

# ES2 Series

## AC Servo Drive User Manual (Lite Version V1.0)



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## Chapter 1: Selection of Servo System

### 1.1 Drive specifications

Table 1-1 ES2 series servo drive basic specifications

Drive model		ES2-04B	ES2-10B	ES2-15B	ES2-30B	
Continuous output current Arms		2.8	5.5	7.6	11.6	
Maximum output current Arms		10	17	17	28	
Power supply input	220VAC	Main power	single/3 phase, AC200~230V, 50/60HZ			
		Control power	Single phase, AC200~230V, 50/60HZ			
Working environment		Temperature	Working: 0°C~50°C Storage: -20°C~85°C			
		Humidity	Below 0~90% RH (No condensation)			
		Working altitude	Under altitude 1000m			
		Vibration/strike	<1G			
		IP Grade / Pollution level	IP20/ Pollution level 2			
Control method			IGBT PWM space vector control			
Encoder			2500-line incremental			
IO port	IO signal	Input	8 (common)			
		Output	5 (common)			
	Pulse signal	Input	2 (Low speed pulse)			
		Output	4 (3 frequency output, 1 open collector output)			
Communication		USB	Connect with PC			
Panel operator			LED display			
Regeneration function			Built-in braking resistor for 750W and above models			
Protection function			Overcurrent, overload, overvoltage, low voltage, over speed, overheat, encoder error, communication error, position deviation, etc.			
Control mode			Position control; speed control; torque control;			
Function spec	Position control mode		Position command format	PULSE/DIR; A, B phase orthogonal pulse;		
			Position input circuit	Differential; open collector		
			Maximum input frequency	Differential 2Mpps Open collector 2Mpps		
			Smoothing filter	Smoothing the position command to make the motor run smoother and more stable		
			Electronic gear	Provide 2 sets of electronic gear ratio		
			Vibration suppression filter	Effectively suppress external signal interference and system resonance frequency to ensure stable operation of equipment		

## 1.2 Servo motors and drives model description

### Drive model description

**ES2 – 04 B F I - XX**

①                    ②    ③    ④    ⑤                    ⑥

①	AC servo series	ES2: YAKO ES2 series AC servo drive
②	Power	04: 400W 10: 1KW 15: 1.5KW 30: 3KW
③	Voltage level	B: 220V
④	Product type	F: General
⑤	Installation methods	I: Flange installation
⑥	Customized model	xx: Customized design number

### Servo motor type description

**ASM D – 08 – 10 30 B - U 1 1 1 - XX**

①   ②                    ③                    ④ ⑤ ⑥                    ⑦ ⑧ ⑨ ⑩

①	Series	YAKO ES2 series AC servo motor
②	Feature	D : Small inertia J: Large inertia H: High inertia
③	Flange	04:40mm 06: 60mm 08: 80mm 09:90mm 10:100mm 11: 110mm 13: 130mm
④	Power	04: 400W 10: 1KW 15: 1.5KW 30: 3KW
⑤	Rated speed(rpm)	10: 1000rpm 15: 1500 rpm 20: 2000 rpm 30: 3000 rpm
⑥	Voltage level	B: 200V
⑦	Encoder type	U: 2500-line incremental
⑧	Shaft connection type	1: Plain 2: Solid, with key 3: Solid, with key and threaded hole 4: Solid, with threaded hole
⑨	Brake, oil seal	1: none 2: oil seal 3: brake 4: oil seal + brake
⑩	Design number	1: Ver. 1
	Customized model	xx: Customized design number

### 1.3 Servo driver and servo motor matching

Table 1-2 Servo drive and motor matching table

Servo motor model	Flange	Power	Rated speed	Max Speed	Drive model ES2-□□B**	Drive SIZE	
Small and large inertia	ASMD-06-0630B	60	600W	3000rpm	5000rpm	04B	B
	ASMJ-06-0230B	60	200W	3000rpm	5000rpm	04B	B
	ASMJ-06-0430B	60	400W	3000rpm	5000rpm	04B	B
	ASMJ-08-0830B	80	750W	3000rpm	4500rpm	10B	B
	ASMJ-08-1025B	80	1KW	2500rpm	3000rpm	10B	B
	ASMJ-09-0830B	90	750W	3000rpm	3900rpm	10B	B
	ASMJ-09-1025B	90	1KW	2500rpm	3300rpm	10B	B
	ASMJ-11-1830B	110	1.8KW	3000rpm	3200rpm	15B	C
	ASMJ-11-1230B	110	1.2KW	3000rpm	3500rpm	15B	C
	ASMJ-11-1530B	110	1.5KW	3000rpm	3100rpm	15B	C
	ASMJ-13-1025B	130	1KW	2500rpm	2600rpm	15B	C
	ASMJ-13-1525B	130	1.5KW	2500rpm	2900rpm	15B	C
	ASMJ-13-2025B	130	2KW	2500rpm	2700rpm	30B	C
	ASMJ-13-2625B	130	2.6KW	2500rpm	2700rpm	30B	C
High inertia	ASMH-13-1010B	130	1KW	1000rpm	1300rpm	15B	C
	ASMH-13-1515B	130	1.5KW	1500rpm	1800rpm	15B	C
	ASMH-13-2315B	130	2.3KW	1500rpm	1700rpm	30B	C

### 1.4 Matching motor number

Table 1-3 Motor number quick reference table

Motor series	Rated voltage	Servo motor model	Motor number
		ASM□-□□-□□□□□-*****	(P01.00)
ASM	220V	ASMJ-06-0230B-U***	6
		ASMJ-06-0430B-U***	7
		ASMD-06-0630B-U***-M	13
		ASMJ-08-0830B-U***	8
		ASMJ-09-0830B-U***	12
		ASMJ-08-1025B-U***	101
		ASMJ-09-1025B-U***	115
		ASMJ-11-1830B-U***	108
		ASMJ-11-1230B-U***	112
		ASMJ-11-1530B-U***	103
		ASMJ-13-1025B-U***	104
		ASMJ-13-1525B-U***	105
		ASMJ-13-2025B-U***	109
		ASMJ-13-2625B-U***	110
		ASMH-13-1010B-U***	106
		ASMH-13-1515B-U***	107
		ASMH-13-2315B-U***	117

### 1.5 Auxiliary cable

Power cable naming rule:

**P1 —ES2 - 03 P08 M**

①	②	③	④	⑤
①	Wire type	P1: normal plug P2: Aviation plug		
②	Drive series	ES2 series drives		
③	Cable length	03: 3 meter 05: 5 meter 10: 10 meter		
④	Power	P08:800W P15: 1.5KW P30: 3KW		
⑤	Installation methods	F: Fixed M: Movable		

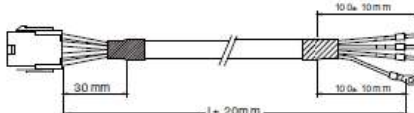
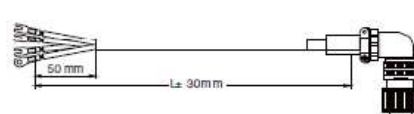


Encoder cable naming rules:

**E1— ES2 - 03 U M**

①	②	③	④	⑤
①	Wire type	P1: normal plug P2: Aviation plug		
②	Drive series	ES2 series drives		
③	Cable length	03: 3 meter 05: 5 meter 10: 10 meter		
④	Encoder spec	U: 2500 lines		
⑤	Installation methods	F: Fixed M: Movable		

Auxiliary cable appearance

Table 1-4 Auxiliary cable appearance

Cable Name	Model	Length(mm)	SIZE-C	
Power Cable	P1-AS1-03P04F	3000		
	P1-AS1-05P04F	5000		
	P1-AS1-10P04F	10000		
	P1-AS1-03P08F	3000		
	P1-AS1-05P08F	5000		
	P1-AS1-10P08F	10000		
	Power Cable	P2-AS1-03P15F	3000	
		P2-AS1-03P30F	3000	
		P2-AS1-05P15F	5000	
		P2-AS1-05P30F	5000	
		P2-AS1-10P15F	10000	
		P2-AS1-10P30F	10000	
Encoder Cable	E1-AS1-03UF	3000		
	E1-AS1-05UF	5000		
	E1-AS1-10UF	10000		
	Encoder Cable	E2-AS1-03UF	3000	
		E2-AS1-05UF	5000	
		E2-AS1-10UF	10000	

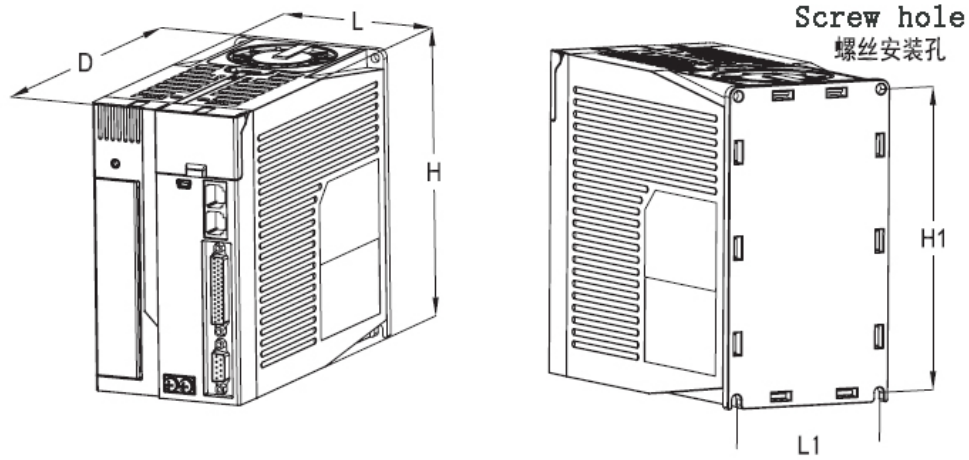
## 1.6 Braking resistance specication

Table 1-5 Built-in braking resistor specifications

Servo drive model		Built-in braking resistor specifications		Minimum allowable resistance value ( $\Omega$ )	Capacitor maximum braking energy (J)
		Resistance ( $\Omega$ )	Capacity (W)		
Single phase 220	ES2-04BFI	-	-	45	18
Single/3 phase 220V	ES2-10BFI	50	50	30	26
Single/3 phase 220V	ES2-15BFI	25	80	20	47
	ES2-30BFI	25	80	15	47

## Chapter 2: Product Installation and Dimensions

### 2.1 Servo drive dimensions



Frame B: ES2-04B, ES2-08B, ES2-10B

Frame C: ,ES2-15B, ES2-30B

Table 2-1 Driver Dimensions

Model	L(mm)	H(mm)	D(mm)	L1(mm)	H1(mm)	D1(mm)	Screw hole
Frame C	90	160	183	80	150	75	4-M4
Frame B	58	160	177	48	150	75	

### 2.2 Servo drive installation

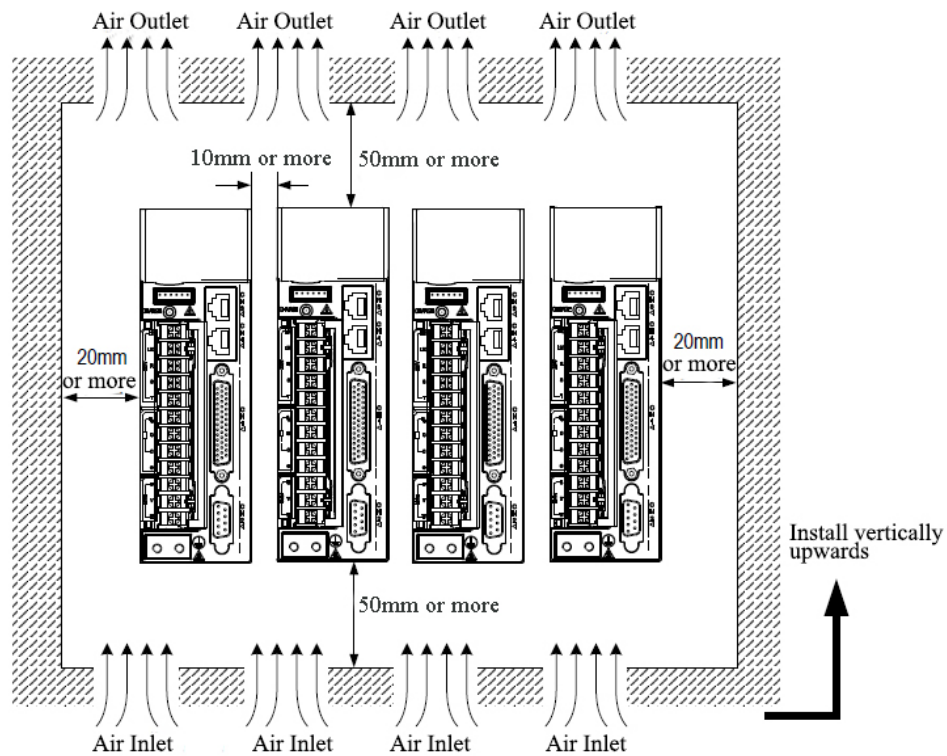


Figure 2-1 Servo drive installation



## Chapter 3: Servo Drive and Motor Connection

### 3.1 System structure diagram

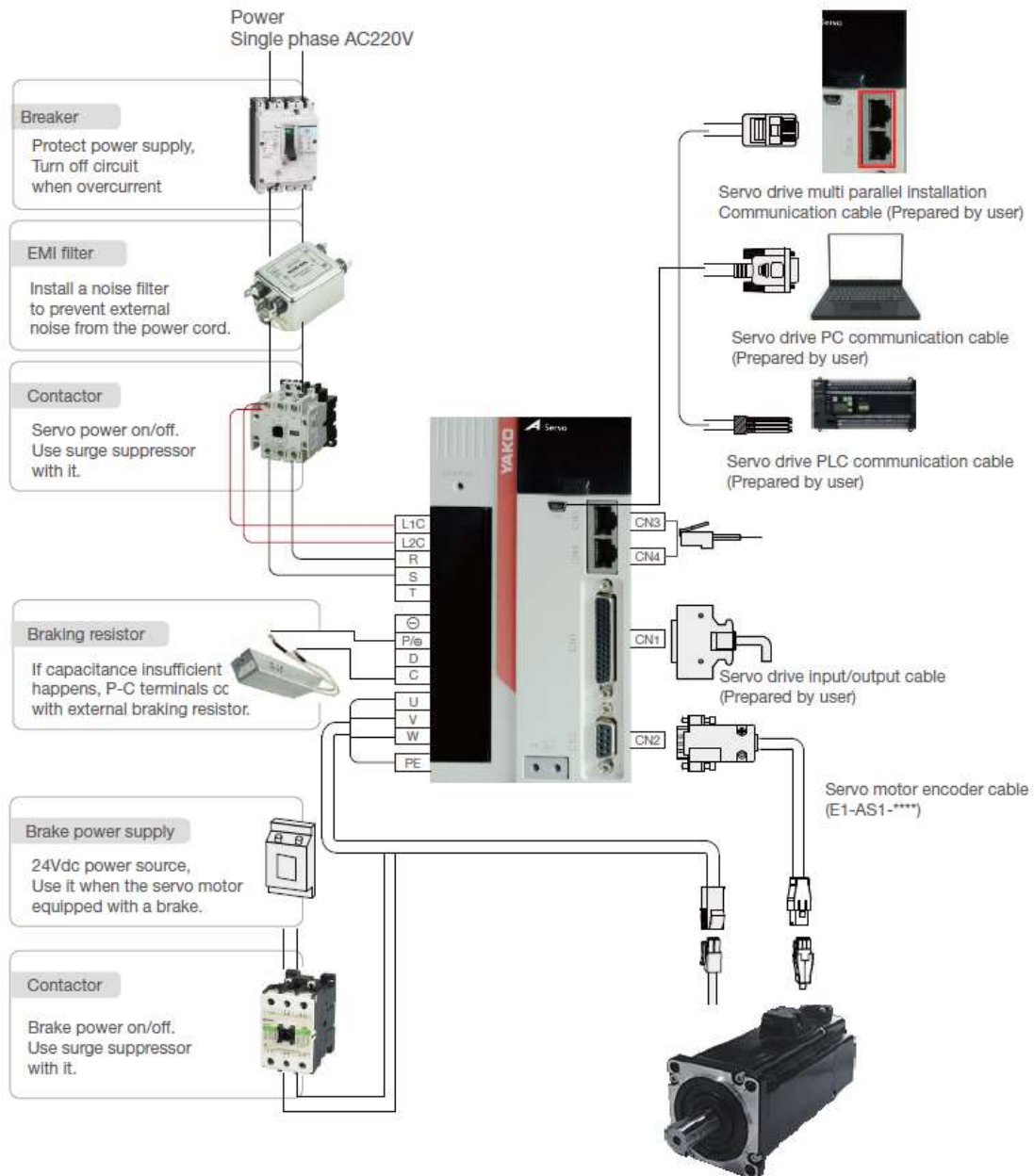


Figure 3-1 System structure diagram

The names, functions and specifications of each part of the drive are as follows.

Table 3-1 Servo drive main circuit terminal name and function

No.	Name	Description
1	L1C, L2C AC control circuit power terminal	Input control circuit power according to specifications
2	R, S, T AC main power terminal	Input main circuit power according to specifications
3	P $\oplus$ , D, C External regenerative resistor terminal	The default wiring is P $\oplus$ connected with D. When using an external regenerative resistor, disconnect P $\oplus$ and D first, and connect an external regenerative resistor between P $\oplus$ and C.
4	U, V, W, PE Motor power cable terminal	Connect servo motor three-phase and ground wire
5	USB communication port	Connect to the PC via Mini USB to monitor, run tests, change

	CN5	parameters, etc.
6	Control port CN1	Connect with host controller for IO signal control
7	Encoder feedback port CN2	Connect for motor encoder feedback

## 3.2 Main circuit

### 3.2.1 Introduction of each part

The functions, names and specifications of each part of the main circuit are as follows:

Table 3-2 Servo drive main circuit terminal function specifications

Name	Terminal mark	Function, specification
Main circuit power input terminal	R、S	Single-phase AC220V power input
	R、S、T	Three-phase AC220V power input
Control circuit power input terminal	L1C、L2C	Control loop power, input according to specifications
External regenerative resistor connection terminal	$P \oplus$ 、D、C	By default, short wires are connected between $P \oplus$ -D. When the braking force is insufficient, please make an open circuit between $P \oplus$ -D. (remove the short wiring) and connect external braking resistor between $P \oplus$ -C External braking resistors should be purchased separately.
Common DC terminal	$P \oplus$ 、 $\bar{\sigma}$	Servo DC bus terminal for common bus connection when multiple units are connected in parallel
Servo motor connection terminal	U、V、W	The servo motor connection terminal, connected to the U, V, W of the motor.
Ground terminal	PE	Two grounding terminals are connected to the power grounding terminal and the motor grounding terminal. Be sure to ground the entire system.

