

## 1. OSP Specifications

### (1) Basic Functions

- : Standard  
○ : Optional  
× : Selection impossible

Item	Description		OSP U10M	OSP U100M
Number of controlled axes	Controlled axes (machine) X-, Y-, and Z-axis (simultaneous 3 axes)	Max. number of simultaneously controllable axes	4 axes	6 axes
		Max. number of controllable axes	6 axes	24 axes
Position encoder	OSP absolute position encoder (no reference zero return required) OSP absolute position encoder (no reference zero return required)		●	●
Minimum input increment	Metric system: 1 $\mu$ m Inch system: 0.0001 in.		●	●
Maximum input increment	$\pm 99999.999$ mm (8-digit decimal number)		●	●
Input unit setting	0.001 mm, 0.01 mm, 1 mm		●	●
Feed function	Direct F code command	Feedrate range: Specified in the machine specification table Override: 0 to 200% Dwell: 0.01 to 99999.99 sec	●	●
	F1-digit feed	4 sets, 8 sets, parameter type	○	○
	Feedrate unit: Mixed use of "mm/rev" and "mm/min" is possible.		●	●
Display function (13 languages (English, German, French, Chinese, etc.) and the required language can be selected from these.)	14-inch color CRT operation panel		×	●
	Compact and thin monochrome display operation panel		●	●
	Compact and thin color display operation panel		○	○
Help function	Displays the alarm information (description, history).		●	●

(2) Operation Functions

● : Standard  
○ : Optional  
× : Selection impossible

Item	Description	OSP U10M	OSP U100M
Program selection	Selects one of the stored programs.	●	●
Schedule program	Scheduled sequential running of stored multiple programs	●	●
	Automatic schedule program update function	○	○
Sequence number search	Starts machining from the specified sequence number.	●	●
Sequence stop	Allows a program to stop at the specified sequence number.	○	○
Mid block sequence restart	Allows sequence restart from a command in a block is possible.	○	○
Mid-auto manual mode & auto restart	Allows manual operation intervention during automatic operation. After the completion of manual operation, restart of automatic operation is possible from the operation interrupted position.	●	●
Multi task processing	Creation/editing of a program and interactive programming operation are possible during machining.	●	●
Program operation	Permits program editing by a screen editor, verify during tape read, and list output.	●	●
Manual operation	Axis feed: Rapid traverse (10 steps), Manual cutting feed (256 steps) Pulse handle (1 pc.)	●	●
Switch operation	Dry run, Z-axis command cancel, Machine lock, Block skip, Optional stop, Single block, Override (spindle, feed axis)	●	●

(3) Programming Functions

● : Standard  
○ : Optional  
× : Selection impossible

Item	Description	OSP U10M	OSP U100M
Program format	Automatic ISO/EIA code recognition N5, G3, X+53, Y+53, Z+53, F+53, S4, T3, M3	●	●
Basic interpolation	Positioning, Linear interpolation, Circular interpolation	●	●
3-dimensional circular interpolation	3-dimensional circular interpolation is possible.	×	○
Helical cutting	Large-diameter thread cutting using an angular cutter is possible.	○	○
Synchronized tapping	High-speed and high-accuracy tapping is possible by synchronizing spindle rotation angular position and feed axis position.	○	○
Cylinder side-face machining function	Programming for machining the side face of a cylindrical workpiece is simplified.	○	○
Slanted-face machining function	Programming for machining on the slanted face of a workpiece is simplified.	×	○
Work coordinate system selection	Selection of a work coordinate system is possible by a program command.	●	●
Standard: 20 pairs	Addition of offset compensation data pairs - 200 pairs      - 300 pairs	○	○
Tool compensation function	Tool length offset: 100 pairs Cutter radius compensation: 100 pairs Max. offset amount: $\pm 99999.999$ mm	●	●
Standard: 100 pairs	Addition of offset compensation data pairs - 200 pairs      - 300 pairs	○	○
3-dimensional tool offset	Direction of offset is specified by I, J, and K	○	○
Attachment compensation function	- Extension attachment      pcs. - Universal attachment      pcs. - Angular attachment      pcs. Angle      deg.	×	○
Graphic conversion	Programmable mirror image: G62	○	○
	Enlarge/contraction: G50, G51	○	○
On-line automatic programming MAP	Coordinate calculation function: Line at angle, Arc, Grid, Double-grid, Square, Bolt hole circle, Omit, Restart	○	○
	Area machining: Facemill, Pocket mill, Round mill		
	Coordinate conversion: Allows the shift, rotation, and copy of a coordinate system.	○	○
inch/mm setting unit selection	Allows the selection of inch system or mm system for programming by the setting for a parameter.	○	○
Automatic any-angle chamfering	Allows chamfering (C, R) in required angle by a simple program.	○	○

