faulty.	(A)Check the XFOV connector. When not using the rapid traverse override, if the user parameter (switch 1: common) <Prevent rapid traverse override> is set to <1: Yes>, then the rapid traverse override can be disabled and this alarm can also be reset with the **[RST]** key. (B)Replace the **[RAPID TRAVERSE OVERRIDE]** switch or the KEY PCB.
IO2048	4	2	Thermal error (cyclone coolant drawn up)	The CFOHERR signal (BY: Thermal error (cyclone coolant drawn up)) was detected. In the factory-installed PLC program, (A)There is an overload on the pump for the coolant. (B)The set value for the thermal relay is faulty. (C)Power voltage is high. (D)There is an open-phase on the power source for the pump.	(A)Follow the procedure below. 1.Remove the cause of the overload on the pump. - Cutting fluid with high viscosity - Clogged pipe 2.Press the reset button for thermal relay FCP8 in the cyclone filter protection unit to reset the trip. 3.Operate the machine after turning the power supply OFF for 20 minutes. (B)Set value for thermal relay FCP8 in the cyclone filter protection unit is not correct. (C)Set the power voltage to the rated value, or set to the rated current value that matches the voltage. (D)Follow the procedure below. 1.Check the wiring to the pump. 2.Press the reset button for thermal relay FCP8 in the cyclone filter protection unit to reset the trip.
IO2049	4	2	ATC arm position error	(A)The ATC arm is not at the zero point. (B)All data was input, or the start data (adjusted absolute values) from the backup memory recovery operation was input.Encoder position data does not match the machine coordinates.	1.When the alarm <<The machine coordinates may be out of position.>> is triggered, perform the expired battery recovery operation. 2.When another cause (besides 1. above) applies, change to manual operation mode, and enable the recovery operation on the ATC arm position recovery screen. Then, while pressing the **[RELSE]** key, press the **[RST]** key to reset the alarm.Hereafter, follow the recovery procedure and perform the operations accordingly.
IO4000	3	2	Abnormal temperature rise in control box	(A)The temperature sensor on the NC PCB detected abnormality. (B)The NC PCB is faulty.	(A)Follow one of the procedures below. (a)Check that the ambient temperature is 40 degrees or less. (b)Check that the cooling fan does not stop. (c)Check the machine parameter. (B)Replace the NC PCB.
IO4001	3	2	Line filter error	CTSLFER signal (BY: Line filter error) was detected. In the factory-installed PLC program, Line filter differential pressure SW was turned ON while CTS is ON.	Follow the procedure below. 1.Recover using the **[RST]** key. 2.Replace the line filter element. 3.Replace the pressure sensor for the line filter.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO4002	3	2	Back wash filter error	CTSRVFER signal (BY: Back wash filter error) was detected. In the factory-installed PLC program, Back wash filter differential pressure SW was turned ON while CTS is ON.	Follow the procedure below. 1.Recover using the **[RST]** key. 2.Back wash by M496. If it still occurs repeatedly, contact the nearest BROTHER approved service dealer.
IO4003	3	2	The coolant level has dropped.	COOLLOWER signal (BY: Coolant low level) was detected. In the factory-installed ladder program, the coolant amount is low.	Increase coolant amount.
IO4004	3	2	Workpiece coordinate zero setting error	001)A value outside of the setting range was set in the workpiece coordinate system selection.	001)Check the PLC program.
				002)A value outside of the setting range was set for the workpiece coordinate zero.	002)Check the PLC program.
IO4005	3	2	Writing not possible for workpiece coordinate zero	An attempt was made from the PLC program to rewrite the workpiece coordinate zero (being used) in one of the following situations. -Scaling -Mirror image mode -Feature coordinate manufacturing mode engaged	Check the PLC program, and perform the write operation only when the workpiece coordinate zero can be written.
IO4006	3	2	Rapid feed override switch is off the position.	(A)The **[RAPID TRAVERSE OVERRIDE]** switch is off the scale. (B)**[RAPID TRAVERSE OVERRIDE]** switch or KEY PCB is faulty.	(A)Adjust the **[RAPID TRAVERSE OVERRIDE]** switch to a setting mark and then press the **[RST]** key. When not using the rapid traverse override, if the user parameter (switch 1: common) <Prevent rapid traverse override> is set to <1: Yes>, then the rapid traverse override can be disabled and this alarm can also be reset with the **[RST]** key. (B)When the alarm still occurs even after calibrating the switch, replace the **[RAPID TRAVERSE OVERRIDE]** switch or the KEY PCB.
IO4007	3	2	Feedrate override switch is off the position.	(A)Potential causes are noted below: (B)**[FEEDRATE OVERRIDE]** switch or KEY PCB is faulty.	(A)Adjust the **[FEEDRATE OVERRIDE]** switch to a setting mark and then press the **[RST]** key. When not using the feedrate override, if the user parameter (switch 1: common) <Prevent cutting feedrate override> is set to <1: Yes>, then the feedrate override can be disabled and this alarm can also be reset with the **[RST]** key. (B)When the alarm still occurs even after calibrating the switch, replace the **[FEEDRATE OVERRIDE]** switch or the KEY PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO4008	3	2	Spindle override switch is off the position.	(A)The **[SPINDLE OVERRIDE]** switch is off the scale. (B)**[SPINDLE OVERRIDE]** switch or KEY PCB is faulty.	(A)Adjust the **[SPINDLE OVERRIDE]** switch to a setting mark and then press the **[RST]** key. When not using the spindle override, if the user parameter (switch 1: common) <Prevent spindle override> is set to <1: Yes>, then the spindle override can be disabled and this alarm can also be reset with the **[RST]** key. (B)When the alarm still occurs even after calibrating the switch, replace the **[SPINDLE OVERRIDE]** switch or the KEY PCB.
IO5500	2	2	Pressure high (automatic oiling)	(A)The pressure was not reduced even just before supplying oil. (B)There is an error with the connection for the XLUB connector on the IO PCB.	(A)Follow one of the procedures below. (a)Check the machine parameter. (b)The lubrication pump is faulty. (c)The pressure sensor is faulty. (d)Relay KFL1 is faulty. (e)Piping is clogged. (B)Check the connection for the XLUB connector on the IO PCB.
IO5501	2	2	Pressure low (automatic oiling)	(A)Pressure did not rise even though the lubrication pump was turned on. (B)There is an error with the connection for the XLUB connector on the IO PCB.	(A)Follow one of the procedures below. (a)Lubrication oil leaks in the track. Check the piping. (b)Check the machine parameter. (c)The lubrication pump is faulty. (d)The pressure sensor is faulty. (e)Relay KFL1 is faulty. (B)Check the connection for the XLUB connector on the IO PCB.
IO5502	2	2	Spindle motor fan locked	The spindle motor fan was locked and the thermal of the fan was turned on.	The spindle motor fan is not rotating. Follow one of the procedures below. (a)Make sure that the motor breaker FC2 is ON. (b)Clean the oil adhering to the spindle motor fan. (c)Check the connection for the XSPKF connector on the IO PCB. (d)Check the connection for the XSFOH connector in spindle motor terminal box.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO5503	2	2	Tool wash filter clogging is predicted.	The number of checks for low fluid level IO_TCLS_OK (Tool cleaning fluid level sensor) at the end of the tool cleaning discharge has exceeded the user parameter (switch 1: installation) setting for <<No. of tool wash filter clogging warning checks (Type 4)>>. In the factory-installed PLC program, (A)The tool wash filter was clogged. (B)The tool change was carried out consecutively while the ATC falls at a slow speed. (C)Tool change was carried out consecutively even though the timing for the AT-axis was slow or late.	Check the PLC program. In the factory-installed PLC program, (A)The tool washing filter must be replaced or cleaned. (B)Review the user parameter (switch 1: installation) <No. of tool wash filter clogging warning checks(Type 4)> or the ATC falling speed. (C)Review the user parameter (switch 1: installation) <No. of tool wash filter clogging warning checks(Type 4)> or the <ATC arm turn speed ratio 1 (M422)>,<ATC arm turn speed ratio 2 (M423)>.
IO5504	2	2	Duplicated errors of expansion input board	The same signal name is set to several terminal blocks via an external input signal.	Search for terminals that are redundant or duplicated using the "Overlapping terminal check" (<Overlapping terminal check> key) on the external input signal screen, and delete accordingly.
IO5505	2	2	Line filter error	CTSLFER signal (BY: Line filter error) was detected. In the factory-installed PLC program, Line filter differential pressure SW was turned ON while CTS is ON.	Follow the procedure below. 1.Recover using the **[RST]** key. 2.Replace the line filter element. 3.Replace the pressure sensor for the line filter.
IO5506	2	2	Automatic greasing signal abnormal	*Pump stop signal did not turned on even just before greasing.	Follow one of the procedures below. (a)Press the **[RST]** key. (b)Check the parameter setting. Machine parameter (system 1: common) <Automatic greasing pause 1>, <Automatic greasing pause 2>, <Automatic greasing abnormal pressure monitoring time> (c)The greasing pump is faulty. (d)The automatic greasing device is faulty.
IO5507	2	2	Automatic greasing discharge abnormal	A discharge error of the greasing device was detected.	Follow one of the procedures below. (a)Check the parameter setting. Machine parameter (system 1: common) <Automatic greasing abnormal pressure monitoring time> (b)Grease leaks in the track. Check the piping. (c)The greasing pump is faulty. (d)The automatic greasing device is faulty.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO5508	2	2	Grease was not supplied automatically	Greasing was not executed even though the greasing pump was turned on.	Follow one of the procedures below. (a)Check the parameter setting. Machine parameter (system 1: common) <Automatic greasing completion monitoring time> (b)Grease leaks in the track. Check the piping. (c)The greasing pump is faulty. (d)The automatic greasing device is faulty.
IO5509	2	2	Chip conveyor relay error	(A)The wiring around the chip conveyor protection relay is disconnected. (B)There is a chip conveyor protection relay failure or malfunction.	(A)Check the wiring connection. (B)The chip conveyor protection relays KFP4 and KFP5 are adhering. Replace the corresponding relay.
IO5510	2	2	Chip auger relay error	(A)The circuit around the chip auger protection relay is disconnected. (B)The chip auger protection relay is defective.	(A)Check the wiring connection. (B)The chip auger protection relays KFC2 and KFC3 are adhering. Replace the corresponding relay.
IO5511	2	2	Touch panel connection error	(A)The connection is faulty for the XTOUCH connector on the KEY PCB or the connector on the TC PCB. (B)The connector is disconnected and/or the connection is faulty for the XUSB_B on the KEY PCB or for the XUSB3 on NC PCB. (C)The KEY PCB, NC PCB or TC PCB is faulty.	(A)Check the connection with the XTOUCH connector on the KEY PCB and the connector on the TC PCB. (B)Check the connection with the XUSB_B connector on the KEY PCB or with the XUSB3 connector on the NC PCB. (The cable is not connected for this connector depending on the machine model.) (C)Replace the KEY PCB, the NC PCB or the TC PCB.
IO5512	2	2	Main CPU temperature error	The main CPU temperature exceeded 95 degrees for ten seconds.	Turn power off for thirty minutes before resuming operation.
IO5513	2	2	Coolant level is low	The user parameter (switch 1: installation) <Time extension when coolant level has dropped> was set to <1: Enable> and the COOLLOWER signal (BY: Coolant low level) was detected.	Increase coolant amount.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO7000	1	2	P1-axis not clamped	The P1 axis cannot be clamped even after 3 seconds has elapsed. (A)The output target or destination of the unclamp output signal is wrong. (B)The logic of the unclamp output signal is inverse. (C)The input target and destination of the unclamp confirmation signal or clamp confirmation signal are wrong. (D)The logic of the unclamp confirmation signal or the clamp confirmation signal is inverse. (E)Use dry contacts or two-wire proximity sensors for the unclamp confirmation signal and the clamp confirmation signal.	(A)Check the following. (a)Check the output setting target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (B)Check the machine parameter (PLC: PLC-axis) <unclamp output signal>(P1-axis). (C)Check the following. (a)Check the input target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (D)Check the machine parameters (PLC: PLC-axis) <unclamp check input signal>(P1-axis) and <clamp check input signal>(P1-axis). (E)Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (PLC: PLC-axis) <clamp check input signal>(P1-axis)
IO7001	1	2	P1- axis not unclamped	The P1 axis cannot be unclamped even after 3 seconds has elapsed. (A)The unclamp valve does not operate. (B)The unclamp confirmation signal is not input.	(A)The unclamping portion is faulty. (B)The unclamp confirmation signal is faulty.
IO7002	1	2	P1-axis clamped	The unclamp confirmation signal was turned off while the P1 axis was turning.	The unclamp confirmation signal is faulty.
IO7003	1	2	P1- axis unclamped	The clamp confirmation signal was turned off or the unclamp confirmation signal was turned on while P1 axis stopped.	(a)The unclamping portion is faulty. (b)The unclamp confirmation signal or clamp confirmation signal is faulty. Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (PLC: PLC-axis) <clamp check input signal>(P1-axis)

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO7004	1	2	P2- axis not clamped	The P2 axis cannot be clamped even after 3 seconds has elapsed. (A)The output target or destination of the unclamp output signal is wrong. (B)The logic of the unclamp output signal is inverse. (C)The input target and destination of the unclamp confirmation signal or clamp confirmation signal are wrong. (D)The logic of the unclamp confirmation signal or the clamp confirmation signal is inverse. (E)Use dry contacts or two-wire proximity sensors for the unclamp confirmation signal and the clamp confirmation signal.	(A)Check the following. (a)Check the output setting target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (B)Check the machine parameter (PLC: PLC-axis) <unclamp output signal>(P2-axis). (C)Check the following. (a)Check the input target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (D)Check the machine parameters (PLC: PLC-axis) <unclamp check input signal>(P2-axis) and <clamp check input signal>(P2-axis). (E)Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (PLC: PLC-axis) <clamp check input signal>(P2-axis)
IO7005	1	2	P2- axis not unclamped	The P2 axis cannot be unclamped even after 3 seconds has elapsed. (A)The unclamp valve does not operate. (B)The unclamp confirmation signal is not input.	(A)The unclamping portion is faulty. (B)The unclamp confirmation signal is faulty.
IO7006	1	2	P2- axis clamped	The unclamp confirmation signal was turned off while the P2 axis was turning.	The unclamp confirmation signal is faulty.
IO7007	1	2	P2- axis unclamped	The clamp confirmation signal was turned off or the unclamp confirmation signal was turned on while P2 axis stopped.	(a)The unclamping portion is faulty. (b)The unclamp confirmation signal or clamp confirmation signal is faulty. Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (PLC: PLC-axis) <clamp check input signal>(P2-axis)

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO7008	1	2	P3- axis not clamped	The P3 axis cannot be clamped even after 3 seconds has elapsed. (A)The output target or destination of the unclamp output signal is wrong. (B)The logic of the unclamp output signal is inverse. (C)The input target and destination of the unclamp confirmation signal or clamp confirmation signal are wrong. (D)The logic of the unclamp confirmation signal or the clamp confirmation signal is inverse. (E)Use dry contacts or two-wire proximity sensors for the unclamp confirmation signal and the clamp confirmation signal.	(A)Check the following. (a)Check the output setting target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (B)Check the machine parameter (PLC: PLC-axis) <unclamp output signal>(P3-axis). (C)Check the following. (a)Check the input target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (D)Check the machine parameters (PLC: PLC-axis) <unclamp check input signal>(P3-axis) and <clamp check input signal>(P3-axis). (E)Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (PLC: PLC-axis) <clamp check input signal>(P3-axis)
IO7009	1	2	P3- axis not unclamped	The P3 axis cannot be unclamped even after 3 seconds has elapsed. (A)The unclamp valve does not operate. (B)The unclamp confirmation signal is not input.	(A)The unclamping portion is faulty. (B)The unclamp confirmation signal is faulty.
IO7010	1	2	P3- axis clamped	The unclamp confirmation signal was turned off while the P3 axis was turning.	The unclamp confirmation signal is faulty.
IO7011	1	2	P3- axis unclamped	The clamp confirmation signal was turned off or the unclamp confirmation signal was turned on while P3 axis stopped.	(a)The unclamping portion is faulty. (b)The unclamp confirmation signal or clamp confirmation signal is faulty. Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (PLC: PLC-axis) <clamp check input signal>(P3-axis)

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO7012	1	2	P4- axis not clamped	The P4 axis cannot be clamped even after 3 seconds has elapsed. (A)The output target or destination of the unclamp output signal is wrong. (B)The logic of the unclamp output signal is inverse. (C)The input target and destination of the unclamp confirmation signal or clamp confirmation signal are wrong. (D)The logic of the unclamp confirmation signal or the clamp confirmation signal is inverse. (E)Use dry contacts or two-wire proximity sensors for the unclamp confirmation signal and the clamp confirmation signal.	(A)Check the following. (a)Check the output setting target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (B)Check the machine parameter (PLC: PLC-axis) <unclamp output signal>(P4-axis). (C)Check the following. (a)Check the input target using the data bank (external I/O signal). (b)Check that it is connected to the terminal block which is set by the parameter. (D)Check the machine parameters (PLC: PLC-axis) <unclamp check input signal>(P4-axis) and <clamp check input signal>(P4-axis). (E)Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (PLC: PLC-axis) <clamp check input signal>(P4-axis)
IO7013	1	2	P4- axis not unclamped	The P4 axis cannot be unclamped even after 3 seconds has elapsed. (A)The unclamp valve does not operate. (B)The unclamp confirmation signal is not input.	(A)The unclamping portion is faulty. (B)The unclamp confirmation signal is faulty.
IO7014	1	2	P4- axis clamped	The unclamp confirmation signal was turned off while the P4 axis was turning.	The unclamp confirmation signal is faulty.
IO7015	1	2	P4- axis unclamped	The clamp confirmation signal was turned off or the unclamp confirmation signal was turned on while P4 axis stopped.	(a)The unclamping portion is faulty. (b)The unclamp confirmation signal or clamp confirmation signal is faulty. Check the following parameters to identify which of the unclamp confirmation signal and clamp confirmation signal is faulty. Machine parameter (PLC: PLC-axis) <clamp check input signal>(P4-axis)
IO7016	1	2	Spare alarm 2	The software version may be old.	Update the software to the latest version.
IO7017	1	2	FAN1 speed low	A low speed was detected for ECB1(FAN1).	(a)Make sure that there are no foreign objects inside the ECB1. (b)Check the ECB1 wiring for a cable disconnection or faulty connector. (c)Replace ECB1. (d)Replace the IO PCB.
IO7018	1	2	FAN2 speed low	A low speed was detected for ECB2(FAN2).	(a)Make sure that there are no foreign objects inside the ECB2. (b)Check the ECB2 wiring for a cable disconnection or faulty connector. (c)Replace ECB2. (d)Replace the IO PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO7019	1	2	FAN3 speed low	A low speed was detected for ECB3(FAN3).	(a)Make sure that there are no foreign objects inside the ECB3. (b)Check the ECB3 wiring for a cable disconnection or faulty connector. (c)Replace ECB3. (d)Replace the IO PCB.
IO7020	1	2	FAN4 speed low	A low speed was detected for ECB4(FAN4).	(a)Make sure that there are no foreign objects inside the ECB4. (b)Check the ECB4 wiring for a cable disconnection or faulty connector. (c)Replace ECB4. (d)Replace the IO PCB.
IO7021	1	2	AVR power FAN speed low	Low FAN speed was detected for TA1 (power unit 1).	(a)Make sure that there are no foreign objects inside the FAN for TA1. (b)Check the TA1 FAN wiring for a cable disconnection or faulty connector. (c)Replace the FAN for TA1. (d)Replace TA1.
IO7022	1	2	Spindle motor FAN speed low	A low FAN speed was detected for the spindle motor (ECS1).	(a)Make sure that there are no foreign objects inside the FAN for the spindle motor (ECS1). (b)Check the FAN wiring on spindle motor (ECS1) for a cable disconnection or faulty connector. (c)Replace the spindle motor (ECS1) FAN. (d)Replace the spindle motor (ECS1).
IO7023	1	2	Illumination sensor communication error 1 (KEY)	The KEY PCB is defective.	Replace the KEY PCB.
IO7024	1	2	Illumination sensor communication error 2 (KEY)	The KEY PCB is defective.	Replace the KEY PCB.
IO7025	1	2	Temperature sensor communication error (KEY)	The KEY PCB is defective.	Replace the KEY PCB.
IO7026	1	2	The 5-V DC power is overcurrent. (3) (KEY)	(A)Overcurrent occurred in the KEY PCB. There is a 5 V power short-circuit on the KEY PCB. (B)The KEY PCB is defective.	(A)Check the wiring for the following connectors. XUSB_A (B)Replace the KEY PCB.
IO7500	1	1	Pot not at upper limit	An axis operation was executed without the pot at the upper end.	Press the **[ATC]** key to move the pot to the upper end.
IO7501	1	1	The tool washing liquid surface is abnormal.	TW_LQLVERR signal (BY: Tool wash coolant level error) was detected. In the factory-installed PLC program, the coolant level was under the minimum dischargeable level in the accumulator when tool wash was turned ON.	Check the PLC program. In the factory-installed PLC program, follow one of the procedures below to restore operation. (a)The tool washing filter must be replaced or cleaned. (b)The tool wash coolant level sensor is faulty. Replace it.
IO7502	1	1	The tool washing liquid surface sensor is normal.	This alarm occurs when the coolant level sensor operation is found to be normal as a result of M295 (Tool wash level sensor failure diagnosis) execution.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
IO7503	1	1	Tool wash filter clogging is predicted.	The number of checks for low fluid level IO_TCLS_OK (Tool cleaning fluid level sensor) at the end of the tool cleaning discharge has exceeded the user parameter (switch 1: installation) setting for <<No. of tool wash filter clogging warning checks (Type 4)>>. In the factory-installed PLC program, (A)The tool wash filter was clogged. (B)The tool change was carried out consecutively while the ATC falls at a slow speed. (C)Tool change was carried out consecutively even though the timing for the AT-axis was slow or late.	Check the PLC program. In the factory-installed PLC program, (A)The tool washing filter must be replaced or cleaned. (B)Review the user parameter (switch 1: installation) <No. of tool wash filter clogging warning checks(Type 4)> or the ATC falling speed. (C)Review the user parameter (switch 1: installation) <No. of tool wash filter clogging warning checks(Type 4)> or the <ATC arm turn speed ratio 1 (M422)>,<ATC arm turn speed ratio 2 (M423)>.
IO7504	1	1	It is in the manual mode of chip conveyor.	SCRWMNLER signal (BY: Chip conveyor manual mode) was detected. In the factory-installed PLC program, the **[MANUAL/STOP/AUTO]** switch on the chip conveyor control box is set to <MANUAL>.	Check the PLC program. In the factory-installed PLC program, set the **[MANUAL/STOP/AUTO]** switch to <AUTO>.
IO7505	1	1	Mode change restricted due to data protection switch	An attempt was made to change the mode even though a mode change is restricted because the **[DATA PROTECTION]** switch is enabled (“ | ”).	Set the **[DATA PROTECTION]** switch to “O” (disable).
IO7506	1	1	Back wash cycle not complete	Back wash cycle was cancelled while operation was not in progress.	Execute command M489.

2.13.6 SP

No.	Stop level	Reset level	Alarm message	Cause	Solution
SP0000	5	3	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP0500	5	2	Control program stopped during operation (High speed task 1)	Stop confirmed in corresponding control program during memory/MDI operation.	Follow one of the procedures below. 1.Press the **[RST]** key. 2.Check the cause that stopped the control program. 3.After addressing the cause in 2, run the control program.
SP0501	5	2	Control program stopped during operation (Standard task 1)	Stop confirmed in corresponding control program during memory/MDI operation.	Follow one of the procedures below. 1.Press the **[RST]** key. 2.Check the cause that stopped the control program. 3.After addressing the cause in 2, run the control program.
SP0502	5	2	Control program stopped during operation (High speed task 2)	Stop confirmed in corresponding control program during memory/MDI operation.	Follow one of the procedures below. 1.Press the **[RST]** key. 2.Check the cause that stopped the control program. 3.After addressing the cause in 2, run the control program.
SP0503	5	2	Control program stopped during operation (Standard task 2)	Stop confirmed in corresponding control program during memory/MDI operation.	Follow one of the procedures below. 1.Press the **[RST]** key. 2.Check the cause that stopped the control program. 3.After addressing the cause in 2, run the control program.
SP0504	5	2	Control program stopped during operation (Standard task 3)	Stop confirmed in corresponding control program during memory/MDI operation.	Follow one of the procedures below. 1.Press the **[RST]** key. 2.Check the cause that stopped the control program. 3.After addressing the cause in 2, run the control program.
SP0505	5	2	No control program (High speed task 1)	There is no corresponding control program in the system.	(a)If the control program is backed up, input the control program from the external I/O screen. (b)Input the factory-default control program.
SP0506	5	2	No control program (Standard task 1)	There is no corresponding control program in the system.	(a)If the control program is backed up, input the control program from the external I/O screen. (b)Input the factory-default control program.
SP0507	5	2	No control program (High speed task 2)	There is no corresponding control program in the system.	(a)If the control program is backed up, input the control program from the external I/O screen. (b)Input the factory-default control program.
SP0508	5	2	No control program (Standard task 2)	There is no corresponding control program in the system.	(a)If the control program is backed up, input the control program from the external I/O screen. (b)Input the factory-default control program.
SP0509	5	2	No control program (Standard task 3)	There is no corresponding control program in the system.	(a)If the control program is backed up, input the control program from the external I/O screen. (b)Input the factory-default control program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SP0510	5	2	Control program execution error (High speed task 1)	Control program writing / RUN command was issued but failed to execute.	1.Perform the control program write operation from the PLC screen on the external I/O screen. 2.Then start the program.
SP0511	5	2	Control program execution error (Standard task 1)	Control program writing / RUN command was issued but failed to execute.	1.Perform the control program write operation from the PLC screen on the external I/O screen. 2.Then start the program.
SP0512	5	2	Control program execution error (High speed task 2)	Control program writing / RUN command was issued but failed to execute.	1.Perform the control program write operation from the PLC screen on the external I/O screen. 2.Then start the program.
SP0513	5	2	Control program execution error (Standard task 2)	Control program writing / RUN command was issued but failed to execute.	1.Perform the control program write operation from the PLC screen on the external I/O screen. 2.Then start the program.
SP0514	5	2	Control program execution error (Standard task 3)	Control program writing / RUN command was issued but failed to execute.	1.Perform the control program write operation from the PLC screen on the external I/O screen. 2.Then start the program.
SP0515	5	2	PLC operation time limit over (High speed task 1)	Scan time for the control program was longer than 1,000 msec.	Check the PLC program.
SP0516	5	2	PLC operation time limit over (Standard task 1)	Scan time for the control program was longer than 10,000 msec.	Check the PLC program.
SP0517	5	2	PLC operation time limit over (High speed task 2)	Scan time for the control program was longer than 100 msec.	Check the PLC program.
SP0518	5	2	PLC operation time limit over (Standard task 2)	Scan time for the control program was longer than 10,000 msec.	Check the PLC program.
SP0519	5	2	PLC operation time limit over (Standard task 3)	Scan time for the control program was longer than 100 msec.	Check the PLC program.
SP0520	5	2	Double coil error	There is an output for the output OM that is the same in the control program.	Check the PLC program.
SP0521	5	2	PLC expanded function mismatch	(A) A command is used that is not supported within the <Expanded function range> on the PLC menu screen. (B) The value specified for the <Expanded function range> on the PLC menu screen does not match the value specified for the <Expanded function> in the ladder program. (C) The values specified for the <Expanded function> in all the ladder programs do not match.	(A)Follow the procedure below. 1. Check the PLC ladder program and then press the **[RST]** key. 2. Execute version upgrade. (B)Follow the procedure below. 1. Check the PLC ladder program and then press the **[RST]** key. 2. Check the <Expanded function range> on the PLC menu screen, and then press the **[RST]** key. (C) Input all ladder programs that have the same values specified for the <Expanded function>, and then press the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SP0522	5	2	PLC expanded function error	(A) A command is used that is not supported within the <Expanded function range> on the PLC menu screen. (B) The value specified for the <Expanded function range> on the PLC menu screen does not match the value specified for the <Expanded function> in the ladder program.	(A)Follow the procedure below. 1. Check the PLC ladder program and then press the **[RST]** key. 2. Execute version upgrade. (B)Follow the procedure below. 1. Check the PLC ladder program and then press the **[RST]** key. 2. Check the <Expanded function range> on the PLC menu screen, and then press the **[RST]** key.
SP0523	5	2	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP0524	5	2	Control program execution setting error (High speed task 2)	Control program has not been assigned to the task.	Check the PLC program.
SP0525	5	2	Control program execution setting error (Standard task 3)	Control program has not been assigned to the task.	Check the PLC program.
SP1500	4	3	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP2000	4	2	PLC watchdog timeout (High speed task 1)	Scan time of the corresponding control program was longer than the <WDT monitor time>.	Check the PLC program.
SP2001	4	2	PLC watchdog timeout (Standard task 1)	Scan time of the corresponding control program was longer than the <WDT monitor time>.	Check the PLC program.
SP2002	4	2	PLC watchdog timeout (High speed task 2)	Scan time of the corresponding control program was longer than the <WDT monitor time>.	Check the PLC program.
SP2003	4	2	PLC watchdog timeout (Standard task 2)	Scan time of the corresponding control program was longer than the <WDT monitor time>.	Check the PLC program.
SP2004	4	2	PLC watchdog timeout (Standard task 3)	Scan time of the corresponding control program was longer than the <WDT monitor time>.	Check the PLC program.
SP2005	4	2	Memory error (High speed task 1)	Corresponding control program failed to secure the required memory.	Contact the nearest BROTHER approved service dealer.
SP2006	4	2	Memory error (Standard task 1)	Corresponding control program failed to secure the required memory.	Contact the nearest BROTHER approved service dealer.
SP2007	4	2	Memory error (High speed task 2)	Corresponding control program failed to secure the required memory.	Contact the nearest BROTHER approved service dealer.
SP2008	4	2	Memory error (Standard task 2)	Corresponding control program failed to secure the required memory.	Contact the nearest BROTHER approved service dealer.
SP2009	4	2	Memory error (Standard task 3)	Corresponding control program failed to secure the required memory.	Contact the nearest BROTHER approved service dealer.
SP2010	4	2	Function execution error (High speed task 1)	Corresponding control program failed to execute a system function.	Contact the nearest BROTHER approved service dealer.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SP2011	4	2	Function execution error (Standard task 1)	Corresponding control program failed to execute a system function.	Contact the nearest BROTHER approved service dealer.
SP2012	4	2	Function execution error (High speed task 2)	Corresponding control program failed to execute a system function.	Contact the nearest BROTHER approved service dealer.
SP2013	4	2	Function execution error (Standard task 2)	Corresponding control program failed to execute a system function.	Contact the nearest BROTHER approved service dealer.
SP2014	4	2	Function execution error (Standard task 3)	Corresponding control program failed to execute a system function.	Contact the nearest BROTHER approved service dealer.
SP2015	4	2	BCD/BIN conversion error (High speed task 1)	There was a BCD/BIN conversion data error in the corresponding control program.	Check the PLC program.
SP2016	4	2	BCD/BIN conversion error (Standard task 1)	There was a BCD/BIN conversion data error in the corresponding control program.	Check the PLC program.
SP2017	4	2	BCD/BIN conversion error (High speed task 2)	There was a BCD/BIN conversion data error in the corresponding control program.	Check the PLC program.
SP2018	4	2	BCD/BIN conversion error (Standard task 2)	There was a BCD/BIN conversion data error in the corresponding control program.	Check the PLC program.
SP2019	4	2	BCD/BIN conversion error (Standard task 3)	There was a BCD/BIN conversion data error in the corresponding control program.	Check the PLC program.
SP2020	4	2	Divided by zero (High speed task 1)	Dividing by the value zero was performed in the corresponding control program.	Check the PLC program.
SP2021	4	2	Divided by zero (Standard task 1)	Dividing by the value zero was performed in the corresponding control program.	Check the PLC program.
SP2022	4	2	Divided by zero (High speed task 2)	Dividing by the value zero was performed in the corresponding control program.	Check the PLC program.
SP2023	4	2	Divided by zero (Standard task 2)	Dividing by the value zero was performed in the corresponding control program.	Check the PLC program.
SP2024	4	2	Divided by zero (Standard task 3)	Dividing by the value zero was performed in the corresponding control program.	Check the PLC program.
SP2025	4	2	Command code error (High speed task 1)	Corresponding control program is corrupt.	Contact the nearest BROTHER approved service dealer.
SP2026	4	2	Command code error (Standard task 1)	Corresponding control program is corrupt.	Contact the nearest BROTHER approved service dealer.
SP2027	4	2	Command code error (High speed task 2)	Corresponding control program is corrupt.	Contact the nearest BROTHER approved service dealer.
SP2028	4	2	Command code error (Standard task 2)	Corresponding control program is corrupt.	Contact the nearest BROTHER approved service dealer.
SP2029	4	2	Command code error (Standard task 3)	Corresponding control program is corrupt.	Contact the nearest BROTHER approved service dealer.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SP2030	4	2	No label specified for JMP, JE or CALL (High speed task 1)	There is no specified label for JMP, JE and CALL in the corresponding control program.	Check the PLC program.
SP2031	4	2	No label specified for JMP, JE or CALL (Standard task 1)	There is no specified label for JMP, JE and CALL in the corresponding control program.	Check the PLC program.
SP2032	4	2	No label specified for JMP, JE or CALL (High speed task 2)	There is no specified label for JMP, JE and CALL in the corresponding control program.	Check the PLC program.
SP2033	4	2	No label specified for JMP, JE or CALL (Standard task 2)	There is no specified label for JMP, JE and CALL in the corresponding control program.	Check the PLC program.
SP2034	4	2	No label specified for JMP, JE or CALL (Standard task 3)	There is no specified label for JMP, JE and CALL in the corresponding control program.	Check the PLC program.
SP2035	4	2	CALL-RET, etc. not in a set (High speed task 1)	CALL-RET, MC-MCR, FOR-NEXT are not configured as a set in the corresponding control program.	Check the PLC program.
SP2036	4	2	CALL-RET, etc. not in a set (Standard task 1)	CALL-RET, MC-MCR, FOR-NEXT are not configured as a set in the corresponding control program.	Check the PLC program.
SP2037	4	2	CALL-RET, etc. not in a set (High speed task 2)	CALL-RET, MC-MCR, FOR-NEXT are not configured as a set in the corresponding control program.	Check the PLC program.
SP2038	4	2	CALL-RET, etc. not in a set (Standard task 2)	CALL-RET, MC-MCR, FOR-NEXT are not configured as a set in the corresponding control program.	Check the PLC program.
SP2039	4	2	CALL-RET, etc. not in a set (Standard task 3)	CALL-RET, MC-MCR, FOR-NEXT are not configured as a set in the corresponding control program.	Check the PLC program.
SP2040	4	2	Access to OM outside of range (High speed task 1)	Corresponding control program accessed an OM that is out of range.	Check the PLC program.
SP2041	4	2	Access to OM outside of range (Standard task 1)	Corresponding control program accessed an OM that is out of range.	Check the PLC program.
SP2042	4	2	Access to OM outside of range (High speed task 2)	Corresponding control program accessed an OM that is out of range.	Check the PLC program.
SP2043	4	2	Access to OM outside of range (Standard task 2)	Corresponding control program accessed an OM that is out of range.	Check the PLC program.
SP2044	4	2	Access to OM outside of range (Standard task 3)	Corresponding control program accessed an OM that is out of range.	Check the PLC program.
SP2045	4	2	MC, CALL, FOR nesting level too deep (High speed task 1)	MC, CALL and FOR nesting levels in the corresponding control program are too deep.	Check the PLC program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SP2046	4	2	MC, CALL, FOR nesting level too deep (Standard task 1)	MC, CALL and FOR nesting levels in the corresponding control program are too deep.	Check the PLC program.
SP2047	4	2	MC, CALL, FOR nesting level too deep (High speed task 2)	MC, CALL and FOR nesting levels in the corresponding control program are too deep.	Check the PLC program.
SP2048	4	2	MC, CALL, FOR nesting level too deep (Standard task 2)	MC, CALL and FOR nesting levels in the corresponding control program are too deep.	Check the PLC program.
SP2049	4	2	MC, CALL, FOR nesting level too deep (Standard task 3)	MC, CALL and FOR nesting levels in the corresponding control program are too deep.	Check the PLC program.
SP2050	4	2	DFC command execution failed (High speed task 1)	Failed to execute the DFC command in the corresponding control program.	Check the PLC program.
SP2051	4	2	DFC command execution failed (Standard task 1)	Failed to execute the DFC command in the corresponding control program.	Check the PLC program.
SP2052	4	2	DFC command execution failed (High speed task 2)	Failed to execute the DFC command in the corresponding control program.	Check the PLC program.
SP2053	4	2	DFC command execution failed (Standard task 2)	Failed to execute the DFC command in the corresponding control program.	Check the PLC program.
SP2054	4	2	DFC command execution failed (Standard task 3)	Failed to execute the DFC command in the corresponding control program.	Check the PLC program.
SP2055	4	2	Size is too big (High speed task 1)	Code compiled in the corresponding control program exceeded the designated size (compile code storage range).	Check the PLC program.
SP2056	4	2	Size is too big (High speed task 2)	Code compiled in the corresponding control program exceeded the designated size (compile code storage range).	Check the PLC program.
SP2057	4	2	No control program (High speed task 1)	There is no control program that was assigned to the execution settings in the system.	Check the execution settings. If the control program is backed up, input the control program from the external I/O screen.
SP2058	4	2	No control program (Standard task 1)	There is no control program that was assigned to the execution settings in the system.	Check the execution settings. If the control program is backed up, input the control program from the external I/O screen.
SP2059	4	2	No control program (High speed task 2)	There is no control program that was assigned to the execution settings in the system.	Check the execution settings. If the control program is backed up, input the control program from the external I/O screen.
SP2060	4	2	No control program (Standard task 2)	There is no control program that was assigned to the execution settings in the system.	Check the execution settings. If the control program is backed up, input the control program from the external I/O screen.
SP2061	4	2	No control program (Standard task 3)	There is no control program that was assigned to the execution settings in the system.	Check the execution settings. If the control program is backed up, input the control program from the external I/O screen.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SP2062	4	2	Control program stopped (High speed task 1)	Control program was stopped. (A)Control program stop operation was carried out. (B)Control program was stopped due to the control program writing operation. (C)Control program stop was detected by the NC monitoring function. (D)Control program operation stopped due to another alarm being triggered.	(A)After the control program has started, press the **[RST]** key. (B)Make sure that the control program is executing, and then press the **[RST]** key. (C)After the control program has started, press the **[RST]** key. (D)Remove the cause of the other alarm that was triggered at the same time.
SP2063	4	2	Control program stopped (Standard task 1)	Control program was stopped. (A)Control program stop operation was carried out. (B)Control program was stopped due to the control program writing operation. (C)Control program stop was detected by the NC monitoring function. (D)Control program operation stopped due to another alarm being triggered.	(A)After the control program has started, press the **[RST]** key. (B)Make sure that the control program is executing, and then press the **[RST]** key. (C)After the control program has started, press the **[RST]** key. (D)Remove the cause of the other alarm that was triggered at the same time.
SP2064	4	2	Control program stopped (High speed task 2)	Control program was stopped. (A)Control program stop operation was carried out. (B)Control program was stopped due to the control program writing operation. (C)Control program stop was detected by the NC monitoring function. (D)Control program operation stopped due to another alarm being triggered.	(A)After the control program has started, press the **[RST]** key. (B)Make sure that the control program is executing, and then press the **[RST]** key. (C)After the control program has started, press the **[RST]** key. (D)Remove the cause of the other alarm that was triggered at the same time.
SP2065	4	2	Control program stopped (Standard task 2)	Control program was stopped. (A)Control program stop operation was carried out. (B)Control program was stopped due to the control program writing operation. (C)Control program stop was detected by the NC monitoring function. (D)Control program operation stopped due to another alarm being triggered.	(A)After the control program has started, press the **[RST]** key. (B)Make sure that the control program is executing, and then press the **[RST]** key. (C)After the control program has started, press the **[RST]** key. (D)Remove the cause of the other alarm that was triggered at the same time.
SP2066	4	2	Control program stopped (Standard task 3)	Control program was stopped. (A)Control program stop operation was carried out. (B)Control program was stopped due to the control program writing operation. (C)Control program stop was detected by the NC monitoring function. (D)Control program operation stopped due to another alarm being triggered.	(A)After the control program has started, press the **[RST]** key. (B)Make sure that the control program is executing, and then press the **[RST]** key. (C)After the control program has started, press the **[RST]** key. (D)Remove the cause of the other alarm that was triggered at the same time.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SP2067	4	2	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP2068	4	2	Checksum error (PLC: high speed control program)	The data structure for the high speed control program in the PLC function is corrupted.	Delete the corrupt high speed control program.
SP2069	4	2	Checksum error (PLC: standard control program)	The data structure for the standard control program in the PLC function is corrupted.	Delete the corrupt standard control program.
SP2070	4	2	Checksum error (PLC: user defined function)	The data structure for the user defined function in the PLC function is corrupted.	Delete the corrupt user defined function.
SP2071	4	2	Checksum error (PLC: system defined function)	The data structure for the system defined function in the PLC function is corrupted.	Delete the corrupt system defined function.
SP2072	4	2	Checksum error (PLC: common file)	The PLC data structure is corrupted.	Format the PLC program.
SP3500	3	3	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP4000	3	2	Control program is outputting outside of the writing range	There is an M or D in the global OM that is outputting outside of the writing range.	(a) Check the PLC program. (b) Check the writing range for the <Power failure retention/write range setting>.
SP4001	3	2	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP5000	2	3	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP5500	2	2	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP6000	2	1	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP6500	1	3	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP7000	1	2	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.
SP7001	1	2	PLC program is being input	(A)After the PLC program was input, an attempt was made to open the I/O screen and POU edit screen even though the **[RST]** key was not pressed. (B)An attempt was made to input the PLC program after the version update but before turning OFF the power.	(A)Press the **[RST]** key. (B)Turn the power off and then on again.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SP7500	1	1	There is a control program not running (High speed task 1)	An attempt was made to start operation, but the corresponding control program is stopped.	Check the PLC program.
SP7501	1	1	There is a control program not running (Standard task 1)	An attempt was made to start operation, but the corresponding control program is stopped.	Check the PLC program.
SP7502	1	1	There is a control program not running (High speed task 2)	An attempt was made to start operation, but the corresponding control program is stopped.	Check the PLC program.
SP7503	1	1	There is a control program not running (Standard task 2)	An attempt was made to start operation, but the corresponding control program is stopped.	Check the PLC program.
SP7504	1	1	There is a control program not running (Standard task 3)	An attempt was made to start operation, but the corresponding control program is stopped.	Check the PLC program.
SP7505	1	1	Indirect specif. err. in sending data for auto notification	PLC program made an invalid specification when indirectly specifying the sending data for the auto notification.	Check the PLC program.

