

DORNA

AC server Driver

EPS-M1 Series

Application Manual

(V1.00)



<http://www.cn-dorna.com>

Safety Precautions

This section when confirming the arrival of goods, storage, handling, installation, wiring, operation, inspection, discarding the user must comply with the important issues will be explained.

Danger

- **Input power.**

This drive input power is AC220V .

- **When the installation begins to run on the machine, the motor is placed in advance at any time to stop the emergency state.**
Otherwise it will lead to personal injury and mechanical damage.
- **In the energized state, make sure the power terminal block installed in the housing.**
Doing so can cause electric shock.
- **After power is turned off or the withstand voltage test, the charging indication (CHARGE) Lamp lighting time, do not touch the power terminals.**
Otherwise it will cause the residual voltage electric shock.
- **Follow the steps appropriate to the product described in the user manual, the instructions test run.**
Servo motor mounted in the state machine, the operation if an error occurs, Not only can cause mechanical damage, and sometimes may also result in personal injury.
- **Never for this product to transform unauthorized persons do not set up, demolition or repair.**
Otherwise it will lead to personal injury, fire or mechanical damage.
- **Please stop means provided on the machine side to ensure safety.**
Holding brake with a brake servo motor is not used to secure the stop means. Otherwise it will cause injury.
- **Make sure the ground terminal and the ground is connected to the servo driver (servo drive power input grounding resistance 100 Ω the following) .**
Doing so can cause an electric shock or fire.

Note custody Handling

- **Keep out, is provided in the following environment.**

Doing so can cause fire, electric shock or damage to the machine.

- Direct sunlight
 - Ambient temperature exceeds the storage, a temperature condition place
 - Relative humidity exceeds the stored, set humidity place
 - Corrosive or flammable gases place
 - Dirt, dust, salt and the metal powder more places
 - Easy splashing water, oil and pharmaceuticals, etc.
 - Vibration or impact will spread to the main places
- **Do not hold the cable, the motor shaft or detector for handling.**

Otherwise it will result in injury or malfunction.

Installation

- **Do not block the intake port and the exhaust port. To make the product into the internal nor foreign body.**
Otherwise, due to internal component aging and lead to failure or fire.
 - **Be sure to follow the installation directions requirement.**
Otherwise it will lead to failure.
 - **When the installation, ensure a predetermined distance between the servo drive and control cabinet, and other machine surface.**
Doing so can cause a fire or malfunction.
 - **Do not apply excessive impact.**
Otherwise it will lead to failure.
-

Wiring Note

- **Please correct and reliable wiring.**
Otherwise it will result in motor runaway, injury or machine malfunction.
 - **Do not connect terminals servomotor drive UA \ UB \ UC , VA \ VB \ VC , WA \ WB \ WC Connecting a commercial power supply.**
Doing so can cause injury or fire.
 - **Please firmly connected to the power source terminal connected to the motor terminals.**
Otherwise it will cause a fire.
 - **Do not allow the main circuit cables and cable input and output signals / Encoder cable using the same casing, and do not bundle or together. When wiring, cables and main circuit input and output signal cables should leave 30cm the above.**
 - **O signal cables and cable encoder use twisted-pair wires or multi-core shielded-twisted-pair cable.**
 - **O signal wiring cable length: up to 3 m ; Encoder cable: up to 20 m .**
 - **Even when the power is turned off, the servo drive is still likely to remain high voltage, and therefore, the charging indication (CHARGE) Lamp lighting time, do not touch the power terminals.**
Please confirm the charge indication (CHARGE) After the light is off, then the connection and inspection work.
 - **Set breakers and other safety devices to prevent the external short circuit connection.**
Otherwise it will cause a fire.
 - **In the following locations, please take appropriate shielding measures.**
 - When the interference due to static electricity, etc.
 - Places with strong electric or magnetic fields
 - There may be radiation to places otherwiseit will cause damage to the machine.
 - **When connecting the battery, please note polarity.**
Otherwise it will cause the battery, servo drives and servo motors and explosion damage.
-

OPERATION

- **To prevent accidents, please (not connected to the mechanical state of the servo motor shaft) of the servomotor commissioning monomers.**

After the trial run properly, then the connection machine operation. Otherwise it will cause injury.

- **When the installation begins to run on supporting machinery, please pre-set parameters consistent with the machinery.**

If you do not set parameters and running, it will lead to loss of control or mechanical failure.

- **Please do not often ON / OFF power supply.**

Since the power supply portion of the servo drive with a capacitor, so the power supply ON When, it will flow through a large charging current. Therefore, if frequently ON / OFF Power supply, will result in the performance of the primary element in the servo drive circuit drops.

- **JOG run(AF 02), Manual load inertia detection (AF 15 Time), and because of the positive overtravel Reverse overtravel caused the emergency stop function is invalid, please pay attention.**

Doing so may result in damage to the machine.

- **When using vertical axis servo motor, a safety device set in an alarm to prevent parts from falling, and the like overtravel state. Also, by setting the fixed stop zero when overtravel occurs.**

Doing so may cause parts from falling off in the overrun state.

- **² extreme parameter adjustment setting change will lead to action servo system becomes unstable Never carry out such operations.**

Doing so may result in personal injury, damage to the machine.

- **When an alarm occurs, please remove the cause and ensure safety alarm reset, resume operation.**

Doing so may result in damage, fire or injury.

- **Do not hold the motor brake with a brake for braking.**

Doing so may cause a malfunction.

- **Servo motor and servo drive use the specified combination.**

Doing so may result in fire or malfunction.

Maintenance Caution

- **Do not change the wiring in an energized state.**

Doing so may result in electric shock or injury.

- **When replacing the servo drive, set the parameter to replace the servo drive is copied to the new servo drive, and then start running again.**

Doing so may result in damage to the machine.

Additional

- For a detailed description of this portion of the illustrations manual safety or removed the protective cover at the time of drawing thereof. In actual operation, be sure to install the required security cover or body to its original position, and then run according to the instructions of the user manual.
- The illustrations in this manual are representative legend, and you receive the product may vary.
- Drive commissioning and use, set the related protection safety devices. Especially due to the loss of the company's products caused indirect losses, and other losses, the Company assumes no responsibility.
- Information contained in this manual describes the general features or introduced, is not always exactly the same in case of actual application, or may be due to further development of the products are fully applicable.

table of Contents

Safety Precautions	2
Chapter One Product Overview	9
1.1 Product inspection	9
1.2 Product number	10
<i>1.2.1. Nameplate</i>	<i>10</i>
<i>1.2.2 Model Description</i>	<i>11</i>
1.3 Servo drive motor corresponding to the model name reference table	12
1.4 Part names servodrive	12
1.5 Maintenance and inspection	12
Chapter 2 Installation	14
2.1 Installation direction and space	14
2.2 Circuit breakers and fuses is recommended spec sheet	14
2.3 Noise and high-order harmonic response	15
<i>2.3.1. Noise filter</i>	<i>15</i>
<i>2.3.2. High harmonics connected to AC / DC reactor</i>	<i>15</i>
2.4 Regenerative resistor is selected	16
Chapter Wiring	17
3.1 System Configuration and Wiring	17
<i>3.1.1 Typical System Architecture</i>	<i>17</i>
<i>3.1.2 is connected with the drive terminal</i>	<i>18</i>
<i>3.1.3 Wiring of the main circuit</i>	<i>18</i>
3.2 Motor-side wiring	19
<i>3.2.1 quick connector terminal defined shape and</i>	<i>19</i>
<i>3.2.1. Air plug terminal defined shape and</i>	<i>20</i>
3.3 Connector CN1 Wiring	twenty one
<i>3.3.1 Terminal arrangement</i>	<i>twenty one</i>
3.4 Connector CN2 Wiring	twenty one
<i>3.4.1 Connector CN2 The arrangement</i>	<i>twenty two</i>
<i>3.4.2 Connector CN2 Signal description</i>	<i>twenty three</i>
<i>3.4.3 Input signal distribution outputs IO</i>	<i>twenty four</i>
<i>3.4.4 Example of connection with the host apparatus</i>	<i>30</i>
3.5 Connector CN3 Wiring	33
<i>3.5.1 Encoder cable</i>	<i>33</i>
<i>3.5.2 Connector CN3 Connection example</i>	<i>35</i>
3.6 Standard Connection	36
<i>Example 3.6.1 connection position control</i>	<i>36</i>
<i>3.6.2 Speed I connection example torque control</i>	<i>37</i>
Chapter IV Panel	38
4.1 Operator Panel	38

4.2 A axis, B axis, C Control switch shaft	39
4.3 Switching function	39
4.3 Status Monitoring	40
4.4 Monitor display (DP 00)	41
 4.4.1 display content	41
 4.4.2 Operation example of the monitoring pattern	41
4.5 Parameter Mode	42
 4.5.1 Instructions	42
 4.5.2 parameter setting (PA 000) example of the operation	42
4.6 Accessibility (AF 00) operation example	43
 4.6.1 Content Accessibility	44
 4.6.1 auxiliary function (AF 00) example of the operation	44
4.7 Parameters method of writing this manual	44
 4.7.1 "set value type" method of writing	45
 4.7.2 "Function Select type" method of writing	45
Chapter V monitor display	46
5.1 Monitor display list	46
5.2 Operation of the exemplary display monitor	48
5.3 Input signal monitoring	48
 5.3.1 display step	49
 5.3.2 display determination method	49
 5.3.3 Display example	50
5.4 Monitoring output signals	50
 5.4.1 display step	50
 5.4.2 display determination method	51
 5.4.3 Display example	51
5.5 Monitoring at power display	52
5.6 other instructions	52
Chapter VI Accessibility	53
6.1 Accessibility glance	53
6.2 Alarm history display (AF 00)	53
6.3 Position assignment (AF 01)	54
6.4 JOG run(AF 02)	55
6.5 Front Panel Lock (AF 03)	56
6.6 Alarm record deletion (AF 04)	57
6.7 Initialization parameter settings (AF 05)	58
6.8 Analog command automatic zero (AF 06)	58
6.9 Speed command offset manual adjustment (AF 07)	59
6.10 Simulation torque instruction manual zeroing (AF 08)	60
6.11 Display Motors models (AF 09)	61
6.12 The software version of the servo drive (AF 10)	61
6.13 Set absolute encoder (AF 11)	62
6.14 Parameter copy (AF 14)	63
6.15 Manually detected load inertia (AF 15)	63

Chapter VII of the test run	65
7.1 Pre-commissioning checks and precautions	65
7.2 Operator Panel via JOG run	65
7.3 Trial run servomotor command in accordance with the upper	66
7.3.1 <i>input connection confirmation circuit and a status signal</i>	66
7.3.2 <i>trial run position control</i>	67
7.3.3 <i>Test run speed control</i>	67
7.4 After the test run the servo motor and a mechanical connection	68
7.5 Trial operation of the servo motor with a brake	68
Chapter VIII run	69
8.1 Select control mode	69
8.2 Universal basic functions set	69
8.2.1 <i>Servo ON setting</i>	69
<i>Switching the motor rotation direction 8.2.2</i>	70
8.2.3 <i>Overtravel Limit</i>	71
8.2.4 <i>set holding brake</i>	73
8.2.5 <i>momentary power failure processing setting</i>	76
8.3 The method of using the absolute encoder	77
8.3.1 <i>Selection absolute encoder</i>	77
8.3.2 <i>Battery to use</i>	78
8.3.3 <i>Battery Replacement</i>	78
8.3.4 <i>Set absolute value encoder (AF011)</i>	78
8.4 Position control	79
<i>Set user parameters 8.4.1</i>	79
8.4.2 <i>Electronic gear setting</i>	80
8.4.3 <i>Position command</i>	82
8.4.4 <i>Smoothing</i>	85
8.4.5 <i>positioning completion signal (COIN)</i>	86
8.4.6 <i>Positioning proximity signal (the NEAR)</i>	86
8.4.7 <i>disable function command pulse (INHIBIT function)</i>	87
8.5 speed control(Analog voltage command) running	87
<i>Set user parameters 8.5.1</i>	87
<i>Setting the input signal 8.5.2</i>	88
8.5.3 <i>offset adjustment instruction</i>	89
8.5.4 <i>soft start</i>	91
8.5.5 <i>Speed command filter</i>	91
8.5.6 <i>using the zero clamp function</i>	91
8.5.7 <i>Encoder signal output</i>	92
8.5.8 <i>with the speed detection output</i>	96
8.6 Torque control operation	96
<i>Set user parameters 8.6.1</i>	96
8.6.2 <i>torque command input</i>	97
8.6.3 <i>skew adjustment</i>	98
8.6.4 <i>Speed limit torque control</i>	99
8.7 speed control (Internally Set Speed Selection) Run	100

<i>Set user parameters 8.7.1</i>	101
<i>Setting the input signal 8.7.2</i>	102
8.10 Combination control mode selection	103
<i>8.10.1 user parameter settings</i>	103
<i>Control mode switching 8.10.2 Description</i>	103
Chapter IX Troubleshooting	104
9.1 Treatment and Causes Alarm	104
9.2 The reason for the warning and treatment measures	108
Chapter X Communications	109
10.1 Communication Interface	109
<i>10.1.1 Communication Connections</i>	109
10.2 Communication parameters	110
10.3 Protocol	111
<i>10.3.1 Code Description</i>	111
<i>10.3.2 Byte structure</i>	111
<i>10.3.3 Communication data structure</i>	112
<i>10.3.4 Communication error handling</i>	118
10.4 mailing address	119
Chapter XI Specifications	121
11.1 Servo Drive Specifications	121
<i>11.1.1 Basic Specifications</i>	121
<i>11.1.2 Speed, position, torque control specifications</i>	122
11.2 Servo Motor Specifications	123
<i>11.2.1 60/80 series servo motor parameter table</i>	123
<i>11.2.2 130 series servo motor parameter table</i>	124
11.3 Servo drive Dimensions	125
11.4 Servo motor Dimensions	125
<i>60/80 11.4.1 series motor mounting dimensions: Unit (mm)</i>	125
<i>11.4.2 130 series motor mounting dimensions: Unit (mm)</i>	126
Chapter XII Appendix	127
12.1 List of monitoring mode	127
12.2 Accessibility glance	129
12.3 User parameters at a glance	130
<i>12.3.1 save user parameters</i>	130
<i>12.3.2 function selection parameter display</i>	130
<i>12.3.3 Parameters</i>	130

Chapter One Product Overview

1.1 Product inspection

to prevent The products in the purchase and transportation process Negligence, please list the items listed in the following detailed examination.

Check Items	reference
Whether the arrival of products I want to buy models?	Product model were examined on the motor and drive plate, the model can be found listed in section Instructions.
Whether the motor shaft running smoothly?	Hand rotating motor shaft, if you can run smoothly, on behalf of the motor shaft is normal. However, with an electromagnetic brake motor, you can not run a smooth hand!
Check for damage?	Visually inspect the appearance of any damage.
Are there loose screws?	Use a screwdriver to install the servo drive test whether there is a screw loose place.

If any of these situations occur, please contact the dealer or manufacturer to get a proper solution. A complete Servo Components

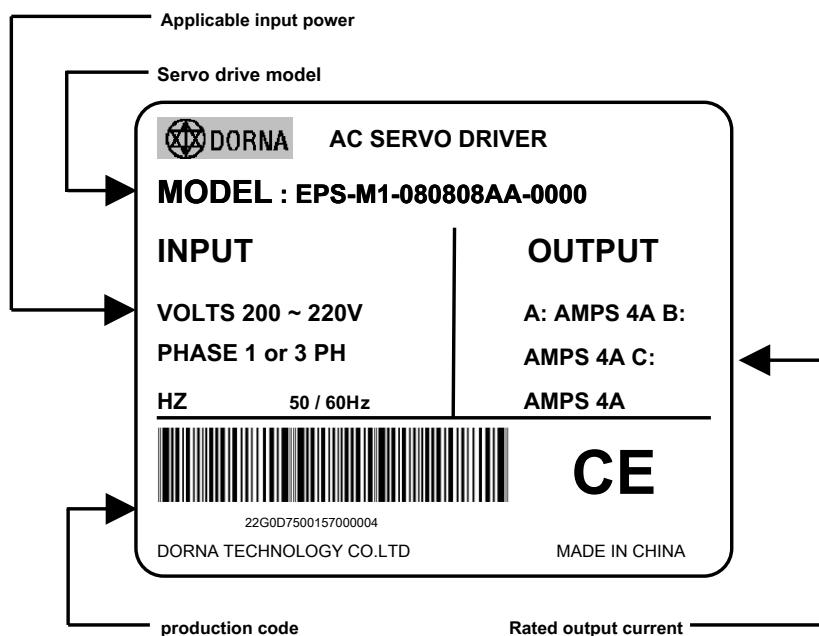
should include the following items.

project number	reference
1	Servo drive and its matching servomotor.
2	Motor power line: <u>The power plug terminal of the driving motor (standard) or a UVW Motor power line (optional).</u>
3	Motor encoder lines: <u>End of the plug and plug motor encoder drive encoder side (standard) or an encoder signal line (optional).</u>
4	CN1 use RJ45 Connectors, RS485 Communication with. (Optional)
5	CN2A \ CN2B \ CN2C use 44-PIN Joints.
6	CN3A \ CN3B \ CN3C use 9-PIN Joints.
7	An installation manual

1.2 Product number

1.2.1. Nameplate

- EPS-M1 Series Servo Drive Nameplate Explanation



1.2.2 Model Description

- EPS-M1 Series servo drives Model Description

EPS - M1 - 080808 AA - 0000

Servo drive name: EPS [1] [2] [3] [4] [5]

[1] Servo drive series		[2] drive Power		[3] Rated input voltage	
mark	specification	mark	specification	mark	specification
M1	M1 series	<u>080808</u> A \ B \ C	Triaxial <= 750W	A	220V
		<u>150808</u> A axis	1 / 1.5KW BC Axis <= 750W		
		<u>151 508</u> AB axis	1 / 1.5KW C Axis <= 750W		
		<u>151515</u> A \ B \ C	Triaxial 1 / 1.5KW		
[4] hardware version		[5] factory code			
mark	specification	mark	specification	mark	specification
A	hardware version A	0000	General Specifications: with mold Quasi amount, the input pulse	A000	Communication type: None CN2A \ CN2B \ CN2 B interface

- Servo Motor Model Description

130 DN MA 2 - 0D75 DKAM

[1] [2] [3] [4] [5] [6] [7] [8] [9]

[1] base number		[2] Name		[3] voltage level	
mark	specification	mark	specification	mark	specification
60	60 Flange	DN		MA Small inertia 220V	
80	80 Flange			HA High inertia 220V	
130	130 Flange				
[4] Design Series		[5] rated power		[6] rated speed	
mark	specification	mark	specification	mark	specification
2	Five pairs of pole motor	<u>0D20</u> 200W		A	1000rpm
		<u>0D40</u> 400W		B	1500rpm
		<u>0D75</u> 750W	1.0KW	C	2000rpm
		<u>0001</u>		D	3000rpm
		<u>01D2</u> 1.2KW			
		<u>01D5</u> 1.5KW			
[7] encoder type			[8] the brake selection		
mark	specification	mark	specification	mark	specification
K	Provincial line increment 5000ppr	A	Without brake	K	Keyway, no oil seal
		B	With brake	Y	Without keyway, oil seal
				M	Keyway, oil seal
				N	No keyway, no oil seal

Note:

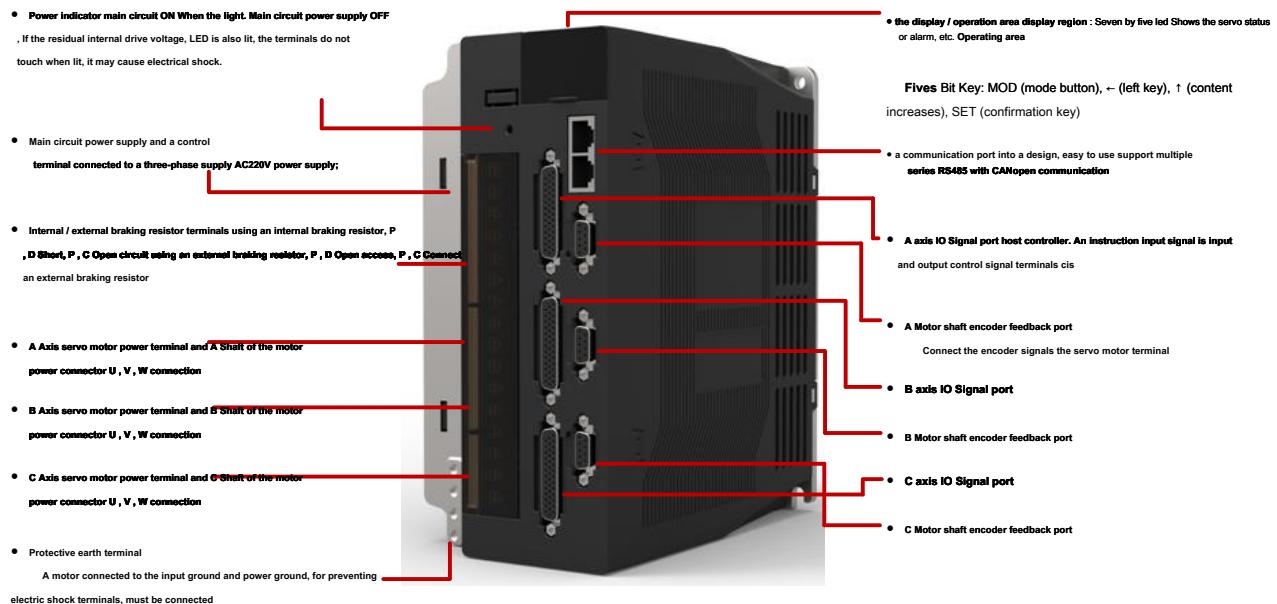
1 , Drive and motor models may be updated, please refer to the corresponding model specific sample or consult the Company.

1.3 Servo drive motor corresponding to the model name reference table

This drive motor designated specifically for supporting the use of the design, make sure you are using the motor model, rated output voltage specifications, coding specifications.

driver			Motor				
model	Input Power PA012 Numerical		model	Input speed rated	torque encoder specifications		
EPS-M1-08	220V	2	60DNMA1-0D20D 200W		3000rpm 0.64N · M 5000PPR		
EPS-M1-08	220V	3	60DNMA1-0D40D 400W		3000rpm 1.27N · M 5000PPR		
EPS-M1-08	220V	12	80DNMA1-0D75D 750W		3000rpm 2.37N · M 5000PPR		
EPS-M1-15	220V	13	80DNMA1-0001D	1KW	3000rpm 3.12N · M 5000PPR		
EPS-M1-15	220V	25	110DNMA1-01D2D 1.2KW		3000rpm 4N · M	5000PPR	
EPS-M1-15	220V	29	110DNMA1-01D8D 1.8KW		3000rpm 6N · M	5000PPR	
EPS-M1-15	220V	33	130DNMA1-0001C 1KW		2000rpm 5N · M	5000PPR	
EPS-M1-15	220V	34	130DNMA1-01D2C 1.2KW		2000rpm 6N · M	5000PPR	
EPS-M1-15	220V	35	130DNMA1-01D5C 1.5KW		2000rpm 7.2 N · M	5000PPR	

1.4 Part names servodrive



1.5 Maintenance and inspection

Please drives and motors for regular maintenance and inspection for safety and ease of use.

Routine inspection and set Period should be checked The following project implementation.

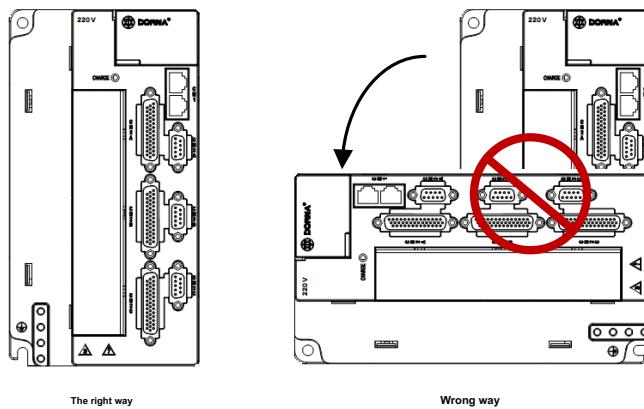
Types of	inspection cycle	Check item
Routine inspection daily		² Confirmed that the ambient temperature, humidity, dust and foreign matter

		<p>² Is there abnormal vibration abnormal sound ² Supply voltage input is normal ² Is there a smell ² Are vents sticky fiber lint and other foreign matter ² Cleanliness of the front of the drive portion, the connector ² And control means connected to the motor unit and the device for loose core leg departing ² Presence or absence of foreign matter embedded in the load portion</p>
Periodic inspection 1 year		<p>² Are there parts of loose fastening ² Are there signs of overheating ² Whether the terminals are damaged or loose</p>

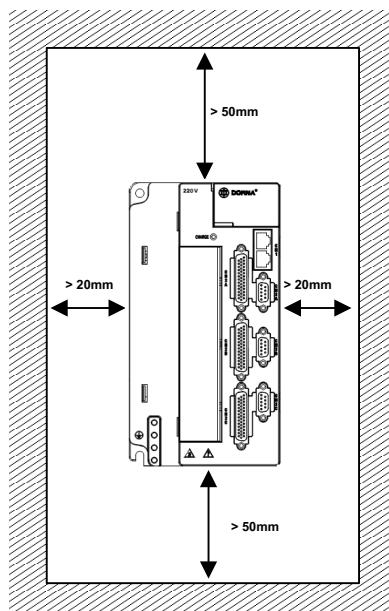
Chapter 2 Installation

2.1 Installation direction and space

Incorrect installation provisions, which will cause the problem. In order to effect good cooling cycle, when installing the AC servo drive, which is vertically and horizontally adjacent articles and bezel (wall) must be enough space, which will cause the problem. AC servo drive which is mounted at the suction, the vent hole is not sealed, a horizontal position, will cause a malfunction.



In order to make the cooling fan to have a relatively low drag, in order to effectively discharge heat, and ask the user to observe a plurality of AC servo drive mounted spaced from the recommended values (as shown below).



2.2 Circuit breakers and fuses is recommended spec sheet

- 220V type

Driver Model	Fuse breaker (Class T)
EPS-M1-080808AA 30A	50A
EPS-M1-151515AA 50A	80A

Note:

- 1 Strongly recommended: Use UL / CSA Recognition fuse and circuit breaker.
- 2 , If the driver is installed as a drain leakage breaker failure protection, in order to prevent leakage breaker malfunction, select a current sensitivity 200mA Above, operating time 0.1 Sec or more.

2.3 Noise and high-order harmonic response

Since the main circuit using a high speed servo drive switching element, and therefore a servo drive and peripheral ground wiring processing process is performed, the switching element may be affected by noise.

To prevent noise, according to need, take the following noise measures.

- Input noise filter mounted on the main circuit side of the drive cable.
- Higher harmonics suppression AC / DC A reactor connected.
- If possible, the command input device and noise filter disposed in the vicinity of the servo drive.
- When wiring, cables main circuit (motor main circuit cable) input and output signal lines should leave 30cm the above. Do not put in the same conduit or bundle together.
- Do not use the same power supply and welding machines, EDM machines. If not the same power supply, when a high frequency signal generator vicinity, connect the noise filter circuit on the input side of the main cable.
- Please be properly grounded

2.3.1. Noise filter

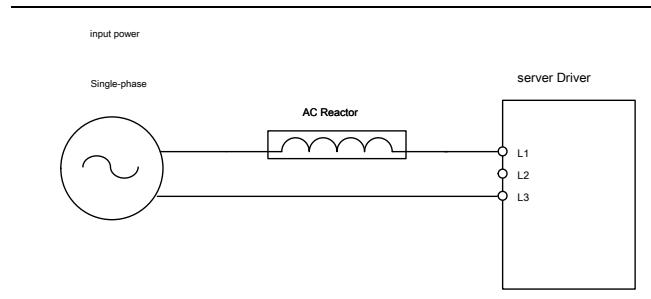
to make sure EMI filter(EMI Filter) To achieve optimal effect to suppress interference servo drive, in addition to the servo drives need to be able to use the hand in accordance with Books in Installation and wiring outside the tolerance, the need to pay attention to the following points:

project content	
1	Servo drive and a noise filter must be installed on the same piece of metal flat.
2	Wiring as short as possible.
3	The metal plate should be grounded.
4	And servo drive noise filter housing or metal grounding should be fixed to the metal plane, and the contact area between the two should be as large as possible.
5	Motor power line use copper mesh shielded cable (if double shield best)
6	In the motor across the line and to ground the shield should be grounded at the shortest distance and the maximum contact area.

2.3.2. High harmonics connected to AC / DC reactor

When the need for high order harmonic response, may be connected with the high harmonics on the servo drive AC / DC Reactor. Referring next to FIG reactor is connected.

use AC Reactor



2.4 Regenerative resistor is selected

When the motor torque in the opposite direction and speed, which represents the energy returned from the load to the servo drive. This infusion of energy DC Bus Such that the capacitor voltage to rise. When it rises to a certain value, the extra energy consumed by the regenerative resistor. Drive with the regenerative resistor, the user may be external regenerative resistor. The following table EPS-M1 Containing regeneration series specifications provided resistance.

Drive enclosure	Regeneration internal resistance specifications		The minimum allowed resistance (Ohm)
	resistance(Ohm)	Capacity (Watt)	
EPS-M1-080808AA	30	100	20
EPS-M1-151515AA	30	100	20

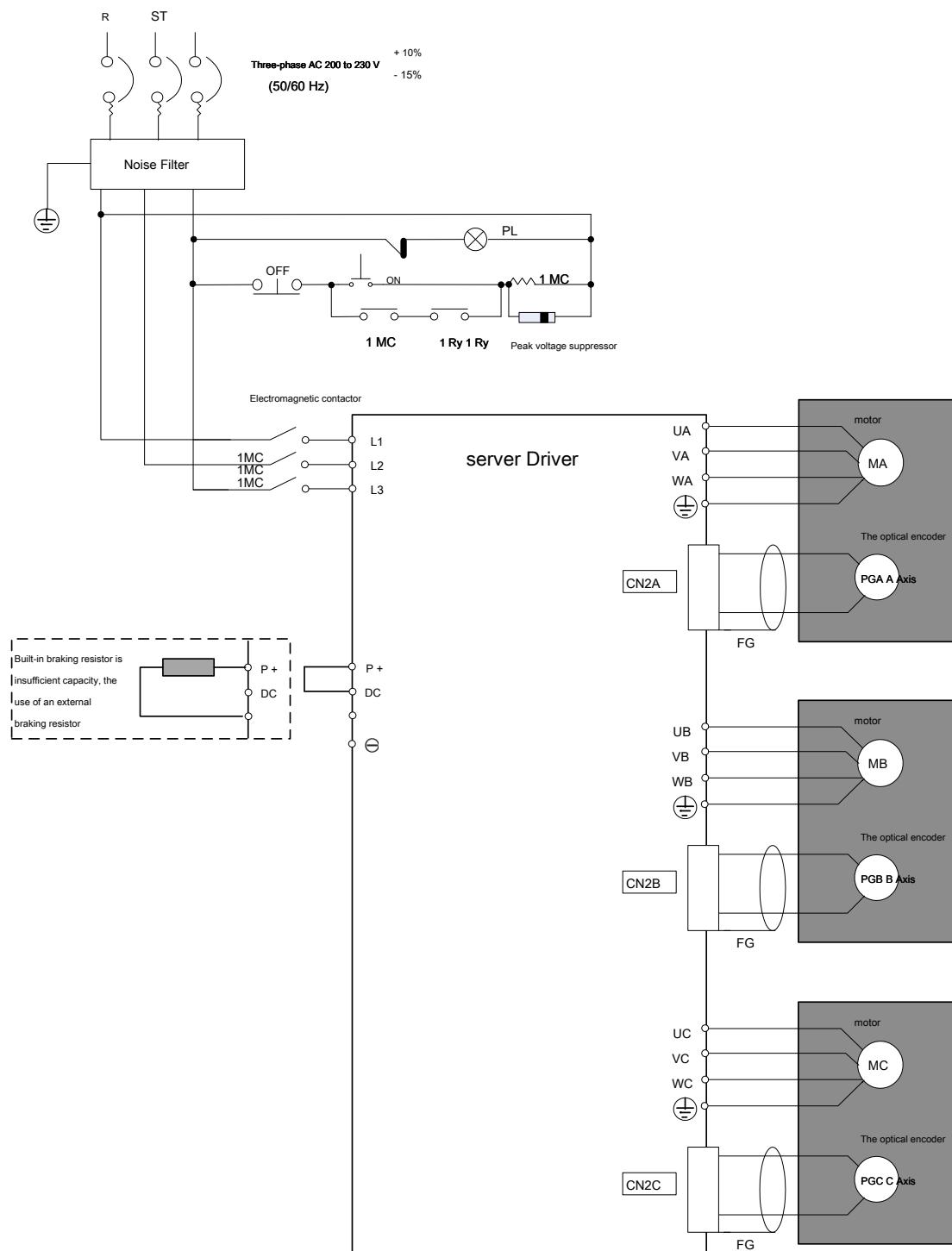
When the regenerative power exceeds the capacity of the regenerative resistor can be built-in regenerative process, should external regenerative resistor. The following items should be noted that when using the regenerative resistor.

project content	
1	Please set the correct resistance value and capacity of regenerative resistor, otherwise it will affect the execution of the function.
2	When the user wants an external regenerative resistor, the resistance value can not be sure to use a resistance value smaller than the minimum allowed; if the user trying to use in parallel to increase the power of the regenerative resistor, the resistance value is sure to meet the constraints.
3	In the natural environment, when the regenerative power (average value) of the regenerative resistor may be used at the rated processing capacity, the temperature will rise to resistance 120 °C above (in the case of continuous regenerative). To ensure safety, it is recommended to use regenerative resistor having a thermal switch.
4	When using an external regenerative resistor, the resistor is connected to the P , C end, P , D Open end. External regenerative resistor the resistance value of the table to select a recommended.

Chapter Wiring

3.1 System Configuration and Wiring

3.1.1 Typical System Architecture



3.1.2 is connected with the drive terminal

Terminal Symbol	name	Explanation	
L1 , L2 , L3	And a main control circuit power supply input terminal	Three-phase connection 220V AC power supply.	
P + , D , C , ⊖	External regenerative resistor or reproducing unit terminals	Using an internal braking resistor	If the built-in regenerative resistor, please P + , D It Between short, P + , C Open end.
		External braking resistor	Built regenerative resistor is insufficient capacity, the P , D It Placed between the open (demolition short wires), in P , C A resistor connected between the external regenerative.
		External braking unit brake unit	P + , P- Are respectively connected to the servo P + End, and P , D versus P , C In the open state.
UA , VA , WA	A Axis servomotor terminal versus A	Axis servomotor.	
UB , VB , WB	B Axis servomotor terminal versus B	Axis servomotor.	
UC , VC , WC	C Axis servomotor terminal versus C	Axis servomotor.	
(	Ground terminal	A ground terminal connected to the power source and the motor ground terminal for ground handling.	
CN1	A \ B \ C Communication connector shaft	RJ45 Splices, connectors RS-485 communication	
CN2A \ CN2B \ CN2C A \ B \ C axis	/ O Connector	Connected to the host controller	
CN3A \ CN3B \ CN3C A \ B \ C Connector	shaft encoder	Connecting the motor encoder	

3.1.3 Wiring of the main circuit

1) Servo drive Main circuit wire size

External terminal name	Terminal symbol	Wire mm2 (AWG)				
		EPS-M1-				
		02	04	08	10	15
power cable	L1 , L2 , L3	1.25 (AWG-16)	2.0 (AWG-14)			
Motor power line	UA \ UB \ UC , VA \ VB \ VC , WA \ WB \ WC	1.25 (AWG-16)	2.0 (AWG-14)			
External regenerative resistance wire	P + , D , C	1.25 (AWG-16)				
Ground wire	(	2.0 (AWG-14)	the above			

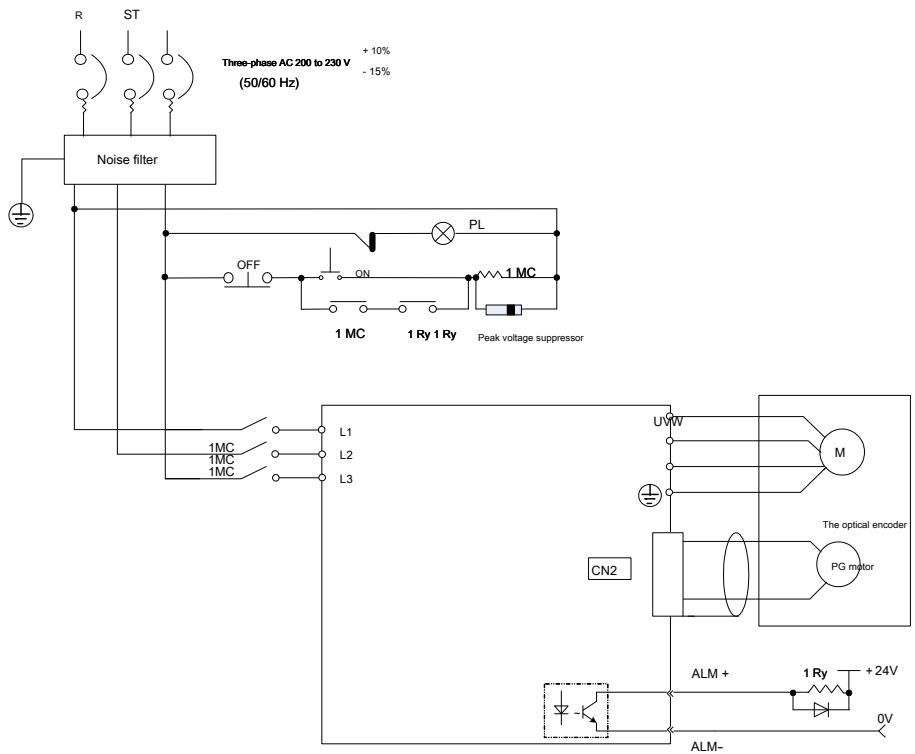
2) A typical example of a main circuit wiring

main circuit wiring Note

When the power-on sequence during design, consider the following points.

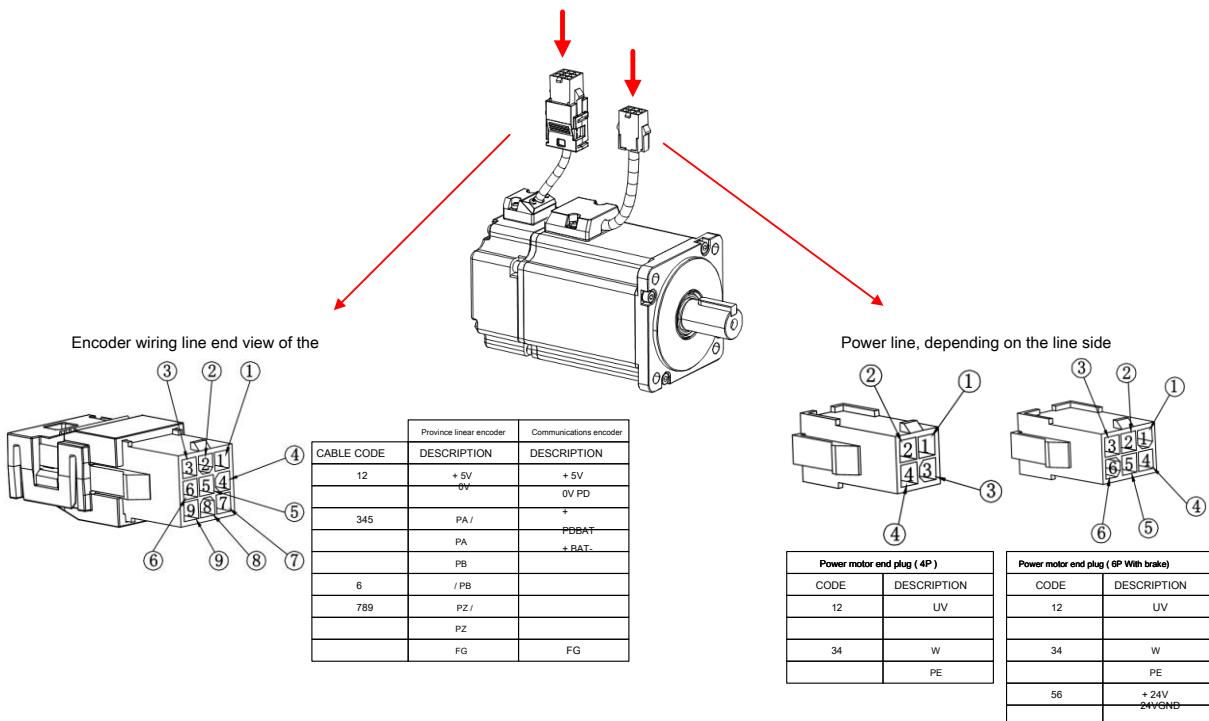
Please power-on sequence to be designed as follows: after outputting the "servo alarm" signal to make the main circuit power supply is in OFF status. When the control power supply is turned on and the main circuit, Turn on the main circuit power supply is turned on at the same time or in the control supply is turned on. When you disconnect the power, cut off the main circuit power before control power.

