TOM Servo Driver Manual

TOM series AC servo driver manual V215

Safety precautions

The following marks are used in the safety-related contents of this instruction book. The instructions about the safety mark are the main content, please be sure to follow.

Danger	Indicates that when used incorrectly, it can cause danger and death.
Attention	Indicates a danger when used incorrectly, resulting in personal injury and possible damage to equipment.
Forbid	Indicates strictly prohibited behavior, otherwise the device will be damaged or unusable.

1. Usage situation

Danger	● it is forbidden to products used for inflammable and explosive occasions, easy to cause damage or cause a fire. ● Do not use the product in damp, direct sunlight, dust, salt and metal powder places.

2. Wiring

Danger	● do not use drive power access to 380 v, 220 v power supply, otherwise it will cause equipment damage or fire. ● Please ground the grounding terminal reliably，Poor grounding may cause electric shock or fire. ● Do not connect the drive U, V, W motor output terminals to the three-phase power supply, otherwise it will cause casualties or fire. ● The output terminals of drive U, V, W motor and motor wiring terminals U, V, W must be connected one-to-one, otherwise the motor may cause equipment damage and casualties due to overspeed. ● Please refer to wire wiring, otherwise it may cause fire

3. Operation

 Attention	● Before starting operation, please confirm whether emergency switch can be activated at any time to stop. ● During the test run, please separate the servo motor from the machine. Install the motor on the machine after confirmation of operation. ● Do not get close to the machine after the servo motor stops and resumes. The machine may suddenly start again. ● Do not switch on or off the power frequently, otherwise it will cause overheating inside the drive.

4. Running

 Forbid	● When the motor running, banned parts in contact with any rotation, otherwise it will cause loss of life. ● Equipment runs, untouchable drives and motors, otherwise it will cause electric shock or burns. ● Do not move the connecting cables while the equipment is in operation, otherwise it may cause personal injury or damage to the equipment.

5.Check and Maintenance

 Forbid	● Please do not disassemble and repair by yourself ● Do not touch the inside of the drive and its motor, otherwise it will cause electric shock. ● Operations such as wiring, maintenance and overhaul are prohibited under the energized state. Please be sure to power off for more than 30 minutes, after the high voltage warning light off, then carry out the above operation.

Chapter 1 Product introduction

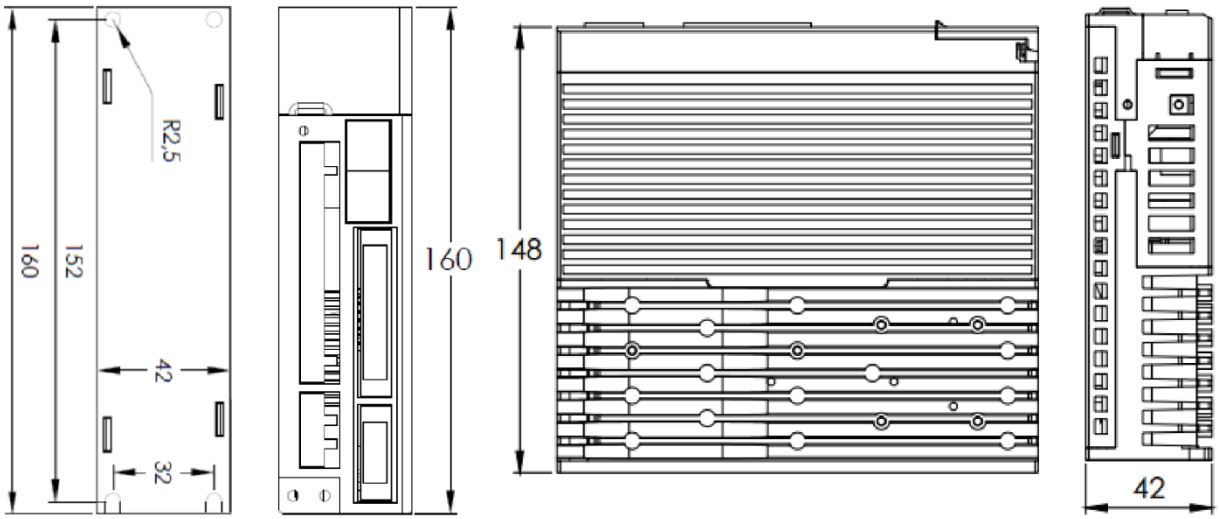
1.1 Servo Driver Technical Specifications

Driver No			N/A	TD-S14001	TD-S17501	N/A	N/A	N/A	N/A	N/A	N/A
Module current(A)			20	20	20	30	50	35	50	75	100
Overload ratio	1.5	Output current	8.49	8.49	8.49	12.73	21.22	14.85	21.22	31.82	42.43
	2		6.36	6.36	6.36	9.55	15.91	11.14	15.91	23.87	31.82
	2.5		5.09	5.09	5.09	7.64	12.73	8.91	12.73	19.09	25.46
	3		4.24	4.24	4.24	6.36	10.61	7.43	10.61	15.91	21.22

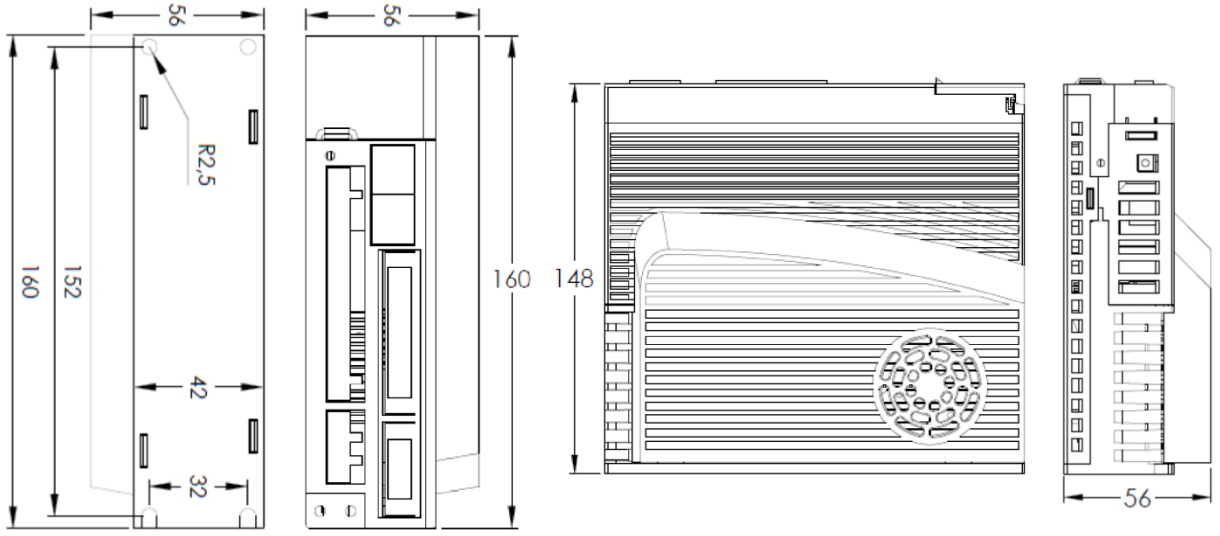
Input power	⚠ TOM series single-phase or three-phase drive 220 vac (voltage fluctuation - 15% ~ + 10%), 50 Hz / 60 Hz ⚠ TOM series drive three-phase 380VAC (voltage fluctuation -15% ~ +10%), 50 Hz /60Hz	
Working Environment	Temperature:Working：0℃～55℃storage：-20℃～+80℃	
Control Method	Humidity:Below 90%（non condensing）	
regenerative brake	Vibration:below0.5G（4.9m/s^2），10 Hz～60 Hz(Discontinuous operation)	
Input power	①Position control ②Speed control ③Torque control ④Communication control	
Working Environment	Built-in（When the power of the internal brake resistor is not enough, the external high power brake resistor can be connected）	
Control characteristi	Velocity frequency response:≥200Hz	
	Speed fluctuation ratio ＜±0.03（Load 0～100%）：＜±0.02×(0.9～1.1）Supply voltage （value corresponds to the rated speed）	
	Speed ratio：1：5000	
	Pulse frequency ≤ 300kHz	
Control input	① Servo on；②ALM-RST；③CCW FSTP；④CW FSTP； ⑤Deviation counter is zeroed/speed selected 1；⑥Instruction pulse disabling/speed selection 2; ⑦CCW Torque limitation；⑧CW Torque limitation 。	
Control output	1. Servo is ready; 2. servo alarm; 3. position arrived; 4. Speed to arrive; 5. torque arrives; 6. brake control signal; 7. Return to original completion;	
Position control	Input mode	① Pulse + Direction； ② A plus B orthogonal impulse。
	Electronic gear ratio	1 ~ 32767/1 ~ 32767 (The default is 131072:1000, that is, 1000 pulses per circle)
	Feedback pulse	131072 Pulse/revolution
Speed control	4 internal speeds (switched by SC1 and SC2 input signal combination)	
Acceleration and deceleration function	Parameters set acceleration and deceleration time1～10000 ms（0 r/min ～ 1000 r/min）	
Monitoring function	Speed, current position, instruction pulse accumulation, position deviation, motor torque, motor current, bus voltage, Absolute rotor position, instruction pulse frequency, operating state, input and output terminal signals, etc	
Protect function	Overspeed, overvoltage and undervoltage of the main power supply, overcurrent, overload, abnormal braking, abnormal encoder, abnormal control power supply, Too bad position, etc	
Applicable load inertia	Less than 5 times the inertia of the motor rotor	