2.13.7 SM

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0000	5	3	Machine setting error	(A)CFast and machine identification signal does not match the NC's internal information. (B)Model information cannot be recognized.	(A)Check following the procedure below. (a)If the NC PCB has been replaced and there is an internal data bank change, check for a data setting error. (b)If the IO PCB has been replaced and this alarm still triggers, make sure that all connectors on the IO PCB have been connected or that the latest IO PCB is being used. If operation does not restore, the PCB may be faulty. Therefore, replace it with the latest IO PCB. (c) If the CFast has been replaced and this alarm still triggers, check the machine and the software version on the version screen. If the wrong CFast is connected, the machine model name does not display correctly. If the wrong name appears, replace the CFast with the correct one. (B)Contact the nearest BROTHER approved service dealer and report the alarm conditions.
SM0001	5	3	Servo PWR off cannot be confirmed.	(A)Servo PWR off cannot be confirmed after resetting abso. encoder counter. (B)Servo off cannot be confirmed although the servo parameter setting has been changed.	The servo amplifier is defective. Contact the nearest BROTHER approved service dealer.
SM0002	5	3	Adjusted abso. data setting error	The value set for adjusted machine coordinates is not within the setting range.	Set the value correctly for **[Adjusted MC coord.]** on the <Reset abso. encoder counter> screen, and adjust the machine again.
SM0003	5	3	Machine param. setting error (SYS 2)	001)The <Quick table> values do not match the machine configuration.	001)Set the parameters of Machine Parameters (system 2: QT-axis) to the correct values and turn power on again.
				002)The number of pulses for additional axis obtained from <gear ratio>(5th- to 8th-axis) and the number of pulses per motor rotation exceeds the acceptable value.	002)Set the parameters of Machine Parameters (system 2: additional axis) to the correct values and turn power on again.
				003)The parameter <Clamp mechanism> is set to <1: Type 2> on an additional axis equipped with a brake mechanism.	003)Set the parameters of Machine Parameters (system 2: additional axis) to the correct values and turn power on again.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				004)There is an axis where the machine parameter (system 2: additional axis) <Optional axis> (5th- to 8th-axes) is set to <Yes(positioning only)>, and the machine parameter (system 2: additional axis) <Expansion I/O board station number for positioning> (5th- to 8th-axes) is set to <0> or has not been set.	004)Set the parameters of Machine Parameters (system 2: additional axis) to the correct values and turn power on again.
				005)<Optional axis> (5th- to 8th-axes) setting for the axis does not match the machine configuration.	005)Set the parameters of Machine Parameters (system 2: additional axis) to the correct values and turn power on again.
				006)A brake signal for another axis is set to the <Brake> (5th- to 8th-axis).	006)Set the parameters of Machine Parameters (system 2: additional axis) to the correct values and turn power on again.
				008)<Brake> (5th-axis) is configured to a setting besides <3: Brake 3> on a U series or M series machine model.	008)Set the parameters of Machine Parameters (system 2: additional axis) to the correct values and turn power on again.
				009)<Brake> (7th-axis) is configured to a setting besides <4: Brake 4> on a U series machine model.	009)Set the parameters of Machine Parameters (system 2: additional axis) to the correct values and turn power on again.
SM0004	5	3	Machine param. setting error (SYS 3)	001)The pulses of magazine obtained from <M-axis gear ratio>, <Distance between magazine pots>, etc. exceeds acceptable value.	001)Set the parameters of Machine Parameters (system 3: common) to the correct values and turn power on again.
				002)When the <M-axis gear ratio (numerator)> / <M-axis gear ratio (denominator)> is multiplied by the number of pulses per motor rotation, and the product or value is not an integer.	002)Set the parameters of Machine Parameters (system 3: common) to the correct values and turn power on again.
				003)The distance per magazine rotation obtained from <Tool storage capacity> and <Distance between magazine pots> exceeds acceptable value.	003)Set the parameters of Machine Parameters (system 3: common) to the correct values and turn power on again.
				004)The number of pulses for the AT-axis, obtained from the <AT-axis gear ratio (numerator)> and <AT-axis gear ratio (denominator)>, exceeds the acceptable value.	004)Set the parameters of Machine Parameters (system 3: common) to the correct values and turn power on again.
				005)When the <AT-axis gear ratio (numerator)> / <AT-axis gear ratio (denominator)> is multiplied by the number of pulses per motor rotation, and the product or value is not an integer.	005)Set the parameters of Machine Parameters (system 3: common) to the correct values and turn power on again.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				006)<M-axis irregular pitch> is set to <1: Enable> when an odd number was set as the machine parameter (system 1: common) <Tool storage capacity>.	006)Set the machine parameters (system 3: common) to the correct values and turn the power OFF and ON again.
SM0005	5	3	Machine param. setting error (SYS 1)	001)An invalid value is set to either or both of **[stroke 1 (-)]**(X- to Z-axis) and **[Distance to zero point]**(Z-axis) for **[Bearing position on fixed side]**(X- to Z-axis) and **[Bearing position on free side]**(X- to Z-axis).	001)Set the parameters of Machine Parameters (system 1: X-, Y- or Z-axis) to the correct values and turn power on again.
SM0006	5	3	Machine param. setting error (PLC)	001)<brake>(P1- to P4-axis) and the <clamp mechanism>(P1- to P4-axis) do not match.	001)Set the parameters of Machine Parameters (PLC: PLC-axis) to the correct values and turn power on again.
				002)The pulse of PLC axis obtained from <lead/gear ratio>(P1- to P4-axis), etc. exceeds acceptable value.	002)Set the parameters of Machine Parameters (PLC: PLC-axis) to the correct values and turn power on again.
				003)A brake signal which is used in another axis is set to <brake>(P1- to P4-axis).	003)Set the parameters of Machine Parameters (PLC: PLC-axis) to the correct values and turn power on again.
				004)<brake>(P1- to P4-axis) is set to <0: None> on an axis where <Brake load test>(P1- to P4-axis) is set to <1: Test>.	004)Set the parameters of Machine Parameters (PLC: PLC-axis) to the correct values and turn power on again.
SM0007	5	3	The X-axis brake-off cannot be confirmed.	X-axis brake OFF is not detected after X-axis servo is turned on.	Follow one of the procedures below. (a)The SR PCB is faulty. Replace the SR PCB. (b)The X-axis amplifier is faulty. Replace the X-axis amplifier.
SM0008	5	3	The Y-axis brake-off cannot be confirmed.	Y-axis brake OFF is not detected after Y-axis servo is turned on.	Follow one of the procedures below. (a)The SR PCB is faulty. Replace the SR PCB. (b)The Y-axis amplifier is faulty. Replace the Y-axis amplifier.
SM0009	5	3	The Z-axis brake-off cannot be confirmed.	Z-axis brake OFF is not detected after Z-axis servo is turned on.	Follow one of the procedures below. (a)Check XBKIN1 on the SR PCB. (b)The SR PCB is faulty. Replace the SR PCB. (c)The Z-axis amplifier is faulty. Replace the Z-axis amplifier.
SM0010	5	3	The *-axis brake-off cannot be confirmed.	QT-axis brake OFF is not detected after QT-axis servo is turned on.	Follow one of the procedures below. (a)The SR PCB is faulty. Replace the SR PCB. (b)The QT-axis amplifier is faulty. Replace the QT-axis amplifier.
SM0011	5	3	The *-axis brake-off cannot be confirmed.	5-axis brake OFF is not detected after 5-axis servo is turned on.	Follow one of the procedures below. (a)Check XBKIN1 to XBKIN5 on the SR PCB that corresponds to the machine parameter (system 2: additional axis) <Brake> (5th-axis). (b)The SR PCB is faulty. Replace the SR PCB. (c)The 5th-axis amplifier is faulty. Replace the 5th-axis amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0012	5	3	The *-axis brake-off cannot be confirmed.	6-axis brake OFF is not detected after 6-axis servo is turned on.	Follow one of the procedures below. (a)Check XBKIN1 to XBKIN5 on the SR PCB that corresponds to the machine parameter (system 2: additional axis) <Brake> (6th-axis). (b)The SR PCB is faulty. Replace the SR PCB. (c)The 6th-axis amplifier is faulty. Replace the 6th-axis amplifier.
SM0013	5	3	The *-axis brake-off cannot be confirmed.	7-axis brake OFF is not detected after 7-axis servo is turned on.	Follow one of the procedures below. (a)Check XBKIN1 to XBKIN5 on the SR PCB that corresponds to the machine parameter (system 2: additional axis) <Brake> (7th-axis). (b)The SR PCB is faulty. Replace the SR PCB. (c)The 7th-axis amplifier is faulty. Replace the 7th-axis amplifier.
SM0014	5	3	The *-axis brake-off cannot be confirmed.	8-axis brake OFF is not detected after 8-axis servo is turned on.	Follow one of the procedures below. (a)Check XBKIN1 to XBKIN5 on the SR PCB that corresponds to the machine parameter (system 2: additional axis) <Brake> (8th-axis). (b)The SR PCB is faulty. Replace the SR PCB. (c)The 8th-axis amplifier is faulty. Replace the 8th-axis amplifier.
SM0015	5	3	The *-axis brake-off cannot be confirmed.	A magazine brake release cannot be detected after the magazine servo is turned on.	Follow one of the procedures below. (a)Check XBKIN2 on the SR PCB. (b)The SR PCB is faulty. Replace the SR PCB. (c)The magazine axis amplifier is faulty. Replace the magazine axis amplifier.
SM0016	5	3	The P1-axis brake-off cannot be confirmed.	P1-axis brake OFF is not detected after P1-axis servo is turned on.	Follow one of the procedures below. (a)Check XBKIN1 to XBKIN5 on the SR PCB that corresponds to the machine parameter (PLC: PLC-axis) <Brake> (P1-axis). (b)The SR PCB is faulty. Replace the SR PCB. (c)The P1-axis amplifier is faulty. Replace the P1-axis amplifier.
SM0017	5	3	The P2-axis brake-off cannot be confirmed.	P2-axis brake OFF is not detected after P2-axis servo is turned on.	Follow one of the procedures below. (a)Check XBKIN1 to XBKIN5 on the SR PCB that corresponds to the machine parameter (PLC: PLC-axis) <Brake> (P2-axis). (b)The SR PCB is faulty. Replace the SR PCB. (c)The P2-axis amplifier is faulty. Replace the P2-axis amplifier.
SM0018	5	3	The P3-axis brake-off cannot be confirmed.	P3-axis brake OFF is not detected after P3-axis servo is turned on.	Follow one of the procedures below. (a)Check XBKIN1 to XBKIN5 on the SR PCB that corresponds to the machine parameter (PLC: PLC-axis) <Brake> (P3-axis). (b)The SR PCB is faulty. Replace the SR PCB. (c)The P3-axis amplifier is faulty. Replace the P3-axis amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0019	5	3	The P4-axis brake-off cannot be confirmed.	P4-axis brake OFF is not detected after P4-axis servo is turned on.	Follow one of the procedures below. (a)Check XBKIN1 to XBKIN5 on the SR PCB that corresponds to the machine parameter (PLC: PLC-axis) <Brake> (P4-axis). (b)The SR PCB is faulty. Replace the SR PCB. (c)The P4-axis amplifier is faulty. Replace the P4-axis amplifier.
SM0020	5	3	Therm. displacement offset parameter setting error	Wrong value has been set to the thermal distortion compensation parameter.	Check the set value of thermal distortion compensation parameter.
SM0021	5	3	Memory expansion option error	Option and OPSEL are inconsistent.	(a)Check the connection with OPSEL. (b)Check the option.
SM0022	5	3	Too many options	Option and OPSEL are inconsistent.	(a)Check the connection with OPSEL. (b)Check the option.
SM0023	5	3	PLC-axis unavailable	IL PCB unit does not support the PLC-axis.	
SM0024	5	3	Servo amplifier version error	An attempt was made to update the version using a firmware file that does not correspond to the servo amplifier being used.	Store only the latest servo amplifier firmware file in the memory card.
SM0025	5	3	The *-axis brake-off cannot be confirmed.	The AT-axis brake OFF status cannot be confirmed after the servo turns ON for the AT-axis.	The PCB may be defective. Contact the nearest BROTHER approved service dealer.
SM0500	5	2	Machine stopped with door open	(A)A door was opened during operation while the door interlock mode was set to automatic mode. (B)A door was opened during operation with the door interlock mode set to setting mode and the **[ENABLE]** switch turned OFF. (C)The **[ENABLE]** switch was turned OFF during operation with the door interlock mode set to setting mode and while a door was open.	Close the door and press the **[RST]** key. For machines equipped with an automatic door specification, press the **[AUTOMATIC DOOR-CLOSE]** switch and then press the **[RST]** key. Make sure that the door lock operates correctly.
SM0501	5	2	Spindle rotation position error	001) <<Arm type ATC>> The ATC arm was not at zero point during spindle rotation.	001) <<Arm type ATC>> (a) Follow the procedure below if the ATC arm is not at the zero point. 1. Press the **[RST]** key. 2. In manual operation mode, press the **[ATC]** key while holding down the **[RELSE]** key to restore the ATM arm to the zero point position. (b) If the ATC arm is at the zero point, the ATC zero point sensor, or the wiring from the sensor to the IO PCB, or the IO PCB is faulty. Contact the nearest BROTHER approved service dealer and report the alarm conditions.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002) <<Turret type ATC>> Raising the Z-axis from the zero point was attempted with the spindle servo ON (this does not occur when the spindle is oriented to 0 degrees).	002) <<Turret type ATC>> Press the **[RST]** key to reset the alarm.
SM0502	5	2	*-axis position shifted	(A)The motor shaft has shifted due to machining load. (B)The axis has shifted during clamping more than the setting for (system 2: QT-axis) <Position check pulse>. (C)Brake power is too low. (D)Air pressure is faulty.	(A)Reduce the cutting load. (B)Make sure that the machine parameter (system 2: QT-axis) <Position check pulse> is not too small. (C)Check that the brake is applied correctly. (D)Check the air pressure.
SM0503	5	2	*-axis position shifted	(A)The motor shaft has shifted due to machining load. (B)The axis has shifted during clamping more than the setting for (system 2: additional axis) <Position check pulse> (5th-axis) . (C)Brake power is too low. (D)Air pressure is faulty.	(A)Reduce the cutting load. (B)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (5th-axis) is not too small. (C)Check that the brake is applied correctly. (D)Check the air pressure.
SM0504	5	2	*-axis position shifted	(A)The motor shaft has shifted due to machining load. (B)The axis has shifted during clamping more than the setting for (system 2: additional axis) <Position check pulse> (6th-axis) . (C)Brake power is too low. (D)Air pressure is faulty.	(A)Reduce the cutting load. (B)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (6th-axis) is not too small. (C)Check that the brake is applied correctly. (D)Check the air pressure.
SM0505	5	2	*-axis position shifted	(A)The motor shaft has shifted due to machining load. (B)The axis has shifted during clamping more than the setting for (system 2: additional axis) <Position check pulse> (7th-axis) . (C)Brake power is too low. (D)Air pressure is faulty.	(A)Reduce the cutting load. (B)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (7th-axis) is not too small. (C)Check that the brake is applied correctly. (D)Check the air pressure.
SM0506	5	2	*-axis position shifted	(A)The motor shaft has shifted due to machining load. (B)The axis has shifted during clamping more than the setting for (system 2: additional axis) <Position check pulse> (8th-axis) . (C)Brake power is too low. (D)Air pressure is faulty.	(A)Reduce the cutting load. (B)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (8th-axis) is not too small. (C)Check that the brake is applied correctly. (D)Check the air pressure.
SM0507	5	2	Spindle in-position check timeout	The axis did not enter the in-position width after completing operation.	Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(spindle)> screen.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0508	5	2	X-axis in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 1: X-, Y- or Z-axis) setting for <In-position width> (X-axis) and <In-position timeout period> (X-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(X-axis)> screen.
SM0509	5	2	Y-axis in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 1: X-, Y- or Z-axis) setting for <In-position width> (Y-axis) and <In-position timeout period> (Y-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(Y-axis)> screen.
SM0510	5	2	Z-axis in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 1: X-, Y- or Z-axis) setting for <In-position width> (Z-axis) and <In-position timeout period> (Z-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(Z-axis)> screen.
SM0511	5	2	*-axis in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 2: QT-axis) setting for <In-position width> and <In-position timeout period>. (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(QT-axis)> screen.
SM0512	5	2	*-axis in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 2: additional axis) setting for <In-position width> (5th-axis) and <In-position timeout period> (5th-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(*-axis)> screen.
SM0513	5	2	*-axis in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 2: additional axis) setting for <In-position width> (6th-axis) and <In-position timeout period> (6th-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(*-axis)> screen.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0514	5	2	*-axis in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 2: additional axis) setting for <In-position width> (7th-axis) and <In-position timeout period> (7th-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(*-axis)> screen.
SM0515	5	2	*-axis in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 2: additional axis) setting for <In-position width> (8th-axis) and <In-position timeout period> (8th-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(*-axis)> screen.
SM0516	5	2	*-axis in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 3: common) settings <M-axis in-position width> and <M-axis in-position timeout period>. (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(magazine)> screen.
SM0517	5	2	*-axis servo power off	(A)A door was opened while the QT-axis was operating with the door interlock mode set to automatic mode. (B)A door was opened while the QT-axis was operating, with the door interlock mode set to setting mode and the **[ENABLE]** switch turned OFF. (C)The servo was turned off during QT-axis travel.	Press the **[RST]** key.
SM0518	5	2	*-axis servo power off	(A)A door was opened while the 5th-axis was operating with the door interlock mode set to automatic operation. (B)A door was opened while the 5th axis was operating, with the door interlock mode set to machine setup and the **[ENABLE]** switch turned OFF. (C)Servo turned OFF while the 5th-axis was travelling.	Press the **[RST]** key.
SM0519	5	2	*-axis servo power off	(A)A door was opened while the 6th-axis was operating with the door interlock mode set to automatic operation. (B)A door was opened while the 6th axis was operating, with the door interlock mode set to machine setup and the **[ENABLE]** switch turned OFF. (C)Servo turned OFF while the 6th-axis was travelling.	Press the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0520	5	2	*-axis servo power off	(A)A door was opened while the 7th-axis was operating with the door interlock mode set to automatic operation. (B)A door was opened while the 7th axis was operating, with the door interlock mode set to machine setup and the **[ENABLE]** switch turned OFF. (C)Servo turned OFF while the 7th-axis was travelling.	Press the **[RST]** key.
SM0521	5	2	*-axis servo power off	(A)A door was opened while the 8th-axis was operating with the door interlock mode set to automatic operation. (B)A door was opened while the 8th axis was operating, with the door interlock mode set to machine setup and the **[ENABLE]** switch turned OFF. (C)Servo turned OFF while the 8th-axis was travelling.	Press the **[RST]** key.
SM0522	5	2	*-axis index timeout	The QT axis does not contact the stopper when it moves at low speed within the time set for the parameter.	Check the setting for machine parameters (system 2: QT-axis). <Stop check time when stopped> <Wait time when stopped> <Stop current reference value when stopped>
SM0523	5	2	*-axis current error	The set current exceeded the limit set for the parameter while the QT axis is contacting the stopper.	1. Check the setting for machine parameters (system 2: QT-axis). <Stop current detection range when stopped> 2. Check the jump wiring for the X3 and X4 motor amplifier connectors, and make sure that is everything is normal and that the wires are not reversed.
SM0524	5	2	Spindle command timeout	Spindle command could not be completed within the time set for <Spindle command timeout period> (machine parameter (system 1: common)).	Check the machine parameter (system 1: common) <Spindle command timeout period> setting. Pressing the **[RST]** key resets the error. The NC PCB is defective. If this error occurs repeatedly, contact the nearest BROTHER approved service dealer.
SM0525	5	2	Spindle position shifted	The spindle position has shifted more than the setting for <Spindle orientation tolerance> (machine parameter (system 1: common)) after spindle orientation was completed.	1. Check the setting for **[Spindle orientation tolerance]** (machine parameter (system 1: common)). 2. Contact the nearest BROTHER approved service dealer.
SM0526	5	2	The servo parameter is being changed.	A servo parameter is changed again during when it is being changed at resetting.	Press the **[RST]** key to clear the alarm.
SM0527	5	2	Machine param. setting error (pitch error offset)	001)The data “Divisions for the *-th Axis Pitch Error Correction Interval” is incorrect.	001)Set the machine parameter (pitch error compensation: common) correctly.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0528	5	2	Pitch error data setting error	Cumulative pitch error compensation exceeds the acceptable value.	Set the machine parameter (pitch error compensation: common) correctly and press the **[RST]** key.
SM0529	5	2	The machine coordin. have exceeded a limit value.	Machine coordinates exceeded the acceptable value.	1. Reset abso. encoder counter. 2. Move the axis to within the allowable range and press the **[RST]** key.
SM0530	5	2	Magazine position deviation amount is too large.	The magazine could not turn as instructed in the command on a turret type ATC.	(a)Check that the total tool weight is not too high. (b)Set the user parameter (switch 1: ATC/magazine) <Turret type magazine low-speed turn mode> to <1:Valid>, and warm up the machine. (c)Contact the nearest BROTHER approved service dealer.
SM0531	5	2	Tapping motion is unavailable.	A tap command is instructed during an error.	Press the **[RST]** key to clear the alarm.
SM0532	5	2	Motor insulation resist. monit. value is abnormal.	Insulation resistance monitor value is abnormal in motor insulation resistance measurement.	The motor insulation resistance has dropped. Use the manual to troubleshoot and check if the insulation resistance drop is caused by the motor or by the cable. Then, make plans to replace what is needed. Press the **[RST]** key to clear the alarm (Normal operation is possible after the alarm is cleared).
SM0533	5	2	Motor insulation resist. monitor value is warned.	Insulation resistance monitor value is in alarm status in motor insulation resistance measurement.	The motor insulation resistance has dropped. Use the manual to troubleshoot and check if the insulation resistance drop is caused by the motor or by the cable. Then, make plans to replace what is needed. Press the **[RST]** key to clear the alarm (Normal operation is possible after the alarm is cleared).
SM0534	5	2	Tool holder has collided with the spindle head.	The tool holder collided with the spindle head.	Recover in accordance with "Recovery of grip error" in the instruction manual.
SM0535	5	2	Speed error when door is open (X-axis)	The X-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0536	5	2	Speed error when door is open (Y-axis)	The Y-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0537	5	2	Speed error when door is open (Z-axis)	The Z-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0538	5	2	Speed error when door is open (*-axis)	The 4th-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0539	5	2	Speed error when door is open (*-axis)	The 5th-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0540	5	2	Speed error when door is open (*-axis)	The 6th-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0541	5	2	Speed error when door is open (*-axis)	The 7th-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0542	5	2	Speed error when door is open (*-axis)	The 8th-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0543	5	2	Speed error when door is open (*-axis)	The 9th-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0544	5	2	Speed error when door is open (P1-axis)	The P1-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0545	5	2	Speed error when door is open (P2-axis)	The P2-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0546	5	2	Speed error when door is open (P3-axis)	The P3-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0547	5	2	Speed error when door is open (P4-axis)	The P4-axis moved at a speed exceeding a certain limit speed when the door was open.	Press the **[RST]** key.
SM0548	5	2	Servo power on timeout	Servo was not turned on within the servo on processing time.	Check connection of the servo amplifier. Contact the maker to describe the failure.
SM0549	5	2	Curve speed error	The speed of each axis has exceeded the maximum speed in cutting feed mode.	(a)Check the program start point, end point, and arc center. (b)Check that **[Smooth path offset cancel angle]** (user parameter/high accuracy: common) is not too large.
SM0550	5	2	The adjusted absolute values could not be automatically set.	001)An alarm (Stop level 5) was triggered when the adjusted absolute values automatically began to set.	001)Reset the alarm before proceeding.
				002)A command was sent to the amplifier, but it was not completed after the specified time had elapsed (positioning amplifier).	002)Check the communication cable connection. The servo amplifier may be faulty. Replace the servo amplifier.
SM0551	5	2	User param. setting error (switch 2)	001)When the machine parameter (system 2: additional axis) <Optional axis> (5th- to 8th-axes) is set to <Yes (positioning only)>, the set value for <5th- (6th-, 7th- or 8th-) axis stroke(-)(+)> is out of the tolerance range.	001)Set the user parameters (Switch 2:Stroke) to the correct values.
				002)The set value for <5th- (6th-, 7th- or 8th-) axis stroke(-)(+)> is out of the tolerance range when the machine parameter (system 2: additional axis) <Optional axis> (5th- to 8th-axis) is configured to another setting besides <No>, the machine parameter (system 2: additional axis) <Gear ratio> (5th- to 8th-axis) is set to “1” and the user parameter (switch 2: stroke) <5th-(6th-, 7th- or 8th-) axis stroke control> is set to <1:Yes>.	002)Make sure that the difference between the set values for <5th- (6th-, 7th- or 8th-) axis stroke(-)> and <5th- (6th-, 7th- or 8th-) axis stroke(+)> is less than 350 degrees.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0552	5	2	The machine coordinates cannot be calculated.	(A)The battery voltage is reduced. (B)The pulse value converted from the machine coordinates exceeds the acceptable value. (C)Machine coordinates calculated from motor feedback position exceeds the acceptable value. (D)Unable to calculate pitch error compensation from motor feedback position.	First, perform the expired battery recovery operation. If the alarm still triggers, the PCB may be defective. Contact the nearest BROTHER approved service dealer.
SM0553	5	2	Thread cutting command timeout	The lathe spindle did not reach the specified speed even after the machine parameter (system 2: common) <Thread cutting command timeout period> had elapsed for the thread cutting command.	(a)Check the machine parameter (system 2: common) <Thread cutting command timeout period> setting. (b)The servo amplifier may be faulty. Replace the servo amplifier.
SM0554	5	2	The tapping synchronous error is too big.	(A)Tolerance during tapping operation exceeded <Synchronized tapping error limit> (machine parameter/system 1: common). (B)Invalid tapping command was issued.	(A)Follow the procedure below. (a)Check the value for <Synchronized tapping error limit> (machine parameter/system 1: common). (b)Check whether the machining conditions are within the capacity. Press the **[RST]** key to recover. (B)Check the program.
SM0555	5	2	The machine coordinates have exceeded a limit value.	Machine coordinates exceeded the range of -800º to 800º.	Press the **[RST]** key to clear the alarm. Thereafter, press the **[+4]** or **[-4]** key while holding down the **[RELSE]** key, and move the axis to within the range of -800º to +800º.
SM0556	5	2	X-axis collision detection	(A)Collision was detected on the X-axis. (B)This alarm was triggered at the same time due to a servo error, but it may have been a misdetection when the alarm was triggered.	(A)After pressing the **[RST]** key, move the feed axis to a safe position while checking the machine status. (B)First, restore operation based on the servo error when a servo error is triggered with another alarm or error.
SM0557	5	2	Y-axis collision detection	(A)Collision was detected on the Y-axis. (B)This alarm was triggered at the same time due to a servo error, but it may have been a misdetection when the alarm was triggered.	(A)After pressing the **[RST]** key, move the feed axis to a safe position while checking the machine status. (B)First, restore operation based on the servo error when a servo error is triggered with another alarm or error.
SM0558	5	2	Z-axis collision detection	(A)Collision was detected on the Z-axis. (B)This alarm was triggered at the same time due to a servo error, but it may have been a misdetection when the alarm was triggered.	(A)After pressing the **[RST]** key, move the feed axis to a safe position while checking the machine status. (B)First, restore operation based on the servo error when a servo error is triggered with another alarm or error.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0559	5	2	Tool collision during ATC	(A)The tool holder collided with the end of the spindle. (B)This alarm was triggered at the same time due to a servo error. (C)If the alarm still triggers in a different situation	(A)Follow one of the procedures below. (a)If the tool has fallen off, follow the instructions below to restore operation. 1.Make sure that there is no error with the grip, the holder, the spindle's taper, the pull stud, the inside of the spindle and cover. (b)If the tool has not fallen off, follow the instructions below to restore operation. 1.Place a box or cushion, etc., to protect the tool and machine because a tool can fall off during the recovery operation. 2.Press the **[+Z]** key while holding down the **[RELSE]** key, and raise the Z-axis to a position where the tool can be removed. 3.Make sure that there is no error with the grip, the holder, the spindle's taper, the pull stud, the inside of the spindle and cover, etc. 4.Press the **[-Z]** key while holding down the **[RELSE]** key to lower the Z-axis. (B)First, restore operation based on the servo error when a servo error is triggered with another alarm or error. (C)Contact the nearest BROTHER approved service dealer and report the alarm conditions.
SM0560	5	2	Door opened while door was locked	(A)A door was opened while it was being locked with the door interlock mode set to setting mode and the **[ENABLE]** switch turned ON. (B)A door was opened while it was being locked with the door interlock mode set to service mode.	Press the **[RST]** key.
SM0561	5	2	Enable switch was turned OFF during operation	The **[ENABLE]** switch was turned OFF during MDI operation with the door interlock mode set to machine setup and while a door was open.	Press the **[RST]** key.
SM0562	5	2	Speed error when door is open (spindle)	The axis moved at a speed exceeding a certain speed limit while the door was open.	Press the **[RST]** key.
SM0563	5	2	Door interlock mode changed – Machine stop	The door interlock mode was changed during operation.	Press the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0564	5	2	Machine param. setting error (SYS 1)	(A)The <Chip auger> was set to <1: Yes> on a machine model not equipped with a chip auger. (B)The value for the machine parameter (system 1: common) <Outside door 1 settings> or <Outside door 2 settings> does not match the machine configuration.	(A)Set the machine parameters (System 1: common) to the correct values. (B)Set the machine parameters (system 1: common) <Outside door 1 settings> and <Outside door 2 settings> to the correct values, and turn the power ON again.
SM0565	5	2	*-axis in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 3: common) settings <AT-axis in-position width> and <AT-axis in-position timeout period>. (b)Make sure that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(AT-axis)> screen.
SM0566	5	2	*-axis position shifted	The position shifted more than the <AT-axis position check pulse>.	Make sure that the machine parameter (system 3: common) <AT-axis position check pulse> is not too small.
SM0567	5	2	Speed error when door is open (*-axis)	The axis moved at a speed exceeding a certain speed limit while the door was open.	Press the **[RST]** key.
SM0568	5	2	Door operation timeout	The automatic door open/close operation took longer than the time set in the machine parameter (system 1: automatic door) <Operation time>.	(a)Check the parameter setting. - Machine parameter (system 1: Automatic door) <Operation time> - Machine parameter (system 1: Automatic door)<Door open reference position> - Machine parameter (system 1: Automatic door) <Offset for door open position> - Machine parameter (system 1: Automatic door) <Offset for door close position> (b)Check the door limit switch. (c)Make sure that there are no chips or shavings between doors R and L. (d)Make sure that there are no chips or shavings between the door and machine cover. (e)Make sure that the door drive and door are connected properly.
SM0569	5	2	Door open timeout	The automatic door does not come into contact with the stopper when it opens at low speed even after the time set for the parameter has elapsed.	Check the parameter setting. - Machine parameter (system 1: Automatic door)<Stop check time when stopped> - Machine parameter (system 1: Automatic door)<Wait time when stopped> - Machine parameter (system 1: Automatic door)<Stop current reference value when stopped>
SM0570	5	2	Enable switch OFF (ENA1)	The **[ENABLE]** switch on the main operation panel was turned OFF during operation.	Press the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0571	5	2	Enable switch OFF (ENA2)	The **[ENABLE]** switch on the manual pulse generator was turned OFF during operation.	Press the **[RST]** key.
SM0572	5	2	Enable switch OFF (ENA3)	The **[ENABLE]** switch on the teaching pendant was turned OFF during operation.	Press the **[RST]** key.
SM0573	5	2	Enable switch OFF (ENA4)	The **[ENABLE]** switch on the magazine panel was turned OFF during operation.	Press the **[RST]** key.
SM0574	5	2	Enable switch OFF (ENA5)	The **[ENABLE]** switch on the front switch panel was turned OFF during operation.	Press the **[RST]** key.
SM0575	5	2	Door was not locked	A machine operation was carried out while the door was not locked.	Press the **[RST]** key.
SM0576	5	2	Machine stopped with door open (Machine setup mode)	Door opened during operation in setting mode.	Press the **[RST]** key.
SM0577	5	2	X-axis servo power off	The servo was turned off during X-axis travel.	Press the **[RST]** key.
SM0578	5	2	Y-axis servo power off	The servo was turned off during Y-axis travel.	Press the **[RST]** key.
SM0579	5	2	Z-axis servo power off	The servo was turned off during Z-axis travel.	Press the **[RST]** key.
SM0580	5	2	*-axis servo power off	The servo was turned off during M-axis travel.	Press the **[RST]** key.
SM0581	5	2	*-axis servo power off	The servo was turned off during AT-axis travel.	Press the **[RST]** key.
SM0582	5	2	Front door lock cannot be confirmed	Door did not lock.	(a)Check the machine parameter (system 1: common) <Door lock check time – Front door/Outer door> setting. (b)Check the door limit switch. Change to “LOCK” if it is set to “UNLOCK”. (c)The limit switch when the door is closed and the distance of the fixing screw for the key is not appropriate. Adjust the distance. (d)Check the wiring and the XDR1 connector on the SR PCB. (e)Replace the SR PCB.
SM0583	5	2	Outer door lock cannot be confirmed	Door did not lock.	(a)Check the machine parameter (system 1: common) <Door lock check time – Front door/Outer door> setting. (b)Check the door limit switch. Change to “LOCK” if it is set to “UNLOCK”. (c)The limit switch when the door is closed and the distance of the fixing screw for the key is not appropriate. Adjust the distance. (d)Check the wiring and the XDR2 connector on the SR PCB. (e)Replace the SR PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0584	5	2	Left side door lock cannot be confirmed	Door did not lock.	(a)Check the machine parameter (system 1: common) <Door lock check time – Left side door> setting. (b)Check the door limit switch. Change to “LOCK” if it is set to “UNLOCK”. (c)The limit switch when the door is closed and the distance of the fixing screw for the key is not appropriate. Adjust the distance. (d)Check the wiring and the XDR3 connector on the SR PCB. (e)Replace the SR PCB.
SM0585	5	2	Right side door lock cannot be confirmed	Door did not lock.	(a)Check the machine parameter (system 1: common) <Door lock check time – Right side door> setting. (b)Check the door limit switch. Change to “LOCK” if it is set to “UNLOCK”. (c)The limit switch when the door is closed and the distance of the fixing screw for the key is not appropriate. Adjust the distance. (d)Check the wiring and the XDR4 connector on the SR PCB. (e)Replace the SR PCB.
SM0586	5	2	Inner door lock cannot be confirmed	Door did not lock.	(a)Check the machine parameter (system 1: common) <Door lock check time – Inner door> setting. (b)Check the door limit switch. Change to “LOCK” if it is set to “UNLOCK”. (c)The limit switch when the door is closed and the distance of the fixing screw for the key is not appropriate. Adjust the distance. (d)Check the wiring and the XDR1 connector on the SR PCB. (e)Replace the SR PCB.
SM0587	5	2	Setup chamber left door lock cannot be confirmed	Door did not lock.	(a)Check the machine parameter (system 1: common) <Door lock check time – Setup chamber left door> setting. (b)Check the door limit switch. Change to “LOCK” if it is set to “UNLOCK”. (c)The limit switch when the door is closed and the distance of the fixing screw for the key is not appropriate. Adjust the distance. (d)Check the wiring and the XDR7 connector on the SR PCB. (e)Replace the SR PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0588	5	2	Setup chamber right door lock cannot be confirmed	Door did not lock.	(a)Check the machine parameter (system 1: common) <Door lock check time – Setup chamber right door> setting. (b)Check the door limit switch. Change to “LOCK” if it is set to “UNLOCK”. (c)The limit switch when the door is closed and the distance of the fixing screw for the key is not appropriate. Adjust the distance. (d)Check the wiring and the XDR8 connector on the SR PCB. (e)Replace the SR PCB.
SM0589	5	2	Outside door 1 lock cannot be confirmed	Door did not lock.	(a)Check the machine parameter (system 1: common) <Door lock check time – Outside door 1> setting. (b)Check the door limit switch. Change to “LOCK” if it is set to “UNLOCK”. (c)The limit switch when the door is closed and the distance of the fixing screw for the key is not appropriate. Adjust the distance. (d)Check the wiring and the XDR5 connector on the SR PCB. (e)Replace the SR PCB.
SM0590	5	2	Outside door 2 lock cannot be confirmed	Door did not lock.	(a)Check the machine parameter (system 1: common) <Door lock check time – Outside door 2> setting. (b)Check the door limit switch. Change to “LOCK” if it is set to “UNLOCK”. (c)The limit switch when the door is closed and the distance of the fixing screw for the key is not appropriate. Adjust the distance. (d)Check the wiring and the XDR6 connector on the SR PCB. (e)Replace the SR PCB.
SM0591	5	2	Magazine door lock cannot be confirmed	Door did not lock.	(a)Check the machine parameter (system 1: common) <Door lock check time – Magazine door> setting. (b)Check the door limit switch. Change to “LOCK” if it is set to “UNLOCK”. (c)The limit switch when the door is closed and the distance of the fixing screw for the key is not appropriate. Adjust the distance. (d)Check the wiring and the XDRMG connector on the SR PCB. (e)Replace the SR PCB.
SM0592	5	2	Shift in position was detected (X-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0593	5	2	Shift in position was detected (Y-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0594	5	2	Shift in position was detected (Z-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0595	5	2	Shift in position was detected (*-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0596	5	2	Shift in position was detected (*-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0597	5	2	Shift in position was detected (*-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0598	5	2	Shift in position was detected (*-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0599	5	2	Shift in position was detected (*-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0600	5	2	Shift in position was detected (*-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0601	5	2	Shift in position was detected (*-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0602	5	2	Shift in position was detected (P1-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0603	5	2	Shift in position was detected (P2-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0604	5	2	Shift in position was detected (P3-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0605	5	2	Shift in position was detected (P4-axis)	Absolute (position) data for the encoder is different from the value when the power was turned OFF.	Use the support application (recovery support) to restore the positioning.
SM0606	5	2	Positioning was restored (X-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0607	5	2	Positioning was restored (Y-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0608	5	2	Positioning was restored (Z-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0609	5	2	Positioning was restored (*-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0610	5	2	Positioning was restored (*-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0611	5	2	Positioning was restored (*-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM0612	5	2	Positioning was restored (*-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0613	5	2	Positioning was restored (*-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0614	5	2	Positioning was restored (*-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0615	5	2	Positioning was restored (*-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0616	5	2	Positioning was restored (P1-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0617	5	2	Positioning was restored (P2-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0618	5	2	Positioning was restored (P3-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0619	5	2	Positioning was restored (P4-axis)	Adjusted counter value has been set.	Make sure that the machine position is correct.
SM0620	5	2	User param. setting error (PLC)	The set value for <P1- (P2-, P3- or P4-) axis stroke(-)(+)> is out of the tolerance range when the machine parameter (PLC: PLC-axis) <Optional axis> (P1- to P4-axes) is configured to another setting besides <No>, when the machine parameter (PLC: PLC-axis) <Type> (P1- to P4-axes) is set to <1: Rotation axis> and when the machine parameter (PLC: PLC-axis) <Lead/gear ratio> (P1- to P4-axes) is set to “1”.	Make sure that the difference between the set values for <P1- (P2-, P3- or P4-) axis stroke(-)> and < P1- (P2-, P3- or P4-) axis stroke(+)> is less than 350 degrees.
SM1500	4	3	Signal cannot be confirmed for Z-axis brake release	The change in brake release signal could not be confirmed when the Z-axis brake was turned ON or OFF.	(a)The cable connection is faulty. Check or re-connect the cable that connects the IL PCB with X5 for the Z-axis servo amplifier. (b)The cable may be broken or cut. Replace the cable that connects the IL PCB with X5 for the Z-axis servo amplifier. (c)The IL PCB may be faulty. Replace the IL PCB assembly. (d)The Z-axis servo amplifier may be faulty. Replace the servo amplifier.
SM1501	4	3	Signal cannot be confirmed for *-axis brake release	The change in brake release signal could not be confirmed when the 5th-axis brake was turned ON or OFF.	(a)Cable connection is faulty. Check the cable that connects the IL PCB unit with X5 on the 5th-axis servo amplifier (including the machine parameter (system 2: additional axis) setting for the <Brake> (5th-axis)) and/or re-connect it. (b)Cable may be broken or cut. Replace the cable that connects the IL PCB unit with X5 for the 5th-axis servo amplifier. (c)IL PCB unit may be faulty. Replace the IL PCB unit. (d)The 5th-axis servo amplifier may be faulty. Replace the servo amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM1502	4	3	Signal cannot be confirmed for *-axis brake release	The change in brake release signal could not be confirmed when the 6th-axis brake was turned ON or OFF.	(a)Cable connection is faulty. Check the cable that connects the IL PCB unit with X5 on the 6th-axis servo amplifier (including the machine parameter (system 2: additional axis) setting for the <Brake> (6th-axis)) and/or re-connect it. (b)Cable may be broken or cut. Replace the cable that connects the IL PCB unit with X5 for the 6th-axis servo amplifier. (c)IL PCB unit may be faulty. Replace the IL PCB unit. (d)The 6th-axis servo amplifier may be faulty. Replace the servo amplifier.
SM1503	4	3	Signal cannot be confirmed for *-axis brake release	The change in brake release signal could not be confirmed when the 7th-axis brake was turned ON or OFF.	(a)Cable connection is faulty. Check the cable that connects the IL PCB unit with X5 on the 7th-axis servo amplifier (including the machine parameter (system 2: additional axis) setting for the <Brake> (7th-axis)) and/or re-connect it. (b)Cable may be broken or cut. Replace the cable that connects the IL PCB unit with X5 for the 7th-axis servo amplifier. (c)IL PCB unit may be faulty. Replace the IL PCB unit. (d)The 7th-axis servo amplifier may be faulty. Replace the servo amplifier.
SM1504	4	3	Signal cannot be confirmed for *-axis brake release	The change in brake release signal could not be confirmed when the 8th-axis brake was turned ON or OFF.	(a)Cable connection is faulty. Check the cable that connects the IL PCB unit with X5 on the 8th-axis servo amplifier (including the machine parameter (system 2: additional axis) setting for the <Brake> (8th-axis)) and/or re-connect it. (b)Cable may be broken or cut. Replace the cable that connects the IL PCB unit with X5 for the 8th-axis servo amplifier. (c)IL PCB unit may be faulty. Replace the IL PCB unit. (d)The 8th-axis servo amplifier may be faulty. Replace the servo amplifier.
SM1505	4	3	Signal cannot be confirmed for *-axis brake release	The change in brake release signal could not be confirmed when the magazine axis brake was turned ON or OFF.	(a)Cable connection is faulty. Check the cable that connects the IL PCB unit with X5 for the magazine servo amplifier and/or re-connect it. (b)Cable may be broken or cut. Replace the cable that connects the IL PCB unit with X5 for the magazine servo amplifier. (c)IL PCB unit may be faulty. Replace the IL PCB unit. (d)The magazine servo amplifier may be faulty. Replace the servo amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM1506	4	3	Signal cannot be confirmed for P1-axis brake release	The change in brake release signal could not be confirmed when the P1-axis brake was turned ON or OFF.	(a)Cable connection is faulty. Check the cable that connects the IL PCB unit with X5 on the P1-axis servo amplifier (including the machine parameter (PLC: PLC-axis) setting for the <Brake> (P1-axis)) and/or re-connect it. (b)Cable may be broken or cut. Replace the cable that connects the IL PCB unit with X5 for the P1-axis servo amplifier. (c)IL PCB unit may be faulty. Replace the IL PCB unit. (d)The P1-axis servo amplifier may be faulty. Replace the servo amplifier.
SM1507	4	3	Signal cannot be confirmed for P2-axis brake release	The change in brake release signal could not be confirmed when the P2-axis brake was turned ON or OFF.	(a)Cable connection is faulty. Check the cable that connects the IL PCB unit with X5 on the P2-axis servo amplifier (including the machine parameter (PLC: PLC-axis) setting for the <Brake> (P2-axis)) and/or re-connect it. (b)Cable may be broken or cut. Replace the cable that connects the IL PCB unit with X5 for the P2-axis servo amplifier. (c)IL PCB unit may be faulty. Replace the IL PCB unit. (d)The P2-axis servo amplifier may be faulty. Replace the servo amplifier.
SM1508	4	3	Signal cannot be confirmed for P3-axis brake release	The change in brake release signal could not be confirmed when the P3-axis brake was turned ON or OFF.	(a)Cable connection is faulty. Check the cable that connects the IL PCB unit with X5 on the P3-axis servo amplifier (including the machine parameter (PLC: PLC-axis) setting for the <Brake> (P3-axis)) and/or re-connect it. (b)Cable may be broken or cut. Replace the cable that connects the IL PCB unit with X5 for the P3-axis servo amplifier. (c)IL PCB unit may be faulty. Replace the IL PCB unit. (d)The P3-axis servo amplifier may be faulty. Replace the servo amplifier.
SM1509	4	3	Signal cannot be confirmed for P4-axis brake release	The change in brake release signal could not be confirmed when the P4-axis brake was turned ON or OFF.	(a)Cable connection is faulty. Check the cable that connects the IL PCB unit with X5 on the P4-axis servo amplifier (including the machine parameter (PLC: PLC-axis) setting for the <Brake> (P4-axis)) and/or re-connect it. (b)Cable may be broken or cut. Replace the cable that connects the IL PCB unit with X5 for the P4-axis servo amplifier. (c)IL PCB unit may be faulty. Replace the IL PCB unit. (d)The P4-axis servo amplifier may be faulty. Replace the servo amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2000	4	2	Return distance too long	The return distance was too great when the servo was turned ON and the return operation could not be carried out. (Note) After the absolute encoder is reset or after the automatic setting is executed for the adjusted absolute values, this alarm may trigger when the servo is first turned ON. This is not an error.	Press the **[RST]** key.
SM2001	4	2	Spindle command error	001)The next spindle command was sent while still processing the current spindle command. (Excluding orientation command while executing spindle stop command)	001)Press the **[RST]** key to clear the alarm. The NC PCB is defective. If this error occurs repeatedly, contact the nearest BROTHER approved service dealer.
				002)Turning the arm was attempted before spindle orientation had been completed.	002)Press the **[RST]** key to clear the alarm. The NC PCB is defective. If this error occurs repeatedly, contact the nearest BROTHER approved service dealer.
SM2002	4	2	*-axis position shifted	The shift in the position of the QT-axis exceeded the tolerance during clamping.	(a)Reduce the machining load. (b)Check that the setting for <Position check pulse> (machine parameter/system 2:QT-axis) is not too small.
SM2003	4	2	*-axis position shifted	(A)The shift in the motor shaft exceeded the tolerance during 5th-axis clamping. (B)Brake power is too low.	(A)Follow the procedure below. (a)Reduce the machining load. (b)Check that the setting for<position check pulse>(5th-axis) (machine parameter/system 2: additional axis) is not too small. (B)Check that the brake is applied correctly.
SM2004	4	2	*-axis position shifted	(A)The shift in the motor shaft exceeded the tolerance during 6th-axis clamping. (B)Brake power is too low.	(A)Follow the procedure below. (a)Reduce the machining load. (b)Check that the setting for<position check pulse>(6th-axis) (machine parameter/system 2: additional axis) is not too small. (B)Check that the brake is applied correctly.
SM2005	4	2	*-axis position shifted	(A)The shift in the motor shaft exceeded the tolerance during 7th-axis clamping. (B)Brake power is too low.	(A)Follow the procedure below. (a)Reduce the machining load. (b)Check that the setting for<position check pulse>(7th-axis) (machine parameter/system 2: additional axis) is not too small. (B)Check that the brake is applied correctly.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2006	4	2	*-axis position shifted	(A)The shift in the motor shaft exceeded the tolerance during 8th-axis clamping. (B)Brake power is too low.	(A)Follow the procedure below. (a)Reduce the machining load. (b)Check that the setting for<position check pulse>(8th-axis) (machine parameter/system 2: additional axis) is not too small. (B)Check that the brake is applied correctly.
SM2007	4	2	Z-axis position error	001)《Arm type ATC》 (A)The Z-axis command was carried out when the Z-axis coordinate was above the ATC zero point distance. (B)A Z-axis was not at the ATC zero point when arm turning is operated.	001)Follow the procedure below. 1.Press the **[RST]** key. 2.Press the **[-Z]** key with the **[RELSE]** key held down to lower the Z-axis below the Z-axis zero point.
				002)<<Turret type ATC>> The Z-axis command was carried out when the Z-axis coordinate was above the Z-axis zero point.	002)Follow the procedure below. 1.Press the **[RST]** key. 2.Press the **[-Z]** key with the **[RELSE]** key held down to lower the Z-axis below the Z-axis zero point.
				003)<<Turret type ATC>> The M498/M499 (Tool wash ON/OFF) command was executed when the Z-axis coordinate was above the Z-axis zero point.	003)Follow the procedure below. 1.Press the **[RST]** key. 2.Press the **[-Z]** key with the **[RELSE]** key held down to lower the Z-axis below the Z-axis zero point.
SM2008	4	2	Spindle rotation position error	001)《Arm type ATC》 A spindle command was used when the ATC arm was not at zero point.	001)Press the **[RST]** key to reset the alarm.
				002)<<Turret type ATC>> The spindle rotation command was issued when the Z-axis coordinate was above the Z-axis zero point.	002)Follow the procedure below. 1. Press the **[RST]** key to reset the alarm. 2. Press the **[-Z]** key with the **[RELSE]** key held down to lower the Z-axis below the Z-axis home position.
SM2009	4	2	Magazine number error	001)《Arm type ATC》 (a)The magazine was not indexed. (b)All data was input, or the start data (adjusted absolute values) from the backup memory recovery operation was input.Encoder position data does not match the machine coordinates.	001)Follow one of the procedures below. (a)When the alarm <<The machine coordinates may be out of position.>> is triggered, perform the expired battery recovery operation. (b)Follow one of the procedures below if (a) above does not apply. 1.Change to manual operation mode, and press the **[RST]** key while pressing the **[RELSE]** key. 2.While holding down the **[RELSE]** key, press the **[MAG.F]** key or the **[MAG.R]** key to move the magazine to the correct position.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002)<<Turret type ATC>> (a)The magazine was not indexed. (b)All data was input, or the start data (adjusted absolute values) from the backup memory recovery operation was input.Encoder position data does not match the machine coordinates.	002)Follow one of the procedures below. (a)When the alarm <<The machine coordinates may be out of position.>> is triggered, perform the expired battery recovery operation. (b)Follow one of the procedures below if (a) above does not apply. 1.Change to manual operation mode, and press the **[RST]** key while pressing the **[RELSE]** key. 2.While holding down the **[RELSE]** key, press the **[MAG.F]** key or the **[MAG.R]** key to move the magazine to the correct position.
SM2010	4	2	Magazine position error	A magazine turn operation was carried out when the Z-axis coordinate was not the ATC zero coordinate.	1.Press the **[RST]** key while holding down the **[RELSE]** key. 2.Press the **[-Z]** key with the **[RELSE]** key held down to lower the Z-axis below the Z-axis zero point.
SM2011	4	2	ATC command error	A number exceeding the number of tools set in the magazine was required by ATC command.	The NC PCB is defective. Contact the nearest BROTHER approved service dealer.
SM2012	4	2	Stroke exceeded (+X)	The axis has exceeded its stroke limit (+X). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis).)
SM2013	4	2	Stroke exceeded (-X)	The axis has exceeded its stroke limit (+X). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis).)
SM2014	4	2	Stroke exceeded (+Y)	The axis has exceeded its stroke limit (+Y). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis).)
SM2015	4	2	Stroke exceeded (-Y)	The axis has exceeded its stroke limit (-Y). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis).)
SM2016	4	2	Stroke exceeded (+Z)	The axis has exceeded its stroke limit (+Z). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis).)
SM2017	4	2	Stroke exceeded (-Z)	The axis has exceeded its stroke limit (-Z). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis).)

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2018	4	2	Stroke exceeded (+*)	(A)The axis travelled and the QT-axis exceeded the <Pallet 1/2 indexing angle> (larger value of the two) with the machine parameter (system 2: QT-axis) <Quick table> set to <Type1>. (B)The axis travelled and the QT-axis exceeded the sum when adding <Overrun angle when stopped> to the <Pallet 1/2 indexing angle> (larger value of the two), with the machine parameter (system 2: QT-axis) <Quick table> set to <Type2>.	(A)Check the value of <Pallet 1/2 indexing angle> of the machine parameter (system 2: QT-axis) . (B)Check the machine parameter (system 2: QT-axis) settings <Pallet 1/2 indexing angle> and <Overrun angle when stopped>.
SM2019	4	2	Stroke exceeded (-*)	(A)The axis travelled and the QT-axis exceeded the <Pallet 1/2 indexing angle> (smaller value of the two) with the machine parameter (system 2: QT-axis) <Quick table> set to <Type1>. (B)The axis travelled and the QT-axis exceeded the difference when subtracting <Overrun angle when stopped> from the <Pallet 1/2 indexing angle> (smaller value of the two), with the machine parameter (system 2: QT-axis) <Quick table> set to <Type2>.	(A)Check the value of <Pallet 1/2 indexing angle> of the machine parameter (system 2: QT-axis) . (B)Check the machine parameter (system 2: QT-axis) settings <Pallet 1/2 indexing angle> and <Overrun angle when stopped>.
SM2020	4	2	Stroke exceeded (+*)	The axis has exceeded its stroke limit (+5). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2021	4	2	Stroke exceeded (-*)	The axis has exceeded its stroke limit (-5). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2022	4	2	Stroke exceeded (+*)	The axis has exceeded its stroke limit (+6). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2023	4	2	Stroke exceeded (-*)	The axis has exceeded its stroke limit (-6). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2024	4	2	Stroke exceeded (+*)	The axis has exceeded its stroke limit (+7). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2025	4	2	Stroke exceeded (-*)	The axis has exceeded its stroke limit (-7). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2026	4	2	Stroke exceeded (+*)	The axis has exceeded its stroke limit (+8). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2027	4	2	Stroke exceeded (-*)	The axis has exceeded its stroke limit (-8). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2028	4	2	Limit exceeded (+X)	(A)The axis has exceeded its <stroke limit (+X)> in MDI or memory operation mode. (B)The axis exceeded its <Stroke limit (+X)> while the axis moved to a safe position during a pallet turn. (C)The axis exceeded its <Stroke limit (+X)> while the column moved during a tool change.	(A)Press the **[RST]** key, and then correct the program. (Check the user parameter (switch 2: stroke) <Stroke limit 1 (+X)>) (B)Check the user parameter (switch 2: stroke) <Stroke limit 1 (+X)>. (C)Check the user parameter (switch 1: manual operation) <X-axis position when changing tool in manual mode>.(Check the user parameter (switch 2: stroke) <Stroke limit 1 (+X)>)
SM2029	4	2	Limit exceeded (-X)	(A)The axis has exceeded its <stroke limit (-X)> in MDI or memory operation mode. (B)The axis exceeded its <Stroke limit (-X)> while the axis moved to a safe position during a pallet turn. (C)The axis exceeded its <Stroke limit (-X)> while the column moved during a tool change.	(A)Press the **[RST]** key, and then correct the program. (Check the user parameter (switch 2: stroke) <Stroke limit 1 (-X)>) (B)Check the user parameter (switch 2: stroke) <Stroke limit 1 (-X)>. (C)Check the user parameter (switch 1: manual operation) <X-axis position when changing tool in manual mode>.(Check the user parameter (switch 2: stroke) <Stroke limit 1 (-X)>)
SM2030	4	2	Limit exceeded (+Y)	(A)The axis has exceeded its <stroke limit (+Y)> in MDI or memory operation mode. (B)The axis exceeded its <Stroke limit (+Y)> while the axis moved to a safe position during a pallet turn. (C)The axis exceeded its <Stroke limit (+Y)> while the column moved during a tool change.	(A)Press the **[RST]** key, and then correct the program. (Check the user parameter (switch 2: stroke) <Stroke limit 1 (+Y)>) (B)Check the user parameter (switch 2: stroke) <Stroke limit 1 (+Y)>. (C)Check the user parameter (switch 1: manual operation) <Y-axis position when changing tool in manual mode>.(Check the user parameter (switch 2: stroke) <Stroke limit 1 (+Y)>)
SM2031	4	2	Limit exceeded (-Y)	(A)The axis has exceeded its <stroke limit (-Y)> in MDI or memory operation mode. (B)The axis exceeded its <Stroke limit (-Y)> while the axis moved to a safe position during a pallet turn. (C)The axis exceeded its <Stroke limit (-Y)> while the column moved during a tool change.	(A)Press the **[RST]** key, and then correct the program. (Check the user parameter (switch 2: stroke) <Stroke limit 1 (-Y)>) (B)Check the user parameter (switch 2: stroke) <Stroke limit 1 (-Y)>. (C)Check the user parameter (switch 1: manual operation) <Y-axis position when changing tool in manual mode>.(Check the user parameter (switch 2: stroke) <Stroke limit 1 (-Y)>)
SM2032	4	2	Limit exceeded (+Z)	The axis has exceeded its stroke limit (+Z) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2033	4	2	Limit exceeded (-Z)	The axis has exceeded its stroke limit (-Z) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2034	4	2	Limit exceeded (+*)	(A)The axis travelled and the QT-axis exceeded the <Pallet 1/2 indexing angle> (larger value of the two) with the machine parameter (system 2: QT-axis) <Quick table> set to <Type1>. (B)The axis travelled and the QT-axis exceeded the sum when adding <Overrun angle when stopped> to the <Pallet 1/2 indexing angle> (larger value of the two), with the machine parameter (system 2: QT-axis) <Quick table> set to <Type2>.	(A)Check the value of <Pallet 1/2 indexing angle> of the machine parameter (system 2: QT-axis) . (B)Check the machine parameter (system 2: QT-axis) settings <Pallet 1/2 indexing angle> and <Overrun angle when stopped>.
SM2035	4	2	Limit exceeded (-*)	(A)The axis travelled and the QT-axis exceeded the <Pallet 1/2 indexing angle> (smaller value of the two) with the machine parameter (system 2: QT-axis) <Quick table> set to <Type1>. (B)The axis travelled and the QT-axis exceeded the difference when subtracting <Overrun angle when stopped> from the <Pallet 1/2 indexing angle> (smaller value of the two), with the machine parameter (system 2: QT-axis) <Quick table> set to <Type2>.	(A)Check the value of <Pallet 1/2 indexing angle> of the machine parameter (system 2: QT-axis) . (B)Check the machine parameter (system 2: QT-axis) settings <Pallet 1/2 indexing angle> and <Overrun angle when stopped>.
SM2036	4	2	Limit exceeded (+*)	The axis has exceeded its stroke limit (+5) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2037	4	2	Limit exceeded (-*)	The axis has exceeded its stroke limit (-5) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2038	4	2	Limit exceeded (+*)	The axis has exceeded its stroke limit (+6) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2039	4	2	Limit exceeded (-*)	The axis has exceeded its stroke limit (-6) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2040	4	2	Limit exceeded (+*)	The axis has exceeded its stroke limit (+7) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2041	4	2	Limit exceeded (-*)	The axis has exceeded its stroke limit (-7) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2042	4	2	Limit exceeded (+*)	The axis has exceeded its stroke limit (+8) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2043	4	2	Limit exceeded (-*)	The axis has exceeded its stroke limit (-8) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2044	4	2	Stroke exceeded 2	The axis has entered stroke 2 (restricted travel range). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis) and machine paramater(system 2: common).)
SM2045	4	2	Limit exceeded 2	The axis has entered stroke limit 2 (not allowed travel range) in MDI or memory operation mode.	Press the **[RST]** key, and then correct the program. (Check the user parameter(switch 2:Stroke).)
SM2046	4	2	Thread cutting speed error	(A)Z-axis speed could not obtained from X- and Y-axes feedrates and radius in helical threading operation. (B)The feedrate of helical linear axis exceeded the limit when helical command was specified.	(A)Check the end point, center point, and feedrate of threading operation after pressing the **[RST]** key. (B)Check the helical command after pressing the **[RST]** key.
SM2047	4	2	No thread cutting function	Helical thread cutting was attempted on a machine not equipped with this option.	Purchase the option.
SM2048	4	2	Calculation error	001)Coordinates cannot be calculated where specified.	001)Check the program.
				002)Measurement result could not be calculated in automatic workpiece measurement mode.	002)Check the program.
SM2049	4	2	Tool breakage error	Tool breakage was detected.	(a)Follow the procedure below. 1.Check the tool life of the broken tool on the magazine tool screen. 2.Press the **[RST]** key. If a spare tool is registered, operation can be resumed. 3.If a spare tool is not registered, replace the tool, set the tool length and life, and then resume operation. *Press the **[RST]** key to reset the tool life to zero. (b)If the tool is not broken, the tool breakage detector needs adjustment. Refer to the manual for details on the adjustment.
SM2050	4	2	Large error in measured value (1)	The measurement result of automatic workpiece measurement has exceeded <Measurement tolerance 1> of <Automatic workpiece measurement> (user parameter).	Press the **[RST]** key, and then check the measurement position in the program.
SM2051	4	2	Large error in measured value (2)	The difference in the result between the current and previous automatic workpiece measurements has exceeded <Measurement tolerance 2> of <Automatic workpiece measurement> (user parameter).	Press the **[RST]** key, and then check the measurement position in the program.
SM2052	4	2	No measurement data	There is no measurement data although a command that uses measurement data (G10, G120, G168) was specified.	Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2053	4	2	No tool in magazine	(A)The tool required for operation is not registered in the magazine. (B)All tool lives have expired for the tools needed in the operations that are registered in the tool list.	(A)Register the tool in the magazine. (B)Change the tool needed for operation, and set the tool life.
SM2054	4	2	Capped	Changing the current tool with one in a capped pot was attempted, or a tool removal command that results in a capped pot moving to the spindle position was used.	Perform ATC with a pot which is not cap-designated.
SM2055	4	2	No A-axis option	Running an A-axis program was attempted although the machine is not equipped with the A-axis option.	Check the program.
SM2056	4	2	No B-axis option	Running an B-axis program was attempted although the machine is not equipped with the B-axis option.	Check the program.
SM2057	4	2	No C-axis option	Running an C-axis program was attempted although the machine is not equipped with the C-axis option.	Check the program.
SM2058	4	2	No empty pot	There was no pot available when changing the tool from standard to large, or vice versa.	Prepare an empty pot.
SM2059	4	2	Invalid pot	An invalid pot was specified when performing ATC.	Perform ATC with a pot other than invalid pots.
SM2060	4	2	Pallet position error	Tool breakage detection (Type 3) was executed before indexing the target pallet inside had been completed.	Execute Tool breakage detection (Type 3) after indexing the target pallet inside has been completed.
SM2061	4	2	Outer pallet additional axis cannot be specified.	Activating the additional axis of the pallet opposite the operation pallet was attempted.	Press the **[RST]** key, and then check the program.
SM2062	4	2	End mill tapping speed error	End milling speed is faster than tapping speed when an end milling/tapping command is used.	Press the **[RST]** key, and then check the program.
SM2063	4	2	No const. speed area for end milling	There is no constant speed range in the end milling section when an end milling/tapping command is used.	Press the **[RST]** key, and then check the program.
SM2064	4	2	No const. speed area for tapping	There is no constant speed range in the tapping section when an end milling/tapping command is used.	Press the **[RST]** key, and then check the program.
SM2065	4	2	End mill tapping	A normal spindle command was used during end milling and tapping.	Press the **[RST]** key to clear the alarm.
SM2066	4	2	XY-axes position error	001)ATC, synchronized tap return, and inching were performed when the X- or Y-axis was out of the stroke.	001)Follow the procedure below. 1.Press the **[RST]** key to reset the alarm. 2.Hold down the **[RELSE]** key and use manual operation to move the X-axis and Y-axis, and return them to within their stroke limit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002)A synchronized tap return and an inching operation were executed when the X- or Y-axis was outside of the stroke.	002)Follow the procedure below. 1.Press the **[RST]** key to reset the alarm. 2.Press the <Cancel synchronized tap return> key on the synchronized tapping return recovery screen to reset the synchronized tapping recovery. 3.Hold down the **[RELSE]** key and use manual operation to move the X-axis and Y-axis, and return them to within their stroke limit.
SM2067	4	2	X-axis position error	Operating the machine was attempted when the X axis was within the ATC operation range.	1.Press the **[RST]** key to reset the alarm. 2.Return the X axes to within their stroke limits.
SM2068	4	2	Tapping command not possible during spindle rotationotating	An end milling/tapping command was used during normal spindle rotation.	Press the **[RST]** key to clear the alarm.
SM2069	4	2	Excessive thermal distortion	Automatic thermal distortion compensation has exceeded the limit (30 mm).	See the parameter setting section in the Instruction Manual, and change the parameter setting so that automatic thermal distortion compensation is performed under the appropriate conditions.
SM2070	4	2	No auto thermal compen. func.(X)	Automatic X-axis thermal compensation was attempted although the machine is not equipped with this option.	Check the program.
SM2071	4	2	No auto thermal compen. func.(Y)	Automatic Y-axis thermal compensation was attempted although the machine is not equipped with this option.	Check the program.
SM2072	4	2	No auto thermal compen. func.(Z)	Automatic Z-axis thermal compensation was attempted although the machine is not equipped with this option.	Check the program.
SM2073	4	2	Compensating diameter(*)	A G/M code command was issued even though it is prohibited during diameter compensation.	Check the program.
SM2074	4	2	During rotational transformation(*)	A G/M code command was issued even though it is prohibited during rotational transformation.	Check the program.
SM2075	4	2	Cutter compensation error	001)An arc command, involute command or a circular cutting command was issued when the cutter compensation was started up or canceled.	001)Check the program.
				002)A travel command was issued to the same position as the cutter compensation startup.	002)Check the program.
				003)ATC command and cutter compensation command were specified simultaneously with G18 and G19 modal.	003)Check the program.
				004)The thread cutting was specified and the cutter compensation was cancelled.	004)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				005)The end point or the end point radius is 0 in the arc command.	005)Check the program.
				006)An attempt was made to change the plane selection before the cutter compensation was cancelled.	006)Check the program.
				007)The compensation direction was changed in the next block following the startup block.	007)Check the program.
SM2076	4	2	Cutter compensation too large	Program radius is smaller than the cutter compensation when cutting an inner arc.	Check the program.
SM2077	4	2	Canned cycle command error	001)The start value for the cutting feed is larger than the start value for the rapid feed in the double drilling cycle (G181, G182) or in the double boring cycle (G185, G186, G189).	001)Check the program.
				002)The value to change the feedrate is greater than the distance from the R-point to the Z-point in the end mill tapping (G177).	002)Check the program.
SM2078	4	2	No pitch data	001)NC: Pitches or threads are not specified although tapping is specified.	001)Press the **[RST]** key, and then set the pitch data.
				002)Conversation: The pitch data is not set in the tool list when tapping.	002)Press the **[RST]** key, and then set the pitch data.
SM2079	4	2	Program restart error	(A)Program restart was attempted when positioning was not completed. After automatic workpiece measurement or skip command is specified, program restart is impossible during positioning command (G90G0XYZ, etc.) (B)G52/G92 (coordinate system setting), scaling, and rotational transformation were performed when positioning was not completed during program restart. (C)Program restart was attempted in a block with smooth path offset function valid. (D)The specified sequence number is not found. (E)Program restart was attempted while the lathe spindle is rotating.	(A)Restart the program after a positioning command which is specified before automatic workpiece measurement or skip command or after automatic workpiece measurement or skip command. (B)Restart the program before automatic workpiece measurement or skip command. (C)Restart the program in a block with smooth path offset function invalid. (D)Check the specified sequence number. (E)Restart the program after stopping the lathe spindle.
SM2080	4	2	Canned cycle address error (*address)	The address of the canned cycle was not specified.	Check the program.
SM2081	4	2	Auto workpc. meas. address error	001)The address required for automatic workpiece measurement was not specified.	001)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002)The specified addresses cannot beaccessed.	002)Check the program.
SM2082	4	2	Macro command error	001)The macro command format is not correct.	001)Check the program.
				002)Identifier specified is incorrect.	002)Check the program.
				003)Argument specified is incorrect.	003)Check the program.
				004)G/M code or address command is issued on the same block.	004)Check the program.
				005)Another macro command is issued on the same block.	005)Check the program.
				006)Macro command (WHILE) corresponding to the macro command (END) could not be found. (A)Macro command (WHILE) corresponding to the macro command (END) was not issued. (B)Sequence number command within the range of the macro command (WHILE/END) was issued.	006)Check the program.
SM2083	4	2	Center through coolant on	M496 was used while CTS was on.	Press the **[RST]** key, and then correct the program.
SM2084	4	2	Tool length range error	Tool length is not set correctly for **[Tool breakage detection option]** (type 2). This error occurs when the length of the tool subject to breakage detection is as below. - (Tool length – Tool breakage detection offset) < - (Breakage detection reference position) - (Tool length – Too breakage detection offset) > - (Breakage detection reference position + Breakage motor stroke)	Make sure that the following parameters are set correctly: User parameter (Tool breakage detection) <Tool breakage detection option>, <Tool breakage detection offset> and <Tool length offset> under the tool list, etc.
SM2085	4	2	Magazine index command error	There is an error with the value for the machine parameter (system 1: common) <Manual tool change position offset>.	Set the machine parameter (system 1: common) <Manual tool change position offset> to a value which is the same or less than the number of tools to be stored in the magazine.
SM2086	4	2	Spindle tool cannot be specified	The tool specified by the M5xx command is attached to the spindle.	Return the spindle tool to the magazine, and then use the M5xx command.
SM2087	4	2	Unregistered miscellaneous function	(A)Executing a non-registered miscellaneous function was attempted. (B)Executing a miscellaneous function not permitted for MDI operation was attempted.	Correct the miscellaneous function code.
SM2088	4	2	Invalid axis specified	The axis specified in the program is not correct.	Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2089	4	2	Door open	(A)Manual operation, MDI operation or memory operation was carried out while a door was open. (B)A command (such as a spindle rotation, ATC, tap, CTS or brake load test operation) that includes a spindle motion was carried out during operation while the side door was open. (C)A command (such as a pallet turn, clamp, unclamp or brake load test) that includes an external additional axis or QT-axis operation was carried out during operation while the outer door was open.	(A)Follow one of the procedures below. (a)Close the door, and then press the **[RST]** key. (b)Check the door limit switch. (c)Make sure that there are no chips or shavings caught between the door and the machine cover. (d)The door sensor is faulty. Replace the door sensor. (e)IL PCB unit is faulty. Replace the IL PCB unit. (B)Close the corresponding door and press the **[RST]** key, and then operate. (C)Close the corresponding door and press the **[RST]** key, and then operate.
SM2090	4	2	Cannot measure in incremental mode	Automatic workpiece measurement was attempted in incremental mode.	Change to absolute mode, and then perform automatic workpiece measurement.
SM2091	4	2	External program number error	Memory operation was executed when the external program selection signal was No.10000 or later.	Set the external program selection signal to No. 9999 or earlier.
SM2092	4	2	Arc radius error has exceeded the limit.	The radius error of the arc, helical thread cutting, cone or spiral has exceeded the value for the user parameter (switch 1: programming) <Arc radius error limit>.	Check the program or the setting for the user parameter (switch 1: programming) <Arc radius error limit>.
SM2093	4	2	Feedrate not specified	Cutting command was specified but the feedrate is not set.	Set feedrate before specifying cutting command.
SM2094	4	2	Wrong tool diameter	The diameter of the spare tool differs from that of the main tool.	Specify main tool correctly on the ATC screen or check the tool data.
SM2095	4	2	Start position cannot be set	(A)Start point setting was attempted when positioning was not completed. Start point cannot be set from when measurement operation is performed to when positioning command is specified. (B)Start point is set to a process with smooth path offset function valid.	(A)Set start point after positioning command which is specified before or after measurement operation. (B)Set start point to a process with smooth path offset function invalid.
SM2096	4	2	Memory operation mode	G17 to G19 was executed via MDI intervention during memory operation.	Press the **[RST]** key.
SM2097	4	2	Unable to prepare next tool	Conversation language machining data for arm type ATC models was input to operate a turret type ATC model.	Assign the tools again.
SM2098	4	2	Press **[M.LCK]** to disable machine lock.	Changing tool by specifying the pot number (M701 ~ M749) was attempted with machine lock ON in memory operation mode (conversation language program).	Press the **[MLCK]** key to turn OFF the machine lock.(Specifying the pot to change the tool is not possible while the machine lock is engaged.)

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2099	4	2	Pallet turn restricted range error	(A)The pallet turn operation was carried out when the X-/Y-axis was inside the pallet turn restricted range. (B)A command was issued to move the X-/Y-axis inside the pallet turn restricted range when the pallet was not indexed. (C)When the user parameter (quick table) <Pallet 1 loading> or <Pallet 2 loading> is set to <At 1st tool change>, the R-point position for the first tool change command (G100/M06) is issued at a position lower than the machine parameter (system 1: common) <R-point lower limit for pallet loading during tool change>.	(A)Follow the procedure below. 1.Press the **[RST]** key to clear the alarm. 2.Check the program. (Check the values for the machine parameters (system 1: common) <Pallet turn restricted distance (Y axis)>, <Move X-axis to safe position turning pallet> and <Move Y-axis to safe position turning pallet>.) 3.Move the X-/Y-axis in manual mode to a point outside of the pallet turn restricted range. (B)Follow the procedure below. 1.Press the **[RST]** key to clear the alarm. 2.Check the program. (Check the values for the machine parameters (system 1: common) <Pallet turn restricted distance (Y axis)>, <Move X-axis to safe position turning pallet> and <Move Y-axis to safe position turning pallet>.) 3.Index the pallet in manual mode. (C)Follow the procedure below. 1.Press the **[RST]** key to clear the alarm. 2.Follow one of the procedures below. (a)Correct the program. (b)Change the user parameter (switch 1: ATC/magazine) setting for <ATC simultaneous operation start position> or <ATC reference tool length>. (c)Change the setting to <0:At operation start> for the user parameters (quick table) <Pallet 1 loading> and/or <Pallet 2 loading>.
SM2100	4	2	ATC arm turn restricted range error	Arm turn was attempted when the X-axis was in ATC arm turn restricted range. (Except when the X-, Y-, and Z-axes are at the ATC zero point.)	1. Press the **[RST]** key to reset the alarm. 2. Press **[-X]** while holding down the **[RELSE]** key to move the X-axis to the position of <ATC arm turn restricted distance (X axis)> (machine parameter(system 1: common)) or farther away from X-axis ATC position.
SM2101	4	2	Servo power off	(A)The **[EMERGENCY]** switch was pressed during machine operation. (B)A door was opened during machine operation while the **[DOOR INTERLOCK]** switch was enabled ("|").	(A)Release the **[EMERGENCY STOP]** switch, and then press the **[RST]** key. (B)Close the door, and press the **[RST]** key.
SM2102	4	2	Pot position error	Pot position is incorrect.	Follow the procedure below. 1.Switch to manual operation mode press the **[RST} key with the [RELSE]** key held down. 2.Then, press the **[ATC]** key with the **[RELSE]** key held down to move the magazine pot to the correct position.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2103	4	2	Editing	Program contents were changed when the program was loaded.	Make sure that the communication (in progress) mark is not displayed, and then press the **[RST]** key.
SM2104	4	2	Magazine position shifted	The position of the magazine has shifted during stop.	Check the value of <M-axis position check pulse> of the machine parameter (system 3: common) .
SM2105	4	2	ATC return position error	When the ATC arm stopped midway, the X-, Y- or Z-axis, pot position or pot shutter position is not in a position where the ATC arm can turn.	Recovery is not possible in ATC arm position recovery mode. Use ATC maintenance mode to restore.Only maintenance personnel who are trained can operate in ATC maintenance mode.
SM2106	4	2	Additional axis operation prohibited range error	Additional axis turn was attempted in manual operation mode when the Z-axis was in the additional axis operation restricted range.	Move the Z-axis out of the additional axis operation restricted range after pressing the **[RST]** key.
SM2107	4	2	Tool type error	When spare tool is used, the type is different from main tool.	Specify main tool correctly on the ATC screen or check the tool data.
SM2108	4	2	Tool data spindle rotational frequency error	Spindle rotation was attempted at a speed of exceeding the maximum spindle speed registered in tool data.	Press the **[RST]** key, and the check the program.
SM2109	4	2	The tapping synchronous error is too big.	(A)Tolerance during the tapping operation exceeded the machine parameter (system 1: common) <Synchronized tapping error limit>. (B)Invalid tapping command was issued.	(A)Follow the procedure below. (a)After checking the value for the machine parameter (system 1: common) <Synchronized tapping error limit>, and use the **[RST]** key to restore operation. (b)After checking whether the machining conditions are within the capacity, and use the **[RST]** key to restore operation. (B)Check the program.
SM2110	4	2	High-accuracy B execution error	Dry run was turned off just before high accuracy mode B function and high accuracy mode B function became valid with offset amount still remaining.	Start operation without dry run offset remaining after pressing the **[RST]** key.
SM2111	4	2	An external output command is being executed.	The mode was changed during data output via external output command.	Press the **[RST]** key. Change the mode after data output via external output command is completed.
SM2112	4	2	The high-accuracy B is being executed.	The dry run was changed by the PLC program while the high accuracy B function was enabled.	The operation described in the left cannot be executed during high accuracy B function. Execute after high accuracy B operation is completed.
SM2113	4	2	Therm. displacement offset parameter setting error	Incorrect value is set for parameters related to automatic thermal distortion compensation.	Check the settings for parameters related to automatic thermal distortion compensation.
SM2114	4	2	Spline function execution error	001)Intervention of manual operation was performed just before the smooth path offset function started, and operation was started with intervention amount remaining on the X-, Y-, and Z-axes.	001)Start operation without intervening manual operation after pressing the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002)Dry run was turned off just before smooth path offset function and smooth path offset function became valid with offset amount still remaining.	002)Start operation without dry run offset remaining after pressing the **[RST]** key.
SM2115	4	2	Feedrate error	(A)F command was not specified during cutting feed per rotation or was specified with the limit value exceeded. Or, if the set value for the user parameter (switch 1: common) <Table load weight> exceeds the machine parameter (system 1: common) <Restricted operation weight>, the feedrate exceeded the machine parameter (system 1: X-, Y- and Z-axes) <Max cutting travel speed(restricted operation weight)>. (B)The spindle does not rotate during cutting feed per rotation. (C)A command for thread cutting was issued when the lathe spindle was not rotating. (D)The speed in the cutting direction in the thread cutting cycle exceeded the limit value.	(A)Press the **[RST]** key and then check the program. Or, check the set value for the user parameter (switch 1: common) <Table load weight>. (B)Press the **[RST]** key and then check the program. (C)Press the **[RST]** key and then check the program. (D)Press the **[RST]** key and then check the program.
SM2116	4	2	Max. speed exceeded	001)The speed specified in the command for feedrate per rotation exceeds <Max. actual cutting travel speed (linear axis)>.	001)Press the **[RST]** key, and then check the program, or set the user parameter (switch 1: programming) <Max. actual cutting travel speed (linear axis)> to the appropriate value.
				002)The speed specified in the command for feedrate per rotation exceeds <Max. actual cutting travel speed (rotation axis)>.	002)Press the **[RST]** key, and then check the program, or set the user parameter (switch 1: programming) <Max. actual cutting travel speed (rotation axis)> to the appropriate value.
SM2117	4	2	Measurement impossible because alarm occurring	The motor insulation resistance measurement was started when an alarm (stop level 5) was triggered.	Execute measurement after resetting the alarm.
SM2118	4	2	Axis travel command error	A command was specified to a traveling axis.	NC PCB is defective. Replace NC PCB. Contact the nearest BROTHER approved service dealer.
SM2119	4	2	Spindle speed error	S command was not specified when spindle rotation was executed or was specified with the limit value exceeded.	Press the **[RST]** key, and the check the program.
SM2120	4	2	Perform Spindle run-in operation	Immediately after machine installation or long-time recess, the spindle run-in operation must be executed.	Press the **[RST]** key. Use the support application (recovery support) to execute the spindle test run-in operation.
SM2121	4	2	The spindle running-in has not been completed yet.	Spindle rotation command was specified without spindle running-in completed.	Press the **[RST]** key, and then use the support application (recovery support) to execute the spindle test run-in operation.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2122	4	2	No tool is mounted in the spindle.	(A)There was no tool at tool clamping in tool change operation. (B)Tool fell at tool clamping in tool change operation.	Insert a tool in the pot and perform ATC after pressing the **[RST]** key.
SM2123	4	2	No interrupt type macro function	An attempt was made to use the interrupt type macro function even though the machine is not equipped with that function option.	Purchase the option.
SM2124	4	2	OPSEL mounted	OPSEL is mounted.	Please contact us if you encounter a situation.
SM2125	4	2	The high-accuracy mode overloads the X axis.	Current command exceeded the acceptable value during high-accuracy mode.	Decrease the cutting load and operation patterns.
SM2126	4	2	The high-accuracy mode overloads the Y axis.	Current command exceeded the acceptable value during high-accuracy mode.	Decrease the cutting load and operation patterns.
SM2127	4	2	The high-accuracy mode overloads the Z axis.	Current command exceeded the acceptable value during high-accuracy mode.	Decrease the cutting load and operation patterns.
SM2128	4	2	Stroke exceeded 3	The axis has entered stroke 3 (restricted travel range). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis) and machine paramater(system 2: common).)
SM2129	4	2	Stroke exceeded 4	The axis has entered stroke 4 (restricted travel range). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis) and machine paramater(system 2: common).)
SM2130	4	2	Stroke exceeded 5	The axis has entered stroke 5 (restricted travel range). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis) and machine paramater(system 2: common).)
SM2131	4	2	Spindle rotating	MDI operation was carried out after rotating the spindle in manual mode, or a constant peripheral speed control command was issued when restarting the program.	Press the reset key, and issue a peripheral speed control command after the spindle stops.
SM2132	4	2	*-axis overload in high accuracy mode	The current command value in high accuracy mode exceeds the tolerance.	Lower the operation pattern and cutting conditions to operate.
SM2133	4	2	*-axis overload in high accuracy mode	The current command value in high accuracy mode exceeds the tolerance.	Lower the operation pattern and cutting conditions to operate.
SM2134	4	2	*-axis overload in high accuracy mode	The current command value in high accuracy mode exceeds the tolerance.	Lower the operation pattern and cutting conditions to operate.
SM2135	4	2	*-axis overload in high accuracy mode	The current command value in high accuracy mode exceeds the tolerance.	Lower the operation pattern and cutting conditions to operate.
SM2136	4	2	*-axis overload in high accuracy mode	The current command value in high accuracy mode exceeds the tolerance.	Lower the operation pattern and cutting conditions to operate.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2137	4	2	Excessive thermal distortion on X-axis	The automatic thermal distortion compensation value has exceeded the compensation limit.	(a)Refer to the parameter setting section in the Operation Manual, and change the parameter setting so that automatic thermal distortion compensation is performed under the appropriate conditions. (b)Review the operation conditions (is X-axis travel often too extreme). (c)Check the load on the load meter while the X-axis is stopped, and make sure that there is no interference.
SM2138	4	2	Excessive thermal distortion on Y-axis	The automatic thermal distortion compensation value has exceeded the compensation limit.	(a)Refer to the parameter setting section in the Operation Manual, and change the parameter setting so that automatic thermal distortion compensation is performed under the appropriate conditions. (b)Review the operation conditions (is Y-axis travel often too extreme). (c)Check the load on the load meter while the Y-axis is stopped, and make sure that there is no interference.
SM2139	4	2	Excessive thermal distortion on Z-axis	The automatic thermal distortion compensation value has exceeded the compensation limit.	(a)Refer to the parameter setting section in the Operation Manual, and change the parameter setting so that automatic thermal distortion compensation is performed under the appropriate conditions. (b)Review the operation conditions (is Z-axis travel often too extreme). (c)Check the load on the load meter while the Z-axis is stopped, and make sure that there is no interference.
SM2140	4	2	Thread cutting execution error	The dry run offset caused the travel distance to change to 0 in the cutting direction for taper thread cutting or the finishing operation.	Press the **[RST]** key. Check the user parameter (switch 1: operation) <Dry run offset lower limit>.
SM2141	4	2	Special setting error (Rapid feed adjustment)	001)When the <Rapid feed special setting selection> was set to <Adjustment> on the <Special setting (Special setting selection)> screen for the data bank, the following parameter values for the <Adjustment> on the on the <Special setting (Special setting selection)> screen are greater than the set values for the <Standard> setting. (a)<ATC speed (2 when ATC rises)> (b)<ATC speed (2 when ATC falls)> (c)<*-axis rapid feed constant FFGN1 > (d)<Z-axis rapid feed constant FFGN3>	001)Follow one of the procedures below. (a)Change the set value for the <Adjustment> parameter to the correct value, and press the **[RST]** key. (b)If the adjustment is not carried out, set the <Rapid feed special setting selection> to the <Standard> setting.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002)When the <Rapid feed special setting selection> was set to <Adjustment> on the <Special setting (Special setting selection)> screen for the data bank, the following parameter values for the <Adjustment> on the <Special setting (Special setting selection)> screen are less than the set values for the <Standard> setting. (a)<*-axis rapid feed time const. TVI1> (b)<*-axis rapid feed time const. TVI2> (c)<*-axis lower limit time const.> + <*-axis rapid feed time const. 3*>	002)Follow one of the procedures below. (a)Change the set value for the <Adjustment> parameter to the correct value, and press the **[RST]** key. (b)If the adjustment is not carried out, set the <Rapid feed special setting selection> to the <Standard> setting.
				003)When the <Rapid feed special setting selection> was set to <Adjustment> on the <Special setting (Special setting selection)> screen for the data bank, the <Adjustment> value is greater than the <Standard> value for the rapid feed acceleration.	003)Follow one of the procedures below. (a)Change the set value for the <Adjustment> parameter to the correct value, and press the **[RST]** key. (b)If the adjustment is not carried out, set the <Rapid feed special setting selection> to the <Standard> setting.
				004)When <Adjustment> has been set for the <Rapid feed special setting selection>, the values that are set for <Z-ax.rpd. control type 1> and <Z-ax.rpd. control type 2> are different under the <Adjustment> parameter on the <Special setting (Rapid feed adjustment)> screen.	004)Follow one of the procedures below. (a)Change the set value for the <Adjustment> parameter to the correct value, and press the **[RST]** key. (b)If the adjustment is not carried out, set the <Rapid feed special setting selection> to the <Standard> setting.
SM2142	4	2	Positioning command error for linear interpolation type	When the user parameter (switch 1: programming) <Positioning method> was set to <1: Linear interpolation type - Positioning method 1>, a command was issued for using at least 2 additional axes simultaneously even though the machine only allowed 1 additional axis to be used for simultaneous linear interpolation commands.	Press the **[RST]** key, and the check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2143	4	2	Program restart error from saved position	The return height operation could not be carried out to the saved position due to the operation status information. Example when return height operation is not possible (a)Call level of the sub program was changed (b)Call number for the call source in the sub program was changed (c)Saved block can no longer execute because macro variable value was changed	Press the **[RST]** key and perform one of the following. (a)Correct the program. (b)Specify the execution pointer, or restart the program that specifies the sequence number.
SM2144	4	2	Pitch data error	The pitch during a tapping operation was less than the <Minimum tapping pitch> in the machine parameter (system 1: common).	Press the **[RST]** key and check the program and pitch data.
SM2145	4	2	No spindle tool during ATC (when ATC rises)	(A)There was no tool at tool unclamping in the tool change operation. (B)Pull stud on an unclamped tool may be loose or worn. (C)This alarm was triggered at the same time due to a servo error. (D)If the alarm still triggers in a different situation	(A)Follow the procedure below. 1.Make sure that a tool has not fallen off into the machine or stuck into a workpiece. 2.If a tool has fallen off, make sure that there is no error with the holder, the spindle's taper, the pull stud, the inside of the spindle and cover, etc. (B)Make sure that the pull stud on an unclamped tool is not loose or worn. (C)First, restore operation based on the servo error when a servo error is triggered with another alarm or error. (D)Contact the nearest BROTHER approved service dealer and report the alarm conditions.To continue to use the machine, set the user parameter (switch 1: ATC/Magazine) <No tool detection function> to <0: Disable>.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2146	4	2	Spindle tool misaligned during ATC	(A)Tool was mounted over the spindle drive key at tool clamping in tool change operation. (B)Changes in the spindle's clamp mechanism due to aging may cause misdetection. (C)This alarm was triggered at the same time due to a servo error. (D)If the alarm still triggers in a different situation	(A)Follow the procedure below. 1.Check whether the end of the tool holder is over the spindle drive key. 2.Place a box or cushion, etc., underneath to protect the tool and machine because a tool can fall off during the recovery operation. 3.Press the **[RST]** key. 4.Press the **[ATC]** key to move to the ATC zero point. 5.Make sure that there is no error with the holder, the spindle's taper, the pull stud, the inside of the spindle and cover, etc. (B)Contact Brother or an approved service dealer. To continue to use the machine, set the user parameter (switch 1: ATC/Magazine) <Tool over key detection function> to <0: Disable>. (C)First, restore operation based on the servo error when a servo error is triggered with another alarm or error. (D)Contact Brother or an approved service dealer. To continue to use the machine, set the user parameter (switch 1: ATC/Magazine) <Tool over key detection function> to <0: Disable>.
SM2147	4	2	Spindle tool missing	(A)The tool came off the spindle. (B)This alarm was triggered at the same time due to a servo error. (C)If the alarm still triggers in a different situation	(A)Follow one of the procedures below. (a)Follow the procedure below. 1.Make sure that a tool has not fallen off into the machine or stuck into a workpiece. 2.Make sure that there is no error with the holder, the spindle's taper, the pull stud, the inside of the spindle and cover, etc. (b)Under certain machining conditions, the tool might be misdetected as missing due to an external force being applied. In this situation, set the user parameter (switch 1: ATC/Magazine) <Tool missing detection function> to <0: Disable> and use. (B)First, restore operation based on the servo error when a servo error is triggered with another alarm or error. (C)Contact Brother or an approved service dealer. To continue to use the machine, set the user parameter (switch 1: ATC/Magazine) <Tool missing detection function> to <0: Disable>.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2148	4	2	Operation restricted in machine setup mode	(A)The **[SINGL]** key was turned OFF during operation with the door interlock mode set to setting mode. (B)The **[DRY]** key was turned OFF during operation with the door interlock mode set to machine setup.	When the door interlock mode is set to machine setup, operation is only possible if only one of the following keys is turned ON: **[SINGL]**, **[DRY]** or **[M.LCK]** key. (a)After pressing the **[RST]** key, turn ON one of the following keys: **[SINGL]**, **[DRY]** or **[M.LCK]** key. (b)Press the **[RST]** key, and then change the door interlock mode to automatic mode.
SM2149	4	2	Axis travel not possible while spindle is rotating	Axis travel was carried out during spindle rotation when the door interlock mode was set to service mode.	(A)After pressing the **[RST]** key, move the axis once the spindle has stopped. (B)Change the door interlock mode to automatic mode or to setting mode.
SM2150	4	2	Axis travel not possible while lathe spindle is rotating	Axis travel was carried out during lathe spindle rotation when the door interlock mode was set to service mode.	(A)After pressing the **[RST]** key, move the axis once the lathe spindle has stopped. (B)Change the door interlock mode to automatic operation or to machine setup.
SM2151	4	2	Brake load test error on Z-axis	Brake load test on Z-axis failed.	The Z-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM2152	4	2	Brake load test error on *-axis	Brake load test on 5th-axis failed.	The 5th-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM2153	4	2	Brake load test error on *-axis	Brake load test on 6th-axis failed.	The 6th-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM2154	4	2	Brake load test error on *-axis	Brake load test on 7th-axis failed.	The 7th-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM2155	4	2	Brake load test error on *-axis	Brake load test on 8th-axis failed.	The 8th-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM2156	4	2	Brake load test error on *-axis	Brake load test on M-axis failed.	The M-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM2157	4	2	Brake load test error on P1-axis	Brake load test on P1-axis failed.	The P1-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM2158	4	2	Brake load test error on P2-axis	Brake load test on P2-axis failed.	The P2-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM2159	4	2	Brake load test error on P3-axis	Brake load test on P3-axis failed.	The P3-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM2160	4	2	Brake load test error on P4-axis	Brake load test on P4-axis failed.	The P4-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM2161	4	2	Operation disabled when door interlock not set to service	(A)The door interlock mode is set to automatic mode. (B)The door interlock mode is set to setting mode.	Change the door interlock mode to service mode.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2162	4	2	No spindle tool during ATC (when ATC falls)	(A)There was no tool at tool clamping in the tool change operation. (B)Tool fell at tool clamping in the tool change operation. (C)Pull stud on a clamped tool may be loose or worn. (D)This alarm was triggered at the same time due to a servo error. (E)If the alarm still triggers in a different situation	(A)Make sure that the tool registered in the ATC tool (Details) screen is fitted onto the magazine. (B)Follow the procedure below. 1.Make sure that a tool has not fallen off into the machine or stuck into a workpiece. 2.If a tool has fallen off, make sure that there is no error with the holder, the spindle's taper, the pull stud, the inside of the spindle and cover, etc. (C)Make sure that the pull stud on a clamped tool is not loose or worn. (D)First, restore operation based on the servo error when a servo error is triggered with another alarm or error. (E)Contact the nearest BROTHER approved service dealer and report the alarm conditions.To continue to use the machine, set the user parameter (switch 1: ATC/Magazine) <No tool detection function> to <0: Disable>.
SM2163	4	2	Timeout for load check during brake load test on Z-axis	The required load was not applied in the brake load test on the Z-axis even after the time set in the parameter elapsed.	(a)Check the machine parameter (system 1: X-, Y- or Z-axis) setting for <Timeout time for load check during brake load test> (Z-axis). (b)The Z-axis motor may be faulty. Replace the motor. (c)The Z-axis servo amplifier may be faulty. Replace the servo amplifier.
SM2164	4	2	Timeout for load check during brake load test on *-axis	The required load was not applied in the brake load test on the 5th-axis even after the time set in the parameter elapsed.	(a)Check the machine parameter (system 2: additional axis) setting for <Timeout time for load check during brake load test> (5th-axis). (b)The 5th-axis motor may be faulty. Replace the motor. (c)The 5th-axis servo amplifier may be faulty. Replace the servo amplifier.
SM2165	4	2	Timeout for load check during brake load test on *-axis	The required load was not applied in the brake load test on the 6th-axis even after the time set in the parameter elapsed.	(a)Check the machine parameter (system 2: additional axis) setting for <Timeout time for load check during brake load test> (6th-axis). (b)The 6th-axis motor may be faulty. Replace the motor. (c)The 6th-axis servo amplifier may be faulty. Replace the servo amplifier.
SM2166	4	2	Timeout for load check during brake load test on *-axis	The required load was not applied in the brake load test on the 7th-axis even after the time set in the parameter elapsed.	(a)Check the machine parameter (system 2: additional axis) setting for <Timeout time for load check during brake load test> (7th-axis). (b)The 7th-axis motor may be faulty. Replace the motor. (c)The 7th-axis servo amplifier may be faulty. Replace the servo amplifier.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2167	4	2	Timeout for load check during brake load test on *-axis	The required load was not applied in the brake load test on the 8th-axis even after the time set in the parameter elapsed.	(a)Check the machine parameter (system 2: additional axis) setting for <Timeout time for load check during brake load test> (8th-axis). (b)The 8th-axis motor may be faulty. Replace the motor. (c)The 8th-axis servo amplifier may be faulty. Replace the servo amplifier.
SM2168	4	2	Timeout for load check during brake load test on *-axis	The required load was not applied in the brake load test on the magazine even after the time set in the parameter elapsed.	(a)Check the machine parameter (system 3: common) setting for <Timeout time for load check during brake load test on M-axis>. (b)The magazine motor may be faulty. Replace the motor. (c)The magazine servo amplifier may be faulty. Replace the servo amplifier.
SM2169	4	2	Timeout for load check during brake load test on P1-axis	The required load was not applied in the brake load test on the P1-axis even after the time set in the parameter elapsed.	(a)Check the machine parameter (PLC: PLC-axis) setting for <Timeout time for load check during brake load test> (P1-axis). (b)The P1-axis motor may be faulty. Replace the motor. (c)The P1-axis servo amplifier may be faulty. Replace the servo amplifier.
SM2170	4	2	Timeout for load check during brake load test on P2-axis	The required load was not applied in the brake load test on the P2-axis even after the time set in the parameter elapsed.	(a)Check the machine parameter (PLC: PLC-axis) setting for <Timeout time for load check during brake load test> (P2-axis). (b)The P2-axis motor may be faulty. Replace the motor. (c)The P2-axis servo amplifier may be faulty. Replace the servo amplifier.
SM2171	4	2	Timeout for load check during brake load test on P3-axis	The required load was not applied in the brake load test on the P3-axis even after the time set in the parameter elapsed.	(a)Check the machine parameter (PLC: PLC-axis) setting for <Timeout time for load check during brake load test> (P3-axis). (b)The P3-axis motor may be faulty. Replace the motor. (c)The P3-axis servo amplifier may be faulty. Replace the servo amplifier.
SM2172	4	2	Timeout for load check during brake load test on P4-axis	The required load was not applied in the brake load test on the P4-axis even after the time set in the parameter elapsed.	(a)Check the machine parameter (PLC: PLC-axis) setting for <Timeout time for load check during brake load test> (P4-axis). (b)The P4-axis motor may be faulty. Replace the motor. (c)The P4-axis servo amplifier may be faulty. Replace the servo amplifier.
SM2173	4	2	Brake load test start position error on Z-axis	The brake load test was executed on the Z-axis close to the end of the stroke / stroke limit.	Execute the brake load test at a position farther away from the end of the Z-axis stroke / stroke limit.
SM2174	4	2	Brake load test start position error on *-axis	The brake load test was executed on the 5-axis close to the end of the stroke / stroke limit.	Execute the brake load test at a position farther away from the end of the 5-axis stroke / stroke limit.
SM2175	4	2	Brake load test start position error on *-axis	The brake load test was executed on the 6-axis close to the end of the stroke / stroke limit.	Execute the brake load test at a position farther away from the end of the 6-axis stroke / stroke limit.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2176	4	2	Brake load test start position error on *-axis	The brake load test was executed on the 7-axis close to the end of the stroke / stroke limit.	Execute the brake load test at a position farther away from the end of the 7-axis stroke / stroke limit.
SM2177	4	2	Brake load test start position error on *-axis	The brake load test was executed on the 8-axis close to the end of the stroke / stroke limit.	Execute the brake load test at a position farther away from the end of the 8-axis stroke / stroke limit.
SM2178	4	2	Brake load test start position error on P1-axis	The brake load test was executed on the P1-axis close to the end of the stroke / stroke limit.	Execute the brake load test at a position farther away from the end of the P1-axis stroke / stroke limit.
SM2179	4	2	Brake load test start position error on P2-axis	The brake load test was executed on the P2-axis close to the end of the stroke / stroke limit.	Execute the brake load test at a position farther away from the end of the P2-axis stroke / stroke limit.
SM2180	4	2	Brake load test start position error on P3-axis	The brake load test was executed on the P3-axis close to the end of the stroke / stroke limit.	Execute the brake load test at a position farther away from the end of the P3-axis stroke / stroke limit.
SM2181	4	2	Brake load test start position error on P4-axis	The brake load test was executed on the P4-axis close to the end of the stroke / stroke limit.	Execute the brake load test at a position farther away from the end of the P4-axis stroke / stroke limit.
SM2182	4	2	Macro variable error	001)A value was assigned that exceeds the range of macro variables.	001)Check the program.
				002)The macro variable number is outside of the range.	002)Check the program.
				003)This macro variable cannot be written.	003)Check the program.
				004)This macro variable cannot be read.	004)Check the program.
				005)An attempt was made to change the currently enabled coordinate system.	005)Check the program.
SM2183	4	2	Macro execution error	001)The nesting of the macro command (WHILE) has exceeded the prescribed number.	001)Check the program.
				002)Macro command (END) corresponding to the macro command (WHILE) could not be found.	002)Check the program.
				003)An attempt was made to execute the macro command (WHILE/DO/END) during MDI operation, or extended memory operation/tape operation.	003)Check the program.
				004)An attempt was made to execute external output during MDI operation or tape operation.	004)Check the program.
				005)An attempt was made to execute the macro command (IF/GOTO) during MDI operation.	005)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				006)An external output command was used, but failed to output externally.	006)Check the program.
				007)An external output command was used, but the buffer size was exceeded.	007)Check the program.
SM2184	4	2	Rotational transformation in progress	001) Linear axis and additional axis commands were issued at the same time during rotational transformation.	001)Check the program.
				002) An external workpiece signal was changed during rotational transformation.	002)Check the program.
SM2185	4	2	Compensating diameter	001) The plane selection was changed during cutter compensation.	001)Check the program.
				002) The return from the sub program was carried out during cutter compensation in a sub program where the macro modal was being called.	002)Check the program.
				003) The workpiece zero return and traveling to the tool change position were carried out during cutter compensation in conversation language.	003)Check the program.
SM2186	4	2	ATC monitoring parameter has not been set correctly	The automatic setting for the ATC monitoring parameter has not been executed. Or, the ATC monitoring setting is not correct.	Contact the nearest BROTHER approved service dealer and report the alarm conditions.
SM2187	4	2	Machining load maximum(*)	Machining load exceeded the <Max. machining load> in the monitoring section for the tool indicated by the auxiliary number.	The tool may be worn and/or chipped.Press the **[RST]** key and perform one of the following. - Replace with a new tool. - Make sure that the machining load monitor parameter is correctly set.
SM2188	4	2	Machining load monitor parameter setting error (common)	<Machining load monitor function> is set to <1: Enable>. The machining load monitor function is not available on the machine being used.	Change the parameter to the correct value, and press the **[RST]** key.
SM2189	4	2	Stroke exceeded 6	The axis has entered stroke 6 (restricted travel range). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis) and machine paramater(system 2: common).)
SM2190	4	2	Stroke exceeded 7	The axis has entered stroke 7 (restricted travel range). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis) and machine paramater(system 2: common).)
SM2191	4	2	Stroke exceeded 8	The axis has entered stroke 8 (restricted travel range). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis) and machine paramater(system 2: common).)