- Three-phase AC220V power input

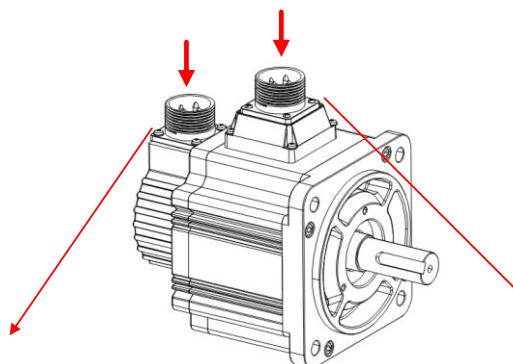


3.2 Motor-side wiring

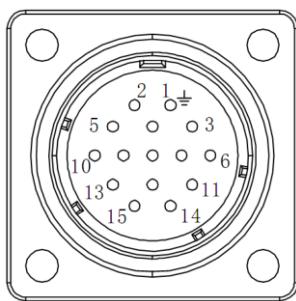
3.2.1 quick connector terminal defined shape and



3.2.1. Air plug terminal defined shape and

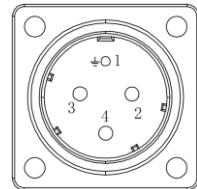


The encoder defined exit

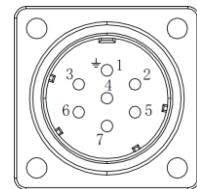


Province linear encoder		Communications encoder
CABLE CODE	DESCRIPTION	DESCRIPTION
12	FG	FG
	+ 5V	+ 5V
345	0V	0V PD
	PA	+BAT
	PB	-
6	PZ	
789	/ PA /	PDBAT-
	PB /	
	PZ	

Power outlet defined



Power motor end plug (4P)	
CODE	DESCRIPTION
12	PE
	V
34	UW



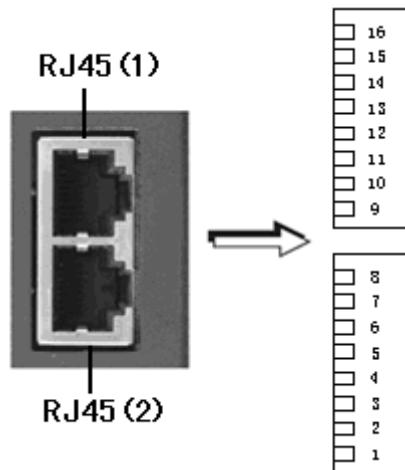
Power motor end plug (7P With brake)	
CODE	DESCRIPTION
12	PE
	V
34	UW
56	+ 24V 24V GND
7	

3.3 Connector CN1 Wiring

Connector CN1 Provide communications plug, servo drives RS485 communication. Different address assignment, respectively, may be A axis, B axis, C Axis servo communications.

3.3.1 Terminal arrangement

(one) Contact Shape



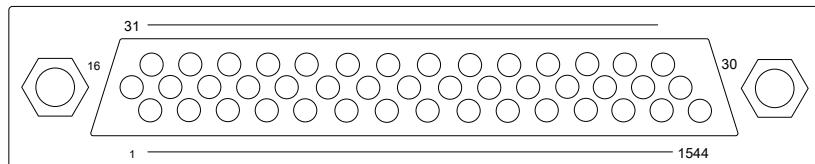
(two) Terminal Assignment

Terminal Identification	Terminal	Features
1,9	RS485 + RS485 Positive signal	
2,10	RS485-	RS485 Negative signal
3,11	GND Digital G	round
4,12		Unused
5,13		Unused
6,14	GND Digital G	round
7,15		
8,16		
shell	FG	Shielded cable

3.4 Connector CN2 Wiring

Connector CN2A , CN2B , CN2C The same definition. CN2A for A Axis control terminal, CN2B for B Axis control terminal, CN2C for C Axis control terminal.

3.4.1 Connector CN2 The arrangement



1	DO4 + Digital Output 4 (+)				31	DI7	Digital input 7
2	DO3 - Digital Output 3 (-)	16	SG	GND	32	DI6	Digital input 6
3	DO3 + Digital Output 3 (+)	17			33	DI5	Digital input 5
4	DO2 - Digital Output 2(-)	18	T-REF Torque command input (+)		34	DI3	Digital input 3
5	DO2 + Digital Output 2 (+)	19	AGND Torque command input (-)		35	PL	Instruction input power supply open collector
6	DO1 - Digital Output 1(-)	20	V-REF Speed reference input (+)		36	/ HPULS High-speed instruction pulse enter(-)	
7	DO1 + Digital Output 1 (+)	twenty one	PAO Divided pulse encoder Export A Inverting (+)		37	/ SIGN Command symbol input (-)	
8	DI4	Digital input 4	twenty two	/ PAO Divided pulse encoder Export A phase(-)	38	HPULS	High-speed instruction pulse Input (+)
9	DI1	Digital input 1	twenty three	/ PBO Divided pulse encoder Export B phase(-)	39	SIGN Command symbol input (+)	
10	DI2	Digital input 2	twenty four	/ PZO Divided pulse encoder Export Z phase(-)	40	/ HSIGN High-speed instruction pulse enter(-)	
11	COM + external 24V power supply enter	25	PBO Divided pulse encoder Export B Inverting (+)		41	/ PULS Command pulse input (-)	
12			26	DO4 - Digital Output 4 (-)	42	HSIGN High speed command sign Input (+)	
13	PZO Divided pulse encoder Export Z Inverting (+)	27			43	PULS Command pulse input (+)	
14			28		44		
15			29	AGND Speed reference input (-)			
			30	DI8		Digital input 8	

(Note)

- 1) Do not use empty terminals.
- 2) Set the input and output signals are connected to the connector housing with the cable shield. Be grounded through the frame-side connector of the servo driver (FG).
- 3) In addition to the alarm signal (ALM) In addition, all input and output signals can be changed by the assigned parameter settings.

3.4.2 Connector CN2 Signal description

- input signal The name and its Function (default The pin distribution)

Control Mode	Signal Name	Pin No.	Features
Common	S-ON	9	Servo ON : Motor becomes energized state.
	C-MOD	10	Control mode switching: switching two control modes.
	POT	348	Forward driving ban
	NOT		Inversion driving ban over travel ban: stop the operation of the servo motor is ON.
	CLR	33	Position deviation pulse clear: Clear position deviation pulse position control.
	A-RST	32	Alarm reset: Releases the servo alarm state.
	INHIBIT	31	Pulse inhibit input
	ZEROSPD	30	Zero speed input signal
Position control	COM +	11	I / O A signal power supply, 24VDC power required by the user.
	HPULS +	38	High-speed pulse input channel
	HPULS-	36	* Symbol pulse train +
	HSIGN +	42	* CCW + CW Pulse train
	HSIGN-	40	* A + B Pulse train
	PULS +	43	Low speed pulse input channel:
	PULS-	41	* Symbol pulse train +
	SIGN +	39	* CCW + CW Pulse train
	SIGN-	37	* A + B Pulse train
	PL	35	The collector terminal of the pulse signal
speed control	V-REF	20	Speed command voltage input
	AGND	29	
Torque Control	T-REF	18	Torque command voltage input
	AGND	19	

- Export Signals name And said Features

Control module	Signal name	Pin type	number	Features
Common	PAO +	twenty one		A Phase signal
	PAO-			
	PBO +	25	twenty three	B Phase signal
	PBO-	twenty three		
	PZO +	13	twenty four	Z Phase signal origin pulse (Z Phase) signal
	PZO-	twenty four		
	ALM +	7		Servo alarm: when the abnormal state is detected OFF .
	ALM-	6		
	COIN +	5		Positioning completion: the position control mode, when the error pulse is less than PA525 (positioning completion width), this signal is active.
	COIN -	4		
	CZ +	3		Optocoupler output Z Phase pulse
	CZ-	2		
	BK +	1		External brake signal output

	BK -	26	
--	------	----	--

3.4.3 Input signal distribution outputs IO

(one) Distribution of the input signal

Usually the input signal may be used in accordance with the factory setting, can be allocated as needed

(1) According to the factory settings using

■ Factory State when the input signal distribution can be obtained by PA500 ~ PA507 Undergo verification.

Parameter Number	name	Setting range Unit	Factory setting	effective time
PA500	port DI1 Input signal selection [0] Servo enable (S-ON) [1 Control mode switching] (C-MODE) [2] Forward drive prohibit (POT) [3] Negative driving ban (NOT) [4] Deviation counter clear (CLR) [5] Alarm Clear (A-RST) [6] Pulse input prohibition (INHIBIT) [7] Zero clamp (ZEROSPD) [8] Forward torque limit (PCL) [9] Negative torque limit (NCL) [10] Gain switching (GAIN) [11 The point of the signal (ZPS) [12] Internal position and velocity negated signal under the control of (CMDINV) [13 Octave division switching instruction] 0 (DIV0) [14 Octave division switching instruction] 1 (DIV1) [15 Internal command speed selection] 0 (INSPD0) [16 Internal command speed selection] 1 (INSPD1) [17 Internal command speed selection] 2 (INSPD2) [Other] special purpose functions	0 ~ 30	0	immediately
PA501	port DI2 Input signal selection	0 ~ 30	1	immediately
PA502	port DI3 Input signal selection	0 ~ 30	2	immediately
PA503	port DI4 Input signal selection	0 ~ 30	3	immediately
PA504	port DI5 Input signal selection	0 ~ 30	4	immediately
PA505	port DI6 Input signal selection	0 ~ 30	5	immediately
PA506	port DI7 Input signal selection	0 ~ 30	6	immediately
PA507	port DI8 Input signal selection	0 ~ 30	7	immediately

■ Input port DI1 ~ DI8 Correct The default should pin and signal name He said the following:

Parameter Number	Port Name	CN2 Port pin	DEFAULT
PA500	DI1	9	S-ON
PA501	DI2	10	C-MOD
PA502	DI3	34	POT
PA503	DI4	8	NOT
PA504	DI5	33	CLR

PA505	DI6	32	A-RST
PA506	DI7	31	INHIBIT
PA507	DI8	30	ZEROSPD

■ 10es The signal shape Select State

Parameter Number	name	Predetermined area	Unit Default	Setting effective time
PA508	Morphology selection input signal 0 b.0001 : DI1 Morphology selection input signal; [0] signal L Active level (optocoupler turns) [1] signal H Active level (optocoupler is not conducting) b.0010 : DI2 Morphology selection input signal; [0] signal L Active level (optocoupler turns) [1] signal H Active level (optocoupler is not conducting) b.0100 : DI3 Morphology selection input signal; [0] signal L Active level (optocoupler turns) [1] signal H Active level (optocoupler is not conducting) b.1000 : DI4 Morphology selection input signal; [0] signal L Active level (optocoupler turns) [1] signal H Active level (optocoupler is not conducting)	b.0000 ~ 1111		b.0000 immediately
PA509	Morphology selection input signal 1 b.0001 : DI5 Morphology selection input signal; [0] signal L Active level (optocoupler turns) [1] signal H Active level (optocoupler is not conducting) b.0010 : DI6 Morphology selection input signal; [0] signal L Active level (optocoupler turns) [1] signal H Active level (optocoupler is not conducting) b.0100 : DI7 Morphology selection input signal; [0] signal L Active level (optocoupler turns) [1] signal H Active level (optocoupler is not conducting) b.1000 : DI8 Morphology selection input signal; [0] signal L Active level (optocoupler turns) [1] signal H Active level (optocoupler is not conducting)	b.0000 ~ 1111		b.0000 immediately

(2) After the assignment change of the input signal used

² servo using the "polarity reversal" ON Prohibiting forward drive, reverse drive is prohibited when the respective signals will not result in the safe direction operation abnormality occurs in the signal line disconnection. When forced to use this setting, be sure to check the operation, to ensure that no security issues. A typical circuit input signal as shown below.

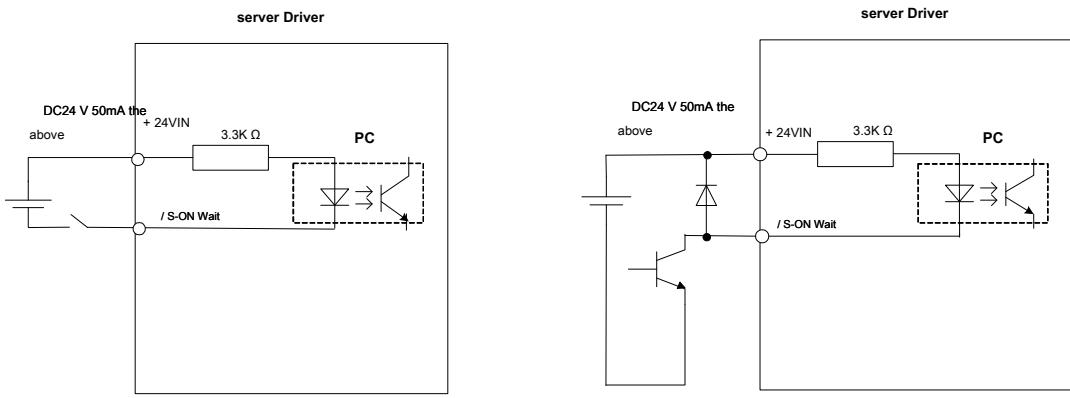


FIG above example, when the optocoupler is turned on, S-ON Signals L Level, when the optocoupler is not conducting, S-ON Signals H Level. parameter PA508

Decide S-ON The active level, PA508.0 = 0 Time, S-ON Signals L Effective level, PA508.0 = 1 Time, S-ON Signals H Effective level.

CN2 Pin name Signal	selection parameter	Signal Name	Parameter signal is negated	Signal state
9	DI1	PA500 = 0	Servo enable (S-ON)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 1	Control mode switching (C-MODE)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 2	Forward drive prohibit (POT)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 3	Negative driving ban (NOT)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 4	Deviation counter clear (CLR)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 5	Alarm Clear (A-RST)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 6	Pulse input prohibition (PULSEHIBIT) PA508.0 = 0	
				PA508.0 = 1 signal H effective
		PA500 = 7	Zero clamp (ZEROSPD)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 8	Forward torque limit (PCL)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 9	Negative torque limit (NCL)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 10	Gain switching (GAIN)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 11	Origin signal (ZPS)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 12	Inverted signal at the internal position and speed control (CMDINV)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 13	Command frequency-division switching frequency 0 (DIV0)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective
		PA500 = 14	Command frequency-division switching frequency 1 (DIV1)	PA508.0 = 0 signal L effective
				PA508.0 = 1 signal H effective

		PA500 = 15	Internal command speed selection 0 (INSPD0) PA508.0 = 0		signal L effective
				PA508.0 = 1	signal H effective
		PA500 = 16	Internal command speed selection 1 (INSPD1) PA508.0 = 0		signal L effective
				PA508.0 = 1	signal H effective
		PA500 = 17	Internal command speed selection 2 (INSPD2) PA508.0 = 0		signal L effective
				PA508.0 = 1	signal H effective
		PA500 = 18	Internal location selected 0 (INPOS0)	PA508.0 = 0	signal L effective
				PA508.0 = 1	signal H effective
		PA500 = 19	Internal location selected 1 (INPOS1)	PA508.0 = 0	signal L effective
				PA508.0 = 1	signal H effective
		PA500 = 20	Internal location selected 2 (INPOS2)	PA508.0 = 0	signal L effective
				PA508.0 = 1	signal H effective
		PA500 = 21	Internal location selected 3 (INPOS3)	PA508.0 = 0	signal L effective
				PA508.0 = 1	signal H effective
		PA500 = 22	Internal position of the trigger (PTRG)	PA508.0 = 0	Rising Edge
				PA508.0 = 1	
		PA500 = 23	Internal control forward position JOG run(P-POS)	PA508.0 = 0	signal L effective
				PA508.0 = 1	signal H effective
		PA500 = 24	Internal reverse position control JOG run(N-POS)	PA508.0 = 0	signal L effective
				PA508.0 = 1	signal H effective
		PA500 = 25	Internal Position Control start next time zero (SHOM)	PA508.0 = 0	Rising Edge
				PA508.0 = 1	
		PA500 = 26	Under internal control stop signal position (PZERO)	PA508.0 = 0	signal L effective
				PA508.0 = 1	signal H effective
10	DI2	PA501 = n	corresponding n No. Signal	PA508.1 = 0	signal L effective
				PA508.1 = 1	signal H effective
34	DI3	PA502 = n	corresponding n No. Signal	PA508.2 = 0	signal L effective
				PA508.2 = 1	signal H effective
8	DI4	PA503 = n	corresponding n No. Signal	PA508.3 = 0	signal L effective
				PA508.3 = 1	signal H effective
33	DI5	PA504 = n	corresponding n No. Signal	PA508.4 = 0	signal L effective
				PA508.4 = 1	signal H effective
32	DI6	PA505 = n	corresponding n No. Signal	PA508.5 = 0	signal L effective
				PA508.5 = 1	signal H effective
31	DI7	PA506 = n	corresponding n No. Signal	PA508.6 = 0	signal L effective
				PA508.6 = 1	signal H effective
30	DI8	PA507 = n	corresponding n No. Signal	PA508.7 = 0	signal L effective
				PA508.7 = 1	signal H effective

(3) Confirm the input signal

State of the input signal may be monitored by an input signal (dP012)Undergo verification. Monitoring respect to the input signal (dP012),Please refer to" 8.4 Input signal monitoring. "

(4) Related Notes

- If there are two IO When the pin is assigned to the same signal, and the active state of this signal is higher grade DI Signal prevail. Such as DI0 with DI1 They are set to 0 (S-ON Signal), the drive S-ON The signal state DI1 (CN2-41 Pin) decision;

(two) Distribution of the output signal

The output signal PA510 , PA511 Set, is assigned to the input and output signal connector (CN2)on.

(1) Confirm Assignment factory state

May by under Parameter assignment to confirm the output signal form the factory state.

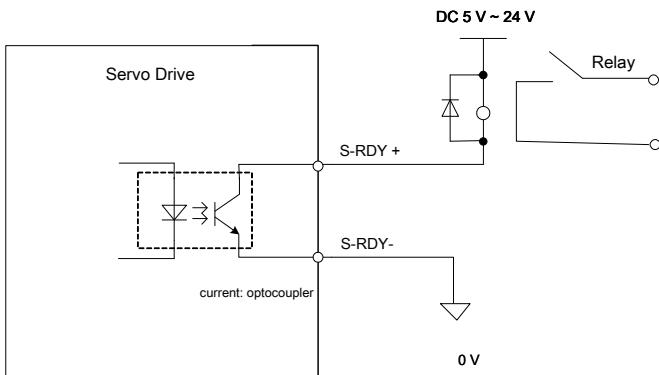
Parameter Number	name	Predetermined area	Unit Default	Setting effective time
PA510	<p>Selection output signal</p> <p>h.0001 : DO1 Output signal selection [0] Alarm signal output (ALM)</p> <p>h.0010 : DO2 Output signal selection [0] Alarm signal output (ALM) [1] Positioning completion (COIN) [2] Z Pulse collector signal (CZ) [3] External brake release signal (BK) [4] Servo ready output (S-RDY) [5] Speed coincidence output (VCMP) [6 Motor rotation detecting) (TGON) [7] Torque limit signal (TLC) [8] Zero speed detection signal (ZSP) [9 The warning output (WARN)</p> <p>h.0100 : DO3 Selection output signal</p> <p>with DO2</p> <p>h.1000 : DO4 Selection output signal</p> <p>with DO2</p>	h. 0000 ~ CCC0		h. 3210 immediately
PA511	<p>Output signal is negated</p> <p>b.0001 : DO1 (Alarm ALM) Morphology selection output signal;</p> <p>[0] Signal is valid when H Level signal (non-conducting optocoupler) [1] Signal is invalid L Level signal (optocoupler turns)</p> <p>b.0010 : DO2 Morphology selection output signal;</p> <p>[0] Signal is valid when L Level signal (optocoupler turns) [1] Signal is invalid H Level signal (non-conducting optocoupler)</p> <p>b.0100 : DO3 Morphology selection output signal;</p> <p>[0] Signal is valid when L Level signal (optocoupler turns) [1] Signal is invalid H Level signal (non-conducting optocoupler)</p> <p>b.1000 : DO4 Morphology selection output signal;</p> <p>[0] Signal is valid when L Level signal (optocoupler turns) [1] Signal is invalid H Level signal (non-conducting optocoupler)</p>	h.0000 ~ 0011		h.0000 immediately

Input port DO1 ~ DO4 Pin corresponding to the following:

Parameter Number	name	CN2 Port pin	DEFAULT
PA510.0	DO1	7 , 6	ALM
PA510.1	DO2	5 , 4	COIN
PA510.2	DO3	3 , 2	CZ
PA510.3	DO4	1 , 26	BK

(2) After the allocation change of the output signal used

² no detectable signal is "invalid" state. For example, speed control, positioning completion (COIN) Signal is "invalid." Distribution of the output signals shown in the following table. A typical output signal of the circuit as shown below:



The maximum current capacity allowable voltage (Note) photocoupler output circuit is as follows:

Voltage: DC30V (The maximum)

DC50mA (maximum)

Above figure as an example, the parameters PA510 Decide COIN Level, when COIN Signal is active, when PA510 = 0 When, optocoupler PC When turned on, L Level is COIN Effective level of a signal; when PA510 = 1 When, optocoupler PC Is not turned on, H Level is COIN Active level of the signal.

CN2 Pin name	Signal selection parameter	Signal Name	Parameter signal is negated	Signal state
7 , 6	DO1	Servo alarm (ALM)	PA511.0 = 0	<u>When the signal is valid H</u>
			PA511.0 = 1	<u>When the signal is valid L</u>
5 , 4	DO2	PA510 = 0	PA511.1 = 0	<u>When the signal is valid L</u>
			PA511.1 = 1	<u>When the signal is valid H</u>
		PA510 = 1	PA511.1 = 0	<u>When the signal is valid L</u>
			PA511.1 = 1	<u>When the signal is valid H</u>
		PA510 = 2	PA511.1 = 0	<u>When the signal is valid L</u>
			PA511.1 = 1	<u>When the signal is valid H</u>
		PA510 = 3	PA511.1 = 0	<u>When the signal is valid L</u>
			PA511.1 = 1	<u>When the signal is valid H</u>
		PA510 = 4	PA511.1 = 0	<u>When the signal is valid L</u>
			PA511.1 = 1	<u>When the signal is valid H</u>
		PA510 = 5	PA511.1 = 0	<u>When the signal is valid L</u>
			PA511.1 = 1	<u>When the signal is valid H</u>
		PA510 = 6	PA511.1 = 0	<u>When the signal is valid L</u>
			PA511.1 = 1	<u>When the signal is valid H</u>

		PA510 = 7	Torque limit signal (TLC)	PA511.1 = 0	When the signal is valid L
		PA510 = 8	Zero speed detection signal (ZSP)	PA511.1 = 1	<u>When the signal is valid H</u>
		PA510 = 9	Warning output (WARN)	PA511.1 = 0	When the signal is valid L
				PA511.1 = 1	<u>When the signal is valid H</u>
3 , 2	DO3 Ditto		collector Z pulse(CZ)	PA511.2 = 0	When the signal is valid L
				PA511.2 = 1	<u>When the signal is valid H</u>
1 , 26	DO4 Ditto		External brake release signal (BK) PA511.3 = 0		When the signal is valid L
				PA511.3 = 1	<u>When the signal is valid H</u>

(3) Related Notes

- Pin alarm signal can not be freely assigned, you can only use the first 7 (ALM +), 6 (ALM-) foot;
- When Z Collector output pulse signal output level can not change state (corresponding to PA [511] Bit useless);
- If there are two IO Pin is assigned as Z Collector output pulse signal, and the active state of this signal is higher grade DO Signal prevail. Such as DO2 with DO3 They are set to 2 (Z Collector signal pulse), DO3 (CN2-3 , 2 Pin) output Z Pulse signal;
- Note that the alarm signal (ALM) Indicates that the alarm is active, no alarm indicates invalid.

3.4.4 Example of connection with the host apparatus

Input and output signals and servo drive means connected with the upper Examples are shown below.

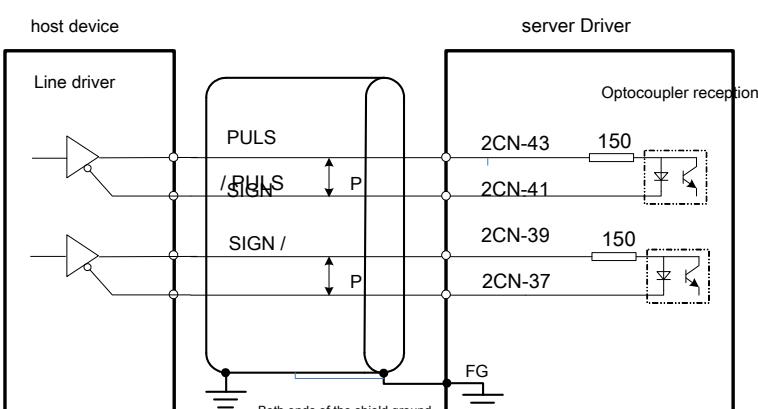
(one) Command input circuit

1) Low speed position command input circuit

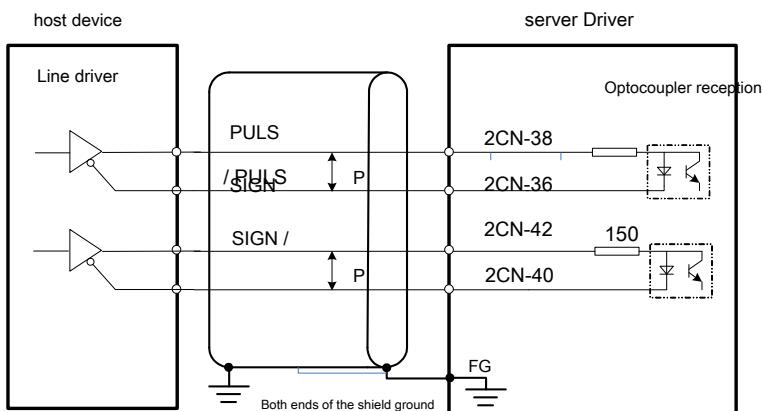
2) Described below CN2 Connector 43-41 (Command pulse input), 39-37 (Instruction symbol input) terminal. Command pulse output circuit of the host device side can be output from the linear drive, open collector output (2 Species) optionally a three. Exemplified hereinafter described.

■ Linear actuator output

- a) Driver receives the pulse through a low speed channel



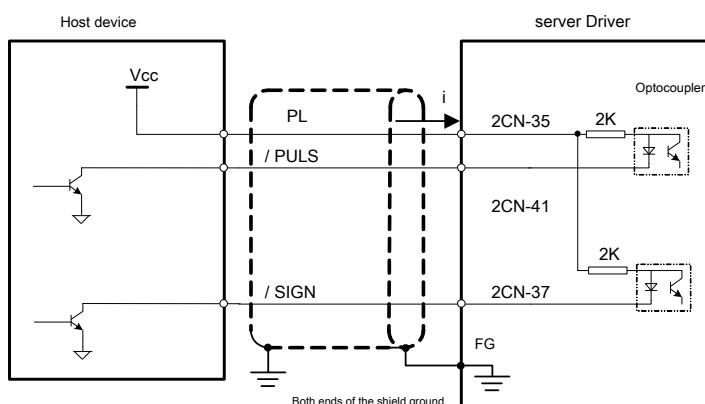
- b) Drive pulses received through a high speed channel. Note that this is 5V System, do not enter greater than 5V power supply.



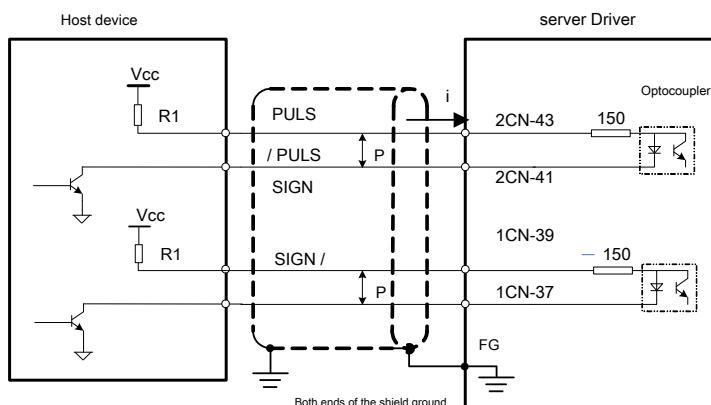
In order to improve the anti-interference high-speed pulse input interface, the controller recommended that the servo drives connected together.

■ Open collector output

a) PC is an open collector output, and provides 24VDC Signal power, connections 1



b) PC is an open collector output, and provides 5VDC , 12VDC , 24VDC Signal power, connections 2



Please press the input current value setting resistor scope of the following claims R1 .

Input Current $i = 10 \sim 15\text{mA}$:

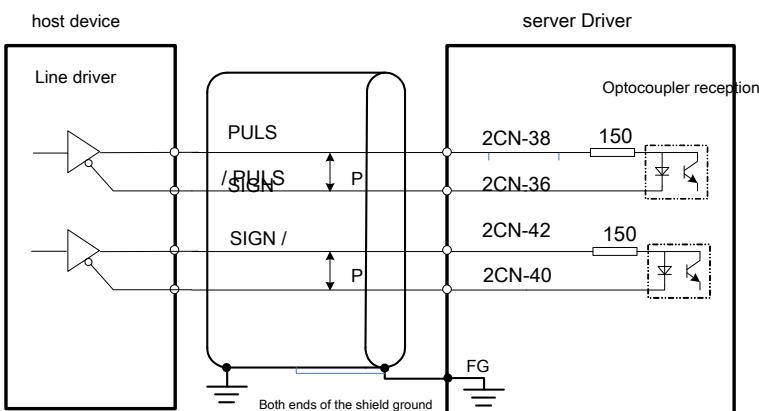
Vcc 24 V Time, $R 1 = 2 \text{ K} \Omega$

Vcc 12 V Time, $R 1 = 510 \Omega$

Vcc 5 V Time, $R 1 = 180 \Omega$

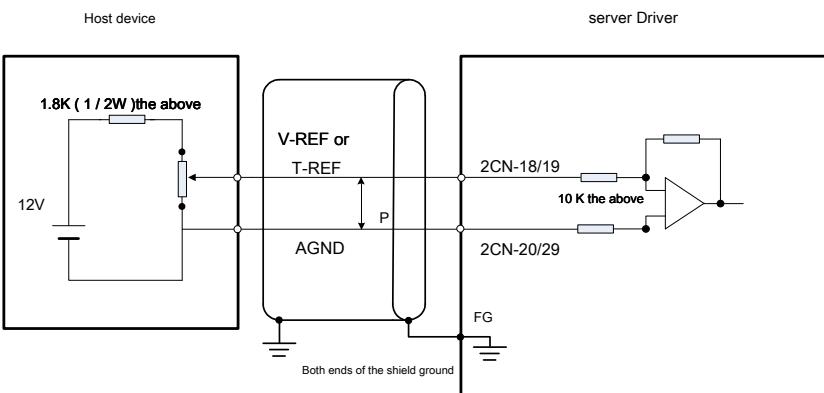
3) High speed position command input circuit

Described below CN2 Connector 16-17 (Command pulse input), 23-24 (Instruction symbol input) terminal. Command pulse output circuit of the host device side only output from the linear drive. Here are some examples.



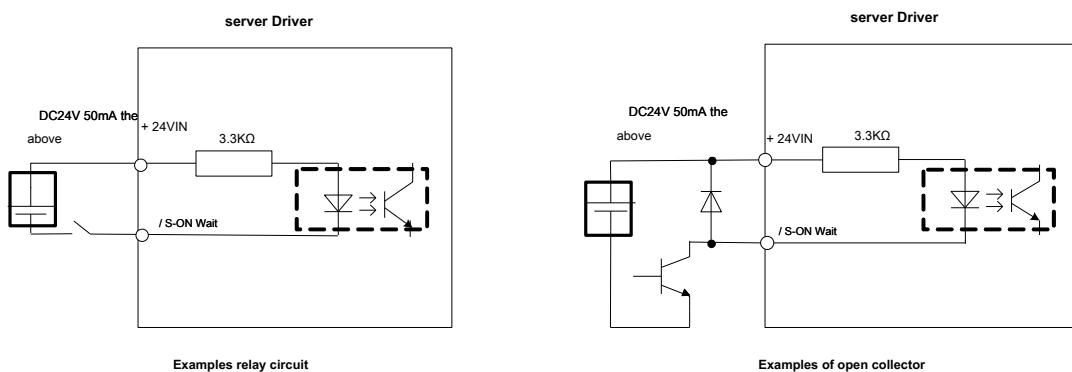
4) Analog input circuit

Described below CN2 Connector 18-19 (Command input rate), 20-29 (Torque command input) terminal. Analog signals refer to the speed command or torque command signal. Input impedance as shown in FIG.



5) Sequence input circuit

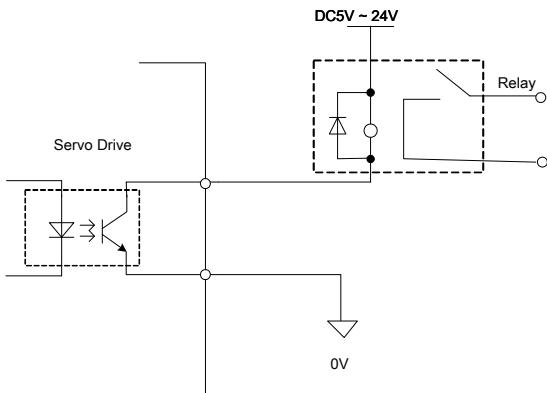
Connected through a relay or open collector transistor circuit. When using the relay connection, select micro current relay. If you do not use micro current relay will cause poor contact.



(two) The output circuit

1) Sequence output circuit

Servo alarm, and other servo ready output signal is constituted by sequentially photocoupler output circuit using the relay connection.

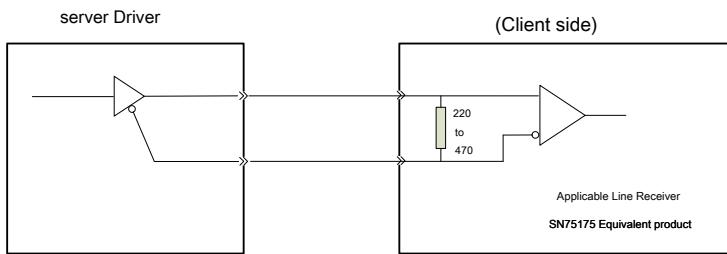


The maximum permissible voltage (Note) photocoupler output circuit, the maximum current as follows:

- ² Voltage: DC30V (maximum)
- ² Current: DC50mA (maximum)

2) Linear driver output circuit

Here CN2 Ports 21-22 (A Phase signal), 25-23 (B Phase signal), 13-24 (Z Phase signal) Terminal will be described. It converts the serial data to the encoder 2 phase(A phase, B phase) Pulse output signal (PAO, /PAO, PBO, /PBO) And the origin pulse signal (PZO, /PZO) Output by the linear driver output circuit. Typically, the speed of the servo drive control, a position control system configured as needed on the host device side. In the upper side of the device, use the linear loop receiver receives.



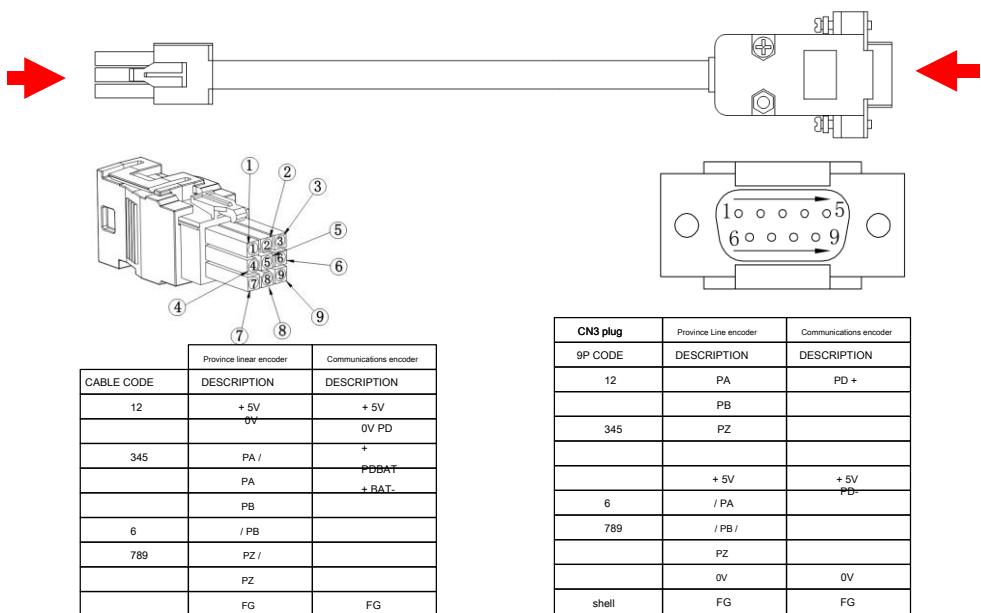
3.5 Connector CN3 Wiring

CN3 Coding terminal, CN3A, CN3B, CN3C The same pin definitions. CN3A for A Shaft encoder terminals, CN3B for B Shaft encoder terminals, CN3C for C Shaft encoder terminals.

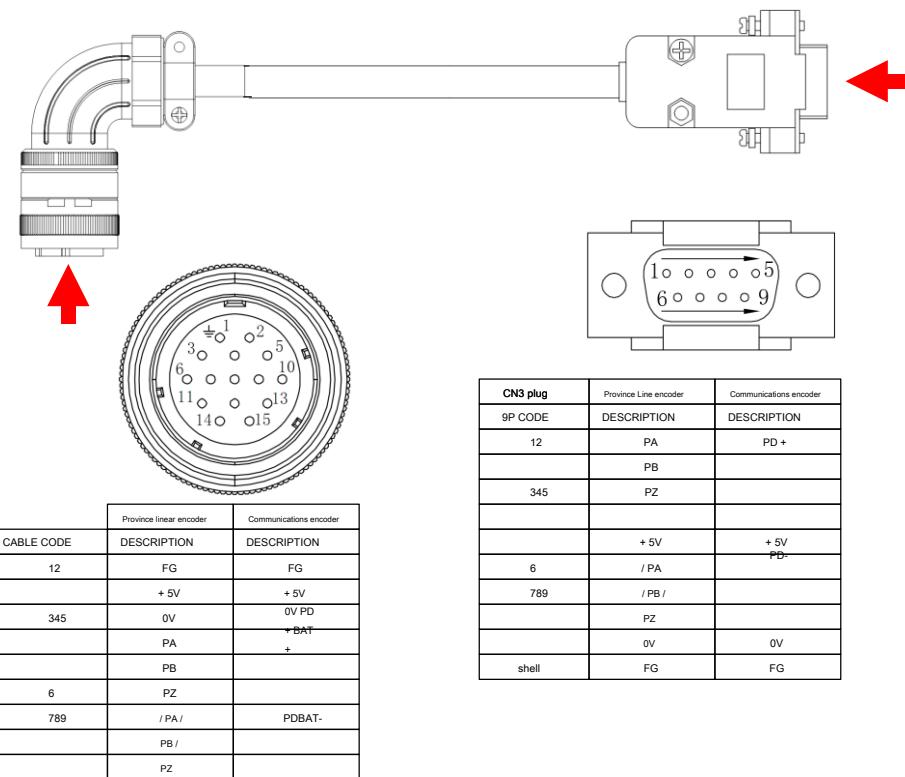
Next, the encoder, for example servo drives and servo drives are connected to the higher-level device from the output signal, and an encoder connected with a port (CN3) The terminal arrangement will be described.

3.5.1 Encoder cable

(one) Quick plug encoder cable



(two) Air plugs encoder cable

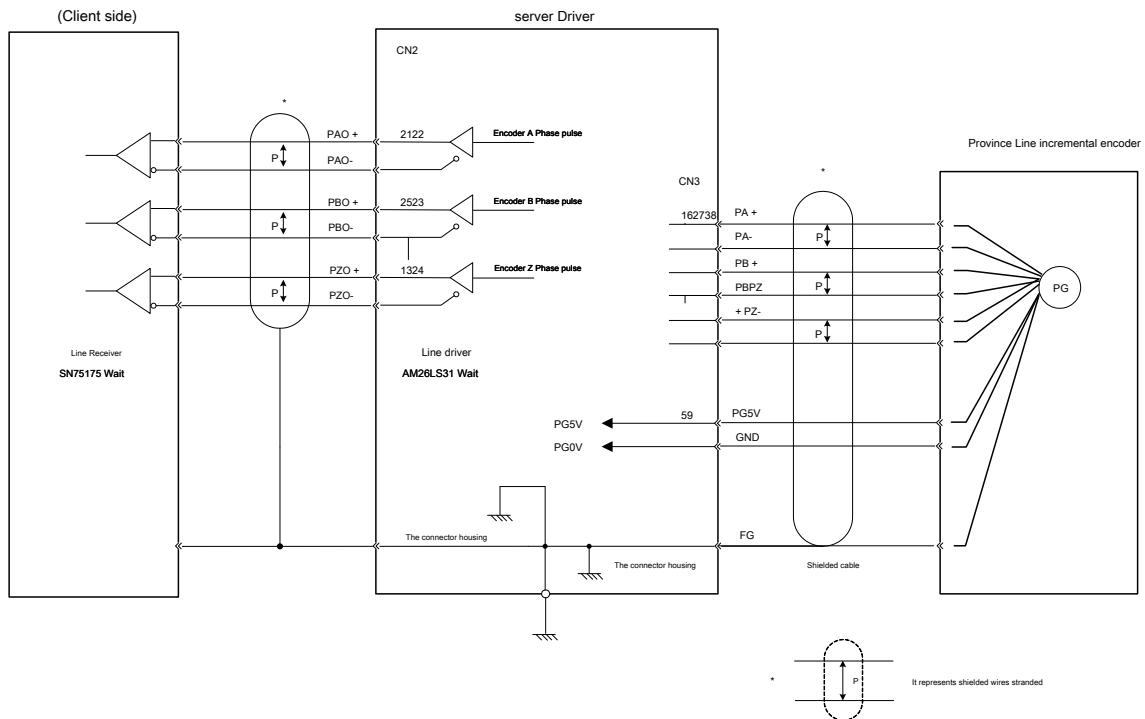


Note:

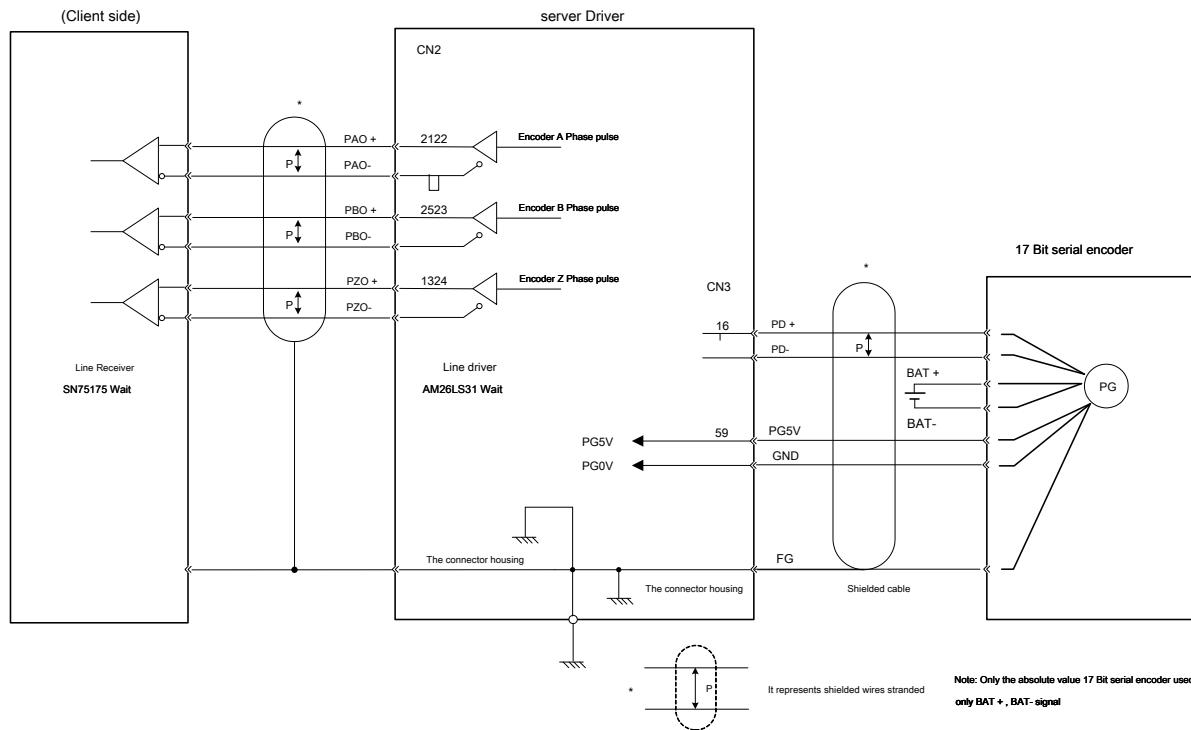
1,17-bit serial encoder is used if the Absolute BAT +, BAT- connecting the external battery. If the serial encoder 17 is not used incremental BAT +, BAT- signal.