Chapter 2 Installation

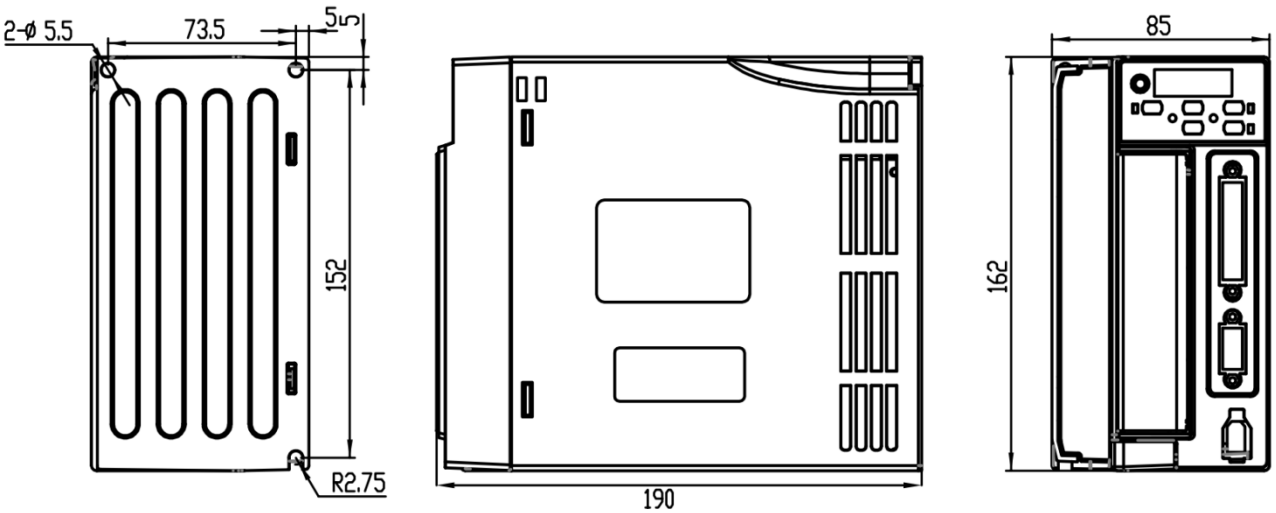
2.1 TD-S14001（400W）Servo drive external size drawing



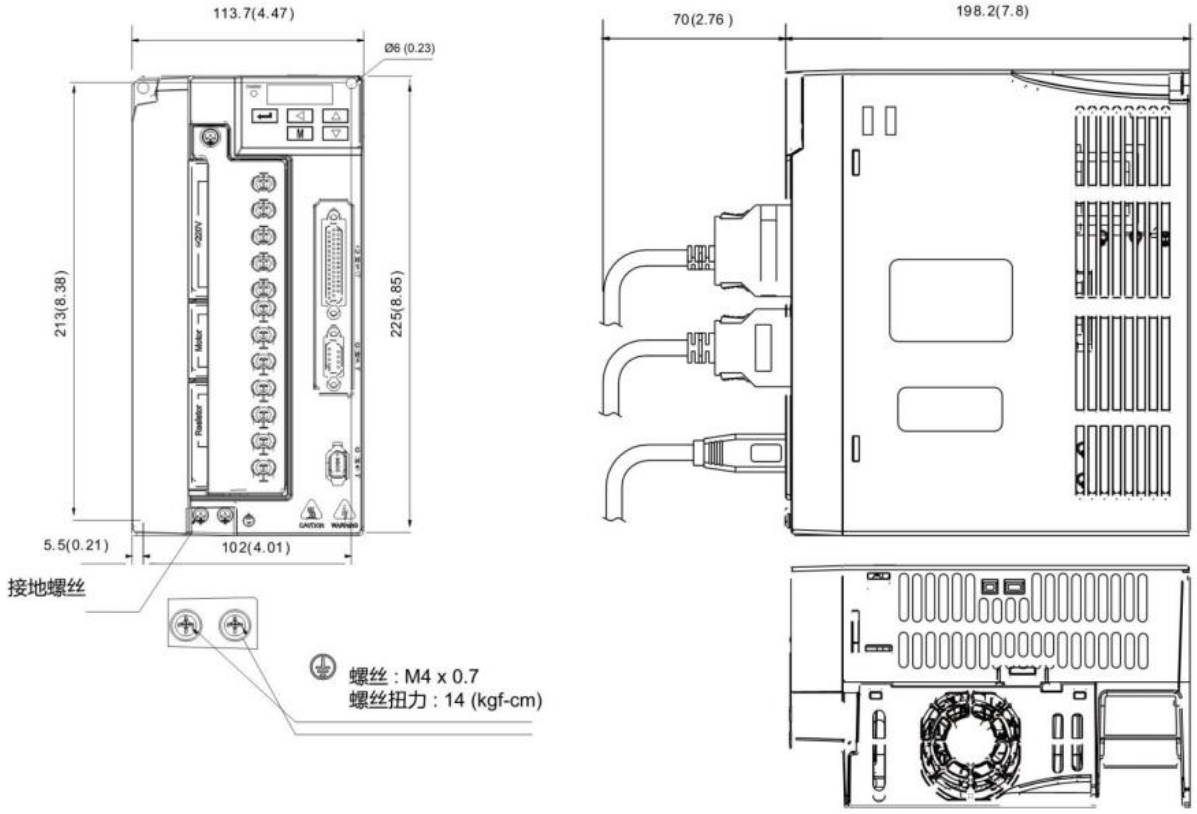
2.2 TD-S17501（750W）Servo drive external size drawing



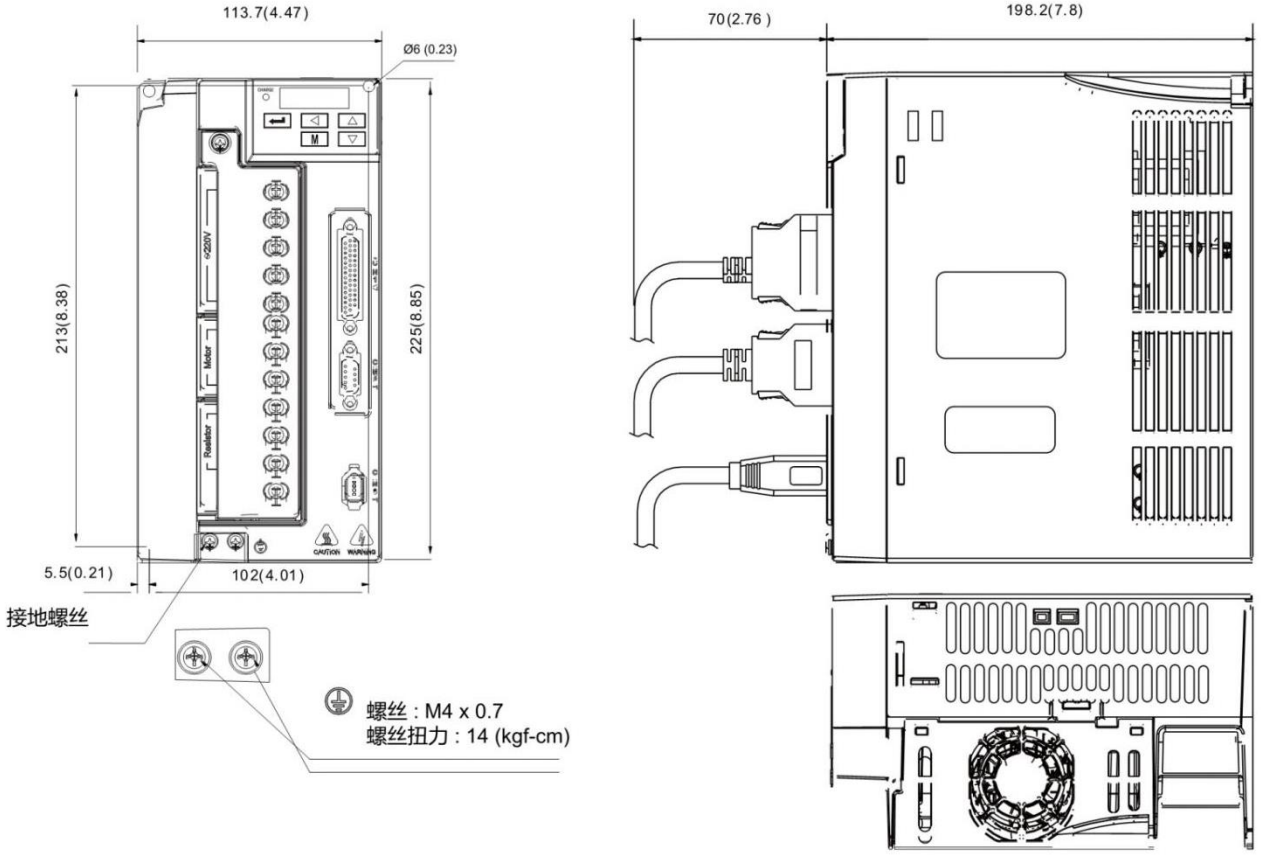
2.3 N/A（1.0 kW～2.6kW）Servo drive external size drawing