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2192	4	2	Stroke exceeded 9	The axis has entered stroke 9 (restricted travel range). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis) and machine paramater(system 2: common).)
SM2193	4	2	Stroke exceeded 10	The axis has entered stroke 10 (restricted travel range). (Excluding manual reset operation.)	Press the **[RST]** key, and then correct the program. (Check the machine parameter(system 1: X-, Y- or Z-axis) and machine paramater(system 2: common).)
SM2194	4	2	Involute interpolation error limit exceeded	There is no end point on the involute curve that passes through the start point in the involute interpolation command. The margin of error, between the involute curve that passes through the start point and the end position on the involute curve that passes through the end point, is greater than the set value for the <Involute interpolation error limit> in the user parameter (switch 1: compensation function).	(a)Press the **[RST]** key and check the program. (b)Press the **[RST]** key, and then correct the user parameter value for <Involute interpolation error limit> in the user parameter (switch 1: compensation function).
SM2195	4	2	Door operation timeout	The automatic door open/close operation took longer than the time set in the machine parameter (system 1: automatic door) <Operation time>.	(a)Check the parameter setting. - Machine parameter (system 1: Automatic door) <Operation time> - Machine parameter (system 1: Automatic door)<Door open reference position> - Machine parameter (system 1: Automatic door) <Offset for door open position> - Machine parameter (system 1: Automatic door) <Offset for door close position> (b)Check the door limit switch. (c)Make sure that there are no chips or shavings between doors R and L. (d)Make sure that there are no chips or shavings between the door and machine cover. (e)Make sure that the door drive and door are connected properly.
SM2196	4	2	Door open timeout	The automatic door does not come into contact with the stopper when it opens at low speed even after the time set for the parameter has elapsed.	Check the parameter setting. - Machine parameter (system 1: Automatic door)<Stop check time when stopped> - Machine parameter (system 1: Automatic door)<Wait time when stopped> - Machine parameter (system 1: Automatic door)<Stop current reference value when stopped>
SM2197	4	2	Spindle rotation not possible during axis travel	Spindle rotation was carried out during axis travel when the door interlock mode was set to service mode.	(a)Press the **[RST]** key, and then rotate the spindle once the axis has stopped. (b)Change the door interlock mode to automatic operation or to machine setup.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2198	4	2	Lathe spindle rotation not possible during axis travel	Lathe spindle rotation was carried out during axis travel when the door interlock mode was set to service mode.	(a)Press the **[RST]** key, and then rotate the lathe spindle once the axis has stopped. (b)Change the door interlock mode to automatic operation or to machine setup.
SM2199	4	2	Automatic door open position error	After the automatic door open operation was completed, the position has shifted from the open position and exceeded the machine parameter (system 1: automatic door) <Door open position detection range>.	Make sure that the machine parameter (system 1: automatic door) <Door open position detection range> is not too small.
SM2200	4	2	Door was not locked	A machine operation was carried out while the door was not locked.	Press the **[RST]** key.
SM2201	4	2	Compensation exceeded for table deflection	In the table deflection compensation function, the difference between the table weight estimate and the set value in the user parameter (switch 1: compensation function) <Standard weight for table deflection compensation> has exceeded the tolerance value.	(a)Make sure that the set value for the user parameter (switch 1:compensation function) <Standard weight for table deflection compensation> is not too large. (b)Make sure that the set value for the user parameter (switch 1:compensation function) <Standard height for table deflection compensation> is not too large. (c)Make sure that the set value for the user parameter (switch 1:compensation function) <Center of gravity correction for table deflection compensation> is not too large. (d)Make sure that the set value for the user parameter (switch 1:compensation function) <Overwrite table deflection compensation> is not too large. (e)Set the user parameter (switch 1:compensation function) <Table deflection compensation function> to <0: Disable>.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2202	4	2	Return position setting error (+Z) during tool change	A) When G100 and M6 are executed without an R command (G49 modal), the values in the user parameters (switch 1: ATC/magazine) <ATC simultaneous operation start position> + <ATC reference tool length> are used as the R command value for operation. That axis travel exceeded the stroke limit (+Z). B) When G100 and M6 are executed without an R command (not G49 modal), the values in the user parameters (switch 1: ATC/magazine) <ATC simultaneous operation start position> + <Tool length offset> in tool data are used as the R command value for operation. That axis travel exceeded the stroke limit (+Z). C) The R command operation for G100 and M6 exceeded the stroke limit (+Z). (G49 modal) D) The R command operation for G100 and M6 exceeded the stroke limit (+Z). (not G49 modal)	A)Check the set value for the user parameter (switch 1: ATC/magazine) <ATC simultaneous operation start position> or <ATC reference tool length>. B)Check the set value for the user parameter (switch 1: ATC/magazine) <ATC simultaneous operation start position> or for the <Tool length offset> in the tool data. C)Check the program. D)Check the program, or check the set value for the <Tool length offset> in the tool data.
SM2203	4	2	Return position setting error (-Z) during tool change	A) When G100 and M6 are executed without an R command (G49 modal), the values in the user parameters (switch 1: ATC/magazine) <ATC simultaneous operation start position> + <ATC reference tool length> are used as the R command value for operation. That axis travel exceeded the stroke limit (-Z). B) When G100 and M6 are executed without an R command (not G49 modal), the values in the user parameters (switch 1: ATC/magazine) <ATC simultaneous operation start position> + <Tool length offset> in tool data are used as the R command value for operation. That axis travel exceeded the stroke limit (-Z). C) The R command operation for G100 and M6 exceeded the stroke limit (-Z). (G49 modal) D) The R command operation for G100 and M6 exceeded the stroke limit (-Z). (not G49 modal)	A)Check the set value for the user parameter (switch 1: ATC/magazine) <ATC simultaneous operation start position> or <ATC reference tool length>. B)Check the set value for the user parameter (switch 1: ATC/magazine) <ATC simultaneous operation start position> or for the <Tool length offset> in the tool data. C)Check the program. D)Check the program, or check the set value for the <Tool length offset> in the tool data.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM2204	4	2	Side door lock restricted	An operation was performed to lock (such as from the door interlock mode being set to automatic operation mode) the side door when the loading system is attempting to open the side door.	Press the **[RST]** key.
SM4000	3	2	Spindle speed error	001) An attempt was made to rotate exceeding the maximum spindle speed.	001)Check the program.
				002) An attempt was made to rotate exceeding the maximum lathe spindle speed.	002)Check the program.
				003) An attempt was made to rotate exceeding the maximum tapping speed.	003)Check the program.
				004) The power is ON and there is no S command for the S code modal.	004)Check the program.
SM4001	3	2	Specified G code cannot be used. (*)	001) An unregistered G code command was issued.	001)Check the program.
				002) A G code command was issued which cannot be used due to the modal status.	002)Check the program.
				003) A G code command was issued which cannot be used due to the user parameter.	003)Check the program.
				004) A G code command was issued which cannot be used due to the machine parameter.	004)Check the program.
				005) A G code command was issued which cannot be used due to the machine configuration.	005)Check the program.
				006) A G code command was issued which cannot be used in MDI operation.	006)Check the program.
				007) A G code command was issued which cannot be used at the same time as an M code.	007)Check the program.
SM4002	3	2	Simultaneous specified code cannot be used. (*AND*)	G/M code command which cannot be used simultaneously in the same block was specified.	Check the program.
SM4003	3	2	Specified M code cannot be used. (*)	001) An unregistered M code command was issued.	001)Check the program.
				002) An M code command was issued which cannot be used due to the modal status.	002)Check the program.
				003) An M code command was issued which cannot be used due to the user parameter.	003)Check the program.
				004) An M code command was issued which cannot be used due to the machine parameter.	004)Check the program.
				005) An M code command was issued which cannot be used due to the machine configuration.	005)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				006) An M code command was issued which cannot be used in MDI operation.	006)Check the program.
				007) An M code command was issued which cannot be used in memory operation.	007)Check the program.
				008) An M code command was issued which cannot be used at the same time as a G code.	008)Check the program.
SM4004	3	2	Invalid character command	The specified characters cannot be used for NC programs.	Check the program.
SM4005	3	2	Same code cannot be used.	Two or more M codes are used in the same block.	Check the program after pressing the **[RST]** key. To specify two or more M codes in the same block, set <Multiple M codes in one block> (user parameter(switch 1: programming)) to <1:Yes>. Then up to three codes can be specified.
SM4006	3	2	Invalid data	The specified format is not correct.	Check the program.
SM4007	3	2	Command data range error	001)The specified data exceeds the address range.	001)Check the program.
				002)An incremental command on the additional axis for positioning was issued that exceeds 800 degrees.	002)Check the program.
				003)The <S command value> in the tool data has exceeded the address command range when the user parameter (switch 1: canned cycle)<Automatically use S command when changing tool> was set to <1:Yes> and there was no S command on the same block as the tool change command.	003)Check the program or the <S command value> for the tool data.
				004)The <F command value> in the tool data has exceeded the address command range when the user parameter (switch 1: canned cycle) <Automatically use F command when changing tool> was set to <1:Yes> and there was no F command on the same block as the tool change command.	004)Check the program or the <F command value> for the tool data.
				005)There was no definition in the character string information, or the character string limit was exceeded.	005)Check the program.
SM4008	3	2	Characters per block exceeded	The number of characters in one block exceeds 128.	Check the program.
SM4009	3	2	No end of program code	M02 or M30 is not included in the program.	Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM4010	3	2	Arc command error	001)There is no radius command when there is a circular cutting command. Or, a command value that was smaller than the compensation was issued.	001)Check the program.
				002)Commands were used incorrectly. (e.g. I, J, or K command and R command are used simultaneously.)	002)Check the program.
				003)Radius of both start point and end point is 0.	003)Check the program.
				004)There is no I or D command when circular cutting command is used, or I command was set to 0.	004)Check the program.
				005)R command was used when spiral or cone command was used.	005)Check the program.
				006)Positive and negative of Q command value and the amount of radius change reverse when spiral or cone command is used.	006)Check the program.
				007)Positive and negative of the amount of change per rotation of linear axis in IJK command and moving direction of linear axis reverse when spiral or cone command is used.	007)Check the program.
				008)The Q command was 0 for a spiral/conical command.	008)Check the program.
				009)The L command exceeded 9999 for a spiral/conical command.	009)Check the program.
				010)The Q or L command was issued that is not an arc command.	010)Check the program.
				011)The number of axes used in the command exceeded the number (1st and 2nd-axes) needed for the plane selection during a conical command.	011)Check the program.
SM4011	3	2	Subprogram call error	001)Nesting of subprogram call exceeded the specified value.	001)Check the program.
				002)A program which was called from a called subprogram was called.	002)Check the program.
				003)A sequence number was specified in the same program during tape operation (General communications device).	003)Check the program.
				004)A sequence number and the number of repeats were specified during tape operation (General communications device).	004)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				005)Called program is duplicated. (A)The calling program was called from the called sub program. (B)The same program as the currently executing program was called.	005)Check the program.
SM4012	3	2	Subprogram number error	001)The sub program name is not written correctly in the program.	001)Check the sub program number in the program.
				002)There is no sub program number or sequence number command.	002)Check the sub program number or the sequence number in the program.
SM4013	3	2	Modal subprogram return error	001)G67 was used although the current mode is not macro modal call mode.	001)Check the program.
				002)Executing G67 was attempted while calling modal sub program.	002)Check the program.
SM4014	3	2	Feedrate error	001)The power is ON and there is no F command for the F code modal during cutting travel.	001)Check the program.
				002)A command was issued that exceeded the limit value during cutting travel. Or, if the set value for the user parameter (switch 1: common) <Table load weight> exceeds the machine parameter (system 1: common) <Restricted operation weight>, the feedrate exceeded the machine parameter (system 1: X-, Y- and Z-axes) <Max cutting travel speed(restricted operation weight)>.	002)Check the program. Or, check the set value for the user parameter (switch 1: common) <Table load weight>.
				003)The feedrate of helical linear axis exceeded the limit when helical interpolation command was specified.	003)Check the helical interpolation command.
				004)Speed command was not specified when synchronized tap return was executed or was specified with the limit value exceeded.	004)Check the speed command.
				005)When a G74 or G84 command was issued, the screw pitch was calculated as 0.	005)Check the feedrate command or the speed command.
				006)The cutting feedrate calculation (spindle speed × screw pitch) fell outside of the range, or exceeded the restricted speed for the cutting feed when a command (G77/G177/G133/G134) was issued using the feedrate per minute.	006)Check the screw pitch command or the speed command.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM4015	3	2	Coordinate calculation address error (*address)	The address necessary for coordinate calculation is not specified.	Check the program.
SM4016	3	2	Arc mode	The specified G or M code is not allowed in arc mode.	Check the program.
SM4017	3	2	No T-code command	A T-command is not used before G100 or M06 is executed.	Check the program.
SM4018	3	2	Subprogram return error	001)A return number was specified by a sub program return command when the number of repeats is set for the sub program call.	001)Check the program.
				002)A return number was specified in the sub program return command (from the main program) during tape operation (General communications device).	002)Check the program.
SM4019	3	2	No applicable sequence	(A)The sequence number which was specified in subprogram call/return command is not found. (B)The sequence number which was specified in macro command (GOTO) is not found. (C)The sequence number which was specified in program restart (sequence search) is not found.	Check the program.
SM4020	3	2	High accuracy A invalid command	001)An interrupt type macro command (M96) was issued in high accuracy mode A.	001)Check the program.
				002)Linear axis and additional axis commands were issued at the same time in high accuracy mode A.	002)Check the program.
				003)An involute interpolation command (G2.2 or G3.2) was issued while using the fully automatic deceleration function in high accuracy mode A.	003)Check the program.
SM4021	3	2	High accuracy A invalid modal	High accuracy mode A start command was used in a modal state where it cannot be started.	Check the program.
SM4022	3	2	Max. speed exceeded	001)The speed specified in the command exceeds the <Max. actual cutting travel speed (linear axis)>.	001)Check the program, or set the user parameter (switch 1: programming) <Max. actual cutting travel speed (linear axis)> to the appropriate value.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002)The speed specified in the command exceeds the <Max. actual cutting travel speed (rotation axis)>. (Note) When the additional axis travels using the conversation language, this may occur even if the speed in the operation display does not exceed the parameter value. This is because the operation display shows the peripheral speed but the actual speed is checked.	002)Check the program, or set the user parameter (switch 1: programming) <Max. actual cutting travel speed (rotation axis)> to the appropriate value.
SM4023	3	2	Mirror image mode (*)	A G/M code command was issued even though it is prohibited in mirror image mode.	Check the program.
SM4024	3	2	Scaling (*)	A G/M code command was issued even though it is prohibited during scaling.	Check the program.
SM4025	3	2	Scaling address error	001)Scaling was attempted for the invalid axis.	001)Check the program.
				002)The item selected for the user parameter (switch 1: programming) does not match the address where scaling is specified in the program.	002)Check the program.
SM4026	3	2	Plane selection error (*)	The specified G-code is not allowed for a plane other than the XY plane.	Check the program.
SM4027	3	2	Two or more axes are specified.	Two or more axes were specified for continuous skip.	Check the program.
SM4028	3	2	Load weight setting error	001) (a)For the table travel device, the alarm is triggered when the difference between the table load weight estimate and the set value in the user parameter (switch 1: common) <Table load weight> exceeds the <Tolerance for weight estimation> in the machine parameter (system 1: common). (b)When the machine model is equipped with a movable table, this alarm is triggered if the table load weight estimate exceeds this machine's maximum load weight. (Note) The weight estimate can change, for example, after replacing the motor.	001) (a)Follow the procedure below and set the estimate for weight load on the table so that it is the same as the user parameter (switch 1: common) <Table load weight>. Launch the support application (adjust machining parameter), and select <Load weight settings>. Follow the screen instructions and change the <Table load weight>. (b)Make sure that the weight load on the table is less than the machine parameter (system 1: common) <Max. load weight>.
				002)This error is triggered if the command value for the quick table current exceeds the tolerance.	002)Make sure that the weight load on the table is less than the machine parameter (system 1: common) <Max. load weight>.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM4029	3	2	Coordinate transformation error	001)The radius exceeded the command range for scaling in an arc command.	001)Check the program.
				002)The difference, between the end point for scaling in the arc command and the end point required for the R command, exceeded the limit value.	002)Check the program.
				003)The distance from the start point to the center point exceeded the command range for scaling in an arc command.	003)Check the program.
SM4030	3	2	Turn external program select off.	Tape operation was attempted when the external program selection is ON.	Turn the external program signal off.
SM4031	3	2	Comment error	Control out/in codes are not in the same block.	Check the program.
SM4032	3	2	No intersection	001)The intersection could not be calculated when cutting inside the workpiece during cutter compensation.	001)Press the **[RST]** key and then check the program or the cutter/nose R compensation amount.
				002)The intersection could not be calculated for the chamfering / corner R command.	002)Press the **[RST]** key, and the check the program.
SM4033	3	2	The tool data control method is different.	001)M code command which cannot be used in the selected tool data management method was specified.	001)Contact the nearest BROTHER approved service dealer and report the alarm conditions.
				002)An L address value in the programmable data input (G10) cannot be used in the tool data control method that was set.	002)Contact the nearest BROTHER approved service dealer and report the alarm conditions.
SM4034	3	2	Multiple M codes cannot be used. (*)	An M code command was issued that cannot be used with multiple M codes on the same block.	Check the program.
SM4035	3	2	CTS unable tool	CTS ON was attempted to a CTS unable tool.	Change to a CTS able tool and turn CTS on.
SM4036	3	2	Comm. issued to area other than (tool) data area.	The offset amount and wear offset are out of the tool data range.	Check the program.
SM4037	3	2	Interrupted program call error	001)Interruption signal was detected when a subprogram specified for interruption program was executed with G65/G66/M98.	001)Check the program.
				002)Interruption signal was detected when a subprogram which is designated for interruption program and operates as the parent program was executed.	002)Check the program.
SM4038	3	2	High-accuracy B unable modal	High accuracy mode B start command was specified in a modal state where it cannot be started.	Check the program.
SM4039	3	2	High-accuracy B unable command	001) An interrupt type macro command (M96) was issued in high accuracy mode B.	001) Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002) Linear axis and additional axis commands were issued at the same time when the machine parameter (high accuracy: common) <High accuracy B additional axis> was set to <0: Invalid> in high accuracy mode B.	002) Check the program or the setting for the machine parameter (high accuracy: common) <High accuracy B additional axis>.
				003) A helical thread cutting interpolation command (G02/G03) was issued on the additional axis when the machine parameter (high accuracy: common) <High accuracy B additional axis> was set to <0: Invalid> in high accuracy mode B.	003) Check the program or the setting for the machine parameter (high accuracy: common) <High accuracy B additional axis>.
				004) Two additional axis commands were issued at the same time when the machine parameter (high accuracy: common) <High accuracy B additional axis> was set to <1: Valid> in high accuracy mode B.	004) Check the program or the setting for the machine parameter (high accuracy: common) <High accuracy B additional axis>.
SM4040	3	2	Too many external output command digit.	The range of data that can be output exceeded the limit when macro variables were output via BPRNT command.	Check the program.
SM4041	3	2	POPEN is unable.	BPRNT or DPRNT command was sent although POPEN command was not sent.	Press the **[RST]** key, and the check the program.
SM4042	3	2	No subprogram (*)	001)The specified sub program does not exist in the specified folder for the user parameter (switch 1: programming) settings <Sub program folder selection *> and <Sub program folder designation *>.	001)Check the program.
				002)When using tape operation, the specified sub program does not exist in the specified folder for the user parameter (switch 1: programming) settings <Sub program folder selection *> and <Sub program folder designation *>. Or, the sub program does not exist in the internal memory's root directory (folder) when the <Sub program folder selection *> is set to the <Current folder>.	002)Check the program.
				003)When calling the external sub program, the specified sub program does not exist in the root directory or folder in the external device.	003)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				004)The folder specified in the user parameter (switch 1: programming) <Sub program folder designation *> does not exist.	004)Check the user parameter (switch 1: programming) <Sub program folder designation *>.
SM4043	3	2	Too many subprograms	The number of sub programs to be called exceeds the limit.	Reduce the number of sub programs.
SM4044	3	2	A command unable to select the lathe spindle	001)While lathe spindle was selected, axis travel command was specified to the additional axis corresponding to lathe spindle.	001)Check the program.
				002)While lathe spindle was selected, clamp/ unclamp commands were specified to the additional axis corresponding to lathe spindle.	002)Check the program.
				003)While lathe spindle was selected, canned cycle was specified.	003)Check the program.
				004)While the lathe spindle was selected, an axis travel command is issued in incremental mode on the additional axis which corresponds to the lathe spindle on the same block as the spindle selection command (M141).	004)Check the program.
				005)While the lathe spindle was selected, an interpolation command is issued on the additional axis which corresponds to the lathe spindle on the same block as the spindle selection command (M141).	005)Check the program.
				006)G/M code command was issued which cannot be used when lathe spindle is selected.	006)Check the program.
SM4045	3	2	Spindle selection error (*)	M code command which cannot be used for the spindle being selected was attempted to be executed.	Press the **[RST]** key, and the check the program.
SM4046	3	2	Communicating	When communication was not finished after operation finished with M30 in tape operation (general communication device), tape operation restart was attempted.	Start tape operation after communication is finished.
SM4047	3	2	There is no P address.	Address P is not specified in a command which requires address P.	Specify address P.
SM4048	3	2	Different from pallet program	A program different from the one set for the user parameter (quick table) was used for tape operation.	Check the user parameter (quick table) <Pallet 1/2 program> or the operation program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM4049	3	2	W/o turning function	Turning command was specified although the machine is not equipped with turning function.	Turning function cannot be used.
SM4050	3	2	Cannot use intrpl. command for positioning on addnl. Axis	Interpolation command was issued to the additional axis set up for positioning.	Check the program.
SM4051	3	2	No spindle speed clamp command	The constant peripheral speed control command (G96) was executed before issuing a maximum spindle speed clamp command using the spindle speed clamp command G92.	Execute the constant peripheral speed control command G96 after specifying the maximum spindle speed clamp using the spindle speed clamp command G92.
SM4052	3	2	Press the **[RST]** key	An alarm was triggered during the reset operation.	Press the **[RST]** key.
SM4053	3	2	Tool length offset cancel error	G49 with no Z-axis command or the H0 command block was executed when the user parameter (switch 1: compensation function) <Travel of X, Y or Z axis when tool length/tool position offset is changed> is set to <0: Type 1> and when the user parameter <Error check when traveling during tool length/tool position offset cancel> is set to <0: Check>. Ex: (Alarm is triggered in N2) N1 G90 G43 H1 (When H1 is not 0) N2 G49	(a)Correct the program. 1.Add Z-axis command to G49 or H0 command block. 2.Use G28/G30 and G53 to add a Z-axis safe position operation to G49 or the block right before the H0 command. (b)Make sure that there is no travel interference during a tool length offset cancel based on G49 or H0 command execution. Set the user parameter <Error check when traveling during tool length/tool position offset cancel> to <1: No> (Configure the setting to <1: No> to make it compatible with CNC-B00 operation).
SM4054	3	2	Tool position offset cancel error	G49 with no X-, Y- or Z-axis command or the H0 command block was executed when the user parameter (switch 1: compensation function) <Travel of X, Y or Z axis when tool length/tool position offset is changed> is set to <0: Type 1> and when the user parameter <Error check when traveling during tool length/tool position offset cancel> is set to <0: Check>. Ex: (Alarm is triggered in N2) N1 G90 G143 H1 (When H1 is not 0) N2 G49	(a)Correct the program. 1.Add X-, Y- and Z-axes command to G49 or H0 command block. 2.Use G28/G30 and G53 to add an X-, Y- and Z-axes safe position operation to G49 or the block right before the H0 command. (b)Make sure that there is no travel interference during a tool position offset cancel on the X-, Y- and Z-axes based on G49 or H0 command execution. Set the user parameter <Error check when traveling during tool length/tool position offset cancel> to <1: No>.
SM4055	3	2	Rotary fixture offset command error	001)There is no axis option that corresponds to the <Axis for calculation> in the standard rotary fixture offset.	001)Set the correct values for <Axis for calculation> in the standard rotary fixture offset for 1. through 3.
				002)The <Axis for calculation> in the standard rotary fixture offset is not set to either <Tilt axis*> or <Rotation axis*>.	002)Set the correct values for <Axis for calculation> in the standard rotary fixture offset for 1. through 3.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				003)The <Axis for calculation> in the standard rotary fixture offset is not set to the pair: <Tilt axis*> and <Rotation axis*>.	003)Set the correct values for <Axis for calculation> in the standard rotary fixture offset for 1. through 3.
SM4056	3	2	Rotary fixture offset in progress (*)	A G/M code command was issued that is prohibited during rotary fixture offset.	Check the program.
SM4057	3	2	Failed to search macro control statement.	The program could not be read during operation.	For tape operation, check the memory card again.
SM4058	3	2	No G code macro program (*)	001)The specified G code macro program does not exist in the specified folder for the data bank <G/M code macro> (common parameter) settings <Selected folder * for G code macro program> and <Specified folder * for G code macro program>.	001)Follow one of the procedures below. (a)Check the program. (b)Check the data bank <G/M code macro> (G code macro) <Program No.>.
				002)The folder specified in <Selected folder * for G code macro program> for the data bank <G/M code macro> (common parameter) does not exist.	002)Check the data bank <G/M code macro> (common parameter) <Specified folder * for G code macro program>.
SM4059	3	2	No M code macro program (*)	001)The specified M code macro program does not exist in the specified folder for the data bank <G/M code macro> (common parameter) settings <Selected folder * for M code macro program> and <Specified folder * for M code macro program>.	001)Follow one of the procedures below. (a)Check the program. (b)Check the data bank <G/M code macro> (M code macro) <Program No.>.
				002)The folder specified in <Selected folder * for M code macro program> for the data bank <G/M code macro> (common parameter) does not exist.	002)Check the data bank <G/M code macro> (common parameter) <Specified folder * for M code macro program>.
SM4060	3	2	G code macro program not set	The program is not set for the G code macro that is used in the program.	Check the data bank <G/M code macro> (G code macro) <G code number>.
SM4061	3	2	M code macro program not set	The program is not set for the M code macro that is used in the program.	Check the data bank <G/M code macro> (M code macro) <M code number>.
SM4062	3	2	Macro program call not possible	After the G code macro call was executed, when the data bank <G/M code macro> (G code macro) <Call type> was set to <1: Type 2>, the macro program was called by the G code by the time the G67 command was executed.	Check the program.
SM4063	3	2	No subprogram in the G code macro folder (*)	The specified subprogram does not exist in the G code macro folder during the extended memory operation or tape operation.	Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM4064	3	2	No subprogram in the M code macro folder (*)	The specified subprogram does not exist in the M code macro folder during the extended memory operation or tape operation.	Check the program.
SM4065	3	2	No rotary fixture offset function	There is no option for the rotary fixture offset function but an order was issued for rotary fixture offset function.	Purchase the option to use this function.
SM4066	3	2	Arc angle error during inner side cutting	There is an arc angle between the start point and end point on the program path for the cutting command when cutting the inner side during cutter/nose R compensation. There is another arc angle between the start point and end point in the tool center path after being offset. The difference between those two arc angles is greater than 180°.	Check the program.
SM4067	3	2	No relief amount	There is no relief amount after cutting in a lathe system operation.	Check the program.
SM4068	3	2	Cutting amount error in thread cutting cycle	001)The amount of cutting in the thread cutting cycle is greater than the cutting distance or the relief amount.	001)Set the user parameters (switch 1: canned cycle) <Finishing amount in thread cutting cycle> and <Finishing angle in thread cutting cycle> to a smaller value, or change the start point in the cycle operation.
				002)The position of the cutting direction after finishing, in the thread cutting cycle, exceeded the start point of the cycle operation.	002)Set the user parameters (switch 1: canned cycle) <Finishing amount in thread cutting cycle> and <Finishing angle in thread cutting cycle> to a smaller value, or change the start point in the cycle operation.
SM4069	3	2	Cutting angle error in thread cutting cycle	The cutting angle is too small for the taper angle in the taper thread cutting cycle.	Set an appropriate value for the user parameter (switch 1: canned cycle) <Finishing angle in thread cutting cycle>.
SM4070	3	2	Taper amount too large	The position which was only shifted by the taper amount toward the cutting direction from the cutting end point in the lathe system cycle exceeded the start point of the cycle operation.	Check the program.
SM4071	3	2	Initial infeed amount error in thread cutting cycle	The initial infeed amount in a complex thread cutting cycle is greater than the thread height.	Check the program.
SM4072	3	2	Finishing allowance error in thread cutting cycle	The finishing allowance in a complex thread cutting cycle is greater than the thread height.	(a)Check the program. (b)Set an appropriate value for the user parameter (switch 1: canned cycle) <Finishing allowance in complex thread cutting cycle>.
SM4073	3	2	Thread height error in thread cutting cycle	The thread height in a complex thread cutting cycle is greater than the approach distance.	Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM4074	3	2	Thread cutting command error	001)3 axis commands for X, Y and Z were issued in thread cutting (G33, G392, G396).	001)Check the program.
				002)Only 1 axis command for X, Y and Z was issued in the thread cutting cycle (G392 and G376).	002)Check the program.
				003)A thread cutting cycle command was issued in which the travel distance for the cutting direction is 0 and there is a taper amount.	003)Check the program.
				004)A command was issued that exceeded the prescribed rough cutting count value in the complex thread cutting cycle (G376).	004)Check the program.
				005)The combination in the thread cutting cycle (G392, G376) is not correct for the lathe machining infeed direction and the axis command.	005)Check the program.
SM4075	3	2	Thread cutting command not possible in feed rate per minute	A thread cutting command was issued during the feed rate per minute (G94) modal. A thread cutting command can only be issued during the feed rate per rotation (G95) modal.	Check the program.
SM4076	3	2	Thread cutting command address error (*address)	The address command required in the thread cutting cycle was not specified.	Check the program.
SM4077	3	2	Cutting amount error in thread cutting cycle	The travel distance for the cutting direction in the complex thread cutting cycle is shorter than the length calculated by the following equation. P x tan (D/2) P: Thread height D: Thread angle	Check the program.
SM4078	3	2	Arc angle error when cutter compensation direction changed	When the offset direction has been changed during cutter/nose R compensation in an arc command, the arc angle for the start and end points in the tool center path after being offset is greater than 180° due to the arc angle for the start and end points set in the programmed path.	Check the program.
SM4079	3	2	Unavailable modal for machining mode specification	The M298 command was issued in a modal status where the M298 (machining mode specification) command cannot be issued.	Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM4080	3	2	Machining mode specification error	The L7 (Adjustment A), L8 (Adjustment B) or L9 (Adjustment C) command was issued in M278 without setting the <Standard mode> in the user parameter (high accuracy: machining mode).	(a)Check the program. (b)Open the support application (adjust machining parameter) screen, and select <Machining mode settings>. Check the <L7 adjustment A>, <L8 adjustment B>, <L9 adjustment C> settings.
SM4081	3	2	The lathe spindle is being selected	The brake load test was executed while the lathe spindle was selected.	Press the **[RST]** key and check the selected spindle.
SM4082	3	2	Interpolation command using 5 axes simultaneously is not possible	An interpolation command was issued that controls five axes simultaneously.	Check the program.
SM4083	3	2	Command using 2 additional axes simultaneously is not possible	An interpolation command was issued that controls two additional axes simultaneously.	Check the program.
SM4084	3	2	Address where command is not possible (*address)	An address was specified that cannot be used. Or, a command with a number value was issued which cannot be used due to the operation status.	Check the program.
SM4085	3	2	Command address error (*address)	A command has not been executed for the address inside the parentheses. If there is no address displayed inside the parentheses, then there are multiple options for the address that is needed to execute the command.	Check the program.
SM4086	3	2	Computation error	001) The computation resulted in an integer overflow.	001)Check the program.
				002) An attempt was made to divide by zero.	002)Check the program.
				003) The TAN computation resulted in an integer overflow.	003)Check the program.
				004) The SQRT argument was a negative value.	004)Check the program.
				005) Failed to convert from BCD to BIN.	005)Check the program.
				006) Failed to convert from BIN to BCD.	006)Check the program.
				007) The computation resulting from a conditional judgement was not possible.	007)Check the program.
SM4087	3	2	Syntax error	001)There is no l-value for the operator.	001)Check the program.
				002)There is no r-value for the operator.	002)Check the program.
				003)Address with command in brackets < > cannot be used.	003)Check the program.
				004)The parentheses do not match.	004)Check the program.
				005)The nesting of the parentheses exceeded the prescribed quantity.	005)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				006)Inside of the parentheses is empty.	006)Check the program.
SM4088	3	2	Arc calculation error	001) The radius for both the start point and end point is zero.	001)Check the program.
				002) The rotation count exceeded 9999 for a spiral/conical command.	002)Check the program.
				003) The start point, end point and center were the same for a spiral/conical command.	003)Check the program.
				004) The start point radius and end point radius were the same for a spiral/conical command.	004)Check the program.
				005) The difference, between the command end point and the end point required for the R command, exceeded the limit value.	005)Check the program.
SM4089	3	2	Scaling	001) A chamfering/corner R command was issued during scaling.	001)Check the program.
				002) A spiral/conical command was issued during scaling.	002)Check the program.
				003) An attempt was made in the programmable data input to change the workpiece coordinate zero being used in scaling.	003)Check the program.
				004) Linear axis and additional axis commands were issued at the same time during scaling.	004)Check the program.
				005) An external workpiece signal was changed during scaling.	005)Check the program.
				006) A circular cutting command was issued even though the scaling setting was different on the two axes selected for the plane.	006)Check the program.
				007) A canned cycle command was issued during scaling for the Z-axis.	007)Check the program.
SM4090	3	2	Mirror image mode	001) A spiral/conical command was issued in mirror image mode.	001)Check the program.
				002) An attempt was made in the programmable data input to change the workpiece coordinate zero being used in mirror image mode.	002)Check the program.
				003) Linear axis and additional axis commands were issued at the same time in mirror image mode.	003)Check the program.
				004) An external workpiece signal was changed while in mirror image mode.	004)Check the program.
				005) A thread cutting command was issued during scaling for the Z-axis.	005)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				006) A canned cycle command was issued during scaling for the Z-axis.	006)Check the program.
SM4091	3	2	Rotary fixture offset in progress	An additional axis was used in the helical thread cutting interpolation command (G02/G03) during rotary fixture offset.	Check the program.
SM4092	3	2	Plane selection error	001)A command was issued on an axis that is not used for plane selection during circular interpolation.	001)Check the program.
				002)A command for the rotation center coordinate during rotational transformation (G68) was issued on an axis that is not used for plane selection.	002)Check the program.
				003)Based on the measurement results, a selection that is not the XY plane was made for rotation transformation (G168), or an axis that is not on the XY plane was specified.	003)Check the program.
				004)The plane selection is different on the block and the next block used for the chamfering/corner R command.	004)Check the program.
SM4093	3	2	Sub program open error (*)	The sub program file failed to open.	If there is another alarm triggering at the same time, first perform recovery for that alarm. If there is no other alarm triggering at the same time, then check the program.
SM4094	3	2	Sub program close error (*)	The sub program file failed to close.	If there is another alarm triggering at the same time, first perform recovery for that alarm. If there is no other alarm triggering at the same time, then check the program.
SM4095	3	2	Angle chamfering/corner R command error	001) One of the addresses for X, Y or Z is needed when a chamfering (,C) or corner R (,R) command is issued on a given angle, but no command was issued.	001)Check the program.
				002) One of the addresses for X, Y, Z, I, J or K is needed when a chamfering (,C) or corner R (,R) command is issued on a given angle, but no command was issued.	002)Check the program.
				003) When a chamfering (,C) or corner R (,R) command is issued on a given angle, a command could not be issued on the additional axis.	003)Check the program.
				004)A chamfering (,C) and corner R (,R) command on a given angle cannot be issued simultaneously.	004)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				005)If a chamfering (,C) or corner R (,R) command on a given angle was issued, that command block and the next block must be an interpolation command.	005)Check the program.
SM4096	3	2	Pallet index not possible	001) A pallet index command was output when the <PALLET> key was not set to <OFF>.	001) After pressing the **[RST]** key, press the <PALLET> + <OFF> keys.
				002) A pallet index command was output due to MDI during memory operation.	002) Press the **[RST]** key.
SM4097	3	2	Interrupt program number error	001) P address command was not issued in an M96 command during extended memory operation and tape operation.	001) Check the P address in the M96 command.
				002) A command value outside of the range was issued for a P address in a M96 command.	002) Check the P address in the M96 command.
SM4098	3	2	Interrupt program return error	A return number was specified in the sub program return command (in the called interrupt program) during tape operation (General communications device).	Check the program.
SM4099	3	2	Interrupt type macro command not possible	001) An M96 command was issued in a macro program that was called using G code or M code.	001)Check the program.
				002) An M96 command was issued in a sub program/macro program that was called using a M98, M198, G65 or G66 command from a macro program that was called using G code or M code.	002)Check the program.
SM4100	3	2	No interrupt program (*)	001)When an interrupt signal is detected during extended memory operation, the interrupt program (that is attempting to call) does not exist in the specified folder for the user parameter (switch 1: programming) settings <Sub program folder selection *> and <Sub program folder designation *>.	001)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002)When an interrupt signal is detected during tape operation, the interrupt program (that is attempting to call) does not exist in the specified folder for the user parameter (switch 1: programming) settings <Sub program folder selection *> and <Sub program folder designation *>. Or, that interrupt program does not exist in the internal memory's root directory (folder) when the <Sub program folder selection *> is set to the <Current folder>.	002)Check the program.
SM4101	3	2	Macro program call address error	001) G/O address command was issued when the macro program was called from a simple call or modal call.	001)Check the program.
				002) G/O address command was issued when the macro program was called from a G code.	002)Check the program.
				003) O address command was issued when the macro program was called from an M code.	003)Check the program.
SM4102	3	2	M code macro call address error	001) In a M code based macro call, two or more M addresses were specified for an M code that was not used for calling when the user parameter <Multiple M codes in one block> was set to <0:No>.	001)Check the program.
				002) In a M code based macro call, four or more M addresses were specified for an M code that was not used for calling when the user parameter <Multiple M codes in one block> was set to <1:Yes>.	002)Check the program.
SM4103	3	2	External sub program call not possible	001) An attempt was made to call an external sub program when the program (External I/O: Change connection device) setting <Connected> was not configured to <2: Memory card>.	001)Set <Connected> to <2: Memory card> for the program (External I/O: Change connection device).
				002) An attempt was made to call an external sub program from tape operation.	002)Check the program.
				003) An attempt was made to call an external sub program again while an external sub program was already being called.	003)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM4104	3	2	Rotation axis/Tilt axis parameter setting error	(A)When the user parameter (rotation axis/tilt axis setting) is set to <Tilt axis*> or <Rotation axis*> for an axis where the machine parameter (system 2: additional axis) <Optional axis> (5th- to 8th-axes) was set to <No>, a command was issued for the feature coordinate setting function. (B)Another setting besides <1: Z -> Y> or <3: X -> Z> has been set to the user parameter (rotation axis/tilt axis settings) <Forward direction for the coordinate system on tilt axis*>. Or, another setting besides <5: Y -> X> has been set to <Forward direction for the coordinate system on tilt axis*>.	(A)Change the following parameters to the correct values, and press the **[RST]** key. (B)Change the following parameters to the correct values, and press the **[RST]** key.
SM4105	3	2	No feature coordinate setting function	The feature coordinate setting function command was specified even though the machine is not equipped with the feature coordinate setting function option.	Purchase the option.
SM4106	3	2	Feature coordinate command error	001)The command for the feature coordinate setting function cannot be executed in this modal status.	001)Check the program.
				002)A command was issued to cancel the feature coordinate manufacturing mode before turning OFF the function that was turned ON while in feature coordinate manufacturing mode. In addition, before the feature coordinate manufacturing mode is cancelled, a command was issued to turn OFF the function that was turned ON when feature coordinate manufacturing mode was started.	002)Check the program.
				003)A feature coordinate setting function command was specified when there was a shift in the local coordinate system.	003)Check the program.
				004)All addresses I, J and K specified for the angle were omitted.	004)Check the program.
				005)A feature coordinate setting function command was specified in the interrupt program.	005)Check the program.
				006)A travel command was executed to move an axis outside of the stroke range.	006)Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				007)An R command was carried out for the tool change command (G100) before the feature coordinate index on an arm type ATC mechanism.	007)Check the program.
				008)A command was carried out that cannot be executed before the axis travel command is issued for the G90 modal to the additional axis (selected as the lathe spindle).	008)Check the program.
SM4107	3	2	Feature coordinate manufacturing mode engaged	A command was specified that cannot be executed while in feature coordinate manufacturing mode. Ex: - A command was issued to rotate an additional axis. - An interrupt type macro command was specified. - A command was issued to select a lathe spindle. - A command was issued to change the workpiece coordinate system.	Check the program.
SM4108	3	2	Command not possible during inverse time feed	G/M code command was specified which cannot be used while in the inverse time feed (G93) modal.	Press the **[RST]** key, and the check the program.
SM4109	3	2	Machining load maximum(*)	Machining load exceeded the <Max. machining load> in the monitoring section for the tool indicated by the auxiliary number.	The tool may be worn and/or chipped.Press the **[RST]** key and perform one of the following. - Replace with a new tool. - Make sure that the machining load monitor parameter is correctly set.
SM4110	3	2	Machining load minimum(*)	Machining load was under the <Min. machining load> in the monitoring section for the tool indicated by the auxiliary number.	The tool may be broken or machining was accidentally done twice. Press the **[RST]** key and perform one of the following. - Replace with a new tool. - Check the condition of the workpiece. - Make sure that the machining load monitor parameter is correctly set.
SM4111	3	2	Cutter compensation interference check error	It was detected that the infeed may be too great on the path offset by the cutter/nose R compensation.	Check the program and cutter compensation amount. If the alarm continues to trigger even though there is no excessive infeed, set the <Cutter compensation interference check> in the user parameter (switch 1: compensation function) to <0:No>.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM4112	3	2	Invalid command in machining mode	The specified command cannot be used in the selected machining mode. Ex: - An additional axis travel command was carried out. - An interrupt type macro was used. - Involute interpolation command (G02.2 and G03.2) was carried out.	(a)Check the program. (b)Open the support application (adjust machining parameter) screen, and select <Machining mode settings>. Check the <Machining mode> selection on the <Machining parameter adjustment (Machining mode)> screen.
SM4113	3	2	Invalid command in accuracy specification mode	The command cannot be used in the specified accuracy mode. Ex: - An additional axis travel command was carried out. - An interrupt type macro was used. - Involute interpolation command (G02.2 and G03.2) was carried out.	(a)Check the program. (b)Open the support application (adjust machining parameter) screen, and select <Machining mode settings>. Check the <Accuracy spec. mode> selection on the <Machining parameter adjustment (accuracy specification)> screen.
SM4114	3	2	Involute interpolation command error	(A)A command was issued for an axis that is not inside the selected plane. (B)The I, J and K commands were not carried out. (C)All the I, J and K commands had a value of 0 when they were carried out. (D)The R command had a value of 0 or less when it was carried out. (E)A command was issued where the start and end points are on the inside of the base circle. (F)A command was issued where the start and end points are equidistant from the center of the base circle. (G)A command with 100 or more rotations was issued.	Press the **[RST]** key and check the program.
SM4115	3	2	Invalid command for involute interpolation modal	G and M code commands were issued but are prohibited while in involute interpolation mode.	Press the **[RST]** key and check the program.
SM4116	3	2	There is no involute interpolation function	The involute interpolation command was specified even though the machine is not equipped with the involute interpolation function option.	Purchase the option.
SM4117	3	2	Involute interpolation cutter compensation error	The difference in the travel angle is 180 degrees or greater between the program path and the path after being offset for an involute interpolation command while carrying out cutter compensation / nose R compensation.	Press the **[RST]** key, and the check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM4118	3	2	An external output command is being executed.	The mode was changed during data output via external output command.	Press the **[RST]** key. Change the mode after data output via external output command is completed.
SM4119	3	2	Coolant pump OFF	Memory operation was started with the **[CLT.P]** key turned OFF.	(a)Turn ON the **[CLT.P]** key. (b)When the user does not wish to use coolant, set the user parameter (switch 1: operation) <Check before coolant pump start> to <0: Disable>.
SM4120	3	2	Chip shower OFF	Memory operation was started with the **[CHP.F]** key key turned OFF.	(a)Turn ON the **[CHP.F]** key. (b)When the user does not wish to use the chip shower, set the user parameter (switch 1: operation) <Check before chip shower start> to <0: Disable>.
SM4121	3	2	Door operation timeout	The automatic door open/close operation took longer than the time set in the machine parameter (system 1: automatic door) <Operation time>.	(a)Check the parameter setting. - Machine parameter (system 1: Automatic door) <Operation time> - Machine parameter (system 1: Automatic door)<Door open reference position> - Machine parameter (system 1: Automatic door) <Offset for door open position> - Machine parameter (system 1: Automatic door) <Offset for door close position> (b)Check the door limit switch. (c)Make sure that there are no chips or shavings between doors R and L. (d)Make sure that there are no chips or shavings between the door and machine cover. (e)Make sure that the door drive and door are connected properly.
SM4122	3	2	Door open timeout	The automatic door does not come into contact with the stopper when it opens at low speed even after the time set for the parameter has elapsed.	Check the parameter setting. - Machine parameter (system 1: Automatic door)<Stop check time when stopped> - Machine parameter (system 1: Automatic door)<Wait time when stopped> - Machine parameter (system 1: Automatic door)<Stop current reference value when stopped>
SM4123	3	2	Compensating diameter	001)Axis travel command execution was attempted in MDI operation during cutter compensation in memory operation.	001)Execute MDI operation after cutter compensation is completed.
				002)An H address was specified in an MDI intervention during cutter compensation in memory operation.	002)Execute MDI operation after cutter compensation is completed.
				003)G code was used in a command that cannot be issued in an MDI intervention during cutter compensation in memory operation.	003)Execute MDI operation after cutter compensation is completed.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				004)M code was used in a command that cannot be issued in an MDI intervention during cutter compensation in memory operation.	004)Execute MDI operation after cutter compensation is completed.
SM5500	2	2	Time to change batteries	The battery voltage for maintaining the absolute encoder data is low.	While the power switch is turned ON, replace all the batteries in the battery compartment (GB1) on the left side of the control box.
SM5501	2	2	Machining load maximum(*)	Machining load exceeded the <Max. machining load> in the monitoring section for the tool indicated by the auxiliary number.	The tool may be worn and/or chipped. Press the **[RST]** key and perform one of the following. - Replace with a new tool. - Make sure that the machining load monitor parameter is correctly set.
SM5502	2	2	Machining load minimum(*)	Machining load was under the <Min. machining load> in the monitoring section for the tool indicated by the auxiliary number.	The tool may be broken or machining was accidentally done twice. Press the **[RST]** key and perform one of the following. - Replace with a new tool. - Check the condition of the workpiece. - Make sure that the machining load monitor parameter is correctly set.
SM5503	2	2	Door operation timeout	The automatic door open/close operation took longer than the time set in the machine parameter (system 1: automatic door) <Operation time>.	(a)Check the parameter setting. - Machine parameter (system 1: Automatic door) <Operation time> - Machine parameter (system 1: Automatic door)<Door open reference position> - Machine parameter (system 1: Automatic door) <Offset for door open position> - Machine parameter (system 1: Automatic door) <Offset for door close position> (b)Check the door limit switch. (c)Make sure that there are no chips or shavings between doors R and L. (d)Make sure that there are no chips or shavings between the door and machine cover. (e)Make sure that the door drive and door are connected properly.
SM5504	2	2	Door open timeout	The automatic door does not come into contact with the stopper when it opens at low speed even after the time set for the parameter has elapsed.	Check the parameter setting. - Machine parameter (system 1: Automatic door)<Stop check time when stopped> - Machine parameter (system 1: Automatic door)<Wait time when stopped> - Machine parameter (system 1: Automatic door)<Stop current reference value when stopped>
SM5505	2	2	*-axis position shifted	(A)The axis has shifted during clamping more than the setting for (system 2: additional axis) <Position check pulse> (5th-axis) . (B)Brake power is too low. (C)Air pressure is faulty.	(A)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (5th-axis) is not too small. (B)Check that the brake is applied correctly. (C)Check the air pressure.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM5506	2	2	*-axis position shifted	(A)The axis has shifted during clamping more than the setting for (system 2: additional axis) <Position check pulse> (6th-axis) . (B)Brake power is too low. (C)Air pressure is faulty.	(A)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (6th-axis) is not too small. (B)Check that the brake is applied correctly. (C)Check the air pressure.
SM5507	2	2	*-axis position shifted	(A)The axis has shifted during clamping more than the setting for (system 2: additional axis) <Position check pulse> (7th-axis) . (B)Brake power is too low. (C)Air pressure is faulty.	(A)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (7th-axis) is not too small. (B)Check that the brake is applied correctly. (C)Check the air pressure.
SM5508	2	2	*-axis position shifted	(A)The axis has shifted during clamping more than the setting for (system 2: additional axis) <Position check pulse> (8th-axis) . (B)Brake power is too low. (C)Air pressure is faulty.	(A)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (8th-axis) is not too small. (B)Check that the brake is applied correctly. (C)Check the air pressure.
SM5509	2	2	*-axis position shifted	(A)The shift in the motor shaft exceeded the tolerance during 5th-axis clamping. (B)Brake power is too low.	(A)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (5th-axis) is not too small. (B)Check that the brake is applied correctly.
SM5510	2	2	*-axis position shifted	(A)The shift in the motor shaft exceeded the tolerance during 6th-axis clamping. (B)Brake power is too low.	(A)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (6th-axis) is not too small. (B)Check that the brake is applied correctly.
SM5511	2	2	*-axis position shifted	(A)The shift in the motor shaft exceeded the tolerance during 7th-axis clamping. (B)Brake power is too low.	(A)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (7th-axis) is not too small. (B)Check that the brake is applied correctly. (C)Check the air pressure.
SM5512	2	2	*-axis position shifted	(A)The shift in the motor shaft exceeded the tolerance during 8th-axis clamping. (B)Brake power is too low.	(A)Make sure that the machine parameter (system 2: additional axis) <Position check pulse> (8th-axis) is not too small. (B)Check that the brake is applied correctly.
SM7000	1	2	There is no P1-axis option.	P1-axis travel command was executed in the PLC program when the machine parameter (PLC: PLC-axis) <Optional axis> (P1-axis) was set to <No>.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7001	1	2	There is no P2-axis option.	P2-axis travel command was executed in the PLC program when the machine parameter (PLC: PLC-axis) <Optional axis> (P2-axis) was set to <No>.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7002	1	2	There is no P3-axis option.	P3-axis travel command was executed in the PLC program when the machine parameter (PLC: PLC-axis) <Optional axis> (P3-axis) was set to <No>.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7003	1	2	There is no P4-axis option.	P4-axis travel command was executed in the PLC program when the machine parameter (PLC: PLC-axis) <Optional axis> (P4-axis) was set to <No>.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7004	1	2	No comm. receivable as P1-ax contr sig is invalid.	P1-axis travel command was executed in the PLC program when the P1-axis control signal was OFF.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7005	1	2	No comm. receivable as P2-ax contr sig is invalid.	P2-axis travel command was executed in the PLC program when the P2-axis control signal was OFF.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.
SM7006	1	2	No comm. receivable as P3-ax contr sig is invalid.	P3-axis travel command was executed in the PLC program when the P3-axis control signal was OFF.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7007	1	2	No comm. receivable as P4-ax contr sig is invalid.	001)P4-axis travel command was executed in the PLC program when the P4-axis control signal was OFF.	001)Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
				002)The P4-axis control signal turned ON when the machine parameter (system 1: automatic door) <Option> is set to <1: Yes>.	002)Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key.
SM7008	1	2	Command is rejected (P1 in process)	P1-axis travel command was executed in the PLC program while the P1-axis was operating or while an alarm was triggered.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7009	1	2	Command is rejected (P2 in process)	P2-axis travel command was executed in the PLC program while the P2-axis was operating or while an alarm was triggered.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.
SM7010	1	2	Command is rejected (P3 in process)	P3-axis travel command was executed in the PLC program while the P3-axis was operating or while an alarm was triggered.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7011	1	2	Command is rejected (P4 in process)	P4-axis travel command was executed in the PLC program while the P4-axis was operating or while an alarm was triggered.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7012	1	2	Stroke exceeded (+P1)	The axis has exceeded <P1-axis stroke(+)> (user parameter/PLC) (Excluding manual reset operation.)	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7013	1	2	Stroke exceeded (-P1)	The axis has exceeded <P1-axis stroke(-)> (user parameter/PLC) (Excluding manual reset operation.)	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7014	1	2	Stroke exceeded (+P2)	The axis has exceeded <P2-axis stroke(+)> (user parameter/PLC) (Excluding manual reset operation.)	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.
SM7015	1	2	Stroke exceeded (-P2)	The axis has exceeded <P2-axis stroke(-)> (user parameter/PLC) (Excluding manual reset operation.)	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.
SM7016	1	2	Stroke exceeded (+P3)	The axis has exceeded <P3-axis stroke(+)> (user parameter/PLC) (Excluding manual reset operation.)	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7017	1	2	Stroke exceeded (-P3)	The axis has exceeded <P3-axis stroke(-)> (user parameter/PLC) (Excluding manual reset operation.)	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7018	1	2	Stroke exceeded (+P4)	The axis has exceeded <P4-axis stroke(+)> (user parameter/PLC) (Excluding manual reset operation.)	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7019	1	2	Stroke exceeded (-P4)	The axis has exceeded <P4-axis stroke(-)> (user parameter/PLC) (Excluding manual reset operation.)	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7020	1	2	P1-axis servo power off	The servo was turned off during P1-axis travel.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7021	1	2	P2-axis servo power off	The servo was turned off during P2-axis travel.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.
SM7022	1	2	P3-axis servo power off	The servo was turned off during P3-axis travel.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7023	1	2	P4-axis servo power off	The servo was turned off during P4-axis travel.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7024	1	2	P1-axis position shifted	(A)The motor shaft was shifted by machining load. (B)The operation shifted more than the machine parameter (PLC: PLC-axis) <Position check pulse> (P1-axis) during clamping. (C)Brake power is too low. (D)Air pressure is faulty.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON. (A)Reduce the machining load. (B)Make sure that the machine parameter (PLC: PLC-axis) <Position check pulse> (P1-axis) is not too small. (C)Check that the brake is applied correctly. (D)Check the air pressure.
SM7025	1	2	P2-axis position shifted	(A)The motor shaft was shifted by machining load. (B)The operation shifted more than the machine parameter (PLC: PLC-axis) <Position check pulse> (P2-axis) during clamping. (C)Brake power is too low. (D)Air pressure is faulty.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON. (A)Reduce the machining load. (B)Make sure that the machine parameter (PLC: PLC-axis) <Position check pulse> (P2-axis) is not too small. (C)Check that the brake is applied correctly. (D)Check the air pressure.
SM7026	1	2	P3-axis position shifted	(A)The motor shaft was shifted by machining load. (B)The operation shifted more than the machine parameter (PLC: PLC-axis) <Position check pulse> (P3-axis) during clamping. (C)Brake power is too low. (D)Air pressure is faulty.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON. (A)Reduce the machining load. (B)Make sure that the machine parameter (PLC: PLC-axis) <Position check pulse> (P3-axis) is not too small. (C)Check that the brake is applied correctly. (D)Check the air pressure.
SM7027	1	2	P4-axis position shifted	(A)The motor shaft was shifted by machining load. (B)The operation shifted more than the machine parameter (PLC: PLC-axis) <Position check pulse> (P4-axis) during clamping. (C)Brake power is too low. (D)Air pressure is faulty.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON. (A)Reduce the machining load. (B)Make sure that the machine parameter (PLC: PLC-axis) <Position check pulse> (P4-axis) is not too small. (C)Check that the brake is applied correctly. (D)Check the air pressure.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7028	1	2	P1-axis in-position check timeout	The axis did not reach in-position after operation was finished.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON. (a)Check the machine parameter (PLC: PLC-axis) settings <Positioning end check distance/angle>(P1-axis) and <In-position timeout period>(P1-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(P1-axis)> screen.
SM7029	1	2	P2-axis in-position check timeout	The axis did not reach in-position after operation was finished.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON. (a)Check the machine parameter (PLC: PLC-axis) settings <Positioning end check distance/angle>(P2-axis) and <In-position timeout period>(P2-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(P2-axis)> screen.
SM7030	1	2	P3-axis in-position check timeout	The axis did not reach in-position after operation was finished.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON. (a)Check the machine parameter (PLC: PLC-axis) settings <Positioning end check distance/angle>(P3-axis) and <In-position timeout period>(P3-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(P3-axis)> screen.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7031	1	2	P4-axis in-position check timeout	The axis did not reach in-position after operation was finished.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON. (a)Check the machine parameter (PLC: PLC-axis) settings <Positioning end check distance/angle>(P4-axis) and <In-position timeout period>(P4-axis). (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(P4-axis)> screen.
SM7032	1	2	P1-axis speed command error	When the P1-axis travel command was executed in the PLC program, the specified speed was faster than <Rapid feedrate> (P1-axis) in the machine parameter (PLC: PLC-axis), or was zero.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7033	1	2	P2-axis speed command error	When the P2-axis travel command was executed in the PLC program, the specified speed was faster than <Rapid feedrate> (P2-axis) in the machine parameter (PLC: PLC-axis), or was zero.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.
SM7034	1	2	P3-axis speed command error	When the P3-axis travel command was executed in the PLC program, the specified speed was faster than <Rapid feedrate> (P3-axis) in the machine parameter (PLC: PLC-axis), or was zero.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7035	1	2	P4-axis speed command error	When the P4-axis travel command was executed in the PLC program, the specified speed was faster than <Rapid feedrate> (P4-axis) in the machine parameter (PLC: PLC-axis), or was zero.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7036	1	2	P1-axis position command error	When the P1-axis travel command was executed in the PLC program, the specified position was greater than upper limit.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7037	1	2	P2-axis position command error	When the P2-axis travel command was executed in the PLC program, the specified position was greater than upper limit.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7038	1	2	P3-axis position command error	When the P3-axis travel command was executed in the PLC program, the specified position was greater than upper limit.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7039	1	2	P4-axis position command error	When the P4-axis travel command was executed in the PLC program, the specified position was greater than upper limit.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7040	1	2	The P1-axis servo cannot be ON.	P1-axis servo is not turned on even though four seconds have elapsed.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7041	1	2	The P2-axis servo cannot be ON.	P2-axis servo is not turned on even though four seconds have elapsed.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.
SM7042	1	2	The P3-axis servo cannot be ON.	P3-axis servo is not turned on even though four seconds have elapsed.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7043	1	2	The P4-axis servo cannot be ON.	P4-axis servo is not turned on even though four seconds have elapsed.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7044	1	2	The P1-axis servo OFF command is detected.	The servo off command was detected during P1-axis travel.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7045	1	2	The P2-axis servo OFF command is detected.	The servo off command was detected during P1-axis travel.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7046	1	2	The P3-axis servo OFF command is detected.	The servo off command was detected during P1-axis travel.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7047	1	2	The P4-axis servo OFF command is detected.	The servo off command was detected during P1-axis travel.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7048	1	2	External panel setting error (*)	IP address of external panel 1 overlapped with that of external panel 2.	Correct each parameter of communication parameter (external panel) and turn the power on again.
SM7049	1	2	No comm receivable as P1-axis servo OFF is active.	When P1-axis attempted to start travel, P1-axis servo off command was being specified.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7050	1	2	No comm receivable as P2-axis servo OFF is active.	When P2-axis attempted to start travel, P2-axis servo off command was being specified.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.
SM7051	1	2	No comm receivable as P3-axis servo OFF is active.	When P3-axis attempted to start travel, P3-axis servo off command was being specified.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7052	1	2	No comm receivable as P4-axis servo OFF is active.	When P4-axis attempted to start travel, P4-axis servo off command was being specified.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7053	1	2	No command receivable as P1-axis stop is active.	When P1-axis attempted to start travel, P1-axis stop command was being specified.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7054	1	2	No command receivable as P2-axis stop is active.	When P2-axis attempted to start travel, P2-axis stop command was being specified.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7055	1	2	No command receivable as P3-axis stop is active.	When P3-axis attempted to start travel, P3-axis stop command was being specified.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7056	1	2	No command receivable as P4-axis stop is active.	When P4-axis attempted to start travel, P4-axis stop command was being specified.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7057	1	2	OPSEL mounted	OPSEL is mounted.	Please contact us if you encounter a situation.
SM7058	1	2	No command is receivable as the door is open (P1-axis)	A travel command was executed for the P1-axis in the PLC program while the door (that corresponds to the machine parameter (PLC: PLC-axis) <Installation position> (P1-axis)) was open.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7059	1	2	No command is receivable as the door is open (P2-axis)	A travel command was executed for the P2-axis in the PLC program while the door (that corresponds to the machine parameter (PLC: PLC-axis) <Installation position> (P2-axis)) was open.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.
SM7060	1	2	No command is receivable as the door is open (P3-axis)	A travel command was executed for the P3-axis in the PLC program while the door (that corresponds to the machine parameter (PLC: PLC-axis) <Installation position> (P3-axis)) was open.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7061	1	2	No command is receivable as the door is open (P4-axis)	A travel command was executed for the P4-axis in the PLC program while the door (that corresponds to the machine parameter (PLC: PLC-axis) <Installation position> (P4-axis)) was open.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7062	1	2	Speed error when door is open (P1-axis)	The P1-axis moved at a speed exceeding a certain limit speed when the door was open.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.
SM7063	1	2	Speed error when door is open (P2-axis)	The P2-axis moved at a speed exceeding a certain limit speed when the door was open.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7064	1	2	Speed error when door is open (P3-axis)	The P3-axis moved at a speed exceeding a certain limit speed when the door was open.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7065	1	2	Speed error when door is open (P4-axis)	The P4-axis moved at a speed exceeding a certain limit speed when the door was open.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7066	1	2	A different key was pressed	The **[START]** switch or the **[PALLET START]** switch was pressed while another key was pressed at the same time. Or, the mode was changed while pressing a key at the same time.	Press the **[RST]** key. If you did not perform an operation while pressing another key at the same time, then replace the KEY PCB.
SM7067	1	2	Command not accepted because P1-axis servo is disabled	P1-axis travel command was executed in the PLC program while the P1-axis servo was disabled.	Press the **[RST]** key.
SM7068	1	2	Command not accepted because P2-axis servo is disabled	P2-axis travel command was executed in the PLC program while the P2-axis servo was disabled.	Press the **[RST]** key.
SM7069	1	2	Command not accepted because P3-axis servo is disabled	P3-axis travel command was executed in the PLC program while the P3-axis servo was disabled.	Press the **[RST]** key.
SM7070	1	2	Command not accepted because P4-axis servo is disabled	P4-axis travel command was executed in the PLC program while the P4-axis servo was disabled.	Press the **[RST]** key.
SM7071	1	2	ATC monitoring parameter error	001)Tool was not mounted correctly. The parameter was not calculated correctly due to this.	001)Follow the procedure below. 1.Make sure that the tool is fitted onto the magazine for <Magazine No. with tool>. 2.Make sure that no tool is fitted onto the magazine for <Magazine No. without tool>.
				002)Z-axis torque raised abnormally close to the ATC zero point. The parameter was not calculated correctly due to this.	002)Refer to the sections <Replace Z-axis motor and coupling,> <Replace Z-axis ball screw> and <Replace Z-axis guide> in the Maintenance Manual to make sure that the parts are correctly assembled.
				003)The measurement results for the <ATC monitoring reference height> has exceeded the tolerance of the machine.	003)Make sure that the pull stud is not loose or worn for tools attached to magazines where the <Magazine No. with tool> applies.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7072	1	2	Command cannot be received (P1-axis) during brake load test	P1-axis travel command was executed in the PLC program when there was an error in the brake load test during brake load test execution.	Turn the CTRL_P1 signal (BY: P1-axis control) OFF, and press the **[RST]** key. Or, turn the CTRL_P1 signal (BY: P1-axis control) ON, and turn the RESET_P1 signal (BY: P1-axis reset) ON.
SM7073	1	2	Command cannot be received (P2-axis) during brake load test	P2-axis travel command was executed in the PLC program when there was an error in the brake load test during brake load test execution.	Turn the CTRL_P2 signal (BY: P2-axis control) OFF, and press the **[RST]** key. Or, turn the CTRL_P2 signal (BY: P2-axis control) ON, and turn the RESET_P2 signal (BY: P2-axis reset) ON.
SM7074	1	2	Command cannot be received (P3-axis) during brake load test	P3-axis travel command was executed in the PLC program when there was an error in the brake load test during brake load test execution.	Turn the CTRL_P3 signal (BY: P3-axis control) OFF, and press the **[RST]** key. Or, turn the CTRL_P3 signal (BY: P3-axis control) ON, and turn the RESET_P3 signal (BY: P3-axis reset) ON.
SM7075	1	2	Command cannot be received (P4-axis) during brake load test	P4-axis travel command was executed in the PLC program when there was an error in the brake load test during brake load test execution.	Turn the CTRL_P4 signal (BY: P4-axis control) OFF, and press the **[RST]** key. Or, turn the CTRL_P4 signal (BY: P4-axis control) ON, and turn the RESET_P4 signal (BY: P4-axis reset) ON.
SM7076	1	2	Spindle taper not specified	The spindle taper specification is not set.	Set the spindle taper specification.
SM7077	1	2	Machining load maximum(*)	Machining load exceeded the <Max. machining load> in the monitoring section for the tool indicated by the auxiliary number.	The tool may be worn and/or chipped. Press the **[RST]** key and perform one of the following. - Replace with a new tool. - Make sure that the machining load monitor parameter is correctly set.
SM7078	1	2	Machining load minimum(*)	Machining load was under the <Min. machining load> in the monitoring section for the tool indicated by the auxiliary number.	The tool may be broken or machining was accidentally done twice. Press the **[RST]** key and perform one of the following. - Replace with a new tool. - Check the condition of the workpiece. - Make sure that the machining load monitor parameter is correctly set.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7079	1	2	Load weight setting error	If the user parameter (switch 1: common) <Notice of light load weight> is set to <1: Enable>, the alarm is triggered when the difference between the table load weight estimate and the set value in the user parameter (switch 1: common) <Table load weight> exceeds the <Tolerance for weight estimation> in the machine parameter (system 1: common). (Note) The weight estimate can change, for example, after replacing the motor.	Follow one of the procedures below. (a)Set the weight estimate for the load on the table so it is the same as the table load weight. Launch the support application (adjust machining parameter), and select the load weight settings. Follow the screen instructions and change the <Table load weight>. (b)Disable the notice of light load weight. Launch the support application (adjust machining parameter), and select the load weight settings. Set the <Notice of light load weight> to <Disable>.
SM7080	1	2	Stroke exceeded (opening direction on automatic door)	The axis travelled going beyond the open position for the automatic door. (Excluding the manual release operation)	Press the **[RST]** key. (Check the machine parameter (system 1: automatic door) <Door open reference position> and <Offset for door open position>.
SM7081	1	2	Stroke exceeded (closing direction on automatic door)	The axis travelled going beyond the close position for the automatic door. (Excluding the manual release operation)	Press the **[RST]** key.
SM7082	1	2	Automatic door position shifted	The position has shifted and exceeded the machine parameter (system 1: automatic door) <Position check pulse>.	Make sure that the machine parameter (system 1: automatic door) <Position check pulse> is not too small.
SM7083	1	2	Automatic door in-position check timeout	The axis did not enter the in-position width after completing operation.	(a)Check the machine parameter (system 1: Automatic door) settings <In-position width> and <In-position timeout period>. (b)Check that the axis does not vibrate after it has stopped. Check the <Position deviation> on the <I/O servo controller(P4-axis)> screen.
SM7084	1	2	Automatic door servo cannot be turned ON	The automatic door servo does not turn ON even though four seconds have elapsed.	Press the **[RST]** key.
SM7085	1	2	Front door unlock cannot be confirmed	The front door could not be unlocked within the time that was set in the parameter.	(a)Check the machine parameter (system 1: common) <Door unlock check time – Front door/Outer door> setting. (b)Check the door limit switch. (c)Check the wiring and the XDR1 connector on the SR PCB. (d)Replace the SR PCB.
SM7086	1	2	Outer door unlock cannot be confirmed	The outer door could not be unlocked within the time that was set in the parameter.	(a)Check the machine parameter (system 1: common) <Door unlock check time – Front door/Outer door> setting. (b)Check the door limit switch. (c)Check the wiring and the XDR2 connector on the SR PCB. (d)Replace the SR PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7087	1	2	Left side door unlock cannot be confirmed	The left side door could not be unlocked within the time that was set in the parameter.	(a)Check the machine parameter (system 1: common) <Door unlock check time – Left side door> setting. (b)Check the door limit switch. (c)Check the wiring and the XDR3 connector on the SR PCB. (d)Replace the SR PCB.
SM7088	1	2	Right side door unlock cannot be confirmed	The right side door could not be unlocked within the time that was set in the parameter.	(a)Check the machine parameter (system 1: common) <Door unlock check time – Right side door> setting. (b)Check the door limit switch. (c)Check the wiring and the XDR4 connector on the SR PCB. (d)Replace the SR PCB.
SM7089	1	2	Inner door unlock cannot be confirmed	The inner door could not be unlocked within the time that was set in the parameter.	(a)Check the machine parameter (system 1: common) <Door unlock check time – Inner door> setting. (b)Check the door limit switch. (c)Check the wiring and the XDR1 connector on the SR PCB. (d)Replace the SR PCB.
SM7090	1	2	Setup chamber left door unlock cannot be confirmed	The setup chamber left door could not be unlocked within the time that was set in the parameter.	(a)Check the machine parameter (system 1: common) <Door unlock check time – Setup chamber left door> setting. (b)Check the door limit switch. (c)Check the wiring and the XDR7 connector on the SR PCB. (d)Replace the SR PCB.
SM7091	1	2	Setup chamber right door unlock cannot be confirmed	The setup chamber right door could not be unlocked within the time that was set in the parameter.	(a)Check the machine parameter (system 1: common) <Door unlock check time – Setup chamber right door> setting. (b)Check the door limit switch. (c)Check the wiring and the XDR8 connector on the SR PCB. (d)Replace the SR PCB.
SM7092	1	2	Outside door 1 unlock cannot be confirmed	Outside door 1 could not be unlocked within the time that was set in the parameter.	(a)Check the machine parameter (system 1: common) <Door unlock check time – Outside door 1> setting. (b)Check the door limit switch. (c)Check the wiring and the XDR5 connector on the SR PCB. (d)Replace the SR PCB.
SM7093	1	2	Outside door 2 unlock cannot be confirmed	Outside door 2 could not be unlocked within the time that was set in the parameter.	(a)Check the machine parameter (system 1: common) <Door unlock check time – Outside door 2> setting. (b)Check the door limit switch. (c)Check the wiring and the XDR6 connector on the SR PCB. (d)Replace the SR PCB.
SM7094	1	2	Magazine door unlock cannot be confirmed	The magazine door could not be unlocked within the time that was set in the parameter.	(a)Check the machine parameter (system 1: common) <Door unlock check time – Magazine door> setting. (b)Check the door limit switch. (c)Check the wiring and the XDRMG connector on the SR PCB. (d)Replace the SR PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7095	1	2	Command not receivable with door unlocked (P1-axis)	A travel command was executed for the P1-axis in the PLC program while the door (that corresponds to the machine parameter (PLC: PLC-axis) <Installation position> (P1-axis) was not locked.	(a)Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P1 signal (BY: P1-axis control) ON, and turn the RESET_P1 signal (BY: P1-axis reset) ON.
SM7096	1	2	Command not receivable with door unlocked (P2-axis)	A travel command was executed for the P2-axis in the PLC program while the door (that corresponds to the machine parameter (PLC: PLC-axis) <Installation position> (P2-axis) was not locked.	(a)Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P2 signal (BY: P2-axis control) ON, and turn the RESET_P2 signal (BY: P2-axis reset) ON.
SM7097	1	2	Command not receivable with door unlocked (P3-axis)	A travel command was executed for the P3-axis in the PLC program while the door (that corresponds to the machine parameter (PLC: PLC-axis) <Installation position> (P3-axis) was not locked.	(a)Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P3 signal (BY: P3-axis control) ON, and turn the RESET_P3 signal (BY: P3-axis reset) ON.
SM7098	1	2	Command not receivable with door unlocked (P4-axis)	A travel command was executed for the P4-axis in the PLC program while the door (that corresponds to the machine parameter (PLC: PLC-axis) <Installation position> (P4-axis) was not locked.	(a)Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P4 signal (BY: P4-axis control) ON, and turn the RESET_P4 signal (BY: P4-axis reset) ON.
SM7099	1	2	Command not receivable during spindle rotation (P1-axis)	A travel command was issued on the P1-axis in the PLC program during spindle rotation when the door interlock mode was set to service mode.	(a)Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P1 signal (BY: P1-axis control) ON, and turn the RESET_P1 signal (BY: P1-axis reset) ON.
SM7100	1	2	Command not receivable during spindle rotation (P2-axis)	A travel command was issued on the P2-axis in the PLC program during spindle rotation when the door interlock mode was set to service mode.	(a)Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P2 signal (BY: P2-axis control) ON, and turn the RESET_P2 signal (BY: P2-axis reset) ON.
SM7101	1	2	Command not receivable during spindle rotation (P3-axis)	A travel command was issued on the P3-axis in the PLC program during spindle rotation when the door interlock mode was set to service mode.	(a)Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P3 signal (BY: P3-axis control) ON, and turn the RESET_P3 signal (BY: P3-axis reset) ON.
SM7102	1	2	Command not receivable during spindle rotation (P4-axis)	A travel command was issued on the P4-axis in the PLC program during spindle rotation when the door interlock mode was set to service mode.	(a)Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P4 signal (BY: P4-axis control) ON, and turn the RESET_P4 signal (BY: P4-axis reset) ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7103	1	2	Command not receivable during lathe spndle rotation(P1-ax.)	A travel command was issued on the P1-axis in the PLC program during lathe spindle rotation when the door interlock mode was set to service mode.	(a)Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P1 signal (BY: P1-axis control) ON, and turn the RESET_P1 signal (BY: P1-axis reset) ON.
SM7104	1	2	Command not receivable during lathe spndle rotation(P2-ax.)	A travel command was issued on the P2-axis in the PLC program during lathe spindle rotation when the door interlock mode was set to service mode.	(a)Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P2 signal (BY: P2-axis control) ON, and turn the RESET_P2 signal (BY: P2-axis reset) ON.
SM7105	1	2	Command not receivable during lathe spndle rotation(P3-ax.)	A travel command was issued on the P3-axis in the PLC program during lathe spindle rotation when the door interlock mode was set to service mode.	(a)Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P3 signal (BY: P3-axis control) ON, and turn the RESET_P3 signal (BY: P3-axis reset) ON.
SM7106	1	2	Command not receivable during lathe spndle rotation(P4-ax.)	A travel command was issued on the P4-axis in the PLC program during lathe spindle rotation when the door interlock mode was set to service mode.	(a)Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. (b)Turn the CTRL_P4 signal (BY: P4-axis control) ON, and turn the RESET_P4 signal (BY: P4-axis reset) ON.
SM7107	1	2	X-axis machine characteristics were identified	The machine characteristics were automatically identified.	Press the **[RST]** key.
SM7108	1	2	Y-axis machine characteristics were identified	The machine characteristics were automatically identified.	Press the **[RST]** key.
SM7109	1	2	Z-axis machine characteristics were identified	The machine characteristics were automatically identified.	Press the **[RST]** key.
SM7110	1	2	X-axis machine characteristics could not be identified	001)There is no compatible operation based on the identified machine characteristics. (a)There is no rapid feed operation. (b)The travel distance for the rapid feed operation is not sufficient. (c)The rapid traverse override is not 100%. (d)There is no rapid feed raising and lowering operations for the Z-axis.	001)Check the program. Set the rapid traverse override to 100%, and re-run the program.
				002)The memory operation stopped during identification.	002)Re-run the program.
				003)The machine lock is enabled.	003)Turn OFF the machine lock, and re-run the program.
				004)The machine characteristics identification resulted in an error.	004)Check the machine status.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7111	1	2	Y-axis machine characteristics could not be identified	001)There is no compatible operation based on the identified machine characteristics. (a)There is no rapid feed operation. (b)The travel distance for the rapid feed operation is not sufficient. (c)The rapid traverse override is not 100%. (d)There is no rapid feed raising and lowering operations for the Z-axis.	001)Check the program. Set the rapid traverse override to 100%, and re-run the program.
				002)The memory operation stopped during identification.	002)Re-run the program.
				003)The machine lock is enabled.	003)Turn OFF the machine lock, and re-run the program.
				004)The machine characteristics identification resulted in an error.	004)Check the machine status.
SM7112	1	2	Z-axis machine characteristics could not be identified	001)There is no compatible operation based on the identified machine characteristics. (a)There is no rapid feed operation. (b)The travel distance for the rapid feed operation is not sufficient. (c)The rapid traverse override is not 100%. (d)There is no rapid feed raising and lowering operations for the Z-axis.	001)Check the program. Set the rapid traverse override to 100%, and re-run the program.
				002)The memory operation stopped during identification.	002)Re-run the program.
				003)The machine lock is enabled.	003)Turn OFF the machine lock, and re-run the program.
				004)The machine characteristics identification resulted in an error.	004)Check the machine status.
SM7113	1	2	Tolerance error between axes for estimated weight	The difference between the table load weight estimates based on the X-axis operation and based on the Y-axis operation has exceeded the tolerance value. (A)There may be an abnormal load during the X-axis/Y-axis rapid feed operation. (B)The X-axis/Y-axis motor or servo amplifier may be faulty.	(A)Check the machine status. (B)Contact the nearest BROTHER approved service dealer.
SM7114	1	2	Command not receivable during service mode (P1-axis)	P1-axis travel command was executed in the PLC program while in service mode.	Turn the CTRL_P1 signal (BY:P1axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P1signal (BY:P1axis control) ON, and turn the RESET_P1 signal (BY:P1axis reset) ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7115	1	2	Command not receivable during service mode (P2-axis)	P2-axis travel command was executed in the PLC program while in service mode.	Turn the CTRL_P2 signal (BY:P2axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P2signal (BY:P2axis control) ON, and turn the RESET_P2 signal (BY:P2axis reset) ON.
SM7116	1	2	Command not receivable during service mode (P3-axis)	P3-axis travel command was executed in the PLC program while in service mode.	Turn the CTRL_P3 signal (BY:P3axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P3signal (BY:P3axis control) ON, and turn the RESET_P3 signal (BY:P3axis reset) ON.
SM7117	1	2	Command not receivable during service mode (P4-axis)	P4-axis travel command was executed in the PLC program while in service mode.	Turn the CTRL_P4 signal (BY:P4axis control) OFF, and press the **[RST]** key. In addition, turn the CTRL_P4signal (BY:P4axis control) ON, and turn the RESET_P4 signal (BY:P4axis reset) ON.
SM7118	1	2	Error in compensation setting for table deflection	The touch panel or TC PCB is faulty. (Note) The weight estimate can change, for example, after replacing the motor.	(a)Set the estimate for weight load on the table so that it is the same as the user parameter (switch 1: compensation function) <Standard weight for table deflection compensation>. Set the value referencing the <Estimated results> on the <Machining parameter adjustment (load weight settings)> screen for the support application (machining parameter adjustment). (b)Set the user parameter (switch 1:compensation function) <Table deflection compensation function> to <0: Disable>.
SM7119	1	2	Teaching pendant panel calibration error (*)	An error occurred during teaching pendant calibration.	(a)Perform calibration again. (b)The teaching pendant is faulty. Contact the nearest BROTHER approved service dealer and report the conditions when the error occurred.
SM7120	1	2	Teaching pendant communic. data is abnormal. (*)	An error was detected in teaching pendant communication data.	Check the connection with teaching pendant.
SM7121	1	2	Side door lock restricted (P1-ax.)	An operation was performed to lock (such as from the door interlock mode being set to automatic operation mode) the side door when the loading system is attempting to open the side door.	After the loading system closes the side door, perform the operation.
SM7122	1	2	Side door lock restricted (P2-ax.)	An operation was performed to lock (such as from the door interlock mode being set to automatic operation mode) the side door when the loading system is attempting to open the side door.	After the loading system closes the side door, perform the operation.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7123	1	2	Side door lock restricted (P3-ax.)	An operation was performed to lock (such as from the door interlock mode being set to automatic operation mode) the side door when the loading system is attempting to open the side door.	After the loading system closes the side door, perform the operation.
SM7124	1	2	Side door lock restricted (P4-ax.)	An operation was performed to lock (such as from the door interlock mode being set to automatic operation mode) the side door when the loading system is attempting to open the side door.	After the loading system closes the side door, perform the operation.
SM7500	1	1	Memory operation mode	MDI operation was attempted during a pause in memory operation.	Execute MDI operation after memory operation is completed.
SM7501	1	1	MDI operation mode	A memory operation or a mode change was made during a pause in MDI operation.	After the MDI operation is complete, perform an operation.
SM7502	1	1	Handle mode	(A)An operation that should be performed in manual mode was attempted in handle mode. (B)User operation is in progress on the teaching pendant.	(A)Set the axis selection switch of the handle to **[OFF]**. (B)Set the **[ENABLE PENDANT]** switch for the teaching pendant to disable (**[O]**).
SM7503	1	1	Spindle stopped with door open	The door was opened during spindle rotation.	Close the door, and press the **[START]** switch. The spindle starts rotating from the position it stopped.
SM7504	1	1	Tap time constant too short	The tap time constant set by the M code is less than the one calculated by the NC, relative to the tap rotation.	Use the M code to set the appropriate time constant for tap rotation.
SM7505	1	1	Pallet position error	001)The pallet was not indexed. (a)Memory operation or external additional axis command was executed without the pallet indexed. (b)A memory operation or external additional axis command was executed even though the pallet sensor signal was not properly input.	001)Index the pallet. (a)Select manual operation mode and index a pallet using the **[P.INDX]** key. (b)Check the pallet sensors 1 and 2. Or, check the XPLT1 and 2 connectors and wiring on the SR PCB.
				002)Memory operation was executed with a pallet which was different from the <PALLET> key indexed.	002)Check the <PALLET> key.
SM7506	1	1	Press the **[PALLET START]** switch	An inner pallet unload command was made before removing workpieces from the outer pallet.	Remove workpieces from the outer pallet, and then press the **[PALLET START]** key.
SM7507	1	1	Different from pallet program	001)A program was restarted that is different from the user parameter (quick table) settings.	001)Check the user parameter (quick table) <Pallet program folder> or <Pallet 1/2 program>, or the operation program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002)The <Pallet 1 program> or <Pallet 2 program> in the user parameter (quick table) was not set and operation was started after changing the <PALLET> key setting to “1↔2”.	002)Set both the user parameters (quick table) <Pallet 1 program> and <Pallet 2 program>, or do not configure the parameter settings.
SM7508	1	1	Spindle lock signal on	Spindle operation was executed when external input signal SPLOCK was ON.	Operate after turning off the input signal.
SM7509	1	1	ATC lock signal on	ATC operation was executed when external input signal ATCLCK was ON.	Operate after turning off the input signal.
SM7510	1	1	XY-axes lock signal on	X- or Y-axis operation was executed when external input signal XYLOCK was ON.	Operate after turning off the input signal.
SM7511	1	1	Z-ax lock signal on	Z-axis operation was executed when external input signal ZLOCK was ON.	Operate after turning off the input signal.
SM7512	1	1	*-ax lock signal on	4-axis operation was executed when external input signal 4LOCK was ON.	Operate after turning off the input signal.
SM7513	1	1	*-ax lock signal on	5-axis operation was executed when external input signal 5LOCK was ON.	Operate after turning off the input signal.
SM7514	1	1	*-ax lock signal on	6-axis operation was executed when external input signal 6LOCK was ON.	Operate after turning off the input signal.
SM7515	1	1	*-ax lock signal on	7-axis operation was executed when external input signal 7LOCK was ON.	Operate after turning off the input signal.
SM7516	1	1	*-ax lock signal on	8-axis operation was executed when external input signal 8LOCK was ON.	Operate after turning off the input signal.
SM7517	1	1	Mode change prohibit signal on	A mode change operation was performed when the external input signal MDLOCK was ON.	Operate after turning off the input signal.
SM7518	1	1	Door locked	Open and close the automatic door when the door interlock is valid.	
SM7519	1	1	Area sensor obstructed	The DR_ARSN_ERR signal was turned ON from the PLC program. If the PLC program has not been changed, the area sensor was interrupted during an automatic door operation.	When the area sensor is not interrupted: - Check the PLC program. - Check the area sensor connection.
SM7520	1	1	Manual operation mode	An operation was carried out that enabled the recovery/inspection operation during manual operation.	Enable recovery operation after manual operation is finished.
SM7521	1	1	No 4-axis option	A 4th-axis JOG or handle operation was executed even though the machine is not equipped with a 4th-axis option.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7522	1	1	No 5-axis option	A 5th-axis JOG or handle operation was executed even though the machine is not equipped with a 5th-axis option.	
SM7523	1	1	No 6-axis option	A 6th-axis JOG or handle operation was executed even though the machine is not equipped with a 6th-axis option.	
SM7524	1	1	No 7-axis option	A 7th-axis JOG or handle operation was executed even though the machine is not equipped with a 7th-axis option.	
SM7525	1	1	No 8-axis option	A 8th-axis JOG or handle operation was executed even though the machine is not equipped with a 8th-axis option.	
SM7526	1	1	During ATC	A mode change operation was performed during a tool change.	Mode cannot be switched during tool change. Switch the mode after tool change operation is finished.
SM7527	1	1	During chamfering/corner R oper.	MDI operation was attempted during chamfering/corner R operations in memory operation.	Perform MDI operation after chamfering/corner R operations are finished.
SM7528	1	1	Restarting invalid	Tape operation was performed when the user parameter (switch 1: operation) <Program repeat> was set to <1: Repeat>.	Set the user parameter (switch 1: operation) <Program repeat> to <0: Stop>.
SM7529	1	1	No MDI execution program	The **[START]** switch was pressed in MDI mode although the MDI program is empty, or all the MDI data required for MDI start is not yet input (conversation type).	Input the MDI program or input the MDI data (conversation type).
SM7530	1	1	Outer pallet additional axis operating	The **[PALLET START]** switch was pressed while the outer pallet additional axis was operating.	Pallet cannot be turned during outer pallet additional axis operation. Operate after outer pallet additional axis operation is finished.
SM7531	1	1	There is no quick table.	A pallet index, an outside index manual operation or a pallet start operation was carried out when the machine parameter (system 2: QT-axis) <Quick table> was set to <0:No>.	These operations cannot be performed in FT model. If it occurred in QT model, check the machine parameter (system 2: QT-axis).
SM7532	1	1	**[PALLET START]** button pressed	The **[OUTER ROTARY TABLE]** switch was pressed while external start was reserved.	Cancel external start reservation, or use the axis after operation is completed.
SM7533	1	1	Indexing prohibit signal on	The **[OUTER ROTARY TABLE]** switch was pressed while external input signal OUTLCK was on.	Operate after turning off external input signal OUTLCK.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7534	1	1	Outer pallet operating	The **[OUTER ROTARY TABLE]** switch was pressed during memory operation on the outer pallet (e.g. pallet turn M code is used after starting memory operation).	Use the key after operation is completed.
SM7535	1	1	Cannot start from midpoint of prog.	Memory operation was executed for external pallet after start position was set for program restart.	Program cannot be restarted for external pallet.
SM7536	1	1	Stroke exceeded (+*)	The outer pallet additional axis has exceeded its stroke limit (+5).	Check the stroke of user parameter (switch 2:Stroke) or the amount of outer pallet index.
SM7537	1	1	Stroke exceeded (-*)	The outer pallet additional axis has exceeded its stroke limit (-5).	Check the stroke of user parameter (switch 2:Stroke) or the amount of outer pallet index.
SM7538	1	1	Stroke exceeded (+*)	The outer pallet additional axis has exceeded its stroke limit (+6).	Check the stroke of user parameter (switch 2:Stroke) or the amount of outer pallet index.
SM7539	1	1	Stroke exceeded (-*)	The outer pallet additional axis has exceeded its stroke limit (-6).	Check the stroke of user parameter (switch 2:Stroke) or the amount of outer pallet index.
SM7540	1	1	Stroke exceeded (+*)	The outer pallet additional axis has exceeded its stroke limit (+7).	Check the stroke of user parameter (switch 2:Stroke) or the amount of outer pallet index.
SM7541	1	1	Stroke exceeded (-*)	The outer pallet additional axis has exceeded its stroke limit (-7).	Check the stroke of user parameter (switch 2:Stroke) or the amount of outer pallet index.
SM7542	1	1	Stroke exceeded (+*)	The outer pallet additional axis has exceeded its stroke limit (+8).	Check the stroke of user parameter (switch 2:Stroke) or the amount of outer pallet index.
SM7543	1	1	Stroke exceeded (-*)	The outer pallet additional axis has exceeded its stroke limit (-8).	Check the stroke of user parameter (switch 2:Stroke) or the amount of outer pallet index.
SM7544	1	1	Turn external program select off.	Program restart was carried out even though the program number for the external program selection signal was different from the program number to be restarted.	Turn off the external program selection signal.
SM7545	1	1	Mirror image mode	MDI operation was attempted during mirror image mode in memory operation.	Execute MDI with mirror image mode canceled.
SM7546	1	1	Scaling	MDI operation was attempted during scaling in memory operation.	Execute MDI with scaling canceled.
SM7547	1	1	Compensating diameter	001)Axis travel command execution was attempted in MDI operation during cutter compensation in memory operation.	001)Execute MDI operation after cutter compensation is completed.
				002)An H address was specified in an MDI intervention during cutter compensation in memory operation.	002)Execute MDI operation after cutter compensation is completed.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				003)G code was used in a command that cannot be issued in an MDI intervention during cutter compensation in memory operation.	003)Execute MDI operation after cutter compensation is completed.
				004)M code was used in a command that cannot be issued in an MDI intervention during cutter compensation in memory operation.	004)Execute MDI operation after cutter compensation is completed.
SM7548	1	1	Close the automatic door.	Memory operation was performed on the machine equipped with an automatic door specification when the **[AUTOMATIC DOOR MANU/AUTO]** switch was set to <AUTO> and the automatic door is not closed or not fully open.	Perform the following and then start memory operation. 1.Set the **[AUTOMATIC DOOR MANU/AUTO]** switch to <MANU>. 2.Press the **[AUTOMATIC DOOR OPEN/CLOSE]** switch to close the door. Or, set the door to a fully open position. 3.Set the **[AUTOMATIC DOOR MANU/AUTO]** switch to <AUTO>.
SM7549	1	1	Machine is operating.	The door lock was unlocked during machine operation.	Stop the machine, and then unlock the door lock.
SM7550	1	1	Additional axis operation prohibited range error	An additional axis turn command was issued in manual operation mode while the Z-axis was inside the restricted travel range for the additional axis.	Move the Z-axis out of the restricted travel range for the additional axis.
SM7551	1	1	Program number error	Memory operation was started when a program number was not set.	Check the user parameter (quick table) <Pallet 1/2 program> or the program number in the slave station communication.
SM7552	1	1	No program (*)	The designated program is not found. The number in brackets ( ) indicates the designated program number.	Check the program number.
SM7553	1	1	Wrong tool type	A tool change command was issued with different types of tools while in manual operation mode.	Perform ATC with the same type of tools.
SM7554	1	1	Invalid pot	A tool change command was issued for an invalid pot.	Only a cap can be set to an invalid pot. Perform ATC with a pot other than invalid pots.
SM7555	1	1	Capped	A tool change command was issued on a pot with a cap.	Perform ATC with a pot which is not cap-designated.
SM7556	1	1	The PLC axis control signal is ON.	PLC-axis travel was executed using a manual operation when a PLC-axis control signal was ON.	Operate PLC axis after turning off the PLC axis control signal.
SM7557	1	1	There is no P1-axis option.	A P1-axis JOG or handle operation was executed even though the machine is not equipped with a P1-axis option.	
SM7558	1	1	There is no P2-axis option.	A P2-axis JOG or handle operation was executed even though the machine is not equipped with a P2-axis option.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7559	1	1	There is no P3-axis option.	A P3-axis JOG or handle operation was executed even though the machine is not equipped with a P3-axis option.	
SM7560	1	1	There is no P4-axis option.	A P4-axis JOG or handle operation was executed even though the machine is not equipped with a P4-axis option.	
SM7561	1	1	Communicating	001)An attempt was made to edit a program or data even though that same data was still being transmitted.	001)Start editing when communication is completed.
				002)An attempt was made to communicate with the master station during an external output command.	002)After the external output command is complete, begin transmission and communication.
SM7562	1	1	No direction data	The program was run without setting the automatic centering measurement direction.	Set the measurement direction.
SM7563	1	1	Setting data error	The data is not set for the required items.	Set the data correctly.
SM7564	1	1	Rotational transformation mode	MDI operation was attempted during coordinate rotation in memory operation.	Execute MDI with rotationaltransformation canceled.
SM7565	1	1	Time to change batteries	The battery voltage for maintaining the absolute encoder data is low.	While the power switch is turned ON, replace all the batteries in the battery compartment (GB1) on the left side of the control box.
SM7566	1	1	An external output command is being executed.	A mode change operation was performed during data output for an external output command.	Change the mode after data output via external output command is completed.
SM7567	1	1	Interrupt type macro execution is being prepared.	A mode change operation was performed during the time from when an interrupt signal was detected until an interrupt program was started.	Mode cannot be switched during interrupt type macro execution preparation. Switch modes after interrupt type macro execution preparation is finished.
SM7568	1	1	Interrupt type macro post-process being executed.	A mode change operation was performed during the time from when an interrupt program was completely excuted until the processing returned to the original program.	Mode cannot be switched during post-processing of interrupt type macro. Switch modes during post-processing of interrupt type macro.
SM7569	1	1	Restart from the middle of the program prohibited.	The program was restarted from the middle of the program even though a restart operation is prohibited while in the middle of the program.	Check <Prohibit restart operation in middle of program> (user parameter(switch 1: operation)).
SM7570	1	1	Spindle rotating	001)An operation was carried out that enabled the recovery/inspection operation during spindle rotation.	001)Enable the recovery operation after the manual operation is finished.
				002)The constant peripheral speed control command was issued during memory operation after spindle rotation in manual mode.	002)Issue the command after stopping the spindle, or issue the constant peripheral speed control command and the spindle rotation command on the same block.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7571	1	1	Command interrupted in high-accuracy mode B.	Travel command was interrupted during operation in high accuracy mode B.	Check the value of <Speed clamp time B> (machine parameter(high accuracy: common)).
SM7572	1	1	Perform Spindle run-in operation	Immediately after machine installation or long-time recess, the spindle run-in operation must be executed.	Use the support application (recovery support) to execute the spindle test run-in operation.
SM7573	1	1	Step travel is excessive	A step travel command was issued when step travel on the rotation axis exceeded 1 degree.	Reduce step travel of the rotary axis to less than 1°.
SM7574	1	1	Lathe spindle is rotating	A recovery/inspection operation was carried out during lathe spindle rotation.	Perform recovery/inspection operation after the lathe spindle is stopped.
SM7575	1	1	Synchr. tapping return restoration position error	Synchronized tap return was commanded when Z-axis coordinates are above the Z-axis return coordinates.	Check the Z-axis return coordinate set values.
SM7576	1	1	Pallet turn speed was restricted	(A)The table load weight exceeds the set value. (B)The viscosity of the lubricant has increased due to cold temperatures.	(A)Make sure that the weight load on the table is not too heavy. If the alarm still triggers, contact the nearest Brother approved service dealer. (B)Press the **[P.INDX]** key in manual operation mode to rotate the pallet about 10 times. If the alarm still triggers, contact the nearest Brother approved service dealer.
SM7577	1	1	Servo disabled for axis required for operation	(A) A jog feed, step feed or handle operation was carried out while the servo was disabled for the selected axis. (B) A spindle normal rotation/stop command was issued while the servo is disabled for the S-axis. (C) A tool change command was issued while the servo was disabled for either the S-, Z- or M-axis. (D) A magazine normal rotation/stop command was issued while the servo was disabled for either the Z- or M-axis. (E) A pallet turn command was issued while the servo was disabled for either the Z- or QT-axis. (F) A machine zero return command was issued while the servo was disabled for either the X-, Y-, Z-, QT-, 5th-, 6th-, 7th- or 8th-axis.	(A) Enable the servo for the selected axis. (B) Enable the servo for the S-axis. (C) Enable the servos for the S-, Z- and M-axes. (D) Enable the servos for the Z- and M-axes. (E) Enable the servos for the Z- and QT-axes. (F) Enable the servos for the X-, Y-, Z-, QT-, 5th-, 6th-, 7th-, 8th-axis.
SM7578	1	1	Enter start position.	Start position was not entered for the program restart but the operation was started.	Enter the start position for program restart.
SM7579	1	1	ATC monitor. parameter setting - Start position error	The ATC monitoring parameter cannot be automatically set when the Z-axis machine coordinate is above the zero point.	Press the **[RELSE]** and **[-Z]** keys to move the machine coordinate down from the Z-axis zero point. Then, execute the automatic setting for the ATC monitoring parameter again.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7580	1	1	ATC monitoring parameter setting - Speed error	001)Rapid traverse override was not 100% when the automatic setting started for the ATC monitoring parameter.	001)After setting the rapid traverse override to 100%, execute the automatic setting for the ATC monitoring parameter again. Do not change the speed while the ATC monitoring parameter is being automatically set.
				002)The speed was changed while the ATC monitoring parameter was being automatically set.	002)After setting the rapid traverse override to 100%, execute the automatic setting for the ATC monitoring parameter again. Do not change the speed while the ATC monitoring parameter is being automatically set.
SM7581	1	1	ATC monitoring parameter setting - Magazine error	001)A magazine number with a tool and a magazine number without a tool were not set.	001)Correctly set the magazine number with a tool and the magazine number without a tool.
				002)The same number has been set for a magazine number with a tool and a magazine number without a tool.	002)Correctly set the magazine number with a tool and the magazine number without a tool.
SM7582	1	1	Operation restricted in machine setup mode	(A)An attempt was made to start operation with the door interlock mode set to setting mode and while the **[SINGL]**, **[DRY]** and **[M.LCK]** keys were all turned OFF. (B)An attempt was made to turn OFF the **[SINGL]** key or **[DRY]** key during operation with the door interlock mode set to setting mode.	When the door interlock mode is set to setting mode, operation is only possible if only one of the following keys is turned ON: **[SINGL]**, **[DRY]** or **[M.LCK]** key. (a)Turn ON one of the following keys: **[SINGL]**, **[DRY]** or **[M.LCK]** key. (b)Change the door interlock mode to automatic operation.
SM7583	1	1	Axis travel not possible while spindle is rotating	Axis travel was carried out during spindle rotation when the door interlock mode was set to service mode.	(a)After stopping the spindle, move the axis. (b)Change the door interlock mode to automatic operation or to machine setup.
SM7584	1	1	Axis travel not possible while lathe spindle is rotating	Axis travel was carried out during lathe spindle rotation when the door interlock mode was set to service mode.	(a)After stopping the lathe spindle, move the axis. (b)Change the door interlock mode to automatic operation or to machine setup.
SM7585	1	1	Operation disabled while spindle is rotating	A manual operation, other than a JOG feed or a handle operation, was performed while the spindle was rotating and with the door interlock mode set to automatic mode.	1.Stop the spindle. 2.Change the door interlock mode to setting mode.
SM7586	1	1	Feature coordinate manufacturing mode engaged	A command was specified that cannot be executed while in feature coordinate manufacturing mode. Ex: - The mode was changed to MDI operation mode. - A rotation command was executed on an additional axis in manual operation mode. - A lathe spindle selection command was executed.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7587	1	1	Restricted travel range error for AT-axis operation	(A)A jog feed, step feed or handle operation was carried out inside the AT-axis restricted travel range. (B)When the AT-axis stopped within the AT-axis restricted travel range, a jog feed, handle operation or a step feed- which does not rotate an amount exceeding the AT-axis restricted travel range- was carried out.	(A)Operate the AT-axis to move it outside of the AT-axis restricted travel range. To move it through the AT-axis restricted travel range, use the step feed to rotate it an amount that exceeds the AT-axis restricted travel range. (B)Use the step feed to rotate it an amount that exceeds the AT-axis restricted travel range.
SM7588	1	1	Machining load could not be measured	Machining load could not be measured due to one of the following reasons. - Spindle override and feedrate override were set to 100% while the machining load is being monitored. - The function is disabled on the common parameter <Machining load monitor function>. - The machining load monitor function has been disabled by the TLDSWOFF signal.	Perform one of the following. - Set the spindle override and the feedrate override to 100%.Or, set the common parameter <Machining load monitor during override> to <1:Monitor>. - Set the common parameter <Machining load monitor function> to <1: Enable>. - Cancel the machining load monitor function from being disabled by the TLDSWOFF signal.
SM7589	1	1	*-axis clamp retry attempt was made (*)	An attempt was made to re-clamp because it was out of position exceeding the machine parameter (system 2: additional axis) <Clamp retry pulse> (7th-axis) after the clamp had initially been completed. The auxiliary number shows the number of retry attempts.	If this occurs often, contact the nearest BROTHER approved service dealer. If this alarm is triggered by a clamp command (M431, M445), it is possible that there is an impact from the machining load during the unclamp that is right before. We recommend decreasing the machining load or machining while clamped.
SM7590	1	1	Support application (ATC tool) running	The mode was changed during a tool change position index or a spindle position index performed in the support application (ATC tool).	Wait for the tool change position index or spindle position index operation to complete, and then switch the mode.
SM7591	1	1	Support application (tool life) running	The mode was changed during a tool change position index or a spindle position index performed in the support application (tool life).	Wait for the tool change position index or spindle position index operation to complete, and then switch the mode.
SM7592	1	1	Support application (ATC tool) operation not selected	The **[START]** switch was pressed even though the tool change position index or spindle position index was not selected in the support application (ATC tool).	Select the tool change position index or spindle position index operation, and then press the **[START]** switch.
SM7593	1	1	Support application (tool life) operation not selected	The **[START]** switch was pressed even though the tool change position index or spindle position index was not selected in the support application (tool life).	Select the tool change position index or spindle position index operation, and then press the **[START]** switch.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7594	1	1	Spindle rotation not possible during axis travel	Spindle rotation was carried out during axis travel when the door interlock mode was set to service mode.	(a)Rotate the spindle once the axis has stopped. (b)Change the door interlock mode to automatic operation or to machine setup.
SM7595	1	1	Lathe spindle rotation not possible during axis travel	Lathe spindle rotation was carried out during axis travel when the door interlock mode was set to service mode.	(a)Rotate the lathe spindle once the axis has stopped. (b)Change the door interlock mode to automatic operation or to machine setup.
SM7596	1	1	Weight estimate in progress	The mode was changed during a weight estimate operation performed for the support application (adjust machining parameter) <Load weight settings>.	Change the mode once the weight estimate operation is complete.
SM7597	1	1	Brake load test error on Z-axis	Brake load test on Z-axis failed.	The Z-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7598	1	1	Brake load test error on *-axis	Brake load test on 5th-axis failed.	The 5th-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7599	1	1	Brake load test error on *-axis	Brake load test on 6th-axis failed.	The 6th-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7600	1	1	Brake load test error on *-axis	Brake load test on 7th-axis failed.	The 7th-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7601	1	1	Brake load test error on *-axis	Brake load test on 8th-axis failed.	The 8th-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7602	1	1	Brake load test error on *-axis	Brake load test on M-axis failed.	The M-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7603	1	1	Brake load test error on P1-axis	Brake load test on P1-axis failed.	The P1-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7604	1	1	Brake load test error on P2-axis	Brake load test on P2-axis failed.	The P2-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7605	1	1	Brake load test error on P3-axis	Brake load test on P3-axis failed.	The P3-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7606	1	1	Brake load test error on P4-axis	Brake load test on P4-axis failed.	The P4-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7607	1	1	Automatic door open/close command error	(A)An open command and close command were input at the same time for the automatic door from the **[AUTOMATIC DOOR OPEN/CLOSE]** switch and the external input signals ATDROP and ATDRCL. (B)The **[AUTOMATIC DOOR OPEN/CLOSE]** switch is faulty.	(A)Do not input an automatic door open command and close command at the same time. (B)Replace the **[AUTOMATIC DOOR OPEN/CLOSE]** switch.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7608	1	1	Support app (adjust machining param) operation not selected	**[START]** switch was pressed even though the <Execute estimate> key was not pressed on the <Machining parameter adjustment (Weight estimate)> screen for the support application (machining parameter adjustment).	First, press the <Execute estimate> key and then press the **[START]** switch.
SM7609	1	1	Door interlock mode changed – Stopped		
SM7610	1	1	Stopped with door open (Setting mode)		
SM7611	1	1	Operation disabled when door interlock not set to service	(A)The door interlock mode is set to automatic operation. (B)The door interlock mode is set to machine setup.	Change the door interlock mode to service mode.
SM7612	1	1	Operation not possible with pressed enable switch	001)**[ENABLE]** switch at another location (besides the operation panel) is being pressed.	001)Press and use the **[ENABLE]** switch on the operation panel.
				002)**[ENABLE]** switch at another location (besides the manual pulse generator) is being pressed.	002)Press and use the **[ENABLE]** switch at the manual pulse generator.
				003)**[ENABLE]** switch at another location (besides the teaching pendant) is being pressed.	003)Press the **[ENABLE]** switch on the teaching pendant to operate.
SM7613	1	1	Door was not locked	A machine operation was carried out while the door was not locked.	Lock the door.
SM7614	1	1	Timeout on fixed torque control for *-axis	QT-axis did not reach the maximum speed even though the machine parameter (system 2: QT-axis) <Maximum angle on fixed torque control> was applied. (A)The table load weight exceeds the set value. (B)The viscosity of the lubricant has increased due to cold temperatures.	(A)Make sure that the weight load on the table is not too heavy. If the alarm still triggers, contact the nearest Brother approved service dealer. (B)Press the **[P.INDX]** key in manual operation mode, and rotate the pallet about 10 times. If the alarm still triggers, contact the nearest Brother approved service dealer.
SM7615	1	1	Maximum angle exceeded on fixed torque control for *-axis	Restart block information without a sequence number was selected when specifying a sequence number on the <Program restart (select restart block information)> screen. (A)The table load weight exceeds the set value. (B)The viscosity of the lubricant has increased due to cold temperatures.	(A)Make sure that the weight load on the table is not too heavy. If the alarm still triggers, contact the nearest Brother approved service dealer. (B)Press the **[P.INDX]** key in manual operation mode, and rotate the pallet about 10 times. If the alarm still triggers, contact the nearest Brother approved service dealer.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SM7616	1	1	Side door lock restricted	An operation was performed to lock (such as from the door interlock mode being set to automatic operation mode) the side door when the loading system is attempting to open the side door.	After the loading system closes the side door, perform the operation.
SM7617	1	1	There is no teaching pendant calibration data.	Calibration data of the teaching pendant is not found.	Perform calibration.
SM7618	1	1	The teaching pendant calibration data is abnormal.	Calibration data of the teaching pendant is not correct.	Perform calibration.
SM7619	1	1	Teaching pendant data error (*)	An error was detected in teaching pendant data.	Please contact us if you encounter a situation.
SM7620	1	1	Brake load test error on J1-axis	Brake load test on J1-axis failed.	The J1-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7621	1	1	Brake load test error on J2-axis	Brake load test on J2-axis failed.	The J2-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7622	1	1	Brake load test error on J3-axis	Brake load test on J3-axis failed.	The J3-axis motor brake may be faulty. Inspect and/or repair the servo motor.
SM7623	1	1	Teaching pendant is being used.	An operation was carried out that enabled the recovery/inspection operation while the teaching pendant is being used.	Set the **[ENABLE PENDANT]** switch for the teaching pendant to **[Disable]**.
SM9000	3	2	Macro error	This is an alarm caused by the macro (system variables) alarm display function (the function that displays the alarm number and alarm message set in the program).	Check the program.
SM9300	1	1		This is an alarm caused by the macro (system variables) alarm display function (the function that displays the alarm message set in the program).	Check the program.