3.5.2 Connector CN3 Connection example

- Province wiring line incremental encoder

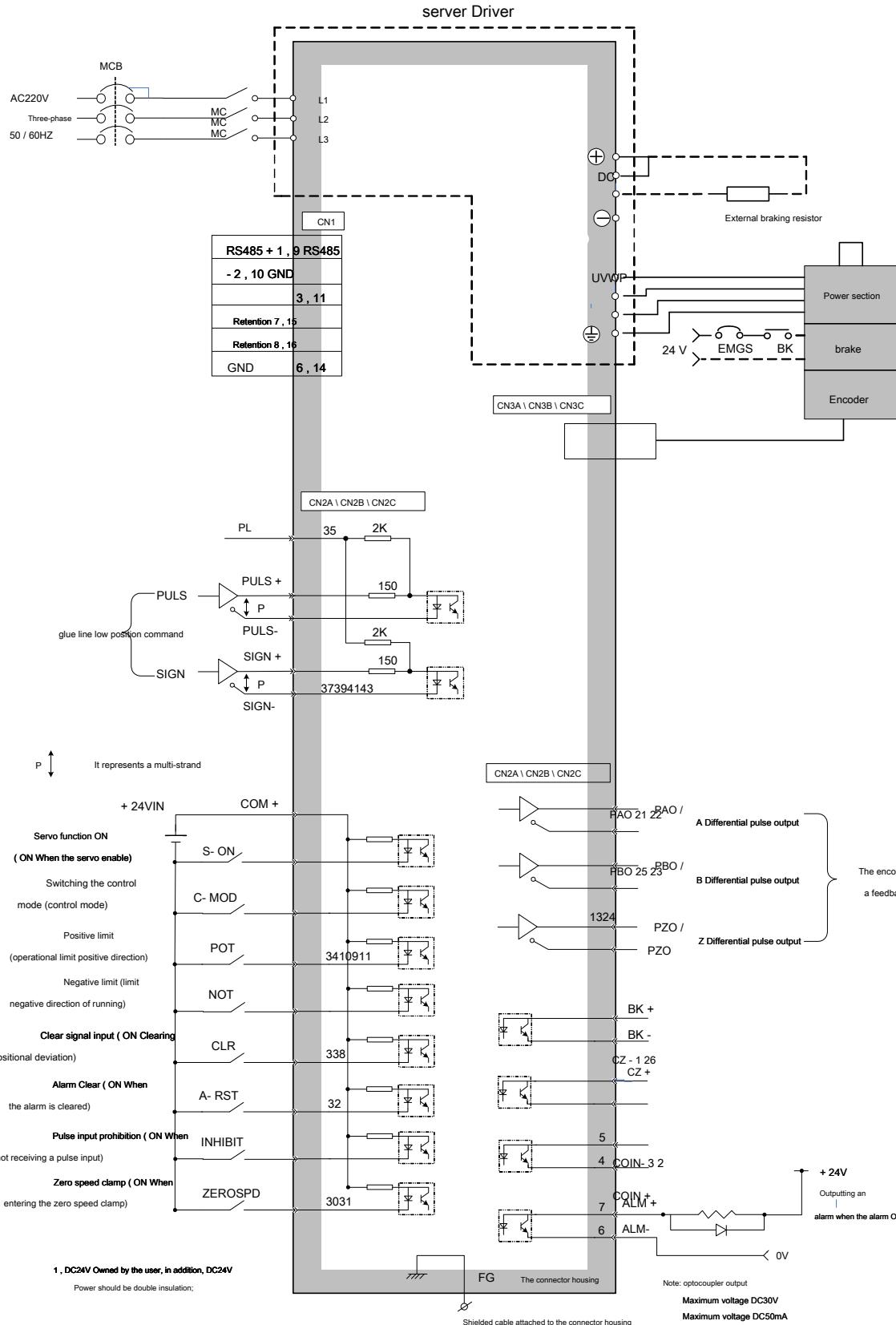


- 17 Serial line encoder

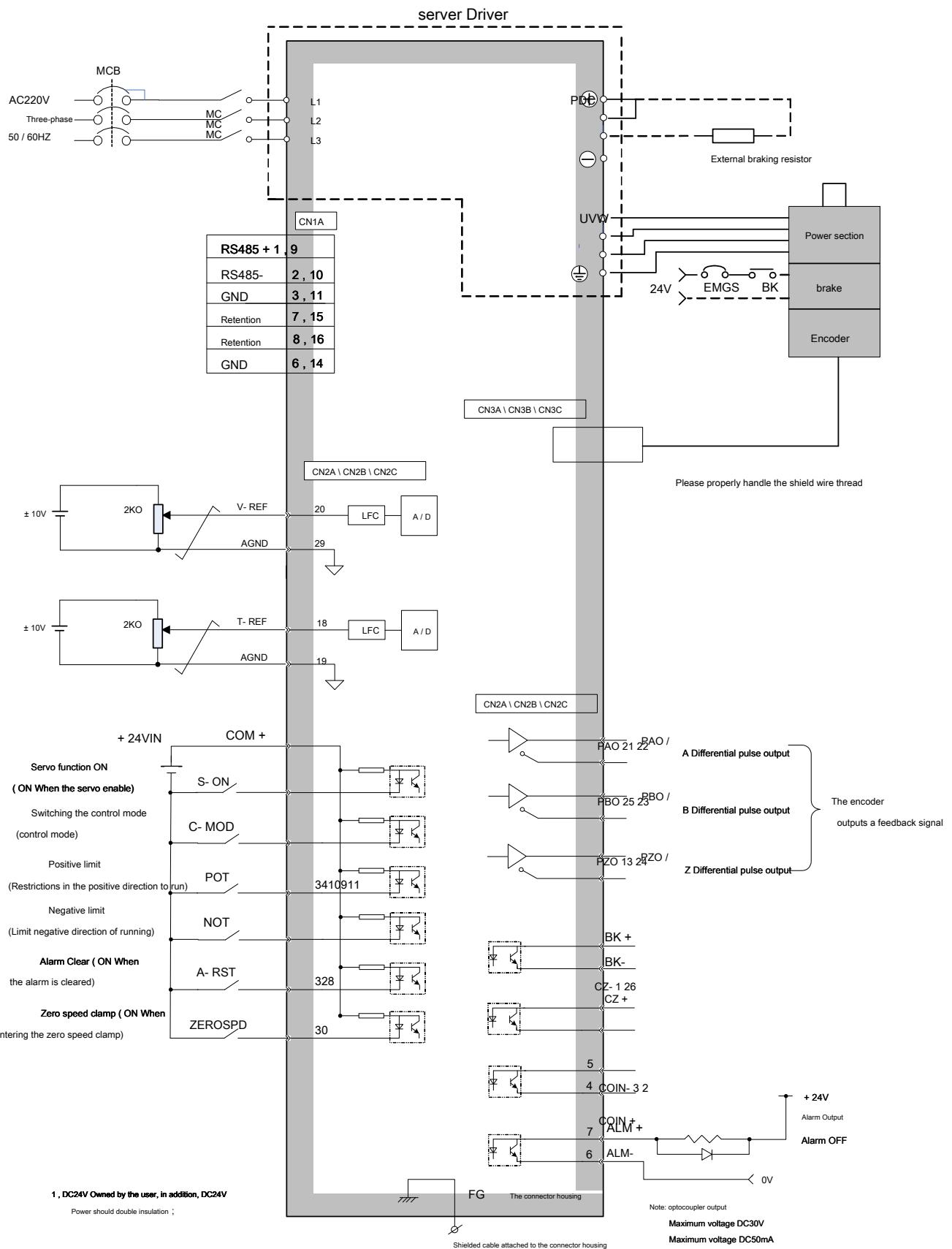


3.6 Standard Connection

Example 3.6.1 connection position control



3.6.2 Speed \ connection example torque control

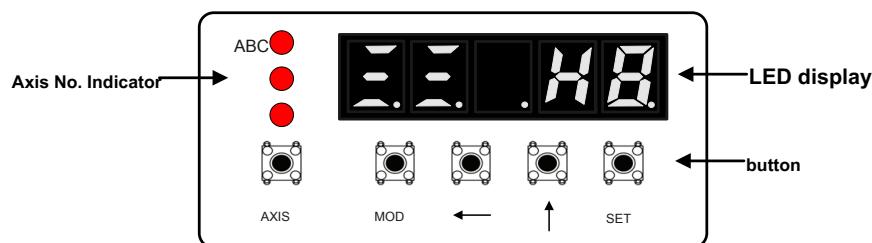


Chapter IV Panel

4.1 Operator Panel

Operator display panel by the panel and the panel operator unit configured operator buttons.

Status may be displayed, the operation executing auxiliary functions, set parameters and monitor the servo drive by a panel operator. As shown in panel operator keys names and functions as follows.



button	Function Description
AXIS	Operation of the panel display and switch between different axes. Circulation order of A Axis → B Axis → C axis
MOD	As a cancel button or switch between different modes layers exit
←	Operation Rotate Left
↑	Operation bit value continues to increase, a carry is not generated. If the data is a signed number, the operation bit +, - switching between
SET	Enter parameters, display the menu, the equivalent of ENTER

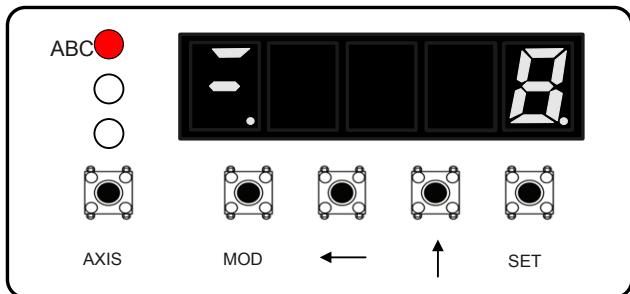
Axis No. Indicator	Function Description
A	On: The current operation interface A axis. Blinking: A Alarm shaft. not bright: A Axis normal, trouble-free.
B	On: The current operation interface B axis. Blinking: B Alarm shaft. not bright: B Axis normal, trouble-free.
C	On: The current operation interface C axis. Blinking: C Alarm shaft. not bright: C Axis normal, trouble-free.

How do I clear servo alarm? In alarm interface, hold down the "←" with "↑" former make clear servo alarm.

(Note) clear the alarm, be sure to rule out the cause of the alarm

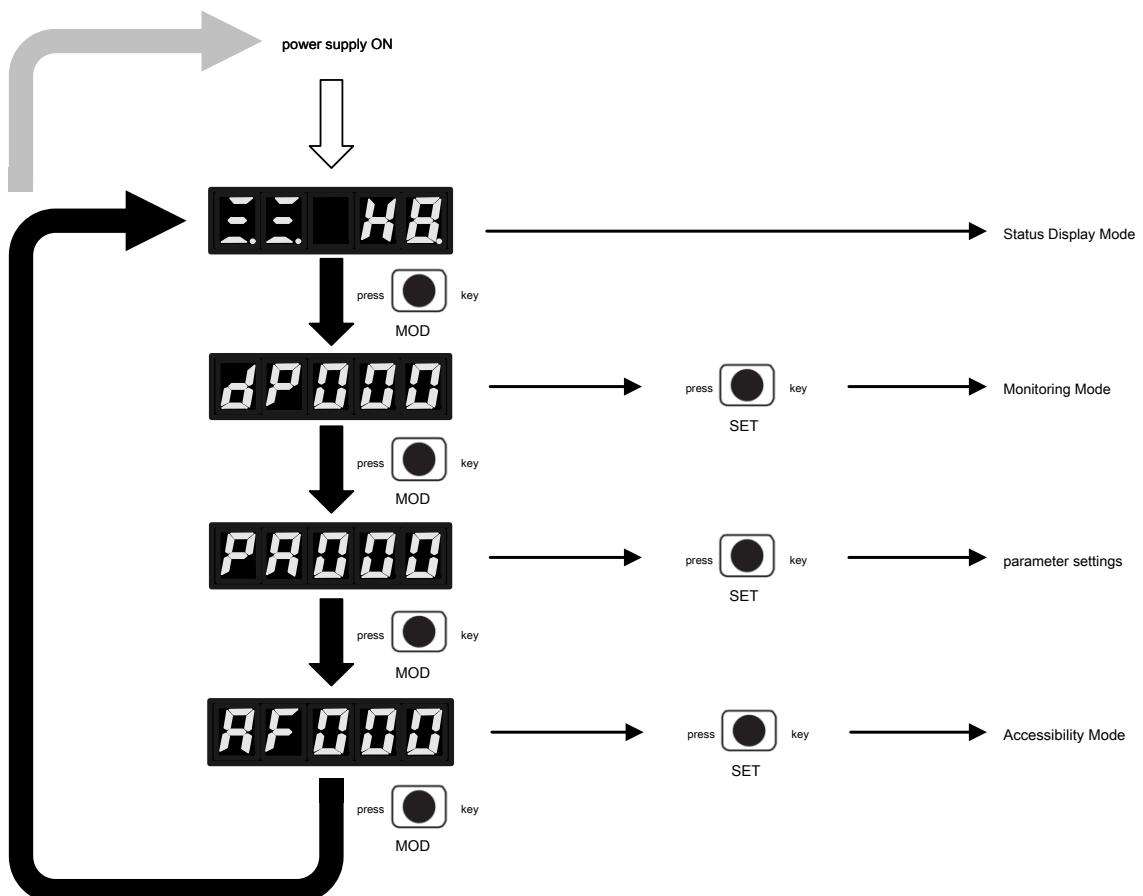
4.2 A axis, B axis, C Control switch shaft

The basic mode of the panel in front of the operator handover required by AXIS Keys to select the number of the corresponding axis, the respective selected shaft axis number indicator light, alarm occurs such other axis, the axis corresponding number flashes. press AXIS Key, followed by sequentially switching A Axis → B Axis → C axis.



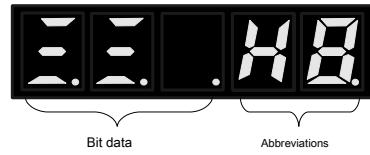
4.3 Switching function

press MODE / SET Key, the function will be switched as follows. Operation of each function, please read the reference section.

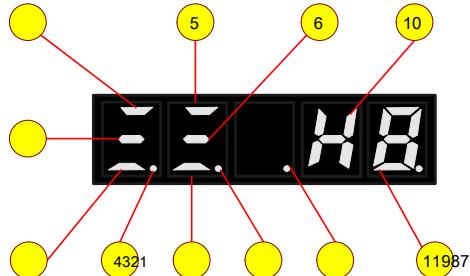


4.3 Status Monitoring

In the display mode using the state bits represent the state of the servo drive. The method of determining the status display is shown below.



Display content



Bit data			
No. surveillance	name	Position control mode Description	Speed, torque control mode Description
1	Power Ready display Main circuit power supply ON When the lights. Main circuit power supply OFF Extinguished.		Main circuit power supply ON When the lights. Main circuit power supply OFF Extinguished.
2	Match flag	Positioning completed (COIN)	Speed Agreement (VCMP) display
3	Clear signal input flag There are clear signals (CLR) Lights when input. Clear off when no signal is input.		There are clear signals (CLR) Lights when input. Clear off when no signal is input.
4	Position control mode flag	Lights	This lamp is off
5	Rotation detection display When the speed is higher than the set speed, the lights (TGON)		When the speed is higher than the set speed, the lights (TGON)
6	Instruction input flag	Command pulse input display	Speed control: significant speed command input Show Torque control: torque command input significant Show
7	Torque detection display	The input torque is higher than a predetermined value (rated torque 20%) Is lit, is less than Off predetermined value.	The input torque is higher than a predetermined value (rated torque 20% Time) lighting, is less than the predetermined Off value.
8	Speed control mode flag	This lamp is off	When the current mode is under the control of the speed, this light bright
9	Torque control mode flag	This lamp is off	The current mode is under torque control, this light bright

Abbreviations			
10	Stop sign	<p>When the left limit, display </p> <p>When the right limit display </p> <p>Simultaneously limiting, are alternately displayed,  </p>	<p>When the left limit, display </p> <p>When the right limit display </p> <p>Simultaneously limiting, are alternately displayed,  </p>
11	Run flag	<p>When the motor field, dynamic display rotation </p> <p><u>When the motor is not energized state, the rotation is stopped</u></p>	<p>When the motor field, dynamic display rotation </p> <p><u>When the motor is not energized state, the rotation is stopped</u></p>

4.4 Monitor display (dP □□)

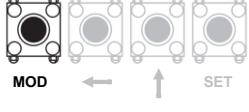
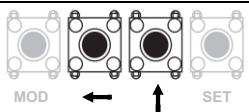
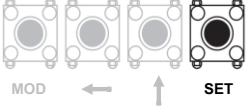
In monitoring mode, the servo drive instruction value set, the internal state of the input state of the output signal and monitors the servodrive (display). It is displayed to the operator on the panel DP Numbers beginning.

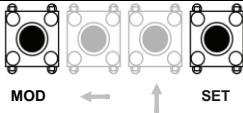
4.4.1 display content

Show the contents of the monitoring mode, please refer to the section " 5.1 "

4.4.2 Operation example of the monitoring pattern

Below Electricity Rotation speed (dP 00) As an example to illustrate prison Depending on the operating method of the display.

step	Rear panel displaying	Use keys	operating
1		 MOD ← ↑ SET	press MOD Key to select the auxiliary functions.
2		 MOD ← ↑ SET	If the parameter number is not displayed DP 00 Press "↑" button or the "←" key to display " DP 00 . "
3		 MOD ← ↑ SET	press SET Key to enter the monitoring screen displayed on the left, the motor speed is displayed 1600rpm .

4			press SET or MOD Key to return to step 1 Display.
5	End		

4.5 Parameter Mode

4.5.1 Instructions

Setting parameters for the servo drive. It is displayed to the operator on the panel PA Numbers beginning.

- Storing a set state when parameter editing is completed, press SET When the storage setting key, LCD display will continue to display the setting state of the setting state of a second symbol.

Display symbols	Description
	The set value is saved correctly (Saved).
	This parameter need to reboot system to be effective (Reset).
	Incorrect setting value or the input data exceeds the maximum and minimum (Out of Range).
	Parameters can not be changed after the password protection (Can not operation).

- Numeric types

The highest representation of a parameter value display Types of.

Display symbols	Description
	Up a no show, expressed as a decimal parameter setting. When the data is unsigned, set up a range of 0-6 The remaining bits set to range 0 ~ 9 ; When the data are symbolic numbers, the highest bit is the sign bit.
	The highest one is displayed as " b "Parameter is set to a binary representation. Each range is set 0 to 1 .
	The highest one is displayed as " d "Parameter is set to a decimal expressed. Each range is set 0-9 .
	The highest one is displayed as " h "Parameter is set to a hexadecimal representation. Each range is set 0 ~ F .

4.5.2 parameter setting (PA 000) example of the operation

Below The first A position loop gain (PA100) As an example to Say Ming modification operation method parameters. The PA100 Value from 40 change into 200 .

step	Rear panel displaying	Use keys	operating
1	PA100	MOD	Value 40

1	PR000			press MOD Key to select the auxiliary functions.
2	PA100			Press "↑" button or the "←" key to display " PA100 . "
3	PA 40			press SET To enter the parameter edit screen, a display on the left shows the current value of 40 .
4	PA 40			Press the "←" key to move the blinking digit display, so that 4 Flashes. (A number of bits represented by a flashing display can be changed.)
5	PA 00			press 6 Times "↑" key to display the value changed to " 00 . "
6	PA 000			Press the "←" key to move the blinking digit display, so that, as the left display.
7	PA 200			press 2 Times "↑" key to display the value changed to " 200 . "
8	Saved			press SET Key, that is PA100 The value is modified 200 . If the value set in the maximum and minimum values of this parameter, and can take effect immediately, as shown on the left is displayed. If the value set in after the maximum and
	RESET			minimum values of this parameter, but the need to re-effective power, as shown on the left is displayed. If the value is not within the set maximum and minimum values of this
	Bulk - r			parameter is displayed as shown on the left. Data set will be discarded.
9	PA100			approximately 1 After seconds, the parameters return to the edit screen, in step 2 Display.
10	PA100			press MODE key, PA100 Value will not be modified, and then exit parameter editing interface, returns to step 2 Display.
11				End

4.6 Accessibility (AF □□) operation example

Performing auxiliary functions for setting servo drive, adjustment related functions. It is displayed to the operator on the panel AF Numbers beginning.

4.6.1 Content Accessibility

Please refer to the section 6.1 .

4.6.1 auxiliary function (AF □□) example of the operation

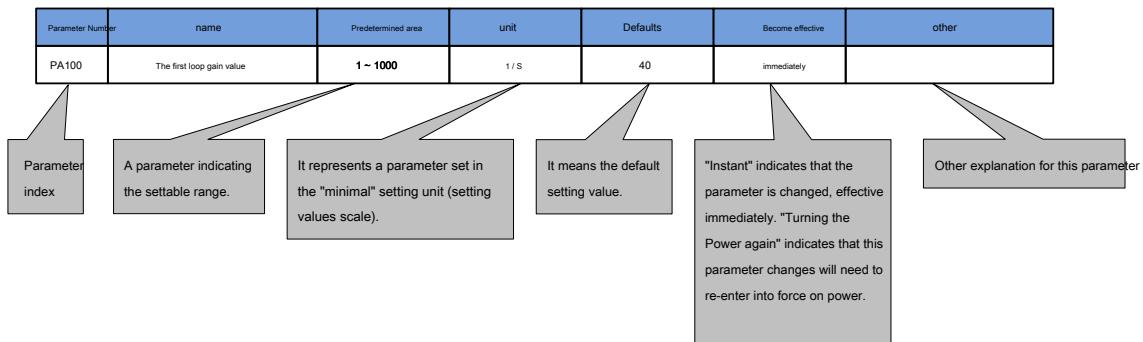
Below Recovery Comeback factory value (AF005) Is an example Bright The method of operation of the auxiliary functions.

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			Press "↑" button or the "←" key to display "AF005 . "
3			If the servo is not running, press SET Key to display the left.
			If the servo is running or set the front panel lock (AF 03), Is displayed on the left, that they can not perform this aid operation.
4			Press and hold the "↑" key to display the left.
5			Left until the display indicating that the operation is completed.
6			After displaying the left release buttons.
7			press MOD Key or SET To exit this auxiliary function, return to step 2 Display.
8	End		

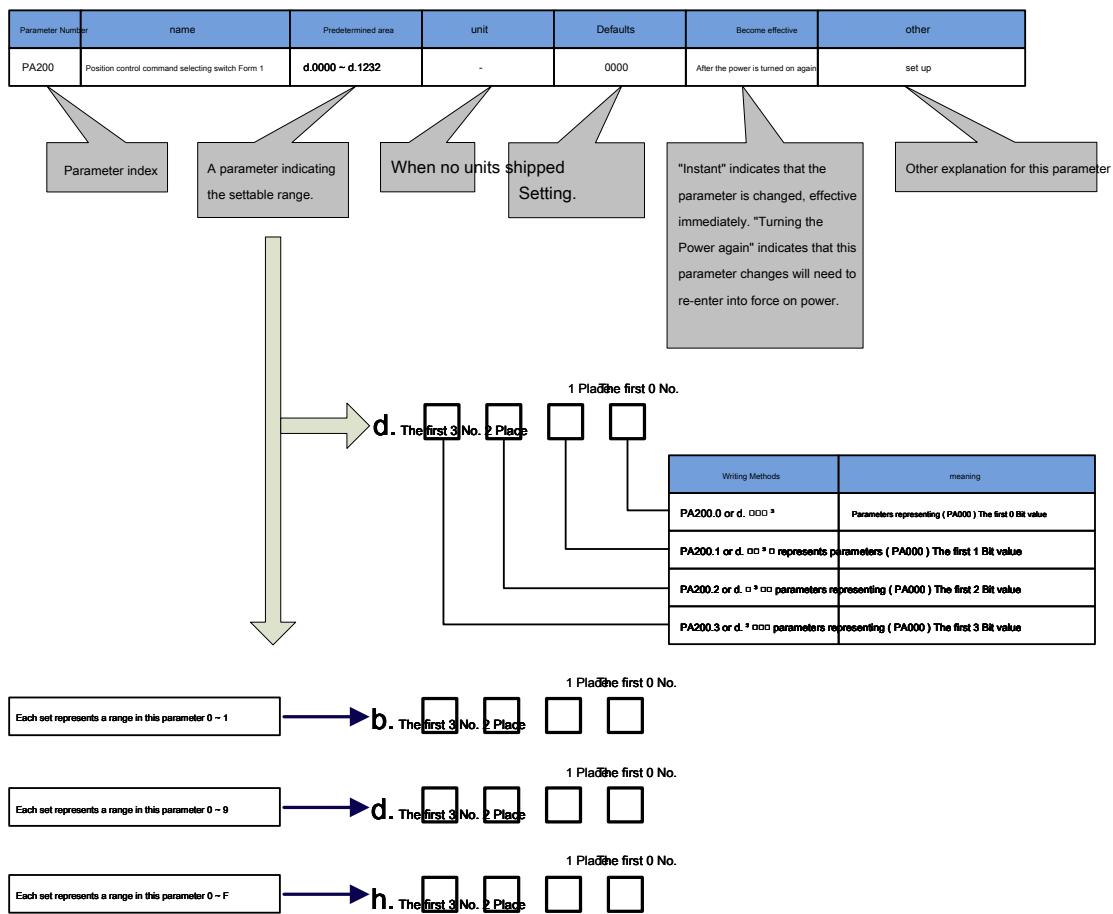
4.7 Parameters method of writing this manual

The following writing method parameters described in this manual.

4.7.1 "set value type" method of writing



4.7.2 "Function Select type" method of writing



Chapter V monitor display

5.1 Monitor display list

A axis, B axis, C Consistent monitoring content shaft.

Refers to the internal state of the monitor display servo drive command value is set, the state of the input signal and the output of the servo drive function to display.

Monitor Display It is shown below.

No. surveillance	Display content	unit
dP 00	Motor speed Display motor running speed.	[r / min]
dP 01	Motor feedback pulses (encoder unit, low 4 Bit) Exhibit low motor encoder feedback pulse sum 4 Bit.	[1 The encoder pulse]
dP 02	Motor feedback pulses (encoder unit, high 5 Bit) Exhibits a high motor encoder feedback pulse sum 5 Bit.	[10000 The encoder pulse]
dP 03	(Before the electronic gear) pulse command input pulse number (user unit, low 4 Bit) In the position control, low pulse command displays the sum of the input pulse number 4 Bit.	[1 Command pulse]
dP 04	(Before the electronic gear) pulse command input pulse number (user unit, high 5 Bit) In the position control, high pulse command displays the sum of the input pulse number 5 Bit.	[10000 The encoder pulse]
dP 05	Error pulses (encoder unit, low 4 Bit) In the position control, the number of error pulses exhibit low sum 4 Bit.	[1 The encoder pulse]
dP 06	Error pulses (encoder unit, high 5 Bit) In the position control, shows a high number of errors the sum of the pulses 5 Bit.	[10000 The encoder pulse]
dP 07	Speed instruction (analog voltage command) In speed control (analog command), displays the voltage value of the analog input. This display value Value of zero drift correction. Voltage exceeds ± 10V Not display correctly.	[0.1V]
dP 08	Internal speed command Show the internal speed command in speed control, position control.	[r / min]
dP 09 Torque	instruction (analog voltage command)	[0.1V]

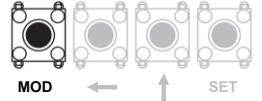
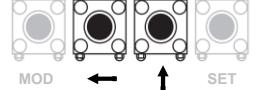
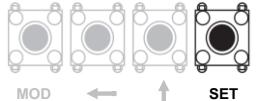
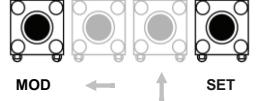
	Under torque control (analog command), displays the voltage value of the analog input. This display value Value of zero drift correction. Voltage exceeds ± 10V Not display correctly.	
dP 10	Internal torque command (rated torque value relative) Display torque control, speed control, the internal torque command in position control.	[%]
dP 11	Torque feedback (with respect to the value of the rated torque) Torque feedback value displayed under torque control, speed control, position control	[%]
dP 12	Input signal monitoring Connected to the display CN2 An input control signal state of the connector	- -
dP 13	Monitoring output signals Connected to the display CN2 Connected to the output drive signal state	- -
dP 14	Command pulse frequency In the position control, the frequency of the command pulse PC.	[0.1Khz]
dP 15	The main circuit voltage Display of the input power is rectified DC Voltage.	[V]
dP 16	The total running time Displays the total running time of the drive. This time is recorded when the electric drive situation Rooms, if executed AF005 (Factory Reset) operation, this value will be cleared.	[Hous]
dP 17	Angle of rotation Electric motor rotation angle display.	[deg]
dP 18	The actual position of the encoder (or ring-type single-turn absolute value of the absolute encoder, only the absolute value of the encoder pulse) When the encoder active) When using the absolute encoder (single-turn or multi-turn absolute value encoder), a display Absolute position data encoder lap.	[2 The encoder pulse]
dP 19	Turns the display encoder (valid only when the absolute encoder) When using the absolute encoder (multiturn absolute encoder), the encoder display lap Absolute position data.	[1 ring]
dP 20	Cumulative load factor (the cumulative load rating as 100%) Rate levels corresponding to motor overload alarm display	[%]
dP 21	Regenerative load ratio (as the regenerative load rating 100%) Regeneration of the corresponding level display overload alarm	[%]

dP 22	DB Load factor (the DB Load rating as 100%) display DB Protection rate levels corresponding brake alarm	[%]
dP 23	Load inertia ratio Display load inertia of the electric motor inertia ratio.	[%]
dP 24	Effective gain monitor Which set of gain data by the display position of the speed control. 1 : Represents the first set of gain 2 : Represents the second set of gain	

5.2 Operation of the exemplary display monitor

With dP 00 For example, the monitor display operation example as follows.

Here is Servo motor speed 1600 rpm When the display example.

step	Rear panel displaying	Use keys	operating
1		 MOD ← ↑ SET	press MOD Key to select the auxiliary functions.
2		 MOD ← ↑ SET	If the parameter number is not displayed DP00 Press "↑" button or the "←" key to display " DP 00 . "
3		 MOD ← ↑ SET	press SET Key to enter the monitoring screen displayed on the left, the motor speed is displayed 1600rpm .
4		 MOD ← ↑ SET	press SET or MOD Key to return to step 1 Display.
5	End		

5.3 Input signal monitoring

State of the input signal can be "monitored inputs (dP 12) "Confirmation display step, and a determination

method of displaying a display example is shown below.

5.3.1 display step

Enter the letter Step number is displayed as shown below.

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			If the parameter number is not displayed DP 12 Press "↑" button or the "←" key to display " DP 12 . "
3			press SET Signal input to enter the monitoring screen displayed on the left.
4			press SET or MOD Key to return to step 1 Display.
5	End		

5.3.2 display determination method

An input signal is distributed by the operator of the panel segment (led) For display lighting state. And input pins led Correspondence

between the numbers in the table below.



On: the input signal corresponding to the
valid: the corresponding input signal level

8765

3

124 Numbering

♦ the input signal is active when the segment above (led) Lighting. ♦ input signal L_Level (input optocoupler turns through

) Below the segment time (LED) Lighting.

display led Numbering	Input pin		Signal name (factory setting)
	9	DI1	
1	10	DI2	C-MOD
2	34	DI3	POT
3	8	DI4	NOT
4	33	DI5	CLR
5	32	DI6	A-RST
6	31	DI7	INHIBIT
7	30	DI8	ZEROSPD

[Note]

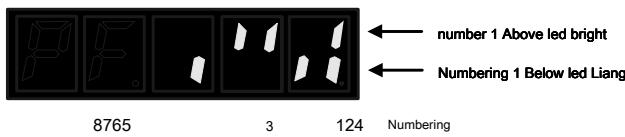
1 In the case where there is no external input, by modifying the parameters PA [508] , PA [509] (input selection signal configuration), but also enables the respective IO Signal is active. dp

12 Both external input IO Signal level of status, and can display the internal status signal is valid.

2 In the case where the input signal is not negated, the state of non-conduction optocoupler POT , NOT Signals do not work, drive prohibit (overtravel).

5.3.3 Display example

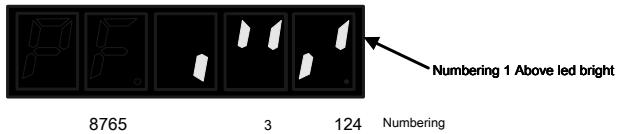
A display example of the input signal is as follows. Input optocoupler is turned on, PA508.0 = 0 , S-ON Signal is active (L Level servo ON).



Input optocoupler is turned on, PA508.0 = 1 , S-ON Signal is invalid (H Level servo ON).



Input optocoupler is not conducting, PA508.0 = 1 , S-ON Signal is active (H Level servo ON).



5.4 Monitoring output signals

State of the output signal can be "output signal monitor (dP 13) "Confirmation display step, and a determination method of displaying a display example is shown below.

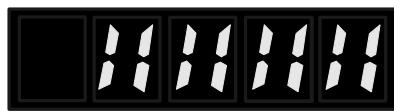
5.4.1 display step

Display step Suddenly The step of displaying the output signal is as follows .

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			If the parameter number is not displayed DP 12 Press "↑" button or the "←" key to display " DP 12 . "
3			press SET Signal input to enter the monitoring screen displayed on the left.
4			press SET or MOD Key to return to step 1 Display.
5	End		

5.4.2 display determination method

Output signal is distributed by the operator of the panel segment (led) For display lighting state. And input pins led Correspondence between the numbers in the table below.



8765 3 124 Numbering

On: the output signal corresponding to the
valid: corresponding to the output signal level

- ♦ output signal is active when the top segment (led) Lighting. ♦ output signal L Level (light output The lower

section is coupled when turned on (led) Lighting.

display led Numbering	Output pins		Signal name (factory setting)
1	7 , 6	DO1 + , DO1 -	ALM
2	5 , 4	DO2 + , DO2 -	COIN
3	3 , 2	DO3 + , DO3 -	CZ
4	1 , 26	DO4 + , DO4 -	BK

[Note]

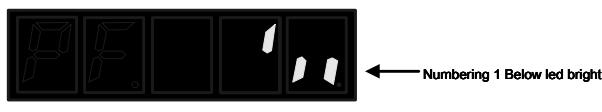
1 , Even when the output signal inactive state, by modifying the parameters PA [511] (Output selection signal configuration), but also causes the respective outputs IO The level of the polarity change. dp 13 Either the output signal level of status display, and can display the internal status signal is valid.

2 The output pin CN2-7, CN2-6 Only as ALM Signal, the output polarity parameter PA [511] (Selecting the output signal form) modified. When the output pin is selected Z Pulse collector output (CZ)Time, dp 13 The corresponding bits are not lit when the selection is Z Exceeds the pulse output pin 1 Time-only output a Z Signal (priority DO2> DO3> DO4).

5.4.3 Display example

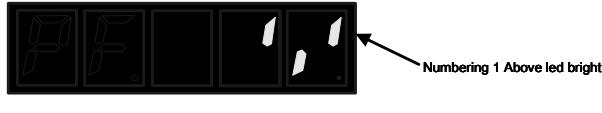
It shows an example of the output signal as follows.

PA511.0 = 0 , ALM Signal is inactive, the optocoupler is turned on (ALM Signals L Level)



8765 3 124 Numbering

PA511.0 = 0 , ALM After the signal is valid, the optocoupler is not conducting (ALM Signals H Level)



8765 3 124 Numbering

PA511.0 = 1 , ALM After the signal is valid, the optocoupler is turned on (ALM Signals L Level)



8765 3 124 Numbering

5.5 Monitoring at power display

If by PA014 set up dP ID, when the power has been set on the display panel operator dP Data number. But if you have set 50 (Default value), the display state when the power is turned on.

Parameter Number	name	Predetermined area	Unit Default	Setting effective time	
PA014	Initial display state Check the monitor content. Set as 50 When the display status code	0 ~ 50		50	Re-power

5.6 other instructions

- dP 01 , dP 03 , dP 05 Numerical display range [- 32767 , 32767], When the display is - 32767 When the display is as follows:



When the number of the feedback pulse motor (dP 02 × 10000 + dP 01), Pulse command input pulses (dP 04 × 10000 + dP 03), The number of pulses deviation (dP 06 × 10000 + dP 05) Is greater than the absolute value of 327 679 999 When the display data will no longer be updated.

Chapter VI Accessibility

6.1 Accessibility glance

A axis, B axis, C Accessibility consistent content shaft. Accessibility by AF To indicate the beginning of the number, execution and operation of the servo motor adjustment related functions. The following table lists the auxiliary function table and the reference section.

AF Numbering	Features	Reference Section
AF 00	Error record	6.2
AF 01	Where the assignment (valid only in position mode)	6.3
AF 02	Jog (JOG) Mode of operation	6.4
AF 03	Front panel lock operation	6.5
AF 04	Clear alarm recording	6.6
AF 05	Initialization parameters	6.7
AF 06	Analog (Speed, torque) command offset is automatically adjusted	6.8
AF 07	Speed command offset manual adjustment	6.9
AF 08	Torque command offset manual adjustment	6.10
AF 09	Check the motor parameters	6.11
AF 10	The software version of the servo drive	6.12
AF 12	Set absolute encoder	6.13
AF 14	Parameter copy	6.14
AF 15	Manual load inertia detecting	6.15

6.2 Alarm history display (AF 00)

Retrospective servo drive alarm display, the display can be traced up to 10 It has been occurring alarm recording. Confirmation number and time stamp alarms can occur *.

* Timestamp

It refers to the 1Hour Control and power is measured continuously after the main circuit power ON time, display the total running time of alarm occurrence. If you press a year 365 Day, every day twenty four Hours of operation, can continuously measuring about 7.5 year.

Alarm remember The step of recording is displayed as shown below.

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			If the parameter number is not displayed AF 00 , Press "↑" or "←" key to display " AF 00 . "
3			press SET Left display key, as the latest alarm code.
4	 Numbers indicate the sequence number of an alarm warning the greater the Old No alarm Alarm list refer		Each time you press the "←" key, the display on the back of an old alarm. Each time you press the "↑" key, a new alarm is displayed on the back. The larger the number of digits left, the older the alarm display.
5			press MOD Key, hex timestamp is displayed.
6	 Numbers indicate the sequence number of an alarm warning the greater the Old No alarm Alarm list refer		Press MOD Button, the interface switch back to this timestamp alarm number. Each time you press the "↑" key, a new alarm is displayed on the back.
7			press SET To exit this auxiliary function, return to step 2 Display.
8	End		

<Supplement>

* same time an alarm occurs continuously, if an error occurred less than intervals 1 Hours is not saved, more than 1 Hours are all saved. * When no alarm occurs, the alarm number 0. * alarm recording by "Alarm record delete (AF 04) "To remove the main circuit or resetting of an alarm even if the power off the servo drive, alarm records are not deleted.