2.4 N/A（1.0kW～3.0kW）Servo drive external size drawing

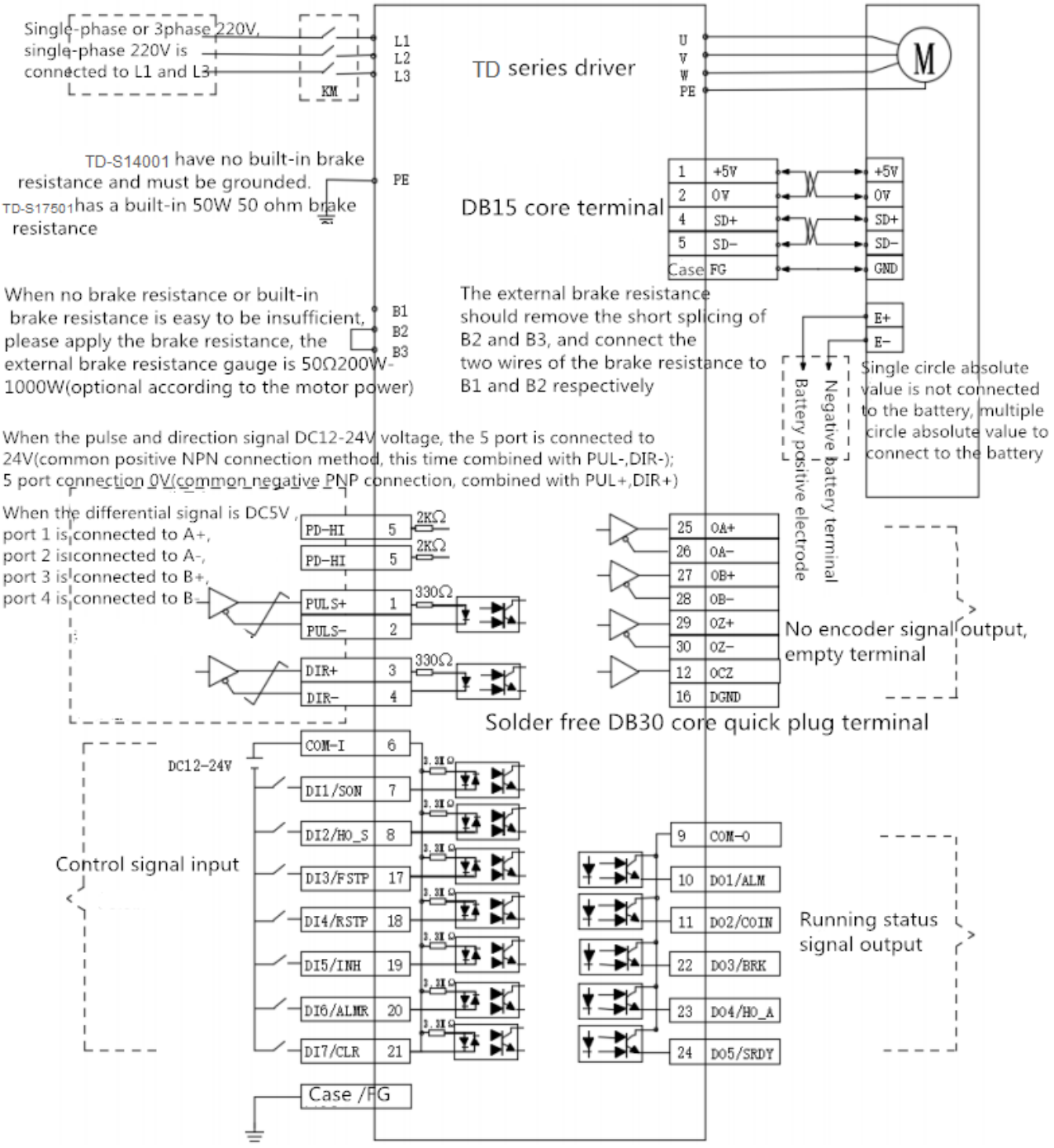


2.5 N/A（3.7kW～11kW）Servo drive external size drawing



2.6 Standard wiring diagram

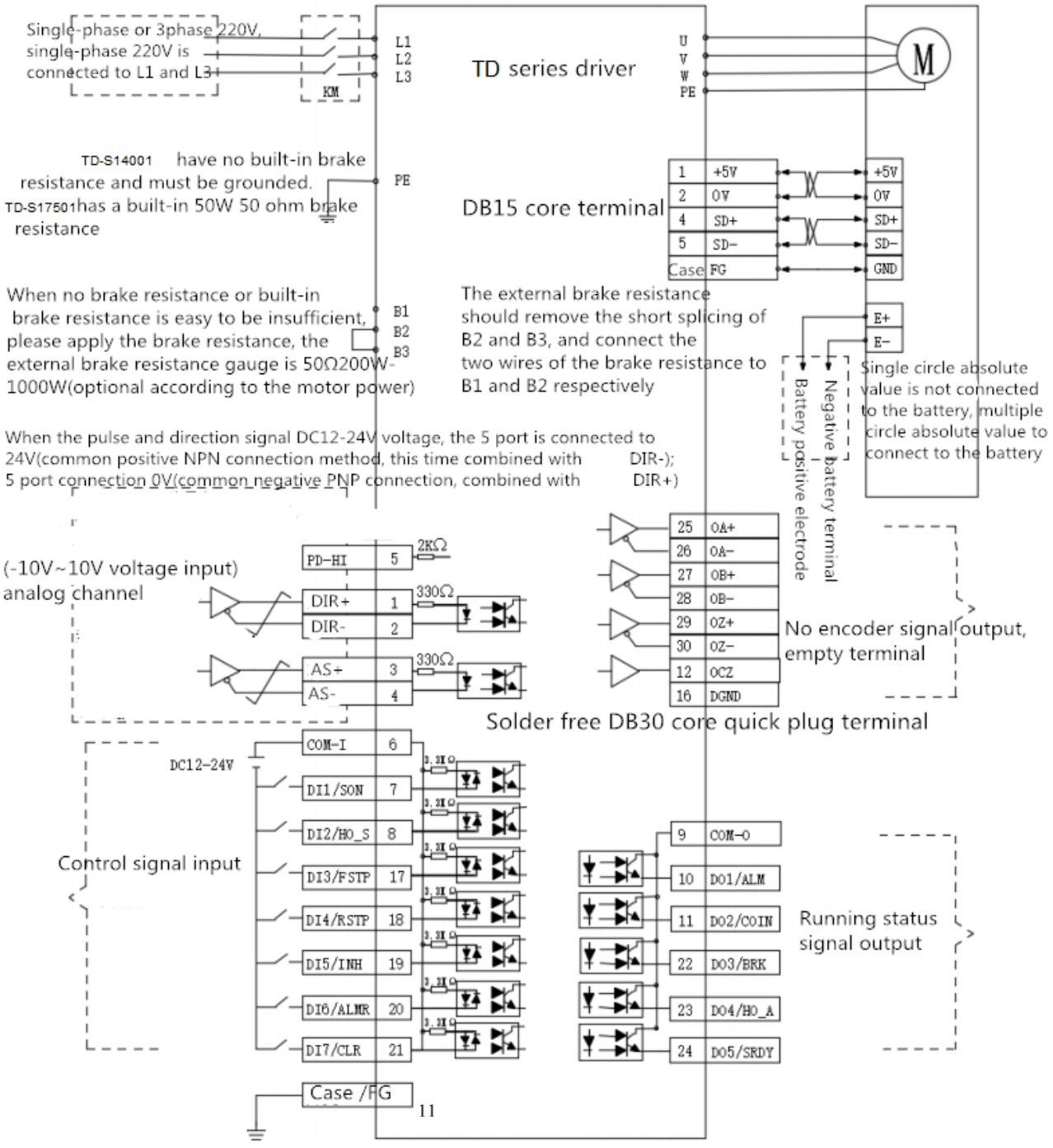
2.6.1 Position mode wiring diagram



Position mode wiring diagram

PS: Just USE RS485 communication have encoder signal output.

2.6.2 Speed/Torque Mode Wiring Diagram

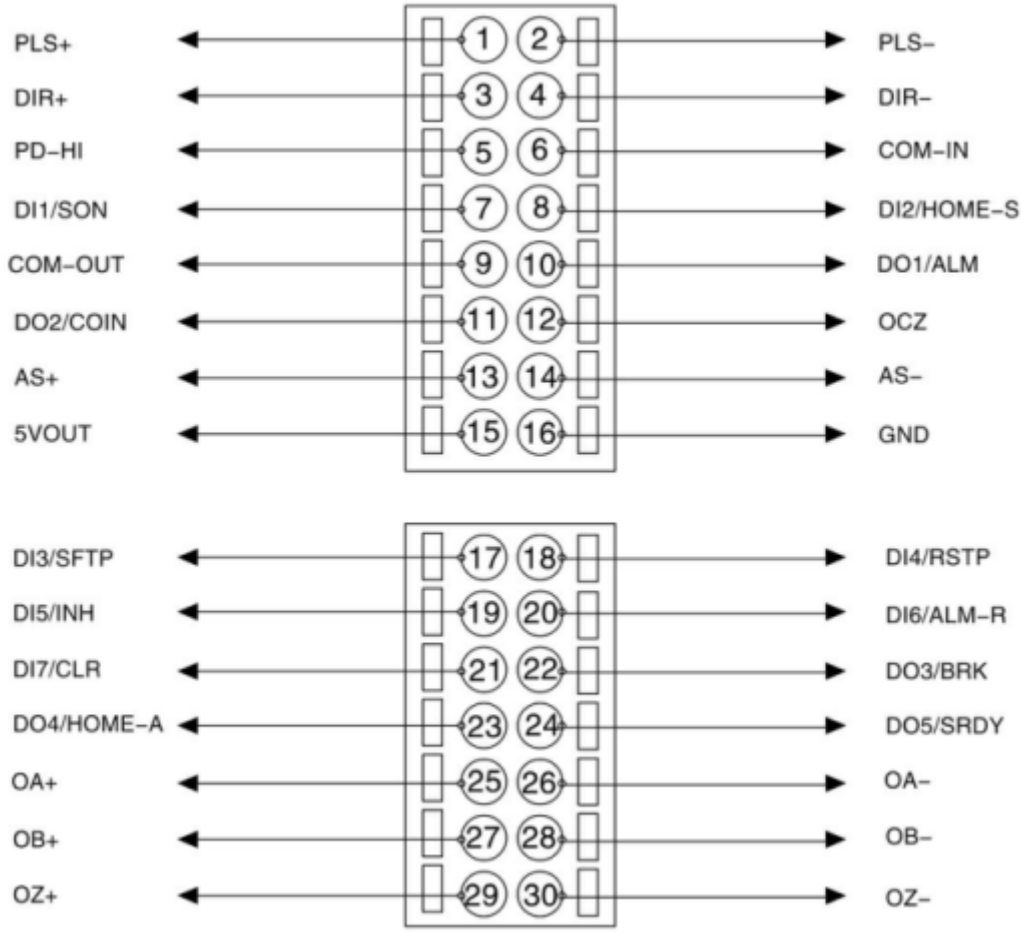


Analog/Torque Mode Wiring

PS: Just USE RS485 communication have encoder signal output.

2.6.3 Sequence diagram of TOM servo control terminals

Sort from top to bottom facing the drive
Control terminal sequence diagram



OA+,OA-,OB+,OB-,OZ+,OZ- are empty terminal

Note 1: The diagram of control signal terminals is sorted from top to bottom facing the driver. For detailed function description of each signal terminal, refer to the description on the next page.
Note 1: The above terminals are assigned by default. You can enter the parameters in group P13 to assign DI and DO functions as required.
Only one input function can be assigned to a unique DI.

2.6.4 Control signal input/output terminal (16-core terminal)

Control mode: P stands for position control mode; S stands for speed control mode; T stands for torque control mode.

