AS2 Series

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

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Content

Chapter 1: Selection of Servo System

1.1 Drive specifications

Table 1-1 AS2 series servo drive basic specifications

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<tr><td colspan="3">Continuous output current Arms</td><td>1.6</td><td>2.8</td><td>5.5</td><td>7.6</td><td>11.6</td></tr>
<tr><td colspan="3">Maximum output current Arms</td><td>5.8</td><td>10</td><td>17</td><td>17</td><td>28</td></tr>
<tr><td colspan="2" rowspan="2">Power supply input</td><td rowspan="2">220VAC</td><td>Main power</td><td colspan="4">single/3 phase, AC200～230V, 50/60HZ</td></tr>
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<tr><td colspan="2" rowspan="5">Working environment</td><td colspan="2">Temperature</td><td colspan="4">Working：0℃～50℃
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<tr><td colspan="2">Humidity</td><td colspan="4">Below 0～90% RH（No condensation）</td></tr>
<tr><td colspan="2">Working altitude</td><td colspan="4">Under altitude 1000m</td></tr>
<tr><td colspan="2">Vibration/strike</td><td colspan="4">＜1G</td></tr>
<tr><td colspan="2">IP Grade / Pollution level</td><td colspan="4">IP20/ Pollution level 2</td></tr>
<tr><td colspan="4">Control method</td><td colspan="4">IGBT PWM space vector control</td></tr>
<tr><td colspan="4">Encoder</td><td colspan="4">17bit serial incremental type / 17bit serial absolute type / 23bit serial incremental type / 23bit serial absolute type</td></tr>
<tr><td colspan="2" rowspan="6">IO port</td><td rowspan="2">IO signal</td><td>Input</td><td colspan="4">8（common）</td></tr>
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<tr><td colspan="4">Panel operator</td><td colspan="4">LED display</td></tr>
<tr><td colspan="4">Regeneration function</td><td colspan="4">Built-in braking resistor for 1000W and above models</td></tr>
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CW/CCW;
A, B phase orthogonal pulse;</td></tr>
<tr><td colspan="2">Position input circuit</td><td colspan="4">Line Driver；Open Collector</td></tr>
<tr><td colspan="2">Maximum input frequency</td><td colspan="4">Line Driver low speed 1Mpps
Line Driver high speed 4Mpps
Open Collector 200Kpps</td></tr>
<tr><td colspan="2">Smoothing filter</td><td colspan="4">Smoothing the position command to make the motor run smoother and more stable</td></tr>
<tr><td colspan="2">Electronic gear</td><td colspan="4">Provide 2 sets of electronic gear ratio</td></tr>
<tr><td colspan="2">Vibration suppression filter</td><td colspan="4">Effectively suppress external signal interference and system resonance frequency to ensure stable operation of equipment</td></tr>
<tr><td colspan="2" rowspan="7">Speed control mode</td><td colspan="2">Command form</td><td colspan="4">Analog voltage command, internal speed command</td></tr>
<tr><td rowspan="3">Speed change rate</td><td>Voltage fluctuation</td><td colspan="4">Rated voltage ±10%: 0.5% (at rated speed)</td></tr>
<tr><td>Load fluctuation</td><td colspan="4">0-100% load: ≤ 0.5% (at rated speed)</td></tr>
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<tr><td colspan="2">Acceleration deceleration setting range</td><td colspan="4">0-10S</td></tr>
<tr><td colspan="2">Analog speed command input</td><td colspan="4">-10V～+10V</td></tr>
<tr><td colspan="2">Torque control mode</td><td colspan="2">Command form</td><td colspan="4">Analog voltage command, internal torque command</td></tr>
</table>

	Analog torque command input	-10V～+10V
Common	Self-tuning function	Inertia identification, rigid setting
	Encoder feedback electronic gear	Setting freely
	Abnormal information record	8 groups historical information records

1.2 Servo motors and drives model description

Drive model description

$$\text{AS2} - \text{04} \quad \text{B} \quad \text{A} \quad \text{I} \quad - \quad \text{XX}$$

① ② ③ ④ ⑤ ⑥

①	AC servo series	AS2：YAKO AS2 series AC servo drive
②	Power	02: 200W 04: 400W 10: 1KW 15: 1.5KW 30: 3KW
③	Voltage level	B：220V T：3 phase 380V
④	Product type	A: Advanced
⑤	Installation methods	I: Flange installation
⑥	Customized model	xx：Customized design number

Servo motor model description

$$\underline{\text{ASM}}\ \underline{\text{D}}\ -\underline{\text{08}}-\underline{\text{10}}\ \underline{\text{30}}\ \underline{\text{B}}\ -\ \underline{\text{A}}\ \underline{1}\ \underline{1}\ \underline{1}\ -\ \underline{\text{XX}}$$

① ②   ③   ④ ⑤ ⑥   ⑦ ⑧ ⑨ ⑩

①	Series	YAKO 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	A5: 50W 01: 100W 02: 200W 04: 400W 08: 750W 10: 1KW 15: 1.5KW 30: 3KW
⑤	Rated speed(rpm)	10: 1000rpm 15: 1500 rpm 20: 2000 rpm 25: 2500 rpm 30: 3000 rpm
⑥	Voltage level	B：200V T：400V
⑦	Encoder type	A: 17-bit incremental type B: 17-bit absolute type C: 23-bit incremental type D: 23-bit absolute type
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 drive and servo motor matching

Table 1-2 Servo drive and motor matching table

Servo motor model		Flange	Power	Rated speed	Max Speed	Drive model AS2-□□BAI	Drive SIZE
Small inertia	ASMD-04-A530B	40	50W	3000rpm	5000rpm	02B	B
	ASMD-04-0130B	40	100W	3000rpm	5000rpm	02B	B
	ASMD-06-0230B	60	200W	3000rpm	5000rpm	02B	B
	ASMD-06-0430B	60	400W	3000rpm	5000rpm	04B	B
Big inertia	ASMJ-06-0230B	60	200W	3000rpm	5000rpm	02B	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-09-1025B	90	1KW	2500rpm	3300rpm	10B	B
	ASMJ-11-1230B	110	1.2KW	3000rpm	3500rpm	15B	C
	ASMJ-11-1530B	110	1.5KW	3000rpm	3100rpm	15B	C
	ASMJ-11-1830B	110	1.8KW	3000rpm	3200rpm	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-13-0915B	130	0.85KW	1500rpm	3000rpm	15B	C
	ASMH-13-1315B	130	1.3KW	1500rpm	3000rpm	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	Small inertia, small capacity	ASMD-04-A530B-A***	1001
			ASMD-04-0130B-A***	1002
			ASMD-04-0130B-D***	4002
			ASMD-06-0230B-A***-S	5402
			ASMD-06-0430B-A***-S	5403
		High inertia, small capacity	ASMJ-04-0130B-A***-S	5401
			ASMJ-06-0230B-A***	1006
			ASMJ-06-0430B-A***	1007
			ASMJ-06-0430B-D***	4007
			ASMJ-06-0430B-A***-S	5404
			ASMJ-08-0830B-A***	1008
			ASMJ-08-0830B-D***	4008
			ASMJ-08-1030B-D***-B	4118
			ASMJ-09-1030B-D***	4122
			ASMJ-11-1230B-D***	4112
			ASMJ-11-1530B-D***	4103
			ASMJ-11-1830B-D***	4108
			ASMJ-13-1025B-D***	4104
			ASMJ-13-1525B-D***	4105
			ASMJ-13-2025B-D***	4109
			ASMJ-13-2625B-D***	4110
		High inertia, medium capacity	ASMH-13-0915B-D***(-N,-H)	4202
			ASMH-13-1315B-D***(-N,-H)	4203

Note：

The above motor models are not completely listed. For more models, please contact technical support.

17bit Inc. When configure encoder, the fourth digit of the motor number is "1"

17bit Abs. When configure encoder, the fourth digit of the motor number is "2"

23bit Inc. When configure encoder, the fourth digit of the motor number is "3"

23bit Abs. When configure encoder, the fourth digit of the motor number is "4"

For example, the motor code "01105" is ASMJ-13-1525B-A***

For example, the motor code "02105" is ASMJ-13-1525B-B***

For example, the motor code "03105" is ASMJ-13-1525B-C***

For example, the motor code "04105" is ASMJ-13-1525B-D***

1.5 Auxiliary cable

Power cable naming rule:

P1 －AS1 － 03 P04 M

  ①   ②   ③ ④ ⑤

①	Wire type	P1: normal plug P2: Aviation plug
②	Drive series	AS1 series, compatible with ES1/ES2/AS2 series
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— AS1 — 03   A   F

① ② ③ ④ ⑤

①	Wire type	P1: normal plug P2: Aviation plug
②	Drive series	AS1 series, compatible with ES1/ES2/AS2 series
③	Cable length	03: 3 meter 05: 5 meter 10: 10 meter
④	Encoder spec	A：17bit inc. B：17bit abs. C：23bit inc. D：23bit abs.
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	
	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	
	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 (Ω)	Capacitor maximum braking energy (J)
		Resistance (Ω)	Resistance (Ω)		
Single phase 220	AS2-02BAI	-	-	90	9
	AS2-04BAI	-	-	45	18
Single/3 phase 220V	AS2-10BAI	50	50	30	26
3 phase 220V	AS2-15BAI	25	80	20	47
	AS2-30BAI	25	80	15	47

Chapter 2: Product Installation and Dimensions

2.1 Servo drive dimensions
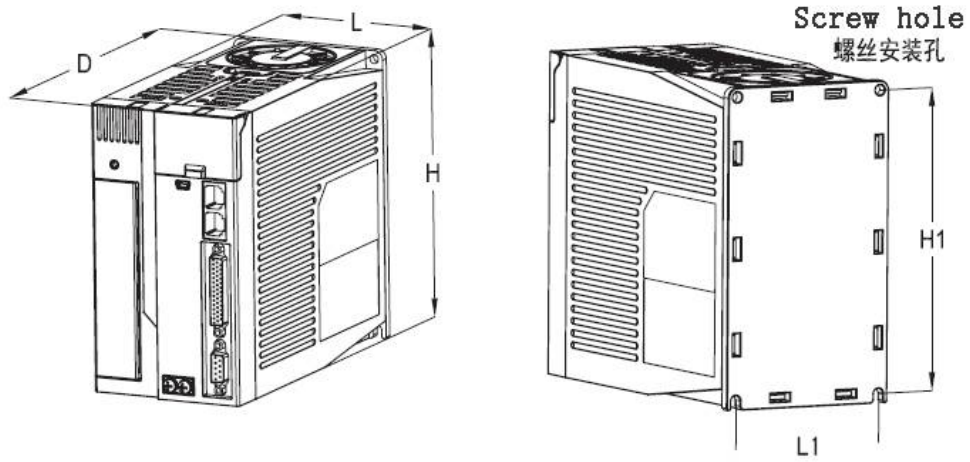
Frame B: AS2-02B, AS2-04B, AS2-10B

Frame C: ,AS2-15B, AS2-30B

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
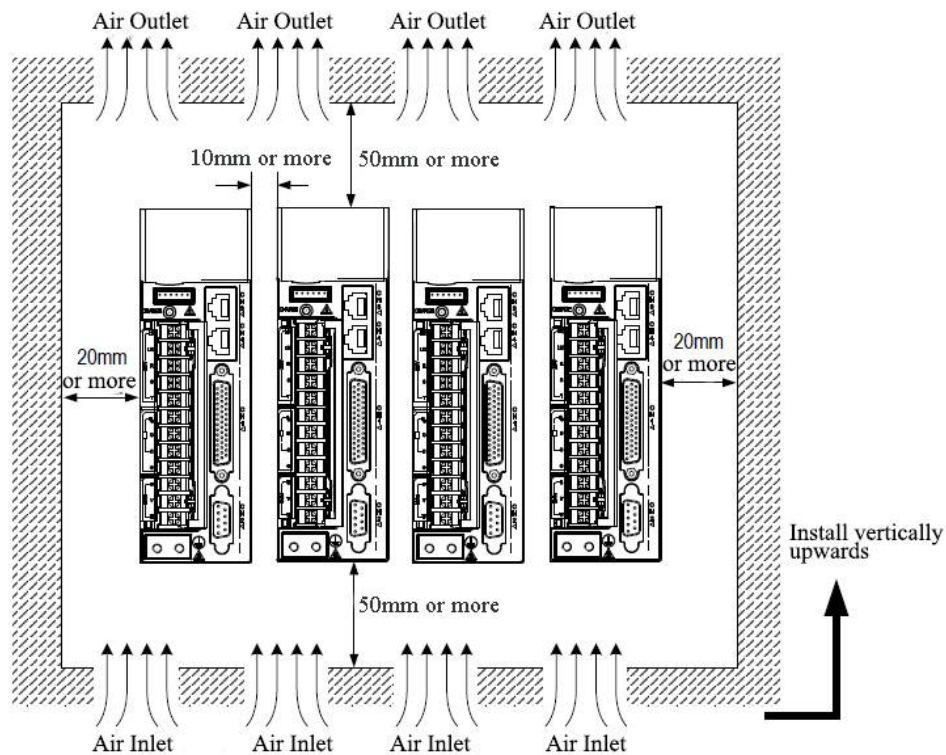
Figure 2-1 Servo drive installation

Chapter 3: Servo Drive and Motor Connection

3.1 System structure diagram
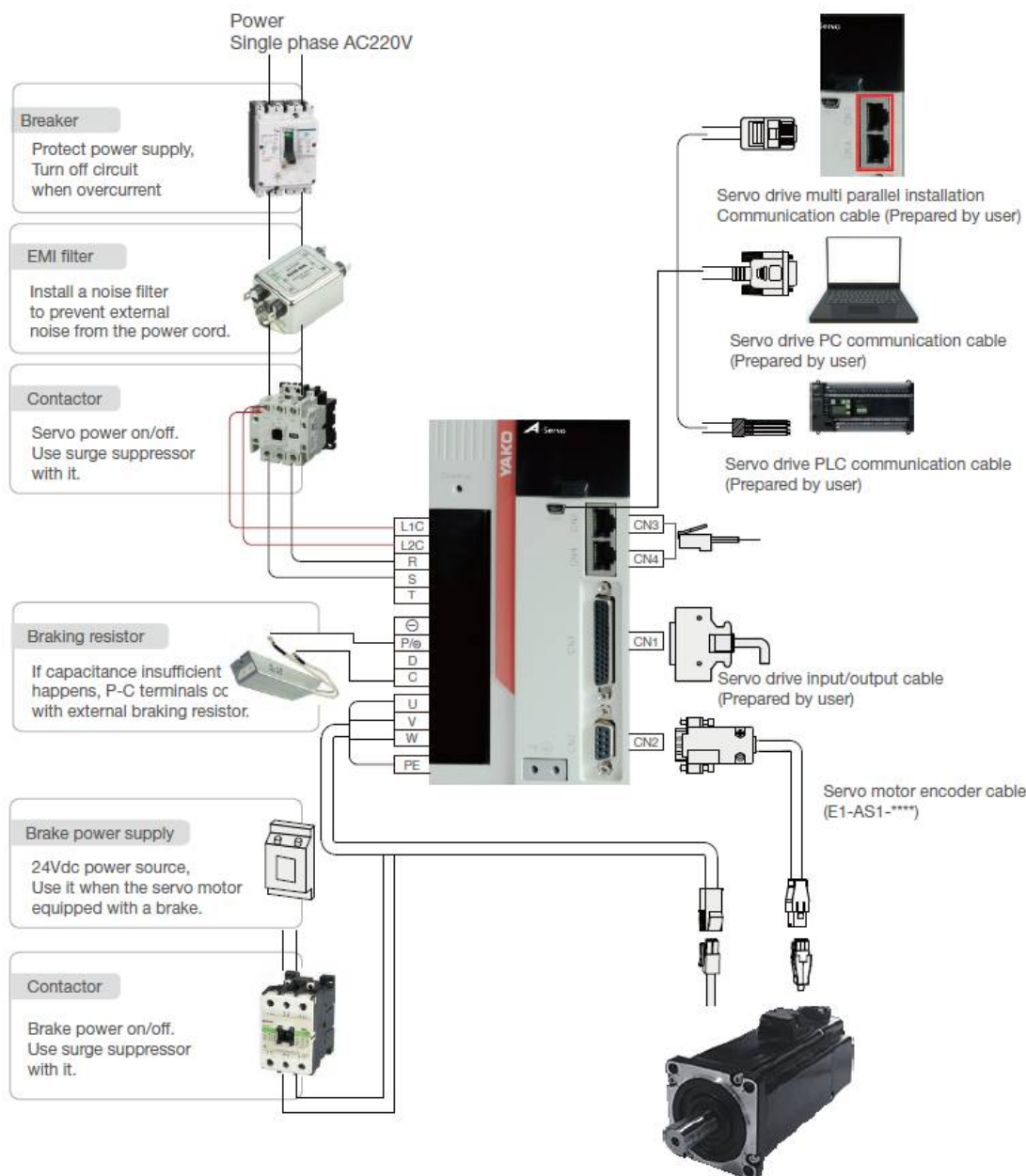
Figure 3-1 System structure diagram

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⊕, D, C External regenerative resistor terminal	The default wiring is P⊕ connected with D. When using an external regenerative resistor, disconnect P⊕ and D first, and connect an external regenerative resistor between P⊕ and C.
4	U, V, W, PE Motor power cable	Connect servo motor three-phase and ground wire

		terminal	
5		Communication control CN3,CN4	Connected to RS485 command device or RS232 command device
6		Control port CN1	Connect to host controller for IO signal control
7		Encoder feedback port CN2	Connected to the motor encoder cable