6.3 Position assignment (AF 01)

After assignment function servo drive position, to perform this function, the motor position feedback pulses and a given position is set to PA766 , PA767 Value.

step	Rear panel displaying	Use keys	operating
------	-----------------------	----------	-----------

1			press MOD Key to select the auxiliary functions.
2			Press "↑" button or the "←" key to display "AF001".
3			press SET Key to display the left.
4			Press and hold the "↑" key to display the left.
5			Left until the display indicating that the operation is completed.
6			After displaying the left release buttons.
7			press MOD Key or SET To exit this auxiliary function, return to step 2 Display.
8	End		

6.4 JOG run(AF 02)

JOG Operation means is not connected to the host apparatus to confirm the operation of the servo motor by the speed control function.

JOG Super Cheng process run prevention function is invalid. Run must take into account the operating range of the machinery used.

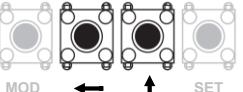
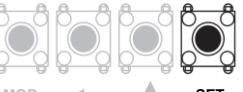
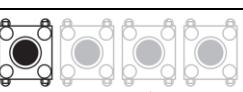
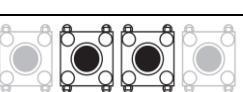
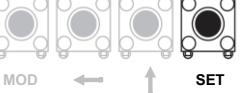
(1) Set the matter before the run

To JOG Run, must first make the following settings. ² S-ON input signal ON , Keep it switched OFF . ² Please consider the operating range of used machinery and so on and then set the JOG speed. JOG Speed through PA306 Set. ² Please take the necessary security measures to make an emergency stop at any time in the state. ² To ensure safety, stop means provided on the machine side

(2)Steps

JOG FIG operation steps are as follows. The following description of the servo motor rotation direction is set to PA000.0 = 0 When the operation (forward rotation when the forward command) Procedures .

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.

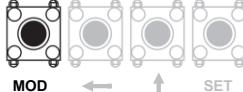
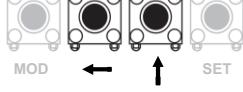
2			If the parameter number is not displayed AF 02 , Press "↑" or "←" key to display " AF 02 . "
3			If the servo is not running and ready, press SET Enter JOG Run screen display contents as shown on the left.
4			If the servo is running or set the front panel lock (AF 03), Is displayed on the left, that they can not perform this aid operation.
5			press MODE Key to enter the servo ON (Motor energized) state.
6			Press the "←" key (forward) or "↑" key (reverse), during key, in accordance with the servo motor PA306 Set speed.
7			press MODE Key to enter the servo OFF (Motor not energized) state. <Supplement> You can also press SET Exit JOG Running interface, the servo will OFF .
8			press SET To exit this auxiliary function, return to step 2 Display.
9	End		

6.5 Front Panel Lock (AF 03)

Password is set to 58 , Operating parameters and functions

can not be set 315 Operable all parameters and functions

Set as its He values, operating instructions reference only The number and function

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			Press "↑" button or the "←" key to display " AF003 . "
3			press SET Key to display the left.

4			press SET Lock password set to enter the state.
5			Press "↑" Key or "←" key to set the password.
6			press SET key, To complete the setup lock password, return to step 2 interface.
7	End		

6.6 Alarm record deletion (AF 04)

All functions of the police records to delete servo drive records.

Note) The alarm log can be deleted by this function. Main circuit power supply is reset even if the alarm or turn off the servo drive, alarm records are not deleted.

Operation step As shown in the following step.

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			Press "↑" button or the "←" key to display "AF004 . "
3			press SET Key to display the left.
4			Press and hold the "↑" key to display the left.
5			Left until the display indicating that the operation is completed.
6			After displaying the left release buttons.
7			press MOD Key or SET To exit this auxiliary function, return to step 2 Display.
8	End		

6.7 Initialization parameter settings (AF 05)

The parameters for the function used to restore the factory settings.² parameter settings must be initialized in the servo OFF Execution in the state. In the servo ON It can not be executed in the state.² to enable the setting, the operator must turn on the power of the servo drive.

Operation step As shown in the following step.

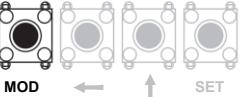
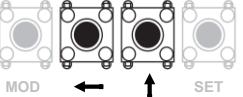
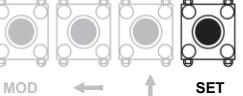
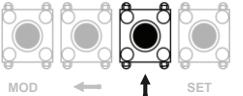
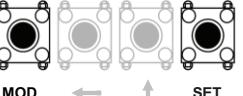
step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			Press "↑" button or the "←" key to display "AF005".
3			If the servo is not running, press SET Key to display the left.
4			If the servo is running or set the front panel lock (AF 03), Is displayed on the left, that they can not perform this aid operation.
5			Press and hold the "↑" key to display the left.
6			Left until the display indicating that the operation is completed.
7			After displaying the left release buttons.
8			press MOD Key or SET To exit this auxiliary function, return to step 2 Display.
9	Re-power		
10	End		

6.8 Analog command automatic zero (AF 06)

Automatic adjustment command is a method of offset voltage command (speed command and torque command) for automatic adjustment of the offset measurement. The measured offset will be stored in the servo drive.

Use face board Executing instructions to automatically adjust the offset amount of the operation The whole procedure is as follows.

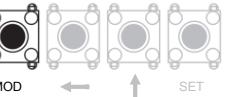
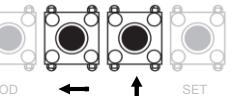
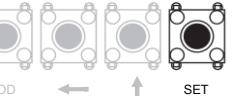
step	Rear panel displaying	Use keys	operating
------	-----------------------	----------	-----------

1	RF 00		press MOD Key to select the auxiliary functions.
2	RF 05		Press "↑" button or the "←" key to display "AF006 . "
3	r E F - o		press SET Key to display the left.
4	- - - - - .		Press and hold the "↑" key to display the left.
5	done		Left until the display indicating that the operation is completed.
6	r E F - o		After displaying the left release buttons.
7	RF 05		press MOD Key or SET To exit this auxiliary function, return to step 2 Display.
8	End		

6.9 Speed command offset manual adjustment (AF 07)

This method of direct accessibility is the input speed command for adjusting the offset. .

Use face board Executing instructions operator manually adjust the offset amount The whole procedure is as follows.

step	Rear panel displaying	Use keys	operating
1	RF 00		press MOD Key to select the auxiliary functions.
2	RF 07		Press "↑" button or the "←" key to display "AF007 . "
3	E . 5 Spd		press SET Key to display the left.
4	-. 5 Spd		If the motor is enabled, the display contents on the left.
5	103		Press SET Speed command to display the current offset

6			Press "↑" Key or "←" button to adjust
7			When you press SET Key "Save" "Flashes, after switching to the step 2 Display.
8			If you do not want to store the data, press MOD Exit, shown as step 2 Display.
9	End		

6.10 Simulation torque instruction manual zeroing (AF 08)

This auxiliary function is a direct torque command input method for adjusting the offset amount.

Use face board Executing instructions operator manually adjust the offset amount The whole procedure is as follows.

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			Press "↑" button or the "←" key to display "AF008 ."
3			press SET Key to display the left.
4			If the motor is enabled, the display contents on the left.
5			Press SET Speed command to display the current offset
6			Press "↑" Key or "←" button to adjust
7			When you press SET Key "Save" "Flashes, after switching to the step 2 Display.
8			If you do not want to store the data, press MOD Exit, shown as step 2 Display.
9	End		

6.11 Display Motors models (AF 09)

Display type, encoder type, and a phase servo motor servo motor drive connections. If the servo drive is a special product specifications, product specifications will display the number.

Operation step As shown in the following step.

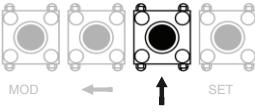
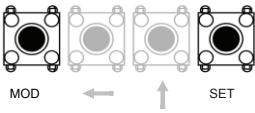
step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			Press "↑" button or the "←" key to display "AF009 . "
3			press SET Key to display the left. It represents the drive model 0 . Initials identified as " d . "
4			press "↑" key to display the motor model. Initials identified as " F . "
5			press "↑" key to display the encoder type. 0 It indicates absolute encoder, 1 , Represents a single absolute encoder, 2 It represents the province linear incremental encoder. Initials identified as " E . "
6			press SET key, To complete the setup lock password, return to step 2 interface.
7	End		

6.12 The software version of the servo drive (AF 10)

Display and servo drive encoder software version features.

Operation step As shown in the following step.

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			Press "↑" button or the "←" key to display "AF005 . "
3			press SET Key to display the left. " d 1.00 "Means DSP Software version 1.00

4	F 103		press "↑" key to display the left. " F 1.03 "Means FPGA Software version 1.03
5	RF 11		press MOD Key or SET To exit this auxiliary function, return to step 2 Display.
6	End		

6.13 Set absolute encoder (AF 11)

This operation only when using absolute encoders effective, this feature is generally used in the following cases.

- When the absolute value of the initial use of motors;
- When the encoder related alarm;
- Want to set multturn absolute encoder value is 0; Note:

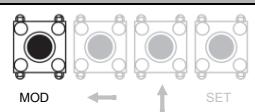
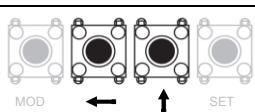
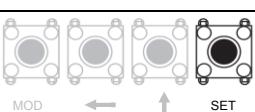
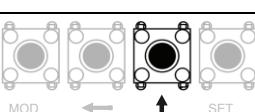
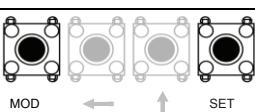
1 , The encoder setting operation only the servo OFF Under carried out;

2 , Absolute encoder related alarm occurs, this is done using only the alarm releasing operation, alarm reset signal

(A-RST) These alarms can not be released;

3 , After this is done, before running correctly, it must re-power, please check the alarm again on the power situation;

4 , After this operation, the absolute value of the multi Circle value set to 0, and the absolute value related alarm is cleared an alarm associated encoder.

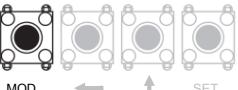
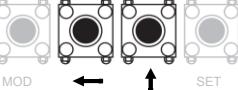
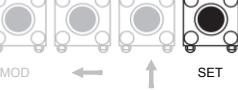
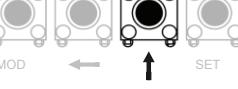
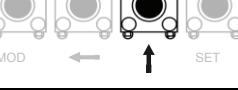
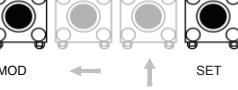
step	Rear panel displaying	Use keys	operating
1	RF 00		press MOD Key to select the auxiliary functions.
2	RF 11		Press "↑" button or the "←" key to display " AF011 . "
3	P6clr		press SET Key to display the left.
4	- - - - -		Press and "↑" key.
5	done		Left until the display indicating that the operation is completed.
6	RF 11		press MOD Key or SET To exit this auxiliary function, return to step 2 Display.
7	Re-power		
8	End		

6.14 Parameter copy (AF 14)

This operation is required in the case of energy without the servo operating, this operation can be performed one shaft to another shaft or a shaft to the other two axes parameter copy. When the copy parameters, the following parameters will not copy.

- PA002.3 (Encoder type);
- PA012 (Motor type selection);

With A axis Operation as an example

step	Rear panel displaying	Use keys	operating
1	AF 00		press MOD Key to select the auxiliary functions.
2	AF 14		Press "↑" button or the "←" key to display "AF014 . "
3	A - b		press SET Key to display the left. Show A Parameters are copied to the shaft B axis.
3	A - E		Press the "↑" key, shown at the left. Show A Parameters are copied to the shaft C axis.
3	A - bE		Press "↑" key. , As shown on the left. Show A Parameters are copied to the shaft B , C axis.
3	PA - b		Select a copy, such as A Parameters are copied to the shaft B axis. press SET Key to display the left.
4	- - - - -		Press and "↑" key.
5	done		Left until the display indicating that the operation is completed.
6	AF 14		press MOD Key or SET To exit this auxiliary function, return to step 2 Display.
7			Re-power
8			End

6.15 Manually detected load inertia (AF 15)

Manual load inertia detection means to carry the load inertia numerical manual operation of the servo system in the detection.

Manual load inertia of timeout detection process prevention function is invalid. Run must take into account the operating range of the machinery used. By parameters

PA300.2 Run Setup distance detection process.

(1) Set the matter before the run

To manually load inertia detection, the following must be set in advance. ² S-ON

input signal ON , Keep it switched OFF .

² Please consider before setting run from the operating range of machinery and other use. Run by a distance PA300.2 Set. ² Please take the necessary

security measures to make an emergency stop at any time in the state. ² To ensure safety, please stop means provided on the machine side.

(2)Steps

Manual Negative Load Procedure inertia detecting follows .

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			Press "↑" button or the "←" key to display "AF015 . "
3			If at the servo is not running and ready, press SET Key to display the left.
4			If the servo is running or set the front panel lock (AF 03), Is displayed on the left, that they can not perform this aid operation.
5			press MOD Key manually load inertia detection.
6			In the detection process, if necessary to stop immediately detected, according to SET Key to exit.
7			After completion of the detection, load inertia numerical display. Unit is Kg.Cm2
8			press MOD Key or SET To exit this auxiliary function, return to step 2 Display.
9	End		

Chapter VII of the test run

7.1 Pre-commissioning checks and precautions

To ensure safety, Proper trial run, in advance of the following items checked and confirmed. project

content	
servo motor Whether the	motor load is disconnected?
	Wiring and connections correct?
	Whether each fastening portion loose?
	When the band is holding brake servo motors, whether previously lifted the brakes? When the brakes are released, the brake required specified voltage is applied (typically DC24V)
server Driver	Each axis corresponding wiring and connections correct? A Power lines connected to the motor shaft UA \ VA \ WA , A axis
	Motor encoder line is connected CN3A , CN2A Access control A Control line shaft . A power
	supply voltage supplied to the servo driver is normal?

7.2 Operator Panel via JOG run

Next, the operator panel by JOG Run the steps described below. ² JOG Operation means is not connected to the host apparatus to confirm the operation of the servo motor by the speed control function. ² JOG Super Cheng process run prevention function is invalid. Run must take into account the operating range of the machinery used.

(1) Set the matter before the run

To JOG Run, must first make the following settings. ² S-ON input signal ON , Keep it switched OFF . ² Please consider the operating range of used machinery and so on and then set the JOG speed. JOG Speed through PA306 Set.

(2)Steps

JOG FIG operation steps are as follows. The following description of the servo motor rotation direction is set to PA000.0 = 0 When the operation (forward rotation when the forward command)

Procedures .

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			If the parameter number display is not " AF 02 ", Press" ↑ "or" ← "key to display" AF 02 . "
3			press SET Enter JOG Run screen display contents as shown on the left. (Note) is set to prohibit writing will show " no_oP . "Please." AF03 "Set state can then write operations.

4			press MODE Key to enter the servo ON (Motor energized) state. The rightmost decimal lit LED indicates that the motor has been energized.
5			Press the "↑" key (forward) or "←" key (reverse), during key, in accordance with the servo motor PA306 Set speed.
6			press MODE Key to enter the servo OFF (Motor not energized) state. <Supplement> You can also press SET Exit JOG Running interface, the servo will OFF .
7			press SET To exit this auxiliary function, return to step 2 Display.
8	End		

7.3 Trial run servomotor command in accordance with the upper

In the upper finger When so carried servomotor test run, check the following:

project	content
1	Inputted from the upper apparatus to confirm the servo motor and the input movement instruction output signal of the servo driver is correctly set.
2	Check the wiring between the servo drive and the host device is correct, the correct polarity setting.
3	Confirm that the servo drive operation setting is correct.

7.3.1 input connection confirmation circuit and a status signal

When the speed control and position control according to the test run host commands, requires the following steps 1 Connections shown confirmed. Please follow The following steps Step, and confirm the connection state of the input signal.

step operating	Reference Section
1	3.3
2	
3	4.3
4	4.3

5	So far, the test is ready for run. Please proceed to trial under each control mode	
---	--	--

7.3.2 trial run position control

For the following position Home control Time The trial operation will be described. In this description the position of the control input signal wiring is completed Rear Commissioning step Sudden.

step operating		Reference Section
1	Verify that the power circuit and the input signal again, and then turn on the power to control the servo drive. 3.1	
2	The pulse output form the host device, by PA200.0 Sets the reference pulse form. 8.4.1	
3	Setting command unit, according to the host device via PA205 with PA206 And the electronic gear ratio is set to the frequency division number PA210 .	8.4.2 8.5.7
4	Re-power. The steps 3 The parameter changes take effect. Turning on the servo power source drives the main circuit.	
5	The servo ON (S-ON) Placed on the input signal ON .	
6	An amount of rotation of the motor easily confirmed (Example: 1 Ring) output pulse command from the host device.	
7	The input command pulse counter (dP00 3, dP004), Monitoring the amount of change before and after the instruction issued pulses, In order to confirm the input command pulse to the number of the servo drive.	5.1
8	The feedback pulse counter (dP00 1, dP002), Monitoring the amount of change before and after the pulse command is issued, in order to confirm the actual rotation amount of the motor.	5.1
9	Are you sure the direction of rotation of the servomotor in accordance with the instruction.	
10	If the drive has a feedback pulse, checking the number of feedback pulses is consistent with the expected value. Feedback pulses = (dP01 * 10000 + dP02) * PA210 * 4 / Encoder resolution	5.1
11	Stop pulse command, the servo OFF .	

7.3.3 Test run speed control

Next, the test run when the speed control method will be described. In this description the speed control signal input terminal is completed (refer to " 4.3.1 Input signal back Even the road And connection state confirmation ") of the commissioning steps.

step operating		Reference Section
1	Verify that the power circuit and the input signal again, and then turn on the power to control the servo drive. 3.1	
2	Speed command input gain adjustment (PA301)	8.5
3	Turning on the servo power source drives the main circuit.	
4	Confirm speed reference input (V-REF , AGND Between voltage) is 0 V And then turning on the servo ON (S-ON)input signal.	
5	Speed reference input (V-REF , AGND Between voltage) from 0 V Slowly began to rise.	
6	By monitoring the speed command (dP07) Confirm the speed command value (voltage).	5.1
7	By monitoring the motor speed (dP00) Confirm the motor speed (rotational speed).	5.1

8	Confirmation step 6 , 7 Value (dP07 with dP00) According to the same conversion relationship.	5.1
9	Are you sure the direction of rotation of the servomotor in accordance with the instruction.	
10	The speed command is input to the recovery 0 V The servo OFF . Speed trial run ends	

7.4 After the test run the servo motor and a mechanical connection

In a single Body test Transport After the line is correct, even Servo motor and mechanical connection, is connected after the test run mechanically.

step project	content	Reference Section
1	parameter settings 1 On control power supply and the main circuit, with the safety function, overtravel brake And other protection-related settings.	3.1 8.2
2	parameter settings 2 The required parameters according to the control method used	
3	installation <u>In Power OFF In a state connected to the servo motors and the like by a mechanical coupling.</u>	
4	an examination <u>Power upper apparatus, the servo drive is set to the servo OFF After confirmation step 1 Whether set in the protective functions operate normally.</u>	
5	run <u>according to" 7.3 The upper command for trial operation servomotor "trial run to confirm the same test run and test run results servomotor and confirm settings consistent with the mechanical units of the instruction.</u>	-
6	Adjustment Trial operation, the servo motor and machine are not accustomed to may appear, please run the full implementation of the run	-
7	S-ON signal input So far, the test run operation ends.	Superior instruction

7.5 Trial operation of the servo motor with a brake

band Brake Test operation of servo motors, please observe the following precautions.

project content
1 When commissioning servo motor with brake, brake before confirming the action, be sure to take measures to prevent falling or due to natural mechanical vibrations caused by external forces.
2 When the servo motor with a brake test run, make sure the operation of the servo motor and the holding brake in a state where the servomotor and the mechanical unconnected. After no problem, please servo motors and mechanical connection after a trial run again.
3 Please brake interlock output servo drive (BK) Holding the brake signal to the servo motor with a brake operation is controlled.

Chapter VIII run

8.1 Select control mode

A axis, B axis, C Consistent control axis function. Below EPS-M1 Series servo drive control can be (a control mode) will be described.

User parameters		Control (Control Mode)	Refer
PA000	h. 00 0 [Factory default]	Position control (pulse command) Position command pulse train using a position servo motor. The number of pulses input to control the position, in order to control the frequency of the input pulse rate. For applications requiring positioning operation.	8.4
	h. 00 1 speed control (Analog voltage command)	Using analog speed command voltage of the servo motor speed control Use in the following situations. • When you want to control the speed A pulse output of the encoder servo drive, when the position control loop constructed by the position of the host device.	8.5
	h. 00 2 Torque Control (Analog voltage command)	Torque command voltage using the analog control output torque of the servomotor. Please use the desired output pushing action and other occasions.	8.6
	h. 00 3 speed control (Input Speed)	use INSPD0 , INSPD1 , INSPD2 Altogether 3 Input signals, by previously setting the servodrive good 8 Speed speed control section. This control mode is selected, no analog command.	8.7
	h. 00 4 ~ h. 00 9	It is above 4 A way of supporting the switch control mode to use, select the appropriate mode control switching customers use	8.10

8.2 Universal basic functions set

8.2.1 Servo ON setting

A servo motor servo energization / non-energized state instruction ON Signal (S-ON) Set.

(1) wait clothes ON letter number (SO N)

species	signal status	Input Level	Explanation
enter S-ON	ON	2CN-9 : " L "Level Servo motor energized state (servo ON State), you can run.	
	OFF	2CN-9 : " H "Level <u>Non-energized</u> state servo motor (servo OFF State), can not run.	

(2) Servo ON Input level selection signal

May be selected by a user input level parameters. That set the servo ON signal(**2CN-9**) Active level.

User parameters	Explanation

PA508	b. 000 0 From the input terminal 2CN-9 Input S-ON Signal is active low. (Factory default)
	b. 000 1 From the input terminal 2CN-9 Input S-ON Signal is active high.

Switching the motor rotation direction 8.2.2

Servo drives can be without changing the conditions of the servo motor wiring, the direction of rotation of the servo motor running inversely

"Inversion mode."

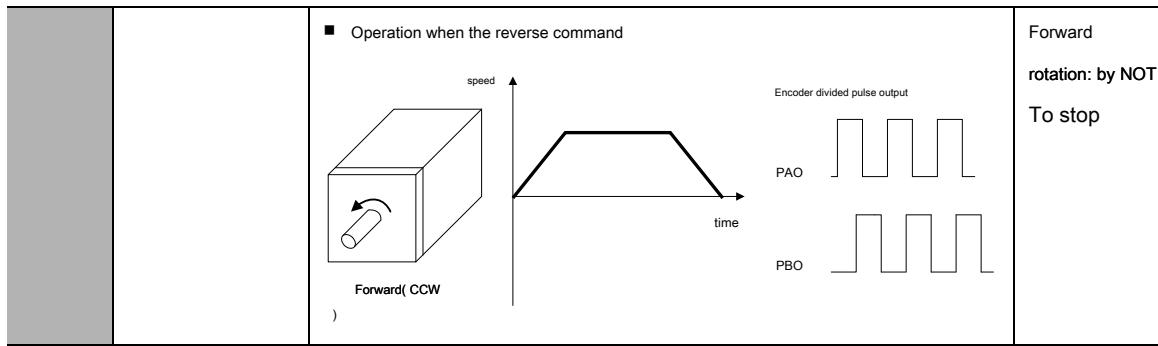
Standard set of "forward direction" as viewed from the load of the servo motor to "counterclockwise rotation (CCW)". "anti

Forward mode "only the rotating direction of the motor is changed, in this case," forward direction "is the load from the servo motor

See side to "clockwise rotation." At this time, the moving direction of the axis (+, -) inverted, the encoder pulse output and the analog

The polarity of the output signal from the servo drive amount monitoring signals remain unchanged.

User parameters	instruction	Overtravel <u>(OT)</u>
PA000	<p>h. 000 0 Standard Setting (Forward rotation)</p> <p>■ When the normal rotation instruction operation</p> <p>Forward (CCW)</p>	<p>Forward rotation: by POT</p> <p>To stop</p>
	<p>command is positive, CCW ■ Operation when the reverse command direction) (Factory default)</p> <p>Reverse (CCW)</p>	<p>When the reverse: by NOT</p> <p>To stop</p>
	<p>h. 000 1 Reverse mode (Forward to reverse command, CW direction)</p> <p>■ When the normal rotation instruction operation</p> <p>Reverse (CW)</p>	<p>When the reverse: by POT</p> <p>To stop</p>



8.2.3 Overtravel Limit

Overtravel beyond the movable means when the movable part of the mechanical setting area of the limit switch (ON) The state, the safety function of the servo motor forcibly stopped.

note	
Limit switch mounted	
In straight line running other occasions, be sure to connect the limit switch to prevent mechanical damage.	
When the contact portion of the limit switch or the occurrence of contact failure disconnection, using the "normally closed contact", the motor is moved to the safe side.	
Using a servo motor in the case of the vertical axis	
Overtravel state, the workpiece may be dropped, to prevent the workpiece from falling off, by setting the zero position of the servomotor is fixed into the state after overtravel. Setting method, please refer to ""	

Connection (1) overtravel signal

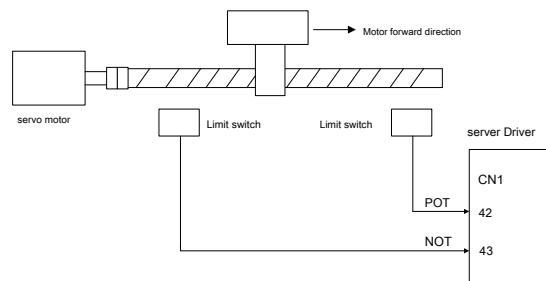
To use the overtravel function, set the input signal following overtravel limit switch is properly connected to the servo drive CN2 even

The connector phase The needle should be No. .

species	Signal Name	Connector Pin Number	set up	significance
enter POT	CN2-34 (Factory default)	ON = L Level May Forward Drive (normal operation) OFF = H Level Prohibit Forward Drive (positive overtravel)	L Level May Forward Drive (normal operation)	(normal operation)
			OFF = H Level Reverse drive is prohibited (reverse overtravel)	
enter NCT	CN2-8 (Factory default)	ON = L Level Reversible side driving (running) OFF = H Level Reverse drive is prohibited (reverse overtravel)	L Level Reversible side driving (running)	
			OFF = H Level Reverse drive is prohibited (reverse overtravel)	

In the case of the linear drive and the like, in order to prevent mechanical damage, sure to press the limit switch is connected as shown in

FIG. Even in the overtravel state, it can be driven to the opposite side. For example, under a positive overtravel state, it can be driven in the reverse side.



■ Important

* Position control, when the motor stops running overtravel, will be retained position deviation pulse. To clear position shift pulses must be clear signal input (CLR).

- * POT , NOT Signal may dispense connector pin number entered by the user parameters freely. For details, see " 3.4.3 O IO signal distribution. "
 - * need to use POT , NOT Signal, please PA003.0 with PA003.1 Set as 0 (Make POT , NOT Signal is active).
 - * Deceleration
-

(2) when the motor is stopped using overtravel method of choice

Setting servo motor rotated Process input overtravel (P O T , NOT) signal Stop method when.

User parameters		Motor stop method After the motor stops significance		
PA001	d. 0 0	Free stop	Coasting through state	DB (Dynamic brake) for fast stop, wait Servo motor stops after coasting into the (non-conductive) state.
	d. 0 0 0			By coasting (NATURAL stop) to stop, the servo motor stops after coasting into the (non-conductive) state.
	d. 0 0 0	Coasting stop		In accordance with the servo OFF When the same method is stopped (stop coasting) Stopped, the servo motor stops after coasting into the (non-conductive) state.
	d. 0 0 1			
	d. 0 0 0		Zero clamp state By Emergency stop torque (PA406) Decelerated to a stop, servo After entering the motor stops zero clamp (servo locked) state.	
	d. 0 0 2		Coasting state By Emergency stop torque (PA406) Decelerated to a stop, servo After the motor stops coasting into the (non-conductive) state.	

² After changing the parameters of this user must be re-starting power to enable the setting. ² set n. 0 0 2 During coasting, if the servo is received ON Signal only when the motor decelerates 0 Only after the servo motor control.

■ term

² coasting stop : Natural stopped by frictional resistance during rotation of the motor.

² deceleration stop : Use deceleration (brake) torque is stopped.

² zero clamp state : Position command being zero. In the zero clamp state, the position deviation is cleared automatically.

* About servo OFF And when this alarm stopping method, refer to " 8.2.5 Servo OFF Stop method selection. "

(3) enable signal overtravel

User parameters		Explanation
PA003	b. 0 0 0 Forward Drive Prohibit (POT) Signal is active.	
	b. 0 0 1 Forward Drive Prohibit (POT) Signal is invalid. (Factory default)	
	b. 0 0 0 Reverse Drive Prohibit (NOT) Signal is active.	
	b. 0 0 1 Reverse Drive Prohibit (NOT) Signal is invalid. (Factory default)	

(4) is stopped when the torque setting overtravel

PA406	Emergency stop torque			
	Predetermined area	Setting unit	Factory default	Effective time
	0 to 300	1%	300	immediately

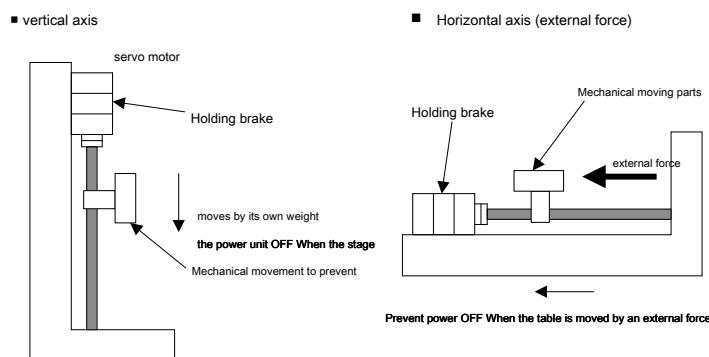
² overtravel setting input signal (POT , NOT) Stop the torque. ² setting unit as%

of rated torque. (100% of rated torque)

² emergency stop when an emergency stop torque setting torque exceeds the maximum torque value of the motor, the actual maximum motor output torque, when an emergency stop torque setting is too small, the deceleration may occur during an alarm E.28 .

8.2.4 set holding brake

Holding brake is used when the servo motor drives the vertical shaft. When the power is servodrive OFF When, with a brake servo motors to maintain the movable portion does not move due to gravity. (Please refer to " 7. 5 test run with a brake servo motor ")



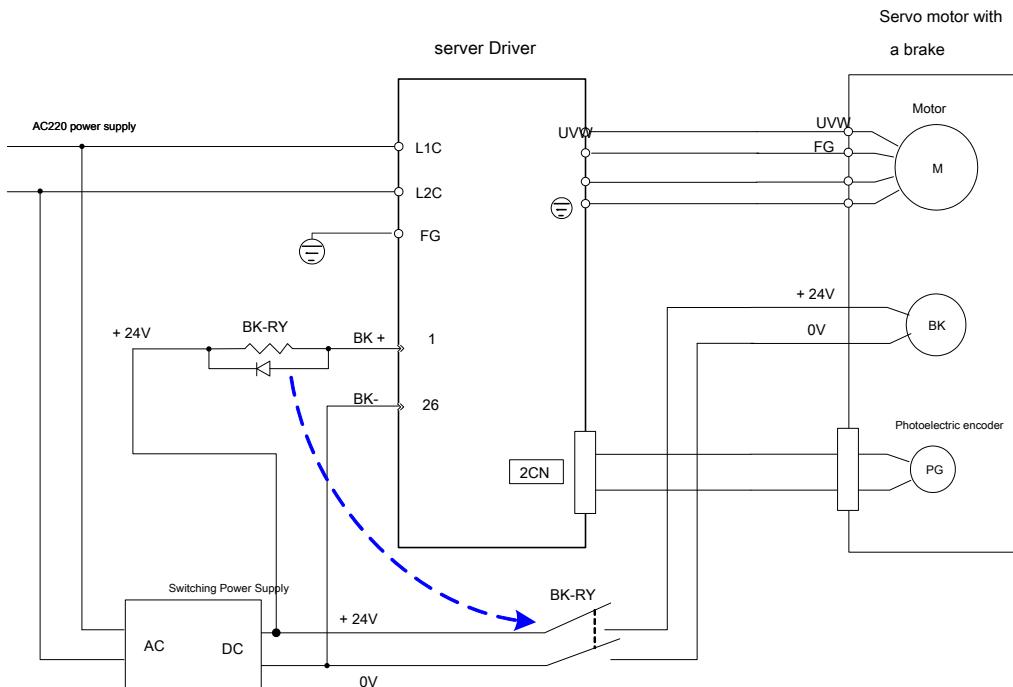
1. Brake servomotor is kept non-excitation dedicated brake, the brake can not be used only for maintaining the stopped state of the servomotor. Servo brake torque about more than 70% of the motor rated torque.

2. When only the speed loop servo motor operation, while the brake operation, the servo is set to OFF Input command is set to " 0V . "

3. When the position loop, since in the servo lock state of the servo motor stops, so do the mechanical brake is operated.

(1) Connection examples

Sequentially output servo drive signals. " BK "And the brake power supply to form a brake ON / OFF . Standard connection circuit examples shown below.



Note:

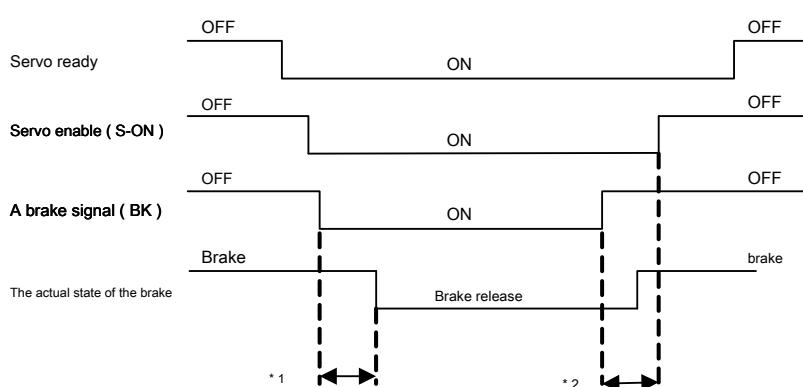
1 , BK-RY : Brake control relay

2 Switching power supply current is selected according to the required brake , Different operating current brake

Different. Switching power supply under normal circumstances DC24V Need to be able to provide> 1A Current;

3 , Brakes DC24V No direction limit input

There brake operation delay time, the operation of the ON , OFF Timing Referring next to FIG.



* 1 , To effectively brake the brake signal by the brake opening time varies;

* 2 ,for PA518 Numerical

(2) manufactured by move Interlock input Out

Type	Signal Name	Connector	Pin Number	set up	significance
Export	BK		We need to allocate	ON = L Level	Release the brake.
				ON = H Level	The use of brakes.

When using a servo motor with a brake, the brake control signal is output, in addition, the present output signal is not used in a factory setting. Must be allocated an output signal (PA510 Setting).

Do not use the motor is connected without brake.

■ important

When in the overtravel state, even if the servo motor is not energized, no output BK signal.

(3) A brake signal (BK) Allocation

A brake signal (BK) In the factory At the time of allocation DO4 (CN2-1 , CN2-26) Signals.

User parameters		Connector Pin Number		significance
		+ Terminal	- Terminal	
PA510	n. □□ 3 □ CN2-4		CN2-5	From the output terminal CN2-4 , CN2-5 Export BK signal.
	n. □ 3 □□ CN2-3		CN2-2	From the output terminal CN2-3 , CN2-2 Export BK signal.
	n.3 □□□ CN2-1		CN2-26	From the output terminal CN2-1 , CN2-26 Export BK signal.

■ Important

For other output allocation method of servo drive signals, refer to " 3.4.3 O IO signal distribution. "

(4) Brake ON Setting timing (after the servo motor stops)

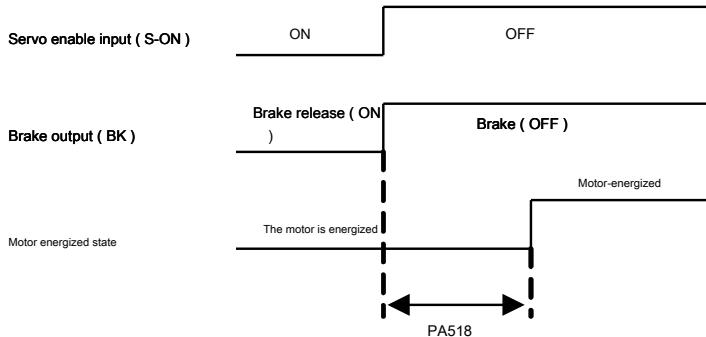
The standard setting is BK Signals S-ON Signal is set to OFF (Servo OFF) Simultaneously output while varying the parameter by a user

More servo OFF Timing.

PA518	Brake command - Servo OFF delay time			
	Predetermined area	Setting unit	Factory default	Effective time
	0 ~ 500	ms	100	immediately

When ² vertical axis, used in the above, since the brake ON The timing of movement of the movable machine may be generated by the action of a minute amount of a portion of the weight or external force. Servo delay parameters by a user of the present OFF Action to eliminate the small amount of movement.

² This user can change parameters of the servo motor is stopped when the brake ON timing. For rotation of the servomotor during brake operation, please refer to this item * 8.2.4 (5) Brake ON Setting timing (rotation servo motor). "



■ important

When an alarm occurs, the servo motor immediately into a non-energized state regardless of the setting of this parameter of the user. Due to the mechanical movable portion or the weight of external force or the like, mechanical movement may occur during the time before the brake is operated.

(5) Brake ON Timing setting (Rotating the servo motor)

In the servo OFF A case where a stop command to the servo motor is rotating or the like when an alarm occurs, according to the following

Said user parameter changes BK Output condition signal.

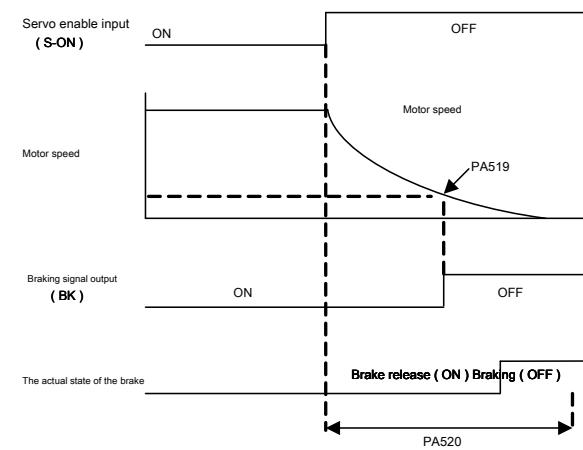
PA519	The brake operation speed instruction Degree limit			
	Predetermined area	Setting unit	Factory default	Effective time
	0 ~ 1000	rpm	100	immediately
PA520	Servo OFF- Brake instruction waiting time			
	Predetermined area	Setting unit	Factory default	Effective time
	100 ~ 1000	1ms	500	immediately

During rotation of the servomotor BK Signal Output Conditions

When any of the following conditions are true, the BK Set to the H level

signal (brake start). ² servo OFF After motor speed PA519 When the servo ² OFF

After more than PA520 The setting time



- Even the important ² PA519 Set to a highest number of rotations or more values with a servo motor, the servo motor will be limited by the maximum speed of the motor itself.

8.2.5 momentary power failure processing setting

To the servo drive Main circuit power supply voltage supplied to the momentary OFF When set to continue running or set to servo OFF.

PA521	Instant stop keeping time			
	Predetermined area	Setting unit	Factory default	Effective time
	40 ~ 800	1ms	60	immediately

Detecting a momentary power failure is detected main circuit power ON / OFF . in case OFF → ON Reset time of the present set

value of the following user parameters, it continues to be run.

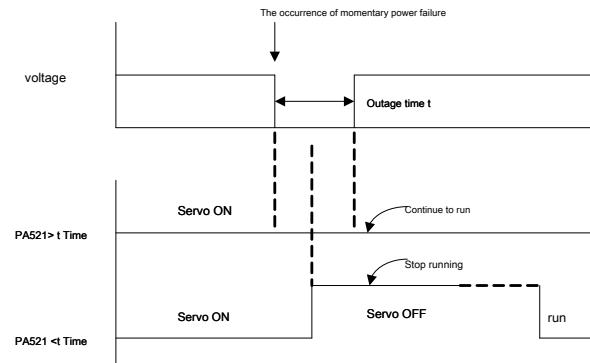
However, in the following case, the setting values of user parameters can not take

effect. ² servo motor load is too large, the occurrence of "undervoltage warning

(during a power failure at the moment A.96) " Time

² When the momentary power failure in the power control period, control becomes not

When (normal power source OFF The same operation)



■ important

Maximum instantaneous power outage holding time set value 800ms , But the servo drive control power retention time is about 200ms . Retention time due to the main circuit power output of the servo drive varies.

Control continues servodrive this case to keep more than a momentary power failure time, prepare uninterrupted power supply..

8.3 The method of using the absolute encoder

If a servomotor with an absolute encoder, the system can be configured to detect an absolute value of the instruction at the controller. the result

Yes, again ON Electricity After the source, may With Not the origin of complex Bit, direct re-run.

Absolute value Code <u>Codec species</u>	Resolution multi-rotation ②	Output range	Operation when the limit is exceeded
Memory having a multi-turn absolute encoder	17 Place	-32 768 ~ + 32767	² exceeds the upper limit of the normal rotation direction (+ 32767) When the multi-rotation data becomes -32 768 . ² reverse direction beyond the lower limit value (- 32768) , The multi-rotation data becomes + 32767 .

When the multi-turn data overflows, an E .58 alarm; Parameters PA007. An alarm can be masked.

User parameters		significance
PA 007	D. E.58 generating alarm	<input type="checkbox"/> 0 <input type="checkbox"/> multi-turn absolute encoder data overflow. (Factory default)
	d. <input type="checkbox"/> 1 <input type="checkbox"/> Multiturn absolute encoder does not overflow alarm data.	