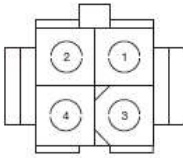
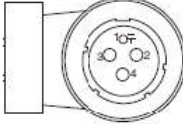
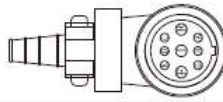
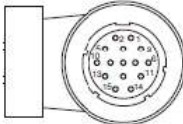
## 3.3 Encoder interface

The encoder line PIN distribution diagram is as follows:

Table 3-3 Encoder line PIN distribution diagram

PIN	2500 line encoder signal	Functional description
1	A+	Encoder signal
2	A-	
3	B+	
4	B-	
5	Z+	
6	Z-	
7	+5V	+5V power output
8	GND	Power GND output
9	--	
Shell	PE	

Table 3-4 Servo motor side connectors

Connector Outline	Terminal Pin Definition			Applicable Motor
	4 Pin connector			
	Pin Number	Signal Type		40、60、80、90
	1	II		Recommend: Plastic shell: AMP-172159-1 Terminal: AMP-170362-1
	2	V		
	3	W		
4	PE			
	4 Pin aviation plug YD28K4TS-E			
	Pin Number	Signal Type		100、110、130
	1	PE		Aviation plug: YD28K4TS-E
	2	U		
	3	V		
4	W			
	9 Pin aviation plug SMS3102A20-18P			
	Pin Number	Signal Type		130
	B	U		Military standard aviation plug: SMS3102A20-18P
	I	V		
	F	W		
	C	PE		
	D	BR+		
	E	BR-		
	9 Pin connector			
Pin Number	2500-Wire Signal	17Bit Signal	40、60、80、90	
3	A+	--	Recommend: Plastic shell: AMP-172161-1 Terminal: AMP-170361-1	
6	A-	--		
2	B+	SD+		
5	B-	SD-		
1	Z+	BAT+		
4	Z-	BAT-		
9	+5V	+5V		
8	GND	GND		
7	PE	PE		
	15 Pin aviation plug YD28K15TS-E			
	Pin Number	2500-Wire Signal	17Bit Signal	100、110、130
	2	+5V	+5V	Aviation plug: YD28K15TS-E
	3	GND	GND	
	4	A+	--	
	7	A-	--	
	5	B+	SD+	
	8	B-	SD-	
	6	Z+	BAT+	
	9	Z-	BAT-	
	1	PE	PE	
17pin aviation plug SMS3102A20-29P				
Pin Number	2500-Wire Signal	17Bit Signal	130	
A	+5V	+5V	Military standard aviation plug: SMS3102A20-29P	
B	GND	GND		
C	A+	--		
D	A-	--		
E	B+	SD+		
F	B-	SD-		
G	PE	PE		
J	Z+	BAT+		
K	Z-	BAT-		

3.4 Control signal

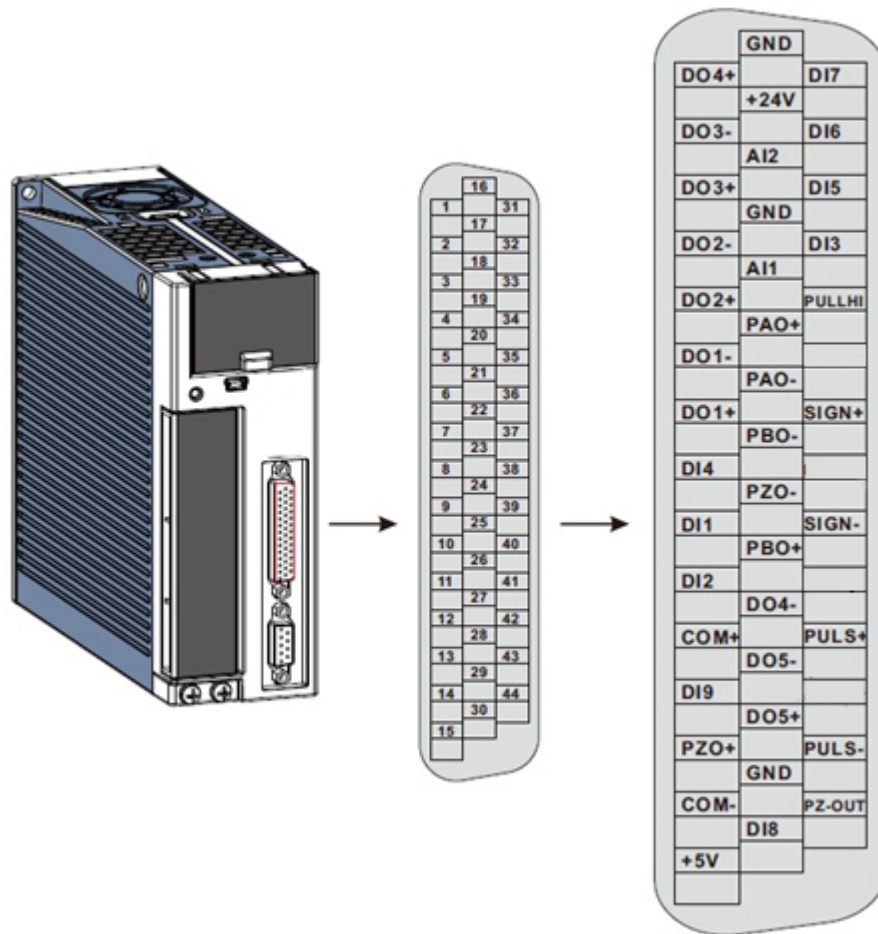


Table 3-5 Control terminal PIN definition

Definition	PIN	Function		
Position command	PILS+	41	Pulse command ( below 2Mpps ) : Pulse, CW, A Phase	
	PULS-	43		
	SIGN+	37		Pulse command ( below 2Mpps ) : Dir, CCW, B Phase
	SIGN-	39		
	PULL HI	35	COM +, power input port , internal connected with current limiting resistor	
	GND	29	Differential signal ground	
Encoder output	PAO+	21	Encoder pulse divider output	
	PAO-	22		
	PBO+	25		
	PBO-	23		
	PZO+	13		
	PZO-	24		
	PZ-OUT	44	Home pulse collector open output	
	GND	29	Home pulse collector open circuit output signal ground ; differential signal ground	
+5V	15	Internal 5 V supply with a maximum output current 200 mA		
GND	29			
PE	Shell			

Definition	PIN	Function		
General purpose input and output signal		Default function	Functional description	
	DI1	9	P-OT	Prohibit forward drive
	DI2	10	N-OT	Prohibit backward drive
	DI3	34	INHIBIT	Pulse inhibit
	DI4	8	ALM-RST	Alarm reset ( Pulse edge valid function)
	DI5	33	S-ON	Servo enable
	DI6	32	ZCLAMP	Zero fixed (set motor in static when the speed of motor is 0 in speed control mode to avoid minor movement)
	DI7	31	GAIN-SEL	Gain switching
	DI8	30	Home Switch	Home switching
	+24V	17		Internal 24 power supply , voltage range +20~28V , maximum output current 200 mA
	COM-	14		Internal 24V ground; open collector pulse input ground;
	COM+	11		Power input, 12 ~ 24V
	DO1+	7	S-RDY+	Servo ready
	DO1-	6	S-RDY-	
	DO2+	5	COIN+	Position arrival
	DO2-	4	COIN-	
	DO3+	3	ZERO+	Zero speed
	DO3-	2	ZERO-	
	DO4+	1	ALM+	Error output
DO4-	26	ALM-		
DO5+	28	BKOFF+	Brake output	
DO5-	27	BKOFF-		

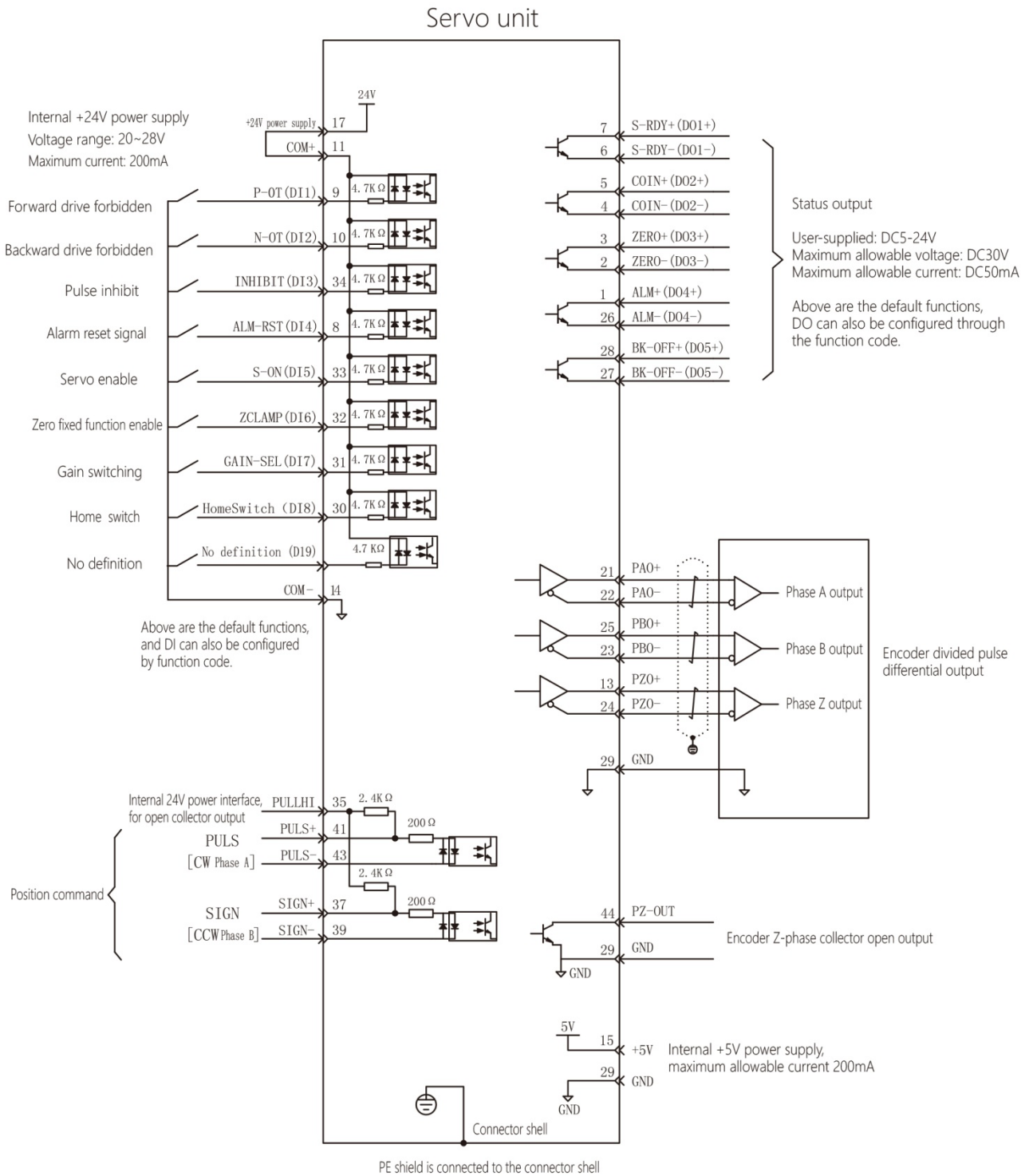


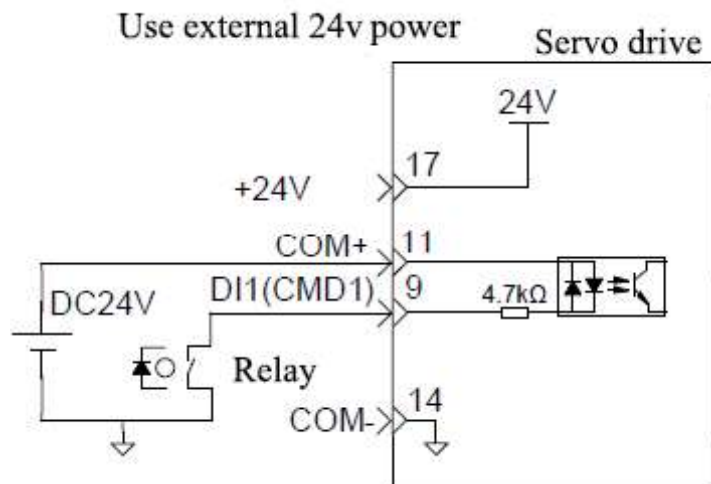
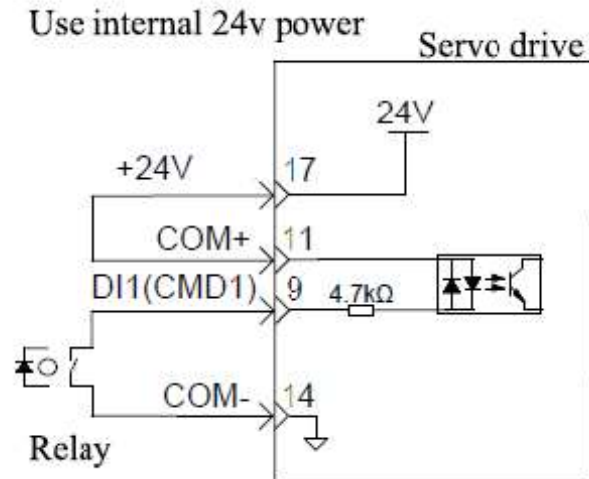
Figure 3-2 General view of the control mode

### 3.4.1 Digital input and output signal

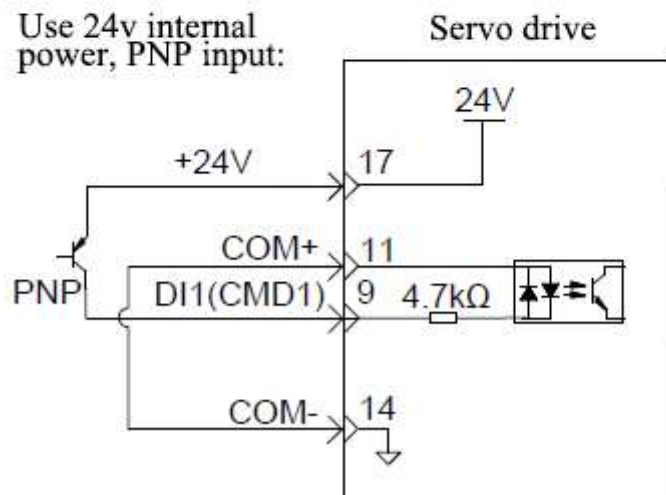
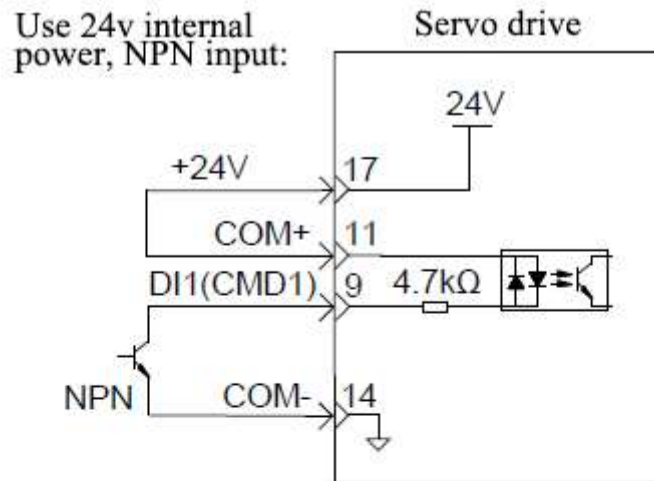
#### 1) Digital input circuit

Take DI1 as an example, DI1~DI8

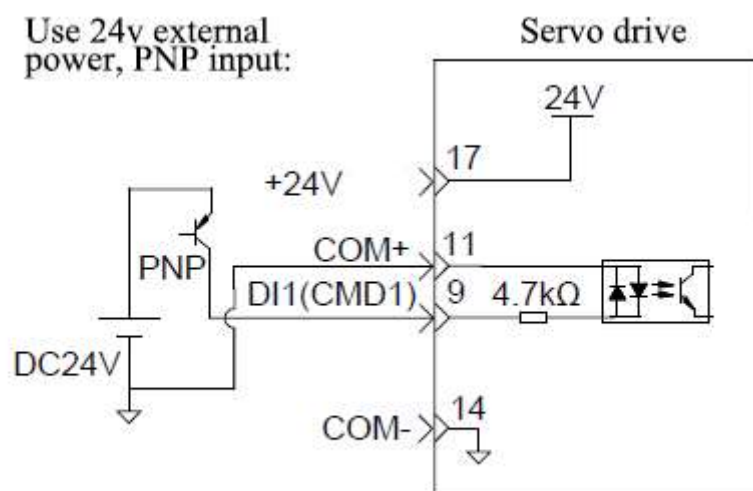
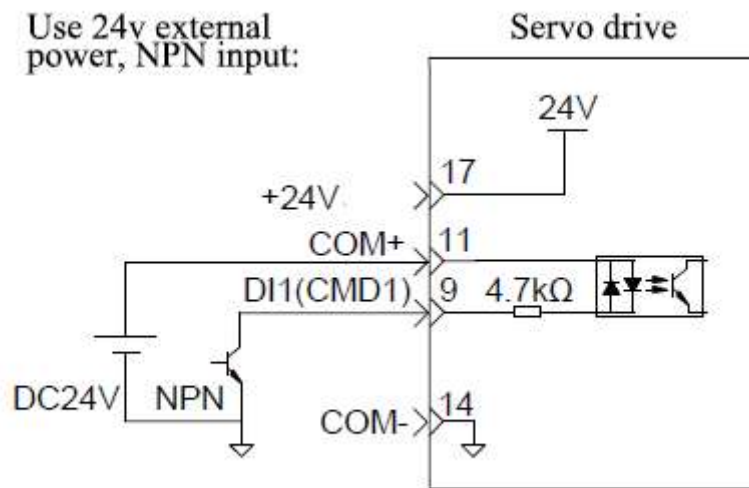
- a) When the host computer is relay output



b) When the host computer is open collector output





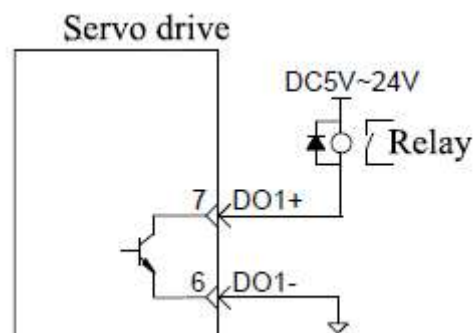


Note: NPN and PNP input mixing is not supported.