Pin No	Signal name	Mark	Mode	Function
1	Command pulse 5V positive end	PULS+	P	● Determine the motor rotation Angle and speed. ● Select the corresponding port according to the pulse voltage.
2	Instruction pulse input negative end	PULS-		
3	Command Direction 5V positive end	DIR+	—	● motor rotation direction. ● It can also be used for directional control when simulating quantitative mode.
4	Instruction Direction input negative end	DIR-		
5	Pulse and direction high voltage input	PD-HI	P	When pulse and direction signals use DC 12V ~ 24V voltage, this port is connected to 24V (co-positive NPN connection, in combination with PULS- and DIR-) or 0V (co-negative PNP connection, in combination with PULS+ and DIR+).
6	Common end of the input terminal	COM-I	—	The common end of the input terminal is used to drive the input optocoupler, connected with DC 12V ~ 24V (positive NPN connection) or 0V (negative PNP connection), the current is more than or equal to 100mA
7	Input terminal 1	DI1	—	This terminal function depends on the user's I/O input function selection. Factory default I/O input function 01 (servo enabling SON)
8	Input terminal 2	DI2	—	This terminal function depends on the user's I/O input function selection. Factory default I/O input function 02 (return to the origin to trigger Home_start)
9	Common end of the output terminal	COM-O	—	The common end of the output terminal, used to drive the output circuit, connected to 0V (positive NPN connection) or DC 12 V ~ 24V (negative PNP connection)
10	Output terminal 1	DO1	—	This terminal function depends on the user's I/O output function selection. The factory default I/O output function is 01 (servo alarm ALM)
11	Output terminal 2	DO2	—	This terminal function depends on the user's I/O output function selection. Factory default I/O output function 02 (location to POS_REACH)
12	Encoder Z phase collector open output	OCZ	—	● Usually Z is believed to be very narrow pulse, please use a high-speed optoelectronic coupler to receive. ● Combined with 16-pin GND, output current ≤ 100mA.
13	Analog speed or torque instruction input	AS+	S/T	● differential mode, the input impedance of 10 k Ω - 10 v ~ + 10 v input range. ● The direction of rotation/torque can be controlled by DIR signal.
14		AS-		
15	Driver internal 5V	5Vout	—	● only for analog input and output current 100 ma, or less. ● Do not use this voltage as it or short circuit with GND, otherwise it will damage the drive!
16	Output Ground	GND	—	● As a Group for 5V, OA, OB, OZ and OCZ

2.6.5 Control signal input/output terminal (DB14-core terminal)

Pin No	Signal name	Mark	Mode	Function
17	Input terminal 3	DI3	—	This terminal function depends on the user's I/O input function selection. Factory default I/O input function 04 (CCW (counterclockwise) driver disallows FSTP)
18	Input terminal 4	DI4	—	This terminal function depends on the user's I/O input function selection. Factory default I/O Input function select 05 (CW (clockwise) drive disable RSTP)
19	Input terminal 5	DI5	—	This terminal function depends on the user's I/O input function selection. Factory default I/O Input function selection 06 (instruction pulse disallow INH)
20	Input terminal 6	DI6	—	This terminal function depends on the user's I/O input function selection. Factory default I/O Input function select 07 (Alarm Clearance ALM_S)
21	Input terminal 7	DI7	—	This terminal function depends on the user's I/O input function selection. Factory default I/O Input function select 08 (pulse deviation counter zero clear CLE)
22	Output terminal 3	DO3	—	This terminal function depends on the user's I/O output function selection. Factory default I/O Output function selection 06 (mechanical brake release BRK)
23	Output terminal 4	DO4	—	This terminal function depends on the user's I/O output function selection. Factory default I/O output function select 07 (go back to complete Home_A)
24	Output terminal 5	DO5	—	This terminal function depends on the user's I/O output function selection. Factory default I/O output function 08 (servo-ready SRDY)
25	Encoder A trust number output	OA+	—	Encoder ABZ signal differential drive output (26LS31 output, equivalent to RS422); When combined with 16-pin GND, the output current is less than or equal to 100mA
26		OA-		
27	Encoder B believes the signal output	OB+		
28		OB-		
29	Encoder Z believes in sign output	OZ+		
30		OZ-		

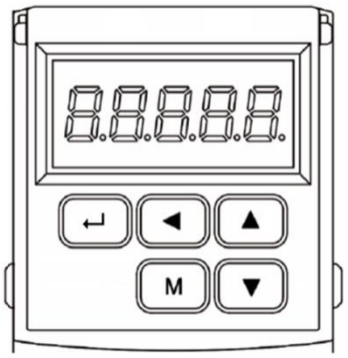
2.6.6 Encoder signal input terminal (DB9-core terminal)

Pin No	Signal name	Mark	Mode
1	5V power supply	+5V	● with a + 5 power servo motor encoder and the public; ● When the cable is longer, multi-line parallel connection is applied to reduce the line voltage drop.
2	Power common	0V	
4	Positive end of the encoder communication signal	SD +	● It is connected with the absolute encoder SD +
5	Negative end of the encoder communication signal	SD -	● It is connected with the absolute encoder SD -
Shell	Shield Ground	FG	● Shield ground terminals

Chapter 3 Display and Panel Operation

3.1 Description operator panel

The operation interface of the servo driver is composed of 5 LED digital tubes and 5 keys, which can be used for the state display and parameter setting of the servo driver. The interface layout is as follows：

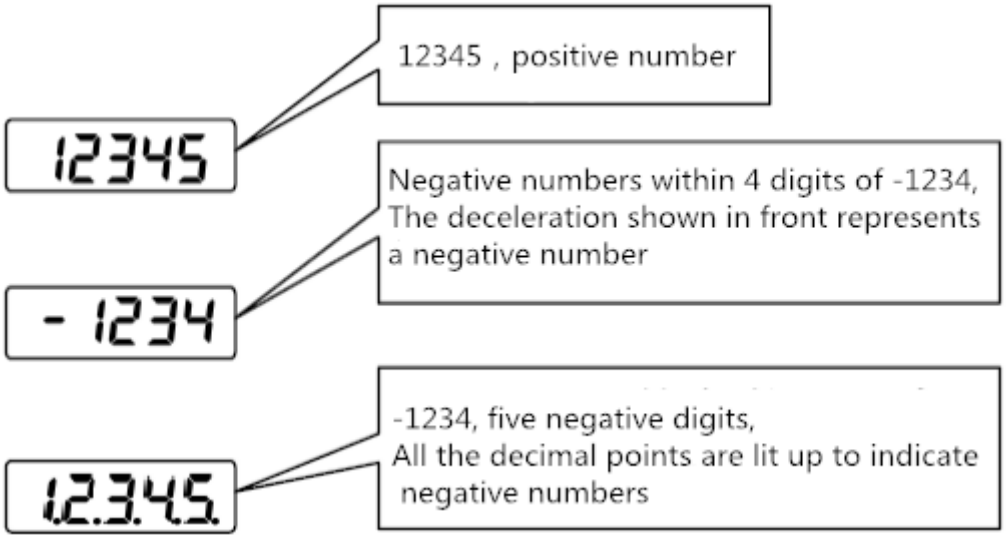


➢ Keys function description

Key	Key name	Function
M	MODE	Switch status monitoring mode/parameter mode/alarm mode to return to the previous menu.
▲	Increase	Add monitor code, parameter number or set value, long press can increase quickly.
▼	Reduce	Reduced monitor code, parameter number or set value, long press can quickly reduce.
◀	Shift	When setting parameters, press the key to move the selected flicker bit to the left by one.
↵	Confirm	Go to the next level menu, or save the Settings.

Numerical display description

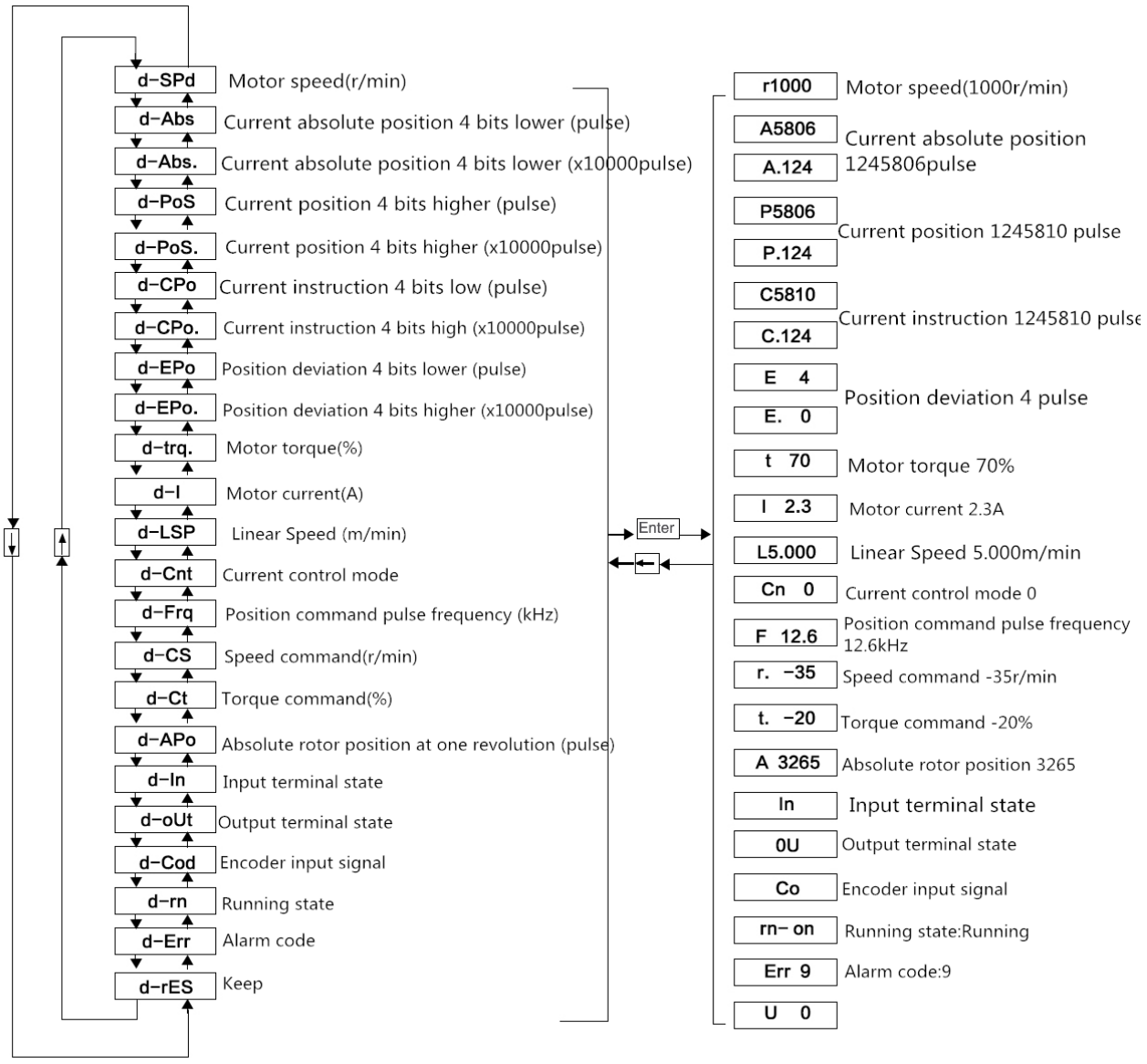
The numerical value uses 5 digital tube display, the front of the numerical value shows a minus sign to represent the negative number, if it is 5 negative number, all the decimal point lit up to represent the negative number. Some display items have prefix characters in front of them. If the number of digits is too long to occupy the prefix character's position, the prefix character will not be displayed, only the value will be displayed.