8.3.1 Selection absolute encoder

User parameters		significance
PA 002	d. <input type="checkbox"/> 0 <input type="checkbox"/> absolute encoder as an incremental encoder. (Factory default)	
	d. <input type="checkbox"/> 1 <input type="checkbox"/> The absolute encoder as an absolute encoder.	

² as the incremental encoder, no backup battery. After this change ² user parameters, power must be cycled to enable the setting.

8.3.2 Battery to use

Even if the power is OFF When the backup battery is also required to make the absolute encoder position information stored.

(1) Battery Selection

Please be prepared according to the specifications of the command controller, the battery should be used corresponds to ER3V (3.6V , 1000mA Toshiba Battery System) products.

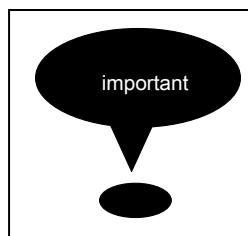
(2) battery mounting

A battery mounted in the battery box encoder cable, not pay attention to the positive and negative reversed.

8.3.3 Battery Replacement

The battery voltage drops to about 3.1V When the servo drive will issue a " 17 Battery warning bit serial encoder (A.97) . "However, the warning is in the power servodrive ON Output. Thus, if the servo drive power ON When the battery voltage is too low, the servo drive without warning. By setting the user warning low battery voltage is more variable parameters. ² battery replacement procedures

1. In the control power servo drive holder ON Replace the battery in a state.
2. After replacing the battery, the power is set to set servodrive OFF To relieve " 17 Battery warning bit serial encoder (A.97) . "
3. The power servo drive is restarted, as no abnormal operation, this indicates the end battery replacement.



The servo drive control power set OFF When the battery has been removed and the connection (including removing the encoder cable), data in the absolute encoder will be lost. At this time, the setting operation must be absolute encoder. Please refer to" 8.4.5 Absolute encoder settings (AF011) . "

8.3.4 Set absolute value encoder (AF011)

At this time, the setting operation must be absolute encoder.

² ² initially occur at start machinery " 17 Battery warning bit serial encoder (A.97)

² When an alarm occurs E55 ~ E62 "is

² want to multi-rotation absolute encoder counter data is set to 0 by the drive panel operator (see 6.13). Executing the AF011 It must be valid on again after the operation.

8.4 Position control

Set user parameters 8.4.1

When the position control using the pulse train, the user set the following parameters.

(1) Control mode selection

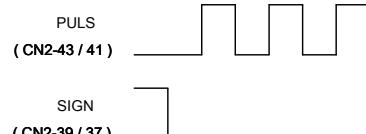
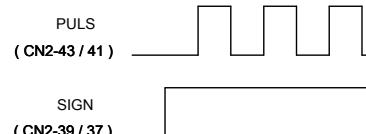
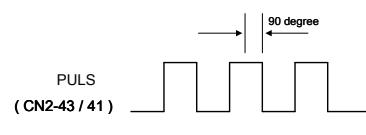
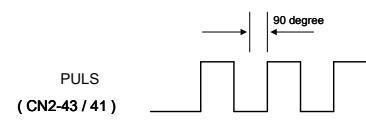
User parameters		significance	
PA000		. H <input type="checkbox"/> 0 <input type="checkbox"/> control mode selection: position control (pulse train reference)	

(2) Pulse command form's Choice

species	Signal Name	Connector Pin Number	
Low input pulse Input channel	PULS +	CN2-43	Command pulse input
	PULS-	CN2-41	Command pulse input
	SIGN +	CN2-39	Symbol input
	SIGN-	CN2-37	Symbol input

Servo drive input side Morphological parameters according to the specifications set the user commands the controller P A200.0 with PA200.1 .

User parameters	Instruction form	Forward command	Reverse command
PA200 d. <input type="checkbox"/> 00 symbol pulse train + (Positive logic) (F)		<p>PULS (CN2-43 / 41)</p> <p>SIGN (CN2-39 / 37)</p>	<p>PULS (CN2-43 / 41)</p> <p>SIGN (CN2-39 / 37)</p>
d. <input type="checkbox"/> 01	CW + CCW	<p>PULS (CN2-43 / 41)</p> <p>SIGN (CN2-39 / 37)</p>	<p>PULS (CN2-43 / 41)</p> <p>SIGN (CN2-39 / 37)</p>
d. <input type="checkbox"/> 02	A Phase + B Phase pulse 4 Frequency (positive logic)	<p>PULS (CN2-43 / 41)</p> <p>SIGN (CN2-39 / 37)</p>	<p>PULS (CN2-43 / 41)</p> <p>SIGN (CN2-39 / 37)</p>

	d. <input type="checkbox"/> 10 symbol pulse train + (Negative logic)	PULS (CN2-43 / 41) 	PULS (CN2-43 / 41) 
	d. <input type="checkbox"/> 12 A Phase + B Phase pulse 4 Frequency (negative logic)	PULS (CN2-43 / 41) 	PULS (CN2-43 / 41) 

(3) Clear action choices

In the clear signal (CLR) Under other conditions, which may be selected by a shift pulse periodically clearing the state of the servodrive

Punch clear, Offset pulse Mode of operation by a user parameter PA200.2 Select from the following three types.

User parameters	content
PA200 d. <input type="checkbox"/> 0 <input type="checkbox"/> basic module	CLR Clear shift pulse signal is inputted. (Factory default) The basic module refers to S-ON Signal is set to OFF , The main power supply is set to OFF And a state of alarm.
d. <input type="checkbox"/> 1 <input type="checkbox"/> offset pulse	is not cleared. Only available CLR Clear signals.
d. <input type="checkbox"/> 2 <input type="checkbox"/> or only in the event of an alarm clear signal input (CLR)	When the clear pulse offset.

8.4.2 Electronic gear setting

(1) Encoder pulses

User parameters	Encoder Specifications	Encoder pulses (P / R) Resolution
PA002	<u>d. 0 <input type="checkbox"/> absolute encoder 32768</u>	131072 (17bit)
	<u>d. 1 <input type="checkbox"/> incremental encoder 32768</u>	
	<u>d. 2 <input type="checkbox"/> incremental encoder 5000</u>	20,000

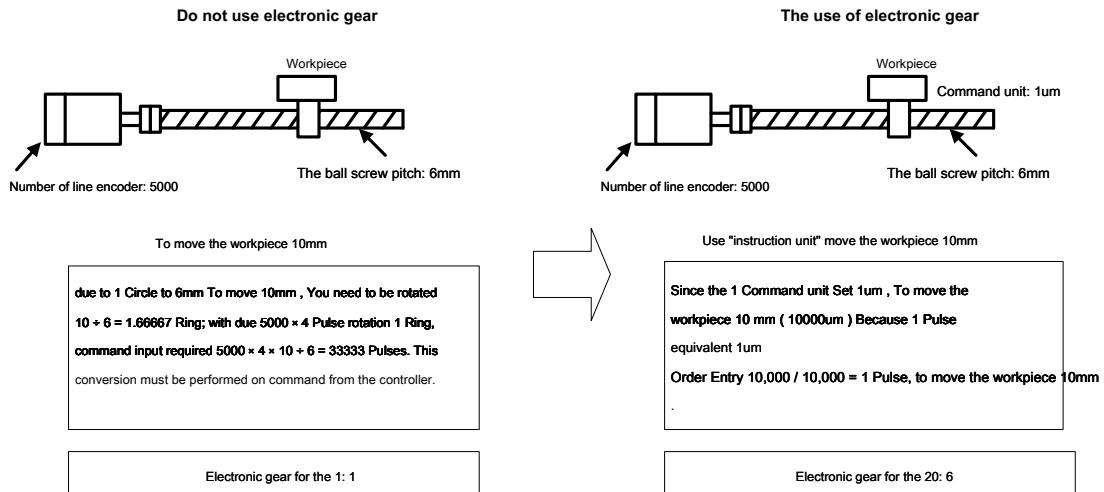
NOTE: indicates the number of bits of resolution of the encoder and the encoder output signal (A phase, B The number of phase pulses) is not the same. coding

The number of pulses \times 4 (After doubling) was equal to the number of bits resolution.

(2) Electronic gear

Electronic gear function refers to the command controller corresponding to the input command pulse movement of the workpiece 1 is set to an arbitrary value of the function.

Such instructions from the instruction control unit of the smallest pulse that is called "an instruction unit."



(3) Related User parameters

PA205 A first electronic gear (molecules)				
	Predetermined area	Setting unit	Factory default	Effective time
1 to 65535		-	1	immediately
PA206 Electronic gear (denominator)				
	Predetermined area	Setting unit	Factory default	Effective time
1 to 65535		-	1	immediately

If the motor shaft and the mechanical reduction ratio is set to a load side n / m , The value may be set by the following equation electronic gear ratio.

(Servo motor rotation m Ring, the load axis n When the circle);

$$\text{Electronic gear } PA = \frac{AB}{206205} \cdot \frac{\text{Encoder pulses}}{\text{Load axis}} \cdot \frac{4}{\text{The amount of movement on the ring}}$$

* Exceeds the set range, the set is divided into the numerator and denominator integer from about within the set range. Be careful not to change the electronic gear ratio.

■ Important

Recommend electronic gear ratio setting range: $0.01 \leq \text{Electronic gear ratio (B / A)} \leq 100$

(4) Electronic gear ratio setting step

Follow The step of setting the electronic gear ratio

Step Description	Explanation
1	Mechanical specifications confirmed Confirmed that the reduction ratio, the pitch of the ball screw, pulley diameter and the like.
2	Check the number of encoder pulses of the servo motor to confirm the number of encoder pulses.
3	Determine the reference unit 1 determines a control instruction from the instruction unit. Decide instruction unit in consideration of mechanical specifications and positioning accuracy on the basis of such factors.
4	Calculating an amount of movement of the load shaft one rotation In the instruction unit determines, based on the computational load required for one revolution of the shaft instruction unit amount.
5	The calculation of electronic gear ratio Electronic gear ratio calculation in accordance with formula electronic gear ratio (B / A) .

6	Set user parameters	The calculated value is set to the electronic gear ratio.
---	---------------------	---

(5) Calculation method of the electronic gear ratio

Position control mode, the actual speed of the load:

$$\text{Speed command pulse} \times (B / A) \times \text{Mechanical reduction ratio.}$$

In the case where the drive pulley and the like, the electronic gear ratio (B / A) It is calculated as follows:

$$\frac{M \cdot P_{\text{pulse}} \cdot B}{A \cdot L} \cdot i$$

P_{pulse} : Motor resolution. It refers to the number of rotation of the pulse motor of the motor feedback element feedback. Such as 5000 line

Incremental encoders, the number of pulses which is fed back to the drive $5000 \times 4 = 20000$;

M : Pulse calculation equivalent (mm) . Resolution refers to the host controller;

L : Screw pitch (mm) ;

i : Mechanical gear ratio

$$i = \frac{\text{Driven pulley teeth (Machine side)}}{\text{Active pulley teeth (motor side)}}$$

For example: the host controller pulse equivalent 0.001mm (1um); Mechanical reduction ratio is: $i = \text{Driven wheel} / \text{capstan} = 36$

/ twenty four ; Screw pitch 6mm ; Motor encoder 5000P / r , The number of feedback pulses per revolution of the encoder $5000 \times 4 = 20,000$.

It is calculated according to the above formula

$$\frac{20000 \cdot B \cdot 0.001}{A \cdot 6} \cdot \frac{2436}{210} \cdot 5$$

Molecular electronic gear should be set to 5 The denominator is set to 1 . If this embodiment is directly connected to the screw, the speed reduction ratio of 1 , The same as the screw pitch 6mm , Then get

$$\frac{20000 \cdot B \cdot 0.001}{A \cdot 6} \cdot \frac{1}{310}$$

8.4.3 Position command

Instruction issued in the form of a pulse train, the servo motor position control. Pulse

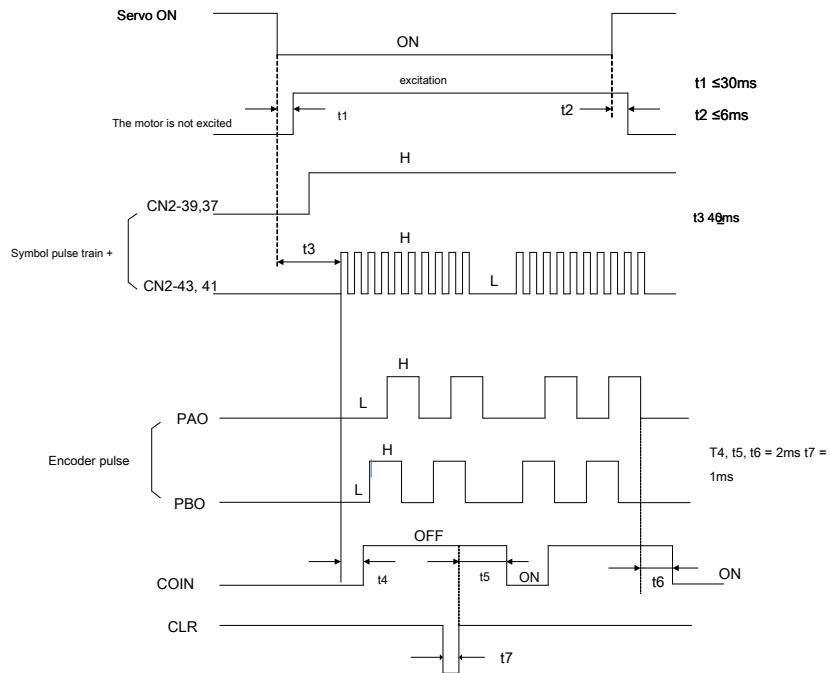
train output mode controller instruction types include the following. Bus driver output ²

² + 24V Open collector output ² + 12V Open collector output ² + 5V Open collector output

- Precautions open collector output of the open collector output signal only to the servodrive CN2-43 , 41 , 39 , 37 .

When the pulse input through open collector, interference tolerance of the input signal will decrease. When the offset due to interference occurs, the following changes in the user parameters.

(Timing example 1) of the input and output signals



(Note) 1 from the servo ON Signal is set to ON The spacing between the input reference pulse functions should be controlled in 40ms the above. If the wait clothes ON Signal is set to ON Played 40ms Within pulse input command, then the servo drive may not accept the command pulse.

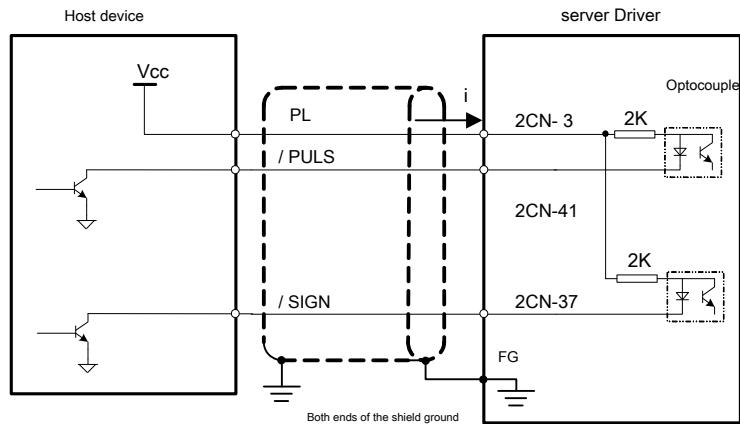
2. Please clear signal ON set as 20μs the above.

Table 8.1 a timing pulse input command signal

Command pulse signal form	Electrical Specifications	Remark
Symbol + input pulse train (SIGN + PULS Signal) Maximum reference frequency: 500kpps (Open collector output: 200kpps)	<p>Forward command: $t_1, t_2 \leq 0.1\text{us}$ Reverse command: $t_3, t_7 \leq 0.1\text{us}$ $t_4, t_5, t_6 > 3\text{us}$ $t \geq 1.0\text{us}$ $t/T (1/100) \leq 50\%$</p>	symbol(SIGN) H = Forward command L = Reverse command
CW Pulse + CCW Maximum pulse frequency command: 500kpps (Open collector output: 200kpps)	<p>Forward command: $t_1, t_2 \leq 0.1\text{us}$ Reverse command: $t_3 > 3\text{us}$, $t \geq 1.0\text{us}$ $t/T (1/100) \leq 50\%$</p>	
90° 2-phase pulse phase difference (A Phase + B Phase) Maximum frequency command: 24 multiplication: 200kpps (Open collector output: 150kpps)	<p>Forward command: $t_1, t_2 \leq 0.1\text{us}$ Reverse command: $t \geq 1.0\text{us}$ $t/T (1/100) = 50\%$</p> <p>B Phase advance A phase 90° . B Phase lag A phase 90° .</p>	

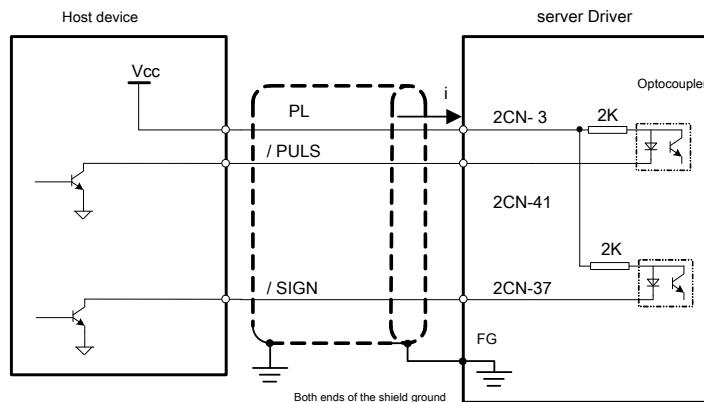
(2) Examples of connection

Examples of connection (a) of the bus driver output

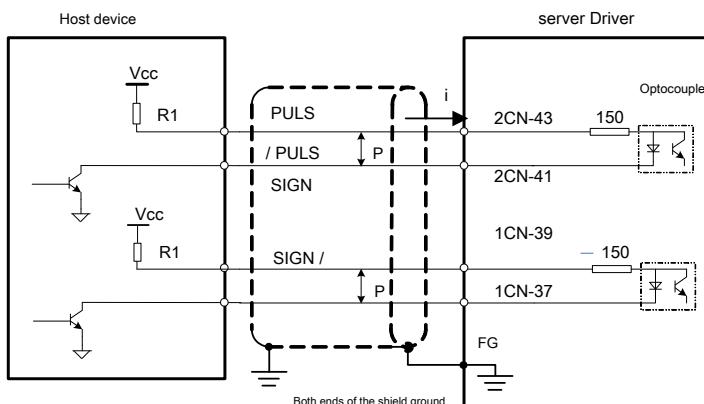


(B) Examples of open collector outputs are connected

When the power source is a collector 24V When, can be connected according to the following FIG.



When the power source is a collector 12V or 5V When, can be connected according to the following FIG.



Please select a limiting resistor R_1 . Ensure that the input current value i Enters the input current within the following ranges $i = 7 \sim 15\text{mA}$.

■ Important

Tolerance to reduce interference signal input through the open collector output command pulse, when the shift occurs due to interference user set parameters

number PA201.0 Set value increases.

8.4.4 Smoothing

The servo drives certain frequency instruction pulse input filter.

(1) Filter associated with User Parameters

PA214	<u>Deceleration command position Between parameter 1</u>			
	Predetermined area	Setting unit	Factory default	Effective time
	0 ~ 1000	0.1ms	0	immediately
PA215	<u>Deceleration command position Between 2 parameters</u>			
	Predetermined area	Setting unit	Factory default	Effective time
	0 ~ 1000	rpm	0	immediately
PA216	<u>Moving average position command time</u>			
	Predetermined area	Setting unit	Factory default	Effective time
	0 to 500	rpm	0	immediately

■ important

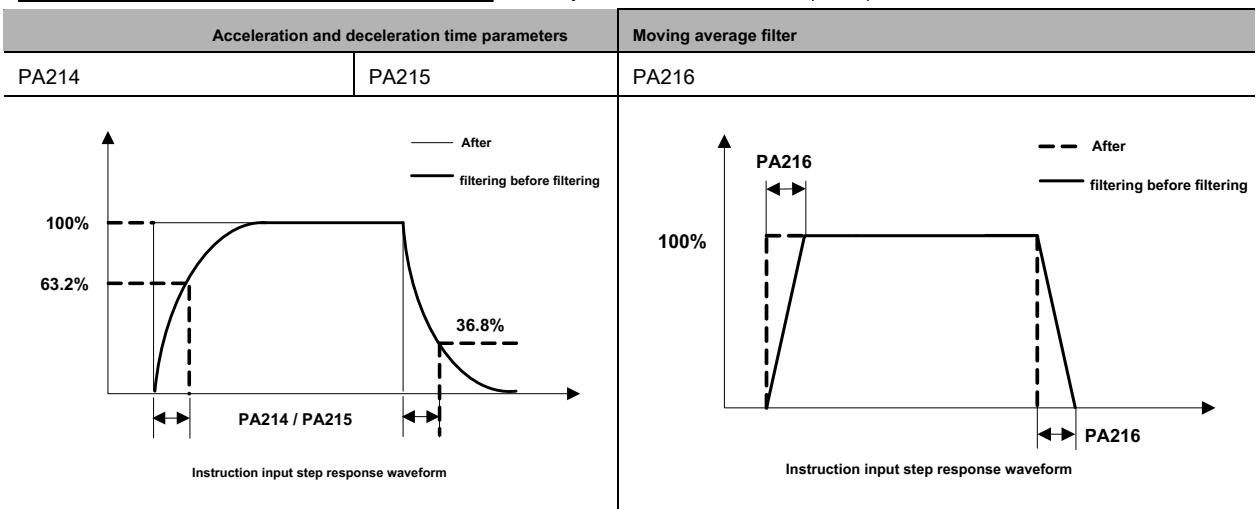
Change in position command acceleration and deceleration time parameters (PA214 , PA215) Under the circumstances, there is no value change will take effect when the command pulse input. To truly reflect the value of the set, enter the clear signal (CLR) Command controller to disable the servo command pulse or ON

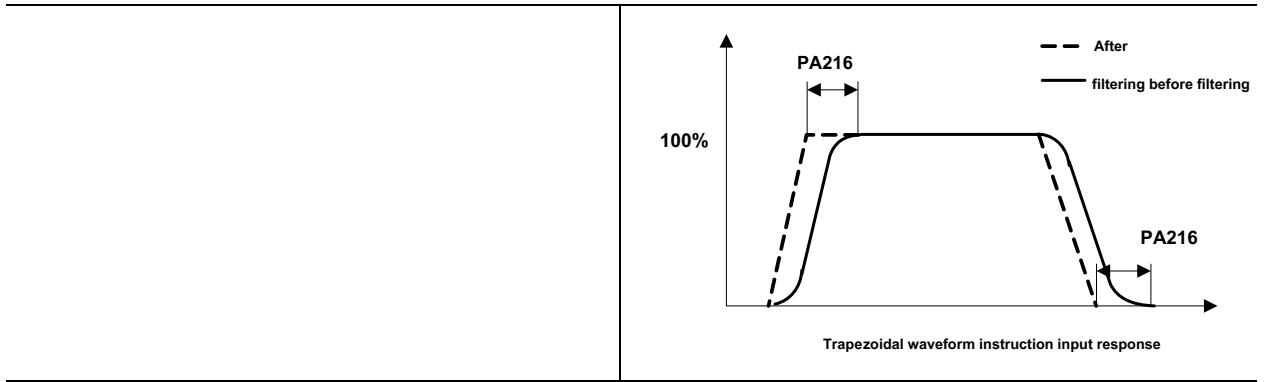
Clear offset pulse. Even in the following cases The motor can be run smoothly In addition the setting of the movement amount (Command pulses) does not affect

- When the command controller instructs deceleration can not be
- When the lower frequency of the command pulse
- When the electronic gear is relatively large (10 Above the fold)

■ supplement

Position command deceleration time constant (PA214 , PA215) Bit The average instruction set movement time (PA216) The differences are as follows





8.4.5 positioning completion signal (COIN)

This signal is a signal indicating the completion of the positioning of the servo motor position control. Please confirm the completion of the positioning of the associated instruction from the controller.

When using looks

Type	Signal Name	Connector Pin Number	Level	name
Export COIN		CN2-5 , 4 (Factory default) ON = L	Level	Positioning completed
			OFF = H Level	Positioning is not completed

Positioning completion signal parameters by a user PA510 Assigned to the output terminal, refer to " 3.4.3 O IO signal distribution. *Assigned at the factory to set **CN2-5 , 4**

PA 525	<u>Positioning completion width</u>			
	Predetermined area	Setting unit	Factory default	Effective time
	0 to 65535	1pulse	10	immediately

If the instruction command from the controller output pulse count and the difference between the moving amount of the servo motor (shift pulse) is lower than this parameter the user set value, the positioning completion signal is output (COIN) Setting unit is the command unit, the electronic gear unit depending on the instruction set. If the value is set too large The offset may be reduced at low speed, but it is possible to normally output COIN Model, so please pay attention. This setting user parameters do not affect the final positioning accuracy

■ supplement

COIN Signal is a position control signal.

8.4.6 Positioning proximity signal (the NEAR)

Positioned close to the signal (NEAR) It is a signal close to the completion of the positioning servo motor Typically the positioning completion signal (COIN) Paired.

Near the positioning signal before receiving acknowledgment for the positioning completion signal in the command controller Positioning operation sequence after the completion of a given preparation to shorten

Place finish Time Actions required time.

Type	Signal Name	Connector Pin Number	Level	name
Export NEAR		Should be allocated	ON = L Level	Positioning has reached near completion
			OFF = H Level	Positioning does not reach near completion

Positioning a proximity signal by a user parameter PA510 Assigned to the output terminal. The need for allocation of the input signal, see " 3.4.3 O IO signal distribution. "

PA 526	<u>NEAR Signal width</u>			
	Predetermined area	Setting unit	Factory default	Effective time
	0 to 65535	4pulse	100	immediately

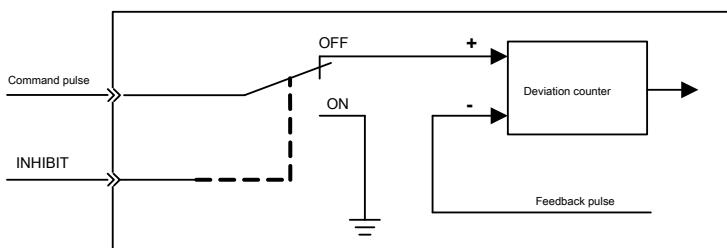
If the output difference (offset) of the command pulse controller instruction and the moving amount of the servo motor is lower than the present user parameters PA526 Set value of the output channels positioned near (NEAR).

Command setting unit is a unit which depends on the electronic command unit gear set than the generally set the width of the positioning completion (PA525) Greater value.

The need for allocation of the input signal, see " 3.4.3 O IO signal distribution. "

8.4.7 disable function command pulse (INHIBIT function)

(1) Command pulse inhibit function (INHIBIT Function) is stopped (disabled when position control) During the pulse input into the servo command count locking features in this function (clamp)status



(2) enter Setting signal

Type	Signal Name	Connector Pin Number	Level	name
enter INHIBIT	CN2-31	(Factory default)	ON = L Level INHIBIT Features ON	<u>(Stop (disable) command pulse count)</u>
			OFF = H Level INHIBIT Features OFF	(Instruction pulses are counted)

INHIBIT Signal function is effective only in the position control

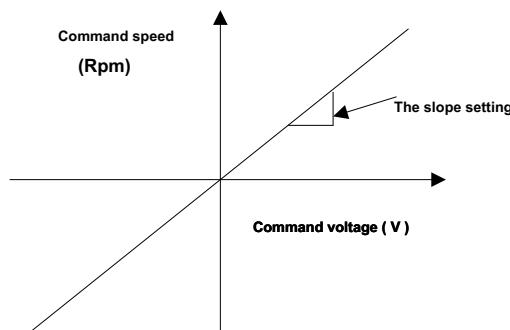
8.5 speed control(Analog voltage command) running

Set user parameters 8.5.1

User parameters	significance
PA000	h. 00 1 Control mode selection: Speed control (analog voltage command)

PA301	Increasing the speed command input beneficial			
	Predetermined area	Setting unit	Factory default	Effective time
	150 ~ 3000	0.01V / Rated speed	600	Do not need

Setting the speed command required to run at the rated speed of the servomotor (V-REF) Analog voltage level.



■ Cases

PA301 = 600 Expressed as a set 6V When the input operation using the motor rated speed (F)

PA301 = 1000 Expressed as a set 10V When entering, use the rated speed of the motor running

PA301 = 200 Expressed as a set 2V When entering, use the rated speed of the motor running

Setting the input signal 8.5.2

(1) Speed command input

In the form of analog voltage command issued to the servo drive speed command, places the input voltage proportional to the speed of the servo motor

Machine speed control.

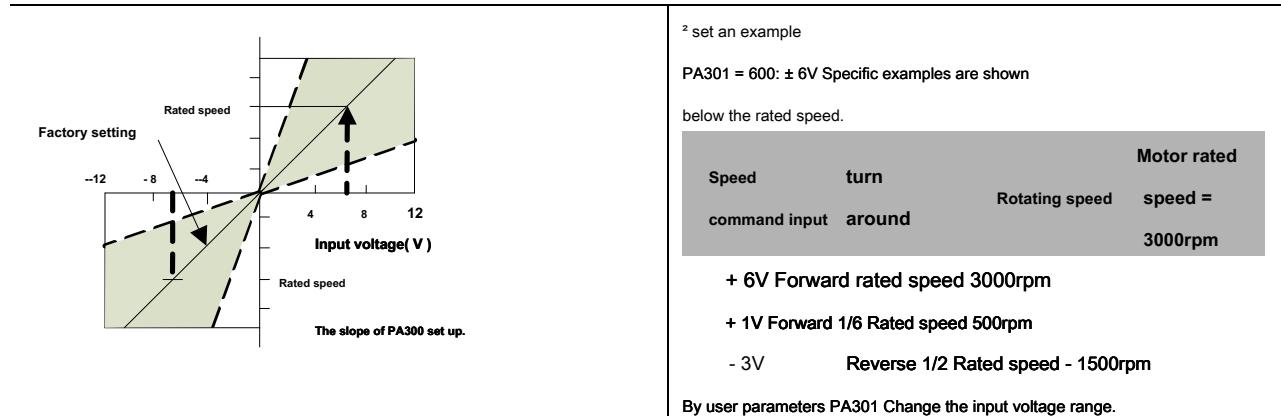
species	Signal Name	Connector Pin Number	name
enter V-REF		CN2-20	Speed command input
	AGND	CN2-29	No new speed command input ground

During use of the speed control (analog voltage command). (PA000.1 = 1 , 5 , 7 , 9)

use PA301 Setting the speed command input gain. For details on setting, refer to " 8.5.1 User parameter setting "

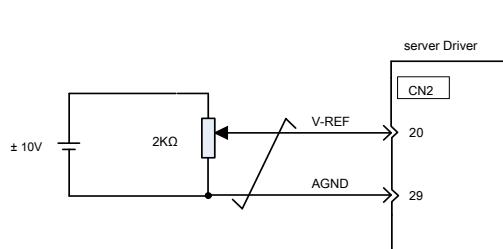
■ ² Input Specifications Input Range: DC ± 2V ~ ± 10V / ² rated speed

maximum allowable input voltage: DC ± 12V

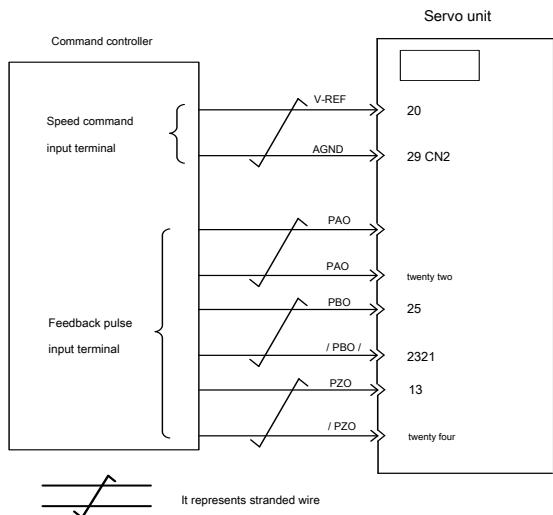


- Examples of the input circuit
- ² In order to be able to take effective measures to prevent interference, be sure
- Use stranded wire during wiring. Examples of variable resistor ²

Wing Communication Industry Co., Ltd. 25HP-10B type



When using a programmable controller in the position control command controller, the controller coupled to the instruction speed command output terminal.



(2) the ratio of the operation instruction signal (P-CON)

species	Signal Name	Connector	Pin Number	set up	significance
enter	P-CON Terminal assignment requires			ON = L Level	With P Servodrive control run.
				OFF = H Level	With PI Servodrive control run.

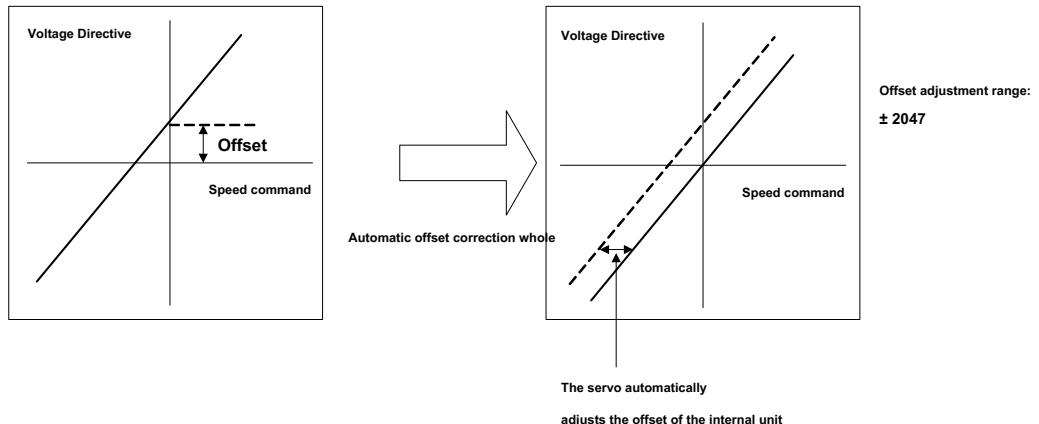
P-CON Signal from PI (Proportional 'integral' or P (Proportional) control in the speed control mode signal. If set to P The control can reduce the vibration due to motor rotation speed and a slight drift caused by the input command. Input command: the drift time of the servo motor may be generated by decreasing the rotation 0V, but the servo rigidity (supporting force) of the stops falling.

P-CON Signal connector pin numbers may be assigned by a user to input parameters elsewhere. Please refer to " 3.4.3 O IO signal distribution. "

8.5.3 offset adjustment instruction

When pacing system mode, even if the voltage as the analog command issued 0V Command, when the motor rotation speed to minor will appear. A minute amount of voltage appears in the command or host control means external circuit (mV This happens when the unit) the offset (Offset). In this case, an instruction may be automatically adjusted ² offset manual adjustment operation at 7.2 Referring auxiliary function mode "using the panel operator (AF 000)".

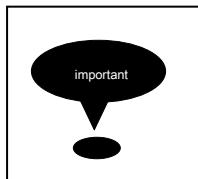
Analog (² speed torque) command to automatically adjust the offset is metered and automatically adjust the voltage offset function. Voltage command when the host controller or external circuit and the offset of the servo drive offset automatically adjusted as follows.



Once an instruction is automatically adjusted offset, the offset will be stored in the servo driver. Can be offset by the speed command manual adjustment (AF007) Undergo verification. Please refer to "8.5.3 (2) Manual speed command offset adjustment."

(1) Speed command offset automatic adjustment

In the state where the instruction position loop controller will offset the servo lock stop pulse is set to zero, the instruction can not be used to automatically adjust the offset (AF006). In this case, using the speed command offset manual adjustment (AF007). When the zero speed command is further provided with a servo lock enforceable zero clamp speed control. Refer to "Use 8.5.6 zero clamp function."



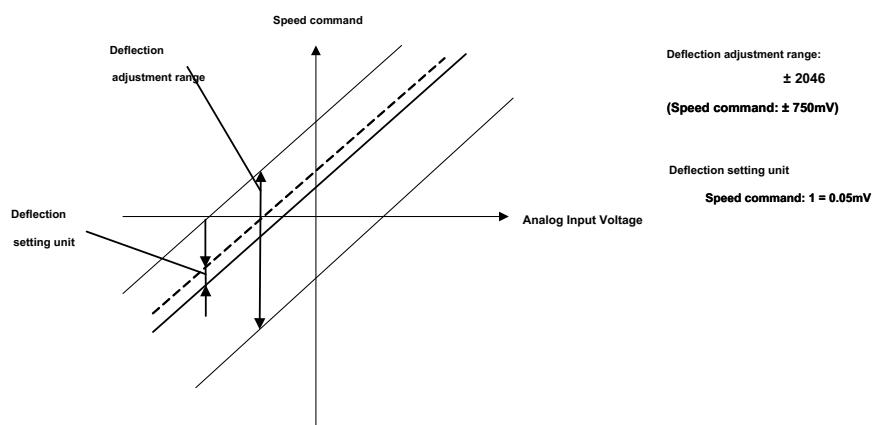
Perform automatic adjustment of the analog value at zero offset servo OFF.
Adjust the velocity command offset is automatically adjusted by the following steps.

(2) Speed command offset manual adjustment

Please under the following conditions using a speed command offset manual adjustment (AF007).

When the command controller ² offset position loop servo-locked pulses stop to automatically adjust settings confirmation ² offset data ² consciously zero shift amount is set for a set amount the basic function and analog (² speed torque) command to automatically adjust offset (AF006) The same, but in the manual adjustment (AF007)

When, at the same time must be adjusted directly input offset. Shown offset adjustment range setting unit follows.



Please Section 6.8 the speed command offset is automatically adjusted.

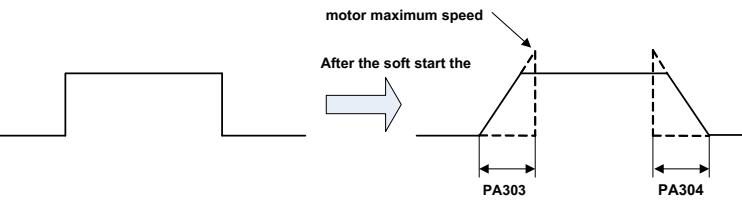
8.5.4 soft start

Soft start servo means Internal server drives the step speed command input into a constant deceleration command function.

PA303	<u>Soft start acceleration time</u>			
	Predetermined area	Setting unit	Factory default	Effective time
	0 ~ 5000	1ms	0	immediately
PA304	<u>Soft start deceleration time</u>			
	Predetermined area	Setting unit	Factory default	Effective time
	0 ~ 5000	1ms	0	immediately

When the input step speed command or set speed selected internal, smooth speed control can be performed.

(General speed control Set to "0") Set values as shown ² PA303 : From the stop state to 1000rpm Time, i.e., the interval 1000rpm Acceleration time ² PA304 : From 1000rpm Time to stop state, i.e., the interval 1000rpm Deceleration time



8.5.5 Speed command filter

PA302	<u>The speed command filter Inter parameters</u>			
	Predetermined area	Setting unit	Factory default	Effective time
	0 ~ 1000	0.01ms	40	immediately

The analog speed command (V-REF) Primary delay filter to input a speed command by smoothing. If the value is set too large, the response may be decreased.

8.5.6 using the zero clamp function

(1) Zero clamp means

The system controller, not the instruction means is disposed at a position loop speed control case feature uses. If the zero clamp (ZEROSPD) (PA300.3 = 0) Signal is asserted ON Or speed command (V-REF) (PA300.3 = 1) Of input voltage PA316 (Clamp level zero) rpm or less, the internal servo drive position loop, velocity ignoring

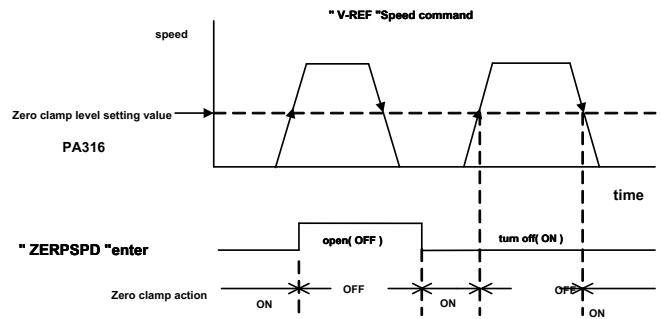
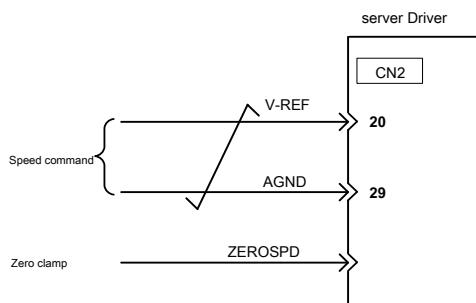
Emergency stop command and servo motor servo lock to enter the state. Servomotor position in force on the zero clamp is clamped within ± 1 pulse, even if the rotation by an external force, will return to zero clamp position.

(2) User parameter settings

User parameters	significance
PA300	Speed control switch 0
	PA300.3 = 0 External use IO control(ZEROSPD signal)
	PA300.3 = 1 Automatic (based on PA316 Range as the speed dead zone)

Switching the operation condition setting zero clamp PA000 = h. 1 □, PA300.3 = 0 Time, ZEROSPD for ON (L Level), it will enter zero clamping action. set up PA000 = h. 1 □

□, PA300.3 = 1 When the speed command (V-REF) Lower than PA316 The set value, enter zero clamping action.



PA316	Zero clamp level				
	Predetermined area	Setting unit	Factory default	Effective time	
	1 ~ 2000	1rpm	30	immediately	

In speed control, select ZEROSPD Effective zero clamp state enters the motor. Even though PA316 Exceeds a set value maximum speed by the servo motor, the maximum speed of the servo motor maximum speed value is still used.