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

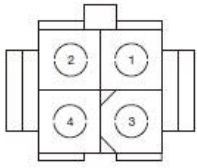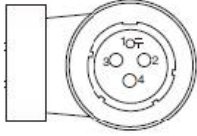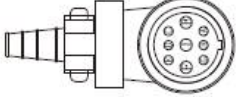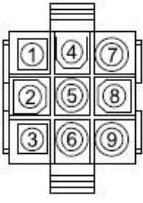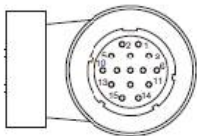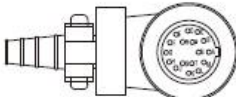| Name	Terminal mark	Function, specification
Main circuit power input terminal	R、S	Single-phase AC220V power input
	R、S、T	Three-phase AC220V power input
Control circuit power input terminal	L1C、L2C	Control loop power, input according to specifications
External regenerative resistor connection terminal	P⊕、D、C	By default, short wires are connected between P⊕-D. When the braking force is insufficient, please make an open circuit between P⊕-D. (remove the short wiring) and connect external braking resistor between P⊕-C External braking resistors should be purchased separately.
Common DC terminal	P⊕、⊖	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	Encoder signal	Functional description
1	--	Encoder signal
2	--	
3	SD+	
4	SD-	
5	--	
6	--	
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	U		
	2	V		Recommend：
	3	W		Plastic shell：AMP-172159-1
	4	PE		Terminal：AMP-170362-1
	4 Pin aviation plug YD28K4TS-E			
	Pin Number	Signal Type		100、110、130
	1	PE		
	2	U		Aviation plug：
	3	V		YD28K4TS-E
	4	W		
	9 Pin aviation plug SMS3102A20-18P			
	Pin Number	Signal Type		130
	B	U		
	I	V		Military standard
	F	W		aviation plug：
	C	PE		SMS3102A20-18P
	D	BR+		
	E	BR-		
	9 Pin connector			
	Pin Number	2500-Wire Signal	17Bit Signal	40、60、80、90
	3	A+	--	
	6	A-	--	
	2	B+	SD+	
	5	B-	SD-	Recommend：
	1	Z+	BAT+	Plastic shell：AMP-172161-1
	4	Z-	BAT-	Terminal：AMP-170361-1
	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	
	3	GND	GND	
	4	A+	--	
	7	A-	--	
	5	B+	SD+	Aviation plug：
	8	B-	SD-	YD28K15TS-E
	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	
	B	GND	GND	
	C	A+	--	
	D	A-	--	
	E	B+	SD+	Military standard
	F	B-	SD-	aviation plug：
	G	PE	PE	SMS3102A20-29P
	J	Z+	BAT+	
	K	Z-	BAT-	

3.4 Control signal
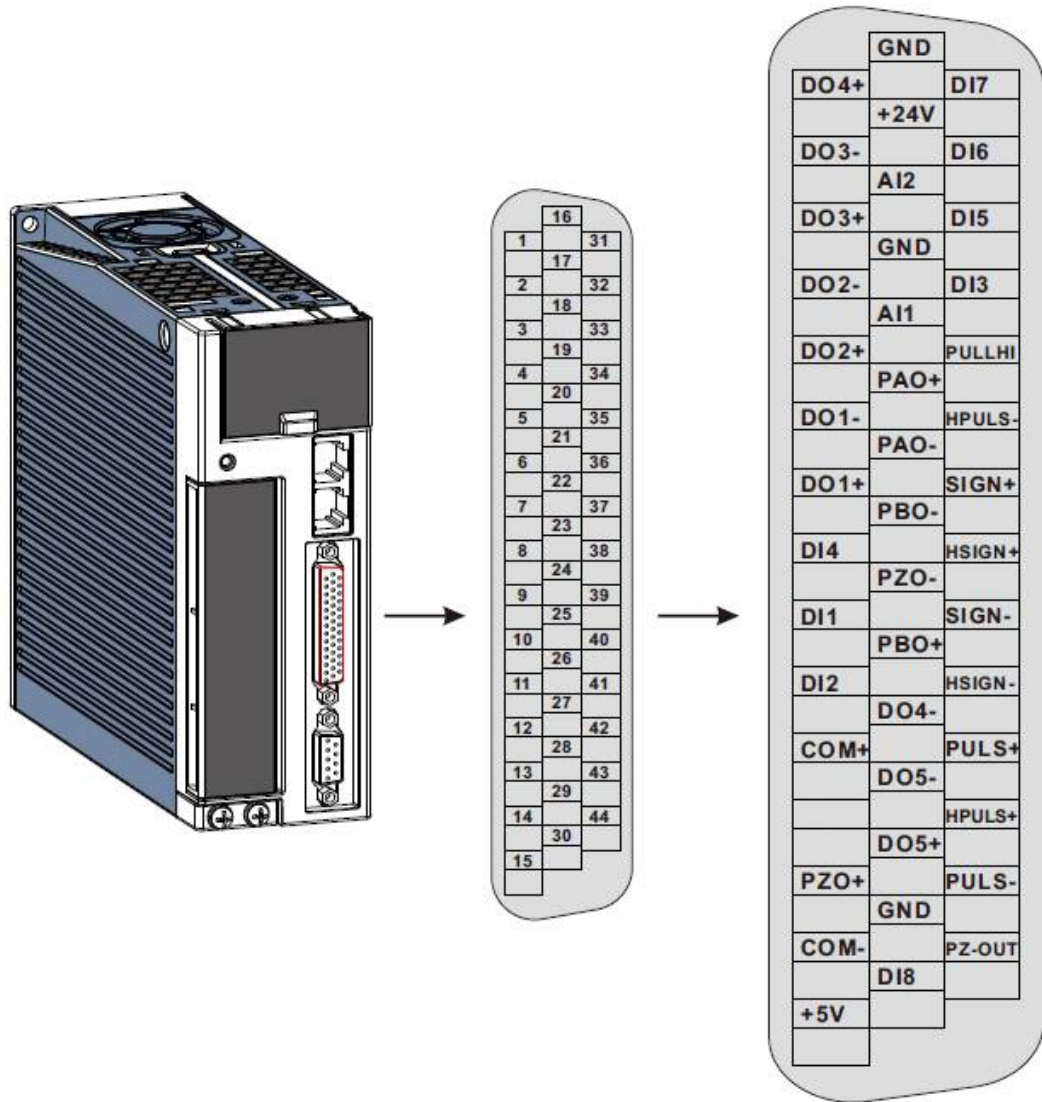
Table 3-5 Control terminal PIN definition

Definition		PIN	Function	
Position command	PILS+	41	Low speed pulse command (differential or single ended)	Differential drive input or open collector input
	PULS-	43		
	SIGN+	37	Low speed pulse command (differential or single ended)	
	SIGN-	39		
	HPULS+	42	High speed pulse command input, differential input required	
	HPULS-	36		
	HSIGN+	38	High speed pulse command input, differential input required	
	HSIGN-	40		
	PULLHI	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	Z-phase pulse collector open output	

		Default function	Functional description
GND	29		Z-phase pulse collector open circuit output signal ground; differential signal ground
+5V	15		Internal 5 V supply with a maximum output current 200 mA
GND	16		
PE	Shell		
AI1	20		Speed, torque analog voltage command input, range ±10V
AI2	18		
GND	19		Analog signal ground
		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
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-	

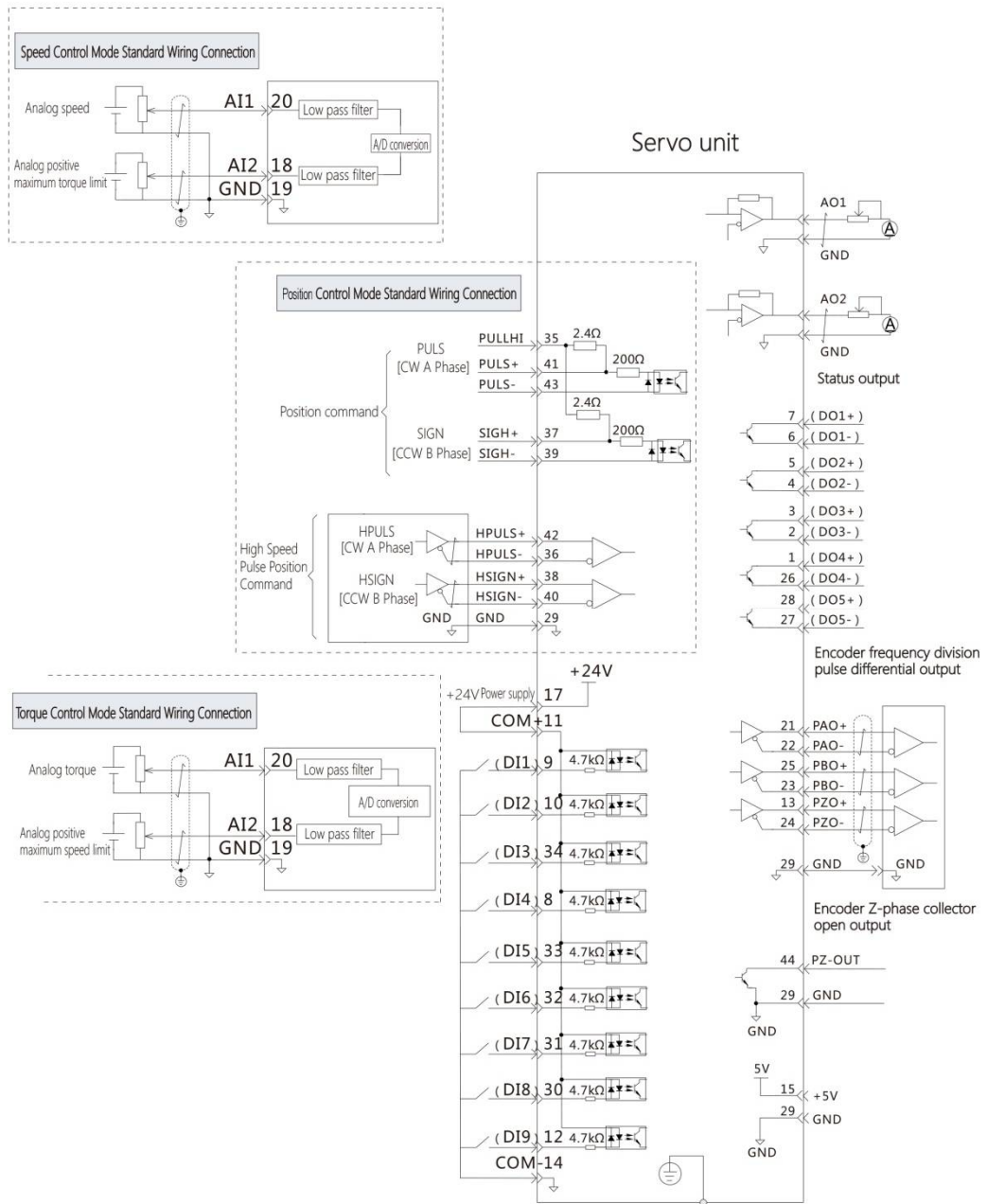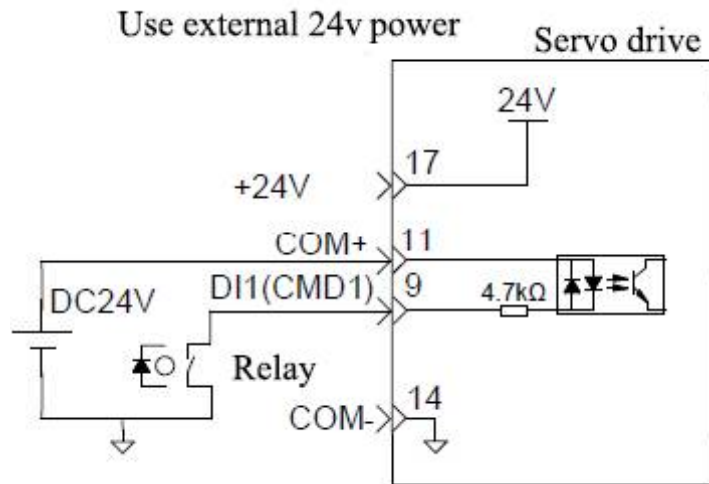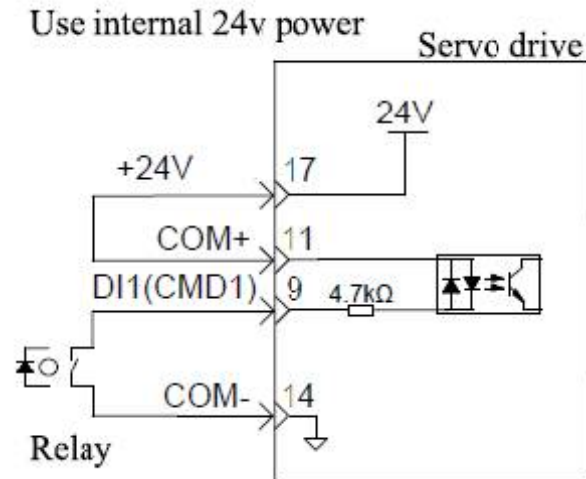(Left side vertical labels: Analog signal input; General purpose input and output signal)

Figure 3-2 General view of the control mode
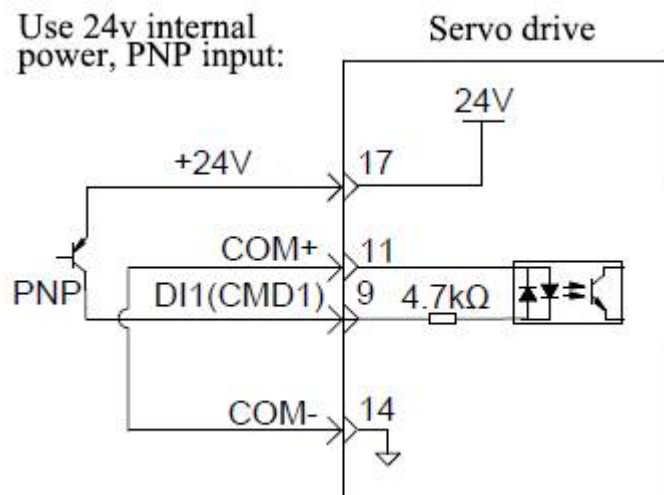
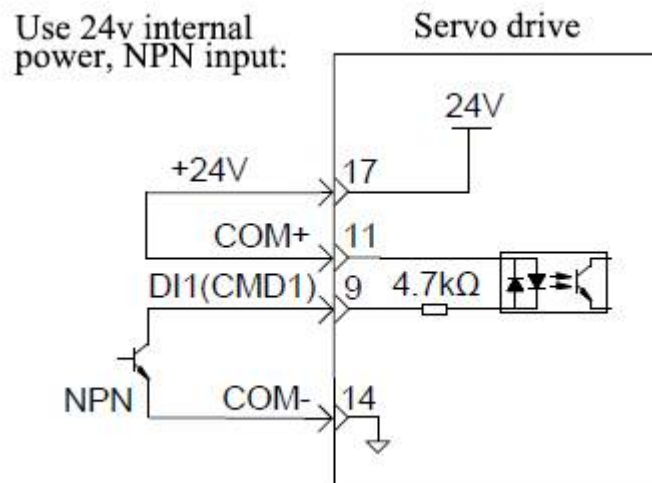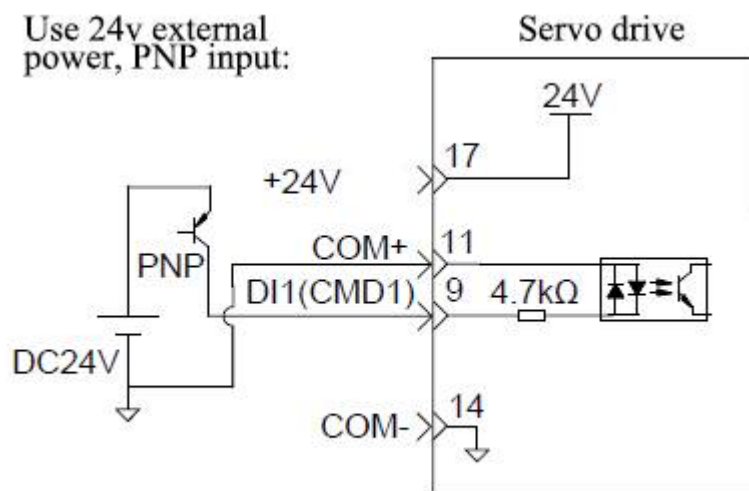**3.4.1 Digital input and output signal**

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

Use 24v internal power, NPN input:

Servo drive

24V

+24V   17

COM+   11

DI1(CMD1)   9   4.7kΩ

NPN   COM-   14

Use 24v internal power, PNP input:

Servo drive

24V

+24V   17

COM+   11

PNP   DI1(CMD1)   9   4.7kΩ

COM-   14

b） When the host computer is open collector output

Use 24v external power, NPN input:

Servo drive

24V

17

+24V

COM+ 11

DI1(CMD1) 9 4.7kΩ

DC24V NPN

COM- 14

Use 24v external power, PNP input:

Servo drive

24V

17

+24V

PNP

COM+ 11

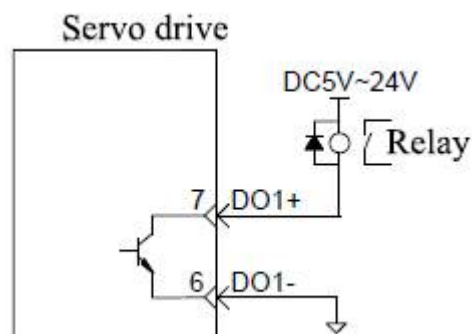DI1(CMD1) 9 4.7kΩ

DC24V

COM- 14

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

Servo drive

DC5V~24V

Relay

7 DO1+

6 DO1-

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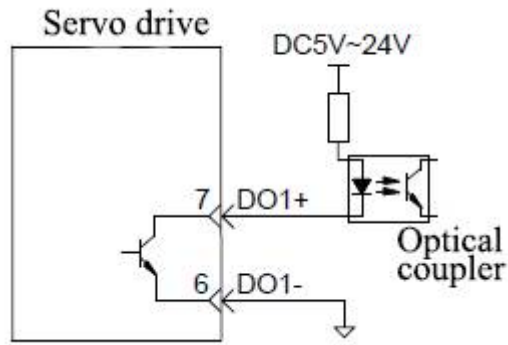
Note: 1. Be sure to connect a current limiting resistor;
2. The maximum allowable voltage and current of the internal optocoupler circuit of the servo driver are as follows:

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

3.4.2 Analog input signal

Signal name	Default function	Pin number	Function description
Analog signal	AI1	20	Analog voltage input signal, resolution: 12bit, Range: -10V ~ +10V
	AI2	18	
	GND	19	Analog input signal ground