3.2 State monitoring

When the servo drive is powered on, the display will continue to display "pr. on" for about one second, and then automatically enter the status monitoring mode

Type. There are 21 kinds of display status. The user uses ▲ and ▼ keys to select the display status needed. You can also modify the value of parameter P00.03 to select the display state after the servo drive is powered on.



Monitor mode operation block diagram

[Note 1] R1000, where R is the motor speed code, and 1000 means the motor speed is 1000 r/min in the counterclockwise direction. If the motor is running in the clockwise direction, the negative speed of -1000 is displayed.The units are r/min.

[Note 2] Position feedback pulse POS and position command pulse CPO are values amplified by the input electronic gear.

The position quantity fed back by the motor encoder is composed of POS. (high 4 bits) + POS (low 4 bits).
For example: P.12 x 10000 + P5806 = 125806 pulses.
Similarly, the position instruction pulse is also composed of CPO. (high 4 bits) + CPO (low 4 bits).

For example: C.12 x 10000 + C5810 =125810 pulses.
[Note 3] When the encoder is fixed, the Z pulse position is fixed as the zero pulse.D-Apo displays the pulse value of the motor encoder's output position signal deviating from the zero pulse. If the number of lines in the encoder is 2500, the D-Apo displays the range from 0 to 9999.

[Note 4] Display of input terminal is shown in Fig. 3-2-1, display of output terminal is shown in Fig. 3-2-2, and display of encoder signal is shown in Fig. 3-2-3.

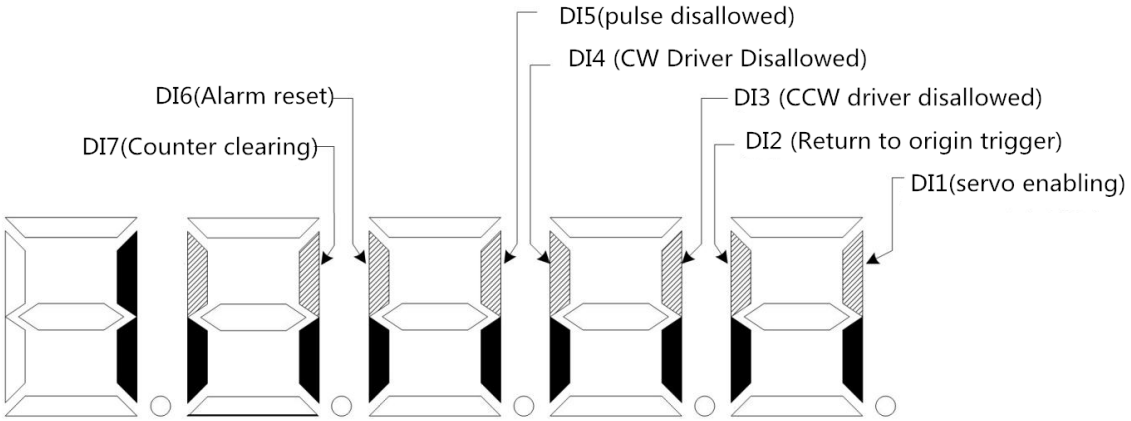


Figure 3-2-1 Input terminal display (the stroke is ON and OFF is OFF)

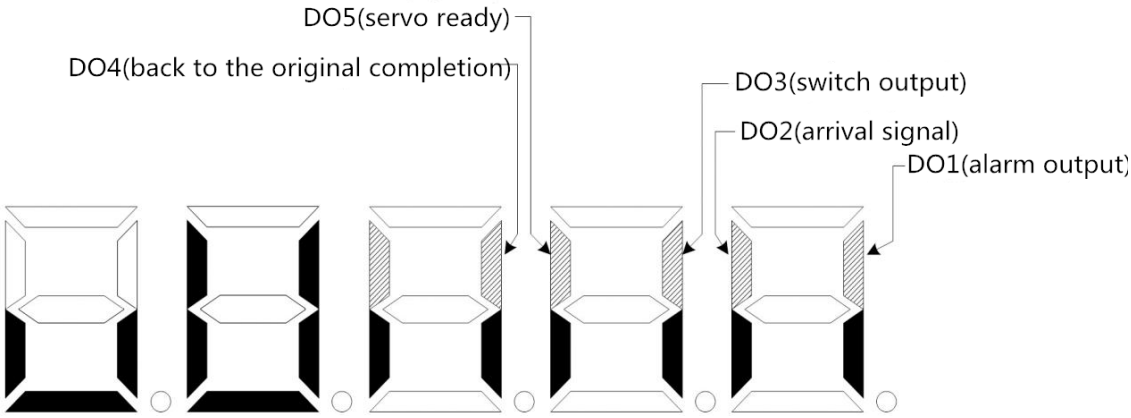


Figure 3-2-2 Display of output terminals (the stroke is ON and OFF is OFF)

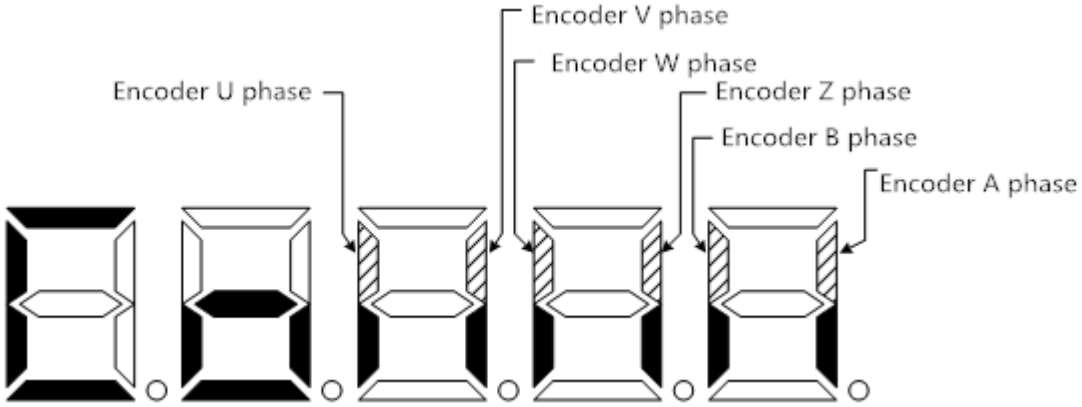


Figure 3-2-3 signal display of encoder (the stroke is ON, OFF is OFF)

[Note 5] The running state is as follows:

RN-OF: the main circuit is not charged, and the servo system is not running;

RN-CH: The main circuit has been charged, and the servo system is not running (the servo is not enabled or there is an alarm);

RN-ON: The main circuit has been charged and the servo system is running.

3.3 [arameter setting

➢ Servo driver parameters can be set by following the following steps

1. Press [M] key in the menu of Layer 1 to switch to "P00." parameter setting mode;

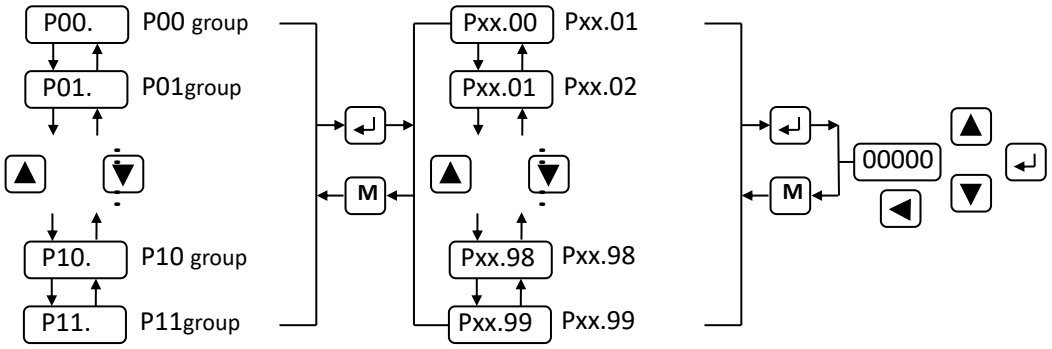
2. Use [▲] and [▼] keys to select different parameter groups P00 ~ P11, press [↵] key to enter the second layer "parameter number" selection menu;

3. Use [▲] and [▼] keys to select different parameter numbers.Press [↵] key to display the value of this parameter, and the lowest value of the parameter flashes. 【 ◄】 key can move the flicker bit, and 【▲】 and 【▼ 】 key can modify the parameter value.

4. Press [↵] key to save the modified value, and the modified value will be immediately reflected in the control.

5. After that, press [▲] and [▼] keys to continue to modify parameters. After modification, press [M] key to return to the parameter selection menu.

6. If you are not satisfied with the value being modified, do not press [↵] to confirm, but press [M] to cancel, the parameter will be restored to its original value, and return to the parameter selection menu.



Operation block diagram of parameter setting

Chapter 4 Parameter and Function

4.2 List of parameters

The factory values in the table below take the servo driver fitted with 60SFM-E01330 (1.27Nm, 3000r/min) motor as an example.

Note: Parameters with "*" indicate that relevant parameters of drivers matching different motors are different.