(3) input signal set up

species	Connector Pin Number	Signal Name	set up	significance
enter	ZEROSPD	We need to allocate	ON = L Level	<u>Zero clamp function ON (effective)</u>
			OFF = H Level	<u>Zero clamp function OFF (invalid)</u>

It is the input signal for switching the operation of the clamp to zero. use ZEROSPD Signal, the

input signal needs to be allocated. About the allocation method, see " 3.4.3 O IO signal distribution. "

■ Important

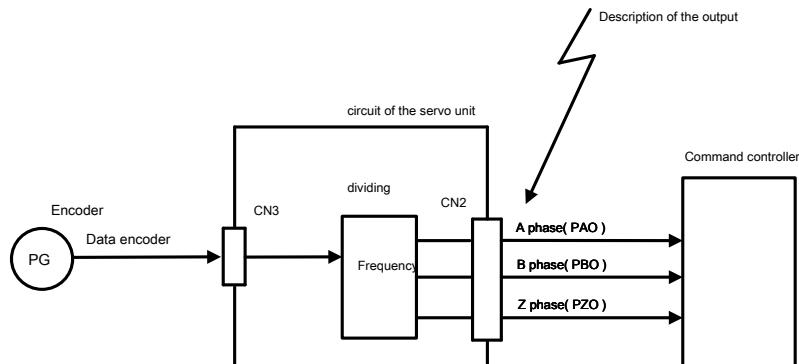
ZEROSPD When the signal has been assigned, even if the operation of the zero clamp PA000 = h. 1 □ under (speed control) is also effective in the case.

8.5.7 Encoder signal output

Encoder feedback pulse After the internal processing punch servo drive output to the outside .

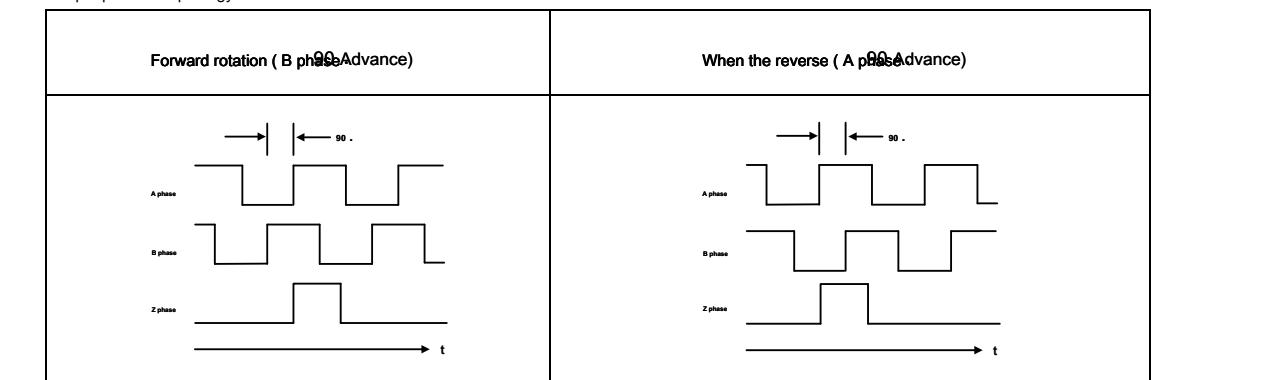
species	Signal Name	Connector Pin Number	name
Export	PAO	CN2-21	A phase encoder output

	/ PAO	CN2-22	Encoder outputs / A Phase
Export	PBO	CN2-25	Encoder output B-phase
	/ PBO	CN2-23	Encoder output / B phase
Export	PZO	CN2-13	Z phase encoder outputs (origin pulse)
	/ PZO	CN2-24	The encoder output / Z phase (origin pulse)



NOTE: fixed origin pulse width, regardless of the frequency dividing ratio

■ Output phase morphology



Please After two revolutions of the servomotor, then the use of servo drives Z Phase pulse output mechanical origin return operation. Constructed according to the mechanical system, the operation can not be performed when please 600rpm The following rate (in terms of the servo motor speed) origin return operation. If 600rpm The above rotation speed, the output may not be properly Z-phase pulse.

Divide

Refers to the data pulse encoder mounted on a servomotor based on user parameters is converted to (PA210) And setting the output pulse density. The unit is "number of pulses / 1 lap."

Encoder pulse Setting the frequency division ratio

PA210	PG Division ratio			
	Predetermined area	Setting unit	Factory default	Effective time
	16 ~ 16384	1P / rew	16384	immediately

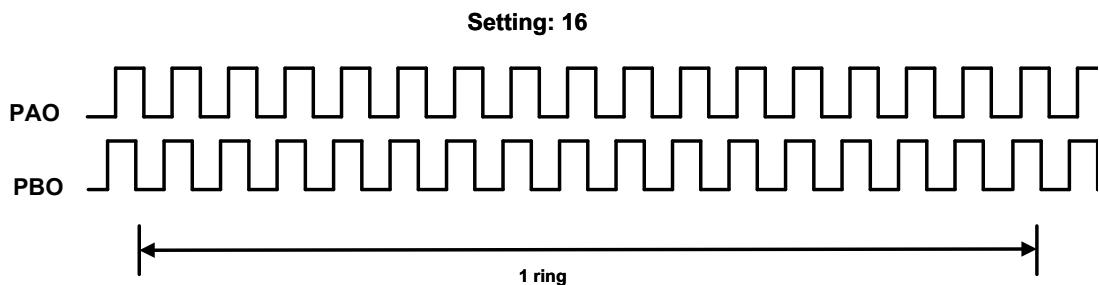
Setting sent from the servo drive to the outside PG output signal (PAO, / PAO, PBO, / PBO) The number of output pulses. Per lap feedback pulses from the encoder is divided as the servo driver PA210 And outputs the set value. (Please set according to the specification of mechanical system and a control instruction.) Further, Because of the setting range use Servo motor encoder pulse The number varies.

Encoder Specifications	Resolution	<u>Encoder pulses (P / R)</u>	Predetermined area
Province Line incremental encoder	20000 pulses / revolution	5000P / R	16 to 5000
Communications encoder 17 Bit, 131,072 pulses / ring		32768P / R	16 ~ 16384

■ important when PA210 Value is set more than the number of encoder lines, the division value of the encoder lines. Such as the use 5000ppr The incremental encoder, PA210 Set as 16384 , It is the number of divided pulse line encoder 5000 .

■ Output Example

PA210 = 16 (each 1 ring 16 Pulse output)



8.5.8 with the speed detection output

Speed and instruction speed of the servo motor coincides, with the output of the speed detection output (VCMP) Signal, on the instructions of the controller associated with the

When using locks.

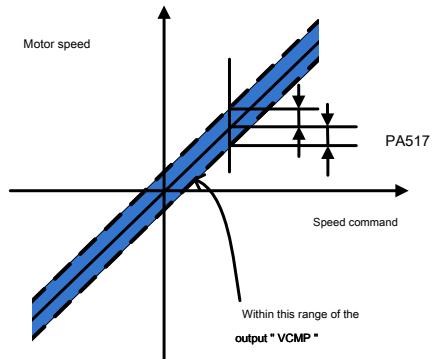
species	Signal Name	Connector Pin Number	set up	significance
Export	VCMP	We need to allocate	ON = L Level	The same speed state
			OFF = H Level	Different speed state

This output signal is required by the parameters PA510 distribution.

Related output Signal distribution, refer to " 3.4.3 O IO signal distribution. "

PA517 With the speed detection width				
Predetermined area	Setting unit	Factory default	Effective time	
0-100	rpm	10	immediately	

If the difference between the speed command and the motor speed is below PA517 The set value, the output " VCMP "signal.



■ Cases

PA517 = 100 Instruction speed 2000rpm , If the motor speed in 1900 ~ 2100rpm Between, then " VCMP "Set ON .

■ supplement" VCMP "Output signal is a speed control signal.

8.6 Torque control operation

Set user parameters 8.6.1

Using the analog voltage command torque When control operation Users need to set the following parameters

User parameters	significance
PA000	h. <input checked="" type="checkbox"/> mode selection control: torque control (analog reference)

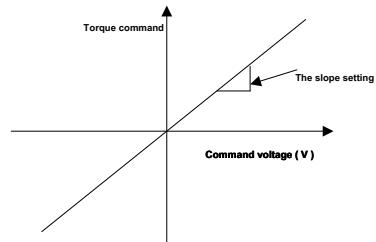
PA400 Increasing torque command input beneficial

Predetermined area	Setting unit	Factory default	Effective time
--------------------	--------------	-----------------	----------------

	10 ~ 100	0.1V / Rated torque	30	immediately
--	----------	---------------------	----	-------------

Setting a desired torque command to the servo motor nominal torque operation (T-REF)

Analog voltage level



■ Cases

PA400 = 30 Expressed as a set 3V Using the motor rated torque (initial value) input

PA400 = 100 Expressed as a set 10V When using the motor rated torque input

PA400 = 20 Expressed as a set 2V When using the motor rated torque input

8.6.2 torque command input

Analog voltage command issued in the form of a torque command to the servo driver Places the servo motor torque control voltage proportional to the input torque.

Type	Signal Name	Connector Pin Number	name
enter T-REF	CN2-18		Torque command input
	AGND	CN2-19	Torque command input

When the torque control is performed using the (analog voltage command) (PA000.1 = 2 , 6 , 8 , 9) . use PA400 Setting a torque command input gain.

- Input Specifications Input Range DC 1V ~ 10V / Maximum allowable torque rated input voltage DC12V

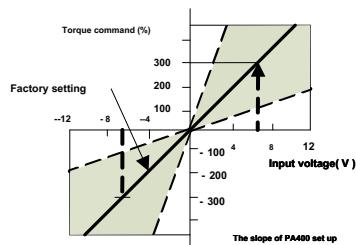
Factory value, PA400 = 30 , 3V Under the conditions of the rated torque

+9V When entering a positive direction for the rated

+ 9V When entering a positive direction for the rated torque 300%

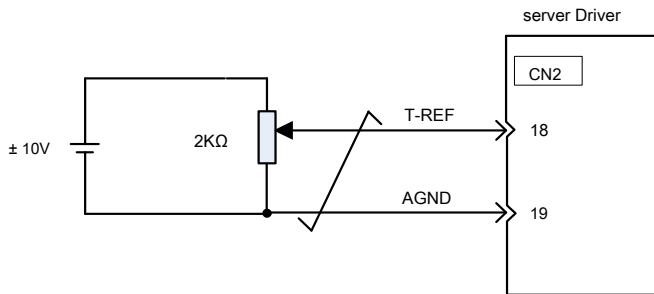
-0.3V When entering the opposite direction to the rated torque 10%

By user parameters PA400 Change input voltage range



- Examples of the input circuit

In order to be able to take effective measures to prevent interference Be sure to use stranded wire during wiring. Variable resistor instance, industrial production wing communication 25HP-10B type



Internal torque command confirmation

1. Confirm Internal torque command via the operator panel may be in monitor mode (dP010) The internal torque command acknowledgment, refer to 4.4.2 The operation monitoring pattern

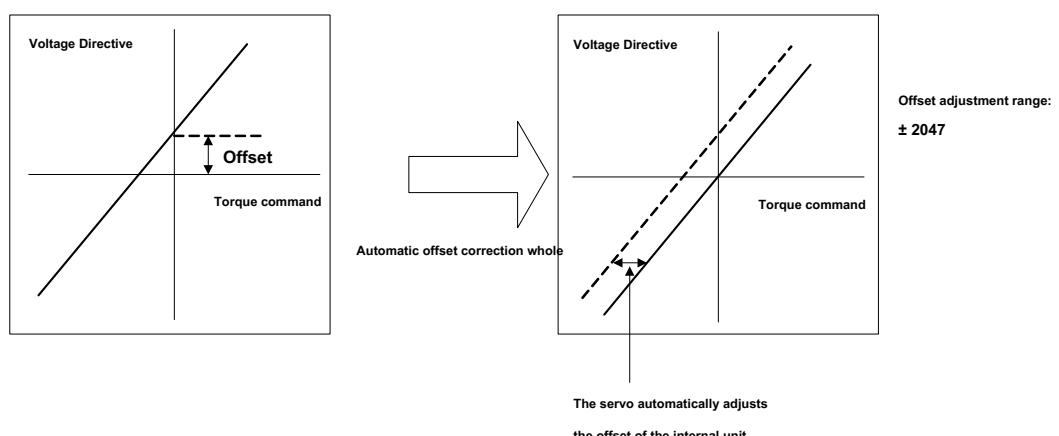
8.6.3 skew adjustment

(1) Torque command offset automatic adjustment

When using the torque control mode, as the analog reference voltage, even though it does 0V Command, when the motor speed at a slight rotation will occur a slight amount of voltage appears in the command or host control means external circuit (mV This happens when the unit) the offset (Offset).

In this case, the offset instructions for automatic adjustment, manually adjusted by the operator panel. Analog (Speed Torque) Offset automatic adjustment instruction (AF006) It is a measure of the offset voltage and the automatic adjustment function.

Voltage command when the host controller or external circuit and the offset of the servo drive offset automatically adjusted as follows.



Once an instruction is automatically adjusted offset, the offset will be stored in the servo driver. Offset by the torque command offset manual adjustment (AF008) Undergo verification.

In the state where the instruction position loop controller will offset the servo lock stop pulse is set to zero, the instruction can not be used to automatically adjust the offset (AF006) In this case, use the torque command offset manual adjustment (AF008) . Please torque command offset is automatically adjusted by the following steps.

(2) Manually adjust the torque command offset

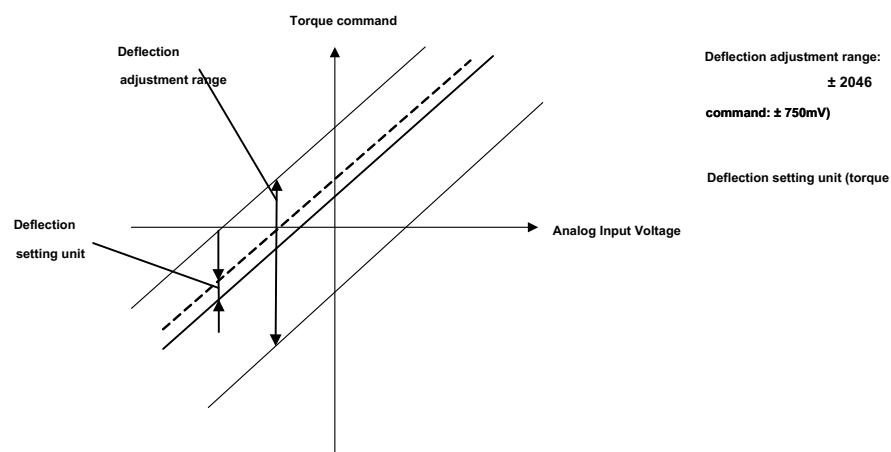
Adjusted manually using the torque command in the following cases offset (AF008)

- Command controller offset position loop pulse will stop the servo lock set to zero
- When consciously offset is set for a set amount
- The basic functions of the analog is confirmed by automatic adjustment of the offset data set (Speed, torque) Offset automatic adjustment instruction (AF006)

The same, but in the manual adjustment

(AF008) When, at the same time must be adjusted directly input offset. The following figure

shows a range and offset adjustment setting unit.



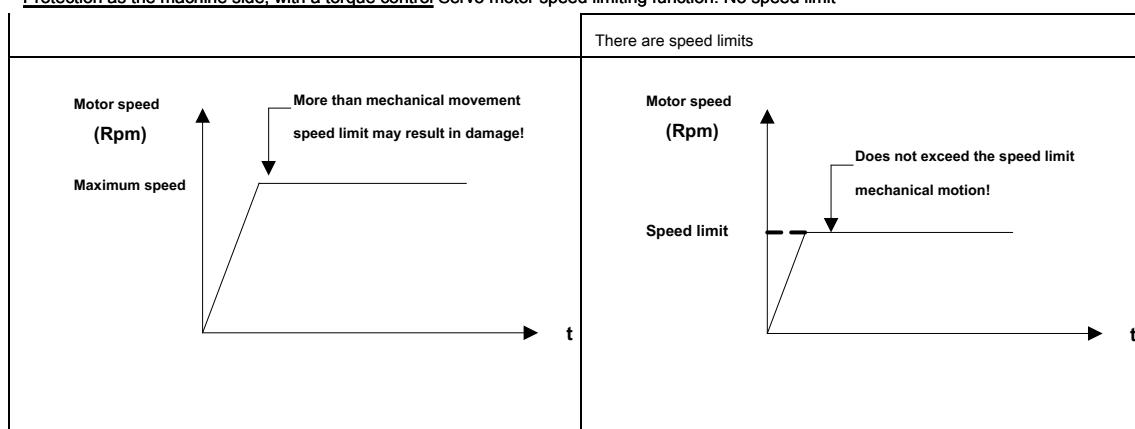
Please torque command offset manual adjustments described below.

8.6.4 Speed limit torque control

Due to the control of the servo motor torque control command is issued to the output torque, and therefore the motor speed is not managed.

If the load torque with respect to the machine side command torque setting is too large, it will exceed the torque machines, resulting in a substantial increase motor speed.

Protection as the machine side, with a torque control Servo motor speed limiting function. No speed limit



(1) Select the speed limit mode (turn Moments Limit Options) User

parameters	significance
PA002	d. <input type="checkbox"/> 0 <input checked="" type="checkbox"/> will PA407 Value is set as the speed limit (internal speed limit function)

	d. □□ 1 □	will V-REF (CN2-5 , 6) It serves as an external speed limit input to V-REF The input voltage PA301 Providing the speed limit setpoint (external speed limit function)
--	-----------	---

(2) Internal speed limit function can

PA 407	When the torque control speed Degree limit			
	Predetermined area	Setting unit	Factory default	Effective time
	0 to 5000	rpm	1500	immediately

Motor speed limit value of torque limit

PA002.1 = 0 When setting this parameter to take effect even if the user PA407 Exceeds a set value maximum speed by the servo motor, the actual value is still limited to the maximum speed of the servo motors used.

(3) external speed Degree limit function

Type Signal Name	Connector Pin Number	name
enter V-REF	CN2-18	External speed limit input
AGND	CN2-19	External speed limit input

Motor speed limit value limiting the input torque voltage command Analog

PA002.1 = 1 Time, V-REF The speed limit input PA407 Speed limit when torque control value smaller effective value.

PA301 Set value determines the polarity of the voltage level regardless of the input value

PA301 Increasing the speed command input beneficial				
	Predetermined area	Setting unit	Factory default	Effective time
	150 ~ 3000	0.01 V / Rated speed	600	immediately

Setting the voltage level of the external speed limit rotational speed when the torque control

PA301 = 600 (Factory value), if the input V-REF (CN2-5 , 6) for 6V Voltage, then the actual speed limit is the rated speed of the servo motors used.

(4) Motor turn Speed limit The output signal

Type Signal Name	Connector Pin Number	name	
enter VLT +	CN2- □□ (assignment required)	ON = L Level	We are limiting motor speed
VLT -	CN2- □□ (assignment required)	OFF = H Level	<u>Motor speed restriction state not</u>

When the torque limit, if speed is reached PA407 Set value or based on the analog voltage command value speed, the output / VLT signal.

need to use / VLT Signal must User Parameter PA510 Output terminal allocation, refer to " 3.4.3 O IO signal distribution. "

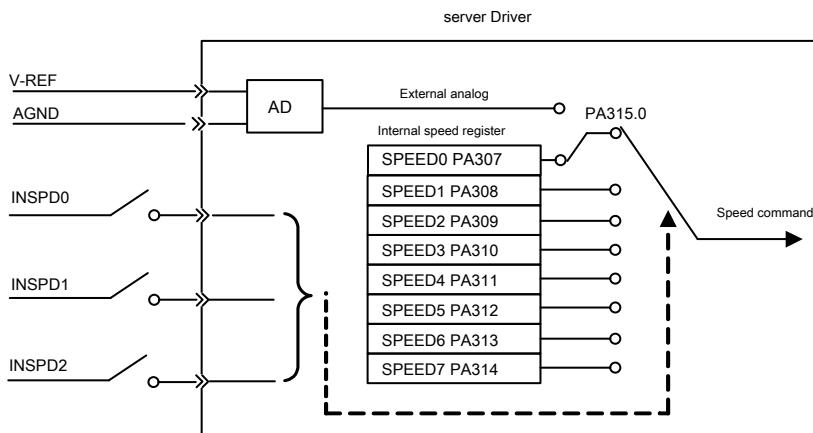
8.7 speed control (Internally Set Speed Selection) Run

Internal speed selection means

Internal speed selection is made by the user within the parameters set in advance servodrive 8 Species and the motor speed using the external input signal selection

Speed for speed control operation function, for running at 8 Kinds of motor speed within the speed control operation is effective. In addition, when PA315.0 Set as 1 After the speed command source is selected as the external analog input. You need not be arranged outside the generator or the speed of the pulse generator.

INSPD2 , INSPD1 , INSPD0 Selecting a combination of internal speed, INSPD2 It is high, INSPD0 It is low. Such as INSPD2 effective, INSPD1 , INSPD0 Invalid, then select the internal speed SPEED4 .



■ Internal speed selection signal (INSPD0 , INSPD1 , INSPD2)

by INSPD0 , INSPD1 , INSPD2 Combination of four signals is completed 8 Select the location of the segment. INSPD The following table signal.

INSPD2	INSPD1	INSPD0	Select the location section
0 (invalid)	0 (invalid)	0 (invalid)	The first 0 Segment position (PA307)
0 (invalid)	0 (invalid)	1 (effective)	The first 1 Segment position (PA308)
0 (invalid)	1 (effective)	0 (invalid)	The first 2 Segment position (PA309)
0 (invalid)	1 (effective)	1 (effective)	The first 3 Segment position (PA310)
1 (effective)	0 (invalid)	0 (invalid)	The first 4 Segment position (PA311)
1 (effective)	0 (invalid)	1 (effective)	The first 5 Segment position (PA312)
1 (effective)	1 (effective)	0 (invalid)	The first 6 Segment position (PA313)
1 (effective)	1 (effective)	1 (effective)	The first 7 Segment position (PA314)

Set user parameters 8.7.1

User parameters	significance		
PA000	<input checked="" type="checkbox"/> H <input type="checkbox"/> 3 <input type="checkbox"/> control mode: the internal control set speed (contact reference)		
PA307 Internal set speed 1 (SPEED0)			
Predetermined area	Setting unit	Factory default	Effective time
- 5000 to 5000	rpm	100	immediately
PA308 Internal set speed 1 (SPEED1)			
Predetermined area	Setting unit	Factory default	Effective time
- 5000 to 5000	rpm	200	immediately

PA309 Internal set speed 1 (SPEED2)	Predetermined area	Setting unit	Factory default	Effective time
- 5000 to 5000	rpm	300	immediately	
PA310 Internal set speed 1 (SPEED3)				
Predetermined area	Setting unit	Factory default	Effective time	
- 5000 to 5000	rpm	400	immediately	
PA311 Internal set speed 1 (SPEED4)				
Predetermined area	Setting unit	Factory default	Effective time	
- 5000 to 5000	rpm	500	immediately	
PA312 Internal set speed 1 (SPEED5)				
Predetermined area	Setting unit	Factory default	Effective time	
- 5000 to 5000	rpm	600	immediately	
PA313 Internal set speed 1 (SPEED6)				
Predetermined area	Setting unit	Factory default	Effective time	
- 5000 to 5000	rpm	700	immediately	
PA314 Internal set speed 1 (SPEED7)				
Predetermined area	Setting unit	Factory default	Effective time	
- 5000 to 5000	rpm	800	immediately	

- Even in the important PA307 ~ PA314 Exceeds a set value maximum speed by the servo motor, the actual value is still limited to the maximum speed of the servo motors used.
-

Setting the input signal 8.7.2

Using the following input signals into Line speed switching operation.

Type	Signal Name	Connector Pin Number	name	
enter INSPD0	CN2- □□ (assignment required)	Internal speed selection signal 0		
INSPD1	CN2- □□ (assignment required)	Internal speed selection signal 1		
INSPD2	CN2- □□ (assignment required)	Internal speed selection signal 2		

About input signal selection

INSPD0 , INSPD1 , INSPD2 Combination of three signals corresponding to the 8 speeds. use INSPD0 , INSPD1 , INSPD2 When run, the user must pass parameters PA 500 ~ PA 507 allocation of the input signal. Please refer to " 3.4.3 O IO signal distribution. "

8.10 Combination control mode selection

The servo control unit may select from a variety of two ways are combined, and are switchable. Control by Pn000.1 To choose. Next, a switching condition and a switching method will be described

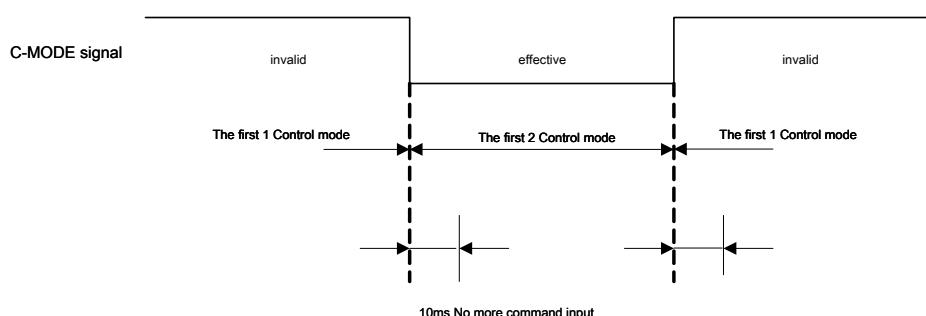
8.10.1 user parameter settings

User parameters		Control combination
PA 000	h. 4 internal speed control (contact reference) ↔ position control (command pulse)	
	h. 5 internal speed control (contact reference) ↔ speed control (analog instruction)	
	h. 6 internal speed control (contact reference) ↔ torque control (analog instruction)	
	h. 7 position control (command pulse) ↔ speed control (analog instruction)	
	h. 8 position control (command pulse) ↔ torque control (analog instruction)	
	h. 9 torque control (analog instruction) ↔ speed control (analog instruction)	
	■ Important	
	You must use an external input signal C-MODE Switching control mode, the parameters required by the user PA 500 ~ PA 507 allocation of the input signal.	

Control mode switching 8.10.2 Description

when PA000.1 Set as 4~9 When the compound control, the control mode selection input signal (C-MODE) Optionally of 1 The first 2 one of the.

C-MODE Invalid signal, select the first 1 Control mode, C-MODE Signal is active, Selection 2 Control mode. Select the front and back 10ms Do not enter within the command. C-MODE Process for controlling a mode switching signal as shown in FIG.



Chapter IX Troubleshooting

A axis, B axis, C The same fault content shaft.

9.1 Treatment and Causes Alarm

Alarm number	Alarm name cause of issue		Can <u>Remove</u>	Measures
E.03	Parameter error Abnormal parameters and calibration		no	1 Perform Factory Reset operation (AF005)
E.04	Parameter format different often	Data format abnormal internal parameters servodrive	no	1 Perform Factory Reset operation (AF005)
E.05	Current Detection 1 Channel anomaly	Abnormal internal circuit	no	1 , Power-off, too 1 Minutes later re-power
E.06	Current Detection 2 Channel anomaly	Abnormal internal circuit	no	1 , Power-off, too 1 Minutes later re-power
E.08	Internal communication error	Servo drive internal communication error	no	1 , Power-off, too 1 Minutes later re-power; 2 Check motor PE It is connected correctly, if there is a large external interference source;
E.10	Encoder disconnection	Province Line encoder signal line Disconnection	no	1 Check encoder wiring; 2 Check parameters PA002.3 Settings match the type of motor encoder;
E.11	Encoder AB Pulse loss	Incremental encoder AB Pulse loss	no	1 Check encoder wiring 2 , Ground and check the drive motor is connected, the shield cable is properly connected; 3 , The encoder checks whether the traces and separate strong electric cables;
E.12	Encoder Z pulse Chong loss	Encoder Z No pulse loss		1 Check encoder wiring;
E.13	Encoder UVW error	Encoder UVW No error		1 Check the motor mounted encoder type is a province line encoder; 2 Check encoder wiring; 3 Whether re-power too quickly;
E.14	Error encoder state	Province-wire initial state No error		1 Check the motor mounted encoder type is a province line encoder; 2 Check encoder wiring; 3 ,an examination PA002.3 The parameter settings are correct; 4 Whether re-power too quickly;
E.15	Main circuit power supply wiring error	Main circuit power supply is a three-phase input phase is not connected.	no	1 Check whether the input power supply phase; 2 , Check the input voltage meet the requirements; 3 Provided PA001.2 for 1 ;
E.16	Abnormal regeneration Reproduction processing circuit anomaly.	Reproduction processing circuit anomaly.	no	1 Reproduction processing circuit anomaly 2 , L1 , L2 , L3 Low input supply voltage; 3 Provided PA009.0 = 1 This alarm mask;

E.17	Abnormal regenerative resistor	Regeneration resistance fault	no	1 , Regenerative resistor is not connected or there is a fault 2 , L1 , L2 , L3 Low input supply voltage; 3 Provided PA009.0 = 1 This alarm mask;
E.18	Undervoltage	The main circuit DC No less than the voltage		1 , Check the input supply voltage is correct; 2 , After checking whether the operation of the electric drive relay (relay should sound power);
E.19 Overvoltage		The main circuit DC Abnormally high voltage	no	1 Check input supply voltage; 2 Check bleeder resistance; 3 ,modify A axis PA536 , PA542 Value, in order to optimize the braking operation timing resistor.
E.20	Power module alarm	Power module alarm	no	1 , Check the drive motor and the match is correct; 2 Reduced drive overload factor (PA402 , PA403); 3 Increased torque filter time (PA104);
E.21	overload	Motor continuous operation in excess of the rated torque.	can	1 , Increasing the overload curve (PA010.3); 2 , Increasing the servo system deceleration time (for position control: reduced PA100 Increase PA214 , PA215 , PA216 ; The speed control: PA302 , PA303 , PA304); 3 Reduced servo overload factor (PA402 , PA403); 4 To replace more powerful servo system;
E.22	Pulse input stranded overflow	Sheer number of pulse input residence.	can	Even when the motor is running at maximum speed corresponding to the input pulse is too late. 1 Check motor model (PA012)is it right or not; 2 Check the electronic gear settings are correct; 3 Check whether the correct frequency of the input pulse;
E.25	Deviation Counter Overflow	Internal position deviation counter overflow, the position deviation exceeds 256 ° 65536	can	1 Check motor JOG RUN is correct; 2 Check the electronic gear settings are correct; 3 Check servo torque limit settings are correct; 4 Check whether there is a limit case;
E.26 Position tolerance		Pulse parameters exceed user position shift PA528 Setting.	can	1 Check motor JOG RUN is correct; 2 Check the electronic gear settings are correct; 3 Check whether there is a limit case; 4 Increase PA528 Value;
E.27 Overspeed		Motor speed exceeds the maximum speed which 1.2 Time	can	1 Check motor U , V , W Wiring is correct; 2 Check parameters are set correctly. If the load inertia is large, the system gain parameter set small, large overshoot is generated, thereby causing the alarm. 3 , Increasing the servo system deceleration time (for position control: reduced PA100 Increase PA214 , PA215 , PA216 ; The speed control: PA302 , PA303 , PA304);
E.28	Motor stall Motor speed for a long time and to Fixed speed mismatch		can	1 Check motor U , V , W Wiring is correct; 2 Check whether the servo parameter modification too small, the response is too slow. 3 Increase PA530 . But too large value may lead to loss of function of this protection, pose a safety fault.

	E.29 Motor out of control	Abnormal motor operation, the motor power line may be an error, an error encoder lines may be, may not match drives and motors	can	1 Check motor U , V , W Wiring is correct; 2 Check encoder type is correct (PA002.3); 3 , Check the drive motor and the correct match (PA012); 4 , The drive gain appropriately reduced. Filtering appropriately increased. Such as increasing PA215 , PA104 . 5 Increase PA005.3 . But too large value may lead to loss of function of this protection, pose a safety fault.
E.30	Paul electronic gear Protect	Electronic gear ratio set too large	can	1 , Check the electronic gear settings are correct; 2 , Check the input pulse frequency is correct;
E.31	Total internal data Operator protection	Internal data number is larger than calculated 32 Place	can	1 , Check the electronic gear settings are correct; 2 , Check the input pulse frequency is correct;
E.35	Inhibit input protection	Limited input signal	can	1 , Check the presence or absence of an input limit signal; 2 By setting parameters PA003.2 = 1 This alarm mask;
E.44	Drive Reset Error	Since the power drive fast or reset exception causes the driver	no	1 , On a drive power greater than the interval 5 second; 2 , Check whether there is severe external interference source;
E.45	internal error 1 Internal drive error 1		no	
E.46	internal error 2 Internal drive error 2		no	
E.47	internal error 3 Internal drive error 3		no	
E.50	17 Bit serial encoder communication error	Servo drive and the encoder can not communicate.	no	1 Check parameters PA002.3 Settings match the type of motor encoder; 2 Check encoder wiring is correct; 3 , Replace the motor;
E.51	17 Bit serial encoder control field parity error	Parity bits, as bit errors, the encoder signal interference or <u>Encoder decoder circuit damage</u>	can	1 Check encoder wiring is correct; 2 Check the encoder shielded cable is properly connected to the server end; 3 , Replace the motor;
E.52	17 The encoder bit-serial communication data parity error	Encoder signals disturbed or damaged encoder decoding circuit	Can Ibid	
E.53	17 Off status bit serial encoder error bit field	Encoder signals disturbed or damaged encoder decoding circuit	Can Ibid	
E.54	17 Bit serial coding Device SFOME As of bit errors	Encoder signals disturbed or damaged encoder decoding circuit	Can Ibid	
E.55	17 Bit serial encoder overspeed	power supply OFF After high-speed rotation of the encoder; absolute encoder or no battery.	can	1 During the inspection of the servo power, whether a greater motor shaft speed. 2 Performing an alarm clear operation absolute encoder (AF.12); 3 Check whether the absolute encoder connected to the battery;
E.56	17 Bit serial encoder Absolute status error	1 , The encoder or the encoder decoding circuit damage damage 2 Serial communications interference;	can Absolute	encoder performs alarm clear message and clear operation multilurn (AF.11)

E.57	17 Error bit serial encoder counts	1 , The encoder or the encoder decoding circuit damage damage 2 Serial communications interference;	can	Absolute encoder performs alarm clear message and clear operation multiturn (AF.11)
E.58	17 Bit serial encoder multiturn information overflow	From the operation of the motor in one direction than 65535 Lap, multi-lap information overflow	can	Absolute encoder performs alarm clear message and clear operation multiturn (AF.11)
E.59	17 Bit serial encoder overheating	Absolute encoder may overheat		1 Check the temperature of the motor; 2 Performing an alarm clear operation absolute encoder (AF.12)
E.60	17 Bit serial encoder multiturn information Error	Multiturn information error	can	1 , Absolute encoder checking the battery voltage; 2 Performing absolute encoder multiturn information and alarm clear clear operation (AF.11)
E.61	17 Bit serial encoder battery alarm	Battery voltage is below 3.1V Battery voltage low	can	1 Replace absolute encoder supply battery; 2 Performing an alarm clear operation absolute encoder (AF.12)
E.62	17 Bit serial encoder battery alarm	Battery voltage is below 2.5V , Multi-turn position information has been lost	No Ibid.	
E.63	17 Bit serial data encoder uninitialized	17 Bit serial encoder memory data error	can	1 ,please confirm PA002.3 Motor encoder type matches correctly; 2 ,please confirm 17 Bit serial encoder performs an initializing operation;
E.64	17 Bit serial data sum check error encoder	17 Bit serial encoder memory data abnormality check sum	can	1 ,please confirm PA002.3 Motor encoder type matches correctly; 2 ,please confirm 17 Bit serial encoder performs an initializing operation;
E.67	And the motor drive does not match	And motor drive models (PA012)Mismatch	can	Although this alarm can be cleared, it can also be PA007.3 Shielded, but not Suitable matching can lead to poor performance motor operation, or operation occurred E.29 Call the police. 1 , Replace the drive 2 After replacing the motor, reset PA012 Value.
E.68	Motor type wrong This should match the type of driver	Motor number	can	Communication encoder having this alarm. Although this alarm can be cleared, too accessible PA007.3 Shield, but inappropriate to cause the motor to match the operating performance may deteriorate, or run occurred E.29 Call the police. 1 , Modify the motor model (PA012) 2 , Replace the motor
E.69	Servo drive error	The servo motor drive does not match	can	Communication encoder having this alarm. Although this alarm can be cleared, too accessible PA007.3 Shield, but inappropriate to cause the motor to match the operating performance may deteriorate, or run occurred E.29 Call the police. 1 , Modify drive model (PA011) 2 , Replace the drive
E.70	Test the absolute encoder count error	Test the absolute encoder count error	can	Effective encoder test mode
E.76	Module temperature too high	Module temperature is too high	can	1 Check whether the fan drive is operating normally; 2 Check ventilation, operating environment; 3 , By setting the parameters PA009.2 = 0 This alarm mask.

E.77 Soft limit alarm Running distance or more than software design Distance opposed	can	1 Check parameters PA779 ~ PA782 The settings are correct; 2 , By setting the parameters P770.3 = 0 This alarm mask.
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9.2 The reason for the warning and treatment measures

Warning No.	Warning name	Warnings	Measures
A.90	Position error Pulses accumulated positional deviation exceeds the set scale		1 Check the electronic gear settings are correct; 2 Check whether there is a limit case 3 Increase PA527 Value;
A.91	overload	It is soon reached the warning before the overload alarm display. If they continue to run, there may be an alarm.	1 , Or from deceleration time is increased number of stops; 2 Increase PA010.3 Value; 3 , Reduce the load; 4 To replace more powerful servo system;
A.92 Regeneration overload		It is about to reach the regenerated warning before the overload alarm display. If they continue to run, there may be an alarm.	1 , Or from deceleration time is increased number of stops; 2 , Using external bleeder resistor (greater power, less resistive); 3 Increase PA010.2 Value;
A.95 Over-voltage warning	It is about to reach over voltage alarm warning before the show. Such as Continues to run, there may be an alarm.		1 , Or from deceleration time is increased number of stops; 2 , Reduced bleed resistor;
A.96 Under-voltage warning	Warning before is about to reach under-voltage alarm display. Such as Continues to run, there may be an alarm.		1 Check the input voltage to meet the requirements;
A.97	17 Battery warning bit serial encoder	Battery voltage is below 3.1V Battery voltage low	1 , Check the battery voltage and the wiring; 2 , Replacement battery

Chapter X Communication

10.1 Communication Interface

Refer to the communication interface 3.3 Chapter "Connector CN1 Wiring."

10.1.1 Communication Connections

- 1) If the drive is a PC with a single connection, the drive CN1 Ports RJ45 (1) PC connection, RJ45 (2) connection 120 Ω About
Terminating resistor.
- 2) If the host computer and the drive is connected to a plurality of drive 1 of CN1 Ports RJ45 (1) PC connection, RJ45 (2) The next stage drive connection
The device RJ45 (1) This stage driver RJ45 (2) The next stage is connected to the drive RJ45 (1) , In this method the cascade, a final drive RJ45 (2)
connection 120 Ω The left and right terminating resistor.

10.2 Communication parameters

This document describes communication only for RS485 of MODBUS communication.

Parameter Number	name	Predetermined area	Unit Default	Setting effective time																																
PA015	<p>RS485 mailing address A axis, B axis, C Address shaft may be the same or different. When the same priority as A Axis>B Axis>C axis. Such as A axis, B Address shafts are 1 , The mailing address is assigned to only A axis, B No communication axis.</p>	1 ~ 31		1 immediately																																
	<p>RS485 Communication function selector switch Communication function selected A Axis setting whichever</p> <p>d. The first 3 No. Place d. The first 0 No.</p> <p>RS485 Communication speed</p> <table border="1"> <tr><td>0123</td><td>52400bps</td></tr> <tr><td></td><td>4800bps</td></tr> <tr><td></td><td>9600bps</td></tr> <tr><td></td><td>19200bps</td></tr> <tr><td></td><td>38400bps</td></tr> <tr><td></td><td>57600bps</td></tr> </table> <p>Protocol</p> <table border="1"> <tr><td>0</td><td>8 , N , 1 (Modbus protocol, RTU Embodiment) 12345678</td></tr> <tr><td></td><td>8 , N , 2 (Modbus protocol, RTU the way)</td></tr> <tr><td></td><td>8 , E , 1 (Modbus protocol, RTU the way)</td></tr> <tr><td></td><td>8 , O , 1 (Modbus protocol, RTU the way)</td></tr> <tr><td></td><td>7 , N , 2 (Modbus protocol, ASCII the way)</td></tr> <tr><td></td><td>7 , E , 1 (Modbus protocol, ASCII the way)</td></tr> <tr><td></td><td>7 , O , 1 (Modbus protocol, ASCII the way)</td></tr> <tr><td></td><td>8 , N , 2 (Modbus protocol, ASCII the way)</td></tr> <tr><td></td><td>8 , E , 1 (Modbus protocol, ASCII the way)</td></tr> <tr><td>9</td><td>8 , O , 1 (Modbus protocol, ASCII the way)</td></tr> </table> <p>Retention</p> <p>Retention</p>	0123	52400bps		4800bps		9600bps		19200bps		38400bps		57600bps	0	8 , N , 1 (Modbus protocol, RTU Embodiment) 12345678		8 , N , 2 (Modbus protocol, RTU the way)		8 , E , 1 (Modbus protocol, RTU the way)		8 , O , 1 (Modbus protocol, RTU the way)		7 , N , 2 (Modbus protocol, ASCII the way)		7 , E , 1 (Modbus protocol, ASCII the way)		7 , O , 1 (Modbus protocol, ASCII the way)		8 , N , 2 (Modbus protocol, ASCII the way)		8 , E , 1 (Modbus protocol, ASCII the way)	9	8 , O , 1 (Modbus protocol, ASCII the way)	d.0000 ~ 0095	d.0095	immediately
0123	52400bps																																			
	4800bps																																			
	9600bps																																			
	19200bps																																			
	38400bps																																			
	57600bps																																			
0	8 , N , 1 (Modbus protocol, RTU Embodiment) 12345678																																			
	8 , N , 2 (Modbus protocol, RTU the way)																																			
	8 , E , 1 (Modbus protocol, RTU the way)																																			
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	7 , O , 1 (Modbus protocol, ASCII the way)																																			
	8 , N , 2 (Modbus protocol, ASCII the way)																																			
	8 , E , 1 (Modbus protocol, ASCII the way)																																			
9	8 , O , 1 (Modbus protocol, ASCII the way)																																			
PA016																																				

10.3 Protocol

use RS-485 When the serial communication interface, each servo drive which must be preset number of servo drive shaft, then the host computer on the parameter

The embodiment of the corresponding control shaft numbers of the servo drive. The method of communication is the use of MODBUS network Communications, which MODBUS be usable

The following two modes: ASCII (American Standard Code for information interchange) Mode or RTU (Remote Terminal Unit) mode.