Speed and torque analog input port, reference P03 group setting for voltage value corresponding command;
Voltage input range: -10V ~ +10V, resolution 12bit
Maximum allowable voltage: ±12V
Input resistor is around 9KΩ
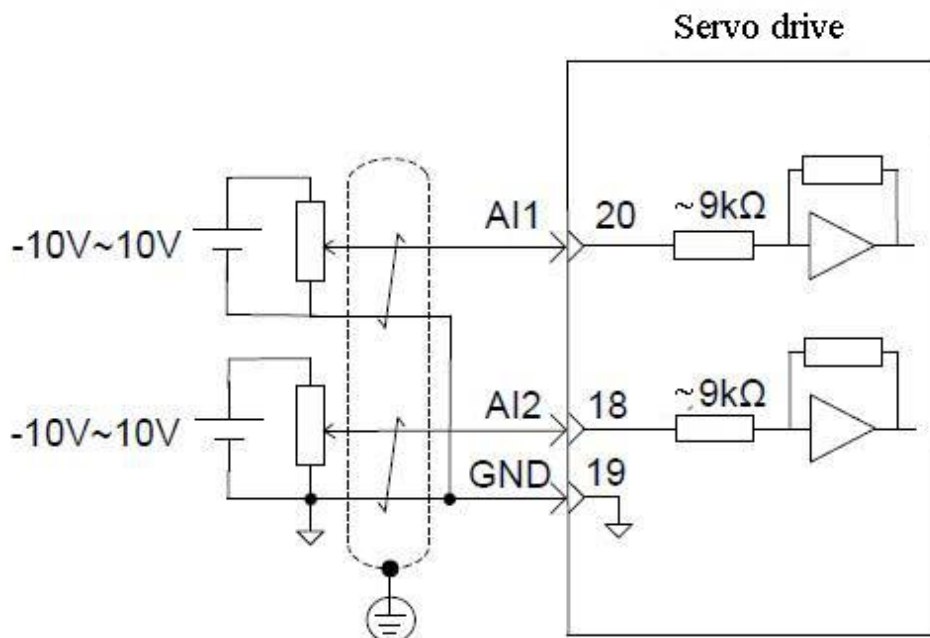
3.4.3 Position command input signal

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

Pulse mode		Maximum frequency（HZ）	Minimum pulse width（us）
Low speed	Differencial	1M	0.5
	Open collector	200K	2.5
High speed differential		4M	0.125

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）Low speed pulse command input
    a）Differential mode
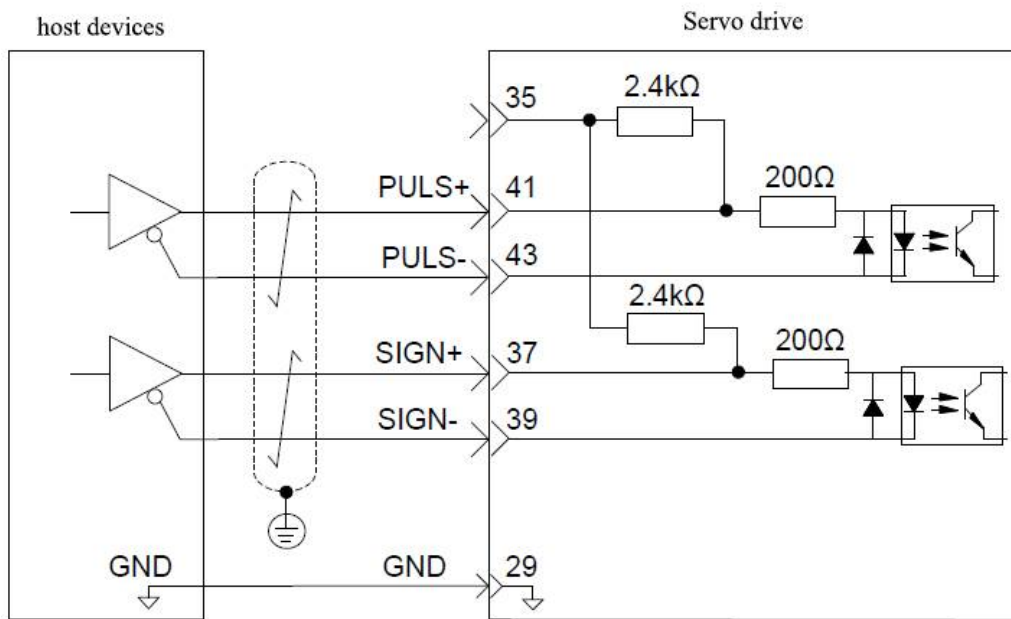
    b）Open collector mode
    ① Use the internal 24V power supply of the drive
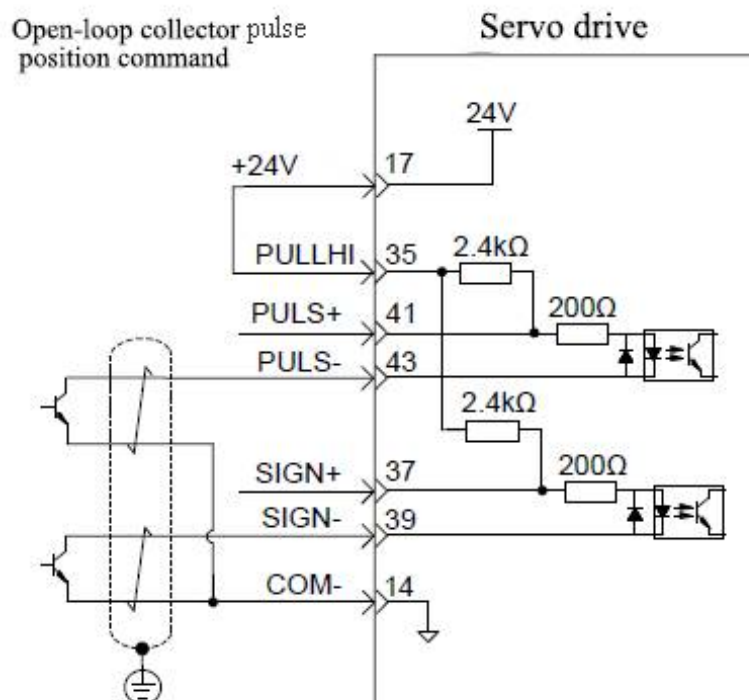
②   Use an external power supply

Option 1: Use the internal resistance of the drive (recommended)
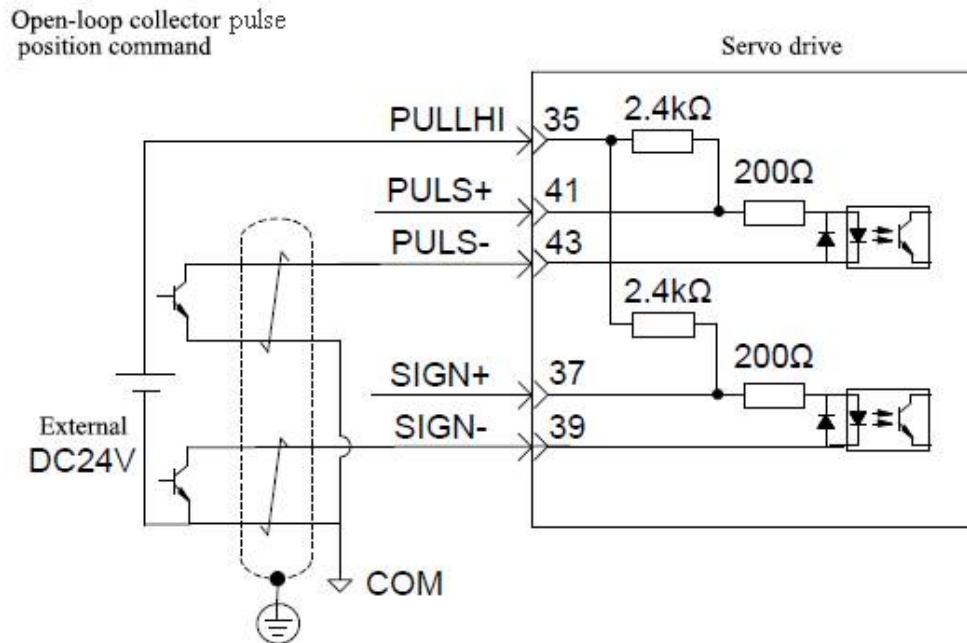
Option 2: Use external resistors and NPN type
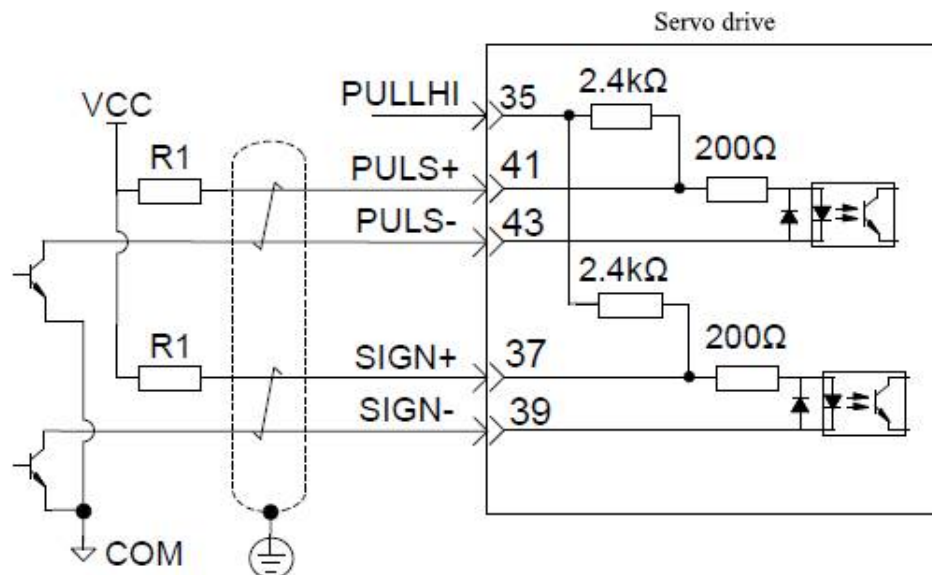
Option 3: Use external resistors and PNP type
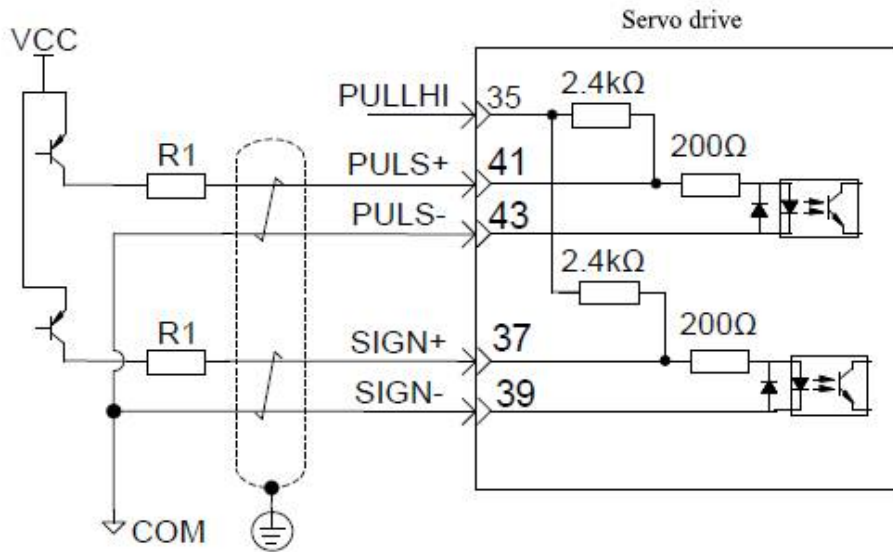
Resistance R1 select formula：$\dfrac{V_{CC}-1.5}{R1+200} = 10mA$

R1 recommended values

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

2）High speed pulse command input

High-speed pulse commands only support differential inputs.
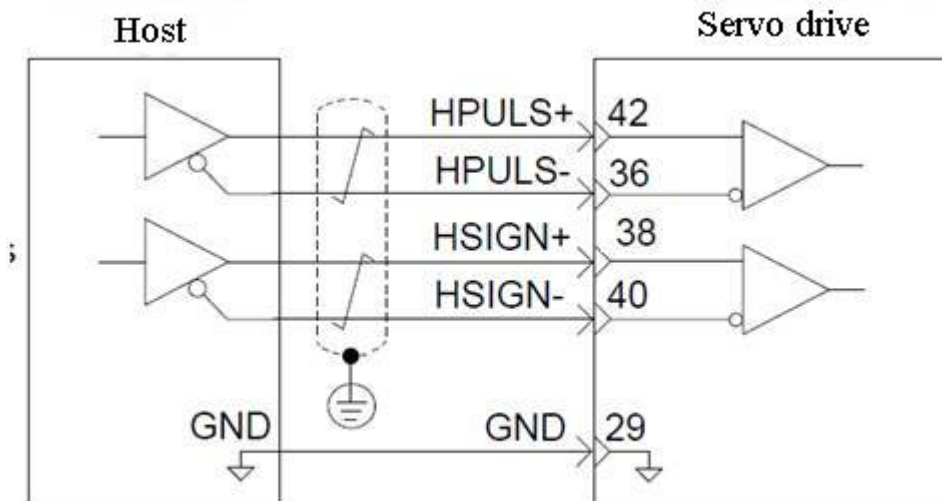
Ensure that the differential input is 5V, otherwise the servo drive input pulse is unstable. It will cause the following problem:
● When a command pulse is input, pulse loss occurs;
● When direction command is input, it is reversed.
Be sure to connect the 5V ground of the host device to the GND of the driver to reduce noise interference.
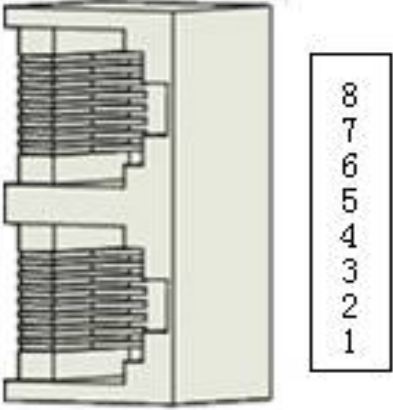
3.5 Communication signals

3.5.1 Industrial bus port CN3/CN4

CN3 and CN4 are used as industrial bus communication ports and host computer communication interfaces.

Table 3-7 Communication cable connector PIN definitions

PIN	Definition	Function	Pin distribution
1	--		
2	--		
3	GND(RS485)	RS485 communication port	
4	RS485+		
5	RS485-		
6	RS232-TXD	RS232 communication port	
7	RX232-RXD		
8	GND(RS232)		
Shell	PE	Shield	

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:
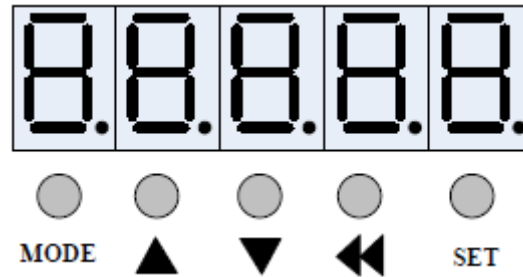
Operation and display interface

1. Button name and function operation

LED display	5 digit 7 part LED display to show servo status and setting
Button	

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

2. 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
"AS2"	AS2	Displays this character when the drive is powered-on for initialization, indicating the serial number of the drive.
"08bA1" （example）	08bA1	Displays this character when the drive is powered-on for initialization, indicating the model of the drive.
"nrd"	nrd	Not ready: after the start or reset is completed, the servo is not ready, for example, the main circuit is not powered.
"rdy"	rdy	Ready: the servo system passed self-test, waiting for host control device to give a servo enable signal.
"run"	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"	Er.✳✳✳	Error: servo system has an error. The three digits of "xxx" represent error code. For the error code, please refer to Chapter 6.

3. 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:

Running status display mode   Parameter browsing or setting mode
(Level 0 menu)
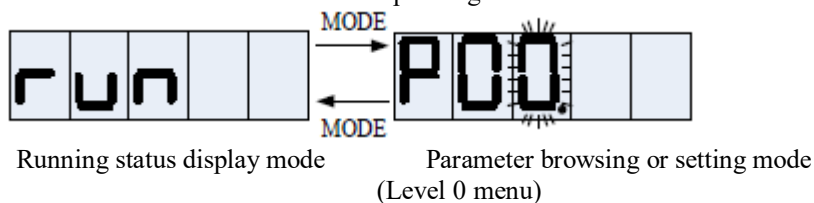
When switching to the parameter display mode, the parameter group number is displayed first in three digits of "Pxx.", also called "level 0 menu". One of the displayed bits is flashing. At this time, press the up ▲ or down ▼ button, the number of the flashing digit will increase or decrease by 1; if the left button ◀◀ is pressed, the flashing digit will move, which is convenient to set to the desired group number:
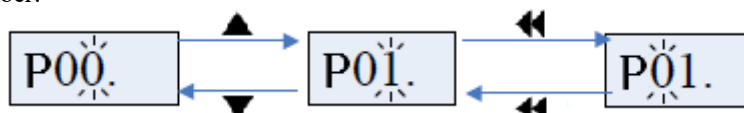
When the desired group number is set, press the SET button to enter the setting status of the parameter number in the group. "Pxx.xx", also called "level 1 menu", is displayed at this time,. After the function code number is confirmed, press the SET button to enter the parameter setting state, also called "Level 2 menu". If the parameter can be modified, the lowest bit will flash, then press ◀◀ / ▲ / ▼ to modify, as shown below:
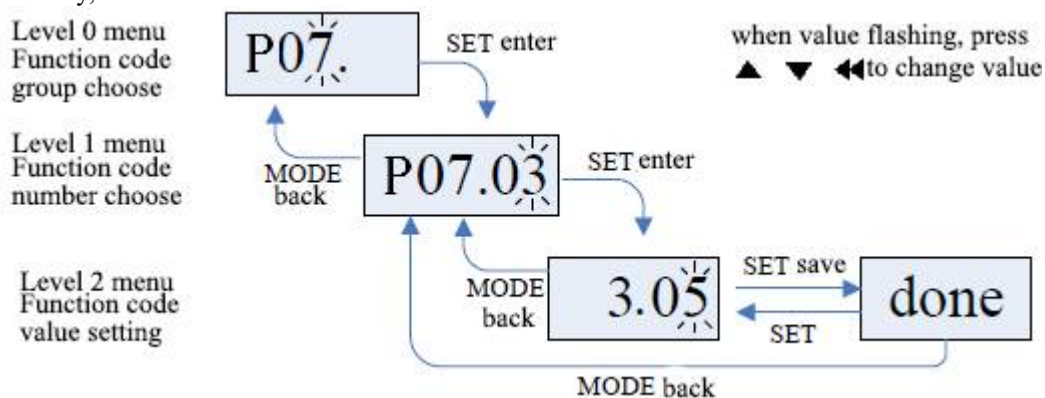
When the SET button is pressed after modification, the word "done" will be displayed. If the modified value is not changed, the word "done" will not be displayed. Press the MODE button to exit status monitoring mode and enter parameter mode for parameter viewing and modification.