## 2) Digital output circuit

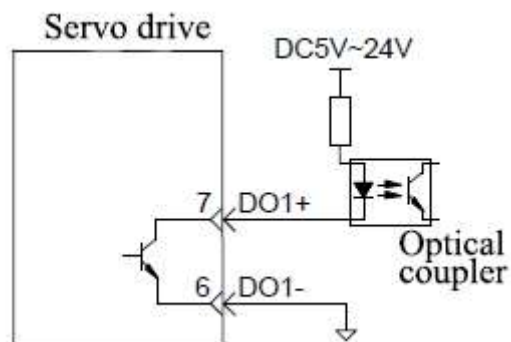
Use DO1 as an example, DO1~DO5 circuit is the same.

a) When the host computer is a relay input



Note: When the host computer is relay input, be sure to connect the freewheeling diode in the correct direction, otherwise the DO port may be damaged.

b) When the host computer is optocoupler input



Note: 1. Be sure to connect a current limiting resistor;  
 2. The maximum allowable voltage and current of the internal optocoupler circuit of the servo driver are as follows:

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

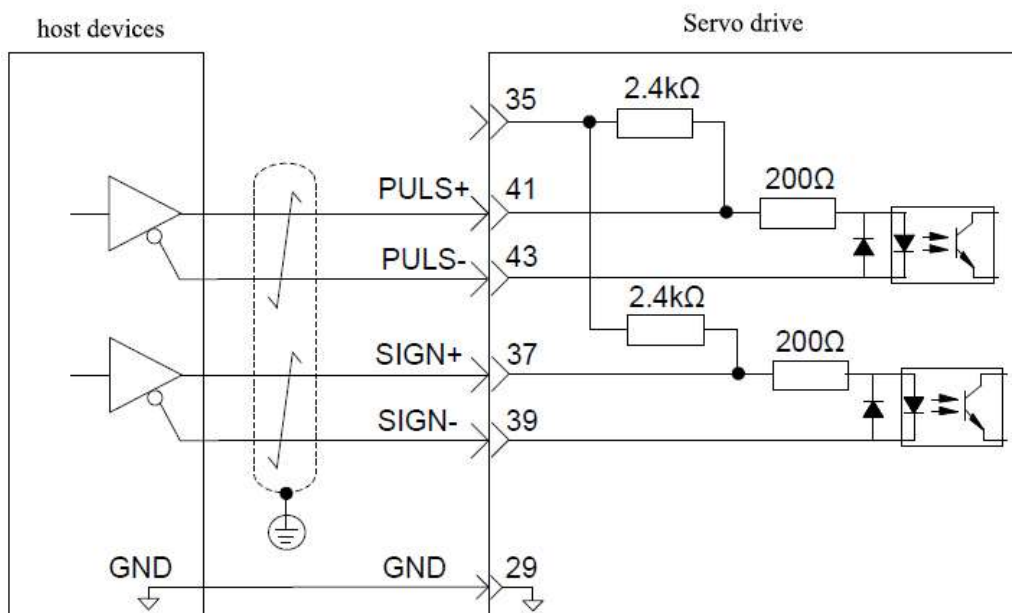
### 3.4.2 Position command input signal

Table 3-6 Correspondence between pulse input frequency and pulse width

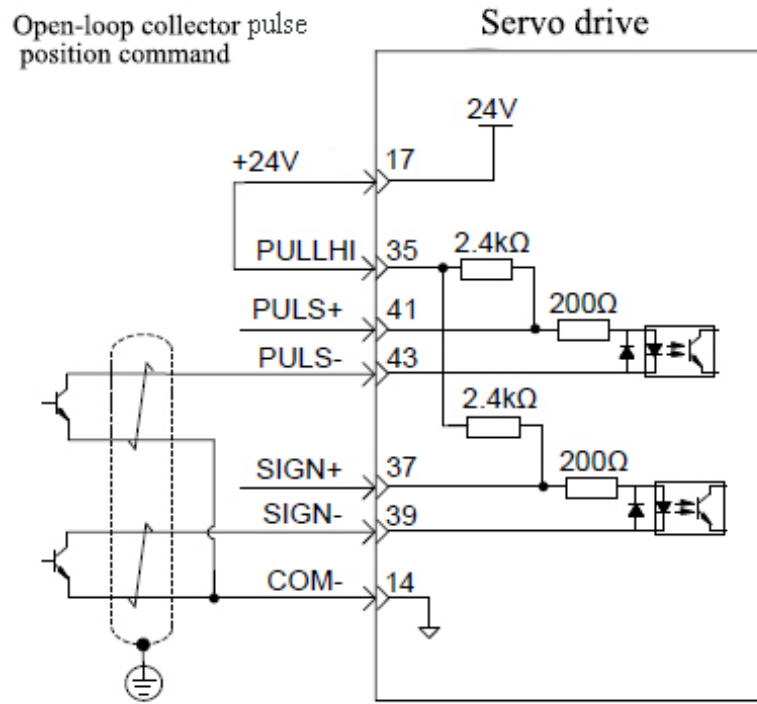
Pulse mode		Maximum frequency (HZ)	Minimum pulse width (us)
Ordinary	Differential	2M	0.25
	Open collector	2M	0.25

Note: The pulse width of the host computer can't be less than the minimum pulse width, otherwise the driver may receive the pulse error.

- 1) Ordinary pulse command input
  - a) Differential mode

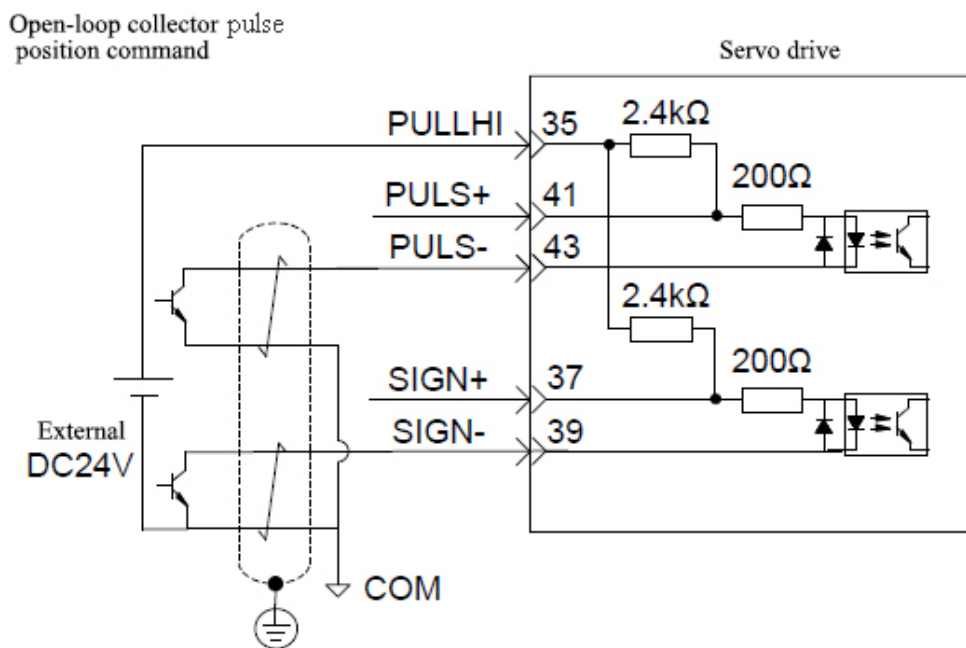


- b) When the collector is open
  - ⊙ Use the internal 24V power supply of the drive

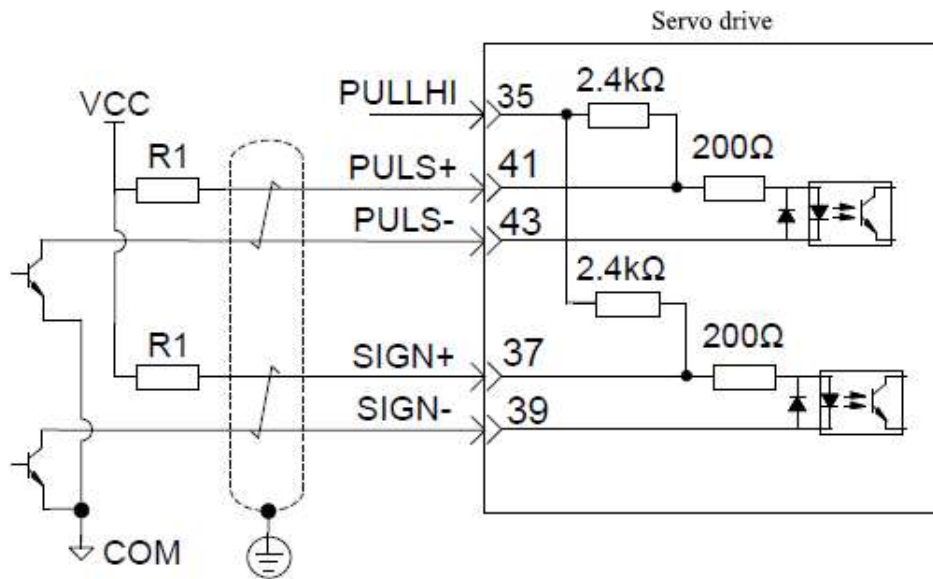


② Use an external power supply

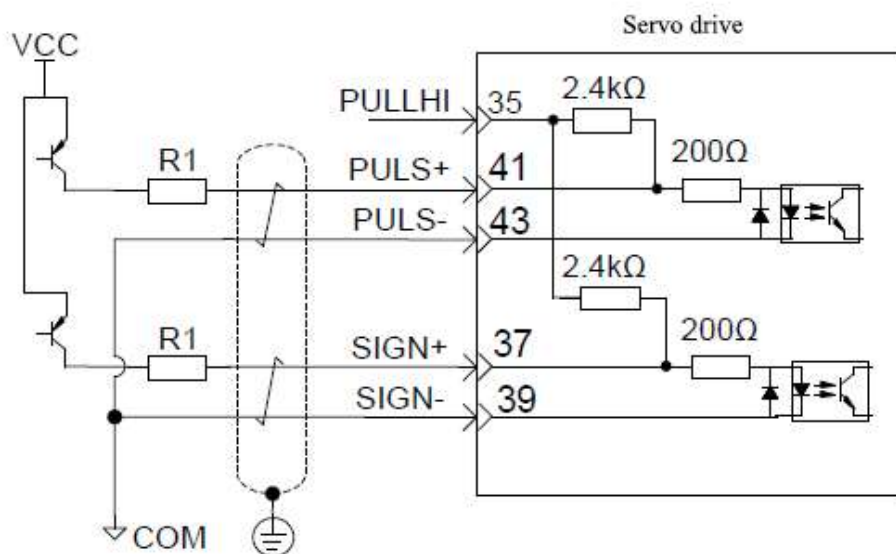
Option 1: Use the internal resistance of the drive (recommended)



Option 2: Use external resistors and NPN type



Option 3: Use external resistors and PNP type



Resistance R1 select formula:  $\frac{V_{CC}-1.5}{R1+2} = 10mA$

R1 recommended values

VCC voltage	R1 resistance	R1 power
24V	2.4KΩ	0.5W
12V	1.5KΩ	0.5W
5V	200Ω	0.5W

### 3.5 Communication signals

#### Mini USB communication CN5

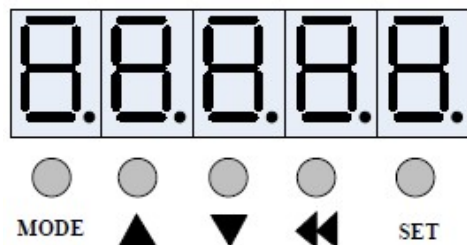
Through CN5, communication between PC and driver can be established, and implement operations such as drive status monitoring, test operation, and parameter reading and writing.

## Chapter 4: Operation and Adjustment

### 4.1 Panel operator description

#### 4.1.1 Interface introduction

The servo driver's operation interface consists 5-digit 7-segment LED digital tube and 5 buttons, which is used for the interface display and parameter setting of the servo driver. The interface is as follows:



Operation and display interface

- 1) Button name and function operation
- 2)

LED display	5 digit 7 part LED display to show servo status and setting
Button	<p>save and enter next menu          move the flashing bit          long press to change page          decrease the value          increase the value          change function code</p>

Note: When an alarm occurs, please eliminate the cause of the alarm before reset.

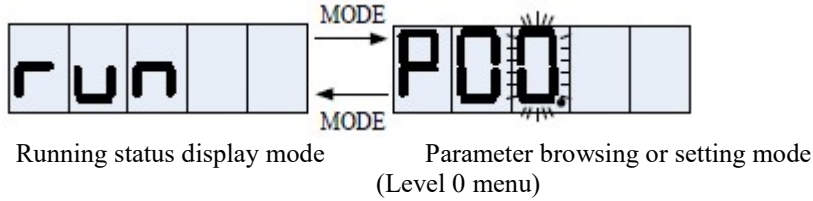
- 3) Servo drive status display

The running status of the servo drive is displayed by the display characters of 5 digit LED tubes, which are shown in the following table:

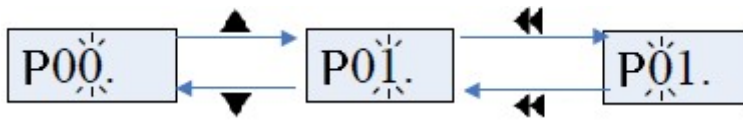
Table 4-1 Digital tube display status description

Symbol	LED display	Status description
“ES2”		Displays this character when the drive is powered-on for initialization, indicating the serial number of the drive.
“08bF1” (example)		Displays this character when the drive is powered-on for initialization, indicating the model of the drive.
“nrd”		Not ready: after the start or reset is completed, the servo is not ready, for example, the main circuit is not powered.
“rdy”		Ready: the servo system passed self-test, waiting for host control device to give a servo enable signal.
“run”		Run: servo is in normal running state. At this time, the servo running status and each variable can be viewed through the P18 group function code.
“Er.xxx”		Error: servo system has an error. The three digits of “xxx” represent error code. For the error code, please refer to Chapter 6.

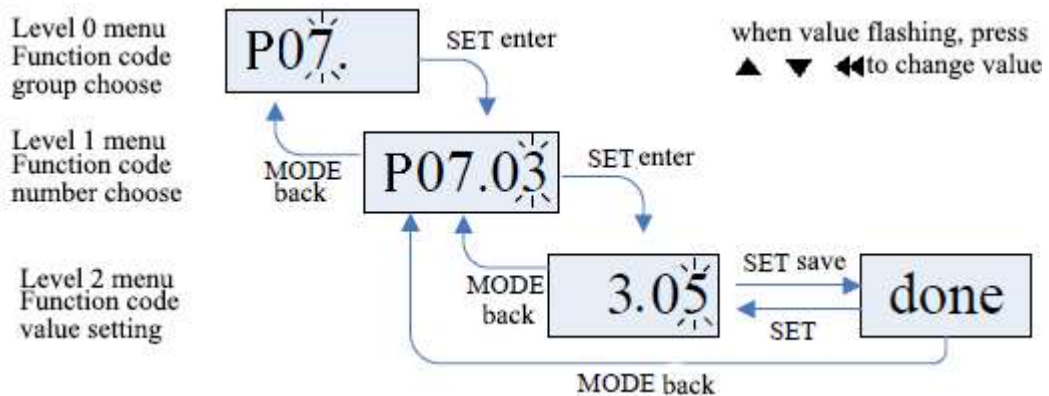
4) How to browse and modify the parameters of the servo drive  
 To view the status of the servo parameters, you need to press the MODE button to switch to the P\*\* group of the function code to select the corresponding function code:



When switching to the parameter display mode, the parameter group number is displayed first in three digits of “Pxx.”, also called “level 0 menu”. One of the displayed bits is flashing. At this time, press the up ▲ or down ▼ button, the number of the flashing digit will increase or decrease by 1; if the left button ◀◀ is pressed, the flashing digit will move, which is convenient to set to the desired group number:



When the desired group number is set, press the SET button to enter the setting status of the parameter number in the group. “Pxx.xx”, also called “level 1 menu”, is displayed at this time. After the function code number is confirmed, press the SET button to enter the parameter setting state, also called “Level 2 menu”. If the parameter can be modified, the lowest bit will flash, then press ◀◀ / ▲ / ▼ to modify, as shown below:



When the SET button is pressed after modification, the word “done” will be displayed. If the modified value is not changed, the word “done” will not be displayed. Press the MODE button to exit status monitoring mode and enter parameter mode for parameter viewing and modification.

**4.1.2 Parameter setting and display**

**1. Modify properties and display features of parameters**

Some parameters can only be viewed and cannot be modified. For example, after entering the Level 2 menu for running parameter, the display parameters does not flash. At this time, the ◀◀ , ▲ / ▼ and SET button will not respond.

Some parameters can only be set in the stop state. Before modifying these parameters, the servo motor needs to be stopped.