The following are MODBUS Communications instructions.

10.3.1 Code Description

- **ASCII mode:**

So-called ASCII Mode, when the data transmission, using American Standard Code communication exchange (ASCII) Each 8-bits Data from two ASCII Byte composed. For example: a 1-byte data 64H (Hexadecimal notation) to ASCII "64" He said, included '6' of ASCII code(36H) and '4' of ASCII code(34H).

digital 0 to 9 And letters A to F of ASCII Code shown in the following table.

table 1

Byte symbol	'0'	'1'	'2'	'3'	'4'	'5'	'6'	'7'
correspond ASCII code	30H	31H	32H	33H	34H	35H	36H	37H
Byte symbol	'8'	'9'	'A'	'B'	'C'	'D'	'E'	'F'
correspond ASCII code	38H	39H	41H	42H	43H	44H	45H	46H

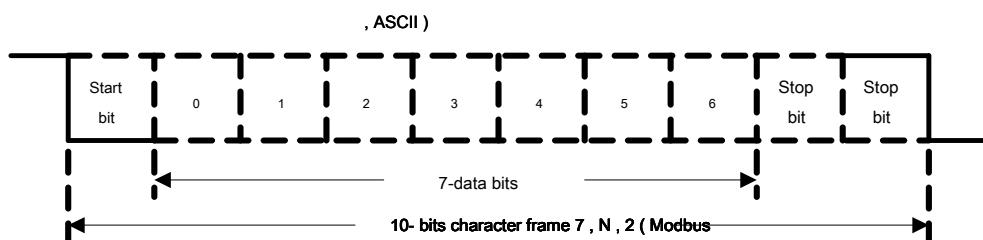
- **RTU mode**

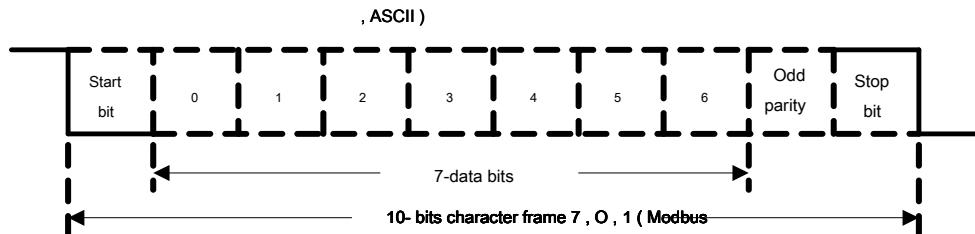
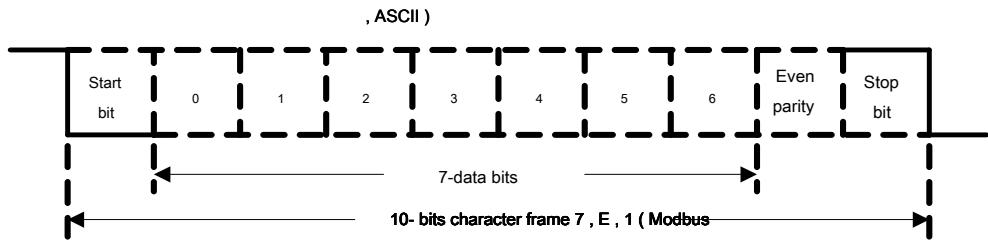
Each 8-bits Data from two 4-bits Hexadecimal byte composed. For example: To exchange value 64H , The direct transmission 1-byte data 64H .

10.3.2 Byte structure

- **10bits Byte frame**

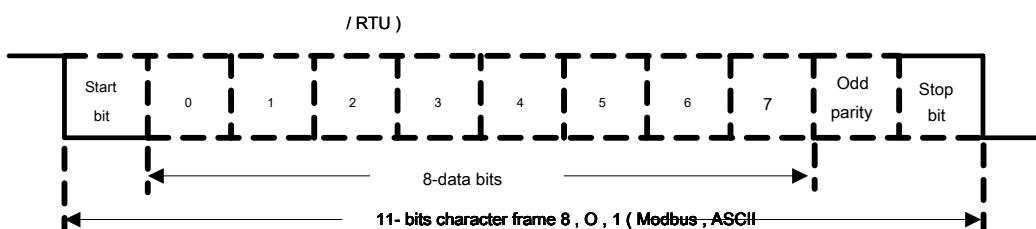
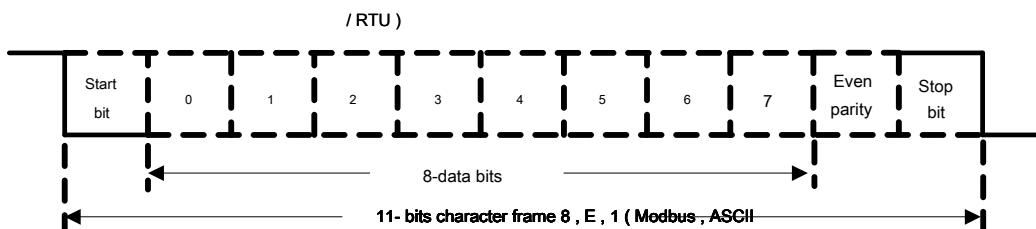
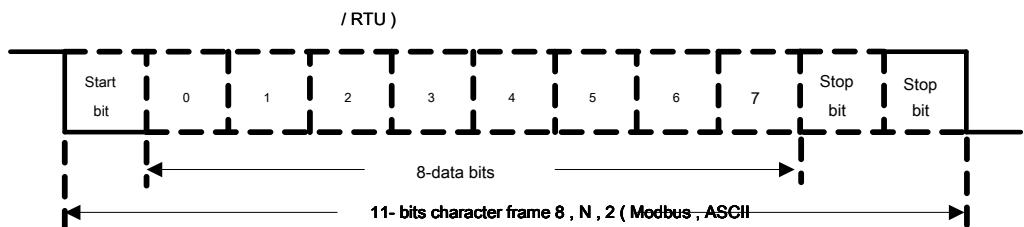
For 7-bits byte





- Byte frame

For 8-bits byte



10.3.3 Communication data structure

Data format is defined in two different communication modes as follows:

- ASCII mode

STX	Start byte ':' (3AH)
ADR	mailing address: 1-byte It contains 2 More ASCII code
CMD	Script: 1-byte It contains 2 More ASCII code
DATA (n-1)	
.....	

DATA (0)	Data Content: n-word = 2n-byte It contains 4n More ASCII code, n <= 12
LRC	Script: 1-byte It contains 2 More ASCII code
End 1	End code 1 :(0DH) (CR)
End 0	End code 0 :(0AH) (LF)

- **RTU mode**

STX	exceed 3.5 Byte dead time
ADR	mailing address: 1-byte
CMD	Script: 1-byte
DATA (n-1)	
.....	
DATA (0)	Data Content: n-word = 2n-byte , n <= 12
CRC	Script: 1-byte
End 1	exceed 3.5 Byte dead time

Communication breakdown of the data format in the following description:

- **STX (Communication start)**

ASCII mode: ' : ' byte(3AH) .

RTU Mode: more than in the current communication speed 3.5 Byte dead time.

- **ADR (mailing address)**

Legal correspondence address range 1 To 127 between. For example: Number of shafts 16 (Hexadecimal 10H) Servo drives Newsletter:

ASCII mode: ADR = '1', '0' => '1' = 31H , '0' = 30H

RTU mode: ADR = 10H

- **CMD (Instruction) and DATA (Data bytes)**

Data bytes may be formatted according to the instruction code. Common instruction code shown in the following table.

Communications command		
command	Command content	Explanation
03H	Read N Words, N <= 29 standard 03 command	
06H	write 1 Words	standard 06 command
10H	write N Words, N <= 29 standard 10 command	

1) Script: 03H Read N Words (word), N ≤29

For example: From the office number 01H Start address servodrive 0200H Continuous reading 2 Words.

ASCII mode:

Instruction information

Respond to information

STX	'.'
ADR	'0'
	'1'
CMD	'0'
	'3'
Starting position of the data (After the first high to low)	'0'
	'2'
	'0'
	'0'
The number of data (WORD)	'0'
	'0'
	'2'
LRC Check (After the first high to low)	'F'
	'8'
End 1	(0DH) (CR)
End 0	(0AH) (LF)

STX	'.'
ADR	'0'
	'1'
CMD	'0'
	'3'
The number of data (to byte Calculation)	'0'
	'4'
Starting data address 0200H Content (After the first high to low)	'0'
	'0'
	'B'
	'1'
The second tranche of address data 0201H Content (After the first high to low)	'1'
	'F'
	'4'
	'0'
LRC Check (After the first high to low)	'E'
	'8'
End 1	(0DH) (CR)
End 0	(0AH) (LF)

RTU mode:

Reference information:

ADR	01H
CMD	03H
Starting position of the data <i>(After the first high to low)</i>	02H
	00H
Data words <i>(After the first high to low)</i>	00H
	02H
CRC Check Low	C5H (Low byte)
CRC Check High	B3H (High byte)

Response information:

ADR	01H
CMD	03H
The number of data <i>(to byte Calculation)</i>	04H
Starting data address 0200H Content	<u>00H (High byte)</u> <u>B1H (Low byte)</u>
The second tranche of address data 0201H Content	<u>1FH (High byte)</u> <u>40H (Low byte)</u>
CRC Check Low	<u>A3H (Low byte)</u>
CRC Check High	D4H (High byte)

2) Script: 06H Write 1 Words (word)

For example: the 100 (0064H) Number is written to the Board 01H Start address servodrive 0200H .

ASCII mode:

Reference information:

STX	'.'
	'0'
ADR	'1'
	'0'
CMD	'6'
	'0'
	'2'
Starting data address <i>(After the first high to low)</i>	'0'
	'0'
	'0'
	'0'
	'0'
	'0'
Data content <i>(After the first high to low)</i>	'6'
	'4'
	'9'
LRC Check	'3'
End 1	(0DH) (CR)
End 0	(0AH) (LF)

Response information:

STX	'.'
ADR	'0'
	'1'
CMD	'0'
	'6'
	'0'
	'2'
Starting data address <i>(After the first high to low)</i>	'0'
	'0'
	'0'
	'0'
	'0'
	'0'
Data content	'6'
	'4'
	'9'
LRC Check	'3'
End 1	(0DH) (CR)
End 0	(0AH) (LF)

RTU mode:

Reference information:		Response information:	
ADR	01H	ADR	01H
CMD	06H	CMD	06H
Starting data address (After the first high to low)	02H	Starting data address (After the first high to low)	02H
	00H		00H
Data content (After the first high to low)	00H	Data content (After the first high to low)	64H
	64H		
CRC Check Low	89H	CRC Check Low	89H
CRC Check High	99H	CRC Check High	99H

3) Script: 10H Write N Words (word), N ≤29

For example: the 100 (0064H), 102 (0066H) is written to the shaft Number 01H Servo drives, the starting address is 0200H .

ASCII mode:

instruction information:		Response information:	
STX	'.'	STX	'.'
ADR	'0'	ADR	'0'
	'1'		'1'
CMD	'1'	CMD	'1'
	'0'		'0'
Starting data address (After the first high to low)	'0'	Starting data address (After the first high to low)	'0'
	'2'		'2'
	'0'		'0'
	'0'		'0'
Number of data words (high)	'0'	Number of data words	'0'
	'0'		'0'
Number of data words (low)	'0'	(After the first high to low)	'0'
	'2'		'2'
Data bytes	'0'	LRC Check	'9'
	'4'		'3'
	'0'	End 1	(0DH) (CR)
	'0'	End 0	(0AH) (LF)
data 1 content (After the first high to low)	'6'		
	'4'		
	'0'		
data 2 content (After the first high to low)	'0'		
	'6'		
	'6'		
LRC Check	'1'		
	'D'		
End 1	(0DH) (CR)		
End 0	(0AH) (LF)		

RTU mode:

Reference information:

ADR	01H
CMD	10H
Starting data address (After the first high to low)	02H 00H
Number of data words (After the first high to low)	00 02
Data bytes	04
data 1 content (After the first high to low)	00H 64H
data 2 content (After the first high to low)	00H 66H
CRC Check Low	50H
CRC Check High	11H

Response information:

ADR	01H
CMD	10H
Starting data address (After the first high to low)	02H 00H
Number of data words (After the first high to low)	00H 02H
CRC Check Low	40H
CRC Check High	70H

- **LRC (ASCII Mode) and CRC (RTU Mode) calculated error detection value**

ASCII mode:

ASCII Mode uses LRC (Longitudinal Redundancy Check) Error detection value. LRC Error detection value from ADR Finally, to sum

Content data sum, the results obtained in 256 As a unit, removing the excess portion (e.g.: The results obtained to add up the hexadecimal 128H

Only take 28H), Then calculated the number of two's complement, namely the results obtained after LRC Error detection value.

RTU mode:

RTU Mode uses CRC (Cyclical Redundancy Check) Error detection value. Step one: a content FFFFH It 16-bits Registers, called CRC register. Step two: the first byte of the instruction and information 16-bits CRC Low byte of XOR (Exclusive OR) Operation and stores the result back CRC register. Step three: Check CRC The lowest bit registers (LSB) If this bit is 0 , Then the right one; If this bit is 1 ,then CRC After register values right one, and then A001H XOR (Exclusive OR) Operations. Step Four: Back Step three, until Step three has been executed 8 Times, it goes to Step five. Step Five: The next byte instruction information Repeat steps two to four steps until all bit groups are fully processed, then CRC That is the contents of the register CRC Error detection value.

Description: calculated CRC After the error detection value, the instruction information, must fill CRC The low, reloading CRC High.

4) End1 , End0 (Communication end)

ASCII mode :

To (0DH) That byte '\ R' (carriage return)and(0AH) That byte '\ N' (new line), On behalf of the communication end.

RTU mode:

More than in the current communication speed 3.5 Byte dead time.

10.3.4 Communication error handling

In the communication process, the error may occur, a common source of error as follows:

- When the read and write parameters, not the address data;
- When writing a parameter, this parameter data exceeds the maximum value or the minimum value for this parameter;
- Disturbed communication, data transmission error check code or error.

When the above-mentioned communication error occurs, the drive is running will not be affected, but the drive will feed back an error frame.

Error frame format is as follows:

PC data frame:

start Slave Address	command	Address data, calibration data, etc.		

Actuator feedback error frame:

start Slave address	response	checking	Error Code		

among them,

Error code = Command frame response + 80H ;

Error code = 00H : Communication normal;

= 01H : Drive can not recognize the requested functionality;

= 02H : Data address given in the request does not exist in the drive;

= 03H : The data given in the request is not allowed (parameter exceeds the maximum or minimum) in the drive;

= 04H : Driver has started the request, but can not complete the request;

For example: Number drive shaft 03H , The parameters PA004 data input 06H Since parameters PA004 The maximum and minimum values are 0 ,and so

Write data will not be hired, the driver will return an error frame, the error code 03 (Exceeding maximum or minimum parameter), the following structure:

PC data frame:

start Slave Address command Address data, calibration data, etc.

03H	06H	0004H	0006H
-----	-----	-------	-------

Actuator feedback error frame:

start Slave address Error code check response code

03H	86H	03H
-----	-----	-----

Note:

If the slave address of the data frame sent by the host computer is 00H , Indicates the frame data is broadcast data, the drive will not return frame.

10.4 mailing address

Address Hex content		Instructions	type of data	Operation (read and write)
0000 ~ 03E7H Parameter Area		correspond 12.3.3 Parameter table parameters. Such as PA005 The corresponding address 0005H ; Such as PA101 The corresponding address 0065H ; Such as PA307 The corresponding address 0133H ; Such as PA530 The corresponding address 0212H ;	according to 12.3.3 Content, the following data types: <ul style="list-style-type: none"> • Unsigned 16 Place • Signed 16 Place • Signed 32 Place 	Read and write
0600 ~ 0628H	Monitoring data (Consistent with the display panel)	Non-real-time data updates, some data are average values only for PC monitor with		Read-only
0600H	Motor speed	R / min	Signed 16 Place Read-only	
0601H	Low number of motor feedback pulse	pulse	Signed 16 Place Read-only	
0602H	Motor feedback pulse High	pulse	Signed 16 Place Read-only	
0603H	Pulse input pulse count low	pulse	Signed 16 Place Read-only	
0604H	Pulse input pulse count high	pulse	Signed 16 Place Read-only	
0605H	Low number of error pulses	pulse	Signed 16 Place Read-only	
0606H	High number of error pulses	pulse	Signed 16 Place Read-only	
0607H	Speed command	0.01V	Unsigned 16 Place Read-only	
0608H	Speed input	R / min	Signed 16 Place Read-only	
0609H	Torque command	0.01V	Unsigned 16 Place Read-only	

060AH	Torque input	%	Signed 16 Place Read-only	
060BH	Internal torque feedback	%	Signed 16 Place Read-only	
060CH	Input signal monitoring		Unsigned 16 Place Read-only	
060DH	Monitoring output signals		Unsigned 16 Place Read-only	
060EH	Command pulse frequency	0.1Khz	Signed 16 Place Read-only	
060FH	The main circuit voltage	V	Unsigned 16 Place Read-only	
0610H	The total running time	H	Unsigned 16 Place Read-only	
0611H	Angle of rotation		Unsigned 16 Place Read-only	
0612H	The actual position of the encoder (Valid only when the absolute encoder)	2pulse	Unsigned 16 Place Read-only	
0613H	Turns display encoder (Valid only when the absolute encoder)	ring	Unsigned 16 Place Read-only	
0614H	Cumulative load factor	%	Unsigned 16 Place Read-only	
0617H	Load inertia ratio	%	Unsigned 16 Place Read-only	
0618H	Effective gain monitor		Unsigned 16 Place Read-only	
0630H	The current alarm	Drive current alarm number	Unsigned 16 Place Read-only	
0631H	The current alert	Drive current alarm number	Unsigned 16 Place Read-only	
0780H	Absolute encoder multiturn information	unit: 1 Ring, limit multiturn absolute encoder Unsigned 16 Place Read-only		
0781H	Single turn absolute encoder High Information	Unit: 1pulse Restrictor absolute encoder	Unsigned 32 Place Read-only	
0782H	Single turn absolute encoder Information Unit Low: 1pulse Restrictor absolute encoder			Read-only
0783H	Low motor feedback position 16 Place	unit: 1pulse	Signed 32 Place Read-only	
0784H	High motor feedback position 16 Place	unit: 1pulse		Read-only
0785H	Motor given low position 16 Place	unit: 1pulse	Signed 32 Place Read-only	
0786H	Motor given high position 16 Place	unit: 1pulse		Read-only

note:

1 , On consecutive addresses in the table can be continuously read / write operations, when the data table is not in continuous operation, the read / write data without effect. Such as 0x0630 Only two data starts, when data is continuously read over 2 A, this data driver is read is determined invalid, an error code is returned.

2 , All drives are data 16 Hexadecimal, divided 16 Position, 32 Bit data. 16 There have bit data symbols and unsigned,

32 Bit data is 2 More 16 Data bit combination. Such as 0781H for 0001H , 0782H for 013AH , The encoder data should 0001013AH , Decimal data is 65850 . Likewise, the motor position feedback 0783H for FFF1H , 0784H for 8A1CH , Motor position feedback data should FFF18A1C , Decimal data is - 947 684 .

3 In the normal mode, the motor position feedback, the data encoder multiturn encoder lap data is counterclockwise (viewed from the axial direction of the motor) increases, decreases clockwise.

Chapter XI Specifications

11.1 Servo Drive Specifications

11.1.1 Basic Specifications

Basic Specifications servodrive shown below.

Basic Specifications			
<u>Input Power 220V system</u>	Three-phase AC220V +10 ~ - 15% , 50 / 60Hz		
control method	Single or three phase full-wave rectifier IGBT PWM control Sine-wave current drive mode		
Feedback	Province Line incremental encoder: 5000ppr (1/20000 Resolution, delta); 17 Bit serial encoder: 17 Bits (incremental / absolute);		
Conditions of Use	Ambient temperature / Storage temperature	Ambient temperature: 0 ~ + 55 ° C Storage temperature: - 20 ~ 85 ° C	
	environment humidity / Humidity storage	90% RH the following (No freezing or condensation)	
	Vibration Resistance / Impact strength	4.9 m / s2 ~ 19.6 m / s2	
	Protection class / Cleanliness	Protection class: IP10 Cleanliness: 2 But it should be ² corrosive or flammable gases ² water, oil, chemicals splash ² less dirt, dust, salt and metal powder environment	
	elevation	1000m the following	
	For standard	CE	
structure		A base mount	
performance	<u>speed control range</u>		
	Rate volatility	Load fluctuations	
		0 ~ 100% Load: ± 0.01% The following (rated speed)	
		Voltage fluctuations	
		Rated voltage ± 10% : 0.001% (Rated speed)	
		Temperature fluctuations	
<u>Torque control accuracy (Reproducibility) ± 3%</u>		25 ± 2 5 °C: ± 0.1% The following (rated speed)	
Soft start time setting		0 ~ 10S (Acceleration and deceleration can be set)	
Input and output signals	Encoder divided pulse output A phase, B phase, Z Phase: linear drive output divider pulses: Province Line incremental encoder 16 ~ Encoder lines;		

			16384 :	
	Sequence input signal	The input signal can be assigned	Count	8 point
			Features	Servo pull-input (S-ON), The control mode switching input (Control mode switching input), the forward drive prohibit input (POT) The negative input to the driving ban (NOT) Deviation counter clear input (CLR) Alarm Clear (A-RST) Gain switching input (GAIN) Inhibit input command pulse (INHIBIT) Wait. And changes may be assigned a positive / negative logic of the signal.
	Output signal sequence	Unallocatable input signal	Count	1 point. Alarm;
		The input signal can be assigned	Count	3 point
			Features	Alarm(ALM), The positioning completion signal (COIN), Z Pulse collector signal (CZ), External brake release signal (BK), Servo ready (S-RDY)Wait. And changes may be assigned a positive / negative logic of the signal.
Communication function RS485 through 1 : N Communicate When	letter	using repeater, the maximum of N = 31 Station address setting shaft Connection		
		parameter setting devices		
		Computer, PC		
Key functions appear	7 segment led * 5 Position, 5 Keys			
Dynamic brake (DB)	In the main circuit power supply OFF , Servo alarm, servo OFF Overtravel (OT) When the action			
Regeneration treatment	Built-in regenerative resistor or external regenerative resistor			
Overtravel (OT) Prevention function	POT , NOT When the input operation of the dynamic brake (DB) Stop, deceleration stop or free run stop			
Protective function	Over current, over voltage, under-voltage, overload, regeneration failure			

11.1.2 Speed, position, torque control specifications

Servo drive speed, position and torque control specifications are as follows

Summary specifications		
control method		
Position control	Feedforward compensation	0 ~ 100% (Setting unit: 1%)
	Positioning completed Width setting	0 ~ 65535 Encoder unit
	input signal Input pulse species	Select one of the following: + the symbol pulse train, CW + CCW Pulse sequence, 90 ° phase difference two-phase pulse (A Phase + B phase)
	Input pulse form	Support linear drive, the maximum input open collector Long receiver driver:

	Pulse frequency	+ Symbol pulse sequence, CW Pulse + CCW Pulse sequence: 4Mpps 90 ° phase difference two-phase pulse: 1M pps Linear drive: + Symbol pulse sequence, CW Pulse + CCW Pulse sequence: 500pps 90 ° phase difference two-phase pulse: 125Kpps Open collector: + Symbol pulse sequence, CW Pulse + CCW Pulse sequence: 200 kpps 90 ° phase difference two-phase pulse: 200 kpps
<u>speed control</u>	<u>When soft start Inter set</u>	0 ~ 5S (Acceleration and deceleration can be set)
	input signal Voltage Directive	Maximum Input Voltage: ± 10 V (Forward rotation when the motor voltage command positive)
	input resistance	approximately 9k Ω
	Internal settings	Speed selection
	<u>speed control</u>	Use external IO Signal input selection
Torque Control input	signal Voltage Directive	Maximum Input Voltage: ± 10 V (Forward side when a positive voltage command output torque)
	input resistance	approximately 9k Ω

11.2 Servo Motor Specifications

Working system: S1 continuous

Thermal class: B level

vibration: 5G

Insulation voltage: AC1500V , 1 minute

Insulation resistance: DC500V , 10MΩ the above

Installation: Flange

Operating temperature: 0 ~ 40 Deg.] C (no freezing)

Working humidity: 20% to 80% (No condensation)

Elevation: elevation 1000 Meters

Protection: fully closed from cold IP65 (In addition to the shaft insertion portion)

11.2.1 60/80 series servo motor parameter table

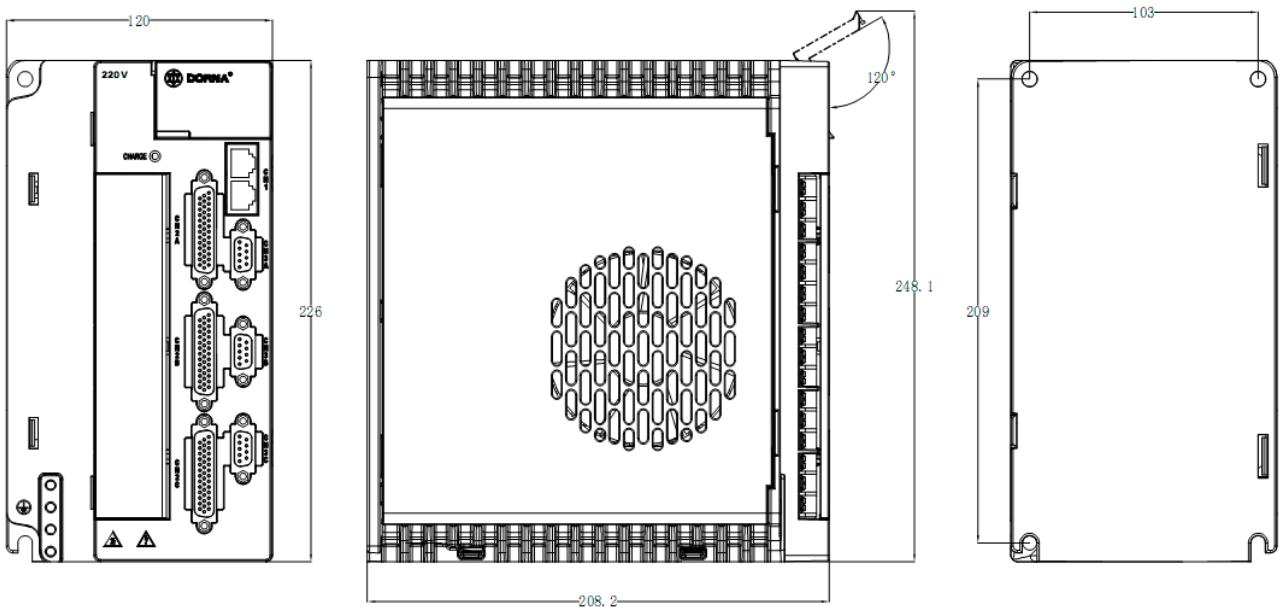
Voltage level		220V		
motor model		60DNMA2-0D20D	60DNMA2-0D40D	80DNMA2-0D75D
cabin seat no		<input type="checkbox"/> 60	<input type="checkbox"/> 60	<input type="checkbox"/> 80
Rated output	W	200	400	750
Rated torque	N · m	0.64	1.28	2.39
<u>Instantaneous maximum torque</u>	N · m	1.91	3.81	7.16
Current Rating	Arms	1.7	2.9	4.2
<u>Instantaneous maximum current</u>	Arms	5	8.7	12.6
Rated speed	Min- ⁻¹	3000	3000	3000
Maximum speed	Min- ⁻¹	5000	5000	4500
Torque constant	N · m / Arms	0.38	0.44	0.57
Moment of inertia	Kg · m ² x10 ⁻⁴	0.094	0.24	0.94

11.2.2 130 series servo motor parameter table

Voltage level		220V		
motor model		<u>130DNMA2-0D85C</u> 130DN <u>MA2-0001C</u> 130DN <u>MA2-01D2C</u>		
cabin seat no		□ 130	□ 130	□ 130
Rated output	W	850	1000	1200
Rated torque	N · m	4.0	5.0	6.0
<u>Instantaneous maximum torque</u>	N · m	12.0	15.0	18.0
Current Rating	Arms	4.1	5.1	6.3
<u>Instantaneous maximum current</u>	Arms	12.7	15.8	19.5
Rated speed	Min ⁻¹	2000	2000	2000
Maximum speed	Min ⁻¹	3000	3000	3000
Torque constant	N · m / Arms	0.98	0.98	0.95
Moment of inertia	Kg · m ² × 10 ⁻⁴	7.7	9.5	11.4

Voltage level		220V		
motor model		<u>130DNMA2-01D5C</u>		
cabin seat no		□ 130		
Rated output	W	1500		
Rated torque	N · m	7.2		
<u>Instantaneous maximum torque</u>	N · m	21.6		
Current Rating	Arms	7.5		
<u>Instantaneous maximum current</u>	Arms	22.8		
Rated speed	Min ⁻¹	2000		
Maximum speed	Min ⁻¹	3000		
Torque constant	N · m / Arms	0.96		
Moment of inertia	Kg · m ² × 10 ⁻⁴	14.3		

11.3 Servo drive Dimensions

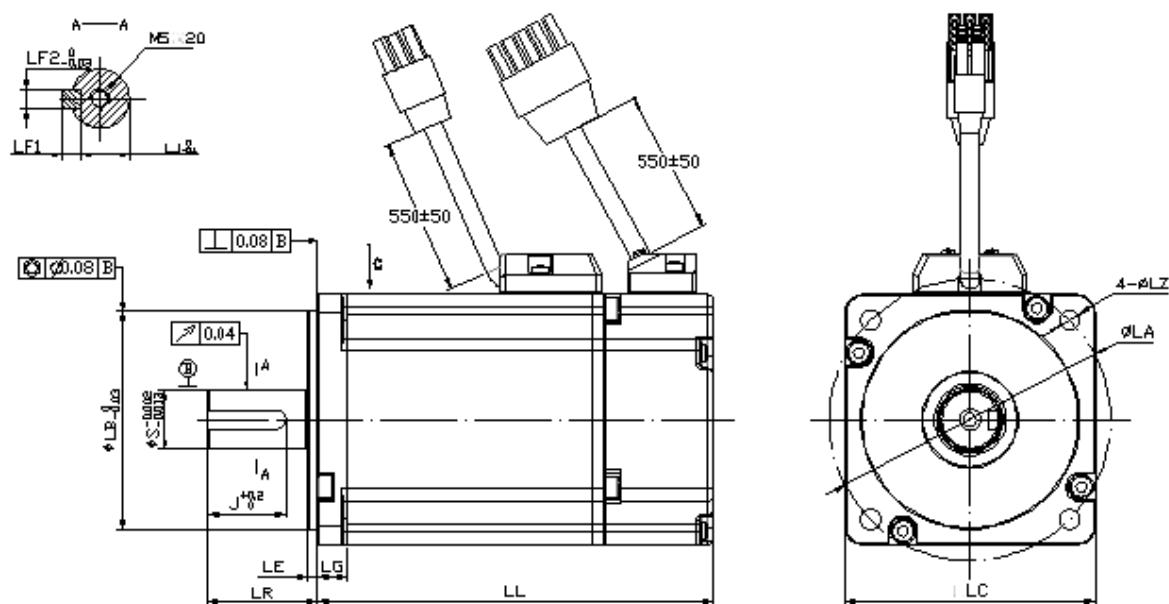


note:

- 1) Dimensions mm .
- 2) If the size and weight of the product changes due to the change occurred without notice.

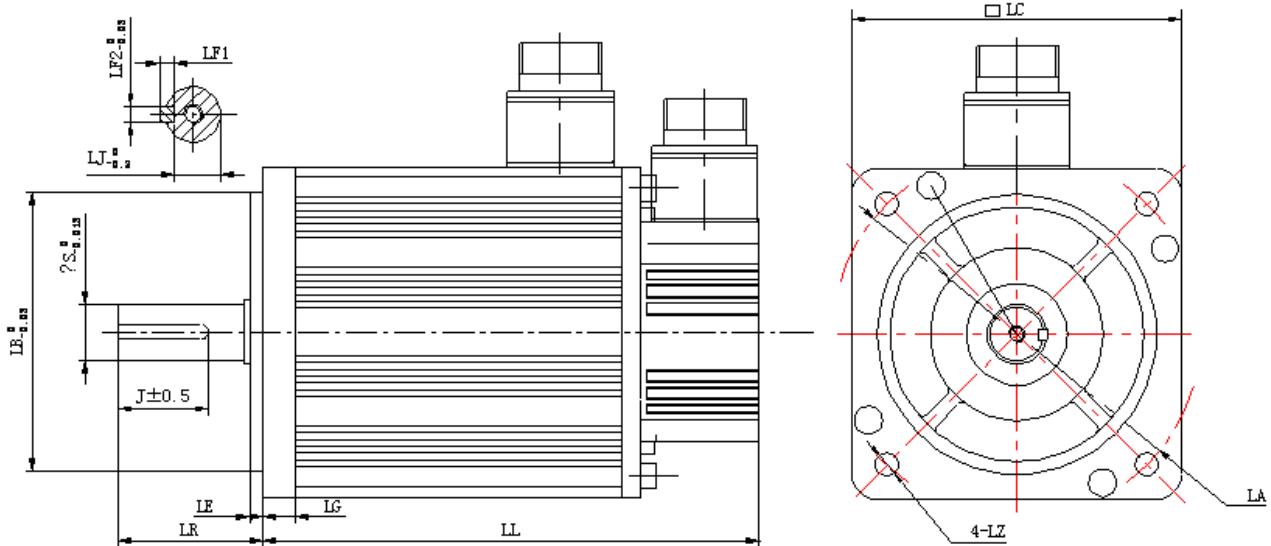
11.4 Servo motor Dimensions

60/80 11.4.1 series motor mounting dimensions: Unit (mm)



model	Flange Dimensions				The size of the shaft					LL (Brake)	LR	LE	LG	
	LC	LA	LB	LZ	S	LJ	J	LF1	LL	F2				
60DNMA2-0D20D 60		70	50	5.5	14	11	20	5	5	103 (153)	30	3	8	
60DNMA2-0D40D 60		70	50	5.5	14	11	20	5	5	123 (173)	30	3	8	
80DNMA2-0D75D 80		90	70	6.5	19	15.5	25	6	6	130 (170)	35	3	9.8	

11.4.2 130 series motor mounting dimensions: Unit (mm)



model	Flange Dimensions				The size of the shaft					LL (Brake)	LR	LE	LG	
	LC	LA	LB	LZ	S	LJ	J	LF1	LL	F2				
130DNMA2-0D85C 130 145 110 9					twenty two	18.5	36			161 (220)	57	5	13	
130DNMA2-0001C 130 145 110 9					twenty two	18.5	36			172 (231)	57	5	13	
130DNMA2-01D2C 130 145 110 9					twenty two	18.5	36			181 (240)	57	5	13	
130DNMA2-01D5C 130 145 110 9					twenty two	18.5	36			197 (256)	57	5	13	

Chapter XII Appendix

12.1 List of monitoring mode

A axis, B axis, C No. consistent monitoring of the content of the shaft.

No. surveillance	Display content	unit
dP 00 Motor speed		[r / min]
dP 01 Motor feedback pulses (encoder unit, low 4 Bit)		[1 The encoder pulse]
dP 02 Motor feedback pulses (encoder unit, high 5 Bit)		[10000 The encoder pulse]
dP 03 (Before the electronic gear) pulse command input pulse number (user unit, low 4 Bit) [1 Command pulse]		
dP 04 (Before the electronic gear) pulse command input pulse number (user unit, high 5 Bit) [10000 The encoder pulse]		
dP 05 Error pulses (encoder unit, low 4 Bit)		[1 The encoder pulse]
dP 06 Error pulses (encoder unit, high 5 Bit)		[10000 The encoder pulse]
dP 07 Speed instruction (analog voltage command)		[V]
dP 08 Internal speed command		[r / min]
dP 09 Torque instruction (analog voltage command)		[V]
dP 10 Internal torque command (rated torque value relative)		[%]
dP 11 Torque feedback (with respect to the value of the rated torque)		[%]
dP 12 Input signal monitoring		- -
dP 13 Monitoring output signals		- -
dP 14 Command pulse frequency		[0.1Khz]
dP 15 The main circuit voltage		[V]
dP 16 The total running time		[Hous]
dP 17 Angle of rotation		[deg]
dP 18 The actual position of the encoder (or ring-type single-turn absolute value of the absolute encoder)		[2 The encoder pulse]
dP 19 Turns the display encoder (valid only when the absolute encoder)		[1 ring]
dP 20 Cumulative load factor (the cumulative load rating as 100 %)		[%]

dP 21 Regenerative load ratio (as the regenerative load rating 100%)	[%]
dP 22 DB Load factor (the DB Load rating as 100%)	[%]
dP 23 Load inertia ratio	[%]
dP 24 Effective gain monitor	1 : Represents the first set of gain
dP 25 Retention	
dP 26 Retention	
dP 27 Retention	
dP 28 Load inertia numerical (Auto)	0.1Kgcm2
dP 29 Retention	

12.2 Accessibility glance

A axis, B axis, C Accessibility consistent content shaft.

AF Numbering	Features	Reference Section
AF 00	Error record	6.2
AF 01	Where the assignment (valid only in position mode)	6.3
AF 02	Jog (JOG) Mode of operation	6.4
AF 03	Front panel lock operation	6.5
AF 04	Clear alarm recording	6.6
AF 05	Initialization parameters	6.7
AF 06	Analog (Speed, torque) command offset is automatically adjusted 6.8	
AF 07	Speed command offset manual adjustment	6.9
AF 08	Torque command offset manual adjustment	6.10
AF 09	Check the motor parameters	6.11
AF 10	The software version of the servo drive	6.12
AF 11	Set absolute encoder	6.13
AF 14	Parameter copy	6.14
AF 15	Manual load inertia detecting	6.15

12.3 User parameters at a glance

12.3.1 save user parameters

When finished editing parameters, press "SET" button, LCD display will continue to display the setting state of the second symbol, the modified parameters are saved automatically.

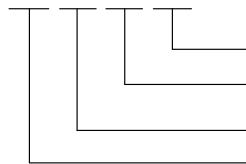
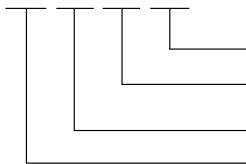
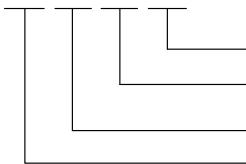
Display symbols	Description
	The set value is saved correctly (Saved). End
	This parameter need to reboot system to be effective (Reset).
	Incorrect setting value or the input data exceeds the maximum and minimum (Out of Range).
	Parameters can not be changed after the password protection (Can not operation).

12.3.2 function selection parameter display

Function selection parameter of each has its own meaning.