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:
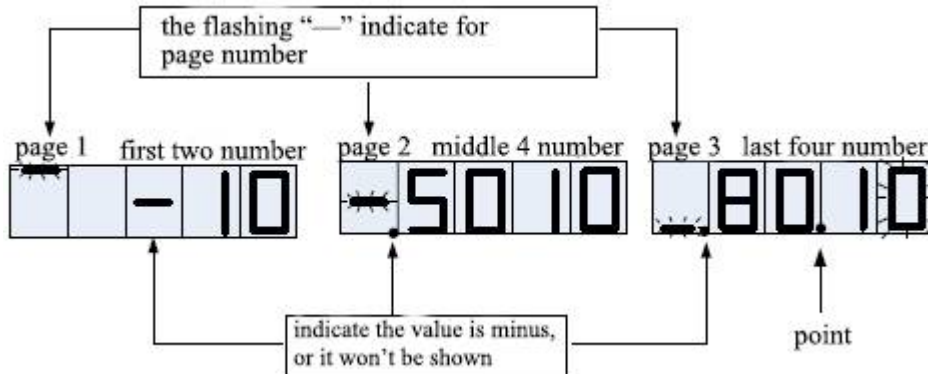
When using the SHIFT button to shift, it will automatically switch to the corresponding display segment. For example, suppose the current flashing bit is thousand. When using SHIFT, it will automatically switch to the middle four digit display, and the 10,000 digit (that is, the rightmost digit of this 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.
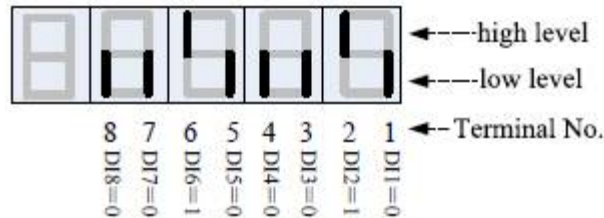
The meaning of the above figure are as follows: DI1＝0；DI2＝1；DI3＝0；DI4＝0；DI5＝0；DI6＝1；DI7＝0；DI8＝0。

4.2 Operating mode instructions

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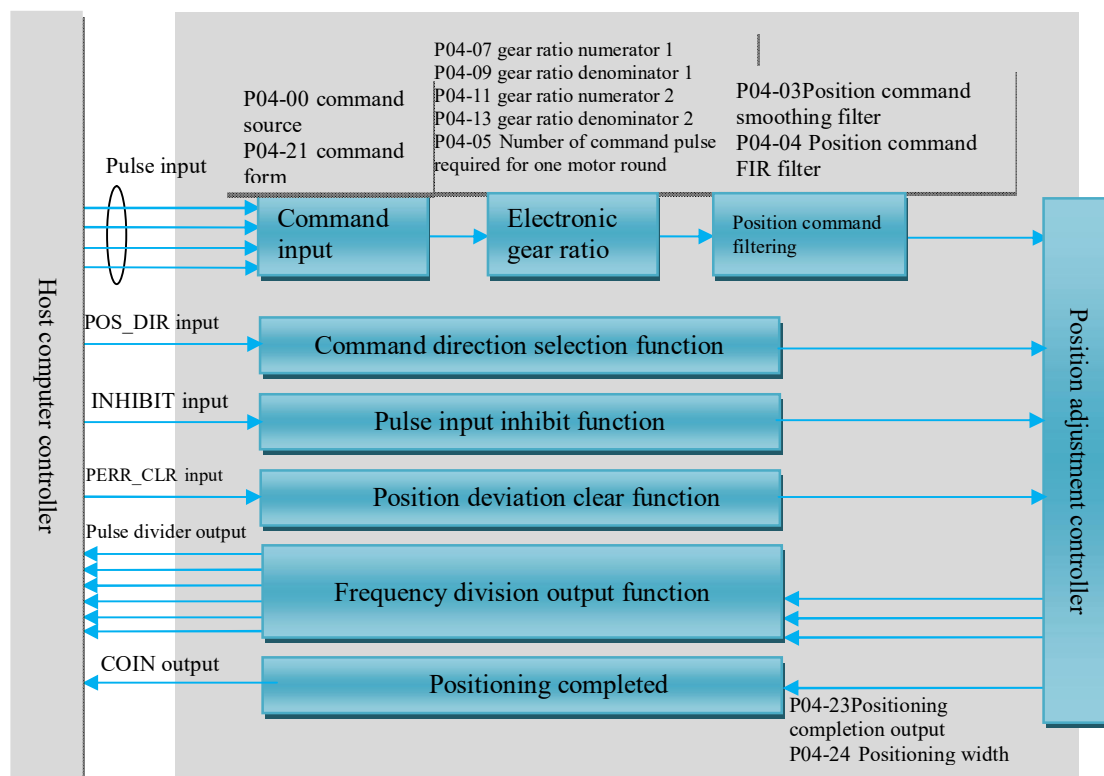
Position mode is a common working mode of the servo drive. The main steps are as follows:

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. Disconnect load, then perform 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
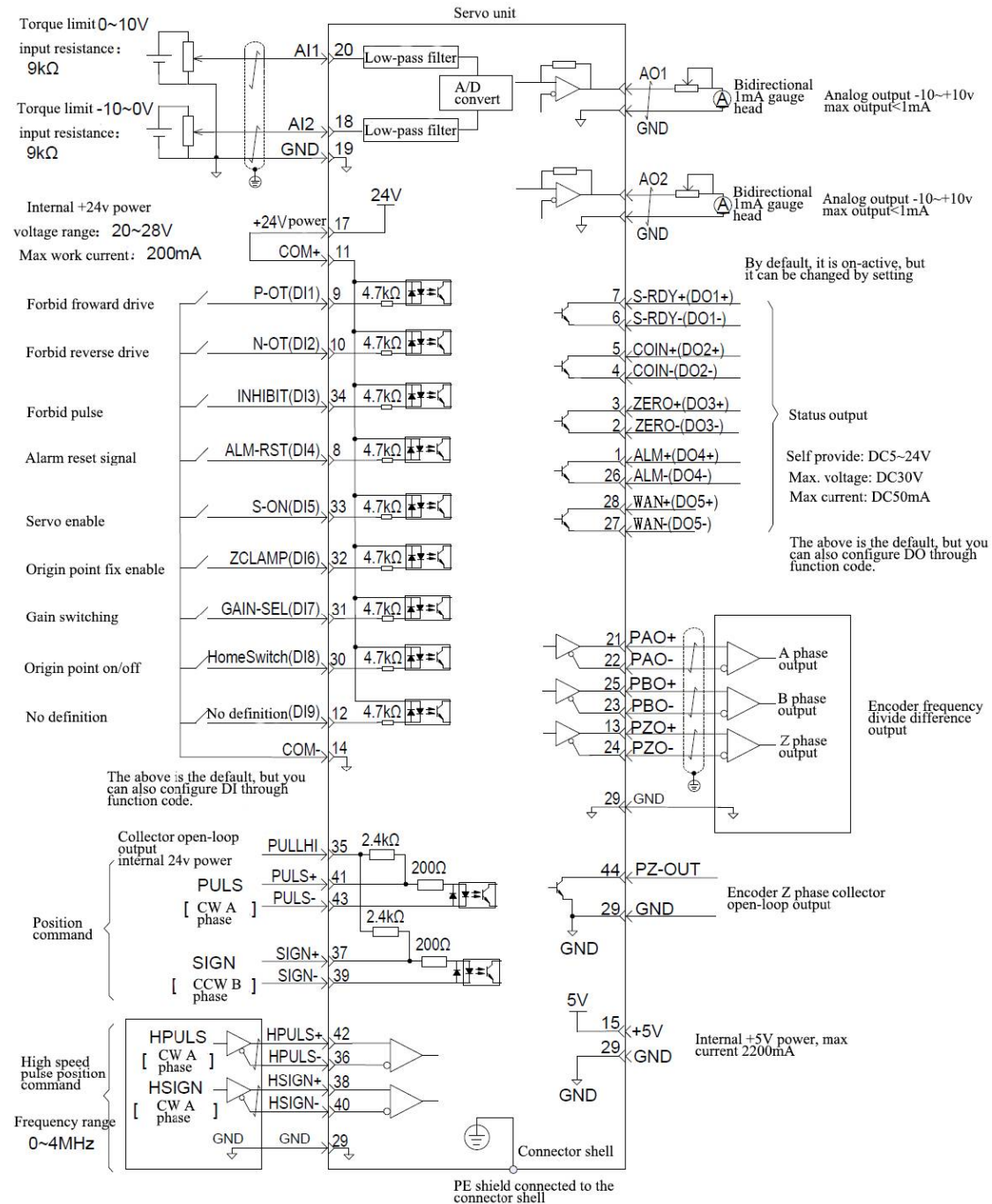
Note:

        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.

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 coming from the low speed pulse command, and other values can be set according to the actual situation.

Function code		Name	Setting range	Min unit	Factory setting	Effective time	Type	Related mode
P04	00	Main position command source	0- By low speed pulse command 1-By high speed pulse command 2-By step amount 4-By multi-segment position command 5- By communication 6- Analog speed mode (dedicated parameters)	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)" , "orthogonal pulse" and "CW+CCW".

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 4- CCW+CW, positive logic 5- CCW+CW, 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	Direction + pulse		
2	Positive logic	AB phase orthogonal pulse		
4	Positive logic	CCW+CW		
1	Negative logic	Direction + pulse		

| 3 | Negative logic | AB phase orthogonal pulse | |
| 5 | Negative logic | CCW+CW | |
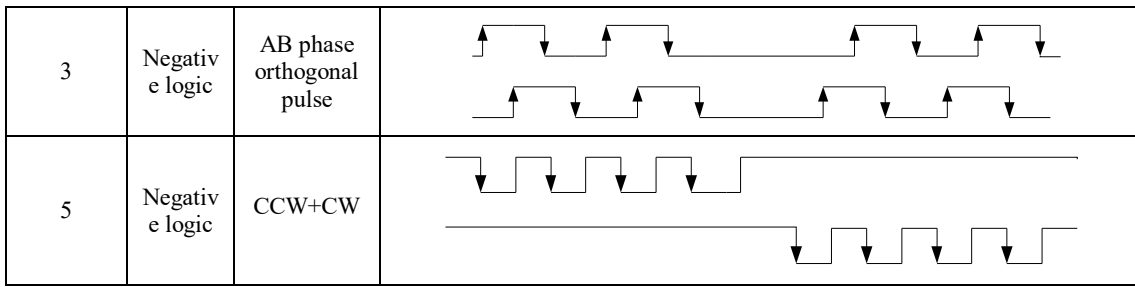
d) Inhibit pulse input

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	Factory setting	Effective time	Type	Related mode
P04	07	gear ratio numerator 1	1~1073741824	1	4	Immediately	Set when motor is running	P
P04	09	gear ratio denominator 1	1~1073741824	1	1	Immediately		P
P04	11	gear ratio numerator 2	1~1073741824	1	4	Immediately		P
P04	13	gear ratio denominator 1	1~1073741824	1	1	Immediately		P

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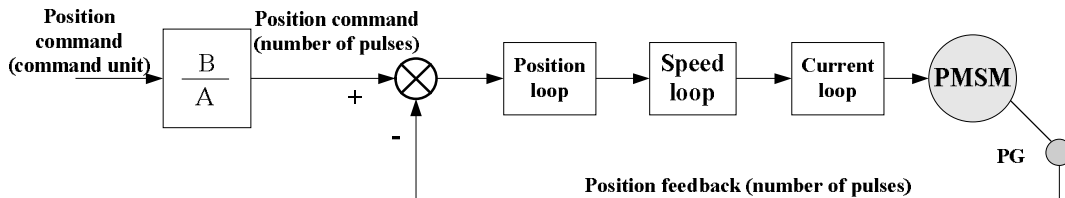
a）When P04-05=0, the motor and the load are connected through the reduction gear. Assuming that the reduction ratio of the motor shaft to the load machine side is n/m (motor rotate m round, load shaft rotate n round), the calculation of the electronic gear ratio is as follows :

$$\text{electronic gear ratio } \frac{B}{A} = \frac{P04-07}{P04-09} = \frac{\text{Encoder resolution}}{\substack{\text{The displacement of load shaft for one round} \\ \text{(command unit)}}} \times \frac{m}{n}$$

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:

$$\text{electronic gear ratio } \frac{B}{A} = \frac{\text{Encoder resolution}}{P04-05}$$

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	0	Re-power	Setting after motor stop	P

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

4.2.2 Speed mode
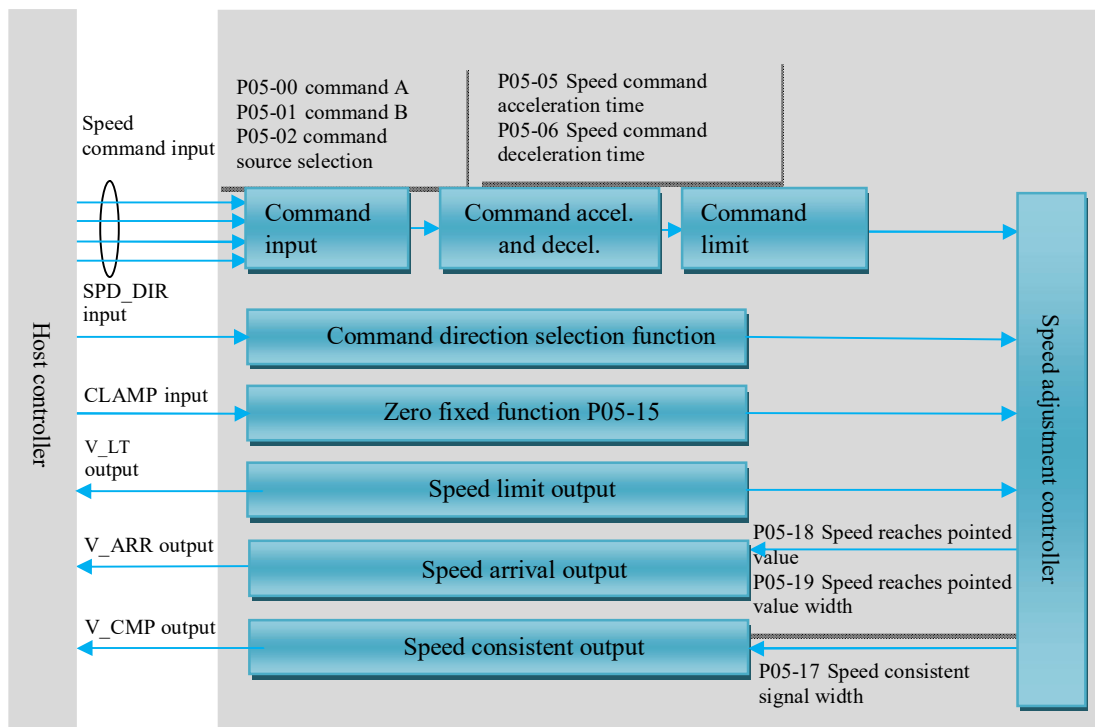
The main steps of speed control mode are as follows:

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 servo power supply and motor encoder are wired correctly.

2. Disconnect motor from the load, and press button to run servo JOG test to confirm whether the motor can run normally or not.

3. Refer to the speed mode wiring, to connect necessary DI/DO signal and analog speed command of CN1 terminal.

4. Make relevant settings for speed mode.

5. Enable servo, first rotate motor at low speed, judge whether the motor rotate direction is correct, and then adjust gain.

Please refer to the debugging steps in section 5.2.

4.2.2.1 Speed mode wiring diagram
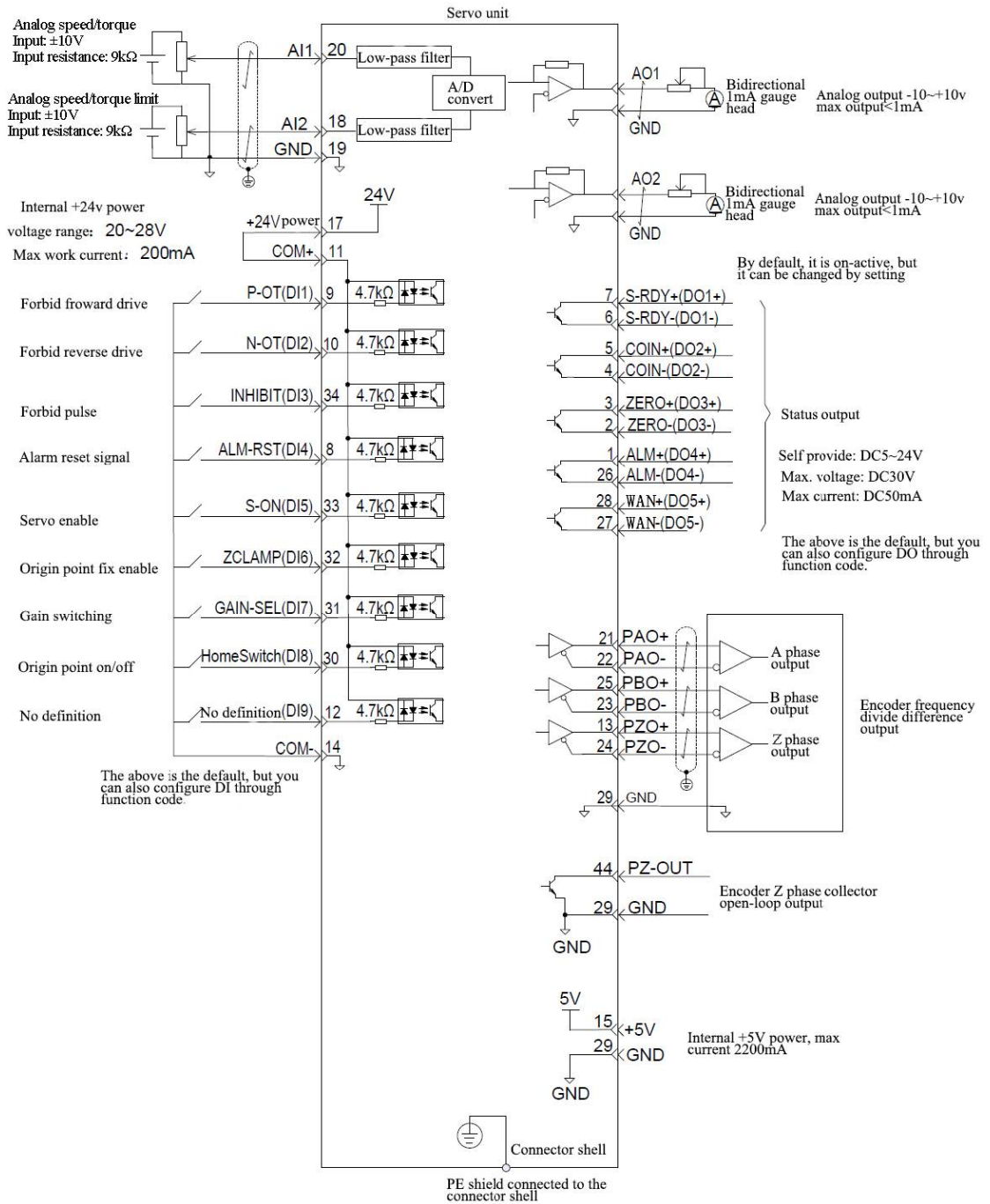
Note：

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.