**2. Five bits parameters set**

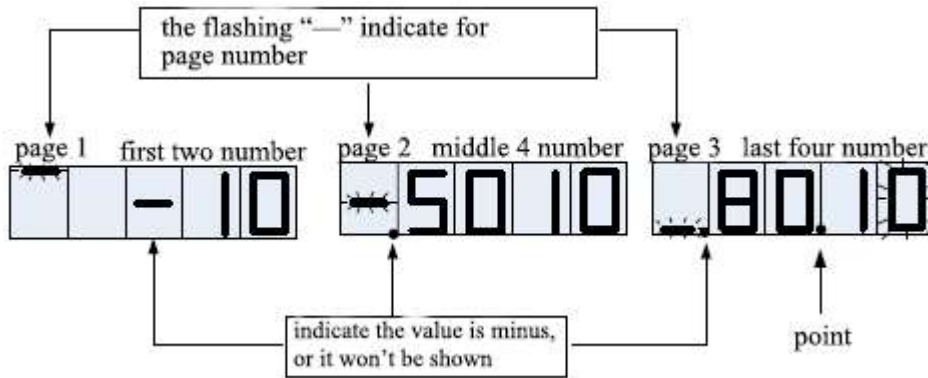
When setting the parameter is between -9999 to 99999, 5 digit display screen can be displayed or edited at once.

**3. Six and more bits parameters set**

When the setting parameter range exceeds the range of [-9999~99999], it exceeds the display range of five digital tubes, so six digits and more digital tube characters are required for display.

In YAKO servo system, the display is performed by a method of displaying 4 digits by 3 pages. At this time, there is a flashing “—” segment in the leftmost character of each screen, which is used to indicate the screen number of the current character.

For example, if the parameter value to be displayed is -10501080.10, it will be divided into three pages as [-10] [5010] [80.10] to show in the screen. And change pages by press . As shown below:



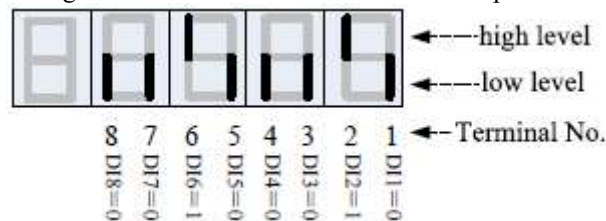
When using the SHIFT button to shift, it will automatically switch to the corresponding display segment. For example, suppose the current flashing bit is thousand. When using SHIFT, it will automatically switch to the middle four digit display, and the 10,000 digit (that is, the rightmost digit of this segment) will flash. Press / at this time, the increase or decrease is 10000. For the parameters that can be modified, the corresponding modifications can be made by shifting. If it is a read-only parameter, you can only use the long press key to scroll through the page.

### 4.1.3 Monitorable parameter list

The monitor display is a function for displaying the command value set in the servo driver, the state of the input/output signal, and the internal state of the servo driver. The monitor display function code table is as follows.

Note: DI/DO terminal status display method

1. A digital tube displays two DI/DO, the short “|” in high position corresponding to high level and low position “|” corresponding to low level. All indications correspond to the physical DI/DO.
2. The status of DIDO is represented by 8 status bits. Currently, the standard DI is 8 channels and DO is 5 channels. The figure below shows the status of the DI input terminal.

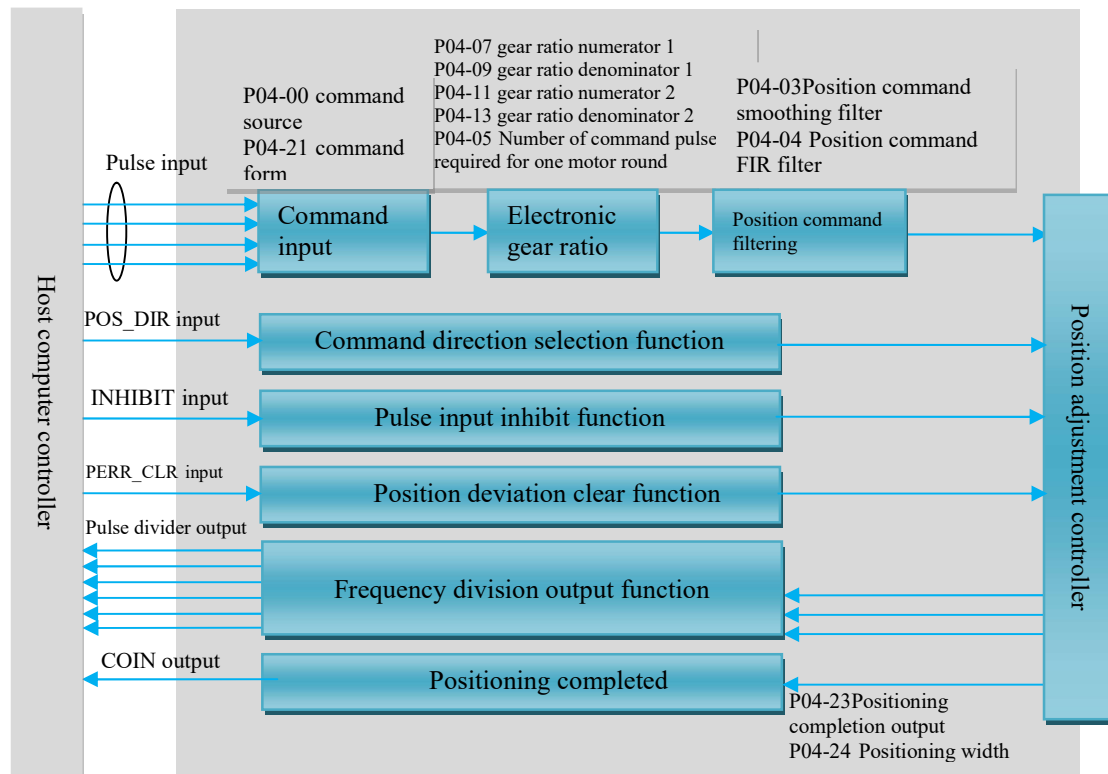


The meaning of the above figure are as follows: DI1=0; DI2=1; DI3=0; DI4=0; DI5=0; DI6=1; DI7=0; DI8=0.



## 4.2 Operating mode instructions

### 4.2.1 Position mode

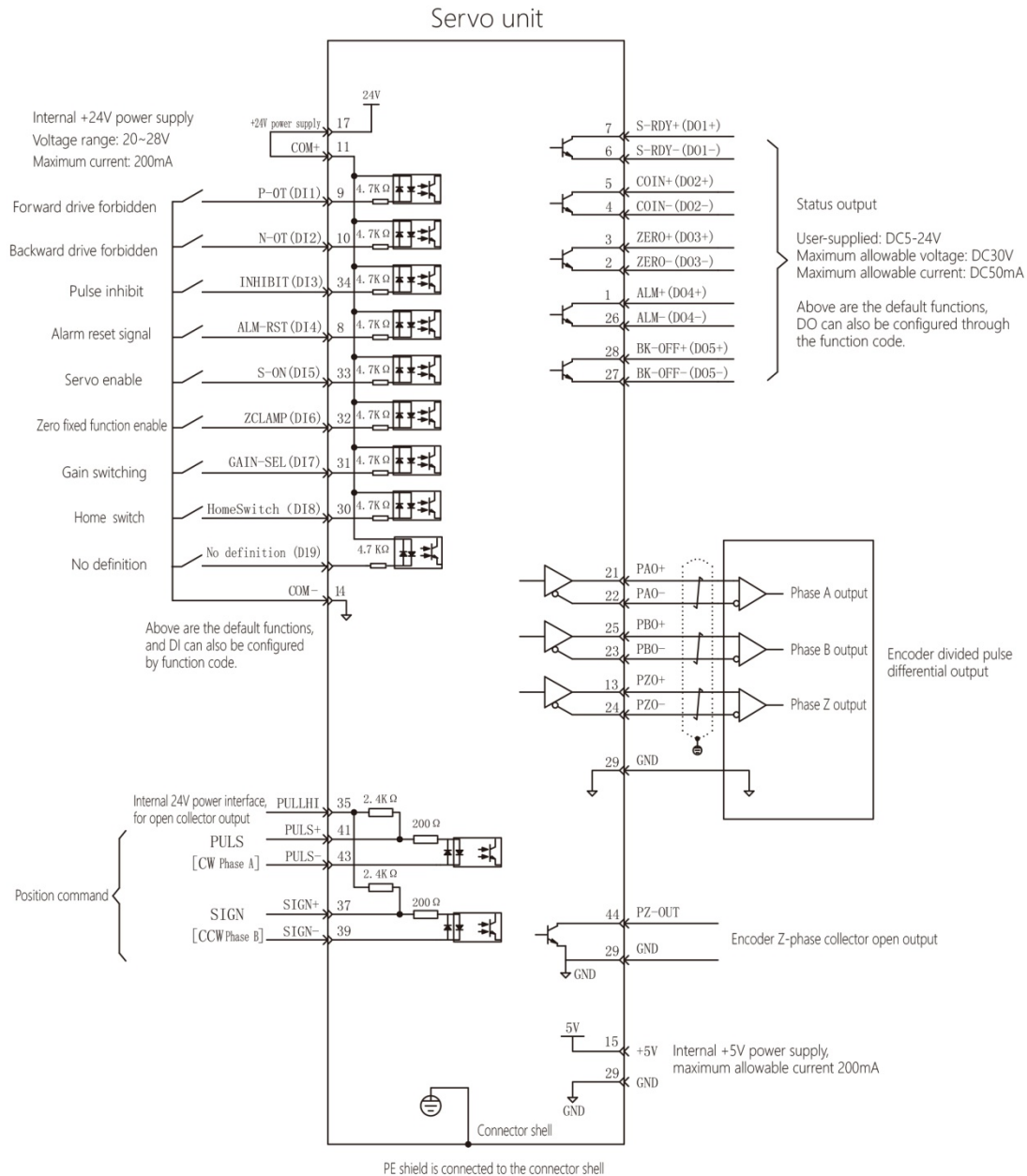


Position mode is a common working mode of the servo drive. The main steps are as follows:

1. Connect the power supply of the servo main circuit and control circuit correctly, as well as the motor power line and encoder line. After the power is turned on, the servo panel displays “rdy”, indicating that the servo power supply is correctly wired and the motor encoder is wired correctly.
2. Perform a servo JOG test run by pressing the button to confirm that the motor can run normally.
3. Refer to the wiring instructions to connect the pulse/direction input and pulse command input in the CN1 terminal and the necessary DI/DO signals, such as servo enable, positioning completion, etc.
4. Make settings related to the position mode. Set the DI/DO according to actual application. The function code refers to P02 group. In addition, if necessary, you need to set the functions such as return-to-origin and frequency division output. For details, see the product manual.
5. Enable the servo and control the servo motor rotation by sending a position command from the host computer. First, let the motor rotate at a low speed, to confirm whether the rotation direction and the electronic gear ratio are normal, and then adjust gain setting. Please refer to the debugging procedure in Section 4.4.



4.2.1.1 Position mode wiring



Note:

1. The signal cable and the power cable must be separated, at least 30cm apart;
2. When the signal cable length is not enough, to extend the cable, the shield layer must be reliably connected to ensure shielding and grounding.  
reliable;
3. +5V with GND as a reference, +24V with COM- as a reference. Do not exceed the maximum allowable current, otherwise the drive can not work properly.
3. The encoder frequency divided output signal is fixed to 1:1.

4.2.1.2 Position control mode related function code setting

Parameter setting in position control mode, including mode selection, command pulse type, electronic gear ratio, DI/DO, etc.

1) Position command input setting

a) Position command source

Set the function code P04-00=0, the position command is derived from the low speed pulse command, and other values can be set according to the actual situation.

Function	Name	Setting range	Min	Factory	Effecti	Type	Related mode
----------	------	---------------	-----	---------	---------	------	--------------

code				unit	setting	ve time		
P04	00	Main position command source	0- By low speed pulse command 4-By multi-segment position command 5- By communication	1	0	Immediately	Setting after motor stop	P

b) Position command direction switching

By setting the DI function FunIN.24, you can use DI to control the direction switching of the position command to satisfy the situation where the direction needs to be switched.

Code	Name	Function name	Setting range	Remark
FunIN.24	POS_DIR	Position command direction	Invalid: No switch Effective: Switch	The logical selection of the relevant terminal is recommended to be: Edge valid

c) Pulse command type selection

Set function code P04-21, select the type of external pulse command, including "direction + pulse (positive and negative logic)" and "orthogonal pulse".

Function code	Name	Setting range	Min unit	Factory setting	Effective time	Type	Related mode
P04	21	Pulse shape 0-direction + pulse, positive logic. (Defaults) 1-direction + pulse, negative logic 2-A phase + B phase orthogonal pulse, positive logic 3-A phase + B phase orthogonal pulse, negative logic	1	0	Re-power	Setting after motor stop	P

The principle of the three pulse command type is as follows:

Pulse command type principle

P04-21	Polarity	Pulse command type	Forward running	Backward running
0	Positive logic	PULS SIGN		
2	Positive logic	PULS SIGN		
1	Negative logic	PULS SIGN		
3	Negative logic	PULS SIGN		

d) Pulse inhibit input

The pulse command input is disabled by setting the DI function FunIN.12.

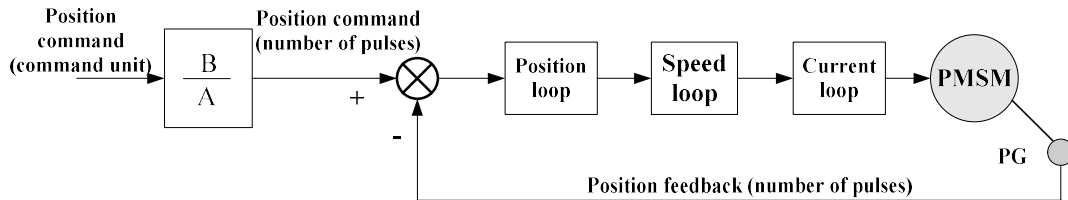
Code	Name	Function name	Setting range	Remark
FunIN.12	INHIBIT	Pulse inhibit	Invalid: allow command pulse input Valid: disable command pulse input	Forbid position command, including internal and external position commands. The logic selection of the corresponding terminal must be: Level active.

2) Electronic gear ratio setting

Set the electronic gear ratio according to the actual situation of the machine and the host computer.

Function code	Name	Setting range	Min unit	Factor y setting	Effective time	Type	Related mode
P04	07	gear ratio numerator 1	1~1073741824	1	4	Immediately	Set when motor is running
P04	09	gear ratio denominator 1	1~1073741824	1	1	Immediately	
P04	11	gear ratio numerator 2	1~1073741824	1	4	Immediately	
P04	13	gear ratio denominator 1	1~1073741824	1	1	Immediately	

The schematic diagram of the electronic gear ratio is as follows:



a) When P04-05=0, the motor and the load are connected through the reduction gear. Assuming that the reduction ratio of the motor shaft to the load machine side is n/m (motor rotate m round, load shaft rotate n round), the calculation of the electronic gear ratio is as follows :

$$\text{electronic gear ratio } \frac{B}{A} = \frac{P04}{P04-0} = \frac{\text{Encoder resolution}}{\text{The displacement of load shaft for one round (command unit)}} \times \frac{m}{n}$$

This model drive supports up to 2 sets of electronic gear ratios, and the gear ratio selection can be completed by using the electronic gear ratio switching function FunIN.23.

b) When P04-05≠0:

$$\text{electronic gear ratio } \frac{B}{A} = \frac{\text{Encoder resolution}}{P04}$$

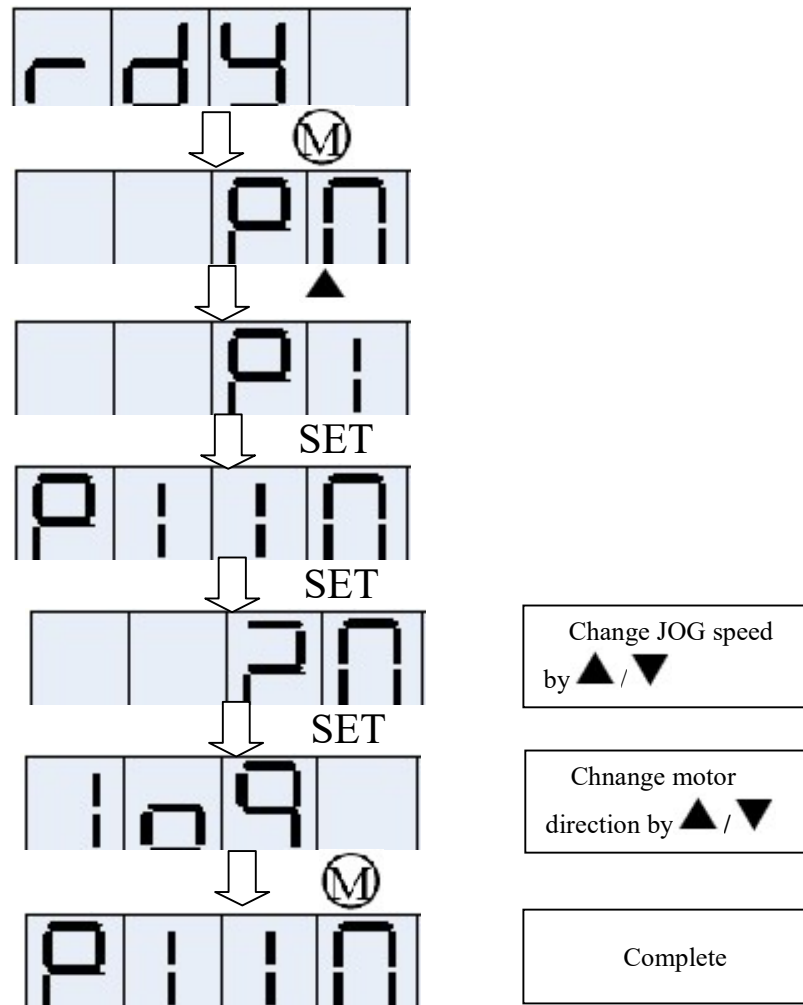
Function code	Name	Setting range	Min unit	Factory setting	Effective time	Type	Related mode
P04	05	Number of pulses required for one motor round	0P/Rev~1048576P/Rev	1P/Rev	0P/Rev	Re-power	Setting after motor stop

At this time, the two sets of electronic gear ratio and electronic gear switching function are invalid.