2.13.8 SL

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL0000	5	3	Machine param. setting error (SYS 1)	001)The "Tool storage capacity" is not set. Or, an incorrect value is set.	001)Set the parameters of Machine Parameters (system 1: common) to the correct values and turn power on again.
SL0001	5	3	Memory is not formatted	The memory has never been cleared or the data is damaged.	Output all data to an external device and format the memory.
SL0002	5	3	Machine param. setting error (PLC)	001)<brake>(P1- to P4-axis) and <clamp mechanism>(P1- to P4-axis) are inconsistent.	001)Set the parameters of Machine Parameters (PLC: PLC-axis) to the correct values and turn power on again.
				002)Machine parameter (PLC: PLC-axis) <Optional axis> (P4-axis) has been set to <Yes> when there is an automatic door option.	002)Set the parameters of Machine Parameters (PLC: PLC-axis) to the correct values and turn power on again.
SL0003	5	3	Local CPU temperature error	Local CPU temperature exceeds 100 degrees.	Turn power off for thirty minutes before resuming operation. If the alarm still triggers again, then the NC PCB is faulty. Replace the NC PCB.
SL0004	5	3	Additional axis configuration error	(A)Machine parameter (system 2: additional axis) <Optional axis> is set to <Yes> on a machine model without a QT and is restricted from adding 1 or more additional axes. (B)Machine parameter (system 2: additional axis) <Optional axis> is set to <Yes> on a machine model with a QT and is restricted from adding 1 or more additional axes. (C)Machine parameter (system 2: additional axis) <Optional axis> is set to <Yes> for 2 or more axes on a machine model without a QT and is restricted from adding 2 or more additional axes. (D)On one pallet side, the machine parameter (system 2: additional axis) <Optional axis> is set to <Yes> for 2 or more axes on a machine model with a QT and is restricted from adding 2 or more additional axes.	(a)Adding additional axes is restricted. Check the machine parameter (system 2: additional axis) setting for the <Optional axis>. (b)Contact a BROTHER Industries dealer.
SL0500	5	2	No machine parameter data	There is no machine parameter data.	Create the machine parameter and turn power off and then on again.
SL0501	5	2	No PLC axis option		
SL0502	5	2	W/o turning function		