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.

4.2.3 Torque mode
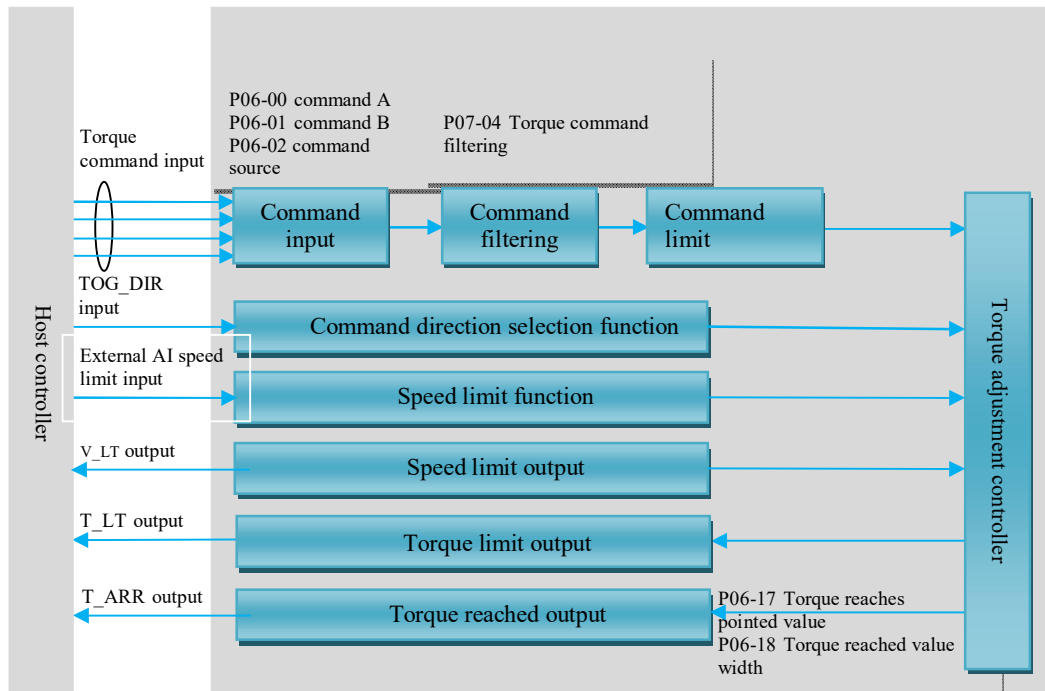
The main steps of torque control mode are as follows:

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 servo power supply and motor encoder are wired correctly.

2. Disconnect motor from the load, and press button to run servo JOG test to confirm whether the motor can run normally or not.

3. Refer to the wiring instructions to connect necessary DI/DO , torque command source and speed limit in the CN1 terminal.

4. Make relevant settings for the torque mode.

5. Enable servo, set a low speed limit value, and apply a forward or reverse torque command to the servo to confirm whether the motor rotates in the correct direction and whether the speed is correctly limited. If it is normal, it can be used normally.

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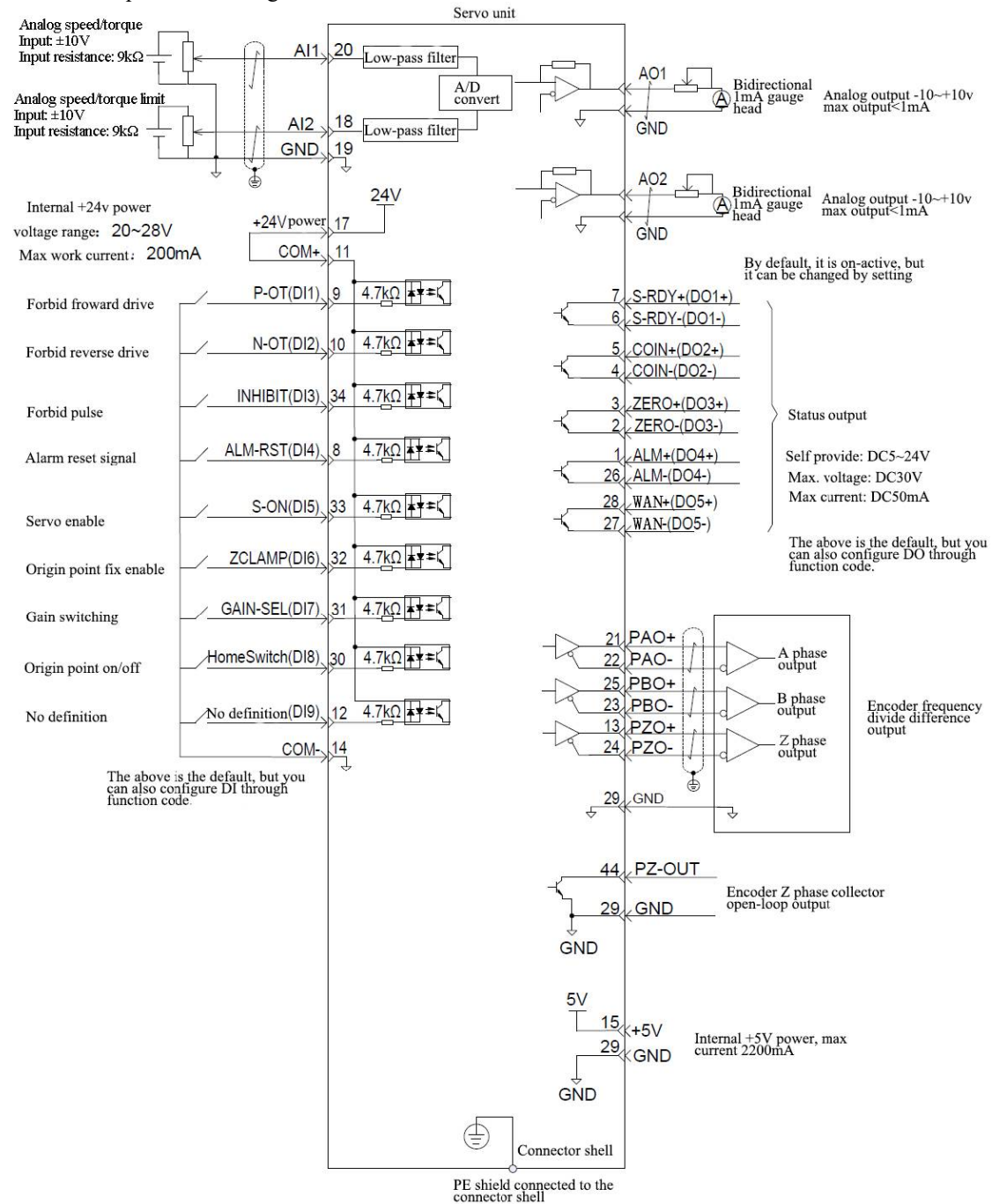
Note：
1. The signal cable and the power cable must be separated, at least 30cm apart;
2. When the signal cable length is not enough, to extend the cable, the shield layer must be reliably connected to ensure shielding and grounding.
3. +5V with GND as a reference, +24V with COM- as a reference. Do not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

Chapter 5: Auxiliary Functions

5.1 JOG run

JOG running flow chart
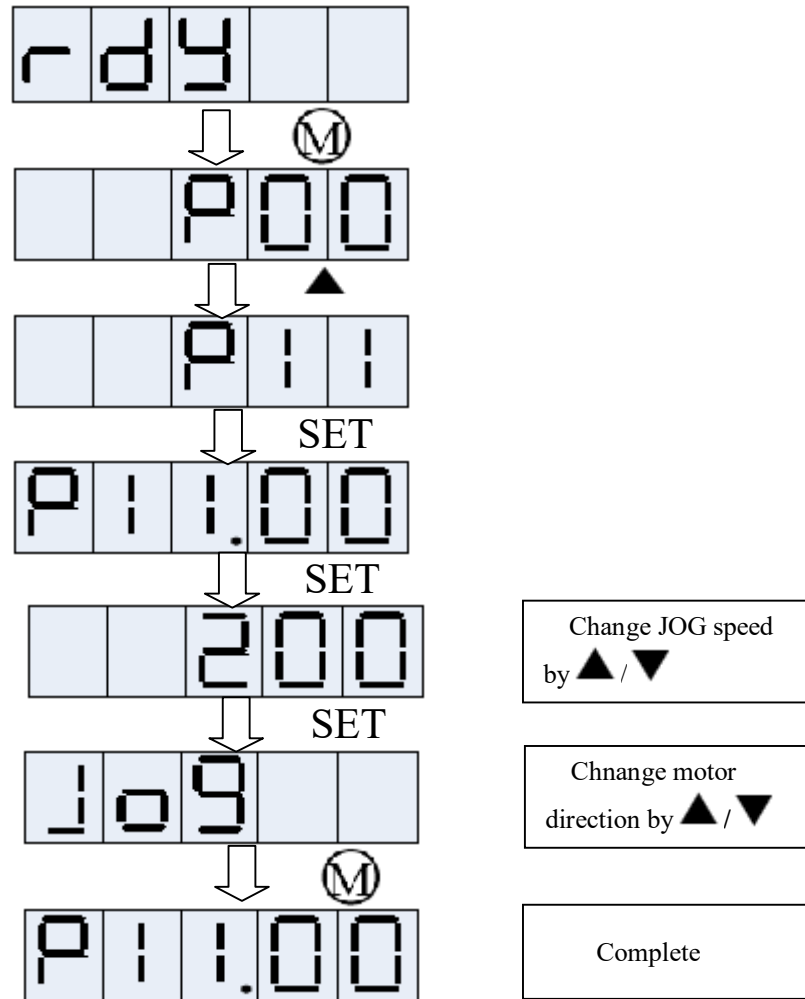
5.2 Alarm reset

Alarm reset flow chart

```
r d Y
      ⬇ Ⓜ
    P 0 0
      ⬇ ▲
    P 1 1
      ⬇ SET
P 1 1 . 0 0
      ⬇ ▲
P 1 1 . 0 1
      ⬇ SET
A L . r S t
      ⬇ SET
d o n E
      ⬇ Ⓜ
P 1 1 . 0 1
```

Complete
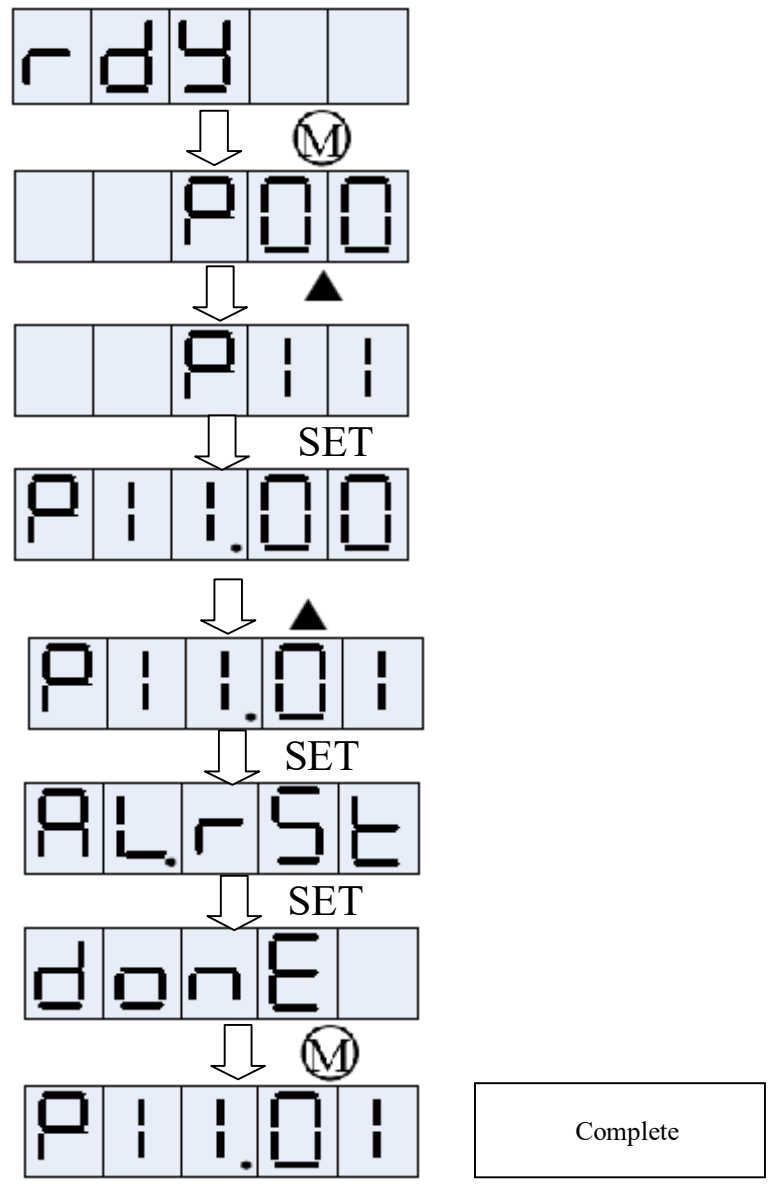
5.3 Parameter initialization

Parameter initialization flow chart

```
r d Y
  ⇩  Ⓜ
    P 0 0
  ⇩     ▲
    P 1 1
  ⇩  SET
P 1 1 . 0 0
  ⇩     ▲
P 1 1 . 0 9
  ⇩  SET
        0
  ⇩
        1
  ⇩  SET
P. 1 n 1 t
  ⇩  SET
d o n E
  ⇩  Ⓜ
P 1 1 . 0 9
```

1—Parameter initialization
2—Clear the fault record

Complete
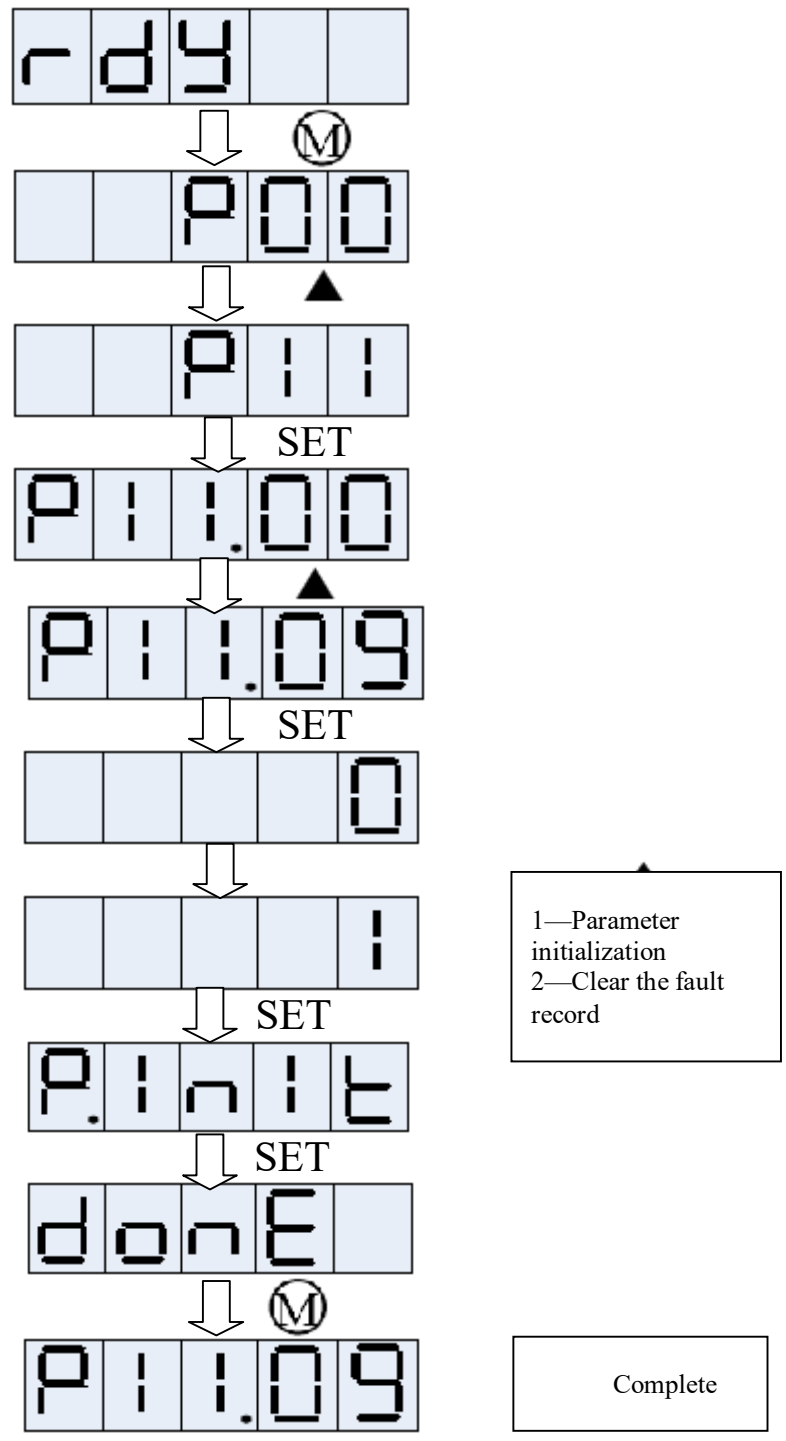
5.4 Analog command offset adjustment