## Chapter 5: Auxiliary Functions

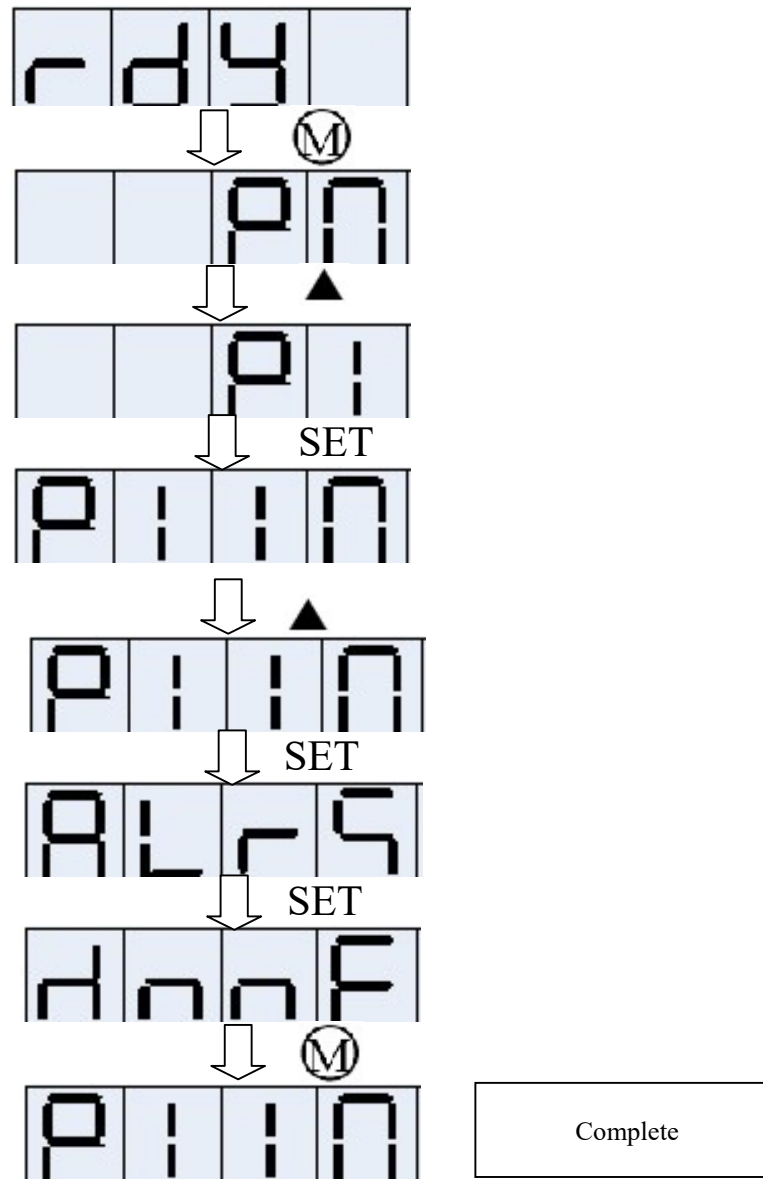
### 5.1 JOG run

JOG running flow chart



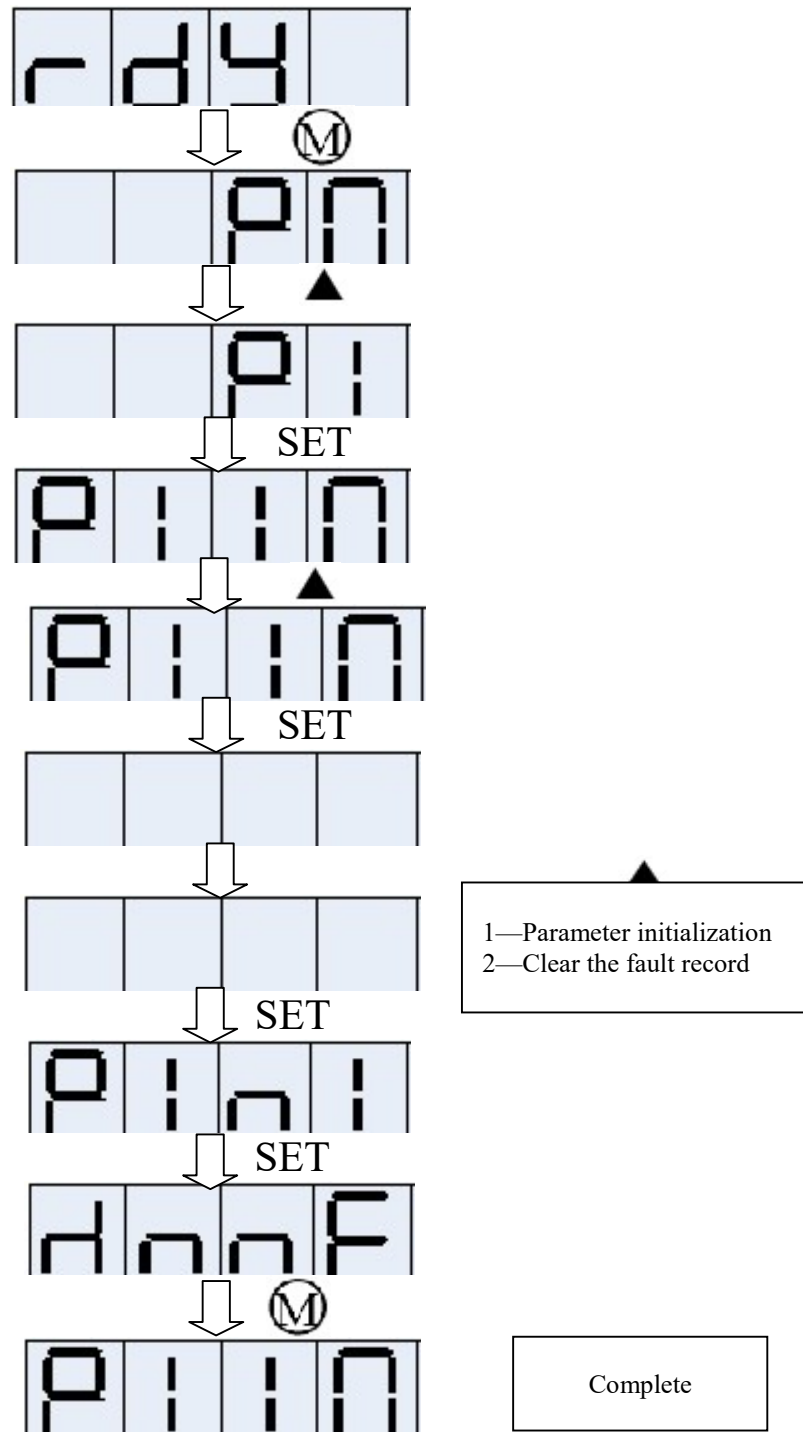
5.2 Alarm reset

Alarm reset flow chart



5.3 Parameter initialization

Parameter initialization flow chart



## 5.4 Digital signal forced input and output function

The servo drive has DI/DO force input and output function. The forced DI input can be used to test driver DI function, and the forced DO output can be used to check the DO signal connection between the host computer and the driver. When using digital signals force input and output functions, the logic of physical DI and virtual DI is given by forced input.

### 1) DI signal forced input

When this function is turned on, each DI signal level is only controlled by the forced input (P11-11) setting, not related to external DI signal status.

#### a) Method of operation

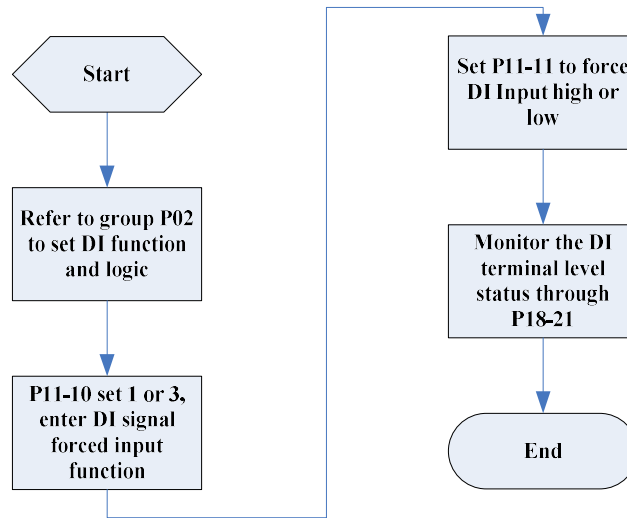


Figure 5-1 Diagram of the DI signal forced input setting procedure

#### Related function code

Function code	Name	Setting range	Min unit	Factory setting	Effective time	Type	Related mode
P11 10	DIDO forced input and output enable	0-no operation 1- forced DI enable 2-forced DO enable 3- forced DI and DO enable	1	0	Immediately	Set when running	PST
P11 11	Set DI forced input	0-0x01FF	1	0x01FF	Immediately	Set when running	PST
P11 12	Set DO forced output	0-0x001F	1	0	Immediately	Set when running	PST

Among them, P11-11 is used to forcibly set the DI level, and the panel is displayed in hexadecimal. After converting to binary, "1" indicates high level and "0" indicates low level.

The DI terminal logic selection is set by the P02 group parameter. P18-21 is used to monitor the status of the DI terminal. The panel displays the level. The P18-21 read by the background software is a decimal number.

For example:

The setting method of "DI1 terminal is valid, and DI2~DI8 terminal is invalid" is as follows: (9 DI terminal logics are "low active")

Since "1" indicates a high level and "0" indicates a low level, the corresponding binary is "11111110", which corresponds to the hexadecimal number "1FE", so

Set the "P11-11" parameter value to "1FE" via the panel.

P11-21 monitor DI level status:

If the DI function is not faulty, the display value of P11-11 is always the same as P18-21.

Therefore, the DI1 terminal is low on the panel and the DI2~DI8 terminals are high.

The display is as follows:

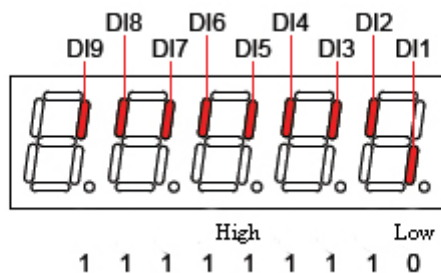


Figure 5-2 Description of the DI level status of P18-21

b) Exit forced input function

The DI signal forced input function does not save to memory, After re-power, it will restored to normal DI. Or it can be switched back to normal DI mode by setting P11-10=0.

2) DO signal forced output

When this function is turned on, each DO signal level is only controlled by the forced output (P11-12) setting, not related to internal DO function status of the drive.

a) a) Method of operation

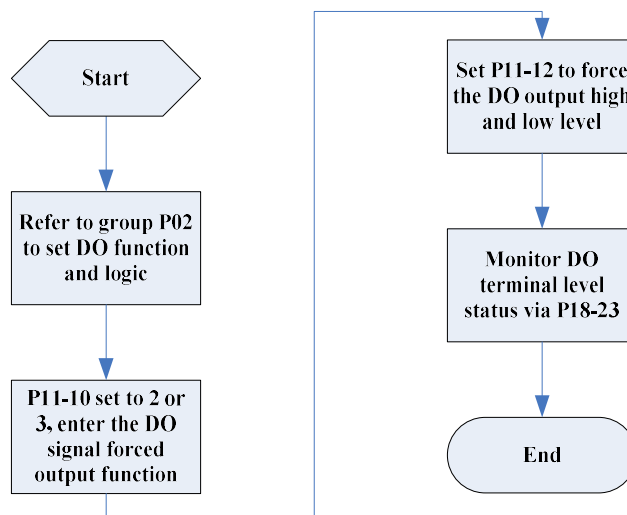


Figure 5-3 Diagram of DO signal forced output setting procedure

Among them, P11-12 is used to force set whether the DO function is valid. The panel is displayed in hexadecimal. After converting to binary, “0” means the DO function is invalid, “1” means the DO function is valid, P18-23 It is used to monitor the DO level status, the level is displayed on the panel, and P18-23 is a decimal number.

For example: "DO1 terminal is invalid, and DO2~DO5 terminal is valid" is set as follows:  
 Because "1" indicates the DO function is valid, and "0" indicates that the DO function is invalid, the corresponding binary is "11110", corresponding to the hexadecimal number "1E", so the parameter value of "P11-12" can be set through the panel. It is "1E". Set the "P11-12" parameter value to "1E" via the panel.

P11-23 monitor DO level status:

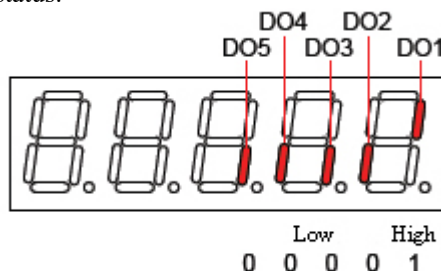


Figure 5-4 Description of the DO level status of P18-23



## b) Exit forced output function

The DO signal forced input function does not save to memory, After re-power, it will restored to normal DO. Or it can be switched back to normal DI mode by setting P11-10=0.

### 5.5 Offline inertia identification

$$\text{Load inertia ratio} = \frac{\text{Mechanical load inertia}}{\text{Motor inertia}}$$

The load inertia ratio is an important parameter of the servo system. Correct setting of the load inertia ratio can help to complete the debugging quickly. The load inertia ratio can be set manually or automatically by the servo drive's inertia identification function.

Using the "Inertia identification function (P11.03)", the motor is rotated by operating the buttons on the servo driver panel to realize the inertia identification, which is the offline inertia identification without the intervention of the host computer;

Note:

When using the inertia identification function, in order to accurately calculate the load inertia ratio, the following conditions must be met:

- The actual motor maximum speed is higher than 200rpm;
- When motor accelerates and decelerates, the acceleration is above 3000 rpm/s;
- The load torque is relatively stable and cannot be changed drastically;
- The actual load inertia ratio does not exceed 120:1;

If the actual load inertia ratio is large and the driver gain is low, the motor will be slow, and the maximum motor speed requirement and acceleration requirement cannot be reached. At this time, increase the speed loop gain (P07.01) first, then performe inertia identification again.

If vibration occurs during the identification process, the inertia identification should be stopped immediately and the gain should be reduced. In addition, the large backlash of the transmission mechanism may cause the inertia identification to fail. Before performing offline inertia identification, first confirm the following:

1) The motor's movable distance should meet the following 2 requirements

a) There is a movable distance of more than one round between the mechanical limit switches: Before performing offline inertia identification, please make sure that the limit switch is installed on the machine and ensure that the motor has a movable distance more than one round. Prevent overtravel in the process of inertia identification that may causing accidents!

b) Meet P08.24 (Number of motor rotation rounds required to complete single inertia identification) requirements: check the current inertia identification maximum speed (P08.20), accelerate time to maximum speed during inertia identification (P08.21), and the number of motor rotation rounds to complete inertia identification (P08.24), ensures that the motor's runnable distance at this stop position is longer than the P08.24 display value. Otherwise, the P08.20 or P08.21 setting value should be appropriately reduced until this requirement is met.

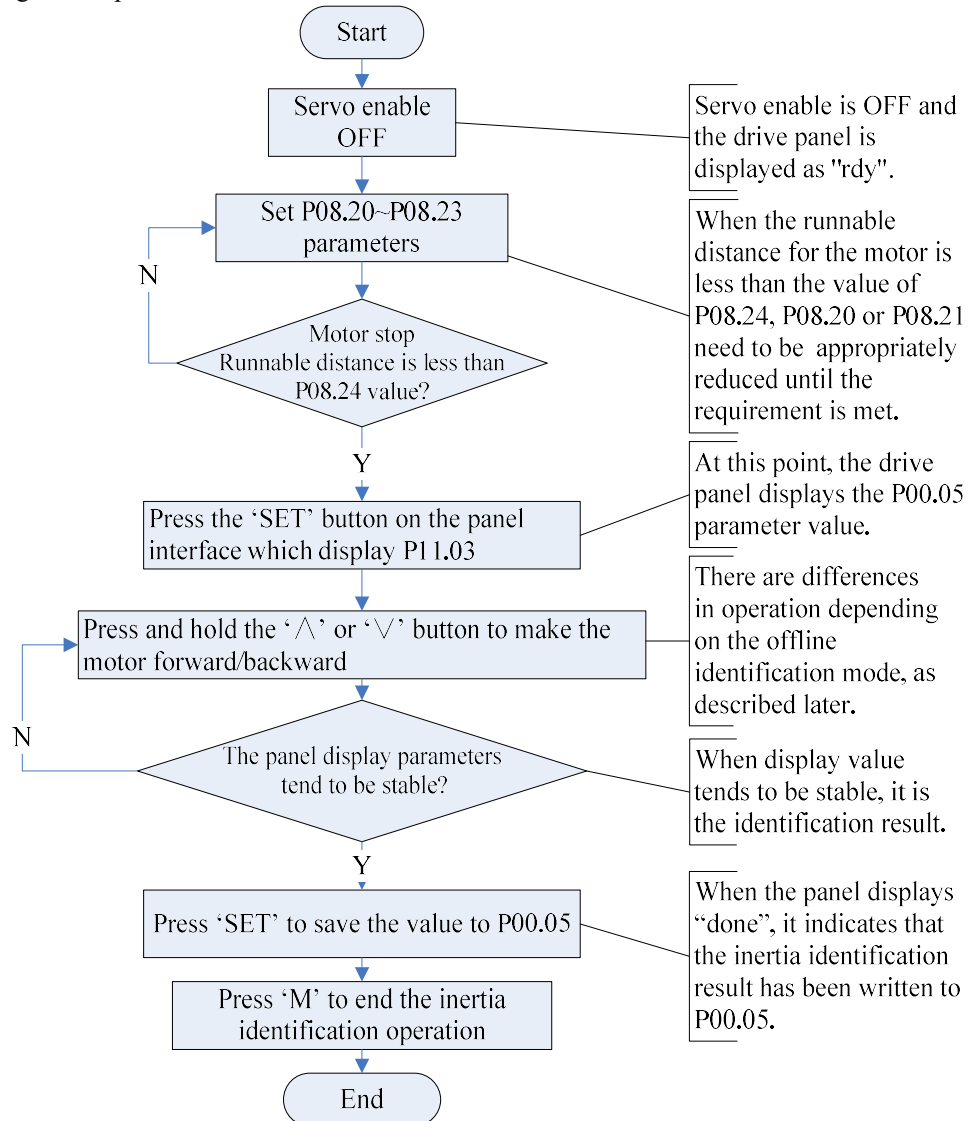
2) Estimated load inertia ratio P00.05

If P00.05 is the default value (1.00) and the actual load inertia ratio is greater than 30.00, the motor may move slow, causing the identification failure. In this case, the following two solution can be taken:

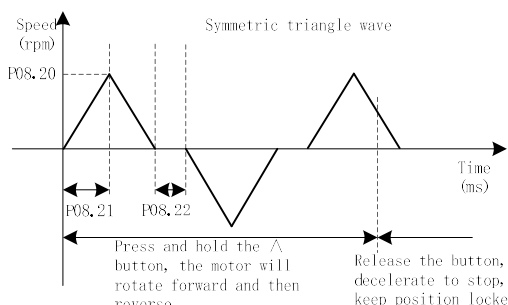
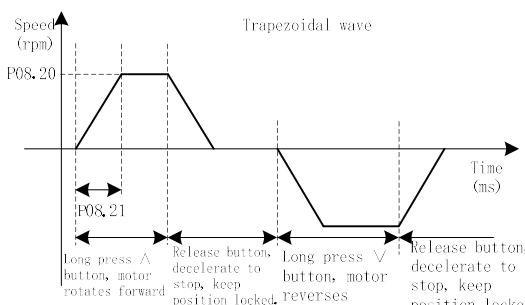
a) Preset P00.05 to a large initial value: the preset value is recommended to start with 5.00 times, and gradually increase until the panel display value is updated during the identification process.

b) Increase the drive rigidity level (P00.04) appropriately so that the actual motor speed can reach the maximum speed of inertia identification (P08.20).