Item	Description	OSP U10M	OSP U100M
Fixed cycle	G73, G74, G76, G81 to G87, G89: 11 kinds Upper limit return, Specified point return, R-point return	●	●
User task 1	Use of GOTO and IF statements and arithmetic operations is possible. Use of subprogram function, common variables, local variables, and system variables, (and variables related to machine operation) is possible.	●	●
	Common variable: 1000 variables (standard: 200)	○	○
User task 2			
Function operation function	Subprogram function, function operation function, and logical operation function can be used.	○	○
Input/output variable function	Input/output control of I/O is possible using a program. (16 points)	○	○
Programmable message function	Allows a message to be displayed on the screen by specifying it in a part program.	○	○
Program branch function	Allows part program branching to be turned on and off by the corresponding switch.	○	○
Programmable stroke limit	Allows stroke limit setting to be changed by G22 and G23.	○	○
Axis name designation function	Allows an axis name to be changed by a G code.	○	○
Skip function	G31 (program skip is controlled by the input of a sensor signal.)	○	○

(4) Interactive Programming Function (automatic programming function for machining center)

- : Standard  
○ : Optional  
× : Selection impossible

Item	Description	OSP U10M	OSP U100M
IGF-M			
Standard	Allows an operator to make a program easily by inputting the data according to the guide messages displayed on the screen. No special NC language is used.	○	○
5-face machining	Programming for 5-face machining is simplified.	×	○
I-MAP	Part program can be edited by following guide drawings. With the graphic calculation function	○	○

(5) Program Capacity

- : Standard  
○ : Optional  
× : Selection impossible

\*: Selection not possible for OSP-U10

Item	Description	OSP U10M	OSP U100M
Program storage capacity	- 320 m   - 640 m   - 1280 m   - 2560 m* - 5120 m*   - 10240 m*	Standard: 160 m	Standard: 320 m
Operation buffer capacity	- 320 m   - 640 m   - 1280 m	Standard: 160 m	Standard: 320 m

(6) Gauging Function

Item	Description	OSP U10M	OSP U100M
Automatic gauging function	Checks the workpiece dimensions and offsets the zero point automatically.	○	○
Automatic tool length offset/Automatic tool breakage detection function	Executes tool length offset and tool breakage detection automatically for tools such as drills, taps, reamers, and boring bars.	○	○
Manual gauging	Simplifies zero-point setting and tool length offset by displaying the operation guide on the screen.	○	○
Interactive gauging	Simplifies zero-point setting and tool length offset by pressing a button according to the operation guide displayed on the screen.	○	○
Gauging data printout	Outputs the gauging data to a printer (connected to RS232C IF).	○	○

(7) Machining Management Function (MacMan)

● : Standard  
○ : Optional  
× : Selection impossible

Item	Description	OSP U10M	OSP U100M
Collection and display of machining management information			
Machining report	Collects and displays the operation progress state for the selected main programs.	●	●
Operation report	Collects and displays the machine operating state (power on time, cutting time, etc.) of the machine.		
Operation history	Collects and displays the machine operation state in time chart in intervals of 10 minutes.		
Trouble information	Collects and displays the status of CNC and operation history at the occurrence of an alarm.		
Output of machining management information	Outputs the machining management information (machining report, operation report, operation history, and trouble information) to floppy disk or printer. For OSP-U10, floppy disk input/output function must be selected separately.	●	●
Network function * Detailed technical consultation is necessary.	Allows input/output of the machining management information (machining report, operation report, operation history, and trouble information) through the network (DNC-P1/P2/P3/T1/T2/T3). The DNC connection function must be selected separately.	○	○