Analog voltage command zero drift automatic adjustment flow chart

1— AI1
2— AI2

Complete
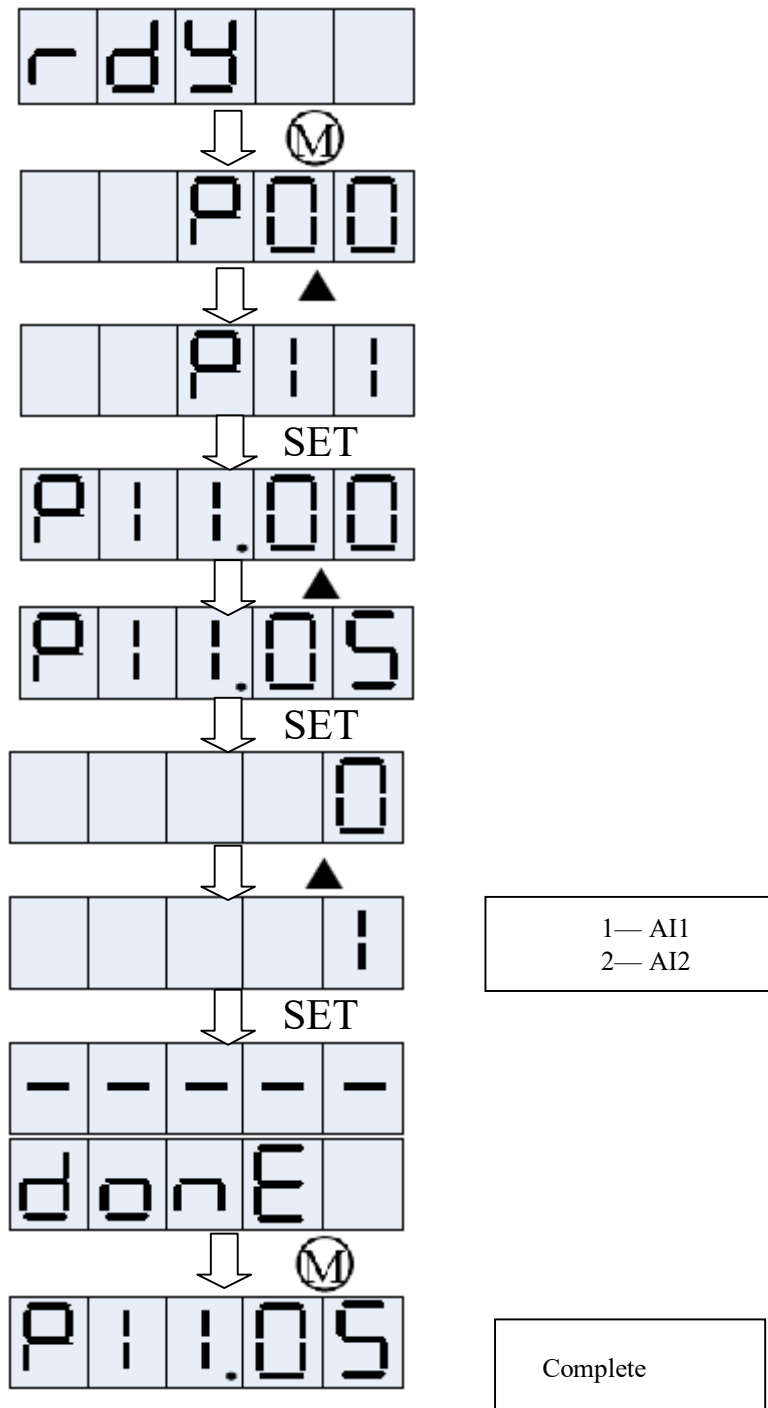
5.5 Digital signal forced input and output function

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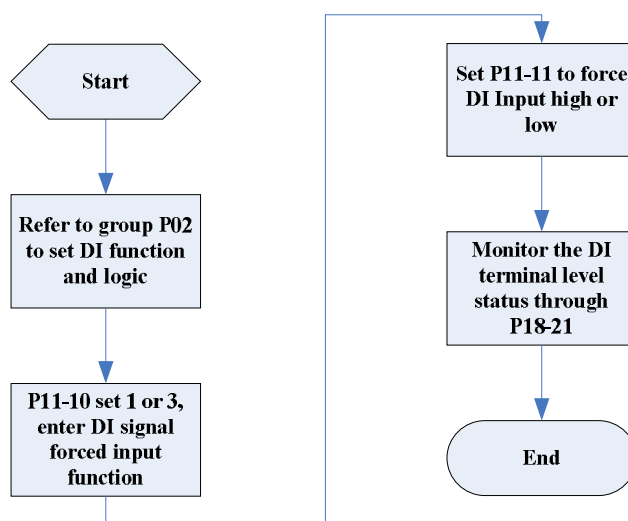
Figure 5-1 Diagram of the DI signal forced input setting procedure

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	P11
P11	11	Set DI forced input	0-0x01FF	1	0x01FF	Immediately	Set when running	P11
P11	12	Set DO forced output	0-0x001F	1	0	Immediately	Set when running	P11

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 "111111110", which corresponds to the hexadecimal number "1FE", so

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

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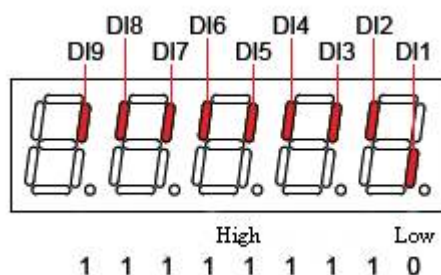
Figure 5-2 Description of the DI level status of P18-21

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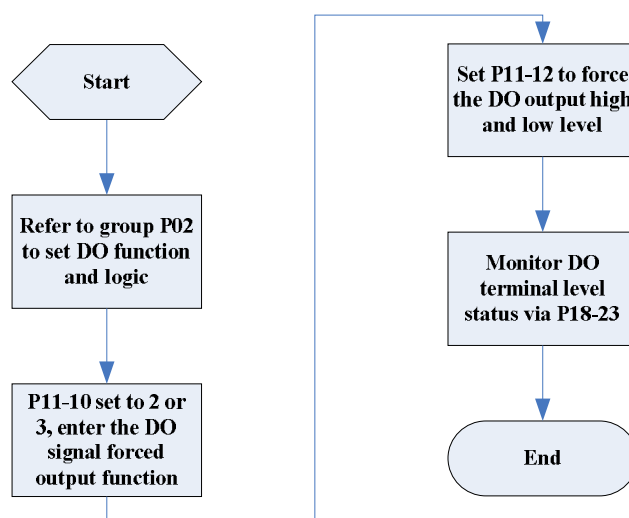
Figure 5-3 Diagram of DO signal forced output setting procedure

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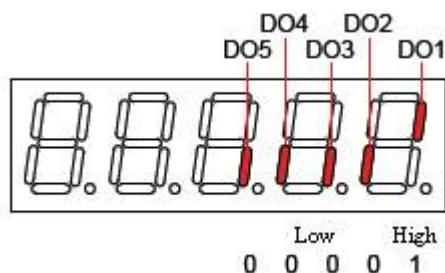
Figure 5-4 Description of the DO level status of P18-23

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.

5.6 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).

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	-	-

The general operation flow of offline inertia identification is as follows:
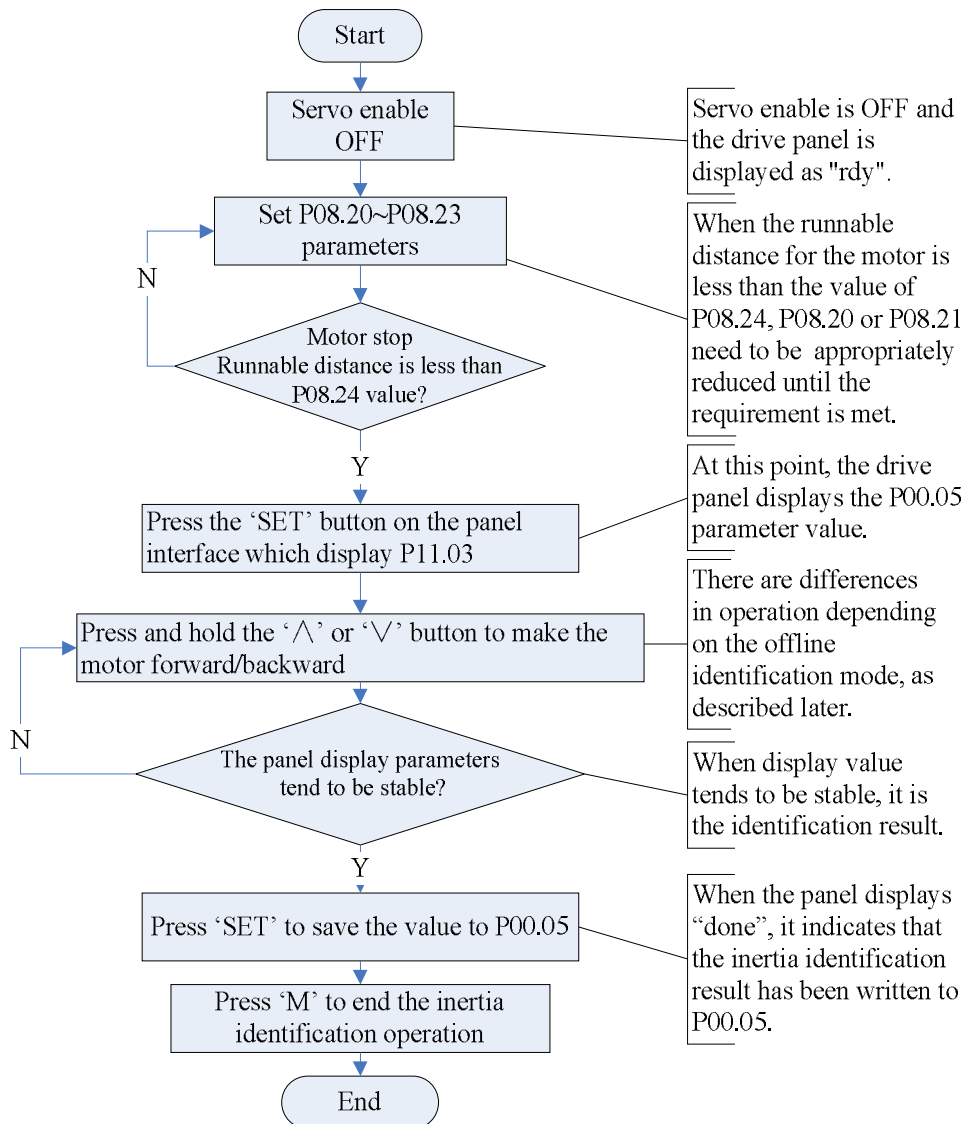
5.7 Mechanical resonance suppression

Mechanical system has a certain resonant frequency. When the servo gain is increased, resonance may occur near the mechanical resonance frequency, and the gain cannot be continuously improved. There are 2 ways to suppress mechanical resonance:

1）Torque command filtering (PH07.04, P07.09)

By setting filter time constant, the torque command is attenuated in the high frequency band above the cutoff frequency, the mechanical resonance is suppressed.

2）Notch filter:

Notch filter can suppress mechanical resonance by reducing the gain at specific frequency. After the notch filter is properly set, the vibration can be effectively suppressed, then you can try to increase servo gain. The principle of the notch filter is shown below.
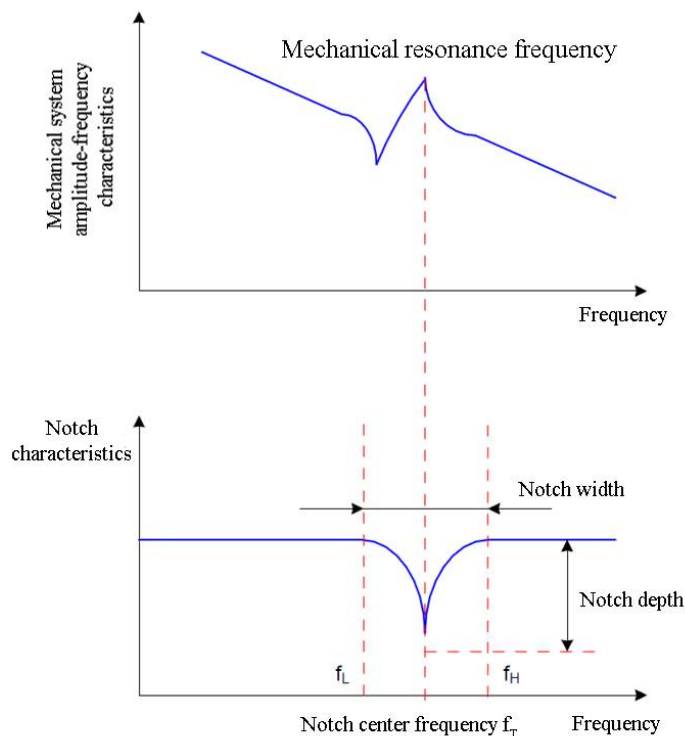
There are 2 sets of notch filter in the servo drive. Each set of notch filter has 3 parameters, which are notch frequency, width class and depth class. This notch filter is a manual notch and the parameters need to be manually set by the user.

Notch filter operation steps

① Analyze resonance frequency;

When using a manual notch, you need to set the frequency of the notch to the actual resonant frequency. How to obtain the resonance frequency: By setting P08.00=3, when the servo is running, the resonance frequency is automatically tested, and the test result is saved in P08.01. Be sure to set P08.00 to 0 after the test is completed.

② Enter the resonant frequency obtained in step ① into the selected notch filter parameters, and enter the width class and depth class;

③ If the resonance is suppressed, the notch filter is effective, and the gain can be continuously adjusted. After the gain is increased, if a new resonance occurs, repeat steps① ～② ;

④ If the vibration cannot be eliminated for a long time, please turn off the servo enable in time

Notch filter width and depth

The notch filter width is used to represent the ratio of the notch width to the center frequency of the notch:

$$\text{Notch filter width} = \frac{f_H - f_L}{f_T}$$

Among them:

f_T：Notch filter center frequency = mechanical resonance frequency

f_H-f_L： The notch width, which represents the frequency bandwidth of -3dB magnitude attenuation that is relative to the center frequency of the notch.

The notch depth level represents the ratio between input and output at center frequency. When the notch depth level is 0, the input is completely suppressed at the center frequency; when the notch depth level is 100, the input is fully passable at the center frequency. Therefore, the smaller notch depth level setting, the deeper the notch depth, and the stronger the suppression of mechanical resonance, but it may cause the system to be unstable, so be careful when using it.

Notch width	Bandwidth/Center frequency
0	0.5
1	0.59
2	0.71
3	0.84
4	1
5	1.19
6	1.41
7	1.68
8	2

Notch depth	Input and output ratio	[dB] meaning
0	0	-∞
1	0.01	-40
2	0.02	-34
3	0.03	-30.5
4	0.04	-28
5	0.05	-26
6	0.06	-24.4
7	0.07	-23.1
8	0.08	-21.9
9	0.09	-20.9
10	0.1	-20
15	0.15	-16.5
20	0.2	-14
25	0.25	-12
30	0.3	-10.5
35	0.35	-9.1
40	0.4	-8
45	0.45	-6.9
50	0.5	-6
60	0.6	-4.4
70	0.7	-3.1
80	0.8	-1.9
90	0.9	-0.9
100	1	0

Notch filter frequency feature
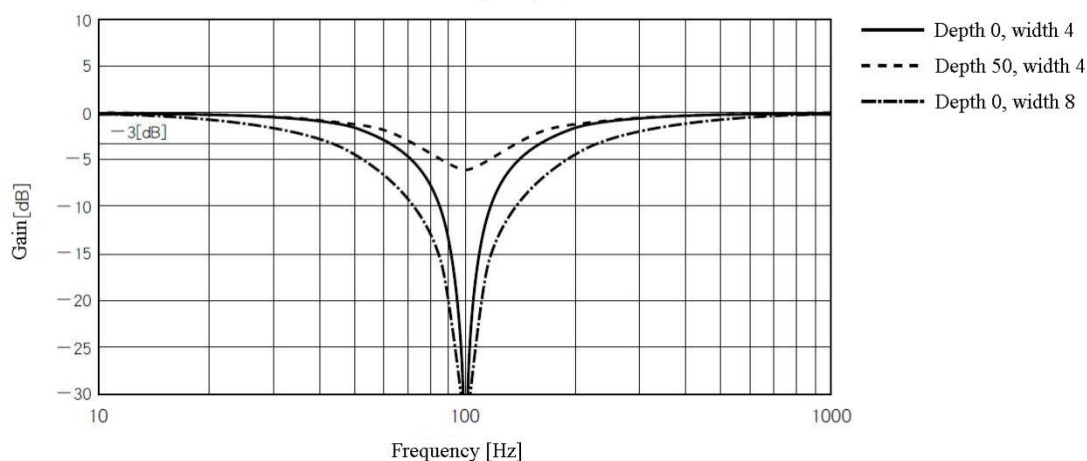
Depth 0, width 4
Depth 50, width 4
Depth 0, width 8

☆ Related function code

Function code		Name	Setting range	Min. unit	Function	Factory setting	Effective time	Mode
P08	00	Adaptive filter mode	0~5	1	0	Immediately	Set when running	PST
P08	01	Resonance frequency	-	1Hz	0	N/A	Display parameter	PST

Function code		Name	Setting range	Min. unit	Function	Factory setting	Effective time	Mode
P08	02	1st notch frequency (manual)	10~4000Hz	1Hz	4000Hz	Immediately	Set when running	PST
P08	03	1st notch width	0~8	1	2	Immediately	Set when running	PST
P08	04	1st notch depth	0~100	1	50	Immediately	Set when running	PST
P08	05	2nd notch frequency (manual)	10~4000Hz	1Hz	4000Hz	Immediately	Set when running	PST
P08	06	2nd notch width	0~8	1	2	Immediately	Set when running	PST
P08	07	2nd notch depth	0~100	1	50	Immediately	Set when running	PST

5.8 Absolute value system homing function and software position limit function

The absolute encoder detects the position within 1 round of motor rotation, and counts the number of motor rounds. It can memorize 16-bit multi-round data. The absolute value mode can be used in position, speed and torque modes. When the drive is powered off, the absolute encoder is powered by the battery and backs up the data. After power-on, the drive directly reads the absolute position information of the encoder, which is used to calculate the absolute position of the machine. It is not necessary to repeat homing operation of the machine (onece it is homed, the absolute position is permanently saved).

1. AS2 servo supports homing function of the absolute encoder system:
   ① User only needs to set the servo drive to the absolute value homing function (set P1609=16) and turn on the homing function (P1608≠0).
   ② User moves mechanical parts to home point, and update the home position (set P1618=1 to update home position). The servo drive sets the current position as home.
   ③ If the machine needs to return to home, it can be processed by function P1608 setting.