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL0503	5	2	Special setting error (Rapid feed adjustment)	When <Adjustment> was set for the <Rapid feed special setting selection>, there are some items in the <Adjustment> parameter that have not been set for the special selection (rapid feed adjustment) screen.	(a)Change the set value for the <Adjustment> parameter to the correct value, and press the **[RST]** key. (b)If the adjustment is not carried out, set the <Rapid feed special setting selection> to the <Standard> setting.
SL0504	5	2	Special setting error (Rapid feed special setting selection)	001)There is an item that has not been set in a category corresponding to the machine parameter (special setting), when the <Rapid feed special setting selection> is set to <Level 1(2/3)> on the <Special setting (Special setting selection)> screen for the data bank.	001)Follow one of the procedures below. (a)Change the <Rapid feed special setting selection> to the <Standard> setting. (b)Set the item that has not been set in the category corresponding to the machine parameter (special setting).
SL0505	5	2	No special setting data	There is no data for the special settings.	Press the **[RST]** key.
SL1500	4	3	User param. setting error (Tool break. detect)	001)<Tool breakage detection option> and machine configuration are inconsistent.	001)Correct each parameter of the user parameter (tool breakage detection) and turn the power on again.
SL1501	4	3	Machine param. setting error	The check sum for the pitch error in the machine parameter is different from the existing check sum.	Contact the nearest BROTHER approved service dealer.
SL2000	4	2	No user parameter data	There is no user parameter data.	Create a user parameter, and then turn the power off and then on again.
SL2001	4	2	No tool in tool list	The tool to be used for machining is not registered in the tool list.	Press the **[RST]** key, and then set the tool in the tool list.
SL2002	4	2	Tap size error	The denominator of the inch screw is zero (0).	Press the **[RST]** key, and then set the tap size correctly.
SL2003	4	2	No workpiece zero data	There is no workpiece coordinate zero point data.	Create workpiece coordinate zero point data or input it from an external device.
SL2004	4	2	No tool data	There is no tool data.	Create tool data or input it from an external device.
SL2005	4	2	No macro variable data	There is no macro variable data.	Create macro variable data or input it from an external device.
SL2006	4	2	Machine param. setting error (SYS 2)	001)The <position>(5th- to 8th-axis) is set to <No pallet> on a machine model equipped with a QT. Or, the <position> (5th- to 8th-axis)is configured to another setting besides <No pallet> on a machine model that is not equipped with a QT.	001)Set the machine parameters (system 2: additional axis) to the correct values.
				002)The <clamp mechanism> value and the <Quick table> value do not match.	002)Set the machine parameters (system 2: QT-axis) to the correct values.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				003)For the <address>(5th- to 8th-axis) values, the additional axis for the A, B or C address is duplicated on the individual table. An additional axis for the 3rd-axis or higher is set to the individual table on a machine model equipped with a QT.	003)Set the machine parameters (system 2: additional axis) to the correct values.
				004)More than 2 <Lathe spindles> are set on a single table for the <Optional axis> (5th to 8th-axes).	004)Set the machine parameters (system 2: additional axis) to the correct values.
				005)<Optional axis> (5th- to 8th-axes) is set to <Yes (lathe spindle)> on a machine model equipped with a QT.	005)Set the machine parameters (system 2: additional axis) to the correct values.
				006)<Optional axis> (5th-axis) is configured to a setting <No> or <Yes (lathe spindle)> and <Optional axis> (7th-axis) is configured to a setting besides <Yes (lathe spindle)> on an M series machine model.	006)Set the machine parameters (system 2: additional axis) to the correct values.
				007)<Brake load test>(5th- to 8th-axis) is set to <1: Test> on the QT-axis or on the additional axis for positioning.	007)Set the machine parameters (system 2: additional axis) to the correct values.
				008)<Brake load test> (5th- to 8th-axes) is set to <1: Test> on an axis where the <Optional axis> (5th to 8th-axes) is set to <No>.	008)Set the machine parameters (system 2: additional axis) to the correct values.
				009)<Brake load test>(5th-axis) is set to <0: No test> on an U series or M series machine model equipped with a **[MODE OF SAFE OPERATION]** switch.	009)Set the machine parameters (system 2: additional axis) to the correct values.
				010)The same value is set for <Pallet 1 indexing angle> <Pallet 2 indexing angle>.	010)Set the machine parameters (system 2: QT-axis) to the correct values.
				011)<Optional axis> (5th- to 8th-axes) is set to <Yes (lathe spindle)>.	011)Set the machine parameters (system 2: additional axis) to the correct values.
				012)The <Fixed torque control> (QT-axis) is set to <1: Enable> and a parameter between <Additional axis stroke 2> and <Additional axis stroke 10> is set to <1: QT-axis>.	012)Set the machine parameters (system 1: common) to the correct values.
				013)<Optional axis> (5th-axis) is configured to another setting besides <Yes> or <Optional axis> (7th-axis) is configured to another setting besides <Yes> on a U series machine model.	013)Set the machine parameters (system 2: additional axis) to the correct values.
				014)<Brake load test> (7th-axis) is set to <0: No test> on a U series machine model.	014)Set the machine parameters (system 2: additional axis) to the correct values.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL2007	4	2	User param. setting error (switch 2)	001)When the machine parameter (system 2: additional axis) <Optional axis> (5th- to 8th-axes) is set to <Yes (lathe spindle)>, the <5th- (6th-, 7th- or 8th-) axis stroke control> is set to <Yes>.	001)Set the user parameters (switch 2:Stroke) to the correct values.
				002)The <5th- (6th-, 7th- or 8th-) axis stroke control> is set to <No> on an additional axis that is set to the machine parameter (system 2: common) <Additional axis stroke*>.	002)Set the user parameters (switch 2:Stroke) to the correct values.
				003)When the machine parameter (system 2: additional axis) <Optional axis> (5th- to 8th-axes) is set to <Yes (positioning only)>, the set value for <External A-(B-) axis indexing(-)(+)> is out of the tolerance range.	003)Set the user parameters (switch 2:Stroke) to the correct values.
SL2008	4	2	Specified memory range exceeded	The specified memory range has been exceeded.	Press the **[RST]** key.
SL2009	4	2	Left- or right-hand thread?	The torsion direction is not set in the tool list when tapping.	Press the **[RST]** key, and then set the torsion direction.
SL2010	4	2	Machine param. setting error (SYS 1)	001)The wrong value is set for the <Spindle air blow/Tool wash control method>.	001)Set the machine parameters (system 1: common) to the correct values.
				002)The <Automatic oiling function> and the <Automatic greasing function> are set together.	002)Set the machine parameters (system 1: common) to the correct values.
				003)One of the values for <Marked position for adjustment>(X- to Z-axis) is not set.	003)Set the machine parameters (system 1: X-, Y- or Z-axis) to the correct values.
				004)The wrong value has been set for <Operation in ATC range>.	004)Set the machine parameters (system 1: common) to the correct values.
				005)The wrong value has been set for <Cyclone filter>.	005)Set the machine parameters (system 1: common) to the correct values.
				006)The wrong value has been set for <Tool wash start position>.	006)Set the machine parameters (system 1: common) to the correct values.
SL2011	4	2	User param. setting error (switch 1)	001)<Conversation/NC language change> is set to <0: Conversation>. It cannot be set due to the machine specification.	001)Set the user parameter (switch 1: system) <Conversation/NC language change> to <1:NC> and then press the **[RST]** key.
				002)<Z-axis travel method during tool change> is set to <1: Type 2>. <1: Type 2> cannot be set on the machine being used.	002)Set the user parameter (switch 1: ATC/Magazine) <Z-axis travel method during tool change> to <0: Type 1>, and then press the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				003)The <Automatic door error level> is set to <2: Level 3> or <3: Level 2> on a machine model not equipped with a QT. <2: Level 3> or <3: Level 2> cannot be set on a machine model not equipped with a QT.	003)Set the user parameter (switch 1: door) <Automatic door error level> to <0: Level 5> or <1: Level 4>, and press the **[RST]** key.
				004)<1: Heavy tool> is set for the <Maximum tool specification settings>. <1: Heavy tool> cannot be set on the machine being used.	004)Set the <Maximum tool specification settings> to <0: Standard tool> and press the **[RST]** key.
				005)The value set for the user parameter (switch 1: compensation function) <Number of blocks to check cutter compensation interference> is larger than the machine parameter (system 1: common) <Maximum blocks to check cutter compensation interference>. Or, there is no set value for <Number of blocks to check cutter compensation interference>.	005)Set a value less than the machine parameter (system 1: common) <Maximum blocks to check cutter compensation interference>, and then press the **[RST]** key.
				006)A value is set that falls outside of the setting range for <ATC arm turn speed ratio 1 (M422)> or <ATC arm turn speed ratio 2 (M423)> in the user parameter (switch 1: ATC/Magazine).	006)Set a value greater than the machine parameter (system 3: common) <Lower limit for ATC arm turn speed ratio>, and then press the **[RST]** key.
				007)The <Order for brake load test execution on 5th- (6th-/7th-/8th-) axis> or the <Order for brake load test execution on P*-axis> is set to <0: First> when the <Brake load test start position on Z-axis> is not set to <1: Zero point> or to <3: ATC zero pt.>.	007)Set the <Brake load test start position on Z-axis> to <1: Zero point> or to <3: ATC zero pt.>. Or, set the <Order for brake load test execution on 5th- (6th-/7th-/8th-) axis> or the <Order for brake load test execution on P*-axis> to another setting besides <0: First>. Then, press the **[RST]** key.
				008)The <Standard circle radius> is set to 0 when the <Rotation axis speed command type> was set to <Type 2>.	008)Set the user parameter (switch 1: programming) <Rotation axis speed command type> to <Type 1>, or set the user parameter (switch 1: programming) <Standard circle radius> to the appropriate value.
				010)<Table deflection compensation function> is set to <1: Enable>.	010)Set the <Table deflection compensation function> to <0: Disable> and press the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				011)Another setting besides <0: Invalid> has been configured for the user parameter (switch 1: ATC/magazine) <No tool detection function> or <Tool over key detection function> or <Tool missing detection function>. Another setting besides <0: Invalid> cannot be configured on the machine being used.	011)Set the user parameters (switch 1: ATC/magazine) <No tool detection function>, <Tool over key detection function> and <Tool missing detection function> to <0: Invalid>, and then press the **[RST]** key.
SL2012	4	2	Too many tools assigned	The number of tools used in the program is larger than the number of tool pots.	Press the **[RST]** key, and then check the program.
SL2013	4	2	T-code range error	The T-command is not within the specified range.	Check the T-command in the program.
SL2014	4	2	No tool in spindle	Tap job was attempted in MDI mode when the tool was not attached to the spindle.	Press the **[RST]** key. Attach the tool to the spindle and then set this tool for **[ATC tool]** on the screen.
SL2015	4	2	Editing	Editing data already being edited was attempted.	Check that the “During communication” mark is not displayed, and then press the **[RST]** key.
SL2016	4	2	There is no machine data 11 (SYSD89).	Machine data 11 (SYSD89) is not found.	Enter machine data 11 (SYSD89).
SL2017	4	2	No external I/O signal data	External I/O signal data is not found.	Create I/O signal data or enter it from outside.
SL2018	4	2	No communication parameter data	Communication parameter data is not found.	Create communication parameter data or enter it from outside.
SL2019	4	2	Machine param. setting error (PLC)	001)The "install. position"(P1- to P4-axis) is set to "Individual" on the QT machine. Or, the "install. position"(P1- to P4-axis) is set to "Table 1" or "Table 2" on another machine besides the QT machine.	001)Set the machine parameters (PLC: PLC-axis) to the correct values.
				002)<Outside 1> or <Outside 2> has been set for the <Installation position> (P1- to P4-axis) while the machine parameter (system 1: common) <Outside door 1 settings> or <Outside door 2 settings> is configured to <None>.	002)Set the machine parameters (PLC: PLC-axis) to the correct values.
SL2020	4	2	No operation level data	There is no operation level data, or it is corrupt.	Create operation level data, or input data from an external source.
SL2021	4	2	Param. not set could not be configured to factory-set values.	During the firmware version update, the factory-set values could not be configured for the parameters which have not be set.	(a)Set the appropriate values for the user parameter, machine parameter and communication parameter that are not set. (b)Insert the latest factory-set parameter file into the USB memory, and update the firmware again.
SL2022	4	2	No data for G/M code macro parameter	No data for G/M code macro parameter	Create parameter data for a G/M code macro or input the data from an external source.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL2023	4	2	Parameter setting error for rotary fixture offset	001)Even though there is an option for a rotary fixture offset function, <Tilt axis *> or <Rotation axis *> is set to an axis where the machine parameter (system 2: additional axis) <Optional axis> (5th- to 8th-axes) was set to <No>.	001) Change the <Tilt axis> and <Rotation axis> to the correct setting, and press the **[RST]** key.
				002)When there is an option for a rotary fixture offset function, <Tilt axis *> or <Rotation axis *> is set to an axis, and the same axis was used in another <Tilt axis *> or <Rotation axis *> setting.	002) Change the <Tilt axis> and <Rotation axis> to the correct setting, and press the **[RST]** key.
				003)When there is an option for a rotary fixture offset function, the machine parameter (system 2: additional axis) <Installation position> (5th- to 8th-axis) for the additional axis is different than the additional axis that is specified in the <Tilt axis *> and <Rotation axis *> combination setting.	003) Change the <Tilt axis> and <Rotation axis> to the correct setting, and press the **[RST]** key.
				004)When there is an option for a rotary fixture offset function, <Forward direction for the coordinate system on tilt axis *> and <Forward direction for the coordinate system on rotation axis *> are set to the same plane.	004) Change the <Forward direction for the coordinate system on the tilt axis*> and <Forward direction for the coordinate system on the rotation axis to the correct setting, and press the **[RST]** key.
SL2024	4	2	User parameter setting error (high accuracy)	001)A value other than <0> is set for both the user parameter (high accuracy: machining mode) <Machining mode> and the user parameter (high accuracy: accuracy specification mode) <Accuracy specification mode>.	001)Open the support application (adjust machining parameter) screen, and select <Machining mode settings>. Both the <Machining mode> and <Accuracy spec. mode> cannot be enabled at the same time. Only use one of them. Set either the <Machining mode> on the <Machining parameter adjustment (Machining mode)> screen or the <Accuracy spec. mode> on the <Machining parameter adjustment (accuracy specification)> screen to <L0: OFF>.
				002)A negative value is set for <Smoothness> when <Standard mode> is set to <2. Rough> in the user parameter (high accuracy:Machining mode).	002)Open the support application (adjust machining parameter) screen, and select <Machining mode settings>. In the <L7 adjustment A>, <L8 adjustment B>, <L9 adjustment C> screen settings, set the <Smoothness> adjustment to a value greater than 0 for the mode where <2:Rough> is set as the <Standard mode>. Then, press the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				003)<0: None> is set for <Standard mode> when the <Machining mode> in the user parameter (high accuracy: machining mode) is set to one of the following <7. Adjust. A>, <8. Adjust. B> or <9. Adjust. C>.	003)Open the support application (adjust machining parameter) screen, and select <Machining mode settings>. Check the <Standard mode> settings on the <Machining parameter adjustment (L7 adjustment A)>, <Machining parameter adjustment (L8 adjustment B)> and <Machining parameter adjustment (L9 adjustment C)> screens.
SL2025	4	2	Parameter required for brake load test has not been set	One of the following user parameters (switch 1: brake load test) required for the brake load test has not been set. 1.<Auto execution of brake load test at mem. op start> 2.<Brake load test start time 1> 3.<Adjust start time for brake load test> 4.<Time extension for brake load test execution>	Change the user parameters (switch 1: brake load test) required for the brake load test to the correct settings.
SL2026	4	2	Rotation axis/Tilt axis parameter setting error	001)The axis used for the <Tilt axis*> or <Rotation axis*> is set to another <Tilt axis*> or <Rotation axis*>.	001)Change the user parameters (rotation axis/tilt axis settings) <Tilt axis*> and <Rotation axis*> to the correct setting, and press the **[RST]** key.
				002)The machine parameter (system 2: additional axis) <Installation position> (5th- to 8th-axis) is different from the additional axis specified for the pair: <Tilt axis*> and <Rotation axis*>.	002)Change the user parameters (rotation axis/tilt axis settings) <Tilt axis*> and <Rotation axis*> to the correct setting, and press the **[RST]** key.
				003)The <Forward direction for the coordinate system on the tilt axis*> and <Forward direction for the coordinate system on the rotation axis*> are set on the same plane.	003)Change the user parameters (rotation axis/tilt axis settings) <Forward direction for the coordinate system on the tilt axis*> and <Forward direction for the coordinate system on the rotation axis*> to the correct setting, and press the **[RST]** key.
SL2027	4	2	User parameter setting error (quick table)	001)<1:At 1st tool change> is set to <Pallet 1 loading> or <Pallet 2 loading>. When an arm type ATC model is equipped with an option to extend the turning diameter and <Move to safe position when turning pallet> (machine parameter (system 1: common)) is set to <1: Type 2>, the parameter cannot be set to <1:At 1st tool change>.	001)Set <0: At operation start> for <Pallet 1 loading> or <Pallet 2 loading>, and then press the **[RST]** key.
SL2028	4	2	Machine param. setting error (SYS 3)	001)The wrong value has been set for <Return angle 1 for AT-axis> or <Return angle 2 for AT-axis>.	001)Set the machine parameters (system 3: common) to the correct values.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL2029	4	2	No field network parameter data	There is no data for the field network parameter.	Create field network parameter data or input the data from an external source.
SL4000	3	2	Mark not found	Delimiters in the data have been lost.	(a)Press the **[RST]** key. Delete the data, and then edit new data. (b)The NC PCB is faulty. Replace the NC PCB. (c)The CFast is faulty. Replace the CFast.
SL4001	3	2	Tool changed during operation	The tool data of the tool being used was changed.	Press the **[RST]** key, and then restart the program.
SL4002	3	2	Maintenance notice setting error	The setting for <Type> on the <Maintenance notice> screen is not within the range.	Check the setting on the screen, and set the type again.
SL4003	3	2	Required data not found	There is no specified data.	Check the program or data bank number.
SL4004	3	2	Not formatted.	An input/output, deletion or memory change command was issued for an unformatted memory card.	Press the **[RST]** key and then format the memory card.
SL4005	3	2	Tool automatic assignment error	001)When the automatic tool assignment was executed, the corresponding file could not be accessed or the corresponding tool was not found.	001)Start operation after checking the machining data, tool pattern, tap drill diameter, cutting conditions, and tool list, and correcting them if necessary.
				002)When the automatic tool assignment was executed, ? could not be calculated.	002)Start operation after checking the machining data and correcting them if necessary.
SL4006	3	2	The tool is different from the one used before.	While the user parameter (switch 1: conversation language) <Check tools used at automatic tool assignment> was set to <Yes>, an attempt was made to start operation with a tool assignment that was different from the previously used tool.	Assign a tool while checking the tool on Program edit - Operation preparation.
SL4007	3	2	Error of the kind of screw thread	001)A program whose thread type is different from the machine was attempted to be operated.	001)Check the setting of the machine parameter (system 1: common) <Change screw type> and operate using a program with a thread type that is appropriate for the machine.
				002)A program for old machine model was attempted to be operated without tool reallocation.	002)Operate after tool reassignment.
SL4008	3	2	The machining data is corrupted.	Destroyed machining data was attempted to be operated or edited	Delete the machining data.
SL4009	3	2	Tool allocation failed when operation started	At automatic tool assignment, -9998 assignment (to give priority to current tools) could not be performed.	(a)Start operation after checking the machining data, tool pattern, tap drill diameter, cutting conditions, and tool list, and correcting them if necessary. (b)Start operation after checking the machining data and correcting them if necessary.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL4010	3	2	W/o smooth path offset function	The <Smooth path offset function> (user parameter/high accuracy: common) is enabled, but the "Smooth path offset" option has not been purchased.	Disable <Smooth path offset function> (user parameter/high accuracy: common) or purchase the option.
SL4011	3	2	Backup memory saving error	Backup memory could not be saved due to its defectiveness.	(a)Restore the backup memory. (b)After clearing the backup memory, enter all data. (c)The NC PCB is faulty. Replace the NC PCB.
SL4012	3	2	PLC program could not be written.	001)An attempt was made to write the PLC program, input via the external input/output (data bank), while the PLC program was being written using the PLC programming software.	001)After the writing in PLC programming software is complete, press the **[RST]** key and write the PLC program.
				002)An attempt was made to write the PLC program, where there is a command that cannot be used in the current settings.	002)After confirming/modifying the command so it can be used in the PLC program, press the **[RST]** key and input the PLC program again.
				003)An attempt was made to write a PLC program that is corrupt.	003)Check the PLC program in the NC or the PLC program for external input.
				004)An attempt was made to write a PLC program that exceeds the amount of free space.	004)Check the PLC program in the NC or the PLC program for external input.
				005)An attempt was made to write a PLC program in which the power failure hold area and writing range are not correctly set.	005)Check the power failure hold area and writing range settings.
				006)An error occurred at conversion.	006)Check the PLC program.
SL4013	3	2	Press the **[RST]** key	Multiple alarms were triggered during the reset operation.	Press the **[RST]** key.
SL4014	3	2	No applicable sequence	(A)The sequence number which was specified in subprogram call/return command is not found. (B)The sequence number which was specified in macro command (GOTO) is not found. (C)The sequence number which was specified in program restart (sequence search) is not found.	Press the **[RST]** key, and the check the program.
SL4015	3	2	Memory overflow (Memory card)	Insufficient memory.	Press the **[RST]** key and then replace the memory card.
SL4016	3	2	External output file cannot be created	The maximum number of external output files already exists in the memory card/FTP server.	Press the **[RST]** key. Check the external output files in the memory card/FTP server.
SL4017	3	2	No machining load monitor data	There is no machining load monitor data.	Press the **[RST]** key.
SL4018	3	2	No G/M code macro data	There is no data for the G/M code macro.	Press the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL5000	2	3	Stop the specified function.	The user parameter (switch 1: common) <Specified function restriction> is set to <0: Disable>. Due to the 2038 problem, the following functions will no longer be available after January 19 , 2038. • Support application (production performance) • HTTP server function • HTTPS server function • OPC UA server function	Follow the procedure below. 1. Set the user parameter (switch 1: common) <Specified function restriction> to <1: Enable>. 2. Set the communication parameters (Ethernet/FTP) <HTTP server function>, <HTTPS server function> and <OPC UA server function> to <0: Disable>. 3. Turn the power off and then on again.
SL5500	2	2	Local CPU temperature error	Local CPU temperature exceeds 90 degrees for one minute.	Turn power off for thirty minutes before resuming operation.
SL5501	2	2	G code macro duplicate error	A G code number is duplicated and registered in the G/M code macro.	Check for and delete any G code numbers that are duplicated in the G code macro screen.
SL5502	2	2	M code macro duplicate error	An M code number is duplicated and registered in the G/M code macro.	Check for and delete any M code numbers that are duplicated in the M code macro screen.
SL7000	1	2	Memory overflow	Insufficient directory or data area	1.Decrease the program size when editing the program, or delete other programs to increase memory space, and then retry operation. 2.Press the **[RST]** key.
SL7001	1	2	Battery has expired. (Local)	Local of back up battery has expired.	(a)Set the current date in the user parameter (switch 1:System). (b)Check the battery and replace it.
SL7002	1	2	Machine data (SYSD89) input is invalid.	Machine parameters could not be entered.	Contact the nearest BROTHER approved service dealer.
SL7003	1	2	There is no machine data (SYSD89).	Machine data 11 (SYSD89) is not found.	Enter machine data 11 (SYSD89).
SL7004	1	2	Machine unit system switching error	Machine unit system switching was failed.	Check that the data bank has abnormal error.
SL7005	1	2	In special operation level	Special operation level is valid.	Contact the nearest BROTHER approved service dealer.
SL7006	1	2	Program restart error from saved position	The return height operation could not be carried out to the saved position due to the operation status information. Example when return height operation is not possible (A)Call level of the sub program was changed (B)Call number for the call source in the sub program was changed (C)Saved block can no longer execute because macro variable value was changed	1.Press the **[RST]** key. 2.Follow one of the procedures below. (a)Correct the program. (b)Specify the execution pointer, or restart the program that specifies the sequence number.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7007	1	2	ATC monitoring parameter has not been set	The automatic setting for the ATC monitoring parameter has not been executed. Or, the ATC monitoring setting is not correct.	1.Contact the nearest BROTHER approved service dealer and report the alarm conditions. 2.Set the following user parameters (switch 1:ATC/Magazine) <No tool detection function>, <Tool over key detection function> and <Tool missing detection function> to <0: Disable>.
SL7008	1	2	The 5-V DC power is overcurrent. (1) (NC)	An overcurrent occurred on the NC PCB.	Check the wiring and the XUSB1 connector on the NC PCB.
SL7009	1	2	The 5-V DC power is overcurrent. (2) (NC)	An overcurrent occurred on the NC PCB.	Check the wiring and the XUSB2, XUSB3 connector on the NC PCB.
SL7010	1	2	X-axis machine characteristics were not identified	The machine characteristics have not been changed from the initial default settings.	Execute the automatic identification operation for the machine characteristics.
SL7011	1	2	Y-axis machine characteristics were not identified	The machine characteristics have not been changed from the initial default settings.	Execute the automatic identification operation for the machine characteristics.
SL7012	1	2	Z-axis machine characteristics were not identified	The machine characteristics have not been changed from the initial default settings.	Execute the automatic identification operation for the machine characteristics.
SL7013	1	2	Time to change batteries	The battery voltage for maintaining the RTC (clock function) is low.	While the power switch is turned ON, replace all the batteries in the battery compartment (GB1) on the left side of the control box.
SL7014	1	2	CFast write frequency exceeded	The CFast write count has exceeded the prescribed value.	
SL7015	1	2	Stop the specified function.	The user parameter (switch 1: common) <Specified function restriction> is set to <0: Disable>. Due to the 2038 problem, the following functions will no longer be available after January 19 , 2038. • Support application (production performance) • HTTP server function • HTTPS server function • OPC UA server function	Press the **[RST]** key. Or, if the 4 functions listed in the cause field are not currently being used, then set the user parameter (switch 1: common) <Specified function restriction> to <1: Enable> and then turn the power OFF and ON. After January 1, 2038 if the user parameter (switch 1: common) <Specified function restriction> is set to <0: Disable>, then the stop level 2 alarm <<Stop the specified function.>> is triggered.
SL7016	1	2	Specified function restriction setting error	The communication parameters (Ethernet/FTP) <HTTP server function>, <HTTPS server function> and <OPC UA server function> are set to <1: Enable> while the user parameter (switch 1: common) <Specified function restriction> is set to <1: Enable>.	Set the communication parameters (Ethernet/FTP) <HTTP server function>, < HTTPS server function> and <OPC UA server function> to <0: Disable>, and then press the **[RST]** key.
SL7500	1	1	Input data error	Data set was not within the specified range.	Set data within the range.
SL7501	1	1	No copy source data	There is no program or data bank to be copied.	Check the program or data bank number.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7502	1	1	Data is write-protected.	001)An attempt was made to change data while the **[DATA PROTECTION]** switch was enabled.	001)Set the **[DATA PROTECTION]** switch to disable and change the data.
				002)An attempt was made to edit the PLC program while the user parameter (switch 1: system) <PLC program protection> is set to <1:Valid>.	002)Set the user parameter (switch 1: system) <PLC program protection> to <0:Invalid>, and then edit the PLC program.
SL7503	1	1	Too many characters	(A)The number of characters in one block exceeds 127. (B)The total number of characters in the MDI program exceeded 255 for MDI operation.	Reduce the number of characters.
SL7504	1	1	Running program	Editing or deleting a file used for the program currently running was attempted.	Edit or delete the program after operation is completed.
SL7505	1	1	Check error	A check error occurred during input in check mode via communication.	
SL7506	1	1	Editing area exceeded	Contents being edited have exceeded the edit area (40M byte).	If this error occurs during editing, split the program. If this error occurs at the start of editing, the program is too large and cannot be edited.
SL7507	1	1	This tool is already registered.	(A)The tool set for **[ATC tool]** is already registered for another pot. (B)The tool set in the tool group is already registered for another pot.	Delete the registered tool, and then set the desired tool.
SL7508	1	1	Too many tools registered	Registering more than 30 tools in one tool group was attempted.	Up to 30 tools can be registered in one group.
SL7509	1	1	Tool is registered to next pot.	Setting a large tool was attempted although a tool is registered to the adjacent pot.	Delete the tool registered to the adjacent pot, or register the large tool to another pot.
SL7510	1	1	Deletion position error	Deleting data was attempted at a position where is deletion not possible.	Move the cursor to a position where deletion is possible, and then delete the data.
SL7511	1	1	Prog. edit prohibit signal on	Changing data was attempted although the program edit prohibit signal was on.	Turn the signal off, and then change the data.
SL7512	1	1	Edit prohibit signal on	Changing data was attempted although the edit prohibit signal was on.	Turn the signal off, and then change the data.
SL7513	1	1	Set position error	The data was set to a position where data setting is not possible.	The data cannot be set for that position.
SL7514	1	1	No subprogram	The sub program is not set although it is necessary for the program to be run.	Set the sub program, or delete the sub program call job.
SL7515	1	1	No tools assigned	Tool assignment has not been completed.	Assign the tools.
SL7516	1	1	Machining sequence setting error	Machining sequence is not 1 to 5, or it is not set.	Set the machining sequence correctly.
SL7517	1	1	No program	There is no program to be run.	Check the program number.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7518	1	1	Too many digits	Data set exceeds the limit for the number of digits.	Set the data within the limit for the number of digits.
SL7519	1	1	Has a minus sign	Negative data was set where not permitted.	Set positive data.
SL7520	1	1	Copy import position error	Copy import was attempted at an incorrect position.	Move the cursor to the correct position (job position), and perform copy import.
SL7521	1	1	No search data	There is no data to be searched for.	Check the data.
SL7522	1	1	Too many jobs	Creating a 100th job was attempted.	Create the program using up to 99 jobs.
SL7523	1	1	Specified subprogram exists.	The sub program you are trying to create already exists.	Create the sub program using another number, or delete the sub program from the current number and use this number to create the sub program.
SL7524	1	1	Change position error	Changing data was attempted at a position changing is not possible.	Move the cursor to the correct position, and then change the data.
SL7525	1	1	Cannot delete during insertion	Deleting a program was attempted during insertion.	Press the **[INS]** key again to stop insertion, or delete the program after insertion is completed.
SL7526	1	1	Insertion position error	Inserting a program was attempted at a position insertion is not possible.	Move the cursor to the correct position, and then insert the program.
SL7527	1	1	Cursor movement position error	The cursor was moved to a different position during program insertion.	Insert all data, and then move the cursor.
SL7528	1	1	Copy insertion position error	Copy insertion was attempted at a position insertion is not possible.	Move the cursor to the correct position, and then copy and insert the data.
SL7529	1	1	Too many operations	A 100th operation was created when editing the operation program.	Create the program using up to 99 operations.
SL7530	1	1	Too many lines	A 100th line was created when editing a contouring or chamfering job.	Create the program using up to 99 lines.
SL7531	1	1	Workpiece zero set position error	Setting the workpiece zero point was attempted at the incorrect position.	Move the cursor to the X position of the workpiece zero point, and then set the zero point.
SL7532	1	1	Cannot search during insertion	Searching was tried during insertion.	Press the **[INS]** key again to stop insertion, or start searching after insertion is completed.
SL7533	1	1	Too many schedules	More than 99 programs were set for a schedule program.	Create the schedule program using up to 99 programs.
SL7534	1	1	Copy not imported	Copy was not imported although copy insertion was attempted.	Import the data to be copied.
SL7535	1	1	Too many workpieces	More than 99 workpieces were inserted.	Create the program using up to 99 workpieces.
SL7536	1	1	No tool in tool list	A tool that is not registered in the tool list was set to the magazine.	Register the tool in the tool list.
SL7537	1	1	Too many points	The number of point random drilling holes has exceeded 12.	The number of drilling holes should be within 12.
SL7538	1	1	Data error (program)	A program with a different unit system was set during editing or editing in operation.	Set the program with the same unit system.
SL7539	1	1	Wrong tool length	The tool length becomes 0 or less when automatically setting the tool length.	Check the user parameter (switch 1: Data) <Automatic tool length compensation>.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7540	1	1	No tool list data	There is no tool list data.	Set the tool list.
SL7541	1	1	No tool pattern data	There is no tool pattern data.	Set the tool pattern.
SL7542	1	1	No tapping drill diameter data	There is no tap drill diameter data.	Set the tap drill diameter.
SL7543	1	1	No cutting condition data	There is no cutting condition data.	Set the cutting condition.
SL7544	1	1	Workpiece material setting error	Workpiece material is not set.	Set the workpiece material.
SL7545	1	1	Required tool not found	There is no tool that corresponds to the desired machining when assigning tools.	Check the machining data, tool pattern, tap drill diameter, cutting conditions, and tool list, and correct them if necessary.
SL7546	1	1	Too many tools	The number of assigned tools has exceeded the magazine capacity.	Change the program so that the number of assigned tools is within the magazine capacity.
SL7547	1	1	No job	The program does not contain jobs.	Check the machining data.
SL7548	1	1	No data in tool list	There is no tool data specified in the tool list.	Set data for the tool number specified in the tool list.
SL7549	1	1	Tool type error	The specified tool is not appropriate for machining.	Set the appropriate tool.
SL7550	1	1	Tap size error	(A)The denominator of the inch screw is zero (0). (B)A tapping call type has been set that cannot be used.	Set the tap size correctly.
SL7551	1	1	There are jobs without tools.	There are jobs with tools not set for the tool pattern when assigning tools.	Set the tool to the tool pattern, and then assign the tools.
SL7552	1	1	Illegal tool pattern	Tools required for machining are not set in the tool pattern when assigning tools.	Check the tool pattern, and correct it.
SL7553	1	1	? cannot be calculated.	Question mark cannot be calculated.	Correct the machining data.
SL7554	1	1	Depth too shallow	The tip of the tool contacts the bottom of the hole when the tool stops after drilling the center hole or chamfering.	Check the machining data and tool list, and correct them if necessary.
SL7555	1	1	Counter boring depth too shallow	The tool contacts the counter boring face when chamfering.	Check the machining data and tool list, and correct them if necessary.
SL7556	1	1	Wrong workpiece height	The maximum tool infeed depth calculated from the workpiece height is lower than the table surface.	Check the machining data and tool list, and correct them if necessary.
SL7557	1	1	Minor diameter too small	The minor diameter of the tool is too small for the machining data.	Check the machining data and tool list, and correct them if necessary.
SL7558	1	1	No tool length setting	The tool length is not set or is zero.	Check the machining data, tool list, tool pattern, cutting conditions, etc., and correct them if necessary.
SL7559	1	1	No tool life setting	The assigned tool is expired.	
SL7560	1	1	Tool too long	The tool length is too long.	
SL7561	1	1	Minor diameter too large	The minor diameter is too large.	
SL7562	1	1	Wrong minor diameter	The minor diameter is not correct.	
SL7563	1	1	Minor diameter length too long	The minor diameter length is too long.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7564	1	1	Wrong minor diameter length	The minor diameter length is not correct.	
SL7565	1	1	Minor diameter length too short	The minor diameter length is too short.	
SL7566	1	1	Tool length too short	The tool cannot reach the infeed depth.	
SL7567	1	1	Tool diameter too small	The tool diameter is too small.	
SL7568	1	1	Wrong tool diameter	The tool diameter is not correct.	
SL7569	1	1	Wrong center angle	The center angle is not correct.	
SL7570	1	1	Wrong chamfer angle	The chamfer angle is not correct.	
SL7571	1	1	Length of teeth too short	The length of teeth is too short.	
SL7572	1	1	Wrong torsion direction	The tap torsion direction is not correct.	
SL7573	1	1	Wrong thread type	The tap type is not correct.	
SL7574	1	1	Wrong thread size	The tap size is not correct.	
SL7575	1	1	Wrong pitches or threads	The tap pitch or thread is not correct.	Check the machining data, tool list, tool pattern, cutting conditions, etc., and correct them if necessary.
SL7576	1	1	Drilling depth not enough	The drilling depth is not deep enough.	Check the machining data, tool list, tool pattern, cutting conditions, etc., and correct them if necessary.
SL7577	1	1	No tool number	Tool check was attempted with the cursor placed in a section where the tool number is not entered.	Enter the tool number or move the cursor to a section where the tool number is entered.
SL7578	1	1	Tool diameter too large	The tool diameter is too large.	Check the machining data, tool list, tool pattern, cutting conditions, etc., and correct them if necessary.
SL7579	1	1	Pocket milling not performed	Chamfering was attempted before pocket milling. (Corner rounding cutter is at the top of the program.)	
SL7580	1	1	Interfered (side)	The tool contacts the side of the workpiece when chamfering.	
SL7581	1	1	Interfered (bottom)	The tool contacts the bottom of the workpiece when chamfering.	
SL7582	1	1	Eye hole tool is attached.	This tool cannot be used for a blind hole.	Check the machining data, tool list, tool pattern, cutting conditions, etc., and correct them if necessary.
SL7583	1	1	Tool not matching cutting cond.	The tool set for tool assignment differs from the tool set for the cutting condition.	
SL7584	1	1	Corner R too large	Corner R is larger than half the shorter axis of X or Y in the pocket milling square pattern.	
SL7585	1	1	Approach radius too small	The approach radius (in program) is less than the tool radius in the chamfering job.	Check the program.
SL7586	1	1	Wrong machine unit system	A program with a different unit system was set during editing or editing in operation.	Set the program with the same unit system.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7587	1	1	No threading function	Helical thread cutting was attempted although the machine is not equipped with this option.	Purchase the option.
SL7588	1	1	No subprogram (*)	001) The specified sub program does not exist in the specified folder for the user parameter (switch 1: programming) settings <Sub program folder selection *> and <Sub program folder designation *>.	001) Check the program.
				002) The folder specified in the user parameter (switch 1: programming) <Sub program folder designation *> does not exist.	002) Check the user parameter (switch 1: programming) <Sub program folder designation *>.
SL7589	1	1	Subprogram number error	001)The sub program number is not written correctly in the program.	001)Check the sub program name in the program.
				002)There is no command for the sub program name or sequence number.	002)Check the sub program name or the sequence number in the program.
SL7590	1	1	Tool number not set	Setting the group number was attempted although the tool number is not set on the <ATC tool> screen.	Set the tool number and then set the group number.
SL7591	1	1	Memory overflow	(A)All data areas or directories are in use. (B)There is insufficient memory for the firmware version update.	Decrease the program size when editing the program, or delete other programs or data banks and waveform data to increase memory space, and then retry operation.
SL7592	1	1	No tool registered in group	The tool is not registered to the tool group specified in the program.	Check the tool group setting.
SL7593	1	1	No recovery instruction data	There is no recovery instruction data provided for the specified alarm.	
SL7594	1	1	Program is write-protected.	Programs from 8000 to 8999 are write-protected.	Release the write-protection.
SL7595	1	1	Cannot be copied.	Copying the data to the current data bank was attempted.	Copy the data to a number other than the number of the current data bank.
SL7596	1	1	No item selected.	The program or data bank number is not selected.	Set the program and data bank number before performing the operation.
SL7597	1	1	NC data being accessed by different operation	Input was attempted although there is an item selected on the NC side.	Unselect the item before input.
SL7598	1	1	Connected device data being accessed by different operation	Output was attempted although there is an item selected on the output destination side.	Unselect the item before output.
SL7599	1	1	Cannot be deleted.	The old data bank file cannot be deleted.	
SL7600	1	1	Not formatted.	An input/output, deletion or memory change command was issued for an unformatted memory card.	Format the memory card.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7601	1	1	Invalidate checksum.	**[1: On]** is set for **[Checksum]** (communication parameter) when a multiple-program file is input.	Set **[0: Off]** for **[Checksum]**.
SL7602	1	1	This program cannot be converted.	The selected program cannot be converted by G-code conversion.	
SL7603	1	1	Workpiece quantity setting error	The number of workpieces is not set when assigning tools.	Set the number of workpieces.
SL7604	1	1	No step data	Zero (0) is set for the step condition (one of the cutting conditions) or it is not set when converting a conversation program to an NC program.	Set the cutting condition correctly.
SL7605	1	1	? not calculated	Question mark calculation is not completed when converting a conversation program to an NC program.	Check that the line data is set correctly, and then assign the tools.
SL7606	1	1	No B-axis option	001)Running the B-axis program was attempted when converting a conversation program to an NC program, although the machine is not equipped with the B-axis option.	
				002)Automatic B-axis setting was attempted at the workpiece coordinate zero point although the machine is not equipped with the B-axis option.	
SL7607	1	1	Next tool in magazine not available	The next tool is not set to the magazine when converting a conversation program to an NC program.	Set the next tool to the magazine.
SL7608	1	1	Wrong data type	Running a different type of program was attempted when converting a conversation program to an NC program.	Check the program.
SL7609	1	1	No tool in spindle	The tool is not attached to the spindle when converting a conversation program to an NC program.	Set the correct tool to the spindle.
SL7610	1	1	Specified G code not found	The specified G-code is not found when converting a conversation program to an NC program.	Check the program.
SL7611	1	1	Mark not found	Delimiters in the data have been lost when converting a conversation program to an NC program.	Delete the data, and create the data again.
SL7612	1	1	Program too large	Machining data size is larger than the buffer capacity when converting a conversation program to an NC program.	Split the machining program. Split programs can be run sequentially using the schedule program function.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7613	1	1	No A-axis option	001)Running an A-axis program was attempted when converting a conversation program to an NC program, although the machine is not equipped with the A-axis option.	
				002)Automatic A-axis setting was attempted at the workpiece coordinate zero point although the machine is not equipped with the A-axis option.	
SL7614	1	1	0 holes (*)	When converting a conversation program to an NC program, "0" was specified for the hole pattern. The figure in brackets ( ) is the job number.	Set the number of holes.
SL7615	1	1	Tap size error (*)	When converting a conversation program to an NC program, the denominator of the inch screw is zero (0). The figure in brackets ( ) is the job number.	Set the tap size correctly.
SL7616	1	1	0 divisions (*)	When converting a conversation program to an NC program, "0" was specified for pattern divisions. The figure in brackets ( ) is the job number.	Set the number of divisions correctly.
SL7617	1	1	Cutter compensation error (*)	When converting a conversation program to an NC program, the arc command is used to start or cancel cutter compensation. The figure in brackets ( ) is the job number.	Use the linear command start or cancel cutter compensation.
SL7618	1	1	No pitch data (*)	When converting a conversation program to an NC program, zero (0) is set for the tapping pitch data in the tool list or it is not set. The figure in brackets ( ) is the job number.	Set the pitch data.
SL7619	1	1	Spindle speed not specified (*)	When converting a conversation program to an NC program, <Peripheral speed> (cutting condition) is not set or the value is too small. The figure in brackets ( ) is the job number.	Set the cutting condition correctly.
SL7620	1	1	Feedrate not specified (*)	When converting a conversation program to an NC program, <Feed> (cutting condition) is not set or the value is too small. The figure in brackets ( ) is the job number.	Set the cutting condition correctly.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7621	1	1	Position cannot be calculated (*)	When converting a conversation program to an NC program, the specified value exceeds +-9999.999. The figure in brackets ( ) is the job number.	Check the program.
SL7622	1	1	Too many lines (*)	When converting a conversation program to an NC program, the number of lines exceeds 99. ("0" is set for <Cutting width> or the value is too small, or the tool diameter is too small). The figure in brackets ( ) is the job number.	Set <Cutting width> and <Tool dia.> correctly.
SL7623	1	1	Too many infeeds (*)	When converting a conversation program to an NC program, the infeed setting is too small. (99 is the maximum). The figure in brackets ( ) is the job number.	Set <Infeed> correctly.
SL7624	1	1	Corner cannot be calculated (*)	When converting a conversation program to an NC program, corner R or corner C for contouring or chamfering cannot be calculated. The figure in brackets ( ) is the job number.	Correct the corner R or C section where the alarm occurred.
SL7625	1	1	Calculation error (*)	When converting a conversation program to an NC program, (A)The additional axis feed rate could not be calculated. (B)The machining path could not be calculated. (C)The tool data could not be calculated for tool assignment. The figure in brackets ( ) is the job number.	(A)Check the program, and set the correct data. (B)Check the program, and set the correct data. (C)Check the tool list, and set the correct data.
SL7626	1	1	Pocket milling not possible (*)	When converting a conversation program to an NC program, the size of the pocket is not correct. (A)The tool diameter is larger than the pattern diameter for circle patterns. (B)The tool diameter is larger than the shorter stroke of X or Y for square patterns. (C)The tool radius is larger than the corner R for square patterns. (Excluding when corner R = 0). (D)The tool diameter is larger than the track width for track patterns. The figure in brackets ( ) is the job number.	Use a tool whose diameter is smaller than the pot diameter.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7627	1	1	Chamfering not possible (*)	When converting a conversation program to an NC program, there is a chamfering function at the top of the pocket milling job. The figure in brackets ( ) is the job number.	Assign the functions so that chamfering comes after milling.
SL7628	1	1	ATC not possible (*)	When converting a conversation program to an NC program, there is a tool change code in a miscellaneous function before or after cutting, or in a miscellaneous function in the motion call job. The figure in brackets ( ) is the job number.	Delete the tool change code.
SL7629	1	1	Too many holes (*)	When converting a conversation program to an NC program, the number of holes in the pattern exceeds 999. The figure in brackets ( ) is the job number.	Set the number of holes again.
SL7630	1	1	Spindle speed exceeded (*)	When a conversation program was converted to an NC program, the specified rotation speed exceeded the machine parameter (system 1: common) <Max. spindle speed>. The figure in brackets ( ) is the job number.	Check the program.
SL7631	1	1	Feedrate exceeded (*)	When a conversation program was converted to an NC program, the feedrate exceeded the machine parameter (system 1: X-, Y- and Z-axes) <Maximum cutting travel speed> or <Rapid feedrate>. The figure in brackets ( ) is the job number.	Set the correct data.
SL7632	1	1	Cutter compensation too large (*)	When converting a conversation program to an NC program, the program radius is smaller than the cutter compensation when cutting the inner arc. The figure in brackets ( ) is the job number.	Set the program radius to be larger than the cutter compensation.
SL7633	1	1	Invalid approach specified (*)	When converting a conversation program to an NC program, <Center> is set for the cutter compensation method of line or arc approach. The figure in brackets ( ) is the job number.	Correct the approach method.
SL7634	1	1	Invalid release specified (*)	When converting a conversation program to an NC program, <Center> is set for the cutter compensation method of line or arc release. The figure in brackets ( ) is the job number.	Correct the release method.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7635	1	1	No cutting length (*)	When converting a conversation program to an NC program, there is no cutting length for the approach or release line. The figure in brackets ( ) is the job number.	Correct the program.
SL7636	1	1	Not a valid B-axis program (*)	When converting a conversation program to an NC program, a B-axis command was used in a program that does not contain a B-axis. The figure in brackets ( ) is the job number.	Change the program.
SL7637	1	1	No axis specified (*)	When converting a conversation program to an NC program, the axis data is not set. The figure in brackets ( ) is the job number.	Set the axis data and then use the travel command.
SL7638	1	1	Invalid axis specified (*)	When converting a conversation program to an NC program, simultaneous 3-axes cutting was attempted using an axes other than X, Y, and Z, or simultaneous 4- or more axes cutting was attempted. The figure in brackets ( ) is the job number.	Simultaneous 3-axes cutting is not possible when an additional axis is included.
SL7639	1	1	B-axis radius not specified (*)	When converting a conversation program to an NC program, the radius is not set for cutting using the B-axis. The figure in brackets ( ) is the job number.	Specify the radius.
SL7640	1	1	No ATC return height (*)	When converting a conversation program to an NC program, the ATC return height is not registered in the program. The figure in brackets ( ) is the job number.	Set the ATC return height.
SL7641	1	1	B-axis command range exceeded (*)	When converting a conversation program to an NC program, the specified travel range of the B-axis was not within 0 ~ 359.999. The figure in brackets ( ) is the job number.	Check the program.
SL7642	1	1	Thread cutting speed error (*)	When converting a conversation program to an NC program, the Z-axis speed could not be calculated from the XY-axes feed rate and radius for helical thread cutting. The figure in brackets ( ) is the job number.	Check the end point, center, and feed rate for thread cutting.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7643	1	1	No thread cutting function (*)	When converting a conversation program to an NC program, helical thread cutting was attempted although the machine is not equipped with this option. The figure in brackets ( ) is the job number.	Purchase the option.
SL7644	1	1	Tool breakage detection pos. error (*)	When converting a conversation program to an NC program, tool breakage detection was attempted at a position below the return height. The figure in brackets ( ) is the job number.	Check <Tool breakage detection return position> (user parameter (tool breakage detection)) or lower the setting for <Return height (job change)> and <Return H (coord. change)>.
SL7645	1	1	Rotational transformation not possible (*)	When converting a conversation program to an NC program, the XY positions after rotational transformation cannot be calculated because the X- or Y-axis machining coordinate positions are not determined. The figure in brackets ( ) is the job number.	Correct the program, and retry operation. (Set both XY travel positions in the first motion call job in the program.)
SL7646	1	1	A-axis radius not specified (*)	When converting a conversation program to an NC program, the radius is not set for cutting using the A-axis.	Specify the radius.
SL7647	1	1	A-axis command range exceeded (*)	When converting a conversation program to an NC program, the specified travel range of the A-axis was not within 0 ~ 359.999. The figure in brackets ( ) is the job number.	Check the program.
SL7648	1	1	Not a valid A-axis program (*)	When converting a conversation program to an NC program, an A-axis command was used in a program that does not contain an A-axis. The figure in brackets ( ) is the job number.	Change the program.
SL7649	1	1	Cannot measure in incremental mode (*)	When converting a conversation program to an NC program, automatic workpiece measurement was attempted in incremental mode. The figure in brackets ( ) is the job number.	Change to absolute mode, and then perform automatic workpiece measurement.
SL7650	1	1	Cannot measure during RT (*)	When converting a conversation program to an NC program, automatic workpiece measurement was attempted in rotational transformation mode. The figure in brackets ( ) is the job number.	Cancel rotational transformation, and then perform automatic workpiece measurement.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7651	1	1	Cannot measure in cutter comp. mode (*)	When converting a conversation program to an NC program, automatic workpiece measurement was attempted in cutter compensation mode. The figure in brackets ( ) is the job number.	Cancel cutter compensation, and then perform automatic workpiece measurement.
SL7652	1	1	Tool type error (*)	When converting a conversation program to an NC program, the specified tool is not appropriate for machining. The figure in brackets ( ) is the job number.	Set the tool appropriate for machining.
SL7653	1	1	No tool length setting (*)	When converting a conversation program to an NC program, the tool length is not set or is zero. The figure in brackets ( ) is the tool number.	Check the machining data, tool list, tool pattern, cutting conditions, etc., and correct them if necessary.
SL7654	1	1	Outside diameter of drill not set (*)	When converting a conversation program to an NC program, the outer diameter of the drill to be used or the minor diameter of drills are not set in the tool list or are zero. The figure in brackets ( ) is the tool number.	Set the drill outer diameter in the tool list.
SL7655	1	1	Left- or right-hand thread? (*)	When converting a conversation program to an NC program, the torsion direction for tapping is not set in the tool list. The figure in brackets ( ) is the tool number.	Set the torsion direction.
SL7656	1	1	Tool life end (*)	When converting a conversation program to an NC program, the life of the current tool or the tool being replaced has expired. The figure in brackets ( ) is the tool number.	Change the tool, and set the tool life.
SL7657	1	1	No tool in tool list (*)	When converting a conversation program to an NC program, the tool used for machining is not registered in the tool list. The figure in brackets ( ) is the tool number.	Set the tool in the tool list.
SL7658	1	1	There are jobs without tools.(*)	When converting a conversation program to an NC program, and when assigning tools, there are jobs where there is no tool set for the tool pattern. The figure in brackets ( ) is the job number.	Set the tool for the tool pattern, and then assign tools.
SL7659	1	1	Conversation/NC conversion error	001) An error occurred when calculating the additional axis speed.	001)Check the program.
				002)Calculating the additional axis speed is not possible because the position of the additional axis is not determined.	002)Perform positioning to determine the position.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				003)An error occurred when opening, reading, or writing the file.	003)Contact the nearest BROTHER approved service dealer.
				004)An error occurred while opening, reading or writing the data from or to the temporary file. ThThe number of files has exceeded the limit (1024 files) because temporary files were created.	004)Delete other programs to increase free space, and then retry operation.
				005)Measurement number was used although measurement operation was not performed.	005)Include a measurement motion in the program before using the measurement number.
				006)Memory is insufficient.	006)Reduce the size of the program you are editing and then quit the program or delete other programs to increase free space and then retry operation.
				007) A motion where the position cannot be determined was used, meaning the data cannot be converted correctly. This error mainly occurs when tapping or drilling after zero point return because the return point is not fixed.	007)Insert a positioning operation between the zero machine return operation and the tapping operation, and set the position.
SL7660	1	1	Same number already specified	Input/output was attempted by specifying the program from the list as well by the program number.	Deselect one before operation.
SL7661	1	1	<No> is set for <Parameter change>	Operation is not possible when <0: Write-protected> is set for <Parameter change>.	Set <1: Writable> for <Parameter change> on I/O screen.
SL7662	1	1	Extended memory operation mode	Editing a file related to the program running in extended memory operation mode was attempted.	Complete operation before editing.
SL7663	1	1	Too many subprograms	The number of sub programs to be called exceeds the limit.	Reduce the number of sub programs.
SL7664	1	1	No C-axis option	Automatic C-axis setting was attempted at the workpiece coordinate zero point although the machine is not equipped with the B-axis option.	
SL7665	1	1	Start position cannot be set	The start point is not within the setting range.	Check the program.
SL7666	1	1	Memory operation data not created	Memory operation data is not created.	Assign tools.
SL7667	1	1	No schedule program	The specified schedule program does not exist.	Check the schedule program number.
SL7668	1	1	Spindle speed not specified	The spindle speed is not set although a rotation command is used in MDI mode.	Set the spindle speed, and then use the rotation command.
SL7669	1	1	No axis specified	The axis data is not set although a travel command is used in MDI mode.	Set the axis data, and then use the travel command.
SL7670	1	1	A-axis command range exceeded	The A-axis angle setting is not correct.	Check the program.
SL7671	1	1	B-axis command range exceeded	The B-axis angle setting is not correct.	Check the program.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7672	1	1	Invalid axis command	Simultaneous 3-axes cutting was attempted using axes other than X, Y, and Z, or simultaneous 4- or more axes cutting was attempted.	Simultaneous 3-axes cutting is not possible when an additional axis is included.
SL7673	1	1	Feedrate not specified	The feed rate is not specified although a cutting command is used in MDI mode.	Set the feed rate, and then use the cutting command.
SL7674	1	1	Radius not set for A-ax cutting	The radius is not specified when cutting using the A-axis.	Specify the radius.
SL7675	1	1	Radius not set for B-ax cutting	The radius is not specified when cutting using the B-axis.	Specify the radius.
SL7676	1	1	Z-axis not specified for tapping	Tapping command was used without setting the Z-axis data in MDI mode.	Set the Z-axis.
SL7677	1	1	XYAB-axes specified for tapping	Tapping was applied by setting the X, Y, A, and B axes in MDI mode.	The X, Y, A, and B axes cannot be used for tapping.
SL7678	1	1	Feed not specified	The feed type is not set in MDI mode.	Set the feed type.
SL7679	1	1	PLC program is write-protected	An attempt was made to input the PLC program via the external input/output (data bank) while the user parameter (switch 1: system) <PLC program protection> is set to <1:Valid>.	Set the user parameter (switch 1: system) <PLC program protection> to <0:Invalid>.
SL7680	1	1	Specified M code cannot be used. (*)	An M code that cannot be used (next tool preparation) was found when conversation program machining data was converted to G-code. The figure in brackets ( ) indicates the process number.	Check the program.
SL7681	1	1	Cannot move to ATC pos. during diameter compensation(*)	The tool change position of the X or Y axis is set in the program currently running in compensation mode. (The tool change position is set on the operation preparation screen.) The figure in brackets ( ) is the process number.	Cancel diameter compensation.
SL7682	1	1	Cannot move to ATC pos. during rotational transformation(*)	This error occurs when converting a conversation program to an NC program. The tool change position of the X or Y axis is set in the program currently running in rotational transformation mode. (The tool change position is set on the operation preparation screen.) The figure in brackets ( ) is the process number.	Cancel rotational transformation.
SL7683	1	1	There are miscellaneous func. that cannot be converted(*)	There are miscellaneous functions (M1, M2, M6, M98, M99) that cannot be converted when converting a conversation program to an NC program. The figure in brackets ( ) is the process number.	Delete the miscellaneous functions causing the error.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7684	1	1	There is no tool for initializing tool life	Although initializing the tool life has been executed on the ATC tool screen, there are no expired tools.	
SL7685	1	1	Cannot be initialized	Although initializing the tool life has been attempted on the ATC tool screen, it cannot be initialized because the initial life has not been set. (This error occurs only when <0:Type 1> is set for <Tool life counting method> in user parameter(switch 1: Data).)	Set the tool life on the tool list.
SL7686	1	1	Addition not possible	Addition was attempted for the value displayed as <**********> on the macro variables screen.	
SL7687	1	1	Log data writing error (*)	001)Output of alarm history detail file was failed.	001)Contact the nearest BROTHER approved service dealer.
				002)The operation log file failed to output.	002)Contact the nearest BROTHER approved service dealer.
SL7688	1	1	Alarm history detail data reading error	Reading of alarm history detail file was failed.	Contact the nearest BROTHER approved service dealer.
SL7689	1	1	There is no alarm history detail data.	(A)The alarm history details have been omitted and were not recorded due to the large quantity of alarms that occurred simulatneously. (B)No file exists with a detailed description for the alarm that has been selected.	(a)Refer to the detailed description of another alarm that occurred almost at the same time. (b)Report the conditions when the error or alarm occurred.
SL7690	1	1	The alarm history detail data is corrupted.	Alarm history detail file to be read is destroyed.	Contact the nearest BROTHER approved service dealer.
SL7691	1	1	Alarm history detail access error	001)A file was attempted to be output with the same name as that of an existing alarm history detail file.	001)Contact the nearest BROTHER approved service dealer.
SL7692	1	1	This is an unusable folder name.	Unusable or existing folder name was specified when a folder was created.	Specify a valid folder name. The following folder names cannot be used. - Other than usable characters (alphameric characters and period) - A period is used for the first or last character, or consecutive periods exist. - Only numeric characters are used. - 0 program name - Conversation program name - Extension is ".NC", ".TC", ".LDR", ".CMT", or ".BPP".
SL7693	1	1	T-code area error	T command is out of the designated range.	Check T commands in the program.
SL7694	1	1	No folder can be made.	001)A folder was attempted to be created in a folder.	
				002)A backup folder could not be created during upgrade operation.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7695	1	1	The same program cannot be copied.		
SL7696	1	1	The same program cannot be checked.		
SL7697	1	1	Transfer to the same folder is unavailable.		
SL7698	1	1	Copy to and check of same folder not available.		
SL7699	1	1	A program is already existing.		
SL7700	1	1	This is a program number of different type.	The specified program number exists in another unit system.	Specify another program number, or delete a program with the same number which exists in another unit system.
SL7701	1	1	Edit cancelled due to error of a comment sentence.	The comment sentence of a program being edited could not be saved because it was not correct. (A)Mode switching from program edit mode was performed. (B)Mode switching was performed while a program which was not being operated was edited in edit during operation mode. (C)Mode switching was performed while a program which was being operated was edited in edit during operation mode with <Save when mode of current program is changed> (user parameter(switch 1: Data)) set to <1:Overwrite save>.	
SL7702	1	1	Automatic setting items lack.	<Cutter compensation>, <Peripheral speed (m/min)>, and <Feed per rotation (mm/rotation)> are not set correctly.	Set correct data.
SL7703	1	1	Automatic setting calculation is unable.	The sum of <Cutter compensation> and <Cutter wear offset> is 0 or less.	Set correct data.
SL7704	1	1	Communication parameter setting error	001)<Sending data code> is <EIA> and <Character length> is <7 bits>.	001)Set correct data.
				002)The same value is set to <Port No.> and <PLC port number>.	002)Set correct data.
				003)The same value is set to <IP address> and <DNS server address 1>/<DNS server address 2>.	003)Set correct data.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7705	1	1	Program folder error	A program was set which was not from the folder that is linked to <Pallet program folder> (user parameter/quick table) when the pallet selection was not turned "OFF" while in memory operation mode.	Check <Pallet program folder> (user parameter/quick table).
SL7706	1	1	This is a folder name that cannot be input.	A folder with an unusable name was attempted to be entered.	Change the folder name of the connected device to the one that can be entered, or select a folder that can be entered.
SL7707	1	1	No folder can enter the current folder position.	When the current folder position was not the root, a folder was attempted to be entered.	A folder cannot be entered in a folder. Set the current folder position on NC side as the root.
SL7708	1	1	There was a subfolder unable to input.	A folder including a subfolder was attempted to be entered.	The subfolder was not entered. Move the current folder on the connected device side and reenter the subfolder.
SL7709	1	1	Interrupted program number error	001) P address was not specified in the M96 command.	001) Check the P address in the M96 command.
				002) A value outside of the range was specified for the P address in the M96 command.	002) Check the P address in the M96 command.
SL7710	1	1	Zero return not performed	Coordinate value setting was attempted using automatic setting when dog type machine zero return was not completed.	Perform machine zero return in manual operation mode.
SL7711	1	1	No tool in magazine	A tool required for operation is not set in the magazine.	Set the tool on the <ATC tool> screen correctly.
SL7712	1	1	No measurement data	Automatic setting (parameter) was attempted although there is no measurement data.	Perform measurement using the automatic centering function.
SL7713	1	1	No auto thermal compen. func.	Opening the compensation data screen was attempted although the machine is not equipped with the automatic thermal compensation function.	
SL7714	1	1	Tape operation mode	Master station communication was attempted during tape operation.	Perform communication after tape operation is completed.
SL7715	1	1	No Z-axis measurement function	This machine is not equipped with Z-axis measurement function.	This machine is not equipped with this function.
SL7716	1	1	Not all items are set	All items required to determine the display position for drawing are not entered.	Set all items.
SL7717	1	1	Check the tool in the spindle.	Already NC tool was set for spindle when setting machining start point for Z axis in conversation mode.	Set to spindle for conversation tool or eliminate the tool of the spindle.
SL7718	1	1	Scheduled program running	Schedule program change was attempted during schedule program operation.	Change the program after schedule program or stop it.
SL7719	1	1	Program number error	The specified program number cannot be set.	Set the correct program number.
SL7720	1	1	No program (*)	The specified program does not exist. The figure in brackets ( ) is the specified program number.	Check the program number.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7721	1	1	Invalid pot	An invalid pot was specified when performing ATC.	Only "Cap" can be set for the invalid pot.
SL7722	1	1	Different from pallet program	A program different from the one set for the user parameter (quick table) was run in memory operation mode.	Check the user parameter (quick table) <Pallet 1/2 program>.
SL7723	1	1	This is a folder name that cannot be checked.	Check was not performed because the folder name was unusable.	Change the folder name of the connected device to the one that can be checked, or select a folder that can be checked.
SL7724	1	1	There was a subfolder that cannot be checked.	A folder including a subfolder was attempted to be checked.	(a)The subfolder was not checked. (b)Move the current folder on the connected device side and recheck the subfolder.
SL7725	1	1	There was a file that cannot be removed.	There is a file other than program (machining data) in the target folder.	Delete on the Folder operation screen. In NC language mode, delete again after pressing <Display of all files>.
SL7726	1	1	Custom screen data abnormal (ID) (Teach)	(A)A control identifier was found before the first page identifier was found. (B)An unrecognizable identifier was found.	Correct and enter the data on the Custom screen of the teaching pendant.
SL7727	1	1	Custom screen data abnormal (Arrang. pos.) (Teach)	(A)The set value of starting point line number/starting point column number is out of range. (B)Control which was larger than 1x1 in size lay offscreen.	Correct and enter the data on the Custom screen of the teaching pendant.
SL7728	1	1	Custom screen data abnormal (Dupl arrang.) (Teach)	Groups or controls other than groups overlap one another.	Correct and enter the data on the Custom screen of the teaching pendant.
SL7729	1	1	Custom screen data abnormal (Ref. address) (Teach)	(A)Reference address of button/lamp is out of range. (B)Reference address of digital switch/data display is out of range. (C)Reference address was set to an odd-numbered address when data width was 32 bits.	Correct and enter the data on the Custom screen of the teaching pendant.
SL7730	1	1	Custom screen data abnormal (Writ. address)(Teach)	(A)Notification address/write address is out of range. (B)Write address was set to an odd-numbered address when data width was 32 bits.	Correct and enter the data on the Custom screen of the teaching pendant.
SL7731	1	1	Custom screen data abnormal (Setting area) (Teach)	(A)The set value of size/dot/data width is out of range. (B)Dot was set to 24 dots when the size of the control was not 2x2, 2x4, 3x3, or 3x5. (C)Data width was set to 32 bits when the size of the control was not 1x2 or 2x4.	Correct and enter the data on the Custom screen of the teaching pendant.
SL7732	1	1	Custom screen data abnormal (No. of items) (Teach)	Setting items are insufficient.	Correct and enter the data on the Custom screen of the teaching pendant.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7733	1	1	Custom screen data abnormal (No. letters) (Teach)	(A)The number of characters of the title exceeds 30 one-byte characters. (B)Total number of characters in character strings for the group arranged on one page exceeds 128 one-byte characters. (C)Total number of characters in character strings for the control besides the group arranged on one page exceeds 256 one-byte characters.	Correct and enter the data on the Custom screen of the teaching pendant.
SL7734	1	1	Custom screen data abnormal (No. of pages) (Teach)	There are nine or more page identifiers.	Correct and enter the data on the Custom screen of the teaching pendant.
SL7735	1	1	Custom screen data abnormal (No. controls) (Teach)	(A)There are 16 or more groups to be arranged on one page. (B)There are 16 or more controls other than groups to be arranged on one page.	Correct and enter the data on the Custom screen of the teaching pendant.
SL7736	1	1	External alarm setting error	Cancel level 1 or 4 was set for the external alarms of Stop level 3 to 5. The specified cancel level is treated as level 2.	Set correct data.
SL7737	1	1	W/o external I/O signal key function		
SL7738	1	1	Special operation level is released		
SL7739	1	1	Version update file is not found.	001)The version update file is not found in the memory card.	001) Store any of the following version update files in the memory card. - Firmware file - Servo amplifier firmware file - Help data file - Firmware file for teaching pendant
				002)There is no version update file on the FTP server.	002) Follow one of the procedures below. (a) Put one of the following version update files onto the FTP server. - Firmware file - Servo amplifier firmware file - Help data file - Firmware file for teaching pendant (b) Check the communication parameter.
SL7740	1	1	Version update files are duplicated	001)There are multiple servo amplifier firmware files for one servo amplifier in the memory card.	001)Store only the latest servo amplifier firmware file in the memory card.
				002)There are multiple help data files in the memory card.	002)Only put the most recent help data file into the memory card.
SL7741	1	1	Memory overflow (Memory card)	Insufficient memory.	Replace the memory card.
SL7742	1	1	Set value outside of setting range	A set value was entered that falls outside of the setting range.	Check the set value or the setting range.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7743	1	1	No G code macro program (*)	001)The specified G code macro program does not exist in the specified folder for the data bank <G/M code macro> (common parameter) settings <Selected folder * for G code macro program> and <Specified folder * for G code macro program>.	001)Follow one of the procedures below. (a)Check the program. (b)Check the data bank <G/M code macro> (G code macro) <Program No.>.
				002)The folder specified in <Selected folder * for G code macro program> for the data bank <G/M code macro> (common parameter) does not exist.	002)Check the data bank <G/M code macro> (common parameter) <Specified folder * for G code macro program>.
SL7744	1	1	No M code macro program (*)	001)The specified M code macro program does not exist in the specified folder for the data bank <G/M code macro> (common parameter) settings <Selected folder * for M code macro program> and <Specified folder * for M code macro program>.	001)Follow one of the procedures below. (a)Check the program. (b)Check the data bank <G/M code macro> (M code macro) <Program No.>.
				002)The folder specified in <Selected folder * for M code macro program> for the data bank <G/M code macro> (common parameter) does not exist.	002)Check the data bank <G/M code macro> (common parameter) <Specified folder * for M code macro program>.
SL7745	1	1	G code macro program not set	The program is not set for the G code macro that is used in the program.	Check the data bank <G/M code macro> (G code macro) <G code number>.
SL7746	1	1	M code macro program not set	The program is not set for the M code macro that is used in the program.	Check the data bank <G/M code macro> (M code macro) <M code number>.
SL7747	1	1	Interrupt type macro command not possible	001) An M96 command was issued in a macro program that was called using G code or M code.	001)Check the program.
				002) An M96 command was issued in a sub program/macro program that was called using a M98, M198, G65 or G66 command from a macro program that was called using G code or M code.	002)Check the program.
SL7748	1	1	Memory operation mode	An operation which cannot be done during the memory operation mode was performed.	Perform the operation after the memory operation is finished.
SL7749	1	1	MDI operation mode	An operation which cannot be done during the MDI operation mode was performed.	Perform the operation after the MDI operation is finished.
SL7750	1	1	No subprogram in the G code macro folder (*)	The specified subprogram is not in the G code macro folder. The program No. was not in the parenthesis ().	Set the G code macro program, or delete the G code macro program call block.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7751	1	1	No subprogram in the M code macro folder (*)	The specified subprogram is not in the M code macro folder. The program No. was not in the parenthesis ().	Set the M code macro program, or delete the M code macro program call block.
SL7752	1	1	Tool assignment error (*)	When converting a conversation program to an NC program, a job was added for which the tool cannot be used because the tool assignment was forced. The figure in brackets ( ) is the job number.	Delete the corresponding data, and assign the tool again.
SL7753	1	1	Version updated Turn power OFF	After the version was updated, an attempt was made again to update the version.	Turn the power back ON and update the version again.
SL7754	1	1	Comm. parameter setting error (Auto notification function)	001) The combination of communication parameters (auto notification function) <Type of sending data>, <Initial address for sending data> and <Sending data length> is invalid.	001)Set the data with the correct parameters.
				002) When setting a value from 3 to 5 for the communication parameter (auto notification function) <Err stp level specifies send data indirectly>, even if the <Err canc lev. specifies send data indirectly> is set to “1”, it is processed as a cancel level 2.	002)Set the data with the correct parameters.
SL7755	1	1	External output file cannot be created	The external output file for the maximum capacity already exists in the memory card.	Check the external output file in the memory card.
SL7756	1	1	Machine is operating from support application	An operation was carried out which cannot be done when a machine operation is selected by the support application.	Deselect the machine operation in the support application, and then perform the operation.
SL7757	1	1	This magazine is already registered.	An attempt was made to register a tool for a magazine where a tool is already registered in the support application (ATC tool).	Deselect the registered tool, and then set the desired tool.
SL7758	1	1	Backup memory card cannot be recognized	Memory card is not connected.	Check the memory card connection.
SL7759	1	1	Memory is full (backup memory card)	Insufficient memory.	Replace the memory card.
SL7760	1	1	Data cannot be automatically backed up	001) Failed to back up due to a backup memory error.	001) Follow one of the procedures below. (a) Restore the backup memory. (b) After clearing the backup memory, input all the data. (c) The NC PCB is faulty. Replace the NC PCB.
				002) Failed to back up due to a data bank error.	002) Delete the corrupt data in the directory display while in program edit mode. Then, create new data.
				003) Failed to back up due to an NC PCB error.	003) The NC PCB is faulty. Replace the NC PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				004) Failed to back up due to a CFast error.	004) The CFast is faulty. Replace the CFast.
				005) Failed to back up because the data bank was being edited or because communication was in progress.	005) Stop and exit the editing or communication operation.
SL7761	1	1	Automatic data backup in progress	An attempt was made to change the data bank, program or document/image while the data was being backed up automatically.	After the data is automatically backed up, then perform the operation.
SL7762	1	1	External sub program call not possible	001) An attempt was made to call an external sub program when the program (External I/O: Change connection device) setting <Connected> was not configured to <2: Memory card>.	001) Set <Connected> to <2: Memory card> for the program (External I/O: Change connection device).
				002) An attempt was made to call an external sub program from tape operation.	002) Check the program.
SL7763	1	1	No interrupt program (*)	An interrupt program was specified that does not exist in the same folder as the main program.	Check the program.
SL7764	1	1	Feature coordinate manufacturing mode engaged	An operation was performed that cannot be executed while in feature coordinate manufacturing mode. Ex: - A change was made to the workpiece coordinate zero in the data bank.	
SL7765	1	1	Writing not possible	001)There is no cursor in the data input field or editing field.	001)Perform the writing operation when there is a cursor in the data input field or editing field.
				002)The calculation result for the exponent notation cannot be written.	002)Enter an integer or decimal point notation in the data input area.
SL7766	1	1	File cannot be created	The maximum number of files already exists in the NC.	Press the **[RST]** key. Check the file in the NC, and then move or delete the file that has 9999 as the file name number.
SL7767	1	1	Special operation level cannot be released		
SL7768	1	1	Communication parameter setting error (server password)	Password is too short.	Set a password with a minimum of 8 characters.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7769	1	1	Screen is dirty. Touch panel low sensitivity mode.	(A)The touch panel is dirty. (B)Calibration was not carried out properly because the touch panel was touched during calibration at power ON. (C)This is a hardware calibration error. (D)The touch panel or TC PCB is faulty.	(A)Clean the touch panel. Press the **[DSP OFF]** key to turn OFF the display (to avoid accidental operation), and then clean the screen. (B)Turn the power off and then on again. Do not touch the touch panel screen until the “brother” logo is displayed. (C)Perform the touch panel hardware calibration. (D)Replace both the touch panel and TC PCB as a set.
SL7770	1	1	No load weight estimate value	There is no load weight estimate value.	Perform the weight estimate operation.
SL7771	1	1	File cannot be created	The maximum number of files already exists in the NC.	Check the file in the NC directory.
SL7772	1	1	Certificate cannot be input	001)An attempt was made to input a certificate that does not support the CSR that was output.	001)Check the connecting device certificate.
				002)The private-key password for the connection device certificate does not match the communication parameter (security) <Private-key password>.	002)Make sure that private-key password for the connection device certificate matches the communication parameter (security) <Private-key password>.
				003)The certificate format for the connection device is not correct.	003)Check the format for the connection device certificate.
SL7773	1	1	Copy range exceeded	Copy or cut range exceeded the prescribed size (20 MB).	Set the copy or cut range within the prescribed size.
SL7774	1	1	Calibration error on touch panel hardware	(A)The touch panel is dirty. (B)Touch panel cleaning error was detected. (C)This is a hardware calibration error. (D)The touch panel or TC PCB is faulty.	(A)Clean the touch panel. Press the <DSP OFF> key to turn OFF the display (to avoid accidental operation), and then clean the screen. (B)After the cleaning is finished, make sure that the alarm has been cleared. (C)Perform the touch panel hardware calibration. (D)Replace both the touch panel and TC PCB as a set.
SL7775	1	1	Version update file mismatch	The firmware file for the connecting directory is corrupt.	Check the firmware file.
SL7776	1	1	Cannot create folder due to too many levels in directory	(A)An attempt was made to copy a folder, exceeding the available levels in the directory. (B)An attempt was made to move a folder, exceeding the available levels in the directory.	(A)The folder(s) was not copied. Move the current folder for the copy destination and redo the operation. (B)The folder(s) was not moved. Move the current destination folder and redo the operation.

No.	Stop level	Reset level	Alarm message	Cause	Solution
SL7777	1	1	Subfolder could not be created	(A)QT-axis did not reach the maximum speed even though the machine parameter (system 2: QT-axis) <Timeout for fixed torque control> has elapsed since the start of the QT-axis operation start. (B)An attempt was made to copy a folder with subfolder(s), exceeding the available levels in the directory.	(A)The subfolder(s) was not copied. Move the current folder for the copy destination and redo the operation. (B)The subfolder(s) was not moved. Move the current destination folder and redo the operation.
SL7778	1	1	Touch panel hardware calibration failed	(A)An attempt was made to register a tool for a magazine where a tool is already registered in the support application (ATC tool). (B)The touch panel is dirty. (C)There was a touch operation while the touch panel hardware calibration was in progress.	(A)Clean the touch panel and perform the touch panel hardware calibration again. Press the **[DSP OFF]** key to turn OFF the display (to avoid accidental operation), and then clean the screen. (B)Perform the touch panel hardware calibration again so that the touch panel is not touched or operated. If an alarm still triggers, turn the power OFF and ON, and perform the touch panel hardware calibration again. (C)Replace both the touch panel and TC PCB as a set.
SL7779	1	1	The file already exists		

2.13.9 CM

No.	Stop level	Reset level	Alarm message	Cause	Solution
CM4000	3	2	DR signal off	DR signal turned off during communication.	Check the communication parameter or the state of the connected device.
CM4001	3	2	Connected to wrong device	(A)An attempt was made to perform tape operation with the program (External I/O: Change connection device) <Connected> to <1: NC COMM device>. (B)When the communication parameter <External output - Output destination> was set to <0: Master stat. output destination>, an attempt was made to issue an external output command while the program (external I/O: change connection device) was <Connected> to <1:NC COMM device>.	(A)Set <Connected> to <0: General COMM device> or <2: Memory card> for the program (External I/O: Change connection device). (B)Change the setting so that it is not <Connected> to <1:NC COMM device> for the program (External I/O: Change connection device). Or, change the communication parameter <External output - Output destination> to another setting that is not <0: Master stat. output destination>.
CM4002	3	2	Press **[RST]** after COMM recovery	Communication was attempted while resetting the communication port.	Press the **[RST]** key after communication recovery time has elapsed.
CM4003	3	2	Communication timeout	The non-response time has exceeded the response monitoring time.	Check the communication parameter or the state of the connected device.
CM4004	3	2	Received invalid data	Invalid data was received when not converting invalid data.	Check the communication parameter or data.
CM4005	3	2	Communication format error	Communication header, data, or footer was not recognized.	Check the communication parameter or data.
CM4006	3	2	Communication TV check error	The number of characters in one block was not correct when the program was received.	Check the communication parameter or data.
CM4007	3	2	CS signal off	The CS signal is off when sending flow control DC1 and DC3 codes.	Check the communication parameter or the state of the connected device.
CM4008	3	2	Receive buffer overflow	Receiving buffer has overflowed.	Check the communication parameter or the state of the connected device.
CM4009	3	2	Communication framing error	Stop bit of the receiving character was not detected.	Check the communication parameter.
CM4010	3	2	Communication parity error	Parity error occurred in the receiving character.	Check the communication parameter.
CM4011	3	2	Communication overrun error	Characters are missing from received data.	Check the communication parameter.
CM4012	3	2	Communicating	(A)Tape operation was attempted in master communication mode (B)Tape operation was attempted again although communication was not completed after tape operation (general communication device) ended due to M30. (C)External output was instructed in master communication mode.	(A)Quit the external program I/O menu and then perform tape operation. (B)Wait until communication is completed, and then perform tape operation. (C)Quit the external program I/O menu and then begin external output.
CM4013	3	2	Press the **[RST]** key after communication is completed.	Communication parameter could not be reflected in slave communicating when the **[RST]** key was pressed.	Press the **[RST]** key after slave communicating is completed.

No.	Stop level	Reset level	Alarm message	Cause	Solution
CM4014	3	2	Communication format error (header/footer)	(A) An attempt was made to input the NC program listed at the header/footer even though the communication parameter <Header/footer> is set to <0:No>. (B) An attempt was made to input the NC program not listed at the header/footer even though the communication parameter <Header/footer> is set to <1:Yes>.	Check the communication parameter or the NC program.
CM4015	3	2	The memory card cannot be identified.	The memory card reader is not connected.	(a)Press the **[RST]** key and then check that the memory card is correctly installed in the drive. (b)Press the **[RST]** key and then check that the memory card is not damaged. (c)If several storage devices are connected to the USB ports, connect only one, and then press the **[RST]** key. (d)The NC PCB is faulty. Replace the NC PCB.
CM4016	3	2	Memory card error	(A)An error associated with the memory card occurred. (B)The memory card is used by another function.	(A)Press the **[RST]** key and then recheck the memory card. (B)After pressing the **[RST]** key and the other functions are complete, execute the operation again.
CM4017	3	2	Multiple memory cards cannot be connected.	Multiple memory devices (e.g. memory card reader) are connected to the USB port.	Connect only one memory device to the USB port and then press the **[RST]** key.
CM4018	3	2	Unusable format (Memory card)	The format of the floppy disk or memory card is not supported.	Press the **[RST]** key and then connect a formatted memory device.
CM4019	3	2	Different from pallet program	A program different from the one set for the user parameter (quick table) was used for tape operation.	Check the user parameter (quick table) <Pallet 1/2 program> or the operation program.
CM4020	3	2	Write protect (Memory card)	Output, deletion, or format was used for a write-protected memory card.	Press the **[RST]** key. Release the write-protection on the memory card.
CM4021	3	2	Folder for connected device not found	When inputting and outputting data via an FTP connection, the folder for the connected device could not be found.	Check the folder for the connected device.
CM4022	3	2	Cannot connect to the server	(A)An invalid FTP server name is set. (B)There is a problem with the DNS server or network environment.	(A)Check the host name for the connected device. Set the correct FTP server name. (B)Check the status of the network cable or the connected device and execute again.
CM4023	3	2	Ethernet communication error (*)	An Ethernet error occurred during communication.	Check the status of the network cable or the connected device and execute again.

No.	Stop level	Reset level	Alarm message	Cause	Solution
CM4024	3	2	Name resolution of destination is failed.	(A)An invalid FTP server name is set. (B)There is a problem with the DNS server or network environment.	(A)Follow the procedure below. 1.Check the destination host name. 2.Set the correct FTP server name. (B)Follow the procedure below. 1.Check the status of the network cable and execute again. 2.Check the status of the connected device and execute again.
CM4025	3	2	Connecting server certificate error	001)The server certificate is not a trusted certificate for the connecting server.	001)Follow one of the procedures below. (a)Input the connecting server certificate as a trusted certificate in the maintenance and communication. (b)In the maintenance and communication, input the connecting server certificate that the certificate authority issued as one from a trusted certificate authority.
				002)The server certificate validity for the connecting server has expired.	002)Check the server certificate validity for the connecting server.
				003)The subject name for the connecting server certificate and the <FTP(S) server name (IP address)> in the communication parameter are different.	003)Change the subject name for the connecting server certificate and the <FTP(S) server name (IP address)> in the communication parameter so that the names match.
CM7000	1	2	There is a PLC program currently being edited/communicating	(A)PLC program is being operated in the external editing software. (B)After input via communication, there is still a PLC program that is not written.	(A)Perform communication again after operation with external editing software is completed. (B)Press the **[RST]** key, write the PLC program and send the data again.
CM7001	1	2	Server certificate validity expired	The server certificate validity end date was reached.	Follow one of the procedures below to update the server certificate. (a)Create a self-signed certificate in the maintenance and communication. (b)Follow the procedure below to input the server certificate acquired from the certificate authority. 1.Create a CSR file in the maintenance and communication. 2.Submit the CSR (that was created) to the certificate authority and acquire a new server certificate. 3.Input the server certificate acquired in the maintenance and communication.
CM7500	1	1	Editing communication data	The data to be sent is being edited.	Send the data after editing is completed.
CM7501	1	1	Communication parameter error	001)<1:EIA> is set for <Sending data code> when starting maintenance communication.	001)Check the communication parameter.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				002)<0: 7 bits> is set for <Character length> and <1:EIA> is set for <Sending data code> when communicating at port A or B.	002)Check the communication parameter.
CM7502	1	1	DR signal off	The DR signal turned off during communication.	Check the communication parameter or the state of the connected device.
CM7503	1	1	CS signal off	The CS signal is off when sending flow control DC1 and DC3 codes.	Check the communication parameter or the state of the connected device.
CM7504	1	1	Receive buffer overflow	Receiving buffer has overflowed.	Check the communication parameter or the state of the connected device.
CM7505	1	1	Communication parity error	Parity error occurred in the received characters.	Check the communication parameter.
CM7506	1	1	Communication overrun error	Characters are missing from received data.	Check the communication parameter.
CM7507	1	1	Communication framing error	The stop bit of the received characters could not be detected.	Check the communication parameter.
CM7508	1	1	Communication timeout	The non-response time has exceeded the response monitoring time.	Check the communication parameter or the state of the connected device.
CM7509	1	1	Communication format error	Communication header, data, or footer was not recognized.	Check the communication parameter or data.
CM7510	1	1	Receive header error	The format of the header received via communication is not correct.	Check the header format.
CM7511	1	1	Receive data name error	The data name of the header received via communication is not correct.	Check the header data name.
CM7512	1	1	Receive response abnormal end	An abnormal end response was received for the command sent via communication.	Check the connected device.
CM7513	1	1	Receive data ignored (symbol)	An invalid symbol was detected in the data received via communication, causing the corresponding record to be ignored.	Check the symbol in the data.
CM7514	1	1	Receive data ignored (ascend)	The symbols in the data received via communication are not in ascending order, causing the corresponding record to be ignored.	Check the sequence of symbols in the data.
CM7515	1	1	Receive data converted (qty.)	The number of items composing one record in the data received via communication is not correct. Excessive items are ignored, and insufficient items are not set.	Check the record format.