4.1.1 P00 group list of parameters

No	Name	Setting range	Factory default	Unit	way of application
P00.00	Password	0～9999	316	—	P，S
P00.01	Driver information (Read only)	—	—	—	P，S
P00.02	Software Version (Read Only)	—	—	—	P，S
P00.03	Initial display state	0～22	0	—	P，S
P00.04	Control Strategy Choice	0～11	0	—	P，S
P00.05	Proportional velocity gain	5～2000	150*	Hz	P，S
P00.06	Velocity integral time constant	1～1000	80*	ms	P，S
P00.07	Torque command filter	1～500	30	%	P，S
P00.08	Speed detection low pass filter	1～500	100	%	P，S

P00.09	Position proportional gain	1～1000	100*	1/s	P
P00.10	Position feed forward gain	0～100	0	%	P
P00.11	The cut-off frequency of the position feedforward low-pass filter	1～1200	300	Hz	P
P00.12	Position command pulse frequency dividing molecule	1～32767	0	—	P
P00.13	Position instruction pulse frequency dividing denominator	1～32767	1000	—	P
P00.14	Position instruction pulse input mode	0～1	0	—	P
P00.15	Reverse the direction of the position instruction pulse	0～1	0	—	P
P00.16	Location completion range	0～30000	262	Encoder unit	P
P00.17	Position out of tolerance detection range	0～30000	400	×0.01 Pulse	P
P00.18	Out-of-position errors are invalid	0～1	0	—	P
P00.19	Position command smoothing filter	0～20000	200*	ms	P

4.1.2 P01 group list of parameters

No	Name	Setting range	Factory default	Unit	way of application
P01.00	Invalid driver disable input	0～1	1	—	P，S
P01.01	JOG running speed	-6000～6000	120	r/min	S
P01.02	Acceleration and deceleration time constants	0～10000	500	ms	S
P01.03	Maximum speed limit	0～6000	6000	r/min	P，S
P01.04	Internal speed 1	-6000～6000	0	r/min	S
P01.05	Internal speed 2	-6000～6000	100	r/min	S
P01.06	Internal speed 3	-6000～6000	300	r/min	S
P01.07	Internal speed 4	-6000～6000	-100	r/min	S
P01.08	On-speed	0～6000	500	r/min	S
P01.09	Retain	—	—	—	—
P01.10	Internal CCW torque limit	0～600	300	%	P，S
P01.11	Internal CW torque limit	-600～0	-300	%	P，S
P01.12	External CCW torque limit	0～600	100	%	P，S
P01.13	External CW torque limit	-600～0	-100	%	P，S
P01.14	Speed trial run, torque limit of JOG operation	0～600	100	%	S
P01.15	Retain	—	—	—	—

4.1.3 P02 group list of parameters

No	Name	Setting range	Factory default	Unit	way of application
P02.00	Analog speed command gain	0～3000	300	（r/min）/ V	S
P02.01	Reverse the direction of the analog speed instruction	0～1	0	—	S
P02.02	Analog speed instruction zero offset compensation	-4096～4096	0	—	S
P02.03	Analog speed instruction has no control area	-500～500	0	—	S
P02.04	Analog speed command filter	1～1000	300	Hz	S
P02.05	Analog torque command gain	1～300	30	% / V	T
P02.06	Input direction of analog torque instruction is reversed	0～1	0	—	T
P02.07	Analog torque instruction zero offset compensation	-500～500	0	—	T
P02.08	Maximum speed limit for torque control	0～4000	2400	r/min	T
P02.09	Analog torque command filter	1～1000	300	Hz	T
P02.10	Low 4-bit input terminal enforces the ON control word	0～1111(0~15)	0	—	ALL
P02.11	High 4-bit input terminal enforces the ON control word	0～1111(0~15)	0	—	ALL
P02.12	Low 4 - bit input terminal takes the reverse control word	0～1111(0~15)	0	—	ALL
P02.13	High 4 - bit input terminal takes the reverse control word	0～1111(0~15)	0	—	ALL

P02.14	Output terminal takes the inverse control word	0～1111(0~31)	0	—	ALL
P02.15	Input terminal to dejitter the time constant	1～1000	16	0.1ms	ALL

4.1.4 P03 group list of parameters

No	Name	Setting range	Factory default	Unit	way of application
P03.00	Speed trial run	-3000～3000	0.0	r/min	S
P03.01	JOG Run	—	—	—	S
P03.02	Encoder is zeroed in	0～1	0	—	ALL
P03.03	Open loop run	0～1	0	—	ALL
P03.04	Analog channel zero offset automatic adjustment	0～1	0	—	ALL
P03.05	Retain	—	—	—	—
P03.06	Servo forced enablement	0～1	0	—	ALL
P03.07	System parameter initialization	0～2	—	—	ALL
P03.08	Driver fan switch	0～1	0	—	ALL
P03.09	Reaching output selection	0～2	0	—	ALL
P03.10	Analog speed instruction minimum speed	3000～3000	0	r/min	S
P03.11	Mechanical brake release delay	0～30000	100	ms	ALL
P03.12	Servo enable holding time	0～30000	100	ms	ALL
P03.13	Pulse command filter selection	1～4	1	—	P
P03.14	Servo failure lower axle arm switch	0～1	1	—	ALL
P03.15	Encoder alarm selection	0～6	5	—	ALL
P00.16	Location completion range	0~6000	10	r/min	ALL
P00.17	Position out of tolerance detection range	0~600	5	%	ALL

4.1.5 P09 group list of parameters

No	Name	Setting range	Factory default	Unit	way of application
P09.00	Communication control start and stop	0～1	0	—	ALL
P09.01	4 bits higher operating pulse number (X10000)	-32767～32767	0	pulse	P
P09.02	Run pulse count 4 bits lower	-9999～9999	0	pulse	P
P09.03	Position mode speed	0～6000	0	r/min	P
P09.04	Speed mode speed	-6000～6000	0	r/min	S
P09.05	Torque mode Torque	-600～600	0	%	T
P09.06	Communication location mode speed	0～1	0	—	P
P09.07	Retain	—	—	—	—
P09.08	Retain	—	—	—	—
P09.09	Communication control start and stop mode	0～1	0	—	ALL
P09.10	Retain	—	—	—	—
P09.11	Retain	—	—	—	—
P09.12	EEPROM storage	0-2	0	—	ALL
P09.13 ~ P09.33 are motor running state parameters read only and cannot be written					
P09.13	Current motor speed	-6000～6000	—	r/min	ALL
P09.14	Current position is 4 digits higher(X10000)	-32767～32767	—	command pulse	P
P09.15	Current position 4 bits lower	-9999～9999	—	command pulse	P
P09.16	Position instruction is 4 bits higher(X10000)	-32767～32767	—	command pulse	P
P09.17	Position instruction 4 bits lower	-9999～9999	—	command pulse	P
P09.18	Position deviation is 4 places lower	-32767～32767	—	command pulse	P
P09.19	Position deviation 4 bits higher (X10000)	-9999～9999	—	command	P

				pulse	
P09.20	Current motor torque	-300～300	—	%	T
P09.21	Current motor current	0~32767	—	0.1A	ALL
P09.22	Current bus voltage	0~32767	—	V	ALL
P09.23	Current control mode	0~11	—	—	ALL
P09.24	Current position instruction pulse frequency	0~32767	—	0.1KHZ	P
P09.25	Current speed instruction	-6000～6000	—	r/min	ALL
P09.26	Current torque instruction	-600～600	—	%	ALL
P09.27	Number of turns in the current absolute position	32767~32767	—	Encoder	ALL
P09.28	Current absolute lap position 4 bits higher (X10000)	0~13	—	Encoder	ALL
P09.29	Current absolute lap position is 4 places lower	0~9999	—	Encoder	ALL
P09.30	error code	0~34	—	ERR	ALL
P09.31	Enter the terminal state DI1/ DI2/ DI3/ DI4	0~15	—	—	ALL
P09.32	Enter the terminal state DI5/ DI6/ DI7	0~15	—	—	ALL
P09.33	Output terminal state DO1/ DO2/ DO3/ DO4/DO5	0~31	—	—	ALL
P09.34	Encoder status bit	0~32	—	—	ALL
P09.35	Encoder battery status bit	0~3	—	—	ALL

4.1.6 P11 group list of parameters

No	Name	Setting range	Factory default	Unit	way of application
P11.00	Baud rate	1～6	3	bps	ALL
P11.01	Station no.	1～255	1	—	ALL
P11.02	Verify	0～2	0	—	ALL
P11.03	Communication delay response time	0-1000	5	Ms	ALL

4.1.7 P12 group list of parameters

No	Name	Setting range	Factory default	Unit	way of application
P12.00	Predefined origin trigger mode	0～1	0	—	P
P12.01	Predefined origin panel button trigger	0～1	0	—	P
P12.02	Return to the origin trigger mode selection	0～2	0	—	P
P12.03	Return to the origin mode of motion	0～5	0	—	P
P12.04	Velocity of return to origin	0～3000	120	r/min	P
P12.05	Return to the origin panel button triggered	0～1	0	—	P
P12.06	The integral part of the engineering unit coefficient	1～32767	1	—	P
P12.07	Retain	—	—	—	P
P12.08	Retain	—	—	—	P
P12.09	The origin is offset 4 bits higher（X10000）	-32767～32767	0	—	P
P12.10	The origin is offset 4 bits lower	-9999～9999	0	—	P
P12.11	Software limit mode	0～1	0	—	P
P12.12	The negative limit of the software based on the origin is 4 bits higher（X10000）	-32767～0	0	—	P
P12.13	The negative limit of the software based on the origin is 4 bits lower	-9999～0	0	—	P
P12.14	The positive limit of software based on the origin is 4 bits high (X10000)	0～32767	0	—	P
P12.15	The software based on the origin is 4 bits lower than the positive limit	0～9999	0	—	P
P12.16 ~ P12.23 are motor running state parameters read only and cannot be written					
P12.16	4 bits higher relative encoder position of motor based on origin (X10000)	-32767～32767	—	Encoder unit	P
P12.17	The motor is 4 bits lower relative to the encoder position based on the origin	-9999～9999	—	Encoder unit	P
P12.18	4 bits higher relative instruction pulse position of motor based on origin (X10000)	-32767～32767	—	Encoder unit	P
P12.19	The motor is 4 bits lower relative to the command pulse position based on the origin	-9999～9999	—	instruction pulse	P
P12.20	Relative feedback encoder position based on	-92233720368547		Encoder	