☆ Related function code

P1608	Homing enable
P1609	Homing mode selection (select 16 for absolute value homing mode)
P1610	High speed for searching home switch
P1611	Low speed for searching home switch
P1612	Acceleration and deceleration time for searching home
P1613	Time limit for searching home
P1614	Mechanical offset after homing is completed
P1618	Update the home position of the absolute position system
P1627	Absolute position homing delay time (avoid mechanical interference for multiple axis homing)
DI signal configuration	FunIN.33-HOME_START, Homing enable (starts homing when it is valid)
DO signal configuration	FunOUT.19-HOME_ATTAIN, Homing completion (output homing completion signal)

2. AS2 servo software position limit function.
   Traditional position limit function can only be given by an external signal, external sensor signal is connected to CN1 port of servo drive.
   Software position limit principle: Compare position feedback with position limit value. When the position value exceeded limit, drive will immediately alarm and stop operation. The servo drive should perform homingfirst and enable the software position limit function.

Comparison of software position limit and hardware position limit

Traditional hardware position limit	Software position limit

1	Can only be limited to linear or single-round rotation	Can be used in both linear and rotary motions, multi-round rotation is also supported
2	Need space on machine to install limit switch	No external wiring is required, prevent malfunction due to poor conection
3	Can't judge machine slippage problem	Internal position comparison to prevent mechanical slippage and abnormality
4	After machine powered off, if mechanical parts moves out of limit switch, servo cannot judge or alarm.	

☆ Related function code

P1622	Software position limit setting selection
P1623	Absolute position limit: maximum
P1625	Absolute position limit: minimum

5.9 Interrupt fixed length function

The interrupt fixed length function: interrupting the current running state of the servo in position control mode, and run a fixed length command which is set in advance. That is, in position control mode, when the servo enable is ON, after the interrupt fixed length function is triggered, the servo motor will run a fixed length without changing motor running direction.

During the interrupt fixed length operation, the drive will ignore any other internal and external position commands (including interrupt fixed length position command), and the input position command counter P18.15 only counts the interrupt fixed length position command. After the interrupt fixed length operation is completed, according to the user setting (P16.06), the drive will keep ignore all the position command, or restore to accept position command, but all the position command input during the interrupt fixed length operation will be discarded.

After the interrupt fixed length is completed, the servo driver outputs interrupt fixed length completion signal (FunOUT.18: XINT_DONE) and positioning completion signal (FunOUT.7: COIN, positioning completion), the host computer receives the interrupt fixed length completion signal to confirm the interrupt is finished. Among them, the output of the interrupt fixed length completion signal don't have relationship with the servo enable (S-ON) and the DI8 terminal logic.

Note: When using the interrupt fixed length function, the driver forcibly uses the DI terminal DI8 as trigger terminal, other DI terminals are invalid. At this time, DI8 terminal (P02.08) is prohibited from being assigned to other DI functions. Logic (P02.18) should be set to be valid for edge effective, otherwise the drive will force its logic to be valid for edge effective.

Interrupt fixed length function flow description:
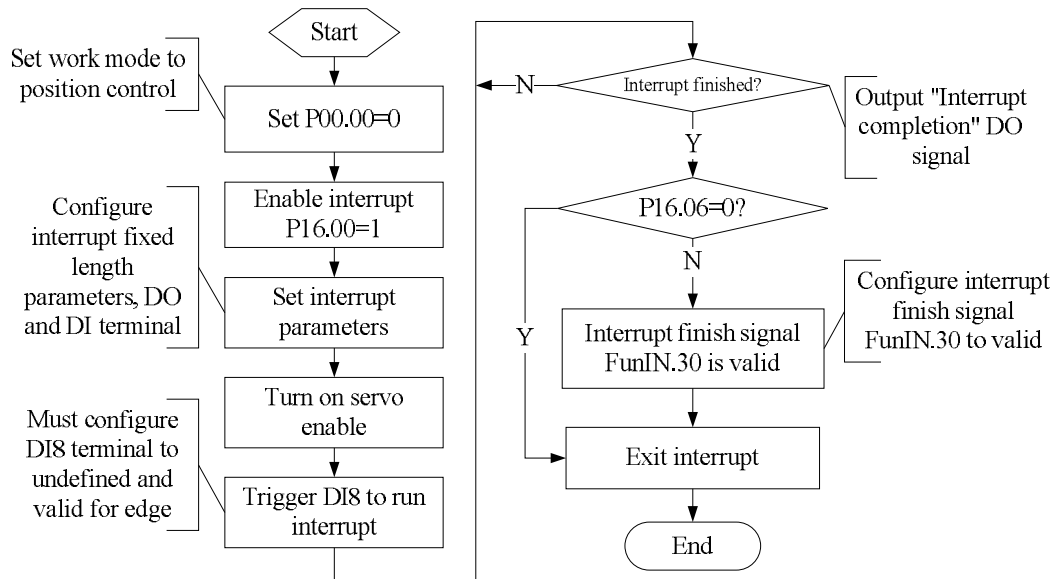
☆ Related function code

P1600	Interrupt fixed length enable
P1601	Interrupt fixed length displacement
P1603	Interrupt fixed length speed
P1604	Interrupt fixed length acceleration time
P1605	Interrupt fixed length deceleration time
P1606	Interrupt fixed length ignore signal input
DI setting	FunIN.30- XINT_FINISH（Interrupt finish signal）
DI setting	FunIN.31- XINT_DISABLE（Interrupt forbidden）
DO setting	FunOut.18- XINT_DONE （Interrupt done signal）

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 resetable 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
5	FPGA fault	1 FPGA initialization exception 2 FPGA logic version is abnormal 3 FPGA detected an exception	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
10	Overcurrent fault B	1 servo motor wiring is not normal; 2 software detects the overcurrent of power transistor; 3 servo motor wiring is not normal;	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
18	Motor code identification error when power-on	The motor parameters are not written in the motor encoder EEPROM. You need to manually set the P01.00 parameter to write the motor code.	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
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;	N0.2	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
51	Encoder battery failure	No battery or battery voltage below 2.6V	No.2	Yes
52	Encoder multi-turn count error	Absolute encoder multi-turn count error	No.2	Yes
53	Encoder multi-turn count overflow	Absolute encoder multi-turn count overflow	No.2	Yes
72	Soft overrun limit error	Soft overrun limit setting is too small	No.2	Yes

73	Position range overrun error	Position range setting is too small	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
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
84	Reset encoder warning	In enabled state, resets encoder when host computer sending commands.
86	Forward overtravel warning	Positive overtravel switch Pot terminal is valid
87	Negative overtravel warning	Negative overtravel switch Not terminal is valid
88	Divided pulse output setting fault	The number of encoder divided pulses does not meet set condition or range
89	AI1\ AI2 zero drift too large	AI1\ AI2 zero drift too large
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
92	RS485 communication error	RS485 communication error
93	Disable operation in enabled state	1 Operate JOG test run in enabled state 2 Operatel inertia identification in the enabled state
94	DI emergency brake	External emergency brake E_STOP terminal trigger
95	Absolute encoder battery low	Battery voltage is lower than 3.2V
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
P03	Analog input and output parameters
P04	Position control parameters
P05	Speed control parameters
P06	Torque control parameters
P07	Gain parameters
P08	Advanced adjustment parameters
P09	Fault and protection parameters
P10	Communication parameter
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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P00	22	Energy consumption braking start voltage	0V~1000V	1	Model parameter	Effective immediately	Set when running	PST
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

P02 group: digital terminal input and output parameters

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P02	00	FunINL signal 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, 1-45 0: no definition 1 to 45: FunIN.1 to 45 (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, 1-45 0: no definition 1 to 45: FunIN.1 to 45 (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, 1-45 0: no definition 1 to 45: FunIN.1 to 45 (refer to the DIDO basic function coding table)	1	12	Effective immediately	Set when running	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P02	04	DI4 terminal function selection	Input function code: 0, 1-45 0: no definition 1 to 45: FunIN.1 to 45 (refer to the DIDO basic function coding table)	1	2	Effective immediately	Set when running	PST
P02	05	DI5 terminal function selection	Input function code: 0, 1-45 0: no definition 1 to 45: FunIN.1 to 45 (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, 1-45 0: no definition 1 to 45: FunIN.1 to 45 (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, 1-45 0: no definition 1 to 45: FunIN.1 to 45 (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, 1-45 0: no definition 1 to 45: FunIN.1 to 45 (refer to the DIDO basic function coding table)	1	32	Effective immediately	Set when running	PST
P02	09	External input terminal filter coefficient	0~65535	0	800	Re-power	Setting after motor stop	PST
P02	10	FunINH signal unassigned 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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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
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 ~ 24 0: no definition 1~24: FunOUT.1~24 refer to DIDO function selection code definition	1	1	Effective immediately	Setting after motor stop	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P02	22	DO2 terminal function selection	Output code: 1 ~ 24 0: no definition 1~24: FunOUT.1~24 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 ~ 24 0: no definition 1~24: FunOUT.1~24 refer to DIDO function selection code definition	1	5	Effective immediately	Setting after motor stop	PST
P02	24	DO4 terminal function selection	Output code: 1 ~ 24 0: no definition 1~24: FunOUT.1~24 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 ~ 24 0: no definition 1~24: FunOUT.1~24 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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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

P03 group: analog input and output parameters

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P03	00	AI1 minimum input	-1000～1000	0.01V	-1000	Effective immediately	Setting after motor stop	PST
P03	01	AI1 minimum value corresponding set value	-1000~1000 torque corresponds to the maximum torque of the system, 100% speed corresponds to the maximum speed of the system)	0.001	-1000	Effective immediately	Setting after motor stop	PST
P03	02	AI1 maximum input	-1000V～1000V	0.01V	1000	Effective immediately	Setting after motor stop	PST
P03	03	AI1 maximum value corresponding set value	-1000～1000	0.001	1000	Effective immediately	Setting after motor stop	PST
P03	04	AI1 zero point adjustment	-6000～6000	0.1mV	0.0mV	Effective immediately	Set when running	PST
P03	05	AI1 dead zone	0～5000	0.1mV	0.0mV	Effective immediately	Set when running	PST
P03	06	AI1 input filter time	0～65535	0.1ms	2.0ms	Effective immediately	Setting after motor stop	PST
P03	07	AI2 minimum input	-1000～1000	0.01V	-1000	Effective immediately	Setting after motor stop	PST
P03	08	AI2 minimum value corresponding set value	-1000~1000 torque corresponds to the maximum torque of the system, 100% speed corresponds to the maximum speed of the system)	0.001	-1000	Effective immediately	Setting after motor stop	PST
P03	09	AI2 maximum input	-1000V～1000V	0.01V	1000	Effective immediately	Setting after motor stop	PST
P03	10	AI2 maximum value corresponding set value	-1000～1000	0.001	1000	Effective immediately	Setting after motor stop	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P03	11	AI2 zero point adjustment	-6000～6000	0.1mV	0.0mV	Effective immediately	Set when running	PST
P03	12	AI2 dead zone	0～5000	0.1mV	0.0mV	Effective immediately	Set when running	PST
P03	13	AI2 input filter time	0 ～65535	0.1ms	2.0ms	Effective immediately	Setting after motor stop	PST
P03	14	Analog 10V corresponding speed value	0 rpm ~9000 rpm	1rpm	3000rpm	Effective immediately	Set when running	PST
P03	15	Analog 10V corresponding torque value	0.0%~500.0%	0.1%	300.0%	Effective immediately	Setting after motor stop	PST
P03	20	AO1 signal selection	0-motor speed (1V/1000rpm) default 1-speed command (1V/1000rpm) 2-torque command (1V/100%) 3-position deviation (0.05V/1 command unit) 4-position amplifier deviation (after electronic gear) (0.05V/1 encoder pulse unit) 5-position command speed (1V/1000 rpm) 6- positioning completion command (positioning completed: 5V, positioning is not completed: 0V) 7-speed feedforward (1V/1000rpm) 8, 9 reserved	1	0	Effective immediately	Set when running	PST
P03	21	AO1 offset voltage	-9999～9999	1mV	9999	Effective immediately	Set when running	PST
P03	22	AO1 magnification	-9999～9999	0.01	100	Effective immediately	Set when running	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P03	23	AO2 signal selection	0-motor speed (1V/1000rpm) default 1-speed command (1V/1000rpm) 2-torque command (1V/100%) 3-position deviation (0.05V/1 command unit) 4-position amplifier deviation (after electronic gear) (0.05V/1 encoder pulse unit) 5-position command speed (1V/1000 rpm) 6- positioning completion command (positioning completed: 5V, positioning is not completed: 0V) 7-speed feedforward (1V/1000rpm) 8, 9 reserved	1	0	Effective immediately	Set when running	PST
P03	24	AO2 offset voltage	-9999～9999	1mV	9999	Effective immediately	Set when running	PST
P03	25	AO2 magnification	-9999～9999	0.01	100	Effective immediately	Set when running	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 1- high speed pulse command 2-step amount given 4-multi-segment position command given 5-given through communication 6- Analog speed mode (reserved)	1	0	Effective immediately	Setting after motor stop	P
P04	01	Reserved parameter		1	0	N/A	Reserved parameter	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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	0.0 ～65535	0.1ms	0.0	Effective immediately	Setting after motor stop	P
P04	04	Position command FIR filter	0.0 ～1280	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	15	Pulse output resolution (32 bit)	16PPR～ 1073741824PPR (calculate: lines of incremental photoelectric encoder*4)	1PPR	10000PPR	Re-power	Setting after motor stop	P
P04	18	Pulse output Z polarity	0-Z pulse is high when it arrives 1-Z pulse is low when it arrives	1	0	N/A	Reserved	P
P04	19	Pulse output function selection	0-encoder crossover output 1-pulse command synchronous output	1	0	Re-power	Setting after motor stop	P
P04	20	Frequency division output pulse form	0-AB quadrature signal 1-pulse + direction	1	0	Re-power	Setting after motor stop	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 4- CCW+CW, positive logic 5- CCW+CW, negative logic	1	0	Re-power	Setting after motor stop	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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	2500 line motor: 7P 17-bit motor: 100P 23-bit motor: 1000P	Effective immediately	Setting after motor stop	P
P04	25	Positioning close range	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	00	Main speed command A source	0-digit value(P0503) 1-AI1 2-AI2 3-multi-speed command 4-communication command given	1	0	Effective immediately	Setting after motor stop	S

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P05	01	Auxiliary speed command B source	0-digit value(P0503) 1-AI1 2-AI2 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	07	Speed command limit selection	0-forward P05.08, reverse P05.09, internal limit (default) 1-AI1 2-AI2 (limited by system max. speed)	1	0	Effective immediately	Set when running	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	14	Speed direction selection	0-direction unchanged 1-direction reversal 2-direction is determined by DI function 25 3-direction is determined by DI function 40/41	1	3	Effective immediately	Setting after motor stop	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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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	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) 1-AI1 2-AI2 3-given through communication 4- Multi-segment torque command	1	0	Effective immediately	Setting after motor stop	T
P06	01	Auxiliary torque command B source	0-digit given (P06-05) 1-AI1 2-AI2 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	-3000～3000(based on rated motor torque)	0.001	0	Effective immediately	Set when running	T

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P06	06	Torque limit source	0-positive and negative internal torque limit (default) 1-positive and reverse external torque limit (selected with P_CL, N_CL) 2-use T-LMT as external torque limit input 3- torque limit is the lower value between positive and negative external torque and external T-LMT (selected by P_CL, N_CL) 4-positive and negative internal torque limit and external T-LMT torque limit (selected with P_CL, N_CL)	1	0	Effective immediately	Set when running	PST
P06	07	T-LMT select	1-AI1 2-AI2	1	2	Effective immediately	Set when running	PST
P06	08	Forward internal torque limit	0~5000(based on rated motor torque)	0.001	3000	Effective immediately	Set when running	PST
P06	09	Backward internal torque limit	0~5000(based on rated motor torque)	0.001	3000	Effective immediately	Set when running	PST
P06	10	Forward side external torque limit	0~5000(based on rated motor torque)	0.001	3000	Effective immediately	Set when running	PST
P06	11	Backward side external torque limit	0~5000(based on rated motor torque)	0.001	3000	Effective immediately	Set when running	PST
P06	12	Emergency stop torque	0~5000(based on rated motor torque)	0.001	5000	Effective immediately	Set when running	PST
P06	13	Speed limit source selection for torque control	0-internal speed limit (P06.15, P06.16 setting) 1-use V-LMT as external speed limit input	1	0	Effective immediately	Set when running	T
P06	14	V-LMT select	1-AI1 2-AI2	1	3	Effective immediately	Set when running	T

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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	0～5000 (1000 corresponds to the rated torque of the motor)	0.001	0	Effective immediately	Set when running	PST
P06	18	Torque arrival effective offset threshold	0～5000 (1000 corresponds to the rated torque of the motor)	0.001	200	Effective immediately	Set when running	PST
P06	19	Torque arrival ineffective offset threshold	0～5000 (1000 corresponds to the rated torque of the motor)	0.001	200	Effective immediately	Set when running	PST
P06	20	Speed limit window in torque mode	1~900	1ms	50	Effective immediately	Set when running	PST
P06	21	Multi-segment torque command 1	-3000～3000 (based on motor rated torque）	0.001	0	Effective immediately	Set when running	T
P06	22	Multi-segment torque command 2	-3000～3000(based on motor rated torque）	0.001	0	Effective immediately	Set when running	T
P06	23	Multi-segment torque command 3	-3000～3000 (based on motor rated torque）	0.001	0	Effective immediately	Set when running	T

P07 group: gain parameter

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P07	00	Position loop gain 1	1.0Hz～2000.0Hz	0.1HZ	39.0HZ	Effective immediately	Set when running	P
P07	01	Speed loop gain 1	1.0Hz～2000.0Hz	0.1HZ	22.0HZ	Effective immediately	Set when running	PS
P07	02	Speed loop integral time 1	0.15ms～512.00ms	0.01ms	25.00ms	Effective immediately	Set when running	PS
P07	03	Speed detection filter 1	0.00ms～100.00ms	0.01ms	0.60ms	Effective immediately	Set when running	PST
P07	04	Torque command filtering 1	0.00ms～100.00ms	0.01ms	1.08ms	Effective immediately	Set when running	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P07	05	Position loop gain 2	1.0Hz～2000.0Hz	0.1HZ	46.0HZ	Effective immediately	Set when running	P
P07	06	Speed loop gain 2	1.0Hz～2000.0Hz	0.1HZ	22.0HZ	Effective immediately	Set when running	PS
P07	07	Speed loop integral time 2	0.15ms～512.00ms	0.01ms	500.00ms	Effective immediately	Set when running	PS
P07	08	Speed detection filter 2	0.00ms～100.00ms	0.01ms	0.00ms	Effective immediately	Set when running	PST
P07	09	Torque command filtering 2	0.00ms～100.00ms	0.01ms	1.03ms	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
P07	11	Gain switching mode	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 switching delay	0~1000.0ms	0.1ms	5.0ms	Effective immediately	Set when running	PS