No.	Stop level	Reset level	Alarm message	Cause	Solution
CM7516	1	1	Receive data converted (range)	(A)The range of items in the data received via communication is not correct, so they are converted. The converted sections are not set. (B)The item length (digits) in the data received via communication is not correct, so the data was converted. The converted places are data for the valid digits.	Check the value of each item.
CM7517	1	1	Communication data edit error	An edit error occurred while processing the communication data.	
CM7518	1	1	Too many receive directories	The number of received directories exceeds 1024.	The number of directories should be l024 or less.
CM7519	1	1	Communication TV check error	The number of characters in one block is not correct when receiving a program.	Check the communication parameter or data.
CM7520	1	1	Received invalid data	Invalid data was received when not converting invalid data.	Check the communication parameter or data.
CM7521	1	1	Communication check sum error	The checksum of the received data is not correct.	Set the checksum correctly, or set <0: Off> for <Checksum> (communication user parameter).
CM7522	1	1	Receive command abnormal end (*)	A command received via TC slave communication ended abnormally. Refer the "Completion code list" of Chapter "External program I/O" in the Data manual for the value in brackets ( ).	Check the cause and send the command again.
CM7523	1	1	Communication interface error	An error occurred in the interface with the communication device.	The NC PCB is faulty. Contact the nearest BROTHER approved service dealer and report the alarm conditions.
CM7524	1	1	Communication version check error	The version of the data to be sent differs from the system version.	Edit the corresponding data again.
CM7525	1	1	Program sent/received (slave)	Sending and receiving the program was performed via slave communication.	
CM7526	1	1	Multiple files cannot be specified.	(A) A file is selected that is not a batch file. (B) Multiple batch files are selected.	(A) When a file is selected that is not a batch file, deselect the file. (B) If multiple batch files are selected, just select one file.
CM7527	1	1	Slave communicating (Ethernet)	The file to be transferred is being used by the Ethernet.	Transfer the file once communication with the slave is finished.
CM7528	1	1	Comm. param. set error (IP address)	An invalid IP address is set.	Set the correct IP address.
CM7529	1	1	Comm. param. set error (mask bit)	An invalid mask bit is set.	Set the correct mask bit.
CM7530	1	1	Comm. param. set error (gateway)	An invalid default gateway is set.	Set the correct default gateway.

No.	Stop level	Reset level	Alarm message	Cause	Solution
CM7531	1	1	Ethernet is disconnected.	Communication with the connected device was Communication with the connected device was interrupted during slave communication.	Check the connected device.
CM7532	1	1	Ethernet communication error (*)	An Ethernet error occurred during communication.	Check the network cable or the state of the connected device, and retry communication.
CM7533	1	1	Old program cannot be checked.	An old program was selected when inputting programs in check mode.	
CM7534	1	1	File access error (*)	An error occurred during access to the file.	Contact the nearest BROTHER approved service dealer.
CM7535	1	1	Memory card cannot be recognized.	Memory card is not connected.	Check the connection of memory card.
CM7536	1	1	Main station is being communicating. (Memory card)	(A)The file to be transferred is being used by the memory card. (B)Maintenance and communication mode is enabled.	(A)Transfer the file once communication with the master is finished. (B)Disable maintenance and communication mode before transferring the file.
CM7537	1	1	Following station is being communicating. (FTP(S))	The file to be transferred is being used by FTP(S).	Transfer the file once communication with the slave is finished.
CM7538	1	1	The main station is being communicating. (FTP(S))	The file to be transferred is being used by FTP(S).	Transfer the file once communication with the master is finished.
CM7539	1	1	Main station is being communicating. (Serial port)	The file to be transferred is being used by the serial port.	Transfer the file once communication with the master is finished.
CM7540	1	1	Folowing station is communicating. (Serial port)	The file to be transferred is being used by the serial port.	Transfer the file once communication with the slave is finished.
CM7541	1	1	Sending failed	(A)File or folder with invalid name was attempted to be output via communication. (B)An unauthorized file or folder was attempted to be accessed.	(A)Check the file name and folder name. (B)Check the access permission for the file or folder.
CM7542	1	1	Receiving failed	File or folder with invalid name was attempted to be entered via communication	Check the file name and folder name.
CM7543	1	1	Deleting failed	(A)File or folder with invalid name was attempted to be deleted. (B)An unauthorized file or folder was attempted to be accessed.	(A)Check the file name and folder name. (B)Check the access permission for the file or folder.

No.	Stop level	Reset level	Alarm message	Cause	Solution
CM7544	1	1	Renaming failed	(A)An attempt was made to rename a file or folder with an invalid name. (B)An invalid name was specified for a file or folder. (C)An unauthorized file or folder was attempted to be accessed.	(A)Check the file name and folder name. (B)Check the file name and folder name. (C)Check the access permission for the file or folder.
CM7545	1	1	Failed to stop control program	Failed to stop control program during PLC program input.	First, end and exit monitor mode in the external editing software, and then input the PLC program.
CM7546	1	1	Memory card error	(A)An error associated with the memory card occurred. (B)The memory card is used by another function.	(A)Recheck the memory card. (B)After the other functions are complete, execute the operation again.
CM7547	1	1	Write protect (Memory card)	Output, deletion, or format was used for a write-protected memory card.	Release write-protection.
CM7548	1	1	Multiple memory cards cannot be connected.	Multiple memory devices (e.g. memory card reader) are connected to the USB port.	Connect only one memory device to the USB port.
CM7549	1	1	Unusable format (Memory card)	The format of the floppy disk or memory card is not supported.	Use a memory device formatted.
CM7550	1	1	Name resolution of destination is failed.	(A)An invalid FTP server name is set. (B)The DNS server and network environment have a problem.	(A)Follow the procedure below. 1.Check the destination host name. 2.Set a correct FTP sever name. (B)Follow the procedure below. 1.Check the status of the network cable and execute again. 2.Check the status of the connected device and execute again.
CM7551	1	1	Communication format error (header/footer)	(A)NC program with header/footer was attempted to input while "header/footer" is set to <0: Not equipped> for communication parameter. (B)An attempt was made to input the NC program not listed at the header/footer even though the communication parameter <Header/footer> is set to <1:Yes>.	Check the communication parameter or NC program.
CM7552	1	1	Name resolution for auto notification destination failed	001)An invalid host name is set.	001)Check the notification host name. Set the correct host name.
				002)There is a problem with the DNS server or network environment.	002)Check the status of the network cable or the connected device and execute again.
CM7553	1	1	Ether. comm. err (*) connecting to auto notific. Destin	An Ethernet communication error occurred when connecting to the auto notification destination.	Check the status of the network cable or the auto notification device, and retry communication.
CM7554	1	1	Auto notification transmission error (*)	An error occurred when sending the auto notification.	Launch the application for receiving auto notifications on the destination device. If the application is already launched, check the settings, and then shut it down and try re-launching it.
CM7555	1	1	Invalid file name	There are characters included that cannot be specified for the file name.	Check the specified file name.

No.	Stop level	Reset level	Alarm message	Cause	Solution
CM7556	1	1	User login	001)The user has logged onto this machine via the FTP.	
				002)The access restriction, on this machine using communication protocol type 2 for an NC communication device, was lifted temporarily.	
CM7557	1	1	Security communication error	A valid server certificate cannot be found.	Check the server certificate in the maintenance and communication.
CM7558	1	1	Connecting server certificate error	001)The server certificate is not a trusted certificate for the connecting server.	001)Follow one of the procedures below. (a)Input the connecting server certificate as a trusted certificate in the maintenance and communication. (b)In the maintenance and communication, input the connecting server certificate that the certificate authority issued as one from a trusted certificate authority.
				002)The server certificate validity for the connecting server has expired.	002)Check the server certificate validity for the connecting server.
				003)The subject name for the connecting server certificate and the <FTP(S) server name (IP address)> in the communication parameter are different.	003)Change the subject name for the connecting server certificate and the <FTP(S) server name (IP address)> in the communication parameter so that the names match.
CM7559	1	1	Following station is being communicating. (OPC UA)	The file to be transferred is being used by OPC UA.	Transfer the file once communication with the slave is finished.
CM7560	1	1	Folder for connected device not found	When inputting and outputting data to maintain and transfer data, the folder for the connected device could not be found.	Use the folder operations to check the folder for the connected device.

2.13.10 PN

No.	Stop level	Reset level	Alarm message	Cause	Solution
PN0000	5	3	Teaching pendant communication error (*)	Communication with teaching pendant failed.	Check connection of the teaching pendant.
PN0001	5	3	Teaching pendant error message (*)	Received an error response from teaching pendant.	Contact the nearest BROTHER approved service dealer.
PN0500	5	2	Teaching pendant removed		Press the **[RST]** key.
PN4000	3	2	There is no external panel 1.	Unable to communicate with external panel 1.	Check connection of the external panel 1.
PN4001	3	2	There is no external panel 2.	Unable to communicate with external panel 2.	Check connection of the external panel 2.
PN7500	1	1	External panel 1 communication error (*)	Failed to communicate with external panel 1.	Check connection of the external panel 1.
PN7501	1	1	External panel 2 communication error (*)	Failed to communicate with external panel 2.	Check connection of the external panel 2.
PN7502	1	1	Response data receiving timeout (External panel 1)	Failed to receive response from external panel 1within the specified time period.	Check connection of the external panel 1.
PN7503	1	1	Response data receiving timeout (External panel 2)	Failed to receive response from external panel 2 within the specified time period.	Check connection of the external panel 2.
PN7504	1	1	External panel 1 error message (*)	Received error response from external panel 1.	Please contact us if you encounter a situation.
PN7505	1	1	External panel 2 error message (*)	Received error response from external panel 2.	Please contact us if you encounter a situation.
PN7506	1	1	External panel 1 communication timeout (Character)	External panel 1 communication error.	Please contact us if you encounter a situation.
PN7507	1	1	External panel 2 communication timeout (Character)	External panel 2 communication error.	Please contact us if you encounter a situation.
PN7508	1	1	External panel 1 communication timeout (Boring)	External panel 1 communication error.	Please contact us if you encounter a situation.
PN7509	1	1	External panel 2 communication timeout (Boring)	External panel 2 communication error.	Please contact us if you encounter a situation.
PN7510	1	1	External panel 1 communication timeout (Protocol)	External panel 1 communication error.	Please contact us if you encounter a situation.
PN7511	1	1	External panel 2 communication timeout (Protocol)	External panel 2 communication error.	Please contact us if you encounter a situation.

2.13.11 FN

No.	Stop level	Reset level	Alarm message	Cause	Solution
FN0000	5	3	Field network parameter setting error (PROFIBUS DP)	001)The I/O size set to the I/O setting exceeds 128 bytes.	001) Set each field network parameter (PROFIBUS DP) to the correct value, and turn the power OFF and then ON again.
FN0001	5	3	Field network parameter setting error (CC-Link slave)	001)The "Slave station category" is not set to "Remote device station."	001)Set each field network parameter (CC-Link) to the correct value, and turn the power OFF and then ON again.
				002)The "Station number" is not set to a value within the setting range.	002)Set each field network parameter (CC-Link) to the correct value, and turn the power OFF and then ON again.
				003)The "Occupied number of stations" is not set to a value within the setting range.	003)Set each field network parameter (CC-Link) to the correct value, and turn the power OFF and then ON again.
				004)The total of the "Station number" and the "Occupied number of stations" is set to a value greater than 65.	004)Set each field network parameter (CC-Link) to the correct value, and turn the power OFF and then ON again.
FN0002	5	3	Field network parameter setting error (CC-Link master)	001)The total for the <Self-station number> and the <Occupied number of stations (for intelligent device stations)> is set to a value greater than 64 stations.	001)Set each field network parameter (CC-Link master) to the correct value, and turn the power OFF and then ON again.
FN2000	4	2	Field network parameter setting error (CC-Link master)	001)The <CC-Link version> is set to <1: Ver.2> when the <Self-station number> is set to <1-64>.	001)Set each field network parameter (CC-Link master) to the correct value.
FN4000	3	2	CC-Link configuration setting error	001)The external I/O signal setting <Specify reserved station> for the CC-Link configuration is set to <0: Specify 0 pts.> and <Specify I/O assignment> is set to <1: Specify 0 pts.> when the field network parameter (CC-Link master) <CC-Link version> is set to <1: Ver.2>.	001)Check the set value for the CC-Link configuration parameter.
				002)The external I/O signal setting <By station category> for the CC-Link configuration is not set to <0: Remote I/O station> and <Specify I/O assignment> is set to one of the following: <2: Specify 8 pts.>, <3: Specify 16 pts.> or <4: Specify mix of 8 &16 pts.> when the field network parameter (CC-Link master) <CC-Link version> is set to <1: Ver.2>.	002)Check the set value for the CC-Link configuration parameter.
				003)In the external I/O signal settings for the CC-Link configuration, the total occupied stations exceeds 32.	003)Check the set value for the CC-Link configuration parameter.

No.	Stop level	Reset level	Alarm message	Cause	Solution
				004)In the external I/O signal settings for the CC-Link configuration, the valid range was exceeded for the signals that can be assigned.	004)Check the set value for the CC-Link configuration parameter.
				005)A parameter was set or saved while there is no valid station number linked in the CC-Link configuration for the external I/O signal setting.	005)Check the set value for the CC-Link configuration parameter.
				006)The leading address for a valid station remote output and remote input are not in multiples of 16 in the CC-Link configuration for the external I/O signal setting.	006)Check the set value for the CC-Link configuration parameter.
				007)The external I/O signal setting <By station category> in the CC-Link configuration is not set to <2: Intelligent device station>, or a station, where <Specify reserved station> is set to <1: Yes>, was specified in the field network parameter (CC-Link master) <Standby master station number>.	007)Check the set value for the CC-Link configuration parameter.
				008)The remote I/O stations, the remote device stations and the intelligent device stations in the CC-Link configuration for the external I/O signal setting have exceeded the maximum number of connected stations.	008)Check the set value for the CC-Link configuration parameter.
				009)The external I/O signal setting <By station category> is set to <2: Intelligent device station> in the CC-Link configuration for all the stations, and the total for <Transient send (or receive) buffer size> exceeded 2048 words.	009)Check the set value for the CC-Link configuration parameter.
FN5000	2	3	Field bus watch dog (FC)	No response from the FC PCB (netX) within the specified time period.	Please contact us if you encounter a situation.
FN5001	2	3	Field bus watch dog (NC)	No request to the FC PCB (netX) within the specified time period.	Please contact us if you encounter a situation.
FN5002	2	3	FC board communication error	FC PCB communication is abnormal.	Please contact us if you encounter a situation.
FN5003	2	3	The FC board communication is abnormal. (*)	There is an FC PCB (netX) data error.	Please contact us if you encounter a situation.
FN5004	2	3	CM PCB error (*)	CM PCB data is abnormal.	Please contact us if you encounter a situation.
FN5005	2	3	FE unit communication error	There is a communication error with the FE unit.	Please contact us if you encounter a situation.

No.	Stop level	Reset level	Alarm message	Cause	Solution
FN5006	2	3	FE unit error (*)	There is a data error with the FE unit.	Please contact us if you encounter a situation.
FN5500	2	2	Interface board error (CM) (*)	(A)There is an error with the parameter set value. (B)here is an interface board error.	(A)Check the parameter set value for the user parameter (CC-Link master) and the CC-Link configuration. (B)Please contact us if you encounter a situation.
FN7000	1	2	Transient parameter error	There is an error with the set value for the transient send parameter.	Check the set value for the PLC OM.
FN7500	1	1	Field bus communication stop	Field bus communications stopped due to an error, etc.	Remove the cause of the stopped communication.
FN7501	1	1	Field network parameter setting error (CC-Link master)	001)An attempt was made to carry out the line test when <Standby master station number> was not set to <0>.	001)Set each field network parameter (CC-Link master) to the correct value.

2.13.12 OM

No.	Stop level	Reset level	Alarm message	Cause	Solution
0000	5	3	Resetting from PLC is disabled	A special operation disabled the reset signals from the PLC and external input signal. Special operation refers to pressing the following 4 buttons simultaneously: **[EMERGENCY]** switch, **[FEED HOLD]** switch, **[START]** switch and **[RELSE]** key.	Turn the power off and then on again.
0001	5	3	Turn power off.	(A)A power OFF level item has been changed in the servo parameter. (B)A process required for turning ON the power again has been carried out.	Turn the power off and then on again.
0002	5	3	Version is being updated.		
0003	5	3	Power failure hold area is changed	Power failure hold area is changed.	(a)Do not run the control programs before turning the power on again. (b)Turn the power off and then on again.
0500	5	2	Door open	(A)A door was opened while the door interlock mode was set to automatic mode. (B)A door was opened while the door interlock mode was set to setting mode and the **[ENABLE]** switch was turned OFF.	(A)Follow one of the procedures below. (a)Close the door. (b)Check the limit switch on the door. (c)Make sure that there are no chips or shavings caught between the door and the machine cover. (d)The door sensor is faulty. Replace the door sensor. (e)IL PCB unit is faulty. Replace the IL PCB unit. (f)The SR PCB is faulty. Replace the SR PCB. (B)Follow one of the procedures below. (a)Close the door. (b)Press the **[ENABLE]** switch.
0501	5	2	Standby mode	The servo turned OFF and it entered into standby mode, because the machine was not operated within the time period that was set in the user parameter (switch 1: common) <Standby mode time>.	Perform any of the following operations, and the servo controller turns on and operation is enabled. (a)Press any key on the operation panel (b)Press **[START]** or **[PALLET START]**
0502	5	2	Adjusted abso. data has been set.	Adjusted counter value has been set.	
0503	5	2	Press the **[RST]** key	A reset level parameter has been changed.	Press the **[RST]** key.
0504	5	2	Reset absolute encoder counter.	The absolute encoder counter was reset.	Press the **[RST]** key to reset the alarm.

No.	Stop level	Reset level	Alarm message	Cause	Solution
0505	5	2	**[MASTER]** is off.	(A)**[EMERGENCY]** switch was pressed. (B)External EMG Stop signal is open. (C)EMG SW ON command (a communication command) is received.	(A)Remove the cause of emergency stop and press the **[RST]** key after releasing the **[EMERGENCY]** switch. (B)Close the input terminal contacts and input the external reset signals. Check the following wiring. IL PCB unit: XTEMSIN 1-2, 3-4 and 5-6 (C)Send the EMG SW OFF command (a communication command).
0506	5	2	Enter your password		Enter the data protection password.
0507	5	2	Change to ATC maintenance mode	Changed to the ATC maintenance mode.	Press the **[RST]** key.
0508	5	2	During measurement of motor insulation resistance	This alarm occurs during measurement of motor insulation resistance. Turn off the servo relay.	
0509	5	2	All control programs stopped	001)PLC program has been overwritten in the main station communication and the slave station communication.	001)Follow the procedure below. 1.Press the **[RST]** key. 2.Remove the cause of the other alarm that was triggered at the same time.
				002)PLC program operation stopped due to another alarm being triggered.	002)Follow the procedure below. 1.Press the **[RST]** key. 2.Remove the cause of the other alarm that was triggered at the same time.
0510	5	2	Motor insulation resistance measurement start	This alarm occurs at the start of measurement of motor insulation resistance. Turn off the servo motors of all axes.	
0511	5	2	Position adjusted	The axis position was adjusted.	Press the **[RST]** key.
0512	5	2	*-axis automatically adjusted	The QT-axis was automatically adjusted.	Press the **[RST]** key.
0513	5	2	*-axis adjustment check again	The QT-axis has been adjusted again. The adjustment needs to be checked again.	Follow the procedure below. 1. Press the **[RST]** key. 2. Press the **[RELSE]** + **[R]** keys.
0514	5	2	**[ENABLE]** switch was turned OFF	The **[ENABLE]** switch was turned OFF during axis travel or in handle mode with the door interlock mode set to machine setup and while a door was open.	(a)Close the door. (b)Press the **[ENABLE]** switch.
0515	5	2	Change to the mode for enabling and disabling the servo	Change to the mode for enabling and disabling the servo.	Press the **[RST]** key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
0516	5	2	**[MASTER ON]** was turned OFF	**[MASTER ON]** conditions were turned OFF while in standby for an operation mode. When the **[MASTER ON]** function is used and an alarm (ALM signal) is triggered on this machine, this alarm may also trigger. - **[EMERGENCY]** switch was pressed. - External emergency stop signal became open. - The emergency switch ON command (a communication command) is received.	Fix the problem that caused the **[MASTER ON]** conditions to turn OFF, and then press the **[RST]** key and **[MANUAL RESET]** switch.
0517	5	2	Select a display language	There is no machine parameter or the data is corrupt.	Select a language to display temporarily.
0518	5	2	Automatic setting for automatic door parameter is complete	The machine parameter (system 1: automatic door) <Offset for door open position> setting has ended.	
0519	5	2	Mode will change to spindle maintenance mode	Mode will change to spindle maintenance mode.	Press the **[RST]** key.
0520	5	2	Erfassung des Servo OFF-Befehls 1	External EMG Stop signal is open.	Close the input terminal contacts and input the external reset signals. Check the following wiring. IL PCB unit: XTEMSIN 1-2, 3-4 and 5-6
0521	5	2	Erfassung des Servo OFF-Befehls 2	External input signal MOSRU turned OFF.	Turn the signal ON and press the **[RST]** key.
1500	4	3	Turn power off.	001)An important parameter, related to the automatic thermal distortion compensation, has been changed.	001)Turn the power off and then on again.
				002)A process required for turning ON the power again has been carried out.	002)Turn the power off and then on again.
1501	4	3	The PLC-axis has been stopped.		
2000	4	2	Counter 1 end	Workpiece counter 1 has reached the setting.	
2001	4	2	Counter 2 end	Workpiece counter 2 has reached the setting.	
2002	4	2	Counter 3 end	Workpiece counter 3 has reached the setting.	
2003	4	2	Counter 4 end	Workpiece counter 4 has reached the setting.	
2004	4	2	Tool life end (*)	The life of the current tool or the tool about to be used has expired. The figure in brackets ( ) is the tool number.	Press the **[RST]** key. Change the tool and then set the tool life.
2005	4	2	Version update has been completed		
2006	4	2	Help data version update has been completed		
2007	4	2	The PLC-axis has been stopped		

No.	Stop level	Reset level	Alarm message	Cause	Solution
2008	4	2	Press the **[RST]** key	A critical parameter was changed.	Press the **[RST]** key.
4000	3	2	Press the **[RST]** key	A critical parameter was changed.	Press the **[RST]** key.
4001	3	2	Check ATC tool.	001)After the ATC recovery operation is complete, the recovery operation was disabled.	001)Check the ATC tool, and then press the **[RST]** key.
				002)Power was shut off while the ATC arm is turning.	002)Check the ATC tool, and then press the **[RST]** key.
				003)Exited from ATC maintenance mode.	003)Check the ATC tool, and then press the **[RST]** key.
				004)Tool data was input from an external source.	004)Check the ATC tool, and then press the **[RST]** key.
4002	3	2	Assign tools. (*)	Operation was attempted when the tool list data is newer than the operation program in conversation mode.	Assign the tools again.
4003	3	2	Switch to manual operation mode for restoration.	001)A stop level 5 alarm was triggered during the tapping operation.	001)Use the support application (recovery support) to perform the synchronized tap return operation.
				002)A stop level 5 alarm in the ATC area was triggered while in memory or MDI operation mode.	002)Follow the instructions in the support application (recovery support) to restore operation.
4004	3	2	Assign tools.	Conversation language machining data created by new version software was entered for operation.	Assign the tools again.
4005	3	2	Check the tapping tool in the spindle.	001) Operation stopped during tapping.	001)The tapping tool on the spindle may be stuck in the workpiece. If it is stuck, use the support application (recovery support) to perform the synchronized tap return.
				002) The recovery operation for the synchronized tap return was completed.	002)The tapping tool on the spindle may be stuck in the workpiece. If it is stuck, use the support application (recovery support) to perform the synchronized tap return.
				003) <Cancel synchronized tap return> key was pressed.	003)The tapping tool on the spindle may be stuck in the workpiece. If it is stuck, use the support application (recovery support) to perform the synchronized tap return.
4006	3	2	The PLC axis has been stopped.		
4007	3	2	The PLC axis has been stopped.		
4008	3	2	Backup memory has been saved	The backup memory has been saved successfully.	
4009	3	2	Make sure all axes are operating in manual operation mode	The mode for enabling and disabling the servo was disengaged.	Press the **[RST]** key and make sure that all axes operate.

No.	Stop level	Reset level	Alarm message	Cause	Solution
4010	3	2	The machine coordinates may be out of position.	All data was input, or the start data (adjusted absolute values) from the backup memory recovery operation was input.When old start data is input, the encoder position data for the magazine, ATC arm and additional axes (when set to no stroke) may not match the machine coordinates.	(a)Press the **[RST]** key. (b)Check the magazine index position. 1.When a <<Magazine number error>> is triggered, make sure that the tool number that is indexed matches the machine state.If it does not match, perform the expired battery recovery operation. 2.When a <<Magazine number error>> is triggered, perform the expired battery recovery operation (do not perform the recovery operation using the **[RELSE]** key + **[MAG.F]** key or the **[RELSE]** key + **[MAG.R]** key). 3.When the magazine is not in the index position, the magazine zero point needs to be re-adjusted. Contact the nearest BROTHER approved service dealer. (c)When an arm type ATC mechanism is used, check the ATC arm position. 1.When an <<ATC arm position error>> is triggered, perform the expired battery recovery operation (do not perform the ATC arm position recovery operation). 2.When the ATC arm is not at the zero point, the ATC arm zero point must be re-adjusted.Contact the nearest BROTHER approved service dealer. (d)Make sure that the machine coordinates for the additional axis are correct. 1.When the machine coordinates for the additional axis are not correct, re-adjust the machine zero point.
4011	3	2	Machine will exit spindle maintenance mode	Machine will exit spindle maintenance mode.	Press the **[RST]** key.
5500	2	2	Oil level low (automatic oiling)	(A)Insufficient lubricant. (B)There is an error with the connection for the XLUB connector on the IO PCB.	(A)Follow the procedure below. 1.Supply oil. 2.Press the **[RST]** key. (B)Check the connection for the XLUB connector on the IO PCB.
5501	2	2	Change grease (automatic greasing)	Grease has run out.	Change the grease cartridge, and press the **[RST]** key.
7000	1	2	Machine parameter was not deleted.	<0: Write-protected> was set for <Parameter change> when formatting or deleting all data banks.	Change to <1: Writable> on the <Input/Output> screen to delete machine parameters.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7001	1	2	*-axis servo power off	(A)A door was opened while the door interlock mode was set to automatic mode or setting mode and while and the **[ENABLE]** switch was turned OFF. (Servo power was turned OFF for the QT-axis.) (B)The **[ENABLE]** switch was turned OFF while door was open and axis was moving.	(A)Close the door. (B)Follow one of the procedures below. (a)Close the door (b)Turn the **[ENABLE]** switch ON.
7002	1	2	*-axis servo power off	(A)A door was opened while the door interlock mode was set to automatic operation or machine setup and while and the **[ENABLE]** switch was turned OFF. (Servo power was turned OFF for the 5th-axis.) (B)The **[ENABLE]** switch was turned OFF while door was open and axis was moving.	(A)Close the door. (B)Follow one of the procedures below. (a)Close the door (b)Turn the **[ENABLE]** switch ON.
7003	1	2	*-axis servo power off	(A)A door was opened while the door interlock mode was set to automatic operation or machine setup and while and the **[ENABLE]** switch was turned OFF. (Servo power was turned OFF for the 6th-axis.) (B)The **[ENABLE]** switch was turned OFF while door was open and axis was moving.	(A)Close the door. (B)Follow one of the procedures below. (a)Close the door (b)Turn the **[ENABLE]** switch ON.
7004	1	2	*-axis servo power off	(A)A door was opened while the door interlock mode was set to automatic operation or machine setup and while and the **[ENABLE]** switch was turned OFF. (Servo power was turned OFF for the 7th-axis.) (B)The **[ENABLE]** switch was turned OFF while door was open and axis was moving.	(A)Close the door. (B)Follow one of the procedures below. (a)Close the door (b)Turn the **[ENABLE]** switch ON.
7005	1	2	*-axis servo power off	(A)A door was opened while the door interlock mode was set to automatic operation or machine setup and while and the **[ENABLE]** switch was turned OFF. (Servo power was turned OFF for the 8th-axis.) (B)The **[ENABLE]** switch was turned OFF while door was open and axis was moving.	(A)Close the door. (B)Follow one of the procedures below. (a)Close the door (b)Turn the **[ENABLE]** switch ON.
7006	1	2	P1-axis servo power off	(A)A door was opened while the door interlock mode was set to automatic operation or machine setup and while and the **[ENABLE]** switch was turned OFF. (Servo power was turned OFF for the P1-axis.) (B)The **[ENABLE]** switch was turned OFF while door was open and axis was moving.	(A)Close the door. (B)Follow one of the procedures below. (a)Close the door (b)Turn the **[ENABLE]** switch ON.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7007	1	2	P2-axis servo power off	(A)A door was opened while the door interlock mode was set to automatic operation or machine setup and while and the **[ENABLE]** switch was turned OFF. (Servo power was turned OFF for the P2-axis.) (B)The **[ENABLE]** switch was turned OFF while door was open and axis was moving.	(A)Close the door. (B)Follow one of the procedures below. (a)Close the door (b)Turn the **[ENABLE]** switch ON.
7008	1	2	P3-axis servo power off	(A)A door was opened while the door interlock mode was set to automatic operation or machine setup and while and the **[ENABLE]** switch was turned OFF. (Servo power was turned OFF for the P3-axis.) (B)The **[ENABLE]** switch was turned OFF while door was open and axis was moving.	(A)Close the door. (B)Follow one of the procedures below. (a)Close the door (b)Turn the **[ENABLE]** switch ON.
7009	1	2	P4-axis servo power off	(A)A door was opened while the door interlock mode was set to automatic operation or machine setup and while and the **[ENABLE]** switch was turned OFF. (Servo power was turned OFF for the P4-axis.) (B)The **[ENABLE]** switch was turned OFF while door was open and axis was moving.	(A)Close the door. (B)Follow one of the procedures below. (a)Close the door (b)Turn the **[ENABLE]** switch ON.
7010	1	2	Configured parameters that were not set to factory-set values.	During the firmware version update, the factory-set values were configured for the parameters which have not be set.	
7011	1	2	Expanded memory is enabled		Press the **[RST]** key.
7012	1	2	Submicron command is currently valid		Press the **[RST]** key.
7013	1	2	High acc.mode B(Look ahead 1000 blocks, smooth path offset)		Press the **[RST]** key.
7014	1	2	Interrupt type macro is enabled		Press the **[RST]** key.
7015	1	2	Turning function is enabled		Press the **[RST]** key.
7016	1	2	Rotary fixture offset is enabled		Press the **[RST]** key.
7017	1	2	High speed processing mode is enabled		Press the **[RST]** key.
7018	1	2	Execute the automatic oiling/greasing cycle ON command	Automatic oiling or automatic greasing error was detected.	After replenishing the lubricant or grease, execute the automatic oiling / greasing cycle ON command in MDI operation. NC language: M478 Conversation language: Miscellaneous function 478

No.	Stop level	Reset level	Alarm message	Cause	Solution
7019	1	2	Scheduled notice to change relocat. detect. device batteries	It is time to change the batteries on the relocation detection device.	Follow the procedure below to replace the batteries for the relocation detection device. 1. Leave the power switch turned ON, and remove all the batteries from the relocation detection device. 2. Check if the alarm <<Change batteries on relocat. detect. device with power ON>> triggers. 3. Install new batteries for the relocation detection device. 4. Press the **[RST]** key and check if the alarm <<Change batteries on relocat. detect. device with power ON>> resets.
7020	1	2	Feature coordinate setting function is enabled		Press the **[RST]** key.
7021	1	2	ATC monitoring parameter was set		
7022	1	2	Machining load could not be measured(*)	The following cause descriptions are divided according to their auxiliary numbers: 0. The parameter number used for the machining load monitor has not been specified. 1 to 99 or 201 to 299. Machining load could not be measured due to one of the following reasons on the tool indicated by the auxiliary number. - The measurement time is shorter than the <Time constant> for the machining load monitor parameter. - There is no section with a constant speed because the tapping or drilling has a short machining time, etc. - There is no cutting travel. - A command was issued to select the lathe spindle.	0. Specify the E address following the M code for turning ON the machining load monitor. Or, register the tool for monitoring the machining load on the ATC tool screen. 1 to 99 or 201 to 299. Perform one of the following. - Set the <Time constant> for the machining load monitor parameter to the correct value. - When the drilling or tapping has a short machining time, set the machining load monitor parameter <Load monitor method> to <1: Average> before using. - Revise the program.
7023	1	2	Involute interpolation function is enabled		Press the **[RST]** key.
7024	1	2	Relocation was detected	The relocation detection device detected that the machine has been relocated.	Check the request code and contact the sales dealer.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7025	1	2	Weight could not be estimated	A weight estimate was not possible due to one of the following reasons. (A)Rapid traverse override is not 100%. (B)The operation was cancelled due to a reset or feed hold operation while an estimate was being calculated. (C)An estimate operation was carried while the machine lock is enabled.	Press the **[RST]** key. (A)Set the rapid traverse override to 100%, and re-execute the estimate operation. (B)Re-execute the estimate operation. (C)Turn OFF the machine lock, and re-execute the estimate operation.
7026	1	2	Notice of server certificate validity end date	Set time for scheduled notice was reached for server certificate validity end date.	Follow one of the procedures below to update the server certificate. (a)Create a self-signed certificate in the maintenance and communication. (b)Follow the procedure below to input the server certificate acquired from the certificate authority. 1.Create a CSR file in the maintenance and communication. 2.Submit the CSR file (that was created) to the certificate authority and acquire a new server certificate. 3.Input the server certificate acquired in the maintenance and communication.
7500	1	1	Counter 1 approaching setting	Workpiece counter 1 reached the end signal setting.	
7501	1	1	Counter 2 approaching setting	Workpiece counter 2 reached the end signal setting.	
7502	1	1	Counter 3 approaching setting	Workpiece counter 3 reached the end signal setting.	
7503	1	1	Counter 4 approaching setting	Workpiece counter 4 reached the end signal setting.	
7504	1	1	Front door open	(A)Front door is open while the user parameter (switch 1: door) <Display alarm when door is open – Front door/Outer door> is set to <1: Yes>. (B)Manual operation, MDI operation or memory operation was carried out while the front door was open. (C)Either the door sensor, IL PCB unit or IO PCB is faulty.	(A)Close the corresponding door. (B)Follow one of the procedures below. (a)Perform an operation after the corresponding door is closed. (b)When the automatic door does not operate, set the **[AUTOMATIC DOOR MANU/AUTO]** switch to <AUTO>, and then perform the operation.Or, check the PLC program. (C)Follow one of the procedures below. (a)Check the limit switch on the door. (b)Make sure that there are no chips or shavings caught between the door and the machine cover. (c)Replace the door sensor. (d)Replace the IL PCB unit. (e)Replace the SR PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7505	1	1	Inner door open	(A)Inner door is open while the user parameter (switch 1: door) <Display alarm when door is open – Inner door> is set to <1: Yes>. (B)Manual operation, MDI operation or memory operation was carried out while the inner door was open. (C)Either the door sensor, IL PCB unit or IO PCB is faulty.	(A)Close the corresponding door. (B)Perform an operation after the corresponding door is closed. (C)Follow one of the procedures below. (a)Check the limit switch on the door. (b)Make sure that there are no chips or shavings caught between the door and the machine cover. (c)Replace the door sensor. (d)Replace the IL PCB unit. (e)Replace the SR PCB.
7506	1	1	Outer door open	(A)Outer door is open while the user parameter (switch 1: door) <Display alarm when door is open – Front door/Outer door> is set to <1: Yes>. (B)One of the following operations was carried out when the outer door was open. - An attempt was made to turn the pallet or clamp/unclamp. - An attempt was made to perform an outside index. - An operation, such as a spindle rotation, ATC operation, magazine turn, tap operation or brake load test, was carried out while the pallet was not indexed. - An attempt was made to rotate the pallet in memory operation while the single operation was turned OFF. - A command was issued to the outer pallet in MDI operation or memory operation. (C)Either the door sensor, IL PCB unit or IO PCB is faulty.	(A)Close the outer door. (B)Close the outer door, and press a key. (C)Follow one of the procedures below. (a)Check the limit switch on the door. (b)Make sure that there are no chips or shavings caught between the door and the machine cover. (c)Replace the door sensor. (d)Replace the IL PCB unit. (e)Replace the SR PCB.
7507	1	1	Spare tool used	A spare tool was used because the tool life has expired during machining,.	
7508	1	1	Tool life ending (*)	The tool life has reached the setting that signals the end of tool life. The figure in brackets ( ) is the tool number.	
7509	1	1	Select axis.	The additional axis change switch is not set after power is turned on.	Set the additional axis select switch.
7510	1	1	Sending completed (*)	The program shown in brackets ( ) was sent to an external device via slave communication.	
7511	1	1	Sending completed (*)	The data shown in brackets ( ) was sent to an external device via slave communication.	

No.	Stop level	Reset level	Alarm message	Cause	Solution
7512	1	1	Receiving completed (*)	The program shown in brackets ( ) was received from an external device via slave communication.	
7513	1	1	Receiving completed (*)	The data shown in brackets ( ) was received from an external device via slave communication.	
7514	1	1	Spindle override on	Spindle override is not 100%.	Set the spindle override to 100%.
7515	1	1	Cutting feedrate override on	Cutting feed rate override is not 100%.	Set the cutting feed rate override to 100%.
7516	1	1	Rapid feed override on	(A)Rapid traverse override is not 100%. (B)When the user parameter (switch 1: common) <Stop using feedrate override during rapid feed> is set to <1: Enabled>, the feedrate override changed to <0%>.	(A)Change the rapid traverse override to 100%. (B)Follow one of the procedures below. (a)Change the feedrate override to another setting beside 0%. (b)Set the user parameter (switch 1:common) <Stop using feedrate override during rapid feed> to <0: Disabled>, and press the **[RST]** key.
7517	1	1	Communication command end (*)	The program shown in brackets ( ) was deleted via NC slave communication.	
7518	1	1	Deletion completed (*)	The program shown in brackets ( ) was deleted via NC slave communication.	
7519	1	1	Deletion completed (*)	The data shown in brackets ( ) was deleted via NC slave communication.	
7520	1	1	Assign tools.	Tool assignment data was changed when tool assignment was completed.	Assign the tools again.
7521	1	1	Calculate ?.	The data associated with ? calculation was changed when ? calculation was completed.	
7522	1	1	Tool change position data was lost.	ATC return data was initialized because the machining sequence was changed.	
7523	1	1	Set machining sequence.	Editing the ATC return data was attempted although the machining sequence is not set.	
7524	1	1	Restarting program	001)Occurs when restarting a program.	001)The alarm is reset after restarting the program.
				002)Attempted to change operation mode during program restart.	002)Change the mode after program restart.
				003)Attempted to start the system during program restart.	003)Start the system after program restart.
7525	1	1	Operation end	Tape operation (general communication device) is completed.	
7526	1	1	DB overwritten in memory oper. mode	When converting a conversation program to an NC program, <Convert> is set for <Tool data>.	Check the parameter.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7527	1	1	Running automatic coolant recovery	This message is displayed at the start of operation during the time set for <Coolant delay time> when <Automatic coolant off time> is enabled.	The alarm is reset after the <Coolant delay time> has elapsed.
7528	1	1	Unable to convert breakage detection data	There was a tool breakage detection command when conversation program machining data was converted to G-code.	Add a tool breakage detection command to the NC program converted to G-code.
7529	1	1	Maintenance (*)	Current value for the item in brackets ( ) exceeded the target value on the <Maintenance notice> screen.	Check the items in brackets ( ). To resume the maintenance notices, set the current value to “0”.
7530	1	1	Prohibition of operating an add. outside axis ON.	The following operation was carried out when the user parameter (switch 1: manual operation) <Prevent external operation for additional axes> was set to <1: Yes>. (A)Controlled the outside additional axis. (B)Controlled additional axes with the pallet not yet indexed.	Index a pallet using the **[P.INDX]** key.
7531	1	1	Restoration completed, so invalidate restoration.	Recovery operation is completed.	
7532	1	1	Restore the ATC arm position.	An operation was carried out to enable recovery/inspection operation, which was not an ATC arm position recovery, when the ATC arm was not at the zero point.	Recover the ATC arm position first.
7533	1	1	Recover tool clamp failure.	An operation was carried out to enable recovery/inspection operation, which was not a tool misclamp recovery, when the tool holder was not properly clamped by the spindle.	Recover tool clamp failure first.
7534	1	1	Invalidate the restoration operation.	(A)One of the following operations was performed while the recovery and inspection operation function is enabled. - The mode was switched to another mode besides manual operation mode, or a numerical or a character key was pressed. - An attempt was made to enable another recovery and inspection operation. - An attempt was made to open the support application. (B)A position adjustment operation was attempted on the next axis while the recovery function is enabled.	Disable the recovery/inspection function first.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7535	1	1	The waveform data is being stored.	M238 was commanded during file saving after specifying End of Waveform Display Measurement {<Completion> key or M239}.	Command M238 after saving the waveform display measurement file.
7536	1	1	The waveform data has not been recorded.	001)Failed to record waveform data.	001)Check the parameters.
				002)Too many data; unable to save waveform data.	002)Change the parameter.
7537	1	1	Operation other than restoration op is prohibited.	An operation other than recovery was commanded when recovery must be performed.	Finish recovery before commanding any other operation.
7538	1	1	Switch to manual operation mode for restoration.	An alarm occurred. Recovery is necessary.	Press any key to release the alarm. Select the manual mode and follow the recovery procedure.
7539	1	1	Press **[M.LCK]** to disable machine lock.	A recovery/inspection operation was executed when the machine lock was left ON.	Press **[Machine Lock]** key to unlock before operation.
7540	1	1	Operating	An operation which cannot be done during machine operation was performed.	Perform the operation after the machine operation is completed.
7541	1	1	Editing	(A)An operation which cannot be done during edit was performed. (B)The operation target is currently edited.	Perform the operation after edit is completed.
7542	1	1	Communicating	(A)An operation which cannot be done during communication was performed. (B)The operation target is currently communicating.	Perform the operation after the communication is completed.
7543	1	1	Required data not found	The specified data does not exist.	1.Check the program or data bank number. 2.Check the file in the memory card.
7544	1	1	Machine param. change disabled	Inputting machine parameters via communication was attempted when <0: Write-protected> is set for <Parameter change>.	To input machine parameters, select <1. I/O> on the <I/O> screen, and set <1: Writable> for <Parameter change>.
7545	1	1	The waveform data is being measured.	M238 was specified again during waveform measurement.	Execute M238 after completing waveform measurement.
7546	1	1	Dry run offset amount (*)	With dry run ON, the set value of dry run offset is lower than the dry run offset lower limit.	Check the values for the user parameters(switch 1: operation) <Dry run offset> and <Dry run offset amount lower limit>.
7547	1	1	The operation history cannot be recorded.	Operation history records exceeded the upper limit. The oldest record will be deleted.	
7548	1	1	No operation is possible under the current level.	The attempted operation is prohibited in the current operation level.	Check the current operation level on the input/output <Operation level> screen.
7549	1	1	The detachable panel can be removed.	Reserved	Reserved
7550	1	1	Operation level setting (*)	Operation level was changed.	
7551	1	1	The password is wrong.		

No.	Stop level	Reset level	Alarm message	Cause	Solution
7552	1	1	Tool assignment is being carried out.	Tool reassignment was executed at operation start because <Assign tools when starting memory operation> was set to <Yes>.	
7553	1	1	Operation disable data has been skipped.		
7554	1	1	The current connection disables a selection.		
7555	1	1	Restart by a sequence search	Sequence number was entered by sequence search.	
7556	1	1	Already specially formatted	Special format was attempted to a special-formatted memory card.	
7557	1	1	This is not an external input signal key.	The memory card is not special-formatted.	Create an external input signal key after performing special format.
7558	1	1	External input signal key cannot be identified.	The special-formatted memory card is not connected.	Check that the special-formatted memory card is connected correctly.
7559	1	1	Cannot use manual op. for positioning on additional axis	A command was issued to move the additional axis used for positioning with a manual intervention operation during axis travel of said axis in memory operation mode.	Wait until the axis travel operation has finished before operating the axis.
7560	1	1	The magazine panel is being operated.	Reserved	Reserved
7561	1	1	During the key check mode	Operation was started in key check mode.	
7562	1	1	During the ATC maintenance mode	An operation was performed that cannot be executed while in ATC maintenance mode.	Exit ATC maintenance mode and then perform the operation.
7563	1	1	During automatic alignment mode	An operation which cannot be done in the automatic centering mode was performed.	Perform the operation after selecting a screen other than the automatic centering screen on the programming screen.
7564	1	1	During the edit mode in operation	An operation which cannot be done in the edit mode in operation was performed.	Operate in a mode other than the edit mode in operation.
7565	1	1	During external input/output operation	An operation which cannot be done when the external input/output screen is displayed was performed.	Perform the operation after selecting a screen other than the external input/output screen on the programming screen.
7566	1	1	During operation of directory display	An operation which cannot be done during directory display operation was performed.	Perform the operation after selecting a screen other than the directory display screen on the programming screen.
7567	1	1	Set the memory card as the connecting destination.	Reserved	Reserved
7568	1	1	The version is being updated.	An operation which cannot be done during version update was performed.	Perform the operation after the completion of version update.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7569	1	1	The version update is being displayed.	An operation which cannot be done when the version update screen is displayed was performed.	Perform the operation after exiting the version update screen, or after the completion of version update.
7570	1	1	The PLC is being edited.	An operation which cannot be done during PLC edit was performed.	Perform the operation after the completion of PLC edit.
7571	1	1	The kind of screw differs.	The thread types are different between the machining data and the forcibly assigned tool.	Modify the machining data or tool list, or assign a correct tool.
7572	1	1	Memory operation program number has been changed.	When the user parameter (switch 1: data) <Set the same program for edit/memory operation programs> is set to <1:Yes>, the system notifies the operator that the memory operation mode was selected after changing the edit program number, and the operation program number was changed to the edit program number.	
7573	1	1	The external input terminal is duplicated.	Overlapping terminals exist in the external input signal.	Modify the overlapping terminals and press the **[RST]** key.
7574	1	1	The smooth path offset function is valid.	(A) A mode change operation was carried out while the smooth path offset function was enabled. (B) A dry run change operation was carried out while the smooth path offset function was enabled.	Perform them after disabling the smooth path offset function.
7575	1	1	The lathe spindle is being selected.	(A) A jog or handle operation was executed for the axis that is functioning as the lathe spindle. (B) The brake load test was executed while the lathe spindle was selected.	(A) A jog or handle operation is not possible on an axis that is functioning as the lathe spindle. (B) Check the spindle that is currently selected.
7576	1	1	Memory operation mode	The **[L.SP]** key was used while the memory was operating (includes stop status).	To do this operation, first finish the memory operation.
7577	1	1	MDI operation mode	The **[L.SP]** key was used while the MDI was operating (includes stop status).	To do this operation, first finish the MDI operation.
7578	1	1	Comment sent. contains letter unable to be input.	There is a character that cannot be entered by key operation after control out (before control out or after control in).	Insert the characters that cannot be entered into a comment or delete them.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7579	1	1	Measure the motor insulation resistance.	This alarm is triggered after the user parameter (switch 1: manual operation) <Motor insulation resistance measurement interval> has elapsed since the last measurement was taken. The alarm is always displayed until motor insulation resistance is measured. If the alarm is reset on the <Inspection (Meas. motor insulation resistance)> screen, the operator message disappears. However, it appears again when the power is turned ON the next time.	
7580	1	1	During measurement of motor insulation resistance	(A)An attempt was made to change the mode when inspection operation is <Valid> on the <Inspection (Meas. motor insulation resistance)> screen. (B)An attempt was made to perform a manual operation when the <Inspection (Meas. motor insulation resistance)> screen was displayed.	
7581	1	1	Data not found	001)The search string or replace string was not found.	001)Change the character string.
				002)The search for block could not be executed because the program being edited and the program that is running are different or because the memory operation is not being used.	002)Execute program during memory operation.
7582	1	1	Replacement performed too many times	The number of strings that can be replaced in one operation has exceeded the limit.	Perform the replacement operation again.
7583	1	1	There is no corresponding function.	This function cannot be used in the machine configuration.	
7584	1	1	Automatic alignment mode	(A) An operation was carried out to change the machine lock to ON during automatic centering. (B) An operation was carried out to change the mode during automatic centering.	After the automatic centering is finished, then perform the operation.
7585	1	1	During measurement	(A)Attempted to switch operation modes during measuring. (B)Attempted to switch dry run during measuring.	Wait until measurement completes.
7586	1	1	Resetting	An operation was carried out during a reset or while the machine was locked.	Wait until resetting or the machine lock is complete, and then perform the operation.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7587	1	1	Servo power on	An operation was carried out on an axis while the servo is ON.	The machine cannot be operated during servo ON. Wait until resetting is complete before performing the operation.
7588	1	1	The feed hold switch is being pushed down.	Performed operations while the feed hold switch is being pressed.	Release the switch, and then perform an operation.
7589	1	1	The pallet selection key is OFF	Attempted to start automatic operation by external start with the <PALLET> key OFF.	Set the <PALLET> key to any position excepting OFF.
7590	1	1	Key oper. prohibit signal on	A key operation was performed while the key lock (operation prohibited) signal is ON.	Turn OFF the key lock (operation prohibited) signal, and then operate the key.
7591	1	1	Performing tool breakage detection	An operation was performed to change the mode or dry run during tool breakage detection, when the user parameter (Tool breakage detection) <Tool breakage detection option> was set to <3:Type3>.	After the tool breakage detection is finished, then perform the operation.
7592	1	1	During high-accuracy B	Dry run was switched when the high accuracy mode B function is valid.	Wait until the end of this mode.
7593	1	1	Constant peripheral speed is being controlled	An operation was performed that cannot be executed while the constant peripheral speed is being controlled.	Cancel constant peripheral speed control.
7594	1	1	Outside door 1 open	(A)Outside door 1 is open while the user parameter (switch 1: door) <Display alarm when door is open – Outside door 1> is set to <1: Yes>. (B)A travel command was issued to the PLC-axis outside of the machine when outside door 1 was open. (C)Either the door sensor, IL PCB unit or IO PCB is faulty.	(A)Close outside door 1. (B)Close the outside door 1 and move the outside PLC axis. (C)Follow one of the procedures below. (a)Check the limit switch on the door. (b)Make sure that there are no chips or shavings caught between the door and the machine cover. (c)Replace the door sensor. (d)Replace the IL PCB unit. (e)Replace the SR PCB.
7595	1	1	Outside door 2 open	(A)Outside door 2 is open while the user parameter (switch 1: door) <Display alarm when door is open – Outside door 2> is set to <1: Yes>. (B)A travel command was issued to the PLC-axis outside of the machine when outside door 2 was open. (C)Either the door sensor, IL PCB unit or IO PCB is faulty.	(A)Close outside door 2. (B)Close the outside door 2 and move the outside PLC axis. (C)Follow one of the procedures below. (a)Check the limit switch on the door. (b)Make sure that there are no chips or shavings caught between the door and the machine cover. (c)Replace the door sensor. (d)Replace the IL PCB unit. (e)Replace the SR PCB.
7596	1	1	Execute synchronized tap return	An operation was performed to enable the recovery/inspection operation, which was not a synchronized tap return, when the synchronized tap return was not restored.	(A)First, perform a synchronized tap return. (B)If a synchronized tap return cannot be performed, first, press the <Cancel synchronized tap return> key on the synchronized tap return recovery screen to reset the synchronized tap recovery. Then, perform the necessary recovery operations.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7597	1	1	Password cannot be unregistered.	A password was attempted to be unregistered at an operation level where password being unregistered is not allowed .	
7598	1	1	Recovery complete	Recovery operation is completed.	
7599	1	1	Version update not required		
7600	1	1	Selection of a spindle is abnormal.	An operation was performed that cannot be executed on the spindle that is currently selected.	Check the spindle that is currently selected.
7601	1	1	Not in program edit mode	The operation cannot be performed when the program edit mode is not enabled.	Enable the program edit mode before performing this operation.
7602	1	1	Drawing	An operation was performed that cannot be executed during the drawing operation.	Perform the operation after the drawing is finished.
7603	1	1	Changing to ATC maintenance mode	An operation was performed that cannot be executed while changing to ATC maintenance mode.	Disengage the ATC maintenance mode.
7604	1	1	Position adjustment is not complete	An unnecessary attempt to adjust the position was made on the axis required for position adjustment.	
7605	1	1	*-axis adjustment check completed	The QT-axis adjustment has been checked.	
7606	1	1	Adjust zero position	An attempt was made to enable recovery operation, which was not a zero position adjustment, even though the zero position adjustment was not complete.	Adjust the zero position first.
7607	1	1	Turn ON the power again before operating	An operation was performed that cannot be executed until the power is turned ON again.	
7608	1	1	Editing / Communicating	(A)An attempt to carry out an operation was made even though the operation cannot be carried out while editing or communicating. (B)The targeted operation is currently being communicated or edited.	Perform the operation once the editing or communication is finished.
7609	1	1	Start signal is ON	On the automatic door specification, the door automatically closed and an attempt was made to operate the program, but the program could not be operated because the start signal is being input.	Turn OFF the start signal. Operation will start.
7610	1	1	Pallet start signal is ON	On the automatic door specification, the door automatically closed and an attempt was made to operate the program, but the program could not be operated because the pallet start signal is being input.	Turn OFF the pallet start signal. Operation will start.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7611	1	1	Restore the spindle speed prior to manual operation after startup	The speed, peripheral speed or orientation prior to manual operation was restored for the spindle or lathe spindle.	
7612	1	1	Sub folder is being displayed	An operation was performed which cannot be carried out while the sub folder is being displayed. - Program list screen for graph settings of tool path simulation - Program list screen for memory operation	Close the sub folder display before operating.
7613	1	1	Chinese is unavailable	Chinese is unavailable in this specification.	Please select and use another language.
7614	1	1	Sequence search in progress	(A)An attempt was made to change the mode while a sequence search was in progress. (B)An attempt was made to perform a start operation while a sequence search was in progress.	Perform the operation after the sequence search is finished.
7615	1	1	High speed control program 10 write-protected	(A)An attempt was made to input high speed control program 10 via communication, but the <Parameter change> is set to <Write-protected>. (B)An attempt was made to edit high speed control program 10, but the <Parameter change> is set to <Write-protected>.	(A)To input or edit high speed control program 10, set <Parameter change> to <Writable> on the I/O screen. (B)To input or edit high speed control program 10, set <Parameter change> to <Writable> on the I/O screen.
7616	1	1	Standard control program 10 write-protected	(A)An attempt was made to input standard control program 10 via communication, but the <Parameter change> is set to <Write-protected>. (B)An attempt was made to edit standard control program 10, but the <Parameter change> is set to <Write-protected>.	(A)To input or edit standard control program 10, set <Parameter change> to <Writable> on the I/O screen. (B)To input or edit standard control program 10, set <Parameter change> to <Writable> on the I/O screen.
7617	1	1	Custom screen displaying	An operation was carried out which cannot be done while the custom screen is displayed on the teaching pendant.	Change the teaching pendant to another screen besides the custom screen and perform the operation.
7618	1	1	S-axis servo is disabled	Setting for S-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7619	1	1	X-axis servo is disabled	Setting for X-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7620	1	1	Y-axis servo is disabled	Setting for Y-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7621	1	1	Z-axis servo is disabled	Setting for Z-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7622	1	1	*-axis servo is disabled	Setting for QT-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7623	1	1	*-axis servo is disabled	Setting for 5th-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7624	1	1	*-axis servo is disabled	Setting for 6th-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7625	1	1	*-axis servo is disabled	Setting for 7th-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7626	1	1	*-axis servo is disabled	Setting for 8th-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7627	1	1	*-axis servo is disabled	Setting for M-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7628	1	1	P1-axis servo is disabled	Setting for P1-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7629	1	1	P2-axis servo is disabled	Setting for P2-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7630	1	1	P3-axis servo is disabled	Setting for P3-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7631	1	1	P4-axis servo is disabled	Setting for P4-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7632	1	1	Changing to the mode for enabling and disabling servo	An operation was performed that cannot be executed while changing to the mode for enabling and disabling the servo.	Exit the mode for enabling and disabling the servo.
7633	1	1	Currently in mode for enabling and disabling servo	An operation was performed that cannot be executed while currently in the mode for enabling and disabling the servo.	Exit the mode for enabling and disabling the servo.
7634	1	1	Relocation detection status has been reset		
7635	1	1	Relocation status detected - temporarily released	The relocation detection status did not reset.	Check the request code and contact the sales dealer.
7636	1	1	Reading enabled for external encoder on *axis	Reading is enabled for external encoder on QT-axis.	Check the machine parameter.
7637	1	1	Reading enabled for external encoder on *axis	Reading is enabled for external encoder on 5th-axis.	Check the machine parameter.
7638	1	1	Reading enabled for external encoder on *axis	Reading is enabled for external encoder on 6th-axis.	Check the machine parameter.
7639	1	1	Reading enabled for external encoder on *axis	Reading is enabled for external encoder on 7th-axis.	Check the machine parameter.
7640	1	1	Reading enabled for external encoder on *axis	Reading is enabled for external encoder on 8th-axis.	Check the machine parameter.
7641	1	1	The operation status has been saved.		
7642	1	1	Outside of specification range.	Attempted to exceed the range for an allowable start position during extended memory operation.	
7643	1	1	Adding additional axes is restricted on this machine(*)		
7644	1	1	Adding additional axes is not restricted on this machine		

No.	Stop level	Reset level	Alarm message	Cause	Solution
7645	1	1	Spindle and magazine axis servo OFF	The door is open while the <Door interlock mode> is set to <Machine setup> and the **[ENABLE]** switch is ON.	Close the door.
7646	1	1	Brake load test is not complete	(A)The start time set for the brake load test was reached. (B)The brake load test failed.	(A)Close the doors and execute the brake load test. (B)After replacing the servo motor, execute the brake load test.
7647	1	1	Brake load test in progress	This alarm is triggered during the brake load test.	
7648	1	1	Execute brake load test	The start time set for the brake load test was reached.	Close the doors and execute the brake load test.
7649	1	1	Brake inspection / repair in progress	The door was unlocked when the brake load test failed.	Close the doors and execute the brake load test.
7650	1	1	Disable inspection operation	The mode was switched to another mode besides manual operation mode, or a numerical or a character key was pressed, while the inspection function was enabled.	Disable the inspection function first before operating.
7651	1	1	Operation other than inspection operation is prohibited	When attempting to perform an inspection operation, another operation command, besides an inspection operation, was issued.	Finish inspection first before operating.
7652	1	1	Screenshot was taken		
7653	1	1	Door was not locked	A machine operation was carried out while the door was not locked.	Lock the door.
7654	1	1	Magazine axis - Servo is OFF	A door is open while the door interlock mode is set to setting mode and the **[ENABLE]** switch is ON.	Close the door.
7655	1	1	Automatic data backup in progress		
7656	1	1	Memory operation in progress	001) An attempt was made to open the <Automatic backup data (data bank) recovery> screen while in memory operation mode (including stops).	001) Perform the operation after exiting memory operation.
				002) An attempt was made to open the <Default data recovery> screen while in memory operation mode (including stops).	002) Perform the operation after exiting memory operation.
7657	1	1	Not in program edit mode	001) An attempt was made to open the <Automatic backup data (data bank) recovery> screen when not in program editing mode.	001) Enable program edit mode before performing this operation.
				002) An attempt was made to open the <Default data recovery> screen when not in program editing mode.	002) Enable program edit mode before performing this operation.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7658	1	1	Waveform data is saved	When <Save standby at measurement start> is set to <1: Yes>, an alarm is triggered while the waveform data is being saved.	
7659	1	1	*-axis servo is disabled	Setting for AT-axis servo is disabled.	Disengage the mode for enabling and disabling the servo.
7660	1	1	Axis operation lock will be temporarily disengaged.		
7661	1	1	Use **[RELSE]** + **[G]** keys to restore ATC arm position	(A)ATC arm position is not at the zero point. (B)ATC arm moved to 180 degrees. (C)Pot position or spindle position was moved. (D)When the ATC arm was not between 175 and 185 degrees, one of the following key combinations for recovery was pressed: Spindle position recovery (**[RELSE]** + **[H]**), pot down (**[RELSE]** + **[D]**) or pot shutter open (**[RELSE]** + **[P]**).	Press the **[RELSE]** + **[G]** keys and follow instructions for the alarm or operator message.
7662	1	1	Use **[RELSE]** + **[H]** keys to restore spindle position	(A)The Y-axis moved following the Y-axis machine parameter (system 1: common) <Safe position for Y-axis when restoring operation>, and a spindle orientation operation was carried out. (B)The keys (**[RELSE]** + **[G]**) for the ATC arm position recovery were pressed when the spindle was not close to the zero point. (C)The keys (**[RELSE]** + **[G]**) for the ATC arm position recovery were pressed when the Y-axis was not close to the ATC position.	Press the **[RELSE]** + **[H]** keys and follow instructions for the alarm or operator message.
7663	1	1	Use **[RELSE]** + **[D]** keys to lower pot	The keys (**[RELSE]** + **[G]**) for the ATC arm position recovery were pressed when the pot position was not in the <Bottom> position.	Press the **[RELSE]** + **[D]** keys and follow instructions for the alarm or operator message.
7664	1	1	Use **[RELSE]** + **[P]** keys to open pot shutter	(A)The keys (**[RELSE]** + **[G]**) for the ATC arm position recovery were pressed when the pot shutter was not in the <Open> position. (B)The keys (**[RELSE]** + **[D]**) for pot down were pressed when the pot shutter was not in the <Open> position.	Press the **[RELSE]** + **[P]** keys and follow instructions for the alarm or operator message.
7665	1	1	Select the tool status	A recovery operation was carried out when the status of the tool that is attached to the spindle, ATC arm or pot was not selected.	Check the status of the tools that are attached to the spindle, ATC arm and pot, and then press the corresponding function key.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7666	1	1	Left side door open	(A)Left side door was opened while the user parameter (switch 1: door) <Display alarm when door is open – Left side door> is set to <1: Yes>. (B)Manual operation, MDI operation or memory operation was carried out while the left side door was open. (C)Either the door sensor, IL PCB unit or IO PCB is faulty.	(A)Close the left side door. (B)Perform an operation after the left side door is closed. (C)Follow one of the procedures below. (a)Check the limit switch on the door. (b)Make sure that there are no chips or shavings caught between the door and the machine cover. (c)Replace the door sensor. (d)Replace the IL PCB unit. (e)Replace the SR PCB.
7667	1	1	Right side door open	(A)Right side door was opened while the user parameter (switch 1: door) <Display alarm when door is open – Right side door> is set to <1: Yes>. (B)Manual operation, MDI operation or memory operation was carried out while the right side door was open. (C)Either the door sensor, IL PCB unit or IO PCB is faulty.	(A)Close the right side door. (B)Perform an operation after the right side door is closed. (C)Follow one of the procedures below. (a)Check the limit switch on the door. (b)Make sure that there are no chips or shavings caught between the door and the machine cover. (c)Replace the door sensor. (d)Replace the IL PCB unit. (e)Replace the SR PCB.
7668	1	1	Setup chamber left door open	(A)Left side door for the setup chamber is open while the user parameter (switch 1: door) <Display alarm when door is open – Setup chamber left door> is set to <1: Yes>. (B)One of the following operations was carried out when the left side door on the setup chamber was open. - An attempt was made to turn the pallet or clamp/unclamp. - An attempt was made to perform an outside index. - An operation, such as a spindle rotation, ATC operation, magazine turn, tap operation or brake load test, was carried out while the pallet was not indexed. - An attempt was made to rotate the pallet in memory operation while the single operation was turned OFF. - A command was issued to the outer pallet in MDI operation or memory operation. (C)Either the door sensor, IL PCB unit or IO PCB is faulty.	(A)Close the corresponding door. (B)Perform an operation after the corresponding door is closed. (C)Follow one of the procedures below. (a)Check the limit switch on the door. (b)Make sure that there are no chips or shavings caught between the door and the machine cover. (c)Replace the door sensor. (d)Replace the IL PCB unit. (e)Replace the SR PCB.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7669	1	1	Setup chamber right door open	(A)Right side door for the setup chamber is open while the user parameter (switch 1: door) <Display alarm when door is open – Setup chamber right door> is set to <1: Yes>. (B)One of the following operations was carried out when the right side door on the setup chamber was open. - An attempt was made to turn the pallet or clamp/unclamp. - An attempt was made to perform an outside index. - An operation, such as a spindle rotation, ATC operation, magazine turn, tap operation or brake load test, was carried out while the pallet was not indexed. - An attempt was made to rotate the pallet in memory operation while the single operation was turned OFF. - A command was issued to the outer pallet in MDI operation or memory operation. (C)Either the door sensor, IL PCB unit or IO PCB is faulty.	(A)Close the corresponding door. (B)Perform an operation after the corresponding door is closed. (C)Follow one of the procedures below. (a)Check the limit switch on the door. (b)Make sure that there are no chips or shavings caught between the door and the machine cover. (c)Replace the door sensor. (d)Replace the IL PCB unit. (e)Replace the SR PCB.
7670	1	1	Magazine door is open	(A)Magazine door is open while the user parameter (switch 1: door) <Display alarm when door is open – Magazine door> is set to <1: Yes>. (B)Manual operation, MDI operation or memory operation was carried out while the magazine door was open. (C)Either the door sensor, IL PCB unit or IO PCB is faulty.	(A)Close the magazine door. (B)Perform an operation after the corresponding door is closed. (C)Follow one of the procedures below. (a)Check the limit switch on the door. (b)Make sure that there are no chips or shavings caught between the door and the machine cover. (c)Replace the door sensor. (d)Replace the IL PCB unit. (e)Replace the SR PCB.
7671	1	1	Magazine chamber shutter is open	Magazine shutter is open while the user parameter (switch 1: door) <Display alarm when door is open – Magazine shutter> is set to <1: Yes>.	Close the magazine chamber shutter.
7672	1	1	Weight estimation complete	An estimate was calculated for the load weight on the table.	Check the load weight estimate results.
7673	1	1	Perform automatic door adjustment	The automatic door adjustment was not carried out after an automatic door error was detected, or after the motor was replaced on the automatic door.	Use the support application (recovery support) to execute the automatic door adjustment operation.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7674	1	1	Connecting server certificate warning	001)The server certificate is not a trusted certificate for the connecting server.	001)Follow one of the procedures below. (a)Input the connecting server certificate as a trusted certificate in the maintenance and communication. (b)In the maintenance and communication, input the connecting server certificate that the certificate authority issued as one from a trusted certificate authority.
				002)The server certificate validity for the connecting server has expired.	002)Check the server certificate validity for the connecting server.
				003)The subject name for the connecting server certificate and the <FTP(S) server name (IP address)> in the communication parameter are different.	003)Change the subject name for the connecting server certificate and the <FTP(S) server name (IP address)> in the communication parameter so that the names match.
7675	1	1	Relocation detection device initialization complete		
7676	1	1	Z-axis perimeter operation in progress	Mode was changed to MDI operation mode while the Z-axis perimeter operation was in progress.	After the Z-axis perimeter motion is complete, then perform the operation.
7677	1	1	Operation restricted in service mode	The attempted operation is prohibited in service mode.	Change the door interlock mode to automatic operation or to machine setup.
7678	1	1	Spindle maintenance mode engaged	An operation was performed that cannot be executed in spindle maintenance mode.	Exit spindle maintenance mode.
7679	1	1	Changing to spindle maintenance mode	An operation was performed that cannot be executed while changing to spindle maintenance mode.	Exit spindle maintenance mode.
7680	1	1	Stopped Z-axis rise to ATC zero point	The **[ATC]** key was released during a tool change operation when the door interlock mode was set to service mode. When the door interlock mode is set to service mode, the tool change operation only executes while the **[ATC]** key is pressed.	Press the **[ATC]** key again to move the Z-axis up to the ATC zero point.
7681	1	1	Drawing is starting up	The drawing function is still starting up.	Press the <GRAPH> key after the time has elapsed.
7682	1	1	Initializing tool life	Editing the tool list or communication was performed while the initialize screen for ATC tool life was displayed.	Close the initialize screen for tool life before editing the tool list or communication.
7683	1	1	PLC function cannot be used	A process required for turning ON the power again has been carried out.	Turn the power off and then on again.
7684	1	1	Operation has been resumed from program restart	The start position was specified by the program restart.	
7685	1	1	Special format is not compatible	An attempt was made to set a signal that cannot be set for the current special format.	Create an external input signal key after performing special format.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7686	1	1	Data is currently being accessed	(A)An operation was performed which cannot be done while data is being accessed. (B)Data is currently being accessed for the target operation.	After the data is finished being accessed, perform the operation.
7687	1	1	No sequence number in restart block information	Restart block information without a sequence number was selected when specifying a sequence number on the <Program restart (select restart block information)> screen.	
7688	1	1	Touch panel hardware calibration in progress		
7689	1	1	Touch panel hardware calibration complete		
7690	1	1	Loading system alarm triggered	An alarm is triggered on the loading system.	Check the loading system status.
7691	1	1	Loading system operation is not available	001)An operation to enable the recovery/inspection operation was carried out on a display device with operation control of the loading system.	001)Release the operation control on the display device, and then enable the recovery/inspection operation.
				002)The brake load test for the loading system was not executed.	002)Make sure that the following brake load test for the loading system can be executed. - LB automatic operation starting (LB_STL) is OFF - Axis travel is not carried out - **[Stop]** key is not pressed (not paused) - LB external stop (BIO_EXSTOP) is OFF - An alarm higher than s top level 2 has not been triggered - When the door guard is closed Ex: Side door and safety fence that separate the loading system and SPEEDIO are closed - There is no display device or NC operation panel with operation control - Brake load test not executing (LB_BTRUN) signal is OFF Refer to the loading system manual for further details.
7692	1	1	Recovery operation disabled	A recovery operation not displayed in the procedure guide was executed.	Execute the recovery operation in the guide instructions.