P12.21 P12.22 P12.23	origin (64-bit data)	75807~ 922337203685477 5807	—		P
P12.24 ～ P12.27	Relative feedback instruction pulse based on origin (64-bit data)	-92233720368547 75807~ 922337203685477 5807	—	instruction pulse	P

4.1.8 P13 group list of parameters

No	Name	Setting range	Factory default	Unit	way of application
P13.00	Input terminal DI1	0～21	01	—	ALL
P13.01	Input terminal DI2	0～21	02	—	ALL
P13.02	Input terminal DI3	0～21	04	—	ALL
P13.03	Input terminal DI4	0～21	05	—	ALL
P13.04	Input terminal DI5	0～21	06	—	ALL
P13.05	Input terminal DI6	0～21	07	—	ALL
P13.06	Input terminal DI7	0～21	08	—	ALL
P13.07	Output terminal DI1	0～10	01	—	ALL
P13.08	Output terminal DI2	0～10	02	—	ALL
P13.09	Output terminal DI3	0～10	06	—	ALL
P13.10	Output terminal DI4	0～10	07	—	ALL
P13.11	Output terminal DI5	0～10	08	—	ALL

4.1.9 P14 group list of parameters

No	Name	Setting range	Factory default	Unit	way of application
P14.00	Multi-segment position operation mode	0～2	2	—	P
P14.01	Number of end points of position instruction	1～16	1	—	P
P14.02	Allowance treatment	0～1	0	—	P
P14.03	unit of time	0～1	0	—	P
P14.04	Displacement instruction type selection	1～2	2	—	P
P14.05	Run start segment	1～16	1	—	P
P14.06	Running instruction source	0～1	0	—	P
P14.07	Panel to trigger	0～1	0	—	P
P14.08	Current position segment	—	—	—	P
P14.09	Keep	—	—	—	P
P14.10	Keep	—	—	—	P
P14.11	Keep	—	—	—	P
P14.12	The first segment of movement displacement is 4 high (X10000)	-32767～32767	1	Instruction unit	P
P14.13	The first segment of movement displacement is 4 low	-9999～9999	0	Instruction unit	P
P14.14	Maximum operating speed of the first displacement	1～6000	200	rpm	P
P14.15	First displacement plus acceleration time	0～32767	200	ms	P
P14.16	Waiting time after the first displacement is completed	0～10000	08	ms(s)	P
P14.87	The sixteenth segment of movement displacement is 4 high (X10000)	-32767～32767	1	Instruction unit	P
P14.88	The sixteenth segment of movement displacement is 4 low	-9999～9999	0	Instruction unit	P
P14.89	Maximum operating speed of the sixteenth displacement	1～6000	200	rpm	P
P14.90	Sixteenth displacement plus acceleration time	0～32767	200	ms	P
P14.91	Waiting time after the sixteenth displacement is completed	0～10000	08	ms(s)	P

4.2Parameter function

4.2.1 Parameter function

No	Name	Function	Parameter range	default
P00.00	Password	1.Password tiers, which correspond to user parameters, system parameters, and manufacturer parameters 2.User Password 316 3.This parameter prevents the parameter from being modified by mistake. System parameters and manufacturer parameters need to be set Set the corresponding permission password to operate. After the operation debugging, finally this . Set the parameter to 316 to ensure that the parameter will not be modified by mistake	0～9999	316
P00.01	Motor Model Code	Example: 22015 ①220 indicates that the drive input voltage is AC220V ②15 indicates that the maximum output effective current of the drive is 15A You can judge whether the adaptive motor is reasonable by viewing the driving information	—	—
P00.02	Software version	You can view the software version number, but you cannot modify it.	—	—
P00.03	Initial display state	Select the display status after the servo drive is powered on. 0: display motor speed; 1: display the absolute position of the motor is 4 bits lower; 2: display the absolute position of the motor 4 bits higher; 3: display feedback increment 4 bits lower; 4: display feedback increment 4 bits higher; 5: display the lower 4 bits of the current position instruction; 6: display the current position instruction 4 bits higher; 7: Display the current position deviation is 4 bits lower; 8: display the current position deviation 4 bits higher; 9: display motor torque; 10: display motor current; 11: display bus voltage; 12: display control mode; 13: display position instruction pulse frequency; 14: display speed instruction; 15: display torque instruction; 16: show the absolute position of the rotor in a revolution; 17: indicates the input terminal status. 18: Display output terminal status; 19: display encoder input signal (no); 20: display running status; 21: display alarm code;	0～21	0

No	Name	Function	Parameter range	default
P00.04	Control Method choice	Through this parameter, the control mode of AC servo drive unit can be set: 0: pulse position control mode; 1: internal speed control mode; 2: test operation control mode; 3: Test JOG control mode; 4: manufacturer encoder zero control mode; 5: Manufacturer's open-loop operation control mode (used for testing motor and encoder); 6: external analog speed control mode; 7: external analog torque control mode; 8: communication position control mode; 9: communication speed control mode; 10: communication torque control mode; 11: internal multi-section position control mode; ① Pulse position control mode, position instruction input from pulse input port; ② Internal speed control mode, SC1 and SC2 combination to select internal speed: For details, see parameters P01.04 to P01.07. ③ Test run control with test JOG control mode, speed command from keyboard Input for testing AC servo drive units and motors: see details P03.00 to P03.01 Parameter Description. Manufacturer's encoder zero control and manufacturer's open loop control mode, used for motor Factory adjustment coding disc zero and motor adaptation test; (5) External simulation mode, speed or torque control with simulation port: See P02.00 ~ P02.09 parameter description for details. ⑥ Communication control mode, with 485 communication control motor position, speed, turn Moment: See P09.00 ~ P09.05 parameter description for details; ⑦ Internal multi-section position control mode, the use of internal parameters preset position, speed For details, see P14.00 ~ P14.91 parameter description.	0～11	0
P00.05	Proportional velocity gain	① Set the proportional gain of the speed loop regulator; ② The larger the setting value, the higher the gain and the greater the rigidity. Determined according to the drive and load conditions. Generally, the greater the load inertia, the greater the set value; ③ Under the condition that the system does not oscillate, try to set a larger value.	5～2000Hz	150*

P00.06	Velocity integral time constant	① Set the integral time constant of the speed loop regulator; ② The smaller the set value, the faster the integral speed and the greater the stiffness. Determined according to the drive and load conditions. Generally, the larger the load inertia, the smaller the set value; ③ If the system does not oscillate, try to set it as small as possible.	1 ～1000ms	80*
P00.07	Torque command filter	① Set the characteristics of the torque command filter. Can suppress the resonance generated by the torque (the motor emits sharp vibration noise); ② If the motor emits sharp vibration and noise, please reduce this parameter; ③ The smaller the value, the lower the cut-off frequency, and the smaller the noise generated by the motor. If the load inertia is large, the set value can be reduced appropriately. If the value is too small, it will slow down the response and may cause instability; ④ The larger the value, the higher the cut-off frequency, and the faster the response. If higher mechanical rigidity is required, the setting value can be appropriately increased.	1～500%	30
P00.08	Speed detection low pass filter	① Set the characteristics of speed detection low-pass filter; ② The smaller the value, the lower the cut-off frequency, and the smaller the noise generated by the motor. If the load inertia is large, the set value can be reduced appropriately. If the value is too small, it will slow down the response and may cause oscillation; ③ The larger the value, the higher the cut-off frequency and the faster the speed feedback response. If a higher speed response is required, the setting value can be appropriately increased.	1～500%	120
No	Name	Function	Parameter range	default
P00.09	Position proportional gain	① Set the proportional gain of the position loop regulator; ② The larger the setting value, the higher the gain and stiffness, and the smaller the position lag under the same frequency instruction pulse condition.However, if the value is too large, it may cause oscillation or overshoot. ③ Parameter values are determined according to the specific servo driver model and load conditions.	1～1000 /s	100*
P00.10	Position feed forward gain	① Set the feedforward gain of the position loop; ② When set to 100%, it means that the position lag is always 0 under the instruction pulse of any frequency; ③ With the increase of the feedforward gain of the position loop, the high-speed response characteristics of the control system are improved, but the position loop of the system is unstable and easy to oscillate; ④ Unless a very high response is required, the feedforward gain of the position loop is usually zero.	0～100％	0
P00.11	Cut-off frequency of the position feed forward low-pass filter	① Set the cut-off frequency of the low-pass filter with the position loop feedforward; ② The function of this filter is to increase the stability of compound position control.	1～1200Hz	300
P00.12	Position command pulse frequency dividing molecule	① Set the octave of the position command pulse (electronic gear)； ② In the position control mode, by setting P00.12 parameters and P00.13 parameters, it can be easily matched with various pulse sources to achieve the user's ideal control resolution (that is, Angle/pulse)； ③ P：Number of pulses of input instruction $P \times G = N \times C$ ； G：Electronic gear ratio G= frequency division of lecular/Dividing denominator； N：Number of motor turns；	1～32767	0