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P07	13	Gain switching level	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
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	Effective immediately	Setting after motor stop	P
P07	20	Speed feedforward gain	0.0%～100.0%	0.1%	0.0%	Effective immediately	Set when running	P
P07	21	Speed feedforward filter time parameter	0.00ms～64.00ms	0.01ms	0.50ms	Effective 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	Effective immediately	Setting after motor stop	PS
P07	23	Torque feedforward gain	0.0%～100.0%	0.1%	0.0%	Effective immediately	Set when running	PS
P07	24	Torque feedforward filter time parameter	0.00ms～64.00ms	0.01ms	0.50ms	Effective immediately	Set when running	PS
P07	25	Speed offset superimposed threshold	0P～100P	1P	7P	Effective immediately	Setting after motor stop	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P07	26	Speed offset	0.0%～100.0%	0.1%	0.0%	Effective immediately	Set when running	P
P07	27	Voltage feedforward gain	0.000~1.000	0.001	0.000	Effective immediately	Set when running	PST
P07	28	Id set	0~65535	0.001	0.000	Effective immediately	Set when running	PST

Group P08: advanced adjustment parameters

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P08	00	Adaptive filter mode	0~5	1	0	Effective immediately	Set when running	PST
P08	01	Resonance frequency	0~65535Hz	1Hz	0	N/A	Display parameter	PST
P08	02	The 1st notch filter frequency (manual)	10~4000Hz	1Hz	4000Hz	Effective immediately	Set when running	PST
P08	03	The 1st notch filter width	0~8	1	2	Effective immediately	Set when running	PST
P08	04	The 1st notch filter depth	0~100	1	50	Effective immediately	Set when running	PST
P08	05	The 2nd notch filter frequency (manual)	10~4000Hz	1Hz	4000Hz	Effective immediately	Set when running	PST
P08	06	The 2nd notch filter width	0~8	1	2	Effective immediately	Set when running	PST
P08	07	The 2nd notch filter depth	0~100	1	50	Effective immediately	Set when running	PST
P08	20	Offline inertia identification maximum speed	200 rpm ~1000 rpm	1rpm	500 rpm	Effective immediately	Setting after motor stop	PST
P08	21	Offline inertia identification acceleration and deceleration time	50ms~800ms	1ms	100ms	Effective immediately	Setting after motor stop	PST
P08	22	Waiting time after a single offline inertia identification is completed	100ms~10000ms	1ms	800ms	Effective immediately	Setting after motor stop	PST
P08	23	Inertia identification mode selection	0-offline inertia	1	0	Effective	Setting after	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
			identification: speed command is positive and negative triangle wave 1-offline inertia identification: Speed command is JOG mode			immediately	motor stop	
P08	24	Motor rotation round for complete single offline inertia identification	0~65535	0.01 round	83	N/A	Display parameter	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	Effective immediately	Set when running	PST
P09	01	Power output lack phase protection selection	0-Enable protection 1-Prohibited protection	1	0	Effective immediately	Set when running	PST
P09	02	Undervoltage detection delay	100 ~20000	0.1ms	700	Effective immediately	Set when running	PST
P09	03	Encoder error shield bit	Bit7-encoder battery failure Bit6-encoder battery low warning Bit5-encoder multi-round count error* Bit3-encoder multi-round count overflow*	1	255	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	0.01	100	Effective immediately	Set when running	PST
P09	06	Motor overload protection factor	10 ～300	0.01	100	Effective immediately	Set when running	PST
P09	07	Undervoltage protection point	50～100 (100 corresponds to the default undervoltage point)	0.01	100	Effective immediately	Set when running	PST
P09	08	Overspeed fault point	50 ～120 (100 corresponds to maximum motor speed)	0.01	120	Effective immediately	Set when running	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P09	09	Position deviation excessive threshold (32 bit)	1P~1073741824P (encoder unit)	1P	2500 line motor: 32767P 17-bit motor: 393216 23-bit motor: 25165824	Effective immediately	Set when running	PST
P09	11	High-speed command pulse input pin filter time	0-100ns	12.5ns	8ns	Re-power	Setting after motor stop	P
P09	12	Low-speed command pulse input pin filter time	0-500 ns	12.5ns	50ns	Re-power	Setting after motor stop	P
P09	13	Quadrature encoder filter time	0-500 ns	12.5ns	80ns	Re-power	Setting after motor stop	PST
P09	14	Encoder Z signal output width	0-60000	200ns	10000	Re-power	Setting after motor stop	PST
P09	15	Bus encoder communication verification continuous error count report failure	1~16	1	3	Effective immediately	Set when running	PST
P09	16	Bus encoder communication check error compensation	0- no compensation 1-use speed command to compensate 2-use speed feedback to compensate 3-compensation using average value of speed command and speed feedback	1	0	Effective immediately	Setting after motor stop	PST

P10 group: communication parameters

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P10	00	Communication address	0~247, 0 is broadcast address	1	1	Effective immediately	Set when running	PST
P10	01	Communication network selection	0-Modbus	1	0	Re-power	Set when running	PST
P10	02	Modbus baud rate setting	0-2400 1-4800 2-9600 3-19200 4-38400 5-57600 6-115200	1	6	Effective immediately	Set when running	PST
P10	03	Modbus data format	0 - no parity, 2 stop bits 1-even parity, 1 stop bit 2-odd parity, 1 stop bit	1	0	Effective imme	Set when runnin	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
			3- no parity, 1 stop bit			diately	g	
P10	04	Update writed communication function code to EEPROM?	0-Do not update EEPROM 1- Update to EEPROM except P11 group and P18 group	-	0	Effective imme diately	Set when runnin g	PST

P11 group: auxiliary function parameters

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P11	00	JOG mode	Effective upon enter					
P11	01	Fault reset	0-no operation 1-fault reset	1	0	Effective imme diately	Settin g after motor stop	PST
P11	03	Inertia recognition function	Effective upon enter	1	0	Effective imme diately	Settin g after motor stop	PST
P11	05	Analog input automatic correction	0- no operation 1~2- AI1~AI2 adjustmen	1	0	Effective imme diately	Settin g after motor stop	PST
P11	06	Absolute encoder reset	0-no operation 1-Absolute encoder related warning and error clearing 2- Absolute encoder multi-turn data reset.	1	0	Re-power	Settin g after motor stop	PST
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 imme diately	Settin g 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 imme diately	Set when runnin g	PST
P11	11	Set DI forced input	0-0x01FF	1	0x01FF	Effective imme diately	Set when runnin g	PST
P11	12	Set DO forced output	0-0x001F	1	0	Effective imme diately	Set when runnin g	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 imme diately	Set when runnin g	PST
P12	01	Default display		1	1	Effecti	Set	PST

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
		settings				ve imme diately	when runnin g	
P12	03	Speed display filter time	0~1000.0ms	0.1ms	5.0ms	Effective imme diately	Set when runnin g	PST
P12	12	Software version number	VV.B.DD	1	0	N/A	Display param eter	
P12	13	FPGA version number	VV.B.DD	1	0	N/A	Display param eter	
P12	14	Product series code	PP.XXX	1	0	N/A	Display param eter	

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 imme diately	Setting after motor stop	P
P13	01	Specify starting segment	1~16	1	1	Effective imme diately	Setting after motor stop	P
P13	02	Specify end segment	1~16	1	1	Effective imme diately	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 imme diately	Setting after motor stop	P
P13	04	Waiting time unit	0-ms 1-s	1	0	Effective imme diately	Setting after motor stop	P
P13	05	Position control method	0-incremental position control 1-absolute position control	1	0	Effective imme diately	Setting after motor stop	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P13	08	Segment 1: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P
P13	13	Segment 2: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P
P13	18	Segment 3: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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
P13	22	Segment 3: waiting time after completion	0～10000	1ms(s)	1000 ms(s)	Effective immediately	Set when running	P
P13	23	Segment 4: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P13	28	Segment 5: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P
P13	33	Segment 6: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P
P13	38	Segment 7: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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
P13	42	Segment 7: waiting time after completion	0～10000	1ms(s)	1000 ms(s)	Effective immediately	Set when running	P
P13	43	Segment 8: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P13	48	Segment 9: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P
P13	53	Segment 10: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P
P13	58	Segment 11: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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
P13	62	Segment 11: waiting time after completion	0～10000	1ms(s)	1000 ms(s)	Effective immediately	Set when running	P
P13	63	Segment 12: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P13	68	Segment 13: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P
P13	73	Segment 14: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(s)	Effective immediately	Set when running	P
P13	78	Segment 15: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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
P13	82	Segment 15: waiting time after completion	0～10000	1ms(s)	1000 ms(s)	Effective immediately	Set when running	P
P13	83	Segment 16: movement displacement (32 bits)	-1073741824 ～ 1073741824(command unit)	1Unit	10000 Unit	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)	1000 ms(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
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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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
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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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
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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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
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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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
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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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
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	00	Interrupt fixed length enable	0-Disable 1-Enable	1	0	Effective immediately	Setting after motor stop	P
P16	01	Interrupt fixed length 1 displacement	-1073741824~1073741824 （Command unit）	1 Unit	10000 Unit	Effective immediately	Set when running	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P16	03	Interrupt fixed length 1 constant running speed	0~9000rpm	1rpm	200rpm	Effective immediately	Set when running	P
P16	04	Interrupt fixed length acceleration time	0~1000ms	1ms	200ms	Effective immediately	Set when running	P
P16	05	Interrupt fixed length deceleration time	0~1000ms	1ms	200ms	Effective immediately	Set when running	P
P16	06	Fixed length lock release signal enable	0~1	1	0	Effective immediately	Set when running	P
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; 16-absolute value homing; 17- indexing absolute value homing;	1	0	Effective immediately	Setting after motor stop	P
P16	10	High-speed for searching home switch signal	10 rpm -3000 rpm	1 rpm	100 rpm	Effective immediately	Setting after motor stop	P
P16	11	Low-speed for searching home switch signal	10 rpm -1000 rpm	1 rpm	10 rpm	Effective immediately	Setting after motor stop	P

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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
P16	18	Absolute value system home position update enable	0-no update; 1- home position is updated to the current position;	10	0	Effective immediately	Set when running	P
P16	19	Absolute value home single-round absolute position	0~1073741824	1Unit	0 Unit	Effective immediately	Set when running	P
P16	21	Absolute value home multi-round data	0~65535	1	0	Effective immediately	Set when running	P
P16	22	Software position limit setting	0-Use hardware limit; 1-Use software limit;	1	0	Effective immediately	Setting after motor stop	P
P16	23	Absolute position maximum limit	-1073741824 ~ 1073741824	1Unit	1073741824	Effective immediately	Set when running	P
P16	25	Absolute position minimum limit	-1073741824 ~ 1073741824	1Unit	-1073741824	Effective immediately	Set when running	P
P16	27	Absolute position homing delay time	0~10000ms	1ms	0ms	Effective immediately	Set when running	P
P16	28	Single round indexing number	1~200	1	50	Effective immediately	Set when running	P
P16	37	Interrupt fixed length 2 displacement	-1073741824~1073741824 （Command unit）	1 Unit	10000 Unit	Effective immediately	Set when running	P
P16	39	Interrupt fixed length 2 constant running speed	0~9000rpm	1rpm	200rpm	Effective immediately	Set when running	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	Bus encoder communication check error counter	-	1	-	N/A	Display parameter	PST
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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
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	27	AI1 sampling voltage value	-	1mV	-	N/A	Display parameter	PST
P18	28	AI2 sampling voltage value	-	1mV	-	N/A	Display parameter	PST
P18	29	AI1 original voltage value	-	1mV	-	N/A	Display parameter	PST
P18	30	AI2 original voltage value	-	1mV	-	N/A	Display parameter	PST
P18	31	Module temperature value	-	1°C	-	N/A	Display parameter	PST
P18	32	Absolute encoder single-round data	-	pulse	-	N/A	Display parameter	PST
P18	34	Absolute encoder multi-round data	-	turn	-	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

Function code		Name	Setting range	Min. unit	Default setting	Effective time	Type	Mode
P18	46	In-time current V at selected fault		0.01A		N/A	Display parameter	PST
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

Input signal function description				
Code	Name	Function Name	Description	Status
FunIN.10	MODE_SWITCH	Mode switching M1-SEL	Switch between speed, position and torque according to the selected control mode (3, 4, 5)	Assign
FunIN.11	ZERO_CLAMP	Zero postion fixed function enable signal	Valid -enable zero postion fixed function, Invalid-disable zero postion 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	P_CL	Forward external torque limit ON	According to the selection of P06-06, the torque limit source is switched. When P06-06=1: Valid - forward external torque limit is valid Invalid - Forward internal torque limit is valid When P06-06=3 and the AI limit value is greater than forward external limit value: Valid - forward external torque limit is valid Invalid - AI torque limit is valid P06-06=4: Valid - AI torque limit is valid Invalid - Forward internal torque limit is valid	Assign
FunIN.16	N_CL	Backward external torque limit ON	According to the selection of P06-06, the torque limit source is switched. When P06-06=1: Valid - backward external torque limit is valid Invalid - backward internal torque limit is valid When P06-06=3 and the AI limit value is greater than backward external limit value: Valid - backward external torque limit is valid Invalid - AI torque limit is valid P06-06=4: Valid - AI torque limit is valid Invalid - backward internal torque limit is valid	Assign
FunIN.17	P_JOG	Forward JOG	Valid - input according to given command Invalid - stop input run command	Assign

	Input signal function description			
Code	Name	Function Name	Description	Status
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
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	SPD_AI_DIRCMD1	Speed mode AI command switch 1		Assign
FunIN.41	SPD_AI_DIRCMD2	Speed mode AI command switch 2		Assign

	Output signal function description			
Code	Name	Function Name	Description	Status
FunOUT.1	S_RDY	Servo ready	The servo state is ready to receive the S-ON valid signal. Valid - servo ready Invalid - servo not ready	Assign
FunOUT.2	ALM	Alarm output signal	Valid when alarm is detected.	Assign
FunOUT.3	WARN	Warning output signal	Warning output signal is valid (conducting)	Assign

Output signal function description				
Code	Name	Function Name	Description	Status
FunOUT.4	TGON	Motor rotation output signal	When the servo motor speed is higher than the speed threshold (P05-16): Valid - motor rotation signal is valid Invalid - motor rotation signal is invalid	Assign
FunOUT.5	V_ZERO	Zero speed signal	The signal output when the servo motor stops rotating. Valid - motor speed is zero Invalid - motor speed is not zero	Assign
FunOUT.6	V_CMP	Speed arrival	In speed control mode, the absolute value of the difference between servo motor speed and speed command is less than P05-17 speed deviation setting value.	Assign
FunOUT.7	COIN	Position arrival	In position control mode, it is valid when the position deviation pulse reaches the positioning completion amplitude P04-24.	Assign
FunOUT.8	NEAR	Positioning proximity signal	In position control mode, it is valid when the position deviation pulse reaches the positioning proximity amplitude P04-25	Assign
FunOUT.9	T_LT	Torque limit signal	Torque limit confirmation signal Valid - motor torque limited Invalid - motor torque is not limited	Assign
FunOUT.10	V_LT	Speed limit signal	Speed-limited signal for speed control Valid - motor speed limited Invalid - motor speed is not limited	Assign
FunOUT.11	BKOFF	Brake release signal output	Brake release signal output: Valid - brake is released, motor shaft is free Invalid - brake is hold, motor shaft is locked	Assign
FunOUT.12	T_ARR	Torque feedback reaches the specified range	Valid - Torque absolute value reaches set value Invalid - Torque absolute value less than set value	Assign
FunOUT.13	V_ARR	Speed feedback reaches the specified range	Valid-speed feedback reaches set value Invalid - speed range does not reach set value	Assign
FunOUT.18	XINT_DONE	Interrupt fixed length completion signal	Output after interrupt fixed length completion	Assign
FunOUT.19	HOME_ATTAIN	Homing complete signal	Output after homing complete	Assign
FunOUT.21	STEP1_OUT	Multi-segment position command 1 completes output	16-segment position completion output	Assign
FunOUT.22	STEP2_OUT	Multi-segment position command 2 completes output	16-segment position completion output	Assign
FunOUT.23	STEP3_OUT	Multi-segment position command 3 completes output	16-segment position completion output	Assign
FunOUT.24	STEP4_OUT	Multi-segment position command 4 completes output	16-segment position completion output	Assign

Appendix A: Error Code Table

Error number Er_	Error Name	Cause of Error	Stop method when error occurs	Fault resetable
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
5	FPGA failure	1 FPGA initialization exception 2 FPGA logic version is abnormal 3 FPGA detected an exception	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
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
18	Power-on motor identification code error	The motor parameters are not written in the motor encoder EEPROM. You need to manually set the P01.00 parameter to write the motor code.	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	No.1	Yes

Error number Er_	Error Name	Cause of Error	Stop method when error occurs	Fault resetable
		3 speed response severely exceeded limit 4 drive failure		
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;	N0.2	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
51	Absolute encoder battery failure	No battery or battery voltage below 2.6V	N0.2	Yes
52	Absolute encoder multi-round count error	Absolute encoder multi-round count error	No.2	Yes
53	Absolute encoder multi-round count overflow	Absolute encoder multi-round count overflow	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
84	Reset encoder warning	In enabled state, the host computer resets the encoder with command
86	Forward overtravel warning	Forward overtravel switch Pot terminal is valid
87	Backward overtravel warning	Backward overtravel switch Not terminal is valid
88	Divided pulse output setting fault	The number of encoder crossover pulses does not meet the set condition or range
89	AI1\ AI2 zero drift too large	AI1\ AI2 zero drift too large

Warning code EE	Warning name	Warning reason
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
92	RS485 communication error	RS485 communication error
93	Disable operation in enabled state	1 Operation JOG test run in enabled state 2 Operational inertia identification in enabled state
94	DI emergency brake	External emergency brake E_STOP terminal trigger
95	Absolute encoder battery low	Battery voltage is lower than 3.2V
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
2018.11.27	V 1.0	Initial release