This manual function selection parameter mining Represented by the following methods.

parameter	meaning
PA000.0 or n. ³³³	Indicates that the user parameter " PA000 "Set the value of" 0 Median "value represents.
PA000.1 or n. ³³³	Indicates that the user parameter " PA000 "Set the value of" 1 Median "value represents.
PA000.2 or n. ³³³	Indicates that the user parameter " PA000 "Set the value of" 2 Median "value represents.
PA000.3 or n. ³³³	Indicates that the user parameter " PA000 "Set the value of" 3 Median "value represents.
n. ³³³³	Show b. ³³³³ , d. ³³³³ or h. ³³³³



b : That 2 Hexadecimal display settings, set bit value range: 0 ~ 1 ;

d : That 10 Hexadecimal display settings, set bit value range: 0 ~ 9 ;

h : That 16 Hexadecimal display settings, set bit value range: 0 ~ F ;

12.3.3 Parameters

Parameter Number	name	Predetermined area	Unit Default	Setting effective time		reference																				
	The basic function selection switch 1	h.0000 ~ 00E1		h.0000	Re-power																					
PA000	<p>The first 3 No. 2 PlaceThe first 1 PlaceThe first 0 Place</p> <p>h.</p> <table border="1"> <tr><td>01</td><td>Reverse mode</td></tr> <tr><td></td><td>Normal mode</td></tr> </table> <table border="1"> <tr><td>01234</td><td>Position control (pulse command) speed control</td></tr> <tr><td></td><td>(analog instruction) torque control (analog)</td></tr> <tr><td></td><td>command the internal speed control (contact reference)</td></tr> <tr><td></td><td>Internal speed control (contact reference) -> position control (command pulse)</td></tr> <tr><td>56789</td><td>Internal speed control (contact reference) -> speed control (analog command) the internal speed control (contact reference) -> torque control (analog reference) position control (command pulse)</td></tr> <tr><td></td><td>-> speed control (analog reference) position control (command pulse) -> torque control (analog instruction) torque control (analog instruction) -> speed control (analog instruction)</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td>Other reservations</td></tr> </table> <p>Reserved select the</p> <p>Retention</p>	01	Reverse mode		Normal mode	01234	Position control (pulse command) speed control		(analog instruction) torque control (analog)		command the internal speed control (contact reference)		Internal speed control (contact reference) -> position control (command pulse)	56789	Internal speed control (contact reference) -> speed control (analog command) the internal speed control (contact reference) -> torque control (analog reference) position control (command pulse)		-> speed control (analog reference) position control (command pulse) -> torque control (analog instruction) torque control (analog instruction) -> speed control (analog instruction)				Other reservations					
01	Reverse mode																									
	Normal mode																									
01234	Position control (pulse command) speed control																									
	(analog instruction) torque control (analog)																									
	command the internal speed control (contact reference)																									
	Internal speed control (contact reference) -> position control (command pulse)																									
56789	Internal speed control (contact reference) -> speed control (analog command) the internal speed control (contact reference) -> torque control (analog reference) position control (command pulse)																									
	-> speed control (analog reference) position control (command pulse) -> torque control (analog instruction) torque control (analog instruction) -> speed control (analog instruction)																									
	Other reservations																									
PA001	The basic function selection switch 2	d.0000 ~ 0150		d.0000	Re-power																					
	<p>d. The first 3 No. 2 No. 1 No. 0 Place</p> <table border="1"> <tr><td>0123</td><td>Free to stop PA406 To stop the motor torque setting, and then enters the servo lock state PA406</td></tr> <tr><td></td><td>To stop the motor torque setting, then enter the free-running state with 2</td></tr> <tr><td></td><td></td></tr> <tr><td>45</td><td>With PA406 Set torque, PA522 Deceleration to stop decelerating the motor, into the servo lock state and PA406 Set torque, PA522 Deceleration to decelerate the motor to stop, and then enters the free running state</td></tr> </table> <p>AC / DC Selected power input</p> <table border="1"> <tr><td>01</td><td>AC Power input: from L1 , L2 , L3 Single-phase input terminal AC220V power supply</td></tr> <tr><td></td><td>AC Power input: from L1 , L2 , L3 Three-phase input terminal AC220V power supply</td></tr> </table> <p>Retention</p>	0123	Free to stop PA406 To stop the motor torque setting, and then enters the servo lock state PA406		To stop the motor torque setting, then enter the free-running state with 2			45	With PA406 Set torque, PA522 Deceleration to stop decelerating the motor, into the servo lock state and PA406 Set torque, PA522 Deceleration to decelerate the motor to stop, and then enters the free running state	01	AC Power input: from L1 , L2 , L3 Single-phase input terminal AC220V power supply		AC Power input: from L1 , L2 , L3 Three-phase input terminal AC220V power supply													
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	To stop the motor torque setting, then enter the free-running state with 2																									
45	With PA406 Set torque, PA522 Deceleration to stop decelerating the motor, into the servo lock state and PA406 Set torque, PA522 Deceleration to decelerate the motor to stop, and then enters the free running state																									
01	AC Power input: from L1 , L2 , L3 Single-phase input terminal AC220V power supply																									
	AC Power input: from L1 , L2 , L3 Three-phase input terminal AC220V power supply																									
PA002	The basic function selection switch 3	d.0000 ~ 2012		d.0000	Re-power																					

Parameter Number	name	Predetermined area	Unit Default	Setting effective time	reference						
	<p>d. The first 3 No. 2 No. 1 No. 0 Place</p> <ul style="list-style-type: none"> Speed / position control select (T-REF distribution) <ul style="list-style-type: none"> 012 no T-REF Allocation T-REF As the external analog torque limit input PCL , NCL It serves as an external torque limit input Torque control selection (V-REF distribution) <ul style="list-style-type: none"> 01 no V-REF Allocation V-REF It serves as an external speed limit input Retention <p>Encoder type selection</p> <table border="1"> <tr><td>01</td><td>Reserved</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td>2 Province Line encoder (5000ppr , 20,000 Resolution)</td></tr> </table>	01	Reserved				2 Province Line encoder (5000ppr , 20,000 Resolution)				
01	Reserved										
	2 Province Line encoder (5000ppr , 20,000 Resolution)										
PA003	The basic function selection switch 4	b.0000 ~ 0111		b.0011	Re-power						
	<p>b. The first 3 No. 2 No. 1 No. 0 Place</p> <ul style="list-style-type: none"> Forward Drive Prohibit (overrun) <ul style="list-style-type: none"> 01 Forward Drive Prohibit (POT) Signal is active. Forward Drive Prohibit (POT) Signal is invalid. Reverse Drive Prohibit (overtravel) <ul style="list-style-type: none"> 01 Reverse Drive Prohibit (NOT) Signal is active. Reverse Drive Prohibit (NOT) Signal is invalid. Driving ban (overrun) alarm selection <ul style="list-style-type: none"> 01 POT / NOT Of any one direction input, the driver no alarm POT / NOT Enter any one direction will occur Err.35 [Inhibit input protection] Z Pulse signal output negated <ul style="list-style-type: none"> 01 Z It outputs a pulse signal is not inverted Z Pulse signal output negated 	b.0000 ~ 1100		b.0000	Re-power						

Parameter Number	name	Predetermined area	Unit Default	Setting effective time	reference								
	<p>b. The first 3 No. 2 No. 1 No. 0 Place</p> <pre> graph TD A["b. The first 3 No. 2 No. 1 No. 0 Place"] --> B[Retention] A --> C[Retention] A --> D[Retention] B --> E["Motor type selection"] C --> E D --> F["PWM Frequency Selection"] E --> G[Retention] F --> H[Retention] </pre> <p>Motor type selection</p> <table border="1"> <tr><td>01</td><td>Motor 1 Motor</td></tr> <tr><td></td><td>type Type 2</td></tr> </table> <p>PWM Frequency Selection</p> <table border="1"> <tr><td>01</td><td>Low</td></tr> <tr><td></td><td>frequency high frequency</td></tr> </table>	01	Motor 1 Motor		type Type 2	01	Low		frequency high frequency				
01	Motor 1 Motor												
	type Type 2												
01	Low												
	frequency high frequency												
PA005	The basic function selection switch 6	d.0000 ~ 0044		d.0022	immediately								
	<p>d. The first 3 No. 2 No. 1 No. 0 Place</p> <pre> graph TD A["d. The first 3 No. 2 No. 1 No. 0 Place"] --> B[Retention] A --> C[Retention] A --> D[Retention] A --> E[Retention] B --> F["Level in response to the speed command of"] C --> F D --> G["Velocity feedback response level"] E --> H[Retention] F --> I[Retention] </pre> <p>Level in response to the speed command of</p> <table border="1"> <tr><td>0-4</td><td>The larger the value, the slower the response level instruction</td></tr> </table> <p>Velocity feedback response level</p> <table border="1"> <tr><td>0-4</td><td>The larger the value, the slower the response level of the speed feedback</td></tr> </table>	0-4	The larger the value, the slower the response level instruction	0-4	The larger the value, the slower the response level of the speed feedback								
0-4	The larger the value, the slower the response level instruction												
0-4	The larger the value, the slower the response level of the speed feedback												
PA006	Retention												
PA007	The basic function selection switch 8	b.0000 ~ 1111		b.0000	Re-power								
	<p>b. The first 3 No. 2 No. 1 No. 0 Place</p> <pre> graph TD A["b. The first 3 No. 2 No. 1 No. 0 Place"] --> B[Retention] A --> C[Retention] A --> D[Retention] A --> E[Retention] A --> F[Retention] B --> G["Warning detection selection"] C --> G D --> H[Retention] E --> I[Retention] F --> J[Retention] </pre> <p>Warning detection selection</p> <table border="1"> <tr><td>01</td><td>The detection</td></tr> <tr><td></td><td>warning is not detectable warning</td></tr> </table>	01	The detection		warning is not detectable warning								
01	The detection												
	warning is not detectable warning												
PA008	Retention	b.0000 ~ 1111		b.0000	Re-power								
PA009	Application of the function selection switch 10 (only A This parameter is valid axis)	b.0000 ~ 0011		b.0000	Re-power								

Parameter Number	name	Predetermined area	Unit Default	Setting effective time	reference								
	<p>b. The first 3 No. 2 No. 1 No. 0 Place</p> <p>And loop detection braking resistor</p> <table border="1"> <tr><td>01</td><td>Detection; if it detects a fault occurs E.17</td></tr> <tr><td></td><td>Does not detect</td></tr> </table> <p>Braking resistor selection</p> <table border="1"> <tr><td>01</td><td>Use drive internal braking resistor</td></tr> <tr><td></td><td>Use external brake resistor. Set the correct braking resistor (PA537 , PA538)</td></tr> </table> <p>Retention</p> <p>Retention</p>	01	Detection; if it detects a fault occurs E.17		Does not detect	01	Use drive internal braking resistor		Use external brake resistor. Set the correct braking resistor (PA537 , PA538)				
01	Detection; if it detects a fault occurs E.17												
	Does not detect												
01	Use drive internal braking resistor												
	Use external brake resistor. Set the correct braking resistor (PA537 , PA538)												
PA010	Application of the function selection switch 11	d.0000 ~ 5553		d.0021	immediately								
	<p>d. The first 3 No. 2 Place</p> <p>Retention</p> <p>Analog delay command input</p> <table border="1"> <tr><td>0-5</td><td>The larger the value, the greater the delay in samples the analog instruction, but the higher the measurement accuracy.</td></tr> </table> <p>External regenerative discharge resistor load rate selection</p> <table border="1"> <tr><td>0-5</td><td>The larger value longer overload</td></tr> </table> <p>Motor overload level setting</p> <table border="1"> <tr><td>0-5</td><td>The larger value longer overload</td></tr> </table>	0-5	The larger the value, the greater the delay in samples the analog instruction, but the higher the measurement accuracy.	0-5	The larger value longer overload	0-5	The larger value longer overload						
0-5	The larger the value, the greater the delay in samples the analog instruction, but the higher the measurement accuracy.												
0-5	The larger value longer overload												
0-5	The larger value longer overload												
PA011	Retention	0 ~ 5		2	Re-power								
PA012	Motor type selection Please refer to 1.3 Section.	0 ~ 59		12	Re-power								
PA013	Retention												
PA014	The initial display number Check the monitor content. Set as 50 When the display status code, provided the non- 50 Value, the initial display to monitor the content number corresponding to the content.	0 ~ 50		50	Re-power								
PA015	RS485 mailing address A axis, B axis, C Address shaft may be the same or different. When the same priority as A Axis> B Axis> C axis. Such as A axis, B Address shafts are 1 , The mailing address is assigned to only A axis, B No communication axis.	1 ~ 31		1	immediately								
PA016	RS485 Communication function selector switch (only A This parameter is valid axis) Communication function selected A Axis setting whichever	d.0000 ~ 0096		d.0095	immediately								

Parameter Number	name	Predetermined area	Unit Default	Setting effective time	reference																																
	<p>d. The first 3 No. 2 Place</p> <p>1 Place the first 0 No.</p> <p>RS485 Communication speed</p> <table border="1"> <tr><td>012345</td><td>52400bps</td></tr> <tr><td></td><td>4800bps</td></tr> <tr><td></td><td>9600bps</td></tr> <tr><td></td><td>19200bps</td></tr> <tr><td></td><td>38400bps</td></tr> <tr><td></td><td>57600bps</td></tr> </table> <p>Protocol</p> <table border="1"> <tr><td>0</td><td>8 , N , 1 (Modbus protocol, RTU Embodiment) 12345678</td></tr> <tr><td></td><td>8 , N , 2 (Modbus protocol, RTU the way)</td></tr> <tr><td></td><td>8 , E , 1 (Modbus protocol, RTU the way)</td></tr> <tr><td></td><td>8 , O , 1 (Modbus protocol, RTU the way)</td></tr> <tr><td></td><td>7 , N , 2 (Modbus protocol, ASCII the way)</td></tr> <tr><td></td><td>7 , E , 1 (Modbus protocol, ASCII the way)</td></tr> <tr><td></td><td>7 , O , 1 (Modbus protocol, ASCII the way)</td></tr> <tr><td></td><td>8 , N , 2 (Modbus protocol, ASCII the way)</td></tr> <tr><td></td><td>8 , E , 1 (Modbus protocol, ASCII the way)</td></tr> <tr><td>9</td><td>8 , O , 1 (Modbus protocol, ASCII the way)</td></tr> </table> <p>Retention</p> <p>Retention</p>	012345	52400bps		4800bps		9600bps		19200bps		38400bps		57600bps	0	8 , N , 1 (Modbus protocol, RTU Embodiment) 12345678		8 , N , 2 (Modbus protocol, RTU the way)		8 , E , 1 (Modbus protocol, RTU the way)		8 , O , 1 (Modbus protocol, RTU the way)		7 , N , 2 (Modbus protocol, ASCII the way)		7 , E , 1 (Modbus protocol, ASCII the way)		7 , O , 1 (Modbus protocol, ASCII the way)		8 , N , 2 (Modbus protocol, ASCII the way)		8 , E , 1 (Modbus protocol, ASCII the way)	9	8 , O , 1 (Modbus protocol, ASCII the way)				
012345	52400bps																																				
	4800bps																																				
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0	8 , N , 1 (Modbus protocol, RTU Embodiment) 12345678																																				
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9	8 , O , 1 (Modbus protocol, ASCII the way)																																				
PA017	Retention																																				
PA018	Retention																																				
PA019	Retention																																				
PA020	<p>Command source selection</p> <p>0 :no</p> <p>1 : AB Same axis command source;</p> <p>2 : BC Same axis command source;</p> <p>3 : ABC Same axis command source;</p>																																				
PA021	Retention																																				
PA022	Retention																																				
PA023	Retention																																				
PA024	Retention																																				
PA100	A first position loop gain	1 ~ 1000	1 / s	40	immediately																																
	<p>It determines the responsiveness of the position control system characteristics. Position loop gain set to a large value, the positioning time can be shortened. However, if set too large may cause vibration, please take note when modified.</p>																																				
PA101	The first speed loop gain	1 ~ 3000	Hz	40	immediately																																
	<p>It determines the speed of the loop response characteristic.</p>																																				

Parameter Number	name	Predetermined area	Unit Default	Setting effective time		reference
	To increase the position loop gain, improving an overall responsiveness of the servo system, shall be set to increase the speed loop gain value. However, if set too large may cause vibration, please take note when modified.					
PA102	The first speed loop integral time constant	1 ~ 2000	0.1 ms	200	immediately	
	Set the speed loop integral time constant. The set value, the larger the integral action, the stronger the anti-disturbance capacity, but may cause excessive vibration is provided.					
PA103	A first velocity detection filter	0 ~ 1000	0.01ms	10	immediately	
	After detecting the speed, you can set the time constant of the low pass filter. The time constant is set large value is large, although the motor noise can be reduced, but also decrease the responsiveness.					
PA104	First torque filter	0 ~ 1000	0.01ms	30	immediately	
	Setting a first order lag filter time constant insertion torque command portion. It may be controlled by twisting resonance vibration occurs. The time constant is set large value is large, although the motor noise can be reduced, but also decreased responsiveness					
PA105	A second position loop gain	1 ~ 1000	1 / s	40	immediately	
PA106	Second speed loop gain	1 ~ 3000	1 Hz	80	immediately	
PA107	A second speed loop integral time constant	1 ~ 2000	0.1 ms	10	immediately	
PA108	A second velocity detection filter	0 ~ 1000	0.01ms	5	immediately	
PA109	Second torque filter	0 ~ 1000	0.01ms	20	immediately	
PA 110	Feedforward gain speed	0 ~ 100	%	0	immediately	
	The speed calculation based on the internal position command control instruction, the value obtained by multiplying the ratio of this parameter, is added to the velocity command from the position control process.					
PA 111	Speed feedforward filter Feedforward input desired time constant first order lag filter before the set speed.	0 ~ 1000	0.1ms	0	immediately	
PA 114	Friction Compensation Gain	0 ~ 1000	0.1%	0	immediately	
PA 115	Smoothing constant friction compensation	0 ~ 1000	0.1%	0	immediately	
PA 116	Friction compensation threshold speed	0 ~ 3000	0.1rpm	100	immediately	
PA 117	Retention					
PA 118	Inertia ratio Setting the respective rotor inertia of the motor and load inertia ratio. PA118 = (Load inertia / rotor inertia) × 100 "%"	0 ~ 5000	1%	200	immediately	
	This parameter is invalid when the real-time automatic gain adjustment.					
PA 119	Retention	0 ~ 32767	0.1ms	0		
PA120	Gain selector switch type applications 1	d.0000 ~ 0034		d.0000	immediately	

Parameter Number	name	Predetermined area	Unit Default	Setting effective time	reference																						
d. The first 3 No. 2 Place	<p>1 Place the first 0 No.</p> <p>Mode switch condition selection</p> <table border="1"> <tr><td>0123</td><td>Internal instruction torque conditions. (Set value: PA121) Condition to the speed command. (Set value: PA122) With acceleration conditions. (Set value: PA123) Is the position error pulse condition. (Set value: PA124) No Mode Switch Function</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table> <p>Retention</p> <p>Retention</p> <p>Retention</p>	0123	Internal instruction torque conditions. (Set value: PA121) Condition to the speed command. (Set value: PA122) With acceleration conditions. (Set value: PA123) Is the position error pulse condition. (Set value: PA124) No Mode Switch Function																								
0123	Internal instruction torque conditions. (Set value: PA121) Condition to the speed command. (Set value: PA122) With acceleration conditions. (Set value: PA123) Is the position error pulse condition. (Set value: PA124) No Mode Switch Function																										
PA121	Mode switch (Torque command)	0 ~ 300	1%	200	immediately																						
PA122	Mode switch (Speed command)	0 ~ 3000	1min-1	0	immediately																						
PA123	Mode switch (Acceleration)	0 ~ 65535	10rpm	0	immediately																						
PA124	Mode switch (Positional deviation)	0 ~ 65535		0	immediately																						
PA125	Gain selector switch type applications 2	d.0000 ~ 0092		d.0000	immediately																						
d. The first 3 No. 2 Place	<p>1 Place the first 0 No.</p> <p>Gain switching selection switch</p> <table border="1"> <tr><td>01</td><td>Manual switching without the use of gain switching function gain</td></tr> <tr><td>2</td><td>The automatic switching mode switching condition A When established, automatically from 1 Switched to the gain → 2 Gain. Switching condition A When not established, automatically from 2 Switched to the gain → 1 Gain.</td></tr> </table> <p>Gain changing condition A</p> <table border="1"> <tr><td>01</td><td>Positioning complete signal ON</td></tr> <tr><td>2345678</td><td>Close signal (NEAR) ON</td></tr> <tr><td>2345678</td><td>Close signal (NEAR) OFF</td></tr> <tr><td></td><td>= Position command filter output 0, And the instruction pulse input OFF</td></tr> <tr><td></td><td>Position command pulse input ON</td></tr> <tr><td></td><td>The torque command is greater than PA126 Speed command value</td></tr> <tr><td></td><td>command value is greater than PA127 Velocity command value</td></tr> <tr><td></td><td>value variation is greater than PA128 Value of the position deviation</td></tr> <tr><td></td><td>deviation is greater than PA129 Numerical</td></tr> </table> <p>Retention</p> <p>Retention</p>	01	Manual switching without the use of gain switching function gain	2	The automatic switching mode switching condition A When established, automatically from 1 Switched to the gain → 2 Gain. Switching condition A When not established, automatically from 2 Switched to the gain → 1 Gain.	01	Positioning complete signal ON	2345678	Close signal (NEAR) ON	2345678	Close signal (NEAR) OFF		= Position command filter output 0, And the instruction pulse input OFF		Position command pulse input ON		The torque command is greater than PA126 Speed command value		command value is greater than PA127 Velocity command value		value variation is greater than PA128 Value of the position deviation		deviation is greater than PA129 Numerical				
01	Manual switching without the use of gain switching function gain																										
2	The automatic switching mode switching condition A When established, automatically from 1 Switched to the gain → 2 Gain. Switching condition A When not established, automatically from 2 Switched to the gain → 1 Gain.																										
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	The torque command is greater than PA126 Speed command value																										
	command value is greater than PA127 Velocity command value																										
	value variation is greater than PA128 Value of the position deviation																										
	deviation is greater than PA129 Numerical																										

Parameter Number	name	Predetermined area	Unit Default	Setting effective time		reference																										
PA126	Gain switching level (torque command)	0 to 300	1%	200	immediately																											
PA127	Gain switching level (speed command)	0 ~ 3000	1 min-1	100	immediately																											
PA128	Gain switching level (speed command change amount)	0 to 65535	10rpm / s	10000	immediately																											
PA129	Gain switching level (positional deviation)	0 to 65535	1pulse	100	immediately																											
PA130	Gain switching time 1	0 to 10000	0.1ms	10	immediately																											
PA131	Gain switching time 2	0 to 10000	0.1ms	10	immediately																											
PA132	Gain switching waiting time 1	0 to 10000	0.1ms	10	immediately																											
PA133	Gain switching waiting time 2	0 to 10000	0.1ms	10	immediately																											
PA134	Retention	0 to 10000		0																												
PA136	Retention																															
PA137	Retention	0 to 500		50																												
PA138	Retention	0 to 5000		0																												
PA139	Retention	0-10		0																												
PA140	Retention	0 to 5000		0																												
PA141	Retention	0-100		0																												
PA142	Retention																															
PA200	Position control switch 1	d.0000 ~ 0232		d.0000	Re-power																											
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012	Servo OFF And position deviation pulse clear case of an alarm does not clear the position deviation pulse (only through CLR Clear signal, OT STATUS will also clear the lock) Clear alarm when the position deviation pulse																															
PA201	Position control switch 2	d.0000 ~ 3107		d.0000	Re-power																											

Parameter Number	name	Predetermined area	Unit Default	Setting effective time	reference												
	<p>d. The first 3 No. 2 No. 0 Place</p> <p>The first 1 Place</p> <p>Pulse input channel filtering level</p> <table border="1"> <tr> <td>The larger the value of 0 to 7, the longer filter time, the lower the cutoff frequency of the input pulse. 0 denotes no filtering.</td> </tr> <tr> <td>cutoff frequency of about 1 330K</td> <td>Input cutoff frequency of about 2 140K</td> </tr> <tr> <td>Input cutoff frequency of about 3 60K</td> <td>Input cutoff frequency of about 4 30K</td> </tr> <tr> <td>Input cutoff frequency of about 5 14K</td> <td></td> </tr> </table> <p>Retention</p> <p>Divided pulse output of the logic inversion</p> <table border="1"> <tr> <td>01</td> <td>Take not anti</td> </tr> <tr> <td></td> <td>inverted</td> </tr> </table> <p>Divide Z Pulse extension</p> <table border="1"> <tr> <td>0 ~ 30: frequency-divided Z Pulse signal is not extended; Other values: frequency division Z Pulse signal is widened, expanded width 16 A feedback A Pulse width, pulse width according to feedback A PA210 0 input parameter determines the cutoff frequency of about 500K Input</td> </tr> </table>	The larger the value of 0 to 7, the longer filter time, the lower the cutoff frequency of the input pulse. 0 denotes no filtering.	cutoff frequency of about 1 330K	Input cutoff frequency of about 2 140K	Input cutoff frequency of about 3 60K	Input cutoff frequency of about 4 30K	Input cutoff frequency of about 5 14K		01	Take not anti		inverted	0 ~ 30: frequency-divided Z Pulse signal is not extended; Other values: frequency division Z Pulse signal is widened, expanded width 16 A feedback A Pulse width, pulse width according to feedback A PA210 0 input parameter determines the cutoff frequency of about 500K Input				
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PA202	Position control switch 3	d.0000 ~ 0002		d.0000	immediately												
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PA203	Retention																
PA204	Retention																
PA205	A first electronic gear ratio (molecules)	1 ~ 65535		1	immediately												
PA206	Electronic gear ratio (denominator)	1 ~ 65535		1	immediately												
PA207	The second electronic gear ratio (molecules)	1 ~ 65535		1	immediately												
PA208	Third electronic gear ratio (molecules)	1 ~ 65535		1	immediately												
PA209	The fourth electronic gear ratio (molecules)	1 ~ 65535		1	immediately												
PA210	The encoder pulse frequency division number	16 ~ 16384	1 P / Rev	16384	Re-power												
	The resolution of the pulse output by OA , OB Each respective rotation 1 Number of output pulses set turns. when PA210 Value is set more than the number of encoder lines, the division value of the encoder lines. Such as the use 5000ppr The incremental encoder, PA210 Is set to be greater than 5000 Value, it pulses the frequency division number is the number of encoder lines 5000 .																
PA211	Retention																
PA212	Retention																

Parameter Number	name	Predetermined area	Unit Default	Setting effective time		reference
PA213	Retention					
PA214	Position command acceleration and deceleration time parameters 1	0 ~ 1000	0.1 ms	0	immediately	
PA215	Position command acceleration and deceleration time parameters 2	0 ~ 1000	0.1 ms	0	immediately	
PA216	Position command average filter	0 ~ 500	0.1 ms	0	immediately	
PA300	Speed control switch	d.0000 ~ 1333		d.0200	Re-power	
	<p>The first 1 Place</p> <p>d. The first 3 No. 2 No. 0 Place</p>					
PA301	Speed command input gain	150 ~ 30,000	0.01 V / Rated speed degree	600	immediately	
PA302	Speed command filter time constant	0 ~ 1000	0.1 ms	0	immediately	
PA303	Command linear acceleration time	0 ~ 5000	1ms	0	immediately	
PA304	Linear deceleration time command	0 ~ 5000	1ms	0	immediately	
PA305	instruction S Acceleration and deceleration time	0 ~ 5000	1ms	0	immediately	
PA306	JOG speed	0 ~ 5000	1 min-1	500	immediately	
PA307	The first internal 0 speed	-5000 to 5000	1 min-1	100	immediately	
PA308	The first internal 1 speed	-5000 to 5000	1 min-1	200	immediately	
PA309	The first internal 2 speed	-5000 to 5000	1 min-1	300	immediately	
PA310	The first internal 3 speed	-5000 to 5000	1 min-1	400	immediately	
PA311	The first internal 4 speed	-5000 to 5000	1 min-1	500	immediately	
PA312	The first internal 5 speed	-5000 to 5000	1 min-1	600	immediately	
PA313	The first internal 6 speed	-5000 to 5000	1 min-1	700	immediately	
PA314	The first internal 7 speed	-5000 to 5000	1 min-1	800	immediately	
PA315	Speed control switch 1	n.0000 ~ n.0021		0	immediately	

Parameter Number	name	Predetermined area	Unit Default	Setting effective time	reference																				
	<p>n. The first 3 No. 2 No. 1 No. 0 Place</p> <table border="1"> <thead> <tr> <th colspan="2">selection</th> </tr> </thead> <tbody> <tr> <td>01</td><td>Zero speed clamp signal in accordance with PA300.3 Set; valid, the speed command is forcibly placed 0;</td></tr> <tr> <td>2 Zero</td><td>Zero speed clamp signal according to the PA300.3 It sets; valid, to PA522 Deceleration is stopped; and when the actual motor Speed becomes PA316 (Zero speed switch clamp level) to the rear position control servo and locked in that position. When the clamped signal is invalid zero speed or the control mode is switched, the zero-speed clamping exit state;</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Speed internal contacts INSPD2 = INSPD1 = INSPD0 = 0 Source selection command</th> </tr> </thead> <tbody> <tr> <td>01</td><td>Command source PA307 Parameter Value</td></tr> <tr> <td>0</td><td>command source external analog input</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Retention</th> </tr> </thead> <tbody> <tr> <td>01</td><td>Retention</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Reserved Zero clamp function</th> </tr> </thead> <tbody> <tr> <td>01</td><td>Reserved Zero clamp function</td></tr> </tbody> </table>	selection		01	Zero speed clamp signal in accordance with PA300.3 Set; valid, the speed command is forcibly placed 0;	2 Zero	Zero speed clamp signal according to the PA300.3 It sets; valid, to PA522 Deceleration is stopped; and when the actual motor Speed becomes PA316 (Zero speed switch clamp level) to the rear position control servo and locked in that position. When the clamped signal is invalid zero speed or the control mode is switched, the zero-speed clamping exit state;	Speed internal contacts INSPD2 = INSPD1 = INSPD0 = 0 Source selection command		01	Command source PA307 Parameter Value	0	command source external analog input	Retention		01	Retention	Reserved Zero clamp function		01	Reserved Zero clamp function				
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PA316	Zero speed clamp level	1 ~ 2000	rpm	30	immediately																				
PA317	Retention																								
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PA400	Torque command input gain	10 ~ 1000	0.1V / Rated torque	30	immediately																				
PA401	Torque input filter time constant	0 ~ 1000	0.1ms	0	immediately																				
PA402	Forward side torque limit	0 ~ 300	1%	300	immediately																				
PA403	Reverse torque limit	0 ~ 300	1%	300	immediately																				
PA404	Forward side external torque limit	0 ~ 100	1%	100	immediately																				
PA405	Reverse external torque limit	0 ~ 100	1%	100	immediately																				
PA406	Emergency stop torque limit	0 ~ 300	1%	300	immediately																				
PA407	Speed limit torque control	0 ~ 5000	1 min-1	1500	immediately																				
PA408	Retention																								
PA409	Torque reaches the threshold	0 ~ 100	1%	2	immediately																				
	In the torque control, when the torque exceeds this value, the output signal "match rate (VCMP) / Torque arrival signal".																								
PA410	The first 1 Frequency notch filter segment	50 ~ 2000	1 Hz	2000	immediately																				
PA411	The first 1 Notch filter segment wave attenuation rate	0 ~ 32	db	0	immediately																				
PA412	The first 2 Frequency notch filter segment	50 ~ 2000	1 Hz	2000	immediately																				
PA413	The first 2 Notch filter segment wave attenuation rate	0 ~ 32	db	0	immediately																				
PA414	Internal torque register 0	0-200	1%	0	immediately																				
	In the torque control, when the external input IO Signal selecting "Internal torque selector 0 (INTor0) "Or" internal torque selection 0 (INTor0) ", And this signal is not simultaneously two invalid, the internal torque select regis mode.																								
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Parameter Number	name			Predetermined area	Unit Default	Setting effective time		reference
	invalid	effective	Internal torque register 0					
	effective	invalid	Internal torque register 1					
	effective	effective	Internal torque register 2					
PA415	Internal torque register 1				0-200	1%	0	immediately
PA416	Internal torque register 2				0-200	1%	0	immediately
PA417	Retention							
PA418	Retention							
PA419	Retention							
PA500	port DI1 Input signal selection			0 ~ 30		0	immediately	
	<p>[0] Servo enable (S-ON) [1 Control mode switching] (C-MODE) [2] Forward drive prohibit (POT) [3] Negative driving ban (NOT) [4] Deviation counter clear (CLR) [5] Alarm Clear (A-RST) [6] Pulse input prohibition (INHIBIT) [7] Zero clamp (ZEROSPD) [8] Forward torque limit (PCL) [9] Negative torque limit (NCL) [10] Gain switching (GAIN) [11 The point of the signal (ZPS) [12] Position, velocity, negated signal under torque control (CMDINV) [13 Octave division switching instruction] 0 (DIV0) [14 Octave division switching instruction] 1 (DIV1) [15 Internal command speed selection] 0 (INSPD0) [16 Internal command speed selection] 1 (INSPD1) [17 Internal command speed selection] 2 (INSPD2) [18 [Reserved] 19 [Reserved] 20 [Reserved] twenty one [Reserved] twenty two [Reserved] twenty three [Reserved] twenty four [Reserved] 25 [Reserved] 26 [Reserved] 28] Internal torque selection 0 (INTor0) [29] Internal torque selection 1 (INTor1) [Other] special purpose functions</p>							
PA501	port DI2 Input signal selection			0 ~ 30		1	immediately	
PA502	port DI3 Input signal selection			0 ~ 30		2	immediately	
PA503	port DI4 Input signal selection			0 ~ 30		3	immediately	
PA504	port DI5 Input signal selection			0 ~ 30		4	immediately	

Parameter Number	name	Predetermined area	Unit Default	Setting effective time		reference																								
PA505	port DI6 Input signal selection	0 ~ 30		5	immediately																									
PA506	port DI7 Input signal selection	0 ~ 30		6	immediately																									
PA507	port DI8 Input signal selection	0 ~ 30		7	immediately																									
PA508	Morphology selection input signal 1	b.0000 ~ 1111		b.0000	immediately																									
	<p>The first 1 Place</p> <p>b. The first 3 [No. 2 No. 0] Place</p> <table border="1"> <tr><td colspan="2">DI 1 Morphology selection input signal</td></tr> <tr><td>01</td><td>signal L Active level (optocoupler turns) signal H Active level</td></tr> <tr><td colspan="2">(optocoupler is not conducting)</td></tr> </table> <table border="1"> <tr><td colspan="2">DI 2 Morphology selection input signal</td></tr> <tr><td>01</td><td>signal L Active level (optocoupler turns) signal H Active level</td></tr> <tr><td colspan="2">(optocoupler is not conducting)</td></tr> </table> <table border="1"> <tr><td colspan="2">DI 3 Morphology selection input signal</td></tr> <tr><td>0</td><td>signal L Effective level (conductive optocoupler) 1</td></tr> <tr><td colspan="2">signal H Active level (optocoupler is not conducting)</td></tr> </table> <table border="1"> <tr><td colspan="2">DI 4 Morphology selection input signal</td></tr> <tr><td>01</td><td>signal L Active level (optocoupler turns) signal H Active level</td></tr> <tr><td colspan="2">(optocoupler is not conducting)</td></tr> </table>	DI 1 Morphology selection input signal		01	signal L Active level (optocoupler turns) signal H Active level	(optocoupler is not conducting)		DI 2 Morphology selection input signal		01	signal L Active level (optocoupler turns) signal H Active level	(optocoupler is not conducting)		DI 3 Morphology selection input signal		0	signal L Effective level (conductive optocoupler) 1	signal H Active level (optocoupler is not conducting)		DI 4 Morphology selection input signal		01	signal L Active level (optocoupler turns) signal H Active level	(optocoupler is not conducting)						
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PA509	Morphology selection input signal 2	b.0000 ~ 1111		b.0000	immediately																									
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PA510	Morphology selection output signal	h.0000 ~ 9990		h.3210	immediately																									

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PA511	Output signal is negated	b.0000 ~ 1111		b.0000	immediately																																
	<p>The first 1 Place</p> <p>b. The first 3 No. 2 No. 0 Place</p> <table border="1"> <tr> <td colspan="2">DO 1 Morphology selection output signal</td> </tr> <tr> <td>01</td> <td>ERR Signal is active (i.e. alarm), the output of the corresponding optocoupler is turned off; no alarm, the optocoupler is turned on.</td> </tr> <tr> <td colspan="2">ERR Signal is active (i.e. alarm), the output of the corresponding optocoupler is turned on; when no alarm, optocoupler off.</td> </tr> <tr> <td colspan="2">DO 2 Morphology selection output signal</td> </tr> <tr> <td>01</td> <td>DO2 Signal is active, the output of the corresponding optocoupler is turned on; DO2 Invalid signal, the optocoupler is turned off.</td> </tr> <tr> <td colspan="2">DO2 Signal is active, the output of the corresponding optocoupler is turned off; DO2 Invalid signal, the optocoupler is turned on.</td> </tr> <tr> <td colspan="2">DO 3 Morphology selection output signal</td> </tr> <tr> <td>0</td> <td>DO3 Signal is active, the output of the corresponding optocoupler is turned on; DO3 Invalid signal, the optocoupler is turned off.</td> </tr> <tr> <td>1</td> <td>DO3 Signal is active, the output of the corresponding optocoupler is turned off; DO3 Invalid signal, the optocoupler is turned on.</td> </tr> <tr> <td colspan="2">DO 4 Morphology selection output signal</td> </tr> <tr> <td>01</td> <td>DO4 Signal is active, the output of the corresponding optocoupler is turned on; DO4 Invalid signal, the optocoupler is turned off.</td> </tr> <tr> <td colspan="2">DO4 Signal is active, the output of the corresponding optocoupler is turned off; DO4 Invalid signal, the optocoupler is turned on.</td> </tr> </table>	DO 1 Morphology selection output signal		01	ERR Signal is active (i.e. alarm), the output of the corresponding optocoupler is turned off; no alarm, the optocoupler is turned on.	ERR Signal is active (i.e. alarm), the output of the corresponding optocoupler is turned on; when no alarm, optocoupler off.		DO 2 Morphology selection output signal		01	DO2 Signal is active, the output of the corresponding optocoupler is turned on; DO2 Invalid signal, the optocoupler is turned off.	DO2 Signal is active, the output of the corresponding optocoupler is turned off; DO2 Invalid signal, the optocoupler is turned on.		DO 3 Morphology selection output signal		0	DO3 Signal is active, the output of the corresponding optocoupler is turned on; DO3 Invalid signal, the optocoupler is turned off.	1	DO3 Signal is active, the output of the corresponding optocoupler is turned off; DO3 Invalid signal, the optocoupler is turned on.	DO 4 Morphology selection output signal		01	DO4 Signal is active, the output of the corresponding optocoupler is turned on; DO4 Invalid signal, the optocoupler is turned off.	DO4 Signal is active, the output of the corresponding optocoupler is turned off; DO4 Invalid signal, the optocoupler is turned on.													
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PA512	Time filtering the input signal	1 ~ 1000	1ms	10	immediately																																
PA513	Retention	1 ~ 100	0.1ms	5	immediately																																
PA514	Retention																																				
PA515	Zero fixed value	0 ~ 3000	1 min-1	10	immediately																																

Parameter Number	name	Predetermined area	Unit Default	Setting effective time		reference																
PA516	Rotation detection value	1 ~ 3000	1 min-1	20	immediately																	
PA517	Speed signal detection width with	1 ~ 100	1 min-1	10	immediately																	
PA518	Brake command - Servo OFF Delay time	0 ~ 500	1 ms	100	immediately																	
PA519	The brake operation speed command limit value	0 ~ 1000	1 min-1	100	immediately																	
PA520	Servo OFF - Brake instruction waiting time	100 ~ 1000	1 ms	500	immediately																	
PA521	Momentary power failure Hold Time	40 ~ 800	1ms	60	immediately																	
PA522	Servo OFF Stop deceleration	0 ~ 1000	1ms	100	immediately																	
PA523	Servo OFF Stop Threshold	20 ~ 2000	rpm	50	immediately																	
PA524	Retention																					
PA525	Positioning completion width	0 to 65535	pulse	10	immediately																	
PA526	NEAR Signal width	0 to 65535	4pulse	100	immediately																	
PA527	Servo ON When the position error warning value (WARN)	1 to 65535	0.01r	200	immediately																	
	Unit is 0.01r . Depending on the encoder resolution differs, for example, a resolution of the encoder 5000ppr Encoder, the unit is $5000 * 4 * 0.01 = 200$ pulse When the warning value is set to 200 When the positional deviation is too large a warning $200 * 200 = 40,000$ More pulse																					
PA528	Servo ON When the position error alarm (ERR) Ditto	1 to 65535	0.01r	500	immediately																	
PA529	Speed deviation alarm detection time	20 ~ 2000	1ms	300	immediately																	
PA530	Speed deviation alarm threshold level	0 ~ 10		5	immediately																	
	If the speed deviation exceeds this threshold, the emergence of E.28 (Excessive speed deviation protection). Set value 10 When the speed deviation is not detected protection.																					
PA531	Overload warning value	5-100	%	50	immediately																	
PA532	Incremental speed threshold	0 ~ 1000	Rpm	0	immediately																	
PA533	Alarm reset input settings	0-3		0	immediately																	
PA534	Main power off detection time (only A This parameter is valid axis)	100 ~ 2000	1ms	100	immediately																	
	Mains disconnect state continues, the time required to set the detection circuit. 2000 When the main power is off is detected as invalid.																					
PA535	Special control switch 1	b.0000 ~ 1111		b.0000	immediately																	
	<p>b. The first 3 No. 2 No. 1 No. 0 Place</p> <table border="1"> <tr> <td colspan="2">ADC Detect</td> </tr> <tr> <td>01</td> <td>Power-on ADC Detection. After power ADC</td> </tr> <tr> <td></td> <td>It does not detect.</td> </tr> </table> <table border="1"> <tr> <td colspan="2">Torque processing</td> </tr> <tr> <td>01</td> <td>No treatment is stopped when the torque for the torque limit PA404</td> </tr> <tr> <td></td> <td>, PA405</td> </tr> </table> <table border="1"> <tr> <td colspan="2">Retention</td> </tr> </table> <table border="1"> <tr> <td colspan="2">Retention</td> </tr> </table>	ADC Detect		01	Power-on ADC Detection. After power ADC		It does not detect.	Torque processing		01	No treatment is stopped when the torque for the torque limit PA404		, PA405	Retention		Retention						
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PA536	Pumping a high pressure compensating process (only A This parameter is valid axis)	-20 to 20	V	-5	immediately																	
PA537	External regenerative resistor (only A This parameter is valid axis)	5 ~ 200	Ohm	30	Re-power																	

Parameter Number	name	Predetermined area	Unit Default	Setting effective time		reference
PA538	External regenerative resistor capacity (only A This parameter is valid axis)	20 ~ 3000	Watt	60	Re-power	
PA539	Retention					
PA540	Retention					
PA541	Retention					
PA542	Pumping low-voltage compensation process (only A This parameter is valid axis)	-20 to 20	V	5	immediately	
PA543	IGBT Temperature compensation (only A This parameter is valid axis) have IGBT Sample temperature temperature correction drive amplitude.	-20 to 20	°C	0	immediately	
PA544	Retention	0 ~ 1000	0.1ms	500	immediately	
PA545	Servo preparation time	0 ~ 1000	ms	10	immediately	
PA600 ~ PA800	Retention					

Note:

1 On the table " **(only A This parameter is valid axis)** "He said: A This parameter is applied to the shaft A axis, B Shaft and C axis; B Shaft and C This parameter is not modified shaft.

Records:

20,150,406 :

- To modify the document 3 axis;

20,150,626 :

- Removing the inner position;
- Adjusted parameters;