The general operation flow of offline inertia identification is as follows:



Offline inertia identification is divided into two modes: positive and negative triangle wave mode and JOG mode. The command of the two modes are different.

Item	Positive/negative triangle wave mode (P08.23=0)	JOG mode (P08.23=1)
Command form		
Max. speed	P08.20	P08.20
Accel./Decel. time	P08.21	P08.21
Intervals	P08.22	Time interval between two key presses operate
Round for rotate	Check P08.24	Control manually
Operate Descript.	Press and hold the UP button: the motor rotates forward first and then backforward Press and hold the DOWN button: the motor rotates backforward first and then rotates forward. Release the button: zero speed stop, keep the position locked	Press UP: motor forward Press DOWN key: motor backforward Release the button: zero speed stop, keep the position locked
For	Short motor travel application	Long motor travel application that can control manually

☆ Related function code:

Function code	Name	Setting range	Min. unit	Function	Factory setting	Effective time	Setting method
P08.20	Inertia recognition maximum speed	200~1000	1rpm	Set the maximum speed of offline inertia identification	500	Immediately	Setting after motor stop
P08.21	Inertia identification acceleration and deceleration time	50~800	1 ms	Set the time for the motor to accelerate from 0 rpm to the maximum speed of inertia identification (P08.20) under offline inertia identification.	100	Immediately	Setting after motor stop
P08.22	Waiting time after completion of single inertia identification	100~10000	1ms	Set the time interval between two speed commands in the forward and reverse triangle mode for offline inertia identification	800	Immediately	Setting after motor stop
P08.23	Inertia identification mode selection	0- positive and negative triangle wave mode 1-JOG mode	1	Set inertia identification mode	0	Immediately	Setting after motor stop
P08.24	Single inertia identification motor rotation round	-	0.01r	Display positive and negative triangle wave mode offline inertia identification motor required rotation round	83	-	-

## Chapter 6: Troubleshooting

Servo drive alarm level is divided into two levels

Alarm level	Name	Description
Level 1	Fault	The servo drive has a serious alarm and cannot work normally. It needs to be shut down to check. DO terminal outputs ALM signal.
Level 2	Warning	The servo drive warns that the device will not be damaged for the time being, but if it is not handled correctly in time, it may cause a high level fault output. DO terminal outputs WARN signal.

### 6.1 Fault diagnosis and treatment

Faults can be divided into:

- Non-resettable NO.1 failure;
- Resettable NO.1 fault;
- Resettable NO.2 fault.

Among them, resettable indicates that after fault handled, we can clear the servo fault status by set P11-01 to 1 or configure DI function FunIN.2: ALM-RST alarm resets.

Non-resettable means that after the fault is handled, drive needs to be re-powered

The NO.1 and NO.2 faults have different stop modes. The NO.1 fault is free to stop and keeps running freely. The NO.2 fault stop mode is set by P00-12.

NO.1, NO.2 reset method for resettable fault: first turn off the servo enable signal (S-ON is set to OFF), then set P11-01=1 or use DI function 2.

When the servo drive fails, the fault "Er.xxx" appears on LED display.

## 6.1.1 Non-resettable NO.1 fault

Fault number Er_	Fault name	Cause of fault	Stop method when fault occurs	Whether the fault can be reset
1	System parameter exception	Abnormal data of servo internal parameters	No.1	No
2	Product model selection failure	Invalid motor or drive model	No.1	No
3	Motor data verification failure	Motor ROM data check error or no data	No.1	No
4	Fault in parameter storage	1. parameter storage device failure 2. parameters read and write too frequently 3. control power supply instability 4. drive failure	No.1	No
6	Program exception	1. system parameter abnormal 2. drive internal failure	No.1	No
7	Control power supply undervoltage	Control circuit power supply undervoltage	No.1	No
8	Short circuit to ground failure detected	1. drive or motor parameters are incorrect; 2. UVW phase-to-phase short circuit; 3. motor burned out; 4. motor is shorted to ground; 5. drive failure;	NO.1	No
9	Overcurrent fault	1 The drive or motor parameters are incorrect; 2 UVW phase-to-phase short circuit; 3 the motor burned out; 4 The motor is shorted to ground; 5 drive failure;	NO.1	No
11	Encoder disconnection	Encoder disconnection	No.1	No
12	Encoder AB signal abnormal	Encoder AB signal is abnormal	No.1	No
13	Encoder check exception	Encoder zero point check exception	No.1	No
14	Motor initial angle detection abnormal	Motor initial angle detection is abnormal	No.1	No
15	Motor out of control	1 Motor UVW phase sequence setting error 2 UVW wiring error 3 Initial position or encoder parameter setting error	No.1	No
16	Current sampling fault	Current sampling fault	No.1	No

## 6.1.2 Resettable NO.1 fault

Fault number Er_	Fault name	Cause of fault	Stop method when fault occurs	Whether the fault can be reset
20	Overvoltage	The main circuit DC voltage abnormally high	No.1	Yes
21	Undervoltage	Main circuit DC voltage low	No.1	Yes

Fault number Er_	Fault name	Cause of fault	Stop method when fault occurs	Whether the fault can be reset
22	Overspeed	1. Speed command exceeds the maximum speed value 2. UVW phase sequence error 3. Speed response too high, severely exceed adjustment range 4. Drive failure	No.1	Yes
27	DI terminal parameter setting fault	Different DI are assigned with same function repeatedly;	No.1	Yes
28	DO terminal parameter setting fault	Different DO are assigned with same output	No.1	Yes
30	Reference position failure	Reference position failure	No.1	Yes

### 6.1.3 Resettable NO.2 fault

Fault number Er_	Fault name	Cause of fault	Stop method when fault occurs	Whether the fault can be reset
43	Position deviation is too large	In the servo ON state, the position deviation exceeds the position deviation value (P09.09)	No.2	Yes
44	Main circuit input phase lack	When lack power input phase, the protection selects parameter P09-00=0 (enable fault, disable warning) or P09-00=1 (enable fault and warning): 1. Three-phase input line is poorly connected 2. Three-phase drive operates under single-phase power	No.2	Yes
46	Drive overload	The load operation exceeds the inverse time curve of the drive; The UVW output may be lack of phase or phase sequence connected incorrectly;	No.2	Yes
47	Motor overload	The load operation exceeds the inverse time curve of the motor; The UVW output may be lack of phase or phase sequence connected incorrectly;	No.2	Yes
49	Electronic gear setting error	Electronic gear ratio exceeds specification range [0.001, 4000]	No.2	Yes
50	Heat sink (fan) overheating	Servo unit heat sink (fan) exceeds the set fault value	No.2	Yes

### 6.2 Reasons for warning and treatment

Fault number Er_	Warning name	Cause of fault
81	Drive overload warning	Warning when 80% of the drive overload limit value is reached

Fault number Er_	Warning name	Cause of fault
82	Motor overload warning	The warning before the motor is about to fail, the warning value is determined by P09_05
83	Changed parameters need to be re-powered to take effect	Changed parameters that need to be re-powered
86	Forward overtravel warning	Positive overtravel switch Pot terminal is valid
87	Negative overtravel warning	Negative overtravel switch Not terminal is valid
90	External regenerative resistor overload	External regenerative resistor power is too small
91	External regenerative resistor is too small	The external regenerative resistor is less than the minimum requirement by the driver; Or parameter setting error
94	DI emergency brake	External emergency brake E_STOP terminal trigger
96	Homing timeout	1. Home switch failure 2. Time limit to find home is too short 3. The high speed for searching home signal is too small
97	Mechanical home point offset error	1 When the home return mode parameter P16-09=6 or P16-09=8 or P16-09=14, the mechanical home offset parameter P16-14 is set to a value greater than 0. 2 When the home return mode parameter P16-09=7 or P16-09=9 or P16-09=15, the mechanical home offset parameter P16-14 is set to less than 0.
98	Main circuit input lack phase	When the power input lack phase protection selects parameter P09-00=1 (enable fault and warning), the driver with rated power of 0.8kW, 1.0kW, 1.5kW, 3.0kW will report a warning when the main circuit input voltage is single-phase. .

Note: The reset method of warning: set P11-01=1 or use DI function 2.

## Chapter 7: Parameter List

Parameter group number	Parameter group function
P00	Basic control parameters
P01	Servo motor parameters
P02	Digital input and output parameters
P04	Position control parameters
P05	Speed control parameters
P06	Torque control parameters
P07	Gain parameters
P09	Fault and protection parameters
P11	Auxiliary function parameters
P12	Keyboard display parameters
P13	Multi-segment position function parameters
P14	Multi-speed function parameters
P16	Special function parameters
P17	Drive parameters
P18	Display parameters

Note: The above parameters are not completely listed. For more parameters, please refer to the detailed manual.



**P00 group: basic control parameters**

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P00	00	Control mode selection	0-position mode 1-speed mode 2-torque mode 3-speed / torque mixing mode 4-position / speed mixing mode 5-position / torque mixing mode 6-reserved 7-pulse/speed mixing mode	1	0	Effective immediately	Setting after motor stop PST
P00	01	Direction of rotation	0-CCW direction is the forward direction (counterclockwise) 1-CW direction is the forward direction (clockwise)	1	0	Re-power	Setting after motor stop PST
P00	02	Pulse output positive direction definition	0-CCW direction is forward direction (the corresponding motor rotation direction when the pulse output OA leads the OB) 1- CW direction is forward direction (reverse mode, OA lag OB)	1	0	Re-power	Setting after motor stop PST
P00	03	Self-adjusting mode	0-invalid 1-standard mode 2-positioning mode	1	0	Effective immediately	Setting after motor stop PST
P00	04	Rigidity level setting	0~31	1	11	Effective immediately	Set when running PST
P00	05	Inertia ratio	0~3000	0.01	1.00	Effective immediately	Set when running PST
P00	07	Maximum speed of the system	0~10000rpm	1rpm	6000rpm	Effective immediately	Setting after motor stop PST
P00	08	System maximum torque	0~500 (times to the rated torque of motor)	0.01	3.00	Effective immediately	Setting after motor stop PST
P00	10	Servo OFF stop mode	0-Free running stop, keep free 1-zero speed stop, keep free	1	0	Effective immediately	Setting after motor stop PST
P00	11	Reserved parameter	0~65535	1	0	N/A	Reserved parameter PST
P00	12	Fault No.2 stop mode selection	0-Free running stop, keep free 1-zero speed stop, keep free	1	0	Effective immediately	Setting after motor stop PST

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode	
P00	13	Stop mode when overtravel	0-free running stop 1- Decelerate the motor with the set torque of the emergency stop torque as the maximum value, and then enter the servo lock state. 2- Decelerate the motor with the set torque of the emergency stop torque as the maximum value, and then enter free running state.	1	1	Effective immediately	Setting after motor stop	PST
P00	14	Brake output ON to command receiving delay	0ms~10000ms	1ms	200ms	Effective immediately	Set when running	PST
P00	15	Static state, the delay between the brake output OFF and power cut-off of the motor	10ms~10000ms	1ms	200ms	Effective immediately	Set when running	PST
P00	16	Rotating state, the speed threshold when the brake output is OFF	0rpm~1000rpm	1rpm	50rpm	Effective immediately	Set when running	PST
P00	17	Rotation state, delay between servo enable OFF and brake output OFF	0ms~10000ms	1ms	500ms	Effective immediately	Set when running	PST
P00	18	Energy consumption resistance setting	0-Use built-in power consumption resistor 1-Use external power-consuming resistors and cool naturally 2-Use external power-consuming resistors and force air-cooled 3- No energy consumption resistor, relying on capacitance absorption	1	0	Effective immediately	Setting after motor stop	PST
P00	19	External resistor power capacity	1W~65535W	1W	Model parameter	Effective immediately	Setting after motor stop	PST
P00	20	External resistance value	User can set it up 1 ohm to 1000 ohm	1ohm	Model parameter	Effective immediately	Setting after motor stop	PST
P00	21	External resistance heating time constant	User can set it up 1ms~7000ms	1ms	Model parameter	Effective immediately	Setting after motor stop	PST
P00	22	Energy consumption braking start voltage	0V~1000V	1	Model parameter	Effective immediately	Set when running	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P00	37	Pulse increment threshold	0~200	1	10	Effective immediately	Set when running	PS
P00	38	Continuous pulseless reception cycle number	1~200	1	3	Effective immediately	Set when running	PS

### P01 group: servo motor parameters

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P01	00	Motor model coding number	1-9999			Effective immediately	Setting after motor stop	PST

### P02 group: digital terminal input and output parameters

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P02	00	FunINL unassigned signal state (HEX)	0~0xFFFF Bit0- corresponds to FunIN.1; Bit1- corresponds to FunIN.2; ..... Bit15-corresponds to FunIN.16	1	0	Re-power	Set when running	PST
P02	01	DI1 terminal function selection	Input function code: 0, 1-40 0: no definition 1 to 40: FunIN.1 to 40 (refer to the DIDO basic function coding table)	1	13	Effective immediately	Set when running	PST
P02	02	DI2 terminal function selection	Input function code: 0, 1-40 0: no definition 1 to 40: FunIN.1 to 40 (refer to the DIDO basic function coding table)	1	14	Effective immediately	Set when running	PST
P02	03	DI3 terminal function selection	Input function code: 0, 1-40 0: no definition 1 to 40: FunIN.1 to 40 (refer to the DIDO basic function coding table)	1	12	Effective immediately	Set when running	PST
P02	04	DI4 terminal function selection	Input function code: 0, 1-40 0: no definition 1 to 40: FunIN.1 to 40 (refer to the DIDO basic function coding table)	1	2	Effective immediately	Set when running	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P02	05	DI5 terminal function selection	Input function code: 0, 1-40 0: no definition 1 to 40: FunIN.1 to 40 (refer to the DIDO basic function coding table)	1	1	Effective immediately	Set when running	PST
P02	06	DI6 terminal function selection	Input function code: 0, 1-40 0: no definition 1 to 40: FunIN.1 to 40 (refer to the DIDO basic function coding table)	1	11	Effective immediately	Set when running	PST
P02	07	DI7 terminal function selection	Input function code: 0, 1-40 0: no definition 1 to 40: FunIN.1 to 40 (refer to the DIDO basic function coding table)	1	3	Effective immediately	Set when running	PST
P02	08	DI8 terminal function selection	Input function code: 0, 1-40 0: no definition 1 to 40: FunIN.1 to 40 (refer to the DIDO basic function coding table)	1	32	Effective immediately	Set when running	PST
P02	10	FunINH unassigned signal state (HEX)	0~0xFFFF Bit0- corresponds to FunIN.17; Bit1- corresponds to FunIN.18; ..... Bit15-corresponds to FunIN.32	1	0	Re-power	Set when running	PST
P02	11	DI1 terminal logic selection	Input polarity: 0-4 0-low level effective 1-high level effective 2-rising edge is valid 3-falling edge is valid 4- rising and falling edges are valid	1	0	Effective immediately	Set when running	PST
P02	12	DI2 terminal logic selection	Input polarity: 0-4 0-low level effective 1-high level effective 2-rising edge is valid 3-falling edge is valid 4- rising and falling edges are valid	1	0	Effective immediately	Set when running	PST
P02	13	DI3 terminal logic selection	Input polarity: 0-4 0-low level effective 1-high level effective 2-rising edge is valid 3-falling edge is valid 4- rising and falling edges are valid	1	0	Effective immediately	Set when running	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P02	14	DI4 terminal logic selection	Input polarity: 0-4 0-low level effective 1-high level effective 2-rising edge is valid 3-falling edge is valid 4- rising and falling edges are valid	1	0	Effective immediately	Set when running	PST
P02	15	DI5 terminal logic selection	Input polarity: 0-4 0-low level effective 1-high level effective 2-rising edge is valid 3-falling edge is valid 4- rising and falling edges are valid	1	0	Effective immediately	Set when running	PST
P02	16	DI6 terminal logic selection	Input polarity: 0-4 0-low level effective 1-high level effective 2-rising edge is valid 3-falling edge is valid 4- rising and falling edges are valid	1	0	Effective immediately	Set when running	PST
P02	17	DI7 terminal logic selection	Input polarity: 0-4 0-low level effective 1-high level effective 2-rising edge is valid 3-falling edge is valid 4- rising and falling edges are valid	1	0	Effective immediately	Set when running	PST
P02	18	DI8 terminal logic selection	Input polarity: 0-4 0-low level effective 1-high level effective 2-rising edge is valid 3-falling edge is valid 4- rising and falling edges are valid	1	0	Effective immediately	Set when running	PST
P02	21	DO1 terminal function selection	Output code: 1 ~ 20 0: no definition 1~20: FunOUT.1~20 refer to DIDO function selection code definition	1	1	Effective immediately	Setting after motor stop	PST
P02	22	DO2 terminal function selection	Output code: 1 ~ 20 0: no definition 1~20: FunOUT.1~20 refer to DIDO function selection code definition	1	7	Effective immediately	Setting after motor stop	PST
P02	23	DO3 terminal function selection	Output code: 1 ~ 20 0: no definition 1~20: FunOUT.1~20 refer to DIDO function selection code definition	1	5	Effective immediately	Setting after motor stop	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P02	24	DO4 terminal function selection	Output code: 1 ~ 20 0: no definition 1~20: FunOUT.1~20 refer to DIDO function selection code definition	1	2	Effective immediately	Setting after motor stop	PST
P02	25	DO5 terminal function selection	Output code: 1 ~ 20 0: no definition 1~20: FunOUT.1~20 refer to DIDO function selection code definition	1	11	Effective immediately	Setting after motor stop	PST
P02	31	DO1 terminal logic level selection	Output polarity inversion setting: 0-1 0-conduct when active (normally open) 1- not conduct when active (normally closed)	1	0	Effective immediately	Setting after motor stop	PST
P02	32	DO2 terminal logic level selection	Output polarity inversion setting: 0-1 0-conduct when active (normally open) 1- not conduct when active (normally closed)	1	0	Effective immediately	Setting after motor stop	PST
P02	33	DO3 terminal logic level selection	Output polarity inversion setting: 0-1 0-conduct when active (normally open) 1- not conduct when active (normally closed)	1	0	Effective immediately	Setting after motor stop	PST
P02	34	DO4 terminal logic level selection	Output polarity inversion setting: 0-1 0-conduct when active (normally open) 1- not conduct when active (normally closed)	1	0	Effective immediately	Setting after motor stop	PST
P02	35	DO5 terminal logic level selection	Output polarity inversion setting: 0-1 0-conduct when active (normally open) 1- not conduct when active (normally closed)	1	0	Effective immediately	Setting after motor stop	PST