(8) Monitoring Function

● : Standard  
○ : Optional  
× : Selection impossible

Item	Description	OSP U10M	OSP U100M
Animated simulation with cycle time calculation function	Provides the means to check a program using animated simulation so that an operator can start actual production without worry. The function simulates the program quickly and calculates the estimated cycle time.	○	○
Simple load monitor function	The CNC monitors the spindle load.	○	○
Tool life management	Counts the number of machine workpieces or cutting time and changes the tool to a spare tool if the count data reaches the preset life value.	○	○
MOP-TOOL	Executes overload monitor and adaptive control (built-in type).	×	○
NC operation monitor	Timers counting the cutting time, run time, spindle rotating time, and external input time, and four work counters are provided. It is possible to generate an alarm when the count value reaches the preset value.	○	○
Operation end buzzer	Sounds a buzzer at the execution of M02, M00 or M01 to indicate the end of operation.	○	○
Work counter installation	It is possible to select cycle stop, cycle start disable for the processing at the full-count of a work counter.	○	○
NC operation meter installation	Calculates the length of time of power ON, spindle rotating, CNC running, etc.	○	○
Synchronized tapping torque monitoring function	Monitors spindle load torque during synchronized tapping.	○	○
Operation end lamp (yellow)	Lights at the execution of M02, M00, or M01 to indicate the end of operation.	○	○
Alarm lamp (red)	Lights at the occurrence of an alarm to indicate that a trouble has occurred with the machine.	○	○
Status indicating lamp (3 tiers)	The lamp consists of three lamps – operation end lamp, alarm lamp, and machining running lamp.	○	○

(9) External Input/Output and Communication Function

● : Standard  
○ : Optional  
× : Selection impossible

Item	Description	OSP U10M	OSP U100M
Reader/Punch interface	Serial interface (RS232C), 1 channel	●	●
	Addition of RS232C interface, addition of __ channels	○	○
Built-in floppy disk drive (3.5")	Allows data exchange between OSP format FD data and MS-DOS format FD data. Format: 2DD/2HD/2HC	○	●
DNC connection * Detailed technical consultation is necessary.	- DNC-A	○	○
	- DNC-B	○	○
	- DNC-C1 - DNC-C2 - DNC-C3	×	○
	- DNC-P1 - DNC-P2 - DNC-P3	○	○
	- DNC-T1 - DNC-T2 - DNC-T3	○	○
	- DNC-DT	×	○

(10) Automation and Unmanned Operation Function

Item	Description	OSP U10M	OSP U100M
Spindle orientation	The spindle is indexed to the predetermined angular position by an M command. (multi-point indexing using an RS command is possible)	○	○
External program selection	A: Pushbutton method B: Rotary switch method (8 steps) C: External input method (BCD 4-digit)	○	○
Automatic power shutoff function	The function shuts off the power automatically when the machine stops by the execution of M02 or due to the occurrence of an alarm.	○	○
Warm-up function	The function automatically turns on the power at the preset time and starts warm-up operation.	○	○
Cycle time reduction function * Detailed technical consultation is necessary.	Proceeds program execution without waiting for answer signals; called by an M command.	○	○



(11) High-speed, High-accuracy Function

- : Standard  
○ : Optional  
× : Selection impossible

\*: Selection not possible for OSP-U10

Item	Description	OSP U10M	OSP U100M
Super Hi-NC	Adaptive velocity control for NURBS curve.	×	○
NURBS command	Allows the use of NURBS commands in a part program.	○	○
Hi <sup>2</sup> -NC	FF tolerance control	×	○
Absolute scale detection	- X-axis   - Y-axis   - Z-axis   - W-axis	○	○
Inductosyn scale detection	- A-axis   - B-axis   - C-axis	○	○

(12) Others

Item	Description	OSP U10M	OSP U100M
External M signal	- 4-position index table (includes emergency stop) - 4 sets   - 8 sets	○	○
Addition of pulse handles	Number of added pulse handles: 1 pcs. (2 pcs. in total), 2 pcs. (3 pcs. in total) Pulse handle installation position: Saddle, Pendant	○	○
Additional axis	- A-axis   - B-axis   - C-axis   - U-axis   - W-axis Rotary table installation: - Specification for rotary table installation - Rotary table installation Rotary table manufacturer	○	○
Ground-fault power shut off function	Prevents accidents caused by ground-fault using the earth leakage breaker.	○	○
Control cabinet lighting	Installs a lamp in the control cabinet.	○	○