No.	Stop level	Reset level	Alarm message	Cause	Solution
7693	1	1	Die QT-Achse kann nicht in Betrieb genommen werden.	A QT-axis operation was carried out under the following conditions: while the door interlock mode was in setting mode, an **[ENABLE]** switch was turned ON, a door was open and the QT-axis was indexed.	After moving the QT-axis so it is not indexed, the QT-axis can be operated when the door is open. Close the door, move the QT-axis so it is not indexed and then operate.

2.14 List of servo errors

2.14.1 Servo errors

- Servo errors: Alarms which are generated by the servos (amps).
- Servo warnings: Warnings which are generated by the servos (amps).
- Servo communication errors: Alarms which are generated when data such as servo parameters are received. (SDO communication errors)
- Servo status errors: Generated when data from the servos has not been received correctly. The causes of errors and the methods of resolving them are the same for all axes.

(Supplement)
Explanation of table contents
- Cancel levels ○: Reset ×: Power supply OFF
- Messages displayed as supplementary messages (XXX): If the space is blank, the supplementary number is displayed.

2.14.1.1 Servo errors

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
15	NC power failure error	0Fh	NC power failure error - NC is detected as being stopped.	Check the power supply, and fix any problems such as power interruptions or voltage drops.	×
16	Invalid frame 0	10h	Invalid frame error on port 0 Rx - Invalid frame is received continuously from port 0. 1. Faulty communications cable. 2. Faulty servo amplifier or NC PCB.	1. Make sure that there are no poor or faulty contacts on the communications cable. 2. Replace the servo amplifier or NC PCB.	○
17	Invalid frame 1	11h	Invalid frame error on port 1 Rx - Invalid frame is received continuously from port 1. 1. Faulty communications cable. 2. Faulty servo amplifier or NC PCB.	1. Make sure that there are no poor or faulty contacts on the communications cable. 2. Replace the servo amplifier or NC PCB.	○
18	CRC error 0	12h	CRC error on port 0 Rx - Continuous error triggered on port 0 Rx. 1. Faulty communications cable. 2. Faulty servo amplifier or NC PCB.	1. Make sure that there are no poor or faulty contacts on the communications cable. 2. Replace the servo amplifier or NC PCB.	○
19	CRC error 1	13h	CRC error on port 1 Rx - Continuous error triggered on port 1 Rx. 1. Faulty communications cable. 2. Faulty servo amplifier or NC PCB.	1. Make sure that there are no poor or faulty contacts on the communications cable. 2. Replace the servo amplifier or NC PCB.	○
20	Transmission error 0	14h	Error on port 0 Tx - Continuous error triggered on port 0 Tx. 1. Faulty communications cable. 2. Faulty servo amplifier or NC PCB.	1. Make sure that there are no poor or faulty contacts on the communications cable. 2. Replace the servo amplifier or NC PCB.	○
21	Transmission error 1	15h	Error on port 1 Tx - Continuous error triggered on port 1 Tx. 1. Faulty communications cable. 2. Faulty servo amplifier or NC PCB.	1. Make sure that there are no poor or faulty contacts on the communications cable. 2. Replace the servo amplifier or NC PCB.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
24	Lost link 0	18h	Lost link on port 0 - Port 0/1 cable is broken or disconnected while servo is ON. The upstream power supply has been interrupted or turned OFF. 1. Broken or disconnected communications cable. 2. Poor or faulty contact between connector and terminals.	1. Replace the communications cable. 2. Make sure that there are no poor or faulty contacts on the communications cable.	○
25	Lost link 1	19h	Lost link on port 1 - Port 0/1 cable is broken or disconnected while servo is ON. The upstream power supply has been interrupted or turned OFF. 1. Broken or disconnected communications cable. 2. Poor or faulty contact between connector and terminals.	1. Replace the communications cable. 2. Make sure that there are no poor or faulty contacts on the communications cable.	○
26	Communication time out	1Ah	Communication timeout - Output data not received during the specified cycle time. The command could not be received during the time period specified by the communication timeout setting. (SM2 event: PDO output data cannot be received) 1. Faulty communications cable. 2. Faulty servo amplifier or NC PCB.	1. Make sure that there are no poor or faulty contacts on the communications cable. 2. Replace the servo amplifier or NC PCB.	○
33	Main circuit error	21h	Error in main circuit power device (power element error) - Drive module overcurrent. - Drive power supply error detected. - Drive module overheating. 1. There is a short-circuit on the wiring between the servo amplifier and servo motor for the U, V and W phases on the servo amplifier. Or, there is a ground fault on the U, V and W phases. 2. There is a short-circuit or ground fault on the U, V and W phases for the servo motor side. 3. Faulty circuit inside the servo amplifier. 4. Faulty control box cooling fan.	1. Check the wiring, and fix any problems such as short-circuits. 2. Replace the servo motor. 3. Replace the servo amplifier. 4. Replace the control box cooling fan.	○
34	Current detection error 0	22h	Current detection error 0 - Current detection value error. 1. Faulty circuit inside the servo amplifier. 2. Faulty servo parameter setting.	1. Replace the servo amplifier. 2. Set the correct servo parameters.	○
35	Current detection error 1	23h	Current detection error 1 - Current detection circuit error.	1. Replace the servo amplifier.	○
36	Current detection error 2	24h	Current detection error 2 - Communication error on current detection circuit. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
37	HWGOFF error 1	25h	Safe torque (thrust) OFF error 1 - Timing error for safe torque (thrust) OFF input. - Safe torque (thrust) OFF 1 and safe torque (thrust) OFF 2 input logic do not match. 1.Faulty circuit inside the servo amplifier. 2.The SR PCB is defective. 3.IL PCB unit is faulty 4.Faulty connection cable between servo amplifier and IL PCB.	1.Replace the servo amplifier. 2.Replace the SR PCB. 3.Replace the IL PCB unit. 4.Replace the cable.	×
38	HWGOFF error 2	26h	Safe torque (thrust) OFF error 2 - Failure or malfunction on safe torque (thrust) OFF circuit. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
49	Converter error	31h	Converter power device error - Converter module overcurrent. - Converter power supply error. - Converter module overheating. 1. Faulty circuit inside the servo amplifier. 2. There is a P/N short-circuit on the main circuit power supply DC block for the servo amplifier. Or, there is a P/N ground fault.	1. Replace the servo amplifier. 2. Check the wiring, and fix any problems such as short-circuits.	○
50	Phase detection error	32h	Phase detection error - Phase detection circuit error. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○
51	Power supply current detection error	33h	Power supply current detection error - Power supply current detection circuit error. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
65	Overload 1	41h	Overload 1 - Effective torque (thrust) exceeded. 1.Faulty circuit inside the servo amplifier. 2.Faulty circuit inside motor encoder. 3.Effective load monitor has exceeded rated torque (thrust). 4.Faulty servo parameter setting. 5.Servo motor holding brake is not released (faulty connection cable between servo amplifier and IL PCB unit, or faulty connection cable between the IL PCB and servo motor, or faulty SR PCB or IL PCB unit). 6.Broken or disconnected servo motor connection cable.	1.Replace the servo amplifier. 2.Replace the servo motor. 3.Monitor the load with the effective load monitor, check if the effective torque (thrust) exceeds the rated value, and revise the operation or load conditions. 4.Set the correct servo parameters. 5.Replace the cable, the SR PCB or the IL PCB unit. 6.Replace the cable.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
66	Overload 2	42h	Overload 2 - Stall overload. 1.Faulty circuit inside the servo amplifier. 2.Faulty circuit inside motor encoder. 3.Faulty servo parameter setting. 4.Servo motor holding brake is not released (faulty connection cable between servo amplifier and IL PCB unit, or faulty connection cable between the IL PCB and servo motor, or faulty SR PCB or IL PCB unit). 5.Broken or disconnected servo motor connection cable.	1.Replace the servo amplifier. 2.Replace the servo motor. 3.Set the correct servo parameters. 4.Replace the cable, the SR PCB or the IL PCB unit. 5.Replace the cable.	○
67	Regeneration resistance overload	43h	Regeneration resistance overload - Regeneration resistance load rate has been exceeded. 1. Regenerative power supply capacity has been exceeded according to the internal regeneration resistance specifications. Load inertia (weight on table) is too great. Or, the takt time is too short. 2. Faulty circuit inside servo amplifier.	1. Revise the operation conditions. If the load inertia (weight on table) exceeds the specified range, set it to within the range. 2. Replace the servo amplifier.	○
69	Continuous rotation speed excessive	45h	Continuous rotation speed excessive - Average rotation speed has been exceeded. 1. The average rotation speed exceeds the maximum rotation speed in a continuous range. The takt time is too short. 2. Faulty circuit inside servo amplifier.	1. Revise the operation conditions. 2. Replace the servo amplifier.	○
70	Converter overload	46h	Converter overload - Effective value for power supply current is excessive. 1. Faulty circuit inside the servo amplifier. 2. There is a P/N short-circuit on the main circuit power supply DC block for the servo amplifier. Or, there is a P/N ground fault.	1. Replace the servo amplifier. 2. Check the wiring, and fix any problems such as short-circuits.	○
71	Converter is overcurrent.	47h	Converter overcurrent - When the cumulative time takes more than 1 ms for the power supply current (during regeneration) to achieve more than 120% of the converter power module capacity. 1. Servo amplifier internal circuit is faulty.	1. Replace the servo amplifier.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
72	Resistance overload on inrush prevention	48h	Resistance overload on inrush prevention - Load factor is too large in rush prevention resistance 1.Main circuit power ON and OFF frequency exceeded the specification value 2.Transient fault occurs frequently on input power supply 3.Faulty circuit inside the servo amplifier.	1.Change the main circuit power ON and OFF frequency. 2.Change the input power voltage. 3.Replace the servo amplifier.	○
81	Amplifier temperature error	51h	Amplifier temperature error - Overheating detected for servo amplifier ambient temperature. 1. Faulty circuit inside the servo amplifier. 2. Control box cooling fan is stopped.	1. Replace the servo amplifier. 2. Replace the control box cooling fan.	○
82	Rush prevention resistor overheat	52h	Rush prevention resistor overheat - Overheating detected on rush prevention resistor. 1. Faulty circuit inside the servo amplifier. 2. Power supply turned ON too frequently. 3. Control box cooling fan is stopped.	1. Replace the servo amplifier. 2. Reduce the frequency for turning the power supply ON and OFF. 3. Replace the control box cooling fan.	○
83	DB resistor overheat	53h	Dynamic brake resistor overheating - Overheating detected on the dynamic brake resistor. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○
84	Internal regeneration resistance overheat	54h	Internal regeneration resistance overheat - Overheating detected on the internal regeneration resistance. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○
85	External error	55h	External error - Error in external regeneration resistor, etc. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○
86	Main circuit overheat	56h	Main circuit power device overheating - Overheating detected on the drive module (15, 30 and 50 A). 1. There is a short-circuit on the wiring between the servo amplifier and servo motor for the U, V and W phases on the servo amplifier. Or, there is a ground fault on the U, V and W phases. 2. There is a short-circuit or ground fault on the U, V and W phases for the servo motor side. 3. Faulty circuit inside the servo amplifier.	1. Replace the cable. 2. Replace the servo motor. 3. Replace the servo amplifier.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
87	Discharge resistance overheat	57h	Overheating on rush prevention and discharge resistance - Overheating detected on rush current prevention resistor detected. - Overheating detected on discharge resistor. 1. Faulty circuit inside the servo amplifier. 2. Power supply turned ON too frequently. 3. Power supply regeneration circuit output is excessive. 4. There is a P/N short-circuit on the main circuit power supply DC block for the servo amplifier. Or, there is a P/N ground fault.	1. Replace the servo amplifier. 2. Reduce the frequency for turning the power supply ON and OFF. 3. Revise the operation conditions. 4. Replace the cable.	○
97	Overvoltage	61h	Overvoltage - DC overvoltage on main circuit. 1. Faulty circuit inside the servo amplifier. 2. Main circuit power supply voltage is outside the specified range.	1. Replace the servo amplifier. 2. Make sure that the power supply voltage is within the specified range.	○
98	Main circuit power shortage	62h	Main circuit power shortage - DC voltage sag on main circuit. 1. Main circuit power supply voltage is below the specified range. 2. Faulty circuit inside the servo amplifier.	1. Make sure that the power supply voltage is within the specified range. 2. Replace the servo amplifier.	○
99	Main power supply open-phase	63h	Open-phase on main power supply - One phase in a 3 phase main circuit power supply is open. 1. One phase is not being input in a 3 phase input R, S and T. 2. Faulty circuit inside the servo amplifier.	1. Check the wiring, and fix any incorrect wiring. 2. Replace the servo amplifier.	○
100	Power supply frequency error	64h	Power supply frequency error - The power supply frequency is lower than 45 Hz or higher than 65 Hz. 1. The power supply frequency is outside the specified range. 2. Faulty circuit inside the servo amplifier.	1. Make sure that the power supply is within the specified range. 2. Replace the servo amplifier.	○
101	Power unbalance ratio error	65h	Power unbalance ratio error - The unbalance ratio for the power supply phases is 8% or more (unbalance ratio for power supply voltages is approximately 10%). 1. The power supply frequency is outside the specified range. 2. Faulty circuit inside the servo amplifier.	1. Make sure that the power supply is within the specified range. 2. Replace the servo amplifier.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
102	Power supply voltage detection error	66h	Power supply voltage detection error - Power supply voltage detection circuit error. 1. The power supply is outside the specified range. 2. Faulty circuit inside the servo amplifier.	1. Make sure that the power supply is within the specified range. 2. Replace the servo amplifier.	×
103	Power overvoltage	67h	Power overvoltage - The peak value for the main circuit AC power voltage exceeded 375 V. (Excluding when the power supply regeneration circuit is operating.)	1. Make sure that the power supply voltage is within the specified range. 2. Replace the servo amplifier.	○
104	An error was detected with the main circuit voltage.	68h	An error was detected with the main circuit voltage. - A failed circuit was detected on the VBUS. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
113	Control power shortage	71h	Insufficient control power supply voltage - The control input power supply voltage dropped or a transient power fault occurred. 1. Faulty circuit inside the servo amplifier. 2. Power supply input voltage is below the specified range.	1. Replace the servo amplifier. 2. Make sure that the power supply voltage is within the specified range.	○
114	12V power shortage	72h	Insufficient control power supply voltage 1 - +-12 V voltage dropped on the switching power supply used for control. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○
115	5V power shortage	73h	Insufficient control power supply voltage 2 - +5 V dropped on the switching power supply used for control. 1. Faulty circuit inside the servo amplifier. 2. Faulty external circuit.	1. Replace the servo amplifier. 2. Disconnect the connector and turn ON the power again. If there is no alarm, check the external circuit.	×
116	Power shortage for insulation resistance detection.	74h	Power shortage voltage for insulation resistance detection. - Power for insulation resistance detection is 120 V or less. 1.Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
129	Encoder disconnected 1	81h	Encoder connector 1 disconnected 1. Broken or disconnected phase signal wire for the incremental encoders A, B and Z (faulty servo motor or servo amplifier). 2. Broken or disconnected power supply line.	1. Replace the servo motor or the servo amplifier. 2. Replace the cable.	×

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
131	Encoder disconnected 2	83h	Encoder connector 2 disconnected 1. Broken or disconnected phase signal wire for the fully-closed encoders A, B and Z (faulty servo motor or servo amplifier). 2. Broken or disconnected power supply line.	1. Replace the servo motor or the servo amplifier. 2. Replace the cable.	○
132	Encoder communication error	84h	Encoder communication error - CRC, SYNC or FORM command error detected during communication with sensors. 1.Faulty circuit inside motor encoder. 2.Error in encoder wiring.	1. Replace the servo motor. 2. Replace the cable.	×
133	Encoder initial error 1	85h	Encoder initial processing error 1 - Error in reading CS data for incremental encoder. - Absolute encoder initial processing error. - Broken or disconnected cable. 1. Error in encoder wiring. 2. Faulty circuit inside the servo amplifier. 3. Faulty circuit inside motor encoder.	1. Replace the cable. 2. Replace the servo amplifier. 3. Replace the servo motor.	×
134	CS error	86h	CS error - CS data position skipped. 1. Error in encoder wiring. 2. Faulty circuit inside the servo amplifier. 3. Faulty circuit inside motor encoder.	1. Replace the cable. 2. Replace the servo amplifier. 3. Replace the servo motor.	×
135	CS disconnected	87h	CS disconnected - Broken or disconnected CS signal line. 1. Error in encoder wiring. 2. Faulty circuit inside the servo amplifier. 3. Faulty circuit inside motor encoder.	1. Replace the cable. 2. Replace the servo amplifier. 3. Replace the servo motor.	×
137	Encoder initial error 2	89h	Encoder initial processing error 2 and absolute encoder is BUSY 1. Faulty circuit inside servo amplifier. 2. Faulty circuit inside motor encoder.	1. Replace the servo amplifier. 2. Replace the servo motor.	×
160	Encoder error 0	A0h	Encoder internal error 0 - No alarm status exists for the status information read from the encoder. 1.Malfunction caused by noise. 2.Faulty circuit inside motor encoder.	When this alarm is triggered even after turning the power OFF and ON again, check the following. 1. Make sure that the servo amplifier ground is grounded correctly. 2. Make sure that the encoder cable is shielded. 3. Replace the servo motor.	×
161	Battery is low (Symbol display)	A1h	Encoder internal error 1 - Battery alarm	Replace the backup batteries.	○
162	Encoder error 2	A2h	This alarm does not trigger.	This alarm does not trigger.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
163	Encoder error 3	A3h	Encoder internal error 3 - Speed error	Replace the servo motor.	○
164	Encoder error 4	A4h	Encoder internal error 4 - EEPROM error (not on spindle) - Calibration memory access error (spindle and lathe spindle)	Replace the servo motor.	○
165	Encoder error 5	A5h	Encoder internal error 5 1.ST error. The absolute sensor and the ASIC internal shift register data do not match (not spindle). 2.Excessive load and position information became invalid. 3.Communication error occurred during axis operation, and position information became invalid. 4.Pulse error (spindle without CTS) 5.Single-turn counter error detected (spindle or lathe spindle with CTS)	Revise the operation conditions when an error occurs during operation. Reset the absolute encoder counter and readjust the position if the error occurs even when the power is turned OFF and back ON. Replace the servo motor if the error still occurs even after performing the recovery steps above..	○
166	Encoder error 6	A6h	Encoder internal error 6 - PS error - CS error 1.Multi-turn counter error detected (not spindle). 2.Error in reading temporary position after turning the power ON (spindle without CTS).	1. If the error is still triggered after turning the power OFF and ON, reset the absolute encoder counter and readjust the position. 2. Replace the servo motor.	○
169	Encoder error 9	A9h	Encoder internal error 9 - Operation temperature error	Replace the servo motor.	○
170	Encoder error 10	AAh	Encoder internal error 10 - Analog signal error 1 - INC error	Replace the servo motor.	○
172	Encoder error 12	ACh	This alarm does not trigger.	This alarm does not trigger.	○
173	Encoder error 13	ADh	Encoder internal error 13 - Setting memory access error	Replace the servo motor.	○
174	Encoder error 14	AEh	This alarm does not trigger.	This alarm does not trigger.	○
175	Encoder error 15	AFh	Encoder internal error 15 - Analog signal error 2 - M code error	Replace the servo motor.	○
176	Version consistency error	B0h	NC PCB and servo amplifier software version combination do not match	Update the software to the latest version for the firmware.	×
177	DB relay adhesion error	B1h	Adhesion occurred on DB relay contact.	Replace the servo amplifier.	○
193	Overspeed	C1h	Overspeed - 120% of maximum motor speed exceeded. 1. Faulty circuit inside the servo amplifier. 2. Faulty circuit inside motor encoder.	1. Replace the servo amplifier. 2. Replace the servo motor.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
194	Speed control error	C2h	Speed control error - The current command and acceleration sign do not match. 1. The U, V and W phase wiring between the servo amplifier and servo motor is incorrect. 2. The A and B phase wiring for the pulse encoder is incorrect. 3. The servo motor is vibrating (oscillating).	1. Replace the cable.	○
195	Speed FB error	C3h	Speed feedback error 1.Servo motor power line broken or disconnected. 2.Faulty circuit inside servo amplifier. 3.When a door was opened/closed, the **[DOOR INTERLOCK MODE]** switch was changed at the same time.	1-1.Replace the cable. 1-2.Replace the servo motor. 2.Replace the servo amplifier. 3.Press the **[RST]** key. When opening/closing a door, do not change the setting on the **[DOOR INTERLOCK MODE]** switch at the same time.	○
197	Model following error	C5h	Damping control error for model tracking - The operating pattern is not suitable for damping control during model tracking. 1. Faulty servo parameter setting.	1. Set the correct servo parameters.	○
198	Spindle speed decreased	C6h	Spindle speed decreased - Speed has dropped below setting value (main spindle only). 1. Main spindle load is excessive.	1. Revise the operation conditions.	○
199	Overspeed	C7h	Overspeed - The actual speed is faster than the internal speed command for the servo amplifier.	1. Set the correct servo parameters. 2. Replace the servo motor.	○
209	Position deviation large	D1h	Position deviation large - Position deviation exceeds setting value. 1. Load inertia is too great. 2. Holding brake is not released. 3. One or all of the U, V and W phase wiring between the servo amplifier and servo motor is disconnected. 4. Faulty circuit inside the servo amplifier. 5. Faulty circuit inside motor encoder. 6. Voltage has dropped for main circuit power supply.	1. Revise the load conditions (weight on table). 2. Replace the cable or the servo motor. 3. Replace the cable. 4. Replace the servo amplifier. 5. Replace the servo motor. 6. Make sure that the power supply capacity for the main circuit and wiring are sufficient.	○
210	Position command error 1	D2h	Position command error 1 - Position command exceeds the setting range. 1. Faulty servo amplifier or NC PCB.	1. Replace the servo amplifier or the NC PCB. 2. Set the correct servo parameters.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
211	Position command error 2	D3h	Position command error 2 - A position command which exceeds the processing range was input. 1. Faulty servo amplifier or NC PCB.	1. Replace the servo amplifier or the NC PCB.	○
220	Relay short-circuit failure in insulation resistance detect	DCh	Short-circuit malfunction or failure on relay for the insulation resistance detection. - Short-circuit malfunction or failure on ground relay for the insulation resistance detection. 1.Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
221	Insulation resistance detection error	DDh	Insulation resistance detection error - Command error or status error during insulation resistance detection. 1.Main circuit power supply was turned OFF. (Emergency stop switch was pressed.) 2.Hardware gate OFF input was turned OFF. (Door was opened.) 3.Bus voltage dropped. 4.Motor is not stopped.	1.Release the emergency stop switch, and then reset the insulation resistance detection mode. 2.Close the door, and then set the insulation resistance detection mode again. 3.Make sure that the main circuit power voltage is within the specification range, and then set the insulation resistance mode detection again. 4.Make sure that the motor has stopped, and then set the insulation resistance detection mode again.	○
222	Turn power off.	DEh	Turn the power supply OFF. - A servo parameter setting was changed and the power supply needs to be turned ON and OFF in order for the change to take effect.	1. Turn the power supply OFF and back ON again.	×
223	Test mode ended	DFh	Test mode ended - End of test mode is detected. 1. This is an indication that the test mode has ended, and operation is normal. (After the test mode is executed, the deviation on the controller is expected to remain, and therefore an alarm is triggered.)	1. Reset the alarm to restore normal operation.	○
224	Motor code and encoder selection is out of setting range	E0h	Motor code and encoder are out of setting range - Motor code and encoder selection is out of setting range (A)Set value for the motor code, encoder interval code and/or encoder type code are outside the specification range. (B)Faulty circuit inside the servo amplifier.	(A)Set the correct servo parameters. (B)Replace the servo amplifier.	×

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
225	Memory error 1	E1h	Memory error 1 - Internal amplifier non-volatile memory error 1.Faulty circuit inside the servo amplifier. (There was no response from the non-volatile memory when the servo parameters are saved.) (Faulty amplifier control PCB)	1. Replace the servo amplifier.	×
226	Memory error 2	E2h	Memory error 2 Check sum error over whole non-volatile memory range (A)The correct values were not written to the CPU from the servo amplifier internal non-volatile memory. (B)Failed to write to the non-volatile memory the last time the power supply was turned OFF. (C)Downloaded FoE parameter and failed to write parameter.	(A)Replace the servo amplifier. (B)Replace the servo amplifier. (C)Follow one of the procedures below. (a)Replace the servo amplifier. (b)Turn OFF the control power supply and restart the servo amplifier.	×
227	CPU error 1	E3h	CPU error 1 - Error accessing RAM inside CPU. 1.The RAM inside the CPU could not be accessed normally. (Control parts for servo amplifier are faulty)	1. Replace the servo amplifier.	×
228	CPU error 2	E4h	CPU error 2 - Check sum error in internal CPU flash memory 1.Faulty circuit inside the servo amplifier. (Flash memory program check sums did not match when the control power supply was turned ON.) (The firmware inside the servo amplifier CPU is corrupt.)	1. Replace the servo amplifier.	×
229	Parameter error 1	E5h	System parameter error 1 - System parameters are outside setting range. (A)Motor code value and amplifier capacity did not match when the motor parameter automatic setting was disabled. (B)System parameter values are outside the setting range. (C)Faulty circuit inside the servo amplifier.	(A)Check the motor model number, motor code and servo amplifier model number. (B)Check and adjust the system parameter setting values. Turn the power supply OFF and back ON again, and make sure that no alarm is triggered. (C)Replace the servo amplifier.	×

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
230	Parameter error 2	E6h	System parameter error 2 - System parameter combination error. - The system parameters and amplifier combination do not match. 1-1. The system parameter setting values and actual hardware combination is incorrect. 1-2. The system parameter setting combination is incorrect. 2. Faulty circuit inside the servo amplifier.	1-1. Check the servo amplifier model number. 1-2. Check and adjust the system parameter setting values. Turn the power supply OFF and back ON again, and make sure that no alarm is triggered. 2. Replace the servo amplifier.	×
231	Motor parameter error	E7h	Motor parameter error - Motor parameter check sum error. 1.The correct values were not written to the CPU from the servo amplifier internal non-volatile memory. 2.Failed to write to the non-volatile memory when the motor parameter was changed.	1. Set the motor parameters again, and then turn the power OFF and back ON again. If the alarm occurs again, replace the servo amplifier. 2. Set the motor parameters again, and then turn the power OFF and back ON again. If the alarm occurs again, replace the servo amplifier.	×
232	Control circuit error 1	E8h	Control circuit error 1 - Access error between CPU and ASIC 1-1.Access to the CPU and peripheral devices was not completed successfully during initialization. 1-2.Faulty servo amplifier control PCB.	1. Replace the servo amplifier.	×
233	Control circuit error 2	E9h	Control circuit error 2 - Control circuit error 1.The servo amplifier control PCB encoder and encoder set value do not match (Faulty servo amplifier control PCB).	1. Replace the servo amplifier.	×
234	Memory error 3	EAh	Memory error 3 - Internal servo amplifier FLASH memory error 1.Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
235	Control circuit error 3	EBh	Control circuit error 3 - Control circuit error 1.Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
236	Converter communication error	ECh	Converter communication error - Error in communication circuit for converter CPU. - Converter CPU error. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
237	Converter early error	EDh	Converter initialization processing error - Error accessing the RAM inside the converter CPU. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
238	Autoconfiguration error 1	EEh	Motor parameter autoconfiguration error 1 - The motor parameter autoconfiguration cannot be executed. 1. Faulty servo parameter setting. 2. Faulty circuit inside motor encoder.	1. Set the correct servo parameters. 2. Replace the servo motor.	×
239	Autoconfiguration error 2	EFh	Motor parameter autoconfiguration error 2 - There is an error in motor parameter autoconfiguration result. 1. Faulty servo parameter setting. 2. Faulty circuit inside motor encoder.	1. Set the correct servo parameters. 2. Replace the servo motor.	×
241	Task processing error	F1h	Task processing error - CPU interrupt processing error. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
242	Initial timeout	F2h	Initial timeout - Initialization processing was not completed within the specified time. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
243	CPU error 3	F3h	This alarm does not trigger.	This alarm does not trigger.	×
300	Encoder error 1	A1h	Encoder internal error 1 - Multi-turn error	Replace the servo motor.	○
500	Positioning amplifier	00h	This occurs when a servo error is detected and the cause is not immediately clear. Thereafter, once the cause is determined, it occurs together with the servo error for that cause.	Follow the recovery procedure for servo errors that occur with other problems.	○
522	Software limit (+)	16h	Software limit error (+) - Moved beyond the software limit coordinate in the positive direction.	Move back inside the software limit. Set the correct parameters.	○
523	Software limit (-)	17h	Software limit error (-) - Did not reach the software limit coordinate in the negative direction.	Move back inside the software limit. Set the correct parameters.	○
524	Point data invalid	18 h	Point data invalid error - Moved to a point that is not registered.	Press the **[RST]** key.	○
527	Machine zero return error	1Bh	Machine zero return operation error - The deceleration time was too short during a machine zero return operation.	Press the **[RST]** key.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
528	Position mismatch error	1Ch	Position data mismatch error - The encoder position cannot be identified correctly.	The machine needs to be readjusted. Press the **[RELSE]** and the **[RST]** keys. After releasing the alarm, the machine zero point needs to be readjusted.	○
533	Main circuit error	21h	Error in main circuit power device (power element error) - Drive module overcurrent. - Drive power supply error detected. - Drive module overheating. 1. There is a short-circuit on the wiring between the servo amplifier and servo motor for the U, V and W phases on the servo amplifier. Or, there is a ground fault on the U, V and W phases. 2. There is a short-circuit or ground fault on the U, V and W phases for the servo motor side. 3. Faulty circuit inside the servo amplifier. 4. Faulty control box cooling fan.	1. Check the wiring, and fix any problems such as short-circuits. 2. Replace the servo motor. 3. Replace the servo amplifier. 4. Replace the control box cooling fan.	○
534	Current detection error 0	22 h	Current detection error 0 - Current detection value error. 1. Faulty circuit inside the servo amplifier. 2. Faulty servo parameter setting.	1. Replace the servo amplifier. 2. Set the correct servo parameters.	○
535	Current detection error 1	23 h	Current detection error 1 - Current detection circuit error.	1. Replace the servo amplifier.	○
536	Current detection error 2	24h	Current detection error 2 - Communication error on current detection circuit. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○
549	Overtravel (+)	31h	Forward overtravel - Power (DC +24 V) for external input signal is faulty. - External wiring is wrong. - Overtravel signal logic is wrong. - Faulty circuit inside the servo amplifier. - Overtraveled.	Set power for external input signal to (DC +24 V+-10%). Check the wiring, and fix any problems. Replace the servo amplifier. Move to a valid range.	○
550	Overtravel (-)	32h	Reverse overtravel - The same as forward overtravel.		○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
565	Overload 1	41h	Overload 1 - Effective torque (thrust) exceeded. 1.Faulty circuit inside the servo amplifier. 2.Faulty circuit inside motor encoder. 3.Effective load monitor has exceeded rated torque (thrust). 4.Faulty servo parameter setting. 5.Servo motor holding brake is not released (faulty connection cable between servo amplifier and IL PCB unit, or faulty connection cable between the IL PCB and servo motor, or faulty SR PCB or IL PCB unit). 6.Broken or disconnected servo motor connection cable.	1.Replace the servo amplifier. 2.Replace the servo motor. 3.Monitor the load with the effective load monitor, check if the effective torque (thrust) exceeds the rated value, and revise the operation or load conditions. 4.Set the correct servo parameters. 5.Replace the cable, the SR PCB or the IL PCB unit. 6.Replace the cable.	○
566	Overload 2	42h	Overload 2 - Stall overload. 1.Faulty circuit inside the servo amplifier. 2.Faulty circuit inside motor encoder. 3.Faulty servo parameter setting. 4.Servo motor holding brake is not released (faulty connection cable between servo amplifier and IL PCB unit, or faulty connection cable between the IL PCB and servo motor, or faulty SR PCB or IL PCB unit). 5.Broken or disconnected servo motor connection cable.	1.Replace the servo amplifier. 2.Replace the servo motor. 3.Set the correct servo parameters. 4.Replace the cable, the SR PCB or the IL PCB unit. 5.Replace the cable.	○
567	Regeneration resistance overload	43h	Regeneration resistance overload - Regeneration resistance load rate has been exceeded. 1.Regenerative power supply capacity has been exceeded according to the internal regeneration resistance specifications. Load inertia (weight on table) is too great. Or, the takt time is too short. 2.Faulty circuit inside servo amplifier.	1.Revise the operation conditions. If the load inertia (weight on table) exceeds the specified range, set it to within the range. 2.Replace the servo amplifier.	○
581	Amplifier temperature error	51h	Amplifier temperature error - Overheating detected for servo amplifier ambient temperature. 1. Faulty circuit inside the servo amplifier. 2. Control box cooling fan is stopped.	1. Replace the servo amplifier. 2. Replace the control box cooling fan.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
582	Rush prevention resistor overheat	52h	Rush prevention resistor overheat - Overheating detected on rush prevention resistor. 1. Faulty circuit inside the servo amplifier. 2. Power supply turned ON too frequently. 3. Control box cooling fan is stopped.	1. Replace the servo amplifier. 2. Reduce the frequency for turning the power supply ON and OFF. 3. Replace the control box cooling fan.	○
583	DB resistor overheat	53h	Dynamic brake resistor overheating - Overheating detected on the dynamic brake resistor. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○
584	Internal regeneration resistance overheat	54h	Internal regeneration resistance overheat - Overheating detected on the internal regeneration resistance. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○
585	External error	55h	External error - Error in external regeneration resistor, etc. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○
597	Overvoltage	61h	Overvoltage - DC overvoltage on main circuit. 1. Faulty circuit inside the servo amplifier. 2. Main circuit power supply voltage is outside the specified range.	1. Replace the servo amplifier. 2. Make sure that the power supply voltage is within the specified range.	○
598	Main circuit power shortage	62h	Main circuit power shortage - DC voltage sag on main circuit. 1. Main circuit power supply voltage is below the specified range. 2. Faulty circuit inside the servo amplifier.	1. Make sure that the power supply voltage is within the specified range. 2. Replace the servo amplifier.	○
599	Main power supply open-phase	63h	Open-phase on main power supply - One phase in a 3 phase main circuit power supply is open. 1. One phase is not being input in a 3 phase input R, S and T. 2. Faulty circuit inside the servo amplifier.	1. Check the wiring, and fix any incorrect wiring. 2. Replace the servo amplifier.	○
613	Control power shortage	71h	Insufficient control power supply voltage - The control input power supply voltage dropped or a transient power fault occurred. 1. Faulty circuit inside the servo amplifier. 2. Power supply input voltage is below the specified range.	1. Replace the servo amplifier. 2. Make sure that the power supply voltage is within the specified range.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
614	12V power shortage	72h	Insufficient control power supply voltage 1 - +-12 V voltage dropped on the switching power supply used for control. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	○
629	Pulse signal error 1	81h	Phase A / Phase B pulse signal error - Problem with encoder wiring. - Faulty circuit inside motor encoder. - Faulty circuit inside the servo amplifier.	1. Replace the cable. 2. Replace the servo amplifier. 3. Replace the servo motor.	×
630	Abs. signal disconnection	82h	Absolute encoder signal disconnection - Problem with encoder wiring. - Faulty circuit inside motor encoder. - Faulty circuit inside the servo amplifier.	1. Replace the cable. 2. Replace the servo amplifier. 3. Replace the servo motor.	○
631	External encoder signal error	83h	External encoder phase A / B signal error - Problem with encoder wiring. - Faulty circuit inside motor encoder. - Faulty circuit inside the servo amplifier.	1. Replace the cable. 2. Replace the servo amplifier. 3. Replace the servo motor.	○
632	Encoder communication error	84h	Communication error between encoder and amplifier - Problem with encoder wiring. - Faulty circuit inside motor encoder. - Faulty circuit inside the servo amplifier.	1. Replace the cable. 2. Replace the servo amplifier. 3. Replace the servo motor.	○
633	Encoder initial error	85h	Encoder initial processing error - Error in reading CS data for incremental encoder. - Absolute encoder initial processing error. - Broken or disconnected cable. 1. Error in encoder wiring. 2. Faulty circuit inside the servo amplifier. 3. Faulty circuit inside motor encoder.	1. Replace the cable. 2. Replace the servo amplifier. 3. Replace the servo motor.	×
635	CS disconnected	87h	CS disconnected - Broken or disconnected CS signal line. 1. Error in encoder wiring. 2. Faulty circuit inside the servo amplifier. 3. Faulty circuit inside motor encoder.	1. Replace the cable. 2. Replace the servo amplifier. 3. Replace the servo motor.	×
645	Encoder command error	91h	Encoder command error - Problem with encoder wiring. - Faulty circuit inside motor encoder.	1. Replace the servo motor. 2. Replace the cable.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
646	Encoder FORM error	92h	Encoder FORM error - Problem with encoder wiring. - Faulty circuit inside motor encoder.	1. Replace the servo motor. 2. Replace the cable.	○
647	Encoder SYNC error	93h	Encoder SYNC error - Problem with encoder wiring. - Faulty circuit inside motor encoder.	1. Replace the servo motor. 2. Replace the cable.	○
648	Encoder CRC error	94h	Encoder CRC error - Problem with encoder wiring. - Faulty circuit inside motor encoder.	1. Replace the servo motor. 2. Replace the cable.	○
661	Encoder error 1	A1h	Encoder error 1 - Faulty circuit inside motor encoder.	Replace the servo motor.	○
662	Battery is low (Symbol display)	A2h	Absolute encoder battery error - Low battery voltage.	Replace the backup batteries.	○
663	Encoder overheating	A3h	Serial encoder internal error 9 - Encoder inside servo motor overheated.	Replace the servo motor.	○
665	Encoder error 3	A5h	Serial encoder internal error 3 - Overspeed error.	Replace the servo motor.	○
666	Encoder error 4	A6h	Serial encoder internal error 6 - Multi-turn counter error detected.	Replace the servo motor.	○
667	Encoder error 5	A7h	Encoder internal error 5 1.ST error. The absolute sensor and the ASIC internal shift register data do not match (not spindle). 2.Excessive load and position information became invalid. 3.Communication error occurred during axis operation, and position information became invalid. 4.Pulse error (spindle without CTS) 5.Single-turn counter error detected (spindle or lathe spindle with CTS)	Revise the operation conditions when an error occurs during operation. Reset the absolute encoder counter and readjust the position if the error occurs even when the power is turned OFF and back ON. Replace the servo motor if the error still occurs even after performing the recovery steps above..	○
668	Encoder error 6	A8h	Encoder error 6 - Faulty circuit inside motor encoder.	Replace the servo motor.	○
669	Encoder error 9	A9h	Encoder internal error 9 - Operation temperature error	Replace the servo motor.	○
678	Encoder error 2	B2h	Encoder error 2 - Faulty circuit inside motor encoder.	Replace the servo motor.	○
679	Rotation amount counter error	B3h	Rotation amount counter error on absolute encoder - Faulty circuit inside motor encoder.	Replace the servo motor.	○
680	1 rotation counter error	B4h	Single rotation counter error on absolute encoder - Faulty circuit inside motor encoder.	Replace the servo motor.	○
681	Initial speed exceeded	B5h	Speed tolerance exceeded when absolute encoder power is ON - Faulty circuit inside motor encoder.	Replace the servo motor.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
682	Encoder memory error	B6h	Encoder internal memory error - Faulty circuit inside motor encoder.	Replace the servo motor.	○
683	Acceleration error	B7h	Acceleration error - Faulty circuit inside motor encoder. - Motor rotation acceleration exceeds speed tolerance.	1. Replace the servo motor. 2. Set the correct servo parameters.	○
693	Overspeed	C1h	Overspeed - 120% of maximum motor speed exceeded. 1. Faulty circuit inside the servo amplifier. 2. Faulty circuit inside motor encoder.	1. Replace the servo amplifier. 2. Replace the servo motor.	○
694	Speed control error	C2h	Speed control error - The current command and acceleration sign do not match. 1. The U, V and W phase wiring between the servo amplifier and servo motor is incorrect. 2. The A and B phase wiring for the pulse encoder is incorrect. 3. The servo motor is vibrating (oscillating). 4. The U, V and W phase wiring between the servo amplifier and servo motor is incorrect.	1. Replace the cable.	○
695	Speed FB error	C3h	Speed feedback error 1.Servo motor power line broken or disconnected. 2.Faulty circuit inside servo amplifier. 3.When a door was opened/closed, the **[DOOR INTERLOCK MODE]** switch was changed at the same time.	1-1.Replace the cable. 1-2.Replace the servo motor. 2.Replace the servo amplifier. 3.Press the **[RST]** key. When opening/closing a door, do not change the setting on the **[DOOR INTERLOCK MODE]** switch at the same time.	○
709	Position deviation large	D1h	Position deviation large - Position deviation exceeds setting value. 1. Load inertia is too great. 2. Holding brake is not released. 3. One or all of the U, V and W phase wiring between the servo amplifier and servo motor is disconnected. 4. Faulty circuit inside the servo amplifier. 5. Faulty circuit inside motor encoder. 6. Voltage has dropped for main circuit power supply.	1. Revise the load conditions (weight on table). 2. Replace the cable or the servo motor. 3. Replace the cable. 4. Replace the servo amplifier. 5. Replace the servo motor. 6. Make sure that the power supply capacity for the main circuit and wiring are sufficient.	○
710	Position command error 1	D2h	Position pulse frequency error 1 - The digital filter settings command for the command pulse input was input.	Replace the servo amplifier or the NC PCB.	○

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
711	Position command error 2	D3h	Position pulse frequency error 2 - The command pulse input frequency is too high. - The electronic gear's setting value is too large.	Replace the servo amplifier or the NC PCB. Set the correct servo parameters.	○
723	Test mode ended	DFh	Test mode ended - End of test mode is detected. 1. This is an indication that the test mode has ended, and operation is normal. (After the test mode is executed, the deviation on the controller is expected to remain, and therefore an alarm is triggered.)	1. Reset the alarm to restore normal operation.	○
725	ROM error	E1h	EEPROM error - EEPROM error inside amplifier. 1. Faulty circuit inside the servo amplifier. (There was no response from EEPROM when the servo parameters are maintained.) (Faulty amplifier control PCB)	1. Replace the servo amplifier.	×
726	Check sum error	E2h	EEPROM check sum error - Check sum error over whole EEPROM range. 1. The correct values were not written to the CPU from the EEPROM in the servo amplifier. 2. There was an error in writing the values to EEPROM the last time the power supply was turned OFF.	1. Replace the servo amplifier. 2. Replace the servo amplifier.	×
727	Internal RAM error	E3h	Internal RAM error - Faulty circuit inside the servo amplifier.	Replace the servo amplifier.	×
728	CPU-ASIC processing error	E4h	Processing error between CPU and ASIC - Faulty circuit inside the servo amplifier.	Replace the servo amplifier.	×
729	Parameter error 1	E5h	System parameter error 1 - System parameters are outside setting range. 1. The system parameter values are outside the setting range. 2. Faulty circuit inside the servo amplifier.	1-1. Check the servo amplifier model number. 1-2. Check and adjust the system parameter setting values. Turn the power supply OFF and back ON again, and make sure that no alarm is triggered. 2. Replace the servo amplifier.	×

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
730	Parameter error 2	E6h	System parameter error 2 - System parameter combination error. - The system parameters and amplifier combination do not match. 1-1. The system parameter setting values and actual hardware combination is incorrect. 1-2. The system parameter setting combination is incorrect. 2. Faulty circuit inside the servo amplifier.	1-1. Check the servo amplifier model number. 1-2. Check and adjust the system parameter setting values. Turn the power supply OFF and back ON again, and make sure that no alarm is triggered. 2. Replace the servo amplifier.	×
731	Turn power off.	E7h	The user parameter (switch 2: stroke) setting <*-axis stroke control> was changed.	Turn the power supply OFF and back ON again.	×
732	Servo amplifier does not match	E8h	There is a problem with the type of servo amplifier connected.	Check the type of servo amplifier.	×
739	Point data error	EFh	Point data check sum error - Faulty circuit inside the servo amplifier.	Replace the servo amplifier.	×
741	Task processing error	F1h	Task processing error - CPU interrupt processing error. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×
742	Initial timeout	F2h	Initial timeout - Initialization processing was not completed within the specified time. 1. Faulty circuit inside the servo amplifier.	1. Replace the servo amplifier.	×

2.14.1.2 Servo warnings

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm bit	Cause	Remedy
1	Amplifier temperature	0	Amplifier temperature warning Amplifier ambient temperature is above the setting temperature range.	Revise the operation conditions.
3	Overload	2	Overload warning - The estimated value for a rise in the winding temperature exceeded the **[Overload warning level]**.	Revise the operation conditions.
4	Regenerative overload	3	Regeneration resistance overload warning - The alarm detection level for the regeneration resistance overload is 90% or higher.	Revise the operation conditions.
8	Position deviation large	7	Position deviation is too large - Position deviation warning setting value is being exceeded.	Revise the operation conditions.
10	Motor overheated	9	Servo motor overheat warning - The servo motor temperature is 130 degrees or higher, or the encoder temperature is 95 degrees or higher.	Revise the operation conditions.
11	Fan stopped	10	Fan stop warning - Cooling fan stopped for 20 seconds	1.Replace the servo amplifier fan. 2.Make sure that the fan power connector for the servo amplifier is connected.
15	(Symbol display)	14	Encoder warning - Battery voltage is below 3.0 V.	Replace the backup batteries.
17	Control power voltage reduction	15	Control power voltage drop - Control power supply is less than AC 147 V.	Replace the servo amplifier.
18	Converter is overloaded.	C0	Converter overload warning - Convertor overload error is at 90% or higher.	Revise the operation conditions.
19	Power unbalance ratio	C1	Power unbalance ratio warning - The unbalance ratio for the power supply phases is 4% or more (unbalance ratio for power supply voltages is approximately 5%).	Revise the operation conditions.
20	Converter is overcurrent.	C2	Converter overcurrent warning Power supply current at acceleration is 120% or higher than maximum converter current. This alarm may be caused by an unbalance in the power when the spindle acceleration and feed axis acceleration overlap.	Revise the operation conditions. If the problem does not improve, replace the ACL or the servo amplifier.
501	Amplifier overheat	0	Amplifier overheat warning - Temperatures that are 90 degrees or higher, or -10 degrees or lower, is detected by the servo amplifier's internal temperature sensor.	Revise the operation conditions.
503	Overload	2	Overload warning - The estimated value for a rise in the winding temperature exceeded the **[Overload warning level]**.	Revise the operation conditions.

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm bit	Cause	Remedy
504	Regenerative overload	3	Regeneration resistance overload warning - The alarm detection level for the regeneration resistance overload is 90% or higher.	Revise the operation conditions.
507	(Symbol display)	6	Encoder warning Refer to auxiliary number 15.	
508	Position deviation large	7	Position deviation is too large - Position deviation warning setting value is being exceeded.	Revise the operation conditions.

2.14.1.3 Servo communication errors

Supp. No.	Messages displayed as supplementary messages (XXX)	Abort code	Cause	Remedy	Cancel level
1		0503 0000h	Toggle bit did not change.	The servo amplifier may be faulty. Replace the servo amplifier.	×
2		0504 0000h	SDO protocol timeout.	The servo amplifier may be faulty. Replace the servo amplifier.	×
3		0504 0001h	Client/Server command code is invalid or unknown.	The servo amplifier may be faulty. Replace the servo amplifier.	×
4		0505 0005h	Outside memory range.	The servo amplifier may be faulty. Replace the servo amplifier.	×
5		0601 0000h	Incompatible object accessed.	The servo amplifier may be faulty. Replace the servo amplifier.	×
6		0601 0001h	Read attempt made on object that is write-only.	The servo amplifier may be faulty. Replace the servo amplifier.	×
7		0601 0002h	Write attempt made on object that is read-only.	The servo amplifier may be faulty. Replace the servo amplifier.	×
8		0601 0003h	Sub index cannot be written. Sub index 0 needs to be cleared for writing access.	The servo amplifier may be faulty. Replace the servo amplifier.	×
9		0601 0004h	SDO complete access is not supported for variable length objects such as ENUM object types.	The servo amplifier may be faulty. Replace the servo amplifier.	×
10		0601 0005h	Object length exceeds the email box size	The servo amplifier may be faulty. Replace the servo amplifier.	×
11		0601 0006h	SDO download was blocked due to an RxPDO mapping object	The servo amplifier may be faulty. Replace the servo amplifier.	×
12		0602 0000h	Object does not exist in the object dictionary.	The servo amplifier may be faulty. Replace the servo amplifier.	×
13		0604 0041h	PDO mapping is not possible on object.	The servo amplifier may be faulty. Replace the servo amplifier.	×
14		0604 0042h	Number or data length of mapping object exceeds PDO limit.	The servo amplifier may be faulty. Replace the servo amplifier.	×
15		0604 0043h	Incompatibility in general parameters.	The servo amplifier may be faulty. Replace the servo amplifier.	×
16		0604 0047h	Incompatibility in general device content.	The servo amplifier may be faulty. Replace the servo amplifier.	×
17		0606 0000h	Access error due to hardware error.	The servo amplifier may be faulty. Replace the servo amplifier.	×
18		0607 0010h	Data type mismatch or service parameter length does not match.	The servo amplifier may be faulty. Replace the servo amplifier.	×

Supp. No.	Messages displayed as supplementary messages (XXX)	Abort code	Cause	Remedy	Cancel level
19		0607 0012h	Data type mismatch or service parameter length is too long.	The servo amplifier may be faulty. Replace the servo amplifier.	×
20		0607 0013h	Data type mismatch or service parameter length is too short.	The servo amplifier may be faulty. Replace the servo amplifier.	×
21		0609 0011h	Sub-index does not exist.	The servo amplifier may be faulty. Replace the servo amplifier.	×
22		0609 0030h	Parameter value range exceeded. (for writing access)	Check the servo parameter values. Replace the servo amplifier.	×
23		0609 0031h	Write parameter is too large.	The servo amplifier may be faulty. Replace the servo amplifier.	×
24		0609 0032h	Write parameter is too small.	The servo amplifier may be faulty. Replace the servo amplifier.	×
25		0609 0036h	Maximum value is smaller than minimum value.	The servo amplifier may be faulty. Replace the servo amplifier.	×
26		0800 0000h	General error.	The servo amplifier may be faulty. Replace the servo amplifier.	×
27		0800 0020h	Data cannot be sent to or stored in the application.	The servo amplifier may be faulty. Replace the servo amplifier.	×
28		0800 0021h	Data cannot be sent to or stored in the application due to local control.	The servo amplifier may be faulty. Replace the servo amplifier.	×
29		0800 0022h	Data cannot be sent to or stored in the application in the current device state.	The servo amplifier may be faulty. Replace the servo amplifier.	×
30		0800 0023h	Object dictionary does not exist.	The servo amplifier may be faulty. Replace the servo amplifier.	×

2.14.1.4 Servo status errors

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
1			Servo amplifier cannot be found.	Check the rotary switch for the servo amplifier. Check the connection on the communications cable. The servo amplifier may be faulty. Replace the servo amplifier. If the machine model is equipped with an FE unit (gateway) option, then check the LED light status for the FE unit.	×
2			Servo amplifier cannot be started.	The servo amplifier may be faulty. Replace the servo amplifier.	×
3			Parameter writing/reading operation timeout.	Check the connection on the communications cable. The servo amplifier may be faulty. Replace the servo amplifier.	×
4			Parameter mismatch.	Check the connection on the communications cable. The servo amplifier may be faulty. Replace the servo amplifier.	×
5			Periodic communication timeout.	Check the connection on the communications cable. The servo amplifier may be faulty. Replace the servo amplifier.	×
6			Command sent to the amplifier but not completed after the specified time has elapsed.	Check the connection on the communications cable. The servo amplifier may be faulty. Replace the servo amplifier.	×
7			Servo readiness for X-, Y- and Z-axes is ON but the main circuit power supply for the spindle is OFF.	Check the power supply voltage for the main circuit. Power supply capacity for supplied power is insufficient. Check the connection on the communications cable. Servo relay KS1 may be faulty. Replace the servo amplifier.	○
8			Servo readiness cannot be checked from the amplifier after the specified time has elapsed.	Check the connection on the communications cable. The servo amplifier may be faulty. Replace the servo amplifier. Make sure that the x14 connector on the servo amplifier is connected.	○
9			Error is returned from the amplifier when FoE is written.	Make sure that the file that is being written is correct. Check the connection on the communications cable. The servo amplifier may be faulty. Replace the servo amplifier.	×
10			FoE writing operation is not complete even after the specified time has elapsed.	Check the connection on the communications cable. The servo amplifier may be faulty. Replace the servo amplifier.	×
11			Command was sent to the amplifier, but it was not completed even after the specified time had elapsed. (Amplifier for positioning)	Check the connection on the communications cable. The servo amplifier may be faulty. Replace the servo amplifier.	×

Supp. No.	Messages displayed as supplementary messages (XXX)	Amp alarm code	Cause	Remedy	Cancel level
12			NC target position and the amplifier's command position do not match. (amplifier for positioning)	Check the connection on the communications cable. The servo amplifier may be faulty. Replace the servo amplifier.	×

CHAPTER 3

MACHINING LOAD MONITOR FUNCTION

3.1 Overview
3.2 Flow When Using Machining Load Monitor Function
3.3 Setting Machining Load Monitor Segments
3.4 Machining Load Monitor Settings
3.5 Examples When Using Machining Load Monitor Function
3.6 PLC Signals
3.7 External Output Signals
3.8 Macro Variables
3.9 Waveform Display
3.10 Machining Load Measurement Conditions
3.11 Special Notes

3.1 Overview

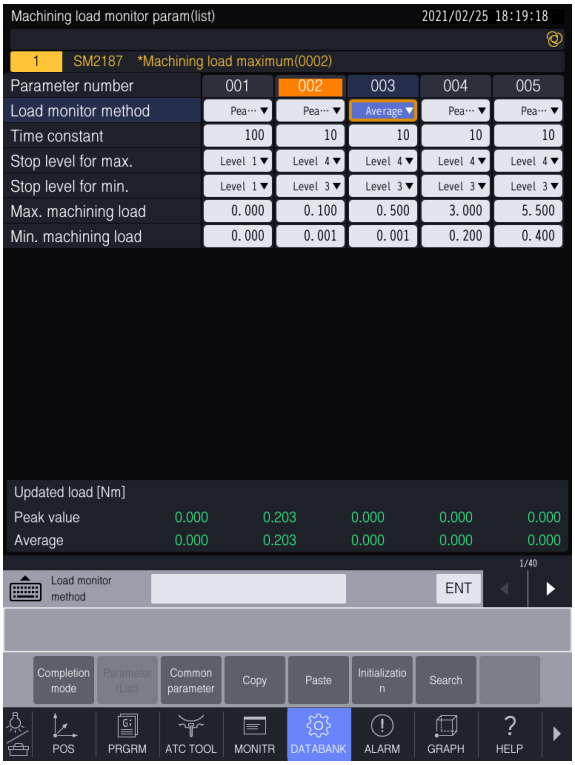
This function measures and monitors the machining load on the spindle. It assesses whether the machining is being carried out properly based on the threshold value set by the customer.
If the machining load exceeds the threshold value set by the customer or falls below it, a notice can be set to prompt the user when the machine stops or an alarm triggers.
When using this function, the parameters need to be set to match the tool and machining conditions.
This function can be enabled and disabled by the <Machining load monitor function> in the common parameter for the machining load monitor. When using this function, set the parameter to <1: Enable>.

(NOTICE) This function is not guaranteed to assess 100% of the time whether the machining is carried out properly or not.

3.2 Flow When Using Machining Load Monitor Function

The measured machining load is different even on the same tool depending on the machining conditions. As a result, the threshold value for the machining load must be set and matched to the tool and machining conditions.
The standard procedure for using the machining load monitor function is shown below.

(1) Set the common parameter <Machining load monitor function> to <1: Enable>.
(2) Select the parameter number used for monitoring on the screen to set the machining load monitor parameters (list). Press the <Initialization> key to initialize the set value (machining load measurement is only carried out).
(3) When using NC language mode, add the M code to enable and disable the machining load monitor in the program. When using conversation language mode, add the auxiliary function to enable and disable the machining load monitor.
(4) Perform test machining that actually cuts in order to determine the threshold value.
(5) On the screen for setting the machining load monitor parameters (list), set the <Load monitor method>, <Max. machining load>, <Stop level for max.>, <Min. machining load> and <Stop level for min.>, using the updated load that is measured (average and peak values) as a reference.



(6) When machining is performed, the machining load monitor is carried out using the conditions that are set.

3.3 Setting Machining Load Monitor Segments

3.3.1 M function (NC language mode only)

Use the M code below to enable or disable the machining load monitor function when in NC language mode.

M code	Description	Maximum machining load monitor	Minimum machining load monitor	Timing of axis travel	Modal / One shot
M340	Machining load monitor OFF	No	No	Before	Modal
M341	Machining load monitor ON	Yes	Yes	Before	
M342	Machining load monitor ON (Max. only)	Yes	No	Before	
M343	Machining load monitor ON (Min. only)	No	Yes	Before	

The M340 modal (function OFF) is enabled following the timing below.

- During tool change (G100/M06)
- At memory operation start
- At power ON
- During a reset
- At operation end
- At operation reset

When enabling a function with an M code, use the same number for the machining load monitor parameter as the tool number for the tool on the spindle to start the load monitor. In addition, the E address after the M code can be used to specify which machining load monitor parameter is used.

Command format

```
M340
M341 E__
M342 E__
M343 E__
```

E: Machining load monitor parameter number (1 to 99, 201 to 299)

Ex:

In the example below, the maximum and minimum machining loads are monitored at the same time on line N3. At this time, the machining load is monitored using the No.4 machining load monitor parameter.

```
N1 G100 T4 Z20.   M03 S10000 ;
N2 M341 ;                 <-------Machining load monitor ON
N3 G01 X-10.    ;         Load monitor executing (using parameter No.4)
N4 M340 ;                 <-------Machining load monitor OFF
N5 Y-10.    ;
```

In addition, the maximum and minimum machining loads are monitored at the same time as shown on line N3 in the example below. However, in this case, “1” is specified as the E address after M341 on line N2. Machining load monitor parameter No.1 is used for monitoring.

```
N1 G100 T4 Z20.   M03 S10000 ;
N2 M341 E1 ;              <-------Machining load monitor ON
N3 G01 X-10.    ;         Load monitor executing (using parameter No.1)
N4 M340 ;                 <-------Machining load monitor OFF
N5 Y-10.    ;
```

3.3.2 Auxiliary function (Conversation language mode only)

Use the auxiliary functions below to enable or disable the machining load monitor function when in conversation language mode.

Auxiliary function	Description	Maximum machining load monitor	Minimum machining load monitor	Timing of axis travel
340	Machining load monitor OFF	No	No	Before
341	Machining load monitor ON	Yes	Yes	Before
342	Machining load monitor ON (Max. only)	Yes	No	Before
343	Machining load monitor ON (Min. only)	No	Yes	Before

The functions are disabled at the following times.

- During tool change (G100/M06)
- At memory operation start
- At power ON
- During a reset
- At operation end
- At operation reset

When using an auxiliary function, a machining load monitor parameter number cannot be specified if it is different from the number of the tool being used. When enabling a function with an auxiliary function, use the same number for the machining load monitor parameter as the tool number for the tool on the spindle to start the load monitor. Make sure that the tool number on the tool list screen and the parameter number for the machining load monitor match each other in order to use these functions.

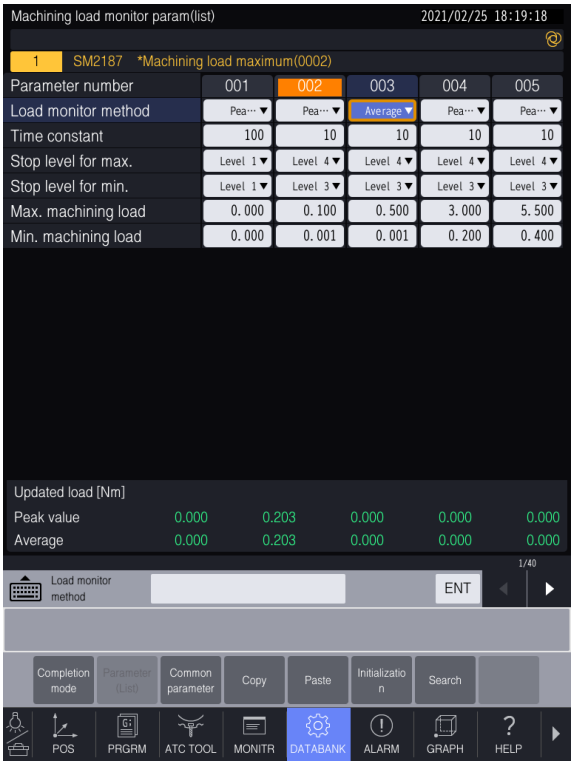
Ex: When the drill is set to tool No.1 and the tap is set to tool No.5 on the tool list screen, the drill setting must be entered to data number 1 for the machining load monitor parameter and the tap setting must be entered to data number 5.

3.4 Machining Load Monitor Settings

This function is used to set the parameters at the setting screen in the data bank menu. Refer to “3.5 Examples when using machining load monitor function” for further details on each parameter setting.

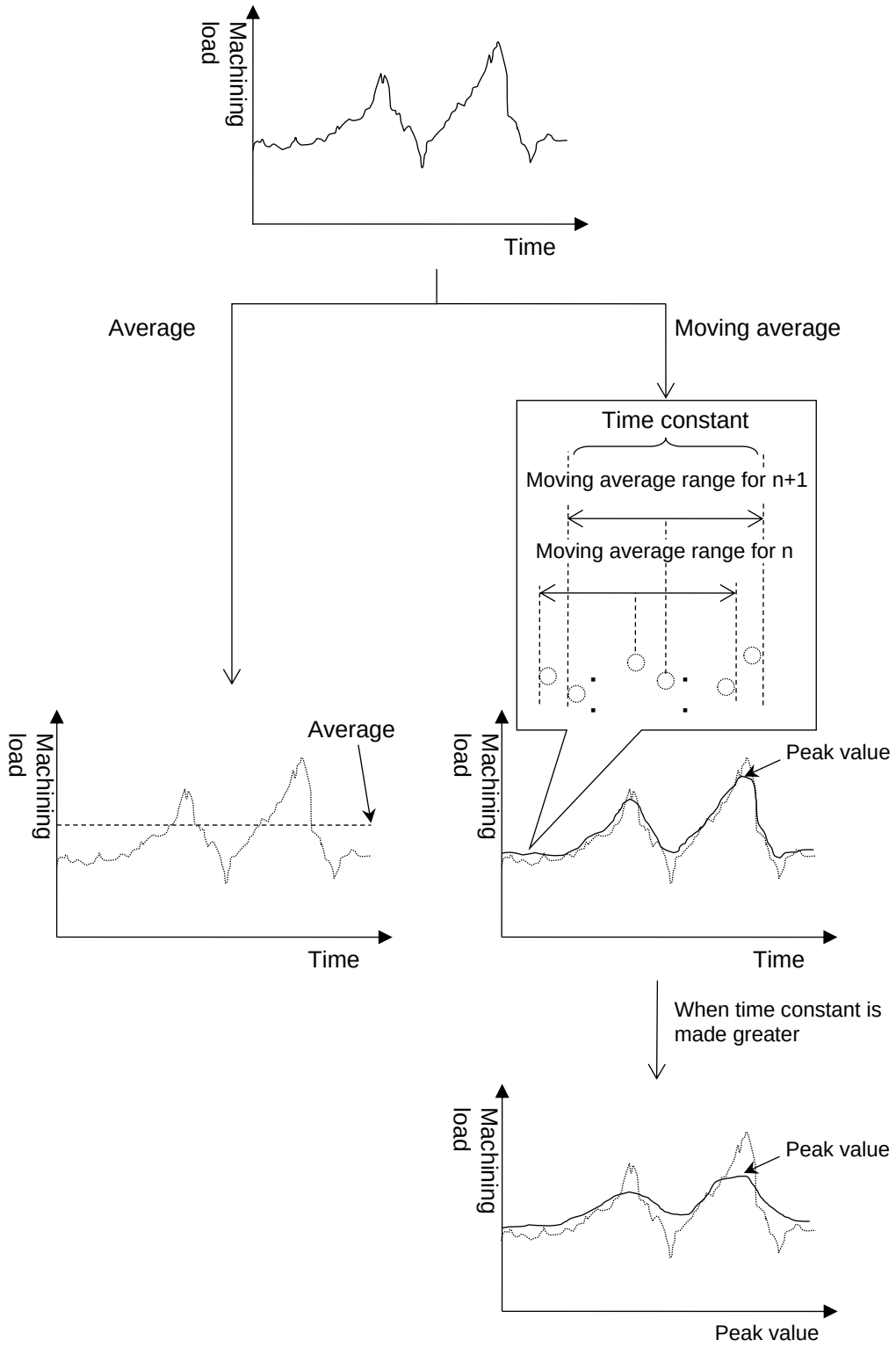
3.4.1 Machining load monitor parameter (list) screen

Set the machining load monitor for one tool (or cutting conditions) in each column on the parameter screen. The user can register up to 198 data records for parameter No. 001 to 099 and 201 to 299. Each item that can be set and its description is shown below.



(1) Load monitor method
Select the machining load monitor method.
0: Peak value
The threshold value is assessed based on the moving average value using the <Time constant> for the measured machining load (refer to figure below).
The maximum (peak value) in the moving average value is used for the threshold value.
The machining load is not measured while the spindle is accelerating/decelerating.

1: Average value
The threshold value is assessed based on the machining load average taken from the start of the machining load measurement until the end of the measurement (refer to figure below).
The machining load is measured while the spindle is accelerating/decelerating.



(2) Time constant
Set the time constant used for the moving average calculation (peak value calculation). (Refer to figure above)
The unit is in [msec] (1 to 999). Normally, the factory-default setting (100[msec]) can be used as is. Normally, the factory-default setting can be used as is. When making the unit value larger, variation per measurement becomes less and the machining load can be measured more consistently. However, any instant fluctuation in the machining load is harder to detect. When changing the unit value, perform test machining before actual machining and make sure that it detects correctly beforehand.

(3) Stop level for max.
Set the stop level for the alarm <<Machining load maximum>> when the measured machining load in the monitoring segment exceeds the <Max. machining load>.
0: Level 1
Operation does not stop.
1: Level 2
Operation stops after 1 cycle.
2: Level 3
Operation stops at the block.
3: Level 4
Operation pauses.