**P04 group: position control parameters**

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P04 00	Main position command A source	0-low speed pulse command 2-step amount given 4-multi-segment position command given 5-given through communication	1	0	Effective immediately	Setting after motor stop	P
P04 01	Reserved parameter		1	0	N/A	Reserved parameter	P
P04 02	Step amount	-9999 command units ~ 9999 command units	1Unit	50Unit	Effective immediately	Setting after motor stop	P
P04 03	Position command smoothing filter	0.0ms~6553.5ms	0.1ms	0.0ms	Effective immediately	Setting after motor stop	P
P04 04	Position command FIR filter	0.0ms~128.0ms	0.1ms	0.0ms	Effective immediately	Setting after motor stop	P
P04 05	Number of instruction unit required for one round (32-bit)	16 Unit/Turn ~ 1073741824 Unit/Turn	1Unit	0Unit	Re-power	Setting after motor stop	P
P04 07	Electronic gear 1 numerator (32 bit)	1~1073741824	1	4	Effective immediately	Set when running	P
P04 09	Electronic gear 1 denominator (32 bit)	1~1073741824	1	1	Effective immediately	Set when running	P
P04 11	Electronic gear 2 numerator (32 bit)	1~1073741824	1	4	Effective immediately	Set when running	P
P04 13	Electronic gear 2 denominator (32 bit)	1~1073741824	1	1	Effective immediately	Set when running	P
P04 21	Pulse shape	0-pulse + direction, positive logic. (Defaults) 1-direction + pulse, negative logic 2-A phase + B phase orthogonal pulse, positive logic 3-A phase + B phase orthogonal pulse, negative logic	1	0	Re-power	Setting after motor stop	P

P04	22	Position deviation clear function	0- Clear position deviation pulse when fault occurs or servo OFF 1- Clear the position deviation pulse only when a fault occurs 2- Cleared by DI input function (PERR-CLR)	1	0	Effective immediately	Setting after motor stop	P
P04	23	Positioning complete (COIN) output	0-Output when the absolute position deviation value is smaller than positioning completion range 1- Output when the absolute position deviation value is smaller than positioning completion range and the filtered position command is 0 2- Output when the absolute position deviation value is smaller than positioning completion range and position command is 0	1	0	Effective immediately	Setting after motor stop	P
P04	24	Positioning completion range	1P~65535P	1P	7P	Effective immediately	Setting after motor stop	P
P04	25	Positioning range close	1P~65535P	1P	65535P	Effective immediately	Setting after motor stop	P

### P05 group: speed control parameters

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P05	Main speed command A source	0-digit value(P0503) 3-multi-speed command 4-communication command given	1	0	Effective immediately	Setting after motor stop	S
P05	Auxiliary speed command B source	0-digit value(P0503) 3-multi-speed command 4-communication command given	1	3	Effective immediately	Setting after motor stop	S



P05	02	Speed command selection	0-main speed command A source 1-auxiliary speed command B source 2-A+B 3-A/B switching	1	0	Effective immediately	Setting after motor stop	S
P05	03	Speed command keyboard setting	-9000rpm ~ 9000rpm	1rpm	200rpm	Effective immediately	Set when running	S
P05	04	Jog speed setting	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	S
P05	05	Speed command acceleration time	0ms-10000ms	1ms	0ms	Effective immediately	Reserved parameter	S
P05	06	Speed command deceleration time	0ms-10000ms	1ms	0ms	Effective immediately	Reserved parameter	S
P05	08	Forward speed limit	0rpm-9000rpm	1rpm	9000rpm	Effective immediately	Set when running	S
P05	09	Backward speed limit	0rpm-9000rpm	1rpm	9000rpm	Effective immediately	Set when running	S
P05	15	Fixed speed for 0V input setting	0rpm~6000rpm	1rpm	10rpm	Effective immediately	Set when running	S
P05	16	Speed threshold of motor running signal output	0rpm~1000rpm	1rpm	20rpm	Effective immediately	Set when running	PS
P05	17	Speed uniform signal width	0rpm~100rpm	1rpm	10rpm	Effective immediately	Set when running	PS
P05	18	Speed reaches the specified value	0rpm~6000rpm	1rpm	1000rpm	Effective immediately	Set when running	PST
P05	19	Speed reaches the specified value width	0rpm~100rpm	1rpm	10rpm	Effective immediately	Reserved parameter	PST
P05	20	Zero speed judgment threshold	0rpm~6000rpm	1rpm	10rpm	N/A	Set when running	PST

### P06 group: torque control parameters

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P06 00	Main torque command A source	0-digit given (P06-05) 3-given through communication	1	0	Effective immediately	Setting after motor stop	T

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P06	01	Auxiliary torque command B source	0-digit given (P06-05) 3-given through communication	1	1	Effective immediately	Setting after motor stop	T
P06	02	Torque command selection	0-Main torque command A source 1- Auxiliary torque command B source 2-A+B source 3-A/B switching	1	0	Effective immediately	Setting after motor stop	T
P06	05	Torque command keyboard setting	-300.0% to 300.0% (based on rated motor torque)	0.1%	0.0%	Effective immediately	Set when running	T
P06	08	Forward internal torque limit	0.0%~500.0% (based on rated motor torque)	0.1%	300.0%	Effective immediately	Set when running	PST
P06	09	Backward internal torque limit	0.0%~500.0% (based on rated motor torque)	0.1%	300.0%	Effective immediately	Set when running	PST
P06	10	Forward side external torque limit	0.0%~500.0% (based on rated motor torque)	0.1%	300.0%	Effective immediately	Set when running	PST
P06	11	Backward side external torque limit	0.0%~500.0% (based on rated motor torque)	0.1%	300.0%	Effective immediately	Set when running	PST
P06	12	Emergency stop torque	0.0%~300.0% (based on rated motor torque)	0.1%	100.0%	Effective immediately	Set when running	PST
P06	15	Positive speed limit during torque control	0rpm-9000rpm	1	3000	Effective immediately	Set when running	T
P06	16	Negetive speed limit during torque control	0rpm-9000rpm	1	3000	Effective immediately	Set when running	T
P06	17	Torque arrival command reference value	0.0% to 500.0% (100% corresponds to the rated torque of the motor)	0.1%	0.0%	Effective immediately	Set when running	PST
P06	18	Torque effective arrival threshold	0.0% to 500.0% (100% corresponds to the rated torque of the motor)	0.1%	20.0%	Effective immediately	Set when running	PST
P06	19	Torque ineffective arrival threshold	0.0% to 500.0% (100% corresponds to the rated torque of the motor)	0.1%	10.0%	Effective immediately	Set when running	PST

**P07 group: gain parameter**

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P07	00	Position loop gain 1	1~2000.0	0.1HZ	320	Effective immediately	Set when running	P
P07	01	Speed loop gain 1	1~2000	0.1HZ	180	Effective immediately	Set when running	PS
P07	02	Speed loop integral time 1	15~51200	0.01ms	3100	Effective immediately	Set when running	PS
P07	03	Speed detection filter 1	0~200	0.01ms	60	Effective immediately	Set when running	PST
P07	04	Torque command filtering 1	126~65535	0.01ms	126	Effective immediately	Set when running	PST
P07	05	Position loop gain 2	1~2000.0	0.1HZ	380	Effective immediately	Set when running	P
P07	06	Speed loop gain 2	1~2000	0.1HZ	180	Effective immediately	Set when running	PS
P07	07	Speed loop integral time 2	15~51200	0.01ms	51200	Effective immediately	Set when running	PS
P07	08	Speed detection filter 2	0~200	0.01ms	0	Effective immediately	Set when running	PST
P07	09	Torque command filtering 2	126~65535	0.01ms	126	Effective immediately	Set when running	PST
P07	10	DI function GAIN-SWITCH switching action selection	0-speed loop regulator P (1) / PI (0) switch, gain is fixed to first group 1-first gain (0), second gain (1) switching	1	0	Effective immediately	Set when running	PS

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P07	11 Gain mode switching	0-first gain fixed 1-second gain fixed 2-using DI input (GAIN-SWITCH) 3-torque command greater 4-speed command change greater 5-speed command greater 6-position deviation greater (P) 7-receive position command (P) 8-positioning is not completed (P) 9-actual speed is greater (P) 10-receive position command and actual speed (P) 11-speed loop controller with PDFF control (PS) 12-reserved 13-speed loop controller with improved PI control (PS)	1	0	Effective immediately	Set when running	PS
P07	12 Gain delay switching	0~1000.0ms	0.1ms	5.0ms	Effective immediately	Set when running	PS
P07	13 Gain level switching	0~20000 (unit: according to the gain switching mode description)	1	50	Effective immediately	Set when running	PS
P07	14 Hysteresis time of gain switching	0~20000 (unit: according to the gain switching mode description)	1	33	Effective immediately	Set when running	PS
P07	15 Position gain switching time	0~1000.0ms	0.1ms	3.3ms	Effective immediately	Set when running	PS
P07	16 Speed regulator PDFF coefficient	0~100.0%	0.1%	100.0%	Effective immediately	Set when running	PS
P07	17 Improved speed PI control level	2~7	1	5	Effective immediately	Set when running	PS
P07	18 Anti-integration saturation coefficient	0~1.000	0.001	0.820	Effective immediately	Set when running	PS

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode	
P07	19	Speed feedforward control selection	0-no speed feedforward 1-internal speed feedforward 2-use AI1 as speed feedforward input 3-use AI2 as speed feedforward input 4-given through communication	1	1	Effectively immediately	Setting after motor stop	P
P07	20	Speed feedforward gain	0.0%~100.0%	0.1%	0.0%	Effectively immediately	Set when running	P
P07	21	Speed feedforward filter time parameter	0.00ms~64.00ms	0.01ms	0.50ms	Effectively immediately	Set when running	P
P07	22	Torque feedforward selection	0-no torque feedforward 1-internal torque feedforward 2-use AI1 as speed feedforward input 3-use AI2 as speed feedforward input 4-given through communication	1	1	Effectively immediately	Setting after motor stop	PS
P07	23	Torque feedforward gain	0.0%~100.0%	0.1%	0.0%	Effectively immediately	Set when running	PS
P07	24	Torque feedforward filter time parameter	0.00ms~64.00ms	0.01ms	0.50ms	Effectively immediately	Set when running	PS
P07	25	Speed offset superimposed threshold	0P~100P	1P	7P	Effectively immediately	Setting after motor stop	P
P07	26	Speed offset	0.0%~100.0%	0.1%	0.0%	Effectively immediately	Set when running	P
P07	27	Voltage feedforward gain	0.000~1.000	0.001	0.000	Effectively immediately	Set when running	PST
P07	28	Id set	0~65535	0.001	0.000	Effectively immediately	Set when running	PST

### P09 group: failure and protection

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode	
P09	00	Power input lack phase protection option	0-Enable fault, disable warning 1-Enable faults and warnings 2- Prohibited faults and warnings	1	2	Effectively immediately	Set when running	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P09	01	Power output lack phase protection selection	0-Enable protection 1-Prohibited protection	1	0	Effective immediately	Set when running	PST
P09	03	Reserved	-	-	-	Effective immediately	Set when running	PST
P09	04	Motor out of control protection	0- protection open 1- protection off	1	0	Effective immediately	Set when running	PST
P09	05	Overload warning value	1%~100%	1%	100%	Effective immediately	Set when running	PST
P09	06	Motor overload protection factor	10%~300%	1%	100%	Effective immediately	Set when running	PST
P09	07	Undervoltage protection point	50% to 100% (100% corresponds to the default undervoltage point)	1%	100%	Effective immediately	Set when running	PST
P09	08	Overspeed fault point	50%~120% (100% corresponds to maximum motor speed)	1%	120%	Effective immediately	Set when running	PST
P09	09	Position deviation excessive threshold (32 bit)	1P~1073741824P (encoder unit)	1P	32767P	Effective immediately	Set when running	PST
P09	12	Command pulse input pin filter time	0-255	20ns	360ns	Re-power	Setting after motor stop	P
P09	13	Quadrature encoder filter time	0-255	20ns	720ns	Re-power	Setting after motor stop	PST

### P11 group: auxiliary function parameters

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P11	00	Keyboard JOG trial run	0-no operation 1-start JOG	1	0	Effective immediately	Setting after motor stop	PST
P11	01	Fault reset	0-no operation 1-fault reset	1	0	Effective immediately	Setting after motor stop	PST
P11	02	Software reset	0-no operation 1-software reset	1	0	Effective immediately	Reserved parameter	PST
P11	03	Inertia recognition function	0-no operation 1-Start inertia recognition	1	0	Effective immediately	Setting after motor stop	PST
P11	04	Initial angle recognition	0-no operation 1-start angle initialization	1	0	Effective immediately	Reserved parameter	PST

							eter	
P11	09	System initialization function	0-no operation 1-Restore factory setting (except P1 and P17 parameters) 2- Clear the fault record	1	0	Effective immediately	Setting after motor stop	PST
P11	10	DIDO forced input and output enable	0-no operation 1- forced DI enable 2-forced DO enable 3-forced DIDO enabled	1	0	Effective immediately	Set when running	PST
P11	11	Set DI forced input	0-0x01FF	1	0x01FF	Effective immediately	Set when running	PST
P11	12	Set DO forced output	0-0x001F	1	0	Effective immediately	Set when running	PST

### P12 group: keyboard display parameters

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P12	00	LED warning display selection	0-LED immediately outputs warning message 1-LED does not output warning message	1	0	Effective immediately	Set when running PST
P12	01	Default display settings		1	1	Effective immediately	Set when running PST
P12	03	Speed display filter time	0~1000.0ms	0.1 ms	5.0ms	Effective immediately	Set when running PST
P12	12	Software version number	VV.B.DD	1	0	N/A	Display parameter
P12	14	Product series code	PP.XXX	1	0	N/A	Display parameter

### P13 group: multi-segment position

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P13	00	Multi-segment position operation mode	0- stop after the end of single operation (P1301 for segment number selection) 1-cycle operation (P1301 for segment number selection) 2-DI switching operation (selected by DI) 3-sequential operation (P1301 for segment number selection)	1	1	Effective immediately	Setting after motor stop P
P13	01	Specify starting segment	1~16	1	1	Effective immediately	Setting after motor stop P

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode	
P13	02	Specify segment end	1~16	1	1	Effective immediately	Setting after motor stop	P
P13	03	Interrupted position handle setting	Valid in the other three modes except DI mode 0: continue to run the segment that has not finished 1: restart from the first segment	1	0	Effective immediately	Setting after motor stop	P
P13	04	Waiting time unit	0-ms 1-s	1	0	Effective immediately	Setting after motor stop	P
P13	05	Position control method	0-incremental position control 1-absolute position control	1	0	Effective immediately	Setting after motor stop	P
P13	08	Segment 1: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	10	Segment 1: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	11	Segment 1: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P
P13	12	Segment 1: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	13	Segment 2: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	15	Segment 2: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	16	Segment 2: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P
P13	17	Segment 2: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	18	Segment 3: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	20	Segment 3: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	21	Segment 3: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P



Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P13	22	Segment 3: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	23	Segment 4: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	25	Segment 4: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	26	Segment 4: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P
P13	27	Segment 4: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	28	Segment 5: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	30	Segment 5: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	31	Segment 5: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P
P13	32	Segment 5: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	33	Segment 6: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	35	Segment 6: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	36	Segment 6: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P
P13	37	Segment 6: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	38	Segment 7: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	40	Segment 7: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	41	Segment 7: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P13	42	Segment 7: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	43	Segment 8: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	45	Segment 8: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	46	Segment 8: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P
P13	47	Segment 8: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	48	Segment 9: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	50	Segment 9: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	51	Segment 9: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P
P13	52	Segment 9: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	53	Segment 10: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	55	Segment 10: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	56	Segment 10: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P
P13	57	Segment 10: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	58	Segment 11: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	60	Segment 11: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	61	Segment 11: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P13	62	Segment 11: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running P
P13	63	Segment 12: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running P
P13	65	Segment 12: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running P
P13	66	Segment 12: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running P
P13	67	Segment 12: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running P
P13	68	Segment 13: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running P
P13	70	Segment 13: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running P
P13	71	Segment 13: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running P
P13	72	Segment 13: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running P
P13	73	Segment 14: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running P
P13	75	Segment 14: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running P
P13	76	Segment 14: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running P
P13	77	Segment 14: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running P
P13	78	Segment 15: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running P
P13	80	Segment 15: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running P
P13	81	Segment 15: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running P