(4) Stop level for min.
Set the stop level for the alarm <<Machining load minimum>> when the measured machining load in the monitoring segment falls below the <Min. machining load>.
0: Level 1
Operation does not stop.
1: Level 2
Operation stops after 1 cycle.
2: Level 3
Operation stops at the block.

(5) Max. machining load
Set the threshold value to trigger the alarm <<Machining load maximum>>.
When <Max. machining load> is initialized (0 or blank field), the alarm <<Machining load maximum>> does not trigger. The unit is in [Nm] (0.000 to 999.999).

(6) Min. machining load
Set the threshold value to trigger the alarm <<Machining load minimum>>.
When <Min. machining load> is initialized (0 or blank field), the alarm <<Machining load minimum>> does not trigger. The unit is in [Nm] (0.000 to 999.999).

Checking measurement results

The results from the actual machining load measurement are displayed at the bottom of the screen. The items and their descriptions are shown below. However, the parameter number fields are displayed in orange when the machining load is in the middle of being measured.

(1) Updated load(Peak value)
Maximum machining load when the travel is averaged from the start of the machining load measurement until it is complete.

(2) Updated load(Average)
Average machining load when measuring from the start of the machining load monitor until it is complete.

The machining load measurement is carried out using both of the above methods regardless of the <Load monitor method> setting. Both items are updated on the screen. (The parameter <Load monitor method> determines which of these measurement values is used for assessing the threshold value).
The unit is in [Nm].

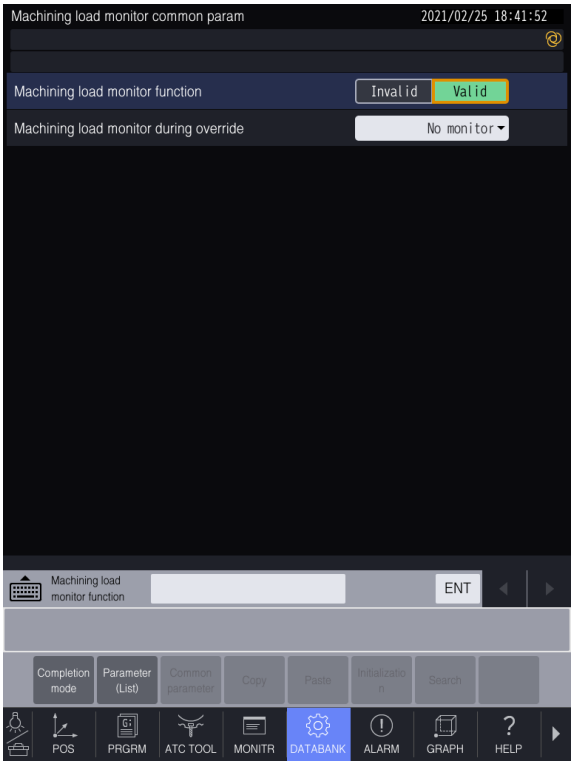
Timing when threshold value is assessed and when measurement value is updated
For the machining load that is measured, the following describes the timing when the <Max. machining load> and <Min. machining load> are assessed and when the <Updated load (Average and peak value)> is updated.

- When changing from modals M341, M342 and M343 (monitor ON) to modal M340 (monitor OFF) (Ex: M341 → M340)
- When a tool change is carried out while modal M341, M342 or M343 (monitor ON) is engaged (Ex: M341 → G100 T3)
- When an M341, M342 or M343 (monitor ON) command is issued again while modal M341, M342 or M343 (monitor ON) is engaged (Ex: M341→ M342, M341 E1 → M341 E2)

When the <Load monitor method> is set to <0: Peak value>, the <Max. machining load> is constantly assessed during the M341 and M342 modals. If the alarm <<Machining load maximum>> is triggered, the <Updated load (Average and peak value)> is updated.

3.4.2 Common parameter screen for machining load monitor

On this screen, the overall settings for the machining load monitor function are configured. Each item that can be set and its description is shown below.



(1) Machining load monitor function
Enable or disable the machining load monitor function.
0: Disable
1: Enable

(2) Machining load monitor during override
Set whether or not to monitor the machining load when the spindle override and feedrate override are not set to 100%.
To carry out the machining load monitor while the override is not set to 100%, set this to <1: Monitor>. When set to <0: No monitor>, if an attempt is made to perform the machining load monitor while the override is not set to 100%, the alarm <<Machining load could not be measured>> is triggered and the machining load monitor is not carried out.
0: No monitor
1: Monitor

3.4.3 Moving cursor

Use the cursor keys to move the cursor to the item you wish to change.
The user can move the cursor more quickly to change a specific parameter number by using the search function (on the machining load monitor parameter (list) screen only). Enter the parameter number into the data input field, and press the **[Search]** key. The cursor moves to the parameter number that is specified.

3.4.4 Enter data directly

(1) Move the cursor to the item you wish to change.
(2) Enter the value into the data input field, and press the **[ENT]** key.
The value is input at the cursor's position, and the cursor moves to the next item.

3.4.5 Copy parameter (Machining load monitor parameter (list) screen only)

(1) Move the cursor to the column for parameter numbers that you wish to import.
(2) Press the <Copy> key.
Import the parameter group 1 at the cursor position.
The imported parameters are saved until other parameters are imported or until the power is turned OFF.

3.4.6 Paste parameter (Machining load monitor parameter (list) screen only)

(1) Move the cursor to the column for the parameter numbers where you wish to paste the imported parameters.
(2) Press the <Paste> key.
Parameter group 1, where the cursor is, changes to the parameters that are imported.

3.4.7 Initialize parameter (Machining load monitor parameter (list) screen only)

(1) Move the cursor to the column for the parameter numbers that you wish to initialize.
(2) Press the <Initialization> key.
Parameter group 1, where the cursor is, initializes.

3.4.8 Exit editing

After the setting is completed, press the <Completion mode> key to end and exit editing.

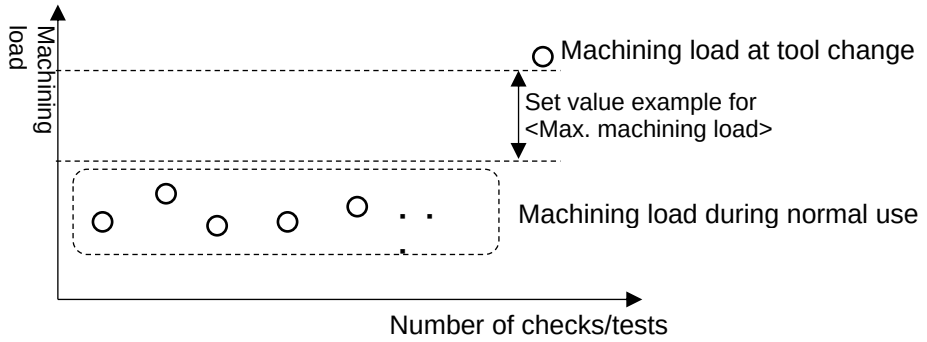
3.5 Examples When Using Machining Load Monitor Function

The parameter settings are different depending on how the user wishes to use the function. Refer to following examples.

3.5.1 Timing reference for tool change

If the tool status deteriorates due to wear or other factors, the machining load tends to increase. The customer can use this features to check and detect the right timing to change the tool according to the customer's preferences.

(1) Follow the description in "3.2 Flow when using machining load monitor function" and perform the test machining multiple times. Then, record the most recent machining load as the normal or standard machining load.
(2) Reproduce the tool status (when the tool status deteriorates) when the tool was changed (by the customer) and record that machining load.
(3) Set the <Max. machining load> between the machining load during normal use and the machining load at the time of a tool change based on the values taken in (1) and (2) above.

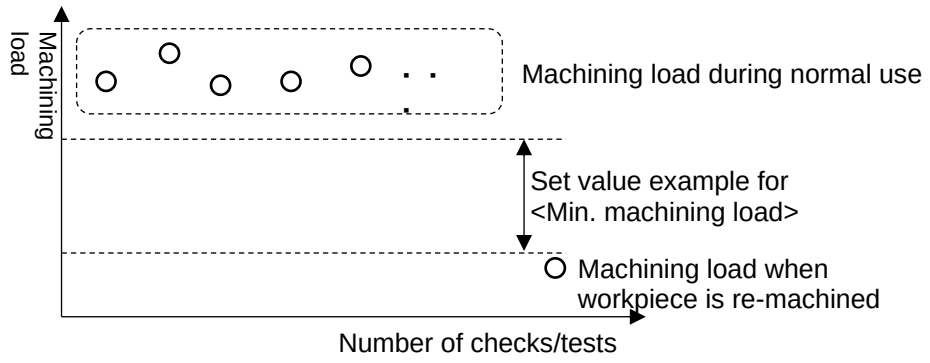


If there is no clear difference between the machining load under normal use and the machining load at the time of a tool change, this function will not be able to assess the timing appropriately. When the set value is changed based on "3.5.3 Parameter adjustment examples", a difference in the machining load under normal use and at the time of a tool change may become more distinct and clear.

3.5.2 Improve machining to avoid re-machining workpieces

If the same workpiece is machined (re-machined) without changing tools, the spindle machining load decreases more than normal use. However, the machining load will not necessarily become 0 because of the contact between the tool and the workpiece, etc. If a workpiece needs to be re-machined, then the workpiece was not machined properly. Therefore, set the <Min. machining load> appropriately to ensure a decrease in the machining load is detected.

(1) Follow the description in "3.2 Flow when using machining load monitor function" and perform the test machining multiple times. Then, record the most recent machining load as the normal or standard machining load.
(2) Re-machine a workpiece that was already machined properly without changing the workpiece, and then record that machining load.
(3) Set the <Min. machining load> between the machining load during normal use and the machining load when the workpiece was re-machined, based on the values taken in (1) and (2) above (refer to figure below).

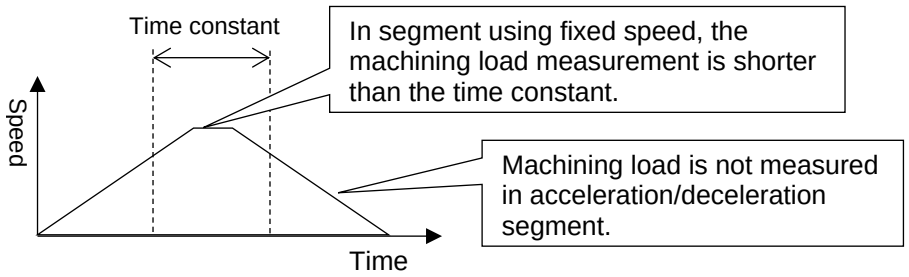


If there is no clear difference between the machining load under normal use and the machining load when a workpiece is re-machined, then this function cannot be used. When the set value is changed based on "3.5.3 Parameter adjustment examples", a difference in the machining load under normal use and when a workpiece is re-machined may become more distinct and clear.

3.5.3 Parameter adjustment examples

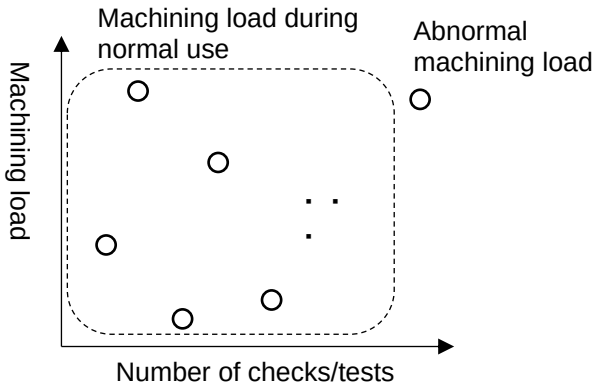
When using this function, the parameter may need to be adjusted depending on the situation. Refer to following examples.

<u>Monitoring the machining load when the segment using a fixed speed is short</u>
When the <Load monitor method> is set to <0: Peak value>, the machining load is not measured because the load is easily affected by the torque during acceleration/deceleration when the spindle accelerates and decelerates. In addition, the operator message <<Machining load could not be measured>> appears when the machining load that is measured does not follow the time constant. As a result, if the operator message <<Machining load could not be measured>> appears, the cause may be that the machining load measurement is shorter than the time constant in the segment using a fixed speed (as shown in the figure below). Therefore, this may be fixed by setting <Load monitor method> to <1: Average>.

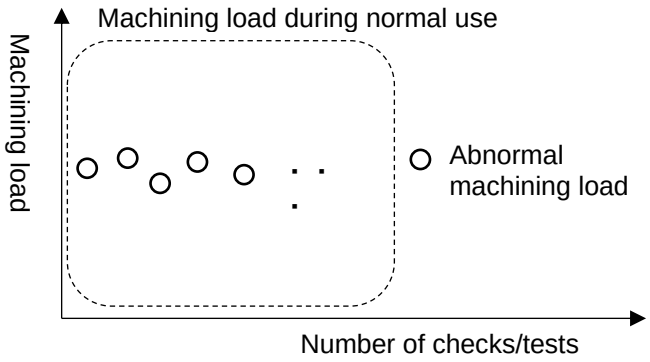


When a distinction cannot be made between normal and abnormal machining loads

If there is a big variation in the machining load as shown in the figure below and a distinction cannot be made between normal and abnormal machining loads, this distinction may be fixed or made clearer by making the <Time constant> bigger or by changing the <Load monitor method> to <1: Average>. If no distinction can be made even after changing this setting noted above, this function will not be able to assess appropriately.



Also, if there is little variation in the machining load as shown in the figure below and a distinction cannot be made between normal and abnormal machining loads, this distinction may be fixed or made clearer by making the <Time constant> smaller. If no distinction can be made even after changing this setting noted above, this function will not be able to assess appropriately.



When the machining load is not consistent

If the results based on the threshold value are not consistent, this could be attributed to a motor temperature change caused by the ambient temperature or by the heat produced by the motor. Refer to the following to determine whether this function can be used or not.

As a timing reference for a tool change, particularly when machining with a small machining load, be sure to check beforehand for any machining load changes caused by motor temperature fluctuation. For example, check the machining load in the morning when starting work (when the ambient temperature and motor temperature are low) and again during the day (when the ambient temperature and motor temperature are high). Then, consider revising the <Max. machining load>. If a clear distinction can be made between abnormal and normal machining loads regardless of the temperature, then after the threshold value is set to the appropriate value and this function can be used.

To improve machining to avoid re-machining workpieces, particularly when machining with a small machining load, be sure to check beforehand for any machining load changes caused by motor temperature fluctuation. For example, compare the machining load in the morning when starting work (when the ambient temperature and motor temperature are low) with the machining load during the day (when the ambient temperature and motor temperature are high). Then, consider revising the <Min. machining load>. If a clear distinction can be made between the machining load when a workpiece is re-machined and the machining load under normal use regardless of the temperature, then after the threshold value is set to the appropriate value and this function can be used.

Stop level setting examples when the maximum and minimum are reached
Refer to the following when setting the stop levels.

(NOTICE) In the event that damage results after the alarms <<Machining load maximum>> and <<Machining load minimum>> are triggered, the stop triggered by this function is designed to prevent a problem from becoming worse. This function is not designed to prevent damage 100% of the time.

Stop level	Usage example
<0: Level 1> (No stop)	To check the effectiveness of the setting after setting <Max. machining load> and <Min. machining load> (when the user does not wish to stop operation for misdetections in order to adjust the settings during actual machining, etc.)
<1: Level 2> (Cycle stop)	To put a measure in place such as a tool change at the end of the program during operation. (NOTICE 1)
<2: Level 3> (Block stop)	To stop quickly in order to minimize the impact or affect on the tool and workpiece. (NOTICE 2)
<3: Level 4> (Immediate stop)	To stop operation as quickly as possible. (NOTICE 3) (NOTICE 4)

(NOTICE 1) Machining is carried out until it is finished even if an alarm is triggered. Therefore, the setting may not prevent the spindle from becoming damaged or broken.
(NOTICE 2) Operation stops during canned cycle machining when the tool and workpiece move to a position away from each other. During other machining that is not a canned cycle, there is a risk that the tool or workpiece may become damaged because the machine stops while the tool and workpiece are in contact.
(NOTICE 3) During canned cycle tapping, operation stops after the tapping is complete.
(NOTICE 4) There is a risk that the tool or workpiece may become damaged because the machine stops while the tool and workpiece are in contact.

3.6 PLC Signals

This function can be disabled by a PLC signal.
In addition, the following monitoring data for the machining load can be output via PLC signals.

<<Machining load maximum>> detection, <<Machining load minimum>> detection, machining load monitoring status, current machining load 1, current machining load 2 and the current parameter number being used

The current machining load 1 is the machining load calculated using a moving average with the <Time constant> for the machining load monitor parameter being used.
The current machining load 2 is the machining load before applying a moving average with the <Time constant> for the machining load monitor parameter. The value is always set regardless if the machining load monitor function is ON or OFF. The unit is in Nm (Display unit: 0.001 Nm).
Refer to “4.2 Global OM description” in the PLC System Manual for further details.

3.7 External Output Signals

The following monitoring data for the machining load can be output via external signals.

<<Machining load maximum>> detection, <<Machining load minimum>> detection and the machining load monitoring status

Refer to “1.6 External I/O signals” in the Operation Manual (Data) for further details.

3.8 Macro Variables

The following items can be referenced using the macro system variables.

<Current machining load 1>
<Parameter No. being used> and the corresponding <Load monitor method>, <Time constant>, <Stop level for max.>, <Stop level for min.>, <Max. machining load> and <Min. machining load>
Parameter No.001 to 099 and 201 to 299 <Updated load (Peak value)> and <Updated load (Average)>

The <Current machining load 1> is the machining load calculated using a moving average with the <Time constant> for the machining load monitor parameter being used.
Refer to “6.2.6 System variables” in the Programming Manual (NC) for further details.

3.9 Waveform Display

The machining load waveform after applying the moving average can be displayed by selecting <3: Machining load 1> from the servo measurement items in the waveform display function.
The displayed machining load (peak value) is the machining load calculated using a moving average with the <Time constant> for the machining load monitor parameter being used.
However, the waveform does not display in the following situations (value is 0).

- When an axis that is not the <0: Spindle> is selected as the servo axis
- When the machining load is not measured, such as when M340 modal is engaged (function OFF) or when the spindle is accelerating or decelerating

The unit is in [Nm] (Display unit: 0.001 Nm).

The machining load waveform before applying the moving average can be displayed by selecting <4: Machining load 2> from the servo measurement items in the waveform display function. The displayed machining load is the machining load before applying the moving average with the <Time constant> for the machining load monitor parameter. The value is always displayed regardless if the machining load monitor function is ON or OFF.
However, the waveform does not display in the following situations (value is 0).

- When an axis that is not the <0: Spindle> is selected as the servo axis

The unit is in Nm (Display unit: 0.001 Nm).

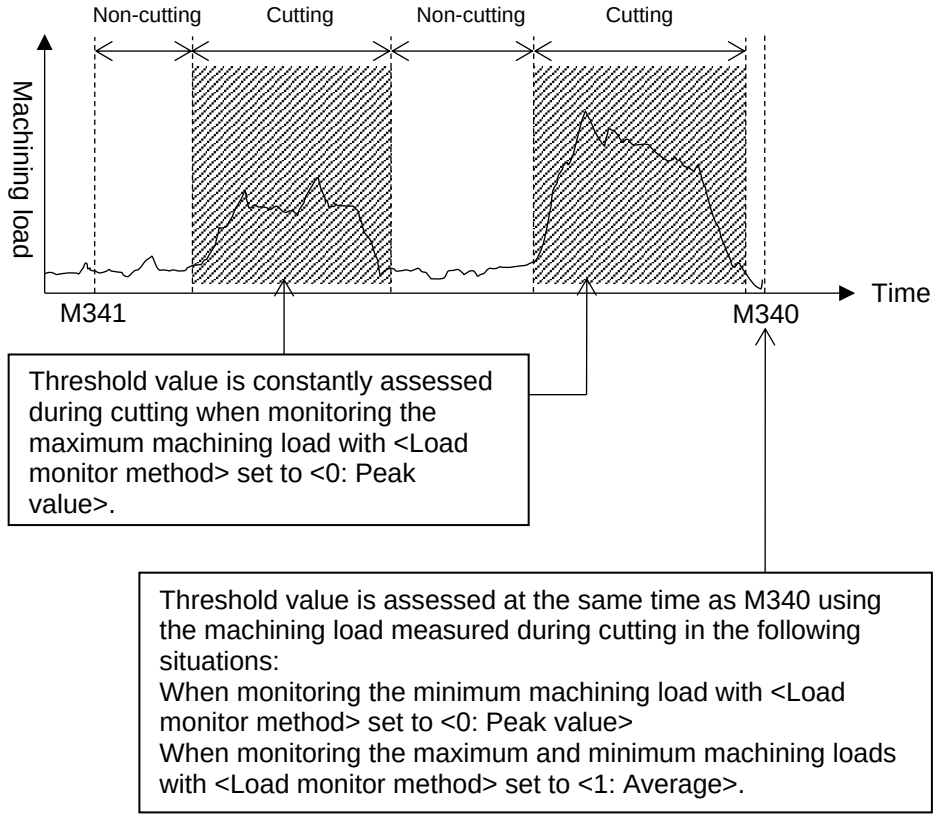
Refer to “6.5 Waveform display” in Operation Manual II for further details.

3.10 Machining Load Measurement Conditions

The machining load is measured when all of the following conditions are met.

- M341 to M343 modal is engaged (function is ON)
- Memory operation mode is engaged
- Cutting in progress
- Spindle rotating
- Dry run is not in progress
- Machine lock is not engaged
- Spindle is not accelerating/decelerating (Peak value only. The average is measured even if it is accelerating/decelerating.)

As a result, the machining load is measured and the machining load that is used for assessing the threshold value is only the diagonal stripe sections (as shown in the figure below). In addition, when the maximum machining load is monitored with <Load monitor method> set to <Peak value>, the threshold value is constantly assessed in the diagonal stripe sections noted below. In all other situations, the threshold value is assessed when the M340 is carried out (Refer to “Timing when threshold value is assessed and when measurement value is updated” under the section “1.9.4.1 Machining load monitor parameter (list) screen”).



3.11 Special Notes

- The machining load value that is measured is a guide for the user. This function is not designed for measuring the torque and force. The machining load that is displayed may be different from the actual machining load.
- When the machining conditions are changed, the machining load that is measured also changes. Revise the <Max. machining load> and <Min. machining load> so they are set to the appropriate values.
- The machining load that is measured may change depending on factors such as fluctuation in the temperature, power voltage or motor temperature.
- The machining load that is measured may change if a component is replaced like the motor. Make sure the <Max. machining load> and <Min. machining load> are set to the appropriate values.
- To issue an M341, M342 or M343 command without the E address, register the tool for monitoring the machining load on the ATC tool screen. If there is no tool mounted on the spindle that is registered, the alarm <<Machining load could not be measured>> is triggered and the machining load monitor will not start.
- This function cannot be used in MDI operation mode. If an M340, M341, M342 or M343 command is issued, the alarm <<Specified M code cannot be used>> is triggered.
- When the lathe spindle is selected while the machining load monitor modal is engaged, the operator message <<Machining load could not be measured>> appears and the machining load monitor stops.
- The machining load monitor is not possible while the lathe spindle selection modal is engaged. If an M341, M341, M342 or M343 command is issued, the alarm <<A command unable to select the lathe spindle>> is triggered.
- If an M340, M341, M342 or M343 command is issued on a machine where the machining load monitor function is unavailable, it follows user parameter (switch 1: programming) <Unregistered M-code>.
- When restarting a program in a segment where the machining load is monitored and when performing test machining, the machining conditions may change and the <<Machining load maximum>> and <<Machining load minimum>> may not be detected properly.
- If the program is stopped by pressing the **[FEED HOLD]** switch or by turning ON the **[SINGL]** key in memory operation, the machining load monitor is paused. Press the **[START]** switch to restart the machining load monitor. In this situation, when performing test machining, the machining conditions may change and the <<Machining load maximum>> and <<Machining load minimum>> may not be detected properly.
- If memory operation is paused by pressing the **[MANU]** key or by pressing the **[MDI]** key during memory operation, the machining load monitor is paused. When the **[MEM]** key is pressed to return back to memory operation mode and then the **[START]** switch is pressed to restore operation, the machining load monitor will restart.
  In this situation, when performing test machining, the machining conditions may change and the <<Machining load maximum>> and <<Machining load minimum>> may not be detected properly.
- When an M341, M342 or M343 modal is changed to the M340 modal using the reset operation, the <Max. machining load> and <Min. machining load> for the machining load being measured will not be assessed and the <Updated load (Average and peak value)> will not be updated.

CHAPTER 4

ATC MONITORING FUNCTION

4.1 ATC Monitoring Function
4.2 Tool Missing Detection Function

4.1 ATC Monitoring Function

4.1.1 Function overview

The ATC monitoring function detects when a tool was not properly changed. It helps prevent machine and tool damage or a machining defect, caused by a mounting error on the tool holder or a missing tool holder during machining.

This function does not use a sensor. It monitors the load pattern on the Z-axis to detect tool mounting errors. When an abnormal load pattern is detected, an alarm is triggered. Machine operation is stopped and it outputs the information to the global OM in the built-in PLC. The function detects “No tool” or “Tool over key” depending on the different scenarios where the load is abnormal.

The factory default settings are shown below for each detection function. When using this function, set the user parameters to another setting that is not <0: Disable>.

User parameter (switch 1: ATC/Magazine)	
<No tool detection function>	<0: Disable>
<Tool over key detection function>	<0: Disable>

On an arm type ATC machine model, <0: Invalid> can only be set because this function is not available.

4.1.1.1 No tool detection function

This function detects when there is no tool on the spindle during an unclamp or clamp operation on the tool holder during ATC. If the user forgets to mount a tool onto the magazine, or if there is a tool clamp error, this function prevents the operation from continuing to machine when there is no tool (i.e., the tool falls off because the tool is incorrectly mounted at an angle on the magazine). In addition, if a tool holder comes off of the spindle during machining, this function helps prevent machine damage caused by a collision between the spindle and the remaining tool. This function only monitors when in memory operation mode.
To use this function, set the <No tool detection function> in the user parameter (switch 1: ATC/Magazine) to <1:Type1>. Or, to stop operation under specific timing conditions, set it to <2: Method 2> and use the built-in PLC function to create separate processing conditions when an alarm occurs.

During an unclamp operation on a tool holder, if a tool is not mounted, the machine operation follows the settings below.

<No tool detection function>	Alarm	Operation when alarm is triggered	Built-in PLC Global OM
<1: Method 1>	<<No spindle tool during ATC (when ATC rises)>> triggers	Machine operation stops at Z-axis zero point	Turns ON <BX1CC No tool detection (when ATC rises)>
<2: Method 2>	Does not trigger	(Operation continues)	Turns ON <BX1CC No tool detection (when ATC rises)>

During a clamp operation on a tool holder, if a tool is not mounted, the machine operation follows the settings below.

<No tool detection function>	Alarm	Operation when alarm is triggered	Built-in PLC Global OM
<1: Method 1>	<<No spindle tool during ATC (when ATC falls)>> triggers	Machine operation stops at Z-axis zero point (NOTE 1)	Turns ON <BX1CD No tool detection (when ATC falls)>
<2: Method 2>	Does not trigger	(Operation continues)	Turns ON <BX1CD No tool detection (when ATC falls)>

No tool detection function monitors when a tool number is set on the ATC tool screen during clamp/unclamp operations on the tool holder.

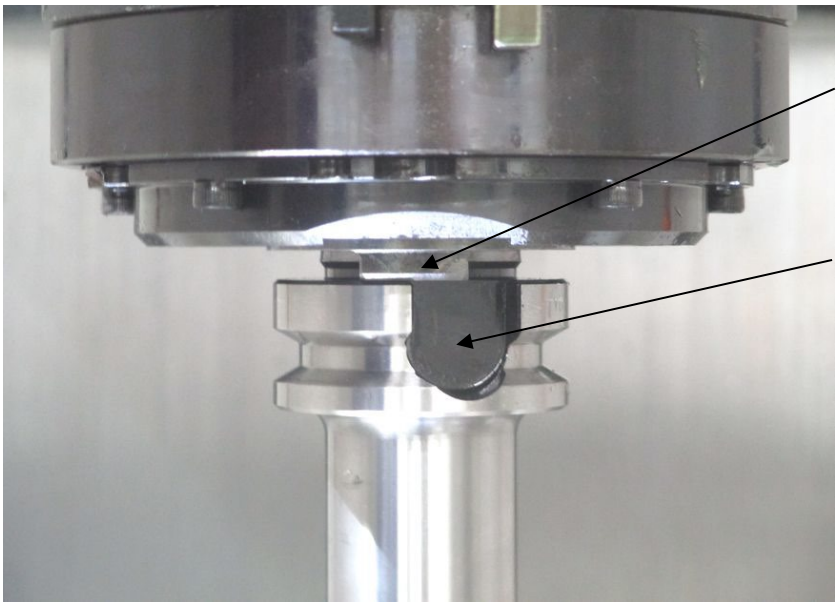
In order to perform a tool change in NC language on a magazine where there is no tool holder, change the tool number so it is not set on the ATC tool screen. Then, specify the magazine number (101-199) in the T code and perform the tool change. When using conversation language, change the tool number so it is not set on the ATC tool screen. Then, specify the magazine number (701-749) and perform the tool change using the signal output.

(NOTE 1) If the Z-axis command is issued using the tool change command (G100/M06), operation may stop at the position below the Z-axis zero point. However, it will not move beyond the command position.
(NOTE 2) Refer to the PLC System Manual for further details on the global OM.

4.1.1.2 Tool over key detection function

If the key pocket on the tool holder is not aligned with the key on the magazine grip, the tool holder goes over the spindle drive key when the tool is clamped and machining will not work properly. This function detects when the tool goes over the spindle drive key (tool over key) during a clamp operation on the tool holder during ATC. It monitors when in memory, MDI and manual operation modes.

Tool over key



To use this function, set the <Tool over key detection function> in the user parameter (switch 1: ATC/Magazine) to <1: Type 1>. Or, to stop operation under specific timing conditions, set it to <2: Method 2> and use the built-in PLC function to create separate processing conditions when an alarm occurs.

When a tool holder goes over the spindle drive key, the machine operation follows the settings below.

<Tool over key detection function>	Alarm	Operation when alarm is triggered	Built-in PLC Global OM
<1: Method 1>	<<Spindle tool misaligned during ATC>> triggers	Machine operation stops at Z-axis zero point (NOTE 1)	Turns ON <BX1CE Tool over key detection>
<2: Method 2>	Does not trigger	(Operation continues)	Turns ON <BX1CE Tool over key detection>

(NOTE 1) If the Z-axis command is issued using the tool change command (G100/M06), operation may stop at the position below the Z-axis zero point. However, it will not move beyond the command position.
(NOTE 2) Refer to the PLC System Manual for further details on the global OM.
(NOTE 3) The tool over key may be detected if there is a contaminant such as chips or shavings stuck between the spindle and tool.

4.1.2 Enable conditions

Each detection function monitors operation according to the table below.

Detection function	Manual operation	MDI operation	Memory operation
No tool detection	(Does not monitor)	(Does not monitor)	Tool change command
Tool over key detection	ATC	Tool change command	Tool change command

(NOTE 1) The function is disabled when the machine lock is ON.
(NOTE 2) The function is disabled when a door is open.

4.1.3 Notes

(NOTICE 1) Each detection function may not operate properly depending on the conditions. The following are examples of causes.

Cause	Countermeasure
Tool holder being used does not meet the limit requirements	Use a compliant tool holder per “3.7.2 Tool holder limits” in Operation Manual I.
Tool holder being used has a worn or loose pull stud.	
ATC monitoring function has not been adjusted after replacing parts related to the Z-axis feed mechanism or ATC mechanism.	An adjustment must be performed for the ATC monitoring function. Contact Brother or the nearest authorized dealer.
ATC monitoring function has not been adjusted after adjusting the Z-axis zero point.	
Part related to the Z-axis feed mechanism or ATC mechanism has deteriorated or failed.	The part(s) must be replaced. Contact Brother or the nearest authorized dealer.
Contaminants such as chips or shavings are stuck between the spindle and tool.	Wipe down the inside of the spindle with a dry rag or cotton swab and remove any chips or shavings that are inside. Keep cleaning until there are no more chips or shavings that are bigger than 0.3 mm. Do not use a screwdriver or similar tool because it can damage the spindle’s taper.

In addition, each detection function may not operate properly depending on the machine status, usage conditions and environment. The detection functions do not necessarily guarantee operation under all conditions.
To continue using the machine, set the user parameter (switch 1: ATC/Magazine) <No tool detection function> and <Tool over key detection function> to <0: Invalid>.

(NOTICE 2) Each detection function may not operate properly when there is a servo error. First, restore operation based on the servo error when a servo error is triggered with another alarm or error.

4.2 Tool Missing Detection Function

4.2.1 Function overview

The tool missing detection function monitors when a tool is missing or about to come off of the spindle. This function helps prevent damage caused by a collision between the spindle and the remaining tool. It monitors when the Z-axis rises in memory, MDI and manual operation modes.

If a tool gets stuck in the workpiece during tapping or other machining, the tool may come off from the spindle when the Z-axis rises thereafter. This function monitors when a tool comes off by the abnormal load that occurs on the Z-axis. When an abnormal load is detected, an alarm is triggered. Machine operation is stopped, it outputs the information to the global OM in the built-in PLC and it reports on the status.

The factory default value is <0: Invalid>. To use this function, set the <Tool missing detection function> in the user parameter (switch 1: ATC/Magazine) to <1: Type 1>. Or, to stop operation under specific timing conditions, set it to <2: Method 2> and use the built-in PLC function to create separate processing conditions when an alarm occurs.
When a tool holder is missing or about to come off of the spindle, the machine operation follows the settings below.

<Tool missing detection function>	Alarm	Operation when alarm is triggered	Built-in PLC Global OM
<1: Method 1>	<<Spindle tool missing>> triggers	Machine is stopped	Turns ON <BX1CF Tool missing detection>
<2: Method 2>	Does not trigger	(Operation continues)	Turns ON <BX1CF Tool missing detection>

(NOTE) Refer to the PLC System Manual for further details on the global OM.

On an arm type ATC machine model, <0: Invalid> can only be set because this function is not available.

4.2.2 Enable conditions

The tool missing detection is enabled when the Z-axis rises using manual operation mode or when the Z-axis rises using rapid feed/cutting feed in memory and MDI operation mode.

(NOTE) The function is disabled when the machine lock is ON.

4.2.3 Notes

(NOTICE 1) The tool holder missing cannot be detected while machining without the Z-axis rising, such as in milling.
(NOTICE 2) This detection function may not operate properly depending on the conditions. The following are examples of causes.

Cause	Countermeasure
Load is too big when machining with the Z-axis rising, such as in back boring.	Revise the machining method and/or machining conditions.
Part(s) related to the Z-axis feed mechanism or ATC mechanism has deteriorated or failed.	The part(s) must be replaced. Contact Brother or the nearest authorized dealer.

In addition, this function may not operate properly depending on the machine status, usage conditions and environment. This function does not necessarily guarantee operation under all conditions.
To continue to use the machine, set the user parameter (switch 1: ATC/Magazine) <Tool missing detection function> to <0: Invalid>.

(NOTICE 3) This detection function may not operate properly when there is a servo error. First, restore operation based on the servo error when a servo error is triggered with another alarm or error.

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CHAPTER 5

COLLISION DETECTION FUNCTION

5.1 Overview
5.2 Collision Detection Function
5.3 Collision Log (List)
5.4 Collision Log (Advanced Display)

5.1 Overview

This function detects a collision between the spindle (or tool) and workpiece or jig, etc.
If a collision is detected, machine operation stops immediately.
The collision log saves the most recent 10 alarms that are triggered by collision detection.

5.2 Collision Detection Function

5.2.1 Collision detection alarm

When a collision is detected during axis travel, one of the following collision alarms is triggered. The collision detection alarm is displayed on the collision log screen. Refer to “5.3 Collision log (list)” and “5.4 Collision log (advanced display)” for further details. The collision detection alarms, similar to the other alarms, are displayed in the alarm and operator message area, the current alarm screen and the alarm log screen.

Alarm message	Cause	Recovery procedure
X-axis collision detection	(A) Collision was detected on the X-axis. (B) This alarm was triggered at the same time due to a servo error. A collision may be detected mistakenly.	(A) After pressing the **[RST]** key, move the feed axis to a safe position while checking the machine status. (B) First, restore operation based on the servo error when a servo error also is triggered.
Y-axis collision detection	(A) Collision was detected on the Y-axis. (B) This alarm was triggered at the same time due to a servo error. A collision may be detected mistakenly.	(A) After pressing the **[RST]** key, move the feed axis to a safe position while checking the machine status. (B) First, restore operation based on the servo error when a servo error also is triggered.
Z-axis collision detection	(A) Collision was detected on the Z-axis. (B) This alarm was triggered at the same time due to a servo error. A collision may be detected mistakenly.	(A) After pressing the **[RST]** key, move the feed axis to a safe position while checking the machine status. (B) First, restore operation based on the servo error when a servo error also is triggered.

(NOTE 1) Even if no collision occurs between the spindle (or tool) and the workpiece or jig, etc., when a disturbance force greater than the standard values is detected due to a machine failure/malfunction or due to travel outside of the stroke range, then a collision detection alarm is triggered.

(NOTE 2) When multiple axes collide at the same time, the collision alarm is triggered for the axis where the disturbance force (greater than the standard values) is initially detected.

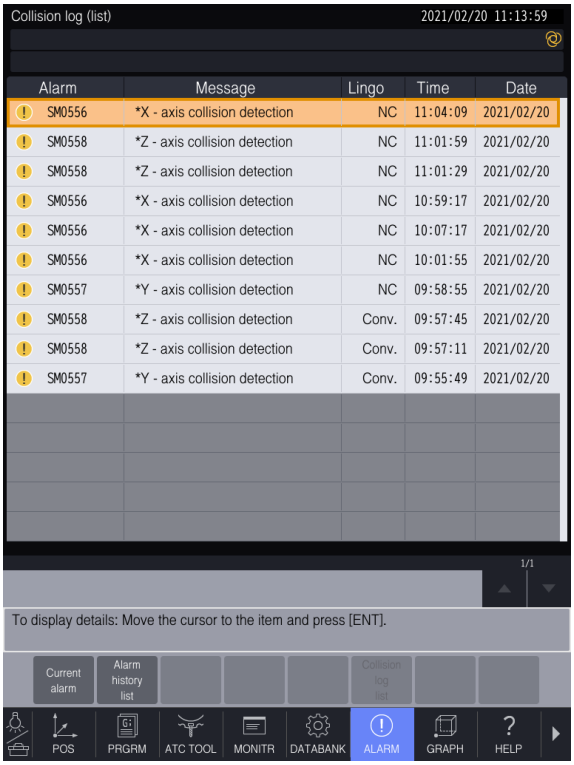
(NOTE 3) When a servo error is triggered and the cause is a communications error, the collision detection alarm may be triggered, but the alarm does not display on the collision log screen.

5.2.2 Special notes

1. Collision detection does not apply to axes that are disabled using the mode for enabling and disabling the servo.
2. When equipped with a turret type ATC, collision detection does not apply to the Z-axis if the Z-axis machine coordinate is at a position that is higher than the “Distance to Z-axis zero”.
3. When equipped with an arm type ATC, collision detection does not apply to X-, Y- and Z-axes if the X- and Y-axes machine coordinates are at the ATC position and the Z-axis machine coordinate is at the zero point.
4. The Z-axis collision detection is not carried out while a load is applied to the Z-axis brake in the brake load test.

5.3 Collision Log (List)

A list of collision detection alarms is displayed.
Press the <Collision log list> key on the alarm log (list) screen to display the collision log (list) screen.



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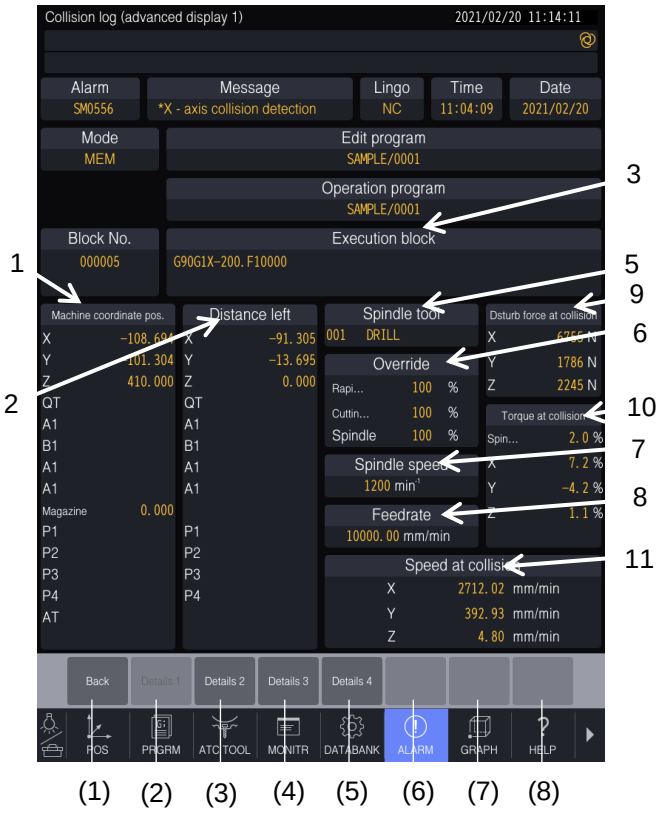
5.4 Collision Log (Advanced Display)

Use the **[CURSOR]** key to select the collision detection alarm that you wish to reference on the collision log (list) screen. After pressing the **[ENT]** key, the advanced information for the collision detection alarm is displayed.

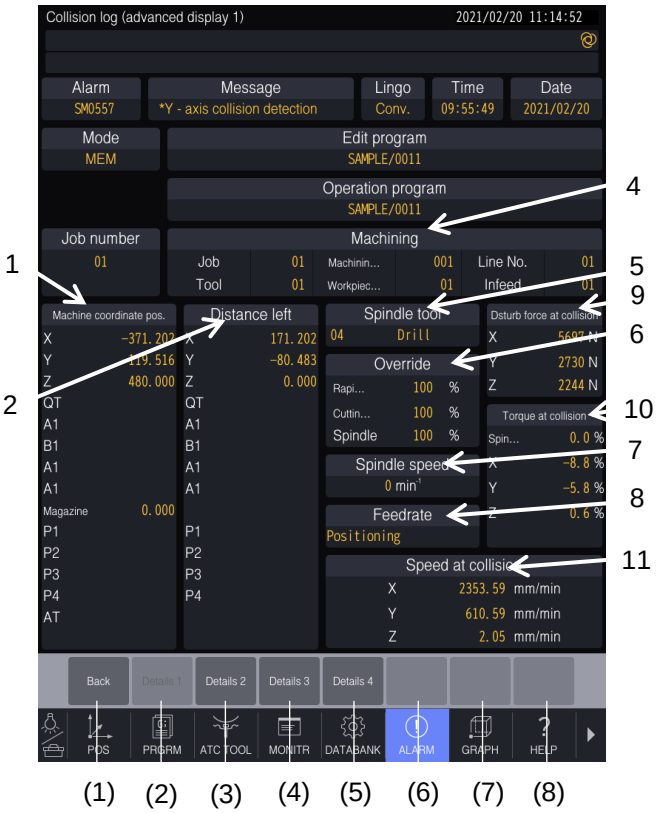
5.4.1 Collision Log (Advanced Display 1)

The machine coordinates, program, tool information, machining conditions and collision detection information are displayed.

(For NC language)



(For conversation language)



Description of screen display

Position	Item name	Description
1	Machine coordinate position	Displays the machine coordinate position when a collision is detected.
2	Distance left	Displays the distance left in the travel command when a collision is detected for memory operation or MDI operation.
3	Execution block *NC language only	Displays the execution block for the travel command when a collision is detected for memory operation or MDI operation.
4	Machining *Conversation language only	Displays the machining information (job, tool, machining position, workpiece number, line number and infeed) when a collision is detected.
5	Spindle tool	Displays the number of the tool that is mounted on the spindle when a collision is detected.
6	Override	Displays settings for the **[RAPID TRAVERSE OVERRIDE]**, **[FEEDRATE OVERRIDE]**, and **[SPINDLE OVERRIDE]** switches
7	Spindle speed	Displays the actual spindle speed when a collision is detected.
8	Feedrate	Displays the actual feedrate when a collision is detected for memory operation or MDI operation. <Positioning> is displayed during axis travel for positioning.
9	Dsturb force at collision	Displays the maximum value of the disturbance force (external force is applied) estimated by the system when a collision is detected. The disturbance force value is an estimate taking into account the servo position and the torque information, and may differ from the force that is actually applied to the machine.
10	Torque at collision	Displays the torque when a collision is detected.
11	Speed at collision	Displays the speed when a collision is detected.

Description of screen operation

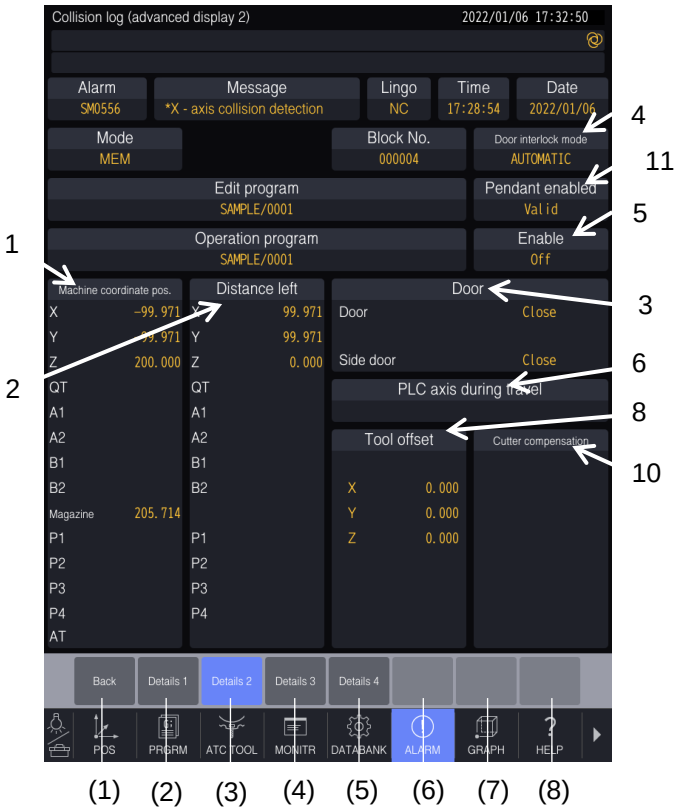
Description of function key operations

Position	Label	Description
(1)	<Back>	Goes back to the <Collision log (list)> screen.
(2)	<Details 1>	Displays the <Collision log (advanced display 1)> screen.
(3)	<Details 2>	Displays the <Collision log (advanced display 2)> screen.
(4)	<Details 3>	Displays the <Collision log (advanced display 3)> screen.
(5)	<Details 4>	Displays the <Collision log (advanced display 4)> screen.

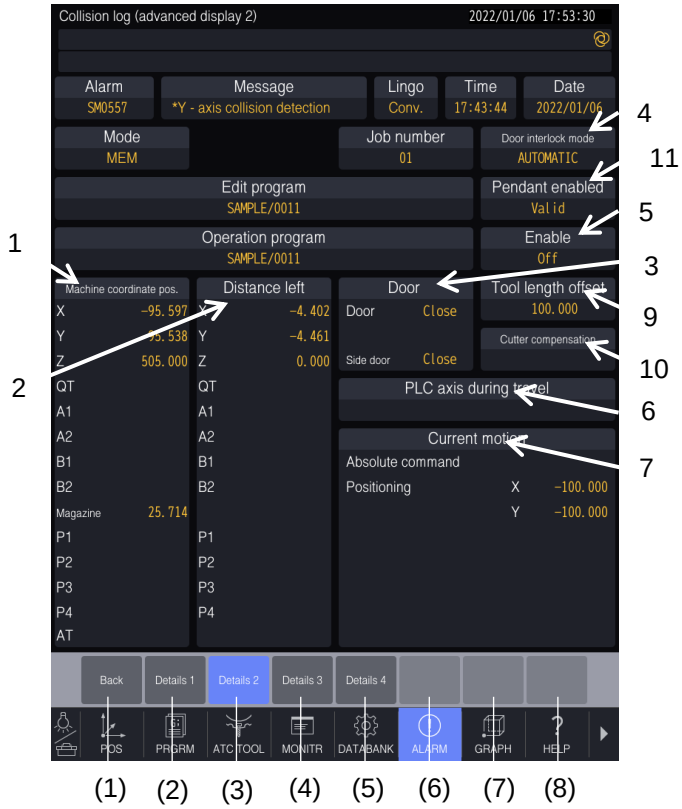
5.4.2 Collision Log (Advanced Display 2)

The machine coordinates, door and door interlock mode status and tool compensation information are displayed.

(For NC language)



(For conversation language)



Description of Screen Display

Position	Item name	Description
1	Machine coordinate position	Displays the same description as in detail display 1.
2	Distance left	Displays the same description as in detail display 1.
3	Door	Displays the door's open/close status when a collision is detected. The door name varies depending on the machine model.
4	Door interlock mode	Displays the status of the door interlock mode when a collision is detected.
5	Enable	Displays the status of the **[ENABLE]** switch when a collision is detected. Displays the name of the device where the switch is pressed when the enable is ON.
6	PLC axis during travel	Displays the PLC axis travel status when a collision is detected. Only the name of the axis that is travelling is displayed, and if the axis is stopped, the field is blank.
7	Current motion (*Conversation language)	Displays the motion when a collision is detected.
8	Tool offset (*NC language)	Displays the offset amount when the tool length offset or tool position compensation is enabled.
9	Tool length offset (*Conversation language)	Displays the offset amount when the tool length offset is enabled.
10	Cutter compensation	Displays the compensation amount when the cutter compensation is enabled.
11	Pendant enabled	Displays the status of the **[ENABLE PENDANT]** switch for the teaching pendant when a collision is detected.

Description of Screen Operation

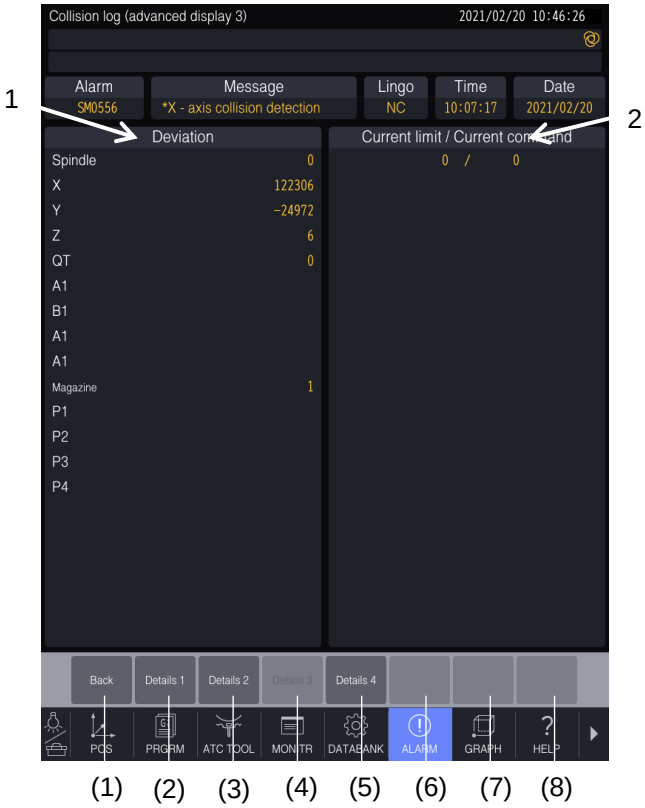
Description of function key operations

Position	Label	Description
(1)	<Back>	Goes back to the <Collision log (list)> screen.
(2)	<Details 1>	Displays the <Collision log (advanced display 1)> screen.
(3)	<Details 2>	Displays the <Collision log (advanced display 2)> screen.
(4)	<Details 3>	Displays the <Collision log (advanced display 3)> screen.
(5)	<Details 4>	Displays the <Collision log (advanced display 4)> screen.

5.4.3 Collision Log (Advanced Display 3)

The log displays the amount of deviation, the current limit and the current command.
Current limit/Current command display is shown only when the machine parameter (system 2: QT-axis) <Quick table> is set to <2: Type 2>.

(Same in NC/conversation language)



Description of Screen Display

Position	Item name	Description
1	Deviation	Displays the deviation when a collision is detected.
2	Current limit / Current command	Displays the current limit / current command on the QT-axis when a collision is detected.

Description of Screen Operation

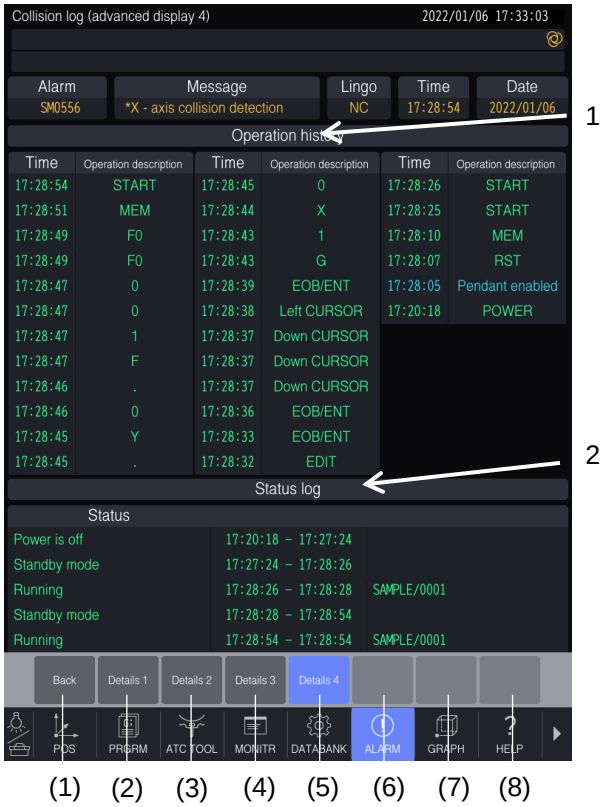
Description of function key operations

Position	Label	Description
(1)	<Back>	Goes back to the <Collision log (list)> screen.
(2)	<Details 1>	Displays the <Collision log (advanced display 1)> screen.
(3)	<Details 2>	Displays the <Collision log (advanced display 2)> screen.
(4)	<Details 3>	Displays the <Collision log (advanced display 3)> screen.
(5)	<Details 4>	Displays the <Collision log (advanced display 4)> screen.

5.4.4 Collision Log (Advanced Display 4)

The operation log displays the 30 operations that came immediately before the collision was detected. The status log displays 5 logs or records.

(Same in NC/conversation language)



Description of Screen Display

Position	Item name		Description
1	User operation log	Time Operation description	Displays 3 columns of the operation log for the operations that came right before a collision was detected. Displays the operations so that the newest ones are on the top-left and the oldest are on the bottom-right.
2	Status log	Status Time Error No./ Program	Displays the status log of the machine right before a collision was detected. The status field displays one of the following: error occurred, standby mode, running, power is off or stopped. In the error number/program field, the error number is displayed when an error is triggered, and the program number or program name is displayed during operation.

Description of Screen Operation

Description of function key operations

Position	Label	Description
(1)	<Back>	Goes back to the <Collision log (list)> screen.
(2)	<Details 1>	Displays the <Collision log (advanced display 1)> screen.
(3)	<Details 2>	Displays the <Collision log (advanced display 2)> screen.
(4)	<Details 3>	Displays the <Collision log (advanced display 3)> screen.
(5)	<Details 4>	Displays the <Collision log (advanced display 4)> screen.

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CHAPTER 6

TABLE DEFLECTION COMPENSATION FUNCTION

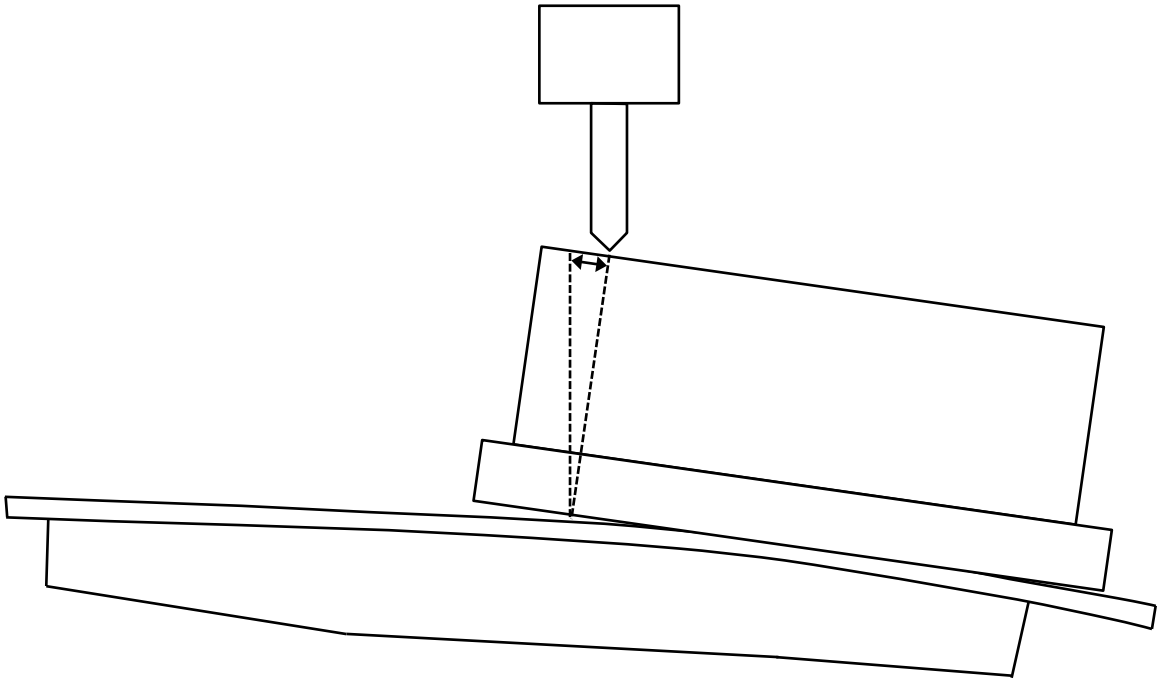
6.1 Function Overview
6.2 Setting Method

6.1 Function Overview

When the load weight on the table is large, the table deflection may cause the positioning accuracy in the X-axis direction to become worse. Based on the set value in the table load conditions, this function predicts an error in the positioning caused by table deflection and then compensates the X-axis positioning accuracy.

This function is available on the following machine models.

Machine model	S500Xd1/S700Xd1/U500Xd1

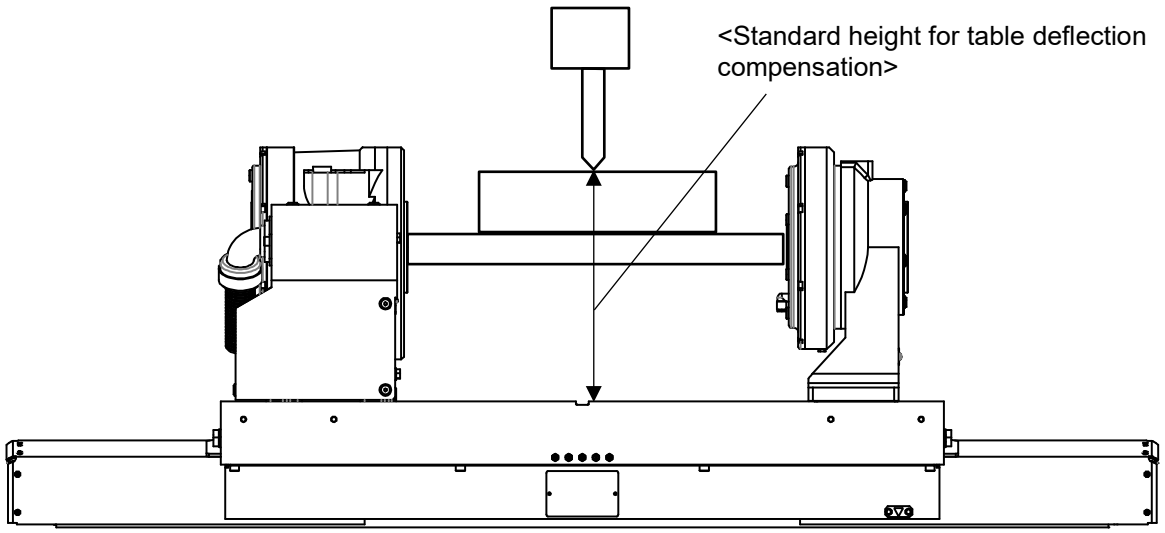


Error caused by table deflection (image)

6.2 Setting Method

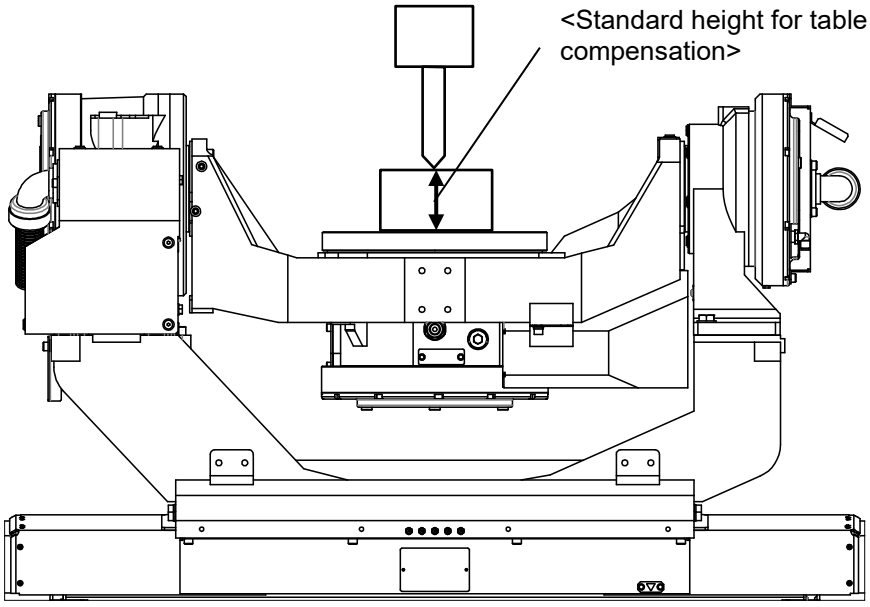
1. Open the <Machining parameter adjustment (load weight settings)> screen for the support application (machining parameter adjustment), and check the value for the <Load weight estimate>. If there is an asterisk (*) displayed for the <Load weight estimate>, or if the <Estimate date and time> comes before the table load was changed out, then follow the screen instructions and perform the <Weight estimate>.
2. Open the <Switch 1 (Compensation function)> screen in the user parameter (switch 1).
3. Set the user parameter (switch 1: compensation function) <Table deflection compensation function> to <1: Enable>.
4. Set the table load weight in the user parameter (switch 1: compensation function) <Standard weight for table deflection compensation>. Set the value that was confirmed in step 1.
5. Set a typical height value (for the machining point) using the machining coordinates in the user parameter (switch 1: compensation function) <Standard height for table deflection compensation>. The amount of compensation is adjusted so that the accuracy is optimal for the machining height that is set.

When using S500Xd1/S700Xd1



Setting example of <Standard height for table deflection compensation>

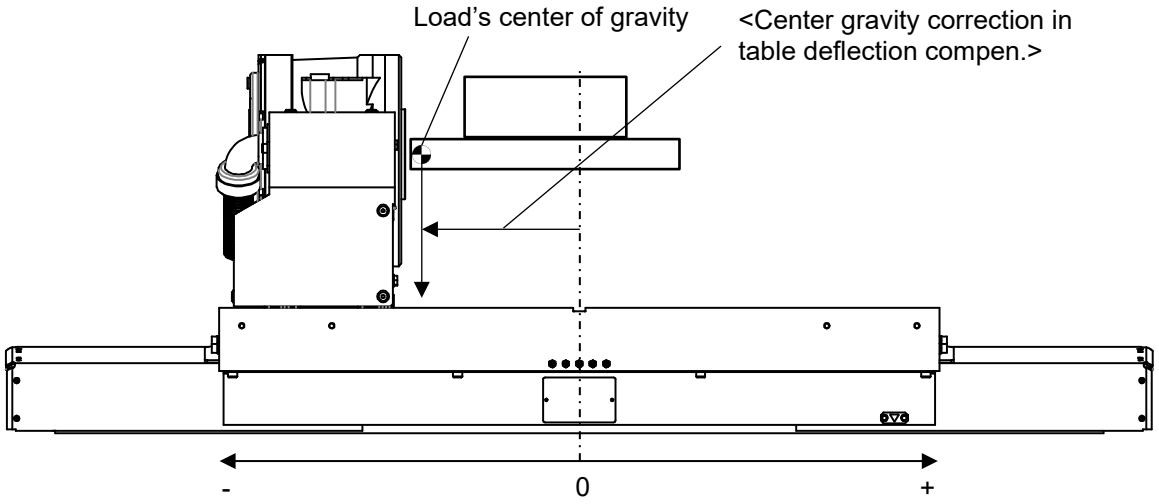
When using U500Xd1



Setting example of <Standard height for table deflection compensation>

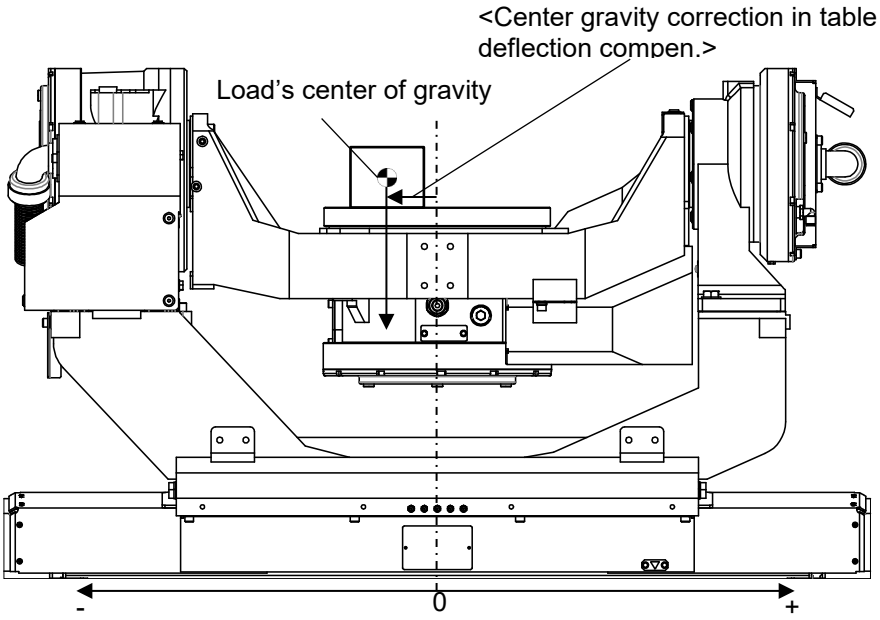
6. If the load is unevenly imbalanced toward one side of the table, set an approximate center of gravity for the table load in the user parameter (switch 1: compensation function) <Center gravity correction in table deflection compen.>. Set a positive value to move the load center in a plus direction from the table center, and set a negative value to move it in a minus direction.

When using S500Xd1/S700Xd1



Setting example of <Center gravity correction in table deflection compen.>

When using U500Xd1



Setting example of <Center gravity correction in table deflection compen.>

(NOTE 1) Accuracy at a level of several microns (μm) cannot be guaranteed because this function predicts the deflection and compensates based on the load conditions without using sensors, etc.

(NOTE 2) Minor adjustments can be made to the compensation using the user parameter (switch 1: compensation function) <Overwrite table deflection compensation>. The larger this value is, the greater the compensation amount is in the table deflection compensation function. This value is normally set to 100%.

(NOTE 3) The alarm <<Error in compensation setting for table deflection>> is triggered when the difference between the table load weight estimate and the set value in the user parameter (switch 1: compensation function) <Standard weight for table deflection compensation> exceeds the machine parameter (system 1: common) <Tolerance for weight estimation 2>.

(NOTE 4) If the compensation amount is too large, the alarm <<Compensation exceeded for table deflection>> is triggered. If the alarm is triggered, make sure that the set value for the user parameter is not too large.

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