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode	
P13	82	Segment 15: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P
P13	83	Segment 16: movement displacement (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	10000Unit	Effective immediately	Set when running	P
P13	85	Segment 16: maximum running speed	0rpm~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P13	86	Segment 16: acceleration/deceleration time	0~65535	1ms(1s)	10ms(s)	Effective immediately	Set when running	P
P13	87	Segment 16: waiting time after completion	0~10000	1ms(s)	1000ms(s)	Effective immediately	Set when running	P

### P14 group Multi-speed command

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode	
P14	00	Multi-speed command operation mode	0- stop after the end of single operation (P1401 for segment number selection) 1-cycle operation (P1401 for segment number selection) 2-DI switching operation (selected by DI)	1	1	Effective immediately	Setting after motor stop	S
P14	01	Speed command end segment selection	1~16	1	16	Effective immediately	Setting after motor stop	S
P14	02	Running time unit selection	0-s 1-min	1	0	Effective immediately	Setting after motor stop	S
P14	03	Acceleration/deceleration time 1	0ms- 65535ms	1ms	10ms	Effective immediately	Setting after motor stop	S
P14	04	Acceleration/deceleration time 2	0ms- 65535ms	1ms	10ms	Effective immediately	Setting after motor stop	S

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P14 05	Acceleration/deceleration time 3	0ms-65535ms	1ms	10ms	Effective immediately	Setting after motor stop	S
P14 06	Acceleration/deceleration time 4	0ms-65535ms	1ms	10ms	Effective immediately	Setting after motor stop	S
P14 07	Speed segment 1	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 08	Running time of speed segment 1	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14 09	Speed up and down time of speed segment 1	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 10	Speed segment 2	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 11	Running time of speed segment 2	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14 12	Speed up and down time of speed segment 2	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 13	Speed segment 3	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 14	Running time of speed segment 3	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P14 15	Speed up and down time of speed segment 3	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 16	Speed segment 4	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 17	Running time of speed segment 4	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14 18	Speed up and down time of speed segment 4	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 19	Speed segment 5	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 20	Running time of speed segment 5	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14 21	Speed up and down time of speed segment 5	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 22	Speed segment 6	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 23	Running time of speed segment 6	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P14 24	Speed up and down time of speed segment 6	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 25	Speed segment 7	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 26	Running time of speed segment 7	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14 27	Speed up and down time of speed segment 7	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 28	Speed segment 8	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 29	Running time of speed segment 8	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14 30	Speed up and down time of speed segment 8	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 31	Speed segment 9	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 32	Running time of speed segment 9	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P14 33	Speed up and down time of speed segment 9	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 34	Speed segment 10	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 35	Running time of speed segment 10	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14 36	Speed up and down time of speed segment 10	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 37	Speed segment 11	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 38	Running time of speed segment 11	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14 39	Speed up and down time of speed segment 11	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 40	Speed segment 12	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 41	Running time of speed segment 12	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S



Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P14 42	Speed up and down time of speed segment 12	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 43	Speed segment 13	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 44	Running time of speed segment 13	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14 45	Speed up and down time of speed segment 13	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 46	Speed segment 14	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 47	Running time of speed segment 14	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14 48	Speed up and down time of speed segment 14	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14 49	Speed segment 15	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14 50	Running time of speed segment 15	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P14	51	Speed up and down time of speed segment 15	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S
P14	52	Speed segment 16	-9000 ~ +9000rpm	1rpm	0rpm	Effective immediately	Setting after motor stop	S
P14	53	Running time of speed segment 16	0~6553.5	0.1s(min)	5.0s(min)	Effective immediately	Setting after motor stop	S
P14	54	Speed up and down time of speed segment 16	0-zero acc./dec. time 1- acc./dec. time 1 2- acc./dec. time 2 3- acc./dec. time 3 4- acc./dec. time 4	1	0	Effective immediately	Setting after motor stop	S

#### P16 group: special function parameters

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P16	08	Homing enable control	0-turn off homing function; 1-Enable homing function by DI input HomingStart signal; 2- Start homing immediately after power-on; 3- Immediately start homing; 4- Taking the current position as home;	1	0	Effective immediately	Setting after motor stop	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P16	09	Homing mode	0- forward homing, deceleration and home points are home switch; 1- backward homing, deceleration and home points are home switch; 2- forward homing, deceleration and home points are motor Z signal; 3- backward homing, deceleration and home points are motor Z signal; 4- forward homing, deceleration point is origin switch, home is motor Z signal; 5- backward homing, deceleration point is origin switch, home is motor Z signal; 6- forward homing, deceleration and home points are forward overtravel switch; 7- backward homing, deceleration and home points are backward overtravel switch; 8- forward homing, deceleration point is forward overtravel switch, home is motor Z signal; 9- backward homing, deceleration point is backward overtravel switch, home is motor Z signal; 10- forward homing, no deceleration point, home is home switch; 11- backward homing, no deceleration point, home is home switch; 12- forward homing, no deceleration point, home is motor Z signal; 13- backward homing, no deceleration point, home is motor Z signal; 14- forward homing, no deceleration point, home is forward overtravel switch; 15- backward homing, no deceleration point, home is backward overtravel switch;	1	0	Effectively immediately	Setting after motor stop	P
P16	10	High-speed for searching home switch signal	10 rpm -3000 rpm	1 rpm	100 rpm	Effectively immediately	Setting after motor stop	P

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode	
P16	11	Low-speed for searching home switch signal	10 rpm -1000 rpm	1 rpm	10 rpm	Effective immediately	Setting after motor stop	P
P16	12	Limit the accel. / decel. time for searching home	0-65535ms	1ms	1000ms	Effective immediately	Setting after motor stop	P
P16	13	Limit time for finding home	0-65535ms	1ms	10000ms	Effective immediately	Setting after motor stop	P
P16	14	Mechanical home offset (32 bits)	-1073741824 ~ 1073741824(command unit)	1Unit	0 Unit	Effective immediately	Setting after motor stop	P

### P18 group: display parameters

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode	
P18	00	Servo status	rdy、run、Err.00~99 (error)、AL.00~10(warning)	1	-	N/A	Display parameter	PST
P18	01	Motor speed feedback (32 bit)	-9000rpm~9000rpm	1rpm	-	N/A	Display parameter	PST
P18	03	Speed command	-9000rpm~9000rpm	1rpm	-	N/A	Display parameter	PST
P18	04	Internal torque command (based on rated torque)	-500.0%~500.0%	0.1%	-	N/A	Display parameter	PST
P18	05	Phase current RMS	0.00A~655.35A	0.01A	-	N/A	Display parameter	PST
P18	06	Bus voltage value	0V~1000V	0.1V	-	N/A	Display parameter	PST
P18	07	Absolute position counter (32 bit)	-1073741824 ~ 1073741824(command unit)	1Unit	-	N/A	Display parameter	PST
P18	09	Electrical angle	0.0~360.0 degree	0.1 degree	-	N/A	Display parameter	PST
P18	10	Mechanical angle (based encoder zero point)	0.0~360.0 degree	0.1 degree	-	N/A	Display parameter	PST
P18	11	Reserved parameter		1	-	N/A	Reserved parameter	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P18	12	Corresponding speed information of input position command	-9000rpm~9000rpm	1rpm	-	N/A	Display parameter	PST
P18	13	Position deviation counter (32 bit)	-1073741824 ~ 1073741824(Encoder minimum resolution unit)	1P	-	N/A	Display parameter	PST
P18	15	Input command pulse counter (32 bit)	-1073741824 ~ 1073741824(command unit)	1Unit	-	N/A	Display parameter	PST
P18	17	Feedback pulse counter (32 bit)	-1073741824 ~ 1073741824(Encoder minimum resolution unit)	1P	-	N/A	Display parameter	PST
P18	19	Position deviation counter command unit (32 bit)	-1073741824 ~ 1073741824(command unit)	1Unit	-	N/A	Display parameter	PST
P18	21	Digital input signal monitoring	-	-	-	N/A	Display parameter	PST
P18	23	Digital output signal monitoring	-	-	-	N/A	Display parameter	PST
P18	25	Total power-on time (32-bit)	0.0-429496729.6s	0.1s	-	N/A	Display parameter	PST
P18	31	Module temperature value	-	1°C	-	N/A	Display parameter	PST
P18	40	Display of fault record	0-current fault 1- the first fault before current fault 2- the second fault before current fault ..... 9- the 9th fault before current fault	1	0	Effective immediately	Set when running	PST
P18	41	error code	-	-	-	N/A	Display parameter	PST
P18	42	Selected fault timestamp (32 bit)	-	0.1s	-	N/A	Display parameter	PST
P18	44	In-time speed at selected fault	-	1rpm	-	N/A	Display parameter	PST
P18	45	In-time current U at selected fault	-	0.01A	-	N/A	Display parameter	PST
P18	46	In-time current V at selected fault	-	0.01A	-	N/A	Display parameter	PST

Function code	Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P18 47	Bus voltage at selected fault	-	0.1V	-	N/A	Display parameter	PST
P18 48	Input terminal status at selected fault	-	-	-	N/A	Display parameter	PST
P18 49	Output terminal status at selected fault	-	-	-	N/A	Display parameter	PST

### DIDO assignment basic function definition

Input signal function description				
Code	Name	Function Name	Description	Status
FunIN.1	S_ON	Servo enable	Invalid - Servo motor enable disabled Active - Servo motor power-on enable	Assign
FunIN.2	ALM_RST	Alarm reset signal (edge valid function)	According to the type of alarm, the servo can continue to work after some alarms are reset. This function is edge effective. When the terminal is set to level effective, it is still only valid when edge change is detected.	Assign
FunIN.3	GAIN_SWITCH	Proportional motion switching / gain switching	When P07.10=0: Invalid - speed control loop is PI control Valid - speed control loop is P control  When P07.10=1: Invalid - use the first set of gains Valid - use the second set of gains	Assign
FunIN.4	CMD_SWITCH	Main and auxiliary running command switching	Invalid - the current run command is A Valid - the current run command is B	Assign
FunIN.5	PERR_CLR	Pulse deviation clear	Recommend to set rising or falling edge effective Invalid - no action Valid - clear pulse deviation	Assign
FunIN.6	CMD1	Multi-segment running command switching CMD1	16 segment command selection	Assign
FunIN.7	CMD2	Multi-segment running command switching CMD2	16 segment command selection	Assign
FunIN.8	CMD3	Multi-segment running command switching CMD3	16 segment command selection	Assign
FunIN.9	CMD4	Multi-segment running command switching CMD4	16 segment command selection	Assign
FunIN.10	MODE_SWITCH	Mode switching M1-SEL	Switch between speed, position and torque according to the selected control mode (3, 4, 5)	Assign

Input signal function description				
Code	Name	Function Name	Description	Status
FunIN.11	ZERO_CLAMP	Zero position fixed function enable signal	Valid -enable zero position fixed function, Invalid-disable zero position fixed function	Assign
FunIN.12	INHIBIT	Pulse inhibit	Valid - disable command pulse input Invalid - allow command pulse input	Assign
FunIN.13	P_OT	Forward overtravel	When the mechanical movement exceeds the movable range limit switch, the overtravel protection function is activated. Active-forward overtravel, forward run disabled Invalid - normal range, forward run enabled	Assign
FunIN.14	N_OT	Backward overtravel	When the mechanical movement exceeds the movable range limit switch, the overtravel protection function is activated. Active-backward overtravel, backward run disabled Invalid - normal range, backward run enabled	Assign
FunIN.15	Reserved			Assign
FunIN.16	Reserved			Assign
FunIN.17	P_JOG	Forward JOG	Valid - input according to given command Invalid - stop input run command	Assign
FunIN.18	N_JOG	Backward JOG	Valid - input reversely according to given command Invalid - stop input run command	Assign
FunIN.23	GEAR_SWITCH	Electronic gear selection	Invalid - electronic gear ratio 1 Valid - electronic gear ratio 2	Assign
FunIN.24	POS_DIR	Position command reversal	Invalid - no reversal; effective - reversal	Assign
FunIN.25	SPD_DIR	Speed command reversal	Invalid - no reversal; effective - reversal	Assign
FunIN.26	TOG_DIR	Torque command reversal	Invalid - no reversal; effective - reversal	Assign
FunIN.29	PSEC_EN	Internal multi-segment position enable signal	Edge effective: Invalid - ignore internal multi-segment command; Valid - start internal multi-segment	Assign
FunIN.30	XINT_FINISH	External confirmation signal of interrupt fixed length completion	Edge valid Invalid - no response; valid - trigger interrupt	Assign
FunIN.31	XINT_DISABLE	Disable interrupt fixed length	Level effective Invalid - no response; valid - trigger interrupt	Assign
FunIN.32	HOME_SWITCH	Home switch signal	Mechanical home switch	Assign
FunIN.33	HOME_START	Homing enable signal	Homing start	Assign
FunIN.34	ESTOP	Emergency stop		Assign
FunIN.35	POS_RUN	Position loop constant speed running		Assign

Input signal function description				
Code	Name	Function Name	Description	Status
FunIN.36	XINT_RST	Reset interrupt fixed length	Forced to exit the fixed length state	Assign
FunIN.37	RUN_SUSPEND	Pause interrupt fixed length	Pause interrupt fixed length operation	Assign
FunIN.38	TCMD1	Multi-segment torque command 1	3 segmen torque command selection	Assign
FunIN.39	TCMD2	Multi-segment torque command 2	3 segmen torque command selection	Assign
FunIN.40	Reserved			Assign
FunIN.41	Reserved			Assign

## Appendix A: Error Code Table

Error number Er_	Error Name	Cause of Error	Stop method when error occurs	Fault reseta ble
1	System parameter exception	The data of the servo internal parameters is abnormal.	No.1	No
2	Product model selection failure	Invalid motor model or drive model	No.1	No
3	Motor data verification failure	Motor ROM data check error or no data	No.1	No
4	Fault in parameter storage	1 parameter storage device failure 2 parameters read and write too frequently 3 control power supply instability 4 drive failure	No.1	No
6	Program exception	1 system parameter abnormal 2 drive internal failure	No.1	No
7	Control circuit undervoltage	Control circuit undervoltage	No.1	No
8	Short circuit to ground detection failure	1 drive or motor parameters are incorrect; 2 UVW phase-to-phase short circuit; 3 the motor burned out; 4 motor is shorted to ground; 5 drive failure;	NO.1	No
9	Overcurrent fault A	1 drive or motor parameters are incorrect; 2 UVW phase-to-phase short circuit; 3 motor burned out; 4 motor is shorted to ground; 5 drive failure;	NO.1	No
10	Overcurrent fault B	1 servo motor wiring is wrong; 2 software detects the overcurrent of the power transistor;	No.1	No
11	Encoder disconnection	Encoder disconnection	No.1	No
12	Encoder AB signal is abnormal	Encoder AB signal is abnormal	No.1	No
13	Encoder check exception	Encoder zero point check exception	No.1	No



Error number Er_	Error Name	Cause of Error	Stop method when error occurs	Fault resettable
14	Motor initial angle detection abnormal	Motor initial angle detection abnormal	No.1	No
15	Motor out of control	1 motor UVW phase sequence setting error 2 UVW wiring error 3 Initial position or encoder parameter setting error	No.1	No
16	Current sampling fault	Current sampling fault	No.1	No
20	Overvoltage	Main circuit DC voltage is abnormally high	No.1	Yes
21	Undervoltage	Main circuit DC voltage low fault	No.1	Yes
22	Overspeed	1 speed command exceeds the maximum speed set value 2 UVW phase sequence error 3 speed response severely exceeded limit 4 drive failure	No.1	Yes
27	DI terminal parameter setting fault	Different DI are assigned the same function repeatedly;	No.1	Yes
28	DO terminal parameter setting fault	Different DO are assigned the same function repeatedly;	No.1	Yes
30	Reference position failure	Reference position failure	No.1	Yes
43	Position deviation is too large	In servo ON state, the position deviation exceeds the position deviation fault value (P09.09)	No.2	Yes
44	Main circuit input lack phase	When the power input lack phase protection selects parameter P09-00=0 (enable fault, disable warning) or P09-00=1 (enable fault and warning): 1 three-phase input line is wrongly connected 2 three-phase drive operates under single-phase power	No.2	Yes
46	Drive overload	The load operation exceeds the inverse time curve of the drive; The UVW output may lack phase or phase sequence connected incorrectly;	No.2	Yes
47	Motor overload	The load operation exceeds the inverse time curve of the motor; The UVW output may lack phase or phase sequence connected incorrectly;	No.2	Yes
49	Electronic gear setting error	Electronic gear ratio exceeds standard range [0.001, 4000]	No.2	Yes
50	Heat sink/fan overheating	Servo unit heat sink/fan exceeds the set fault value	No.2	Yes

Warning code EE	Warning name	Warning reason
81	Drive overload warning	Failure when 80% of the drive overload fault value is reached
82	Motor overload warning	The warning before the motor is about to fail, the warning value is determined by P09_05
83	Changed parameters need to be re-powered to take effect	Changed parameters that need to be re-powered
86	Forward overtravel warning	Forward overtravel switch Pot terminal is valid

87	Backward overtravel warning	Backward overtravel switch Not terminal is valid
90	External regenerative resistor overload	External regenerative resistor power is too small
91	External regenerative resistor is too small	The external regenerative resistance is less than the minimum required by the driver; Or parameter setting error
94	DI emergency brake	External emergency brake E_STOP terminal trigger
96	Homing timeout	1 home switch failure 2 time limit to find the origin is too short 3 the high speed of searching home switch signal is too small
97	Mechanical home offset error	1 When the home return mode parameter P16-09=6 or P16-09=8 or P16-09=14, the mechanical home offset parameter P16-14 is set to a value greater than 0. 2 When the home return mode parameter P16-09=7 or P16-09=9 or P16-09=15, the mechanical home offset parameter P16-14 is set to less than 0.
98	Main circuit input lack phase	When the power input lack phase protection selects parameter P09-00=1 (enable fault and warning), the driver with rated power of 0.8kW, 1.0kW, 1.5kW, 3.0kW will report a warning when the main circuit input voltage is single-phase.

## Appendix B: Version Change Record

Date	Version after hanged	Changed content
2019-03-12	V1.0	Initial release