P00.13	Position instruction pulse frequency dividing denominator	C：Photoelectric encoder line number/turn, this system C = 32768； ④ EX：When the input instruction pulse is 6000, the servo motor rotates 1 turn $G=\frac{N\times C\times 4}{P}=\frac{1\times 32768\times 4}{6000}=\frac{8192}{375}$ The parameter P00.12 is set to 8192, and the parameter P00.13 is set to 375； ⑤The recommended range of electronic gear ratio is 1:50 ≤ G ≤ 50 ; ⑥ When the electronic gear input parameter P00.12 and P00.13 digit tube number do not When sufficient, use high electronic gear ratio: P10.10 higher 4 position electronic gear Numerator, P10.11 high 4 electronic gear denominator, default factory is 0; Total molecule = P10.10*10000+P00.12; (High 4 digits 1 means 10000) Total female = P10.11*10000+P00.13; (High 4 digits 1 means 10000) ⑦ When the total numerator is 0, the value of the denominator represents the number of pulses required per revolution of the motor	1～32767	1000
P00.14	Position instruction pulse input mode	① Set the input form of position instruction pulse; ② The parameters are set as one of the three input modes: Set to 0: pulse + direction; Set to 1: A and B phase 4 frequency; Set to 2: double pulse input; ③ The parameter change takes effect only after the system is powered on	0～1	0
P00.15	Direction of the position instruction is reversed	① Set to 0: normal; 1: Position instruction pulse direction reversed. (2) CCW is viewed from the axial direction of the motor, and the counterclockwise direction becomes positive; CW is seen from the axis of the motor, clockwise direction to reverse.	0～1	0
P00.16	Location completion range	① The pulse range of positioning is completed under the control of setting position; ② This parameter provides the position control mode to determine whether the servo driver is finished The basis for positioning. When the number of remaining pulses in the position deviation counter is less than Or equal to the set value of this parameter, the servo driver considers that the positioning has been completed. Signal ON when positioning is completed, otherwise OFF; ③ Users can complete the function COIN/Pos_ by P13 group	0～30000	262

		parameter allocation Reach output DO terminal. The factory default is DO2.		
P00.17	Position out of tolerance detection range	① Set the detection range of position out of tolerance alarm; ② In the position control mode, when the value of the position deviation counter exceeds the value of this parameter, the servo driver will give an alarm for the position deviation.	0～30000	400
No	Name	Function	Parameter range	default
P00.18	Out-of-position errors are invalid	Set to 0: the position out-of-tolerance alarm detection is effective; Set to 1: The detection of position out of tolerance alarm is invalid, and the detection of position out of tolerance error is stopped.	0～1	0
P00.19	Position command smoothing filter	① Smoothing and filtering the command pulse, with exponential acceleration and deceleration, and the value represents the time constant. When set to 0, the filter has no effect. ②The filter will not lose the input pulse, but the command delay phenomenon will occur; ③This filter is used for ● The upper controller has no acceleration/deceleration function or the command frequency is low; ● The electronic gear has a large division and multiplication frequency (>10); ● When the motor is running, the phenomenon of stepping jumping and unevenness occurs;	0～20000	200*

4.2.2 **P01** group parameters detailed description

No	Name	Function	Parameter range	default
P01.00	Invalid driver disable input	0：CCW、CW Input forbidden valid； When FSTP is ON, CCW driver allows; When FSTP is OFF, the torque in CCW direction remains 0. When the RSTP is ON, the CW driver allows it. When RSTP is OFF, the torque in CW direction remains 0. When both FSTP and RSTP are OFF, a driver ban error alarm will be generated. 1：Cancel CCW, CW input prohibitions; CCW and CW drivers are allowed regardless of FSTP and RSTP switching status. FSTP, RSTP are OFF, there will be no driver prohibited input error alarm.	0~1	1
P01.01	JOG running speed	①Sets the speed of the JOG operation.	-6000~6000	120
P01.02	Speed mode acceleration and deceleration time constant	① The setting value is the acceleration time of the motor from 0 to 1000 r/min; ② Acceleration and deceleration characteristics are linear; ③ Only used for speed control mode, position control mode is invalid; ④ Set to 0 if the servo drive is used in combination with an external position ring.	1～10000ms	500
P01.03	Maximum speed limit	① The maximum speed limit of the servo motor is set, which has nothing to do with the direction of rotation; ② If the setting value exceeds the rated speed, the actual speed limit is the rated speed.	0～6000 r/min	6000
P01.04	Inner speed 1	SC1 OFF，SC2 OFF：Inner speed 1；	-6000～6000 r/min	0
P01.05	Inner speed 2	SC1 ON ，SC2 OFF：Inner speed 2；		100
P01.06	Inner speed 3	SC1 OFF，SC2 ON ：Inner speed 3；		300
P01.07	Inner speed 4	SC1 ON ，SC2 ON ：Inner speed 4。		-100

P01.08	On-speed	① Set the arrival speed and has nothing to do with the direction of rotation; ② In the non-position control mode, if the motor speed exceeds the set value, then SCMP ON, otherwise SCMP OFF; ③ In the position control mode, this parameter is not used; ④ The comparator has the hysteresis characteristic.	0～6000 r/min	500
P01.10	Internal CCW torque limit	① Set the internal torque limit value of the servo motor in the CCW direction; ② The setting value is the percentage of the rated torque; ③ This restriction is valid at all times; ④ If the setting value exceeds the maximum allowable system overload capacity, the actual torque limit is the maximum allowable system overload capacity.	0～600%	300
No	Name	Function	Parameter range	default
P01.11	Internal CW torque limit	① Set the internal torque limit value of the servo motor in CW direction; ② The setting value is the percentage of the rated torque; ③ This restriction is valid at all times; ④ If the setting value exceeds the maximum allowable system overload capacity, the actual torque limit is the maximum allowable system overload capacity.	-600%～0	-300
P01.12	External CCW torque limit	① Set the external torque limit value of the servo motor in the CCW direction; ② The setting value is the percentage of the rated torque; ③ Only valid when the CCW torque limit input terminal (F/RIL) ON; ④ When the restriction is effective, the actual torque limit is the minimum of the maximum allowable overload capacity of the system, internal CCW torque limit and external CCW torque limit.	0～600%	100
P01.13	External CW torque limit	① Set the external torque limit value in the CW direction of the servo motor; ② The setting value is the percentage of the rated torque; ③ Only valid when CW torque limit input terminal (F/RIL) ON; ④ When the restriction is effective, the actual torque limit is the minimum absolute value of the maximum allowable overload capacity of the system, internal CW torque limit and external CW torque limit.	-600%～0	-100
P01.14	Speed trial run, JOG operating torque limit	① Set the torque limit value in the speed trial run and JOG operation mode; ② Independent of the direction of rotation, two-way effective; ③ The setting value is the percentage of the rated torque, 1 times the rated torque, set to 100; ④ Internal and external torque limits remain in effect.	0～300%	100

4.2.3 **P02** group parameters detailed description

No	Name	Function	Parameter range	default
P02.00	Analog speed command gain	Set the analog speed input voltage and motor speed proportional relationship.	0～3000	300
P02.01	Analog speed instruction The input direction is reversed	Set to 0: when the speed instruction of analog quantity is positive, the speed direction is CCW; Set to 1: When the speed instruction of the analog quantity is positive, the speed direction is CW.	0～1	0
P02.02	Analog speed zero offset compensation	Zero offset compensation for the analog speed input.	-500～500	0
P02.03	The simulated velocity has no action zone	The instruction is 0 when the input voltage of analog speed is located in the uncontrolled action zone.	-500～500	0

P02.04	Analog speed command filter	① Low pass filter for analog velocity input; ② The larger the setting value is, the faster the response speed of the input analog quantity is, and the greater the influence of signal noise is.The smaller the setting value is, the slower the response speed is and the less the influence of signal noise is.	1～1000	300
P02.05	Analog torque command gain	Set the proportional relationship between the analog torque input voltage and the motor torque	1～300	30
P02.06	Input direction of analog torque instruction is reversed	Set to 0: when the analog torque instruction is positive, the torque direction is CCW; Set to 1: When the analog torque instruction is positive, the torque direction is CW.	0～1	0
P02.07	Analog torque instruction zero offset compensation	Zero offset compensation for the analog torque input.	-500～500	0
P02.08	Maximum speed limit for torque control	① In torque control, motor running speed is limited within this parameter; ② It can prevent the phenomenon of overspeed under light load.	0～4000	2400
P02.09	Analog torque command filter	Low pass filter for analog torque input. The larger the setting value is, the faster the response speed to the torque input analog quantity is, and the greater the influence of signal noise is. The smaller the setting value is, the slower the response speed is and the less the influence of signal noise is.	1～1000	300
No	Name	Function	Parameter range	default
P02.10	Low 4-bit input terminal enforces the ON control word	①Set the input terminal internal force ON to be effective.It is represented as a 4-bit binary number, with 0 for non-enforced ON and 1 for enforced ON. Position 0: SON servo enabling; Bit 1: ALRS alarm clearance; Bit 2: FSTP CCW driver disabled; Bit 3: RSTP CW driver disabled.	Panel operation 0000 to 1111 Communication operation 0 ~ 15	0
P02.11	High 4-bit input terminal enforces the ON control word	①Set the input terminal internal force ON to be effective.It is represented as a 4-bit binary number, with 0 for non-enforced ON and 1 for enforced ON. Bit 0: CLE/SC1 Deviation Counter Clearing/Speed Selection 1; 1 bit: INH/SC2 instruction pulse disable/speed select 2; 2 bits: FIL CCW torque limit; 3 bits: RIL CW torque limit.	Panel operation 0000 to 1111 Communication operation 0 ~ 15	0
P02.12	Low 4 - bit input terminal takes the reverse control word	Set the input terminal to be inverted. It is represented by a 4-bit binary number, 0 means no inversion, 1 means inversion. The input terminals represented by binary numbers are as follows: Bit 0: DI1 input terminal 1; 1 bit: DI2 input terminal 2; 2 bits: DI3 input terminal 3; 3 bits: DI4 input terminal 4.	Panel operation 0000 to 1111 Communication operation 0 ~ 15	0
P02.13	High 4 - bit input terminal takes the reverse control word	Set the input terminal to be inverted. It is represented by a 4-bit binary number, 0 means no inversion, 1 means inversion. The input terminals represented by binary numbers are as follows: Bit 0: DI5 input terminal 5; 1 bit: DI6 input terminal 6; 2 bits: DI7 input terminal 7; Bit 3: Remain reserved.	Panel operation 0000 to 1111 Communication operation 0 ~ 15	0

P02.14	Output terminal takes the inverse control word	It is represented by a 5-bit binary number, 0 means no inversion, 1 means inversion. Bit 0: DO1 output terminal 1; 1 bit: DO2 output terminal 2; 2 bits: DO3 output terminal 3; 3 bits: DO4 output terminal 4; 4 bits: DO5 output terminal 5.	Panel operation 0000 to 1111 Communication operation 0 ~ 15	0
P02.15	Enter terminal filtering time	The input terminal to jitter filtering time.	1～1000	16

4.2.4 **P03** group parameters detailed description

No	Name	Function	Parameter range	default
P03.00	Speed trial run	Set to 1, and press SET key to enter the speed trial run, the speed is SET by the key.	-3000～3000	0
P03.01	JOG Run	Set to 1, and press SET key to enter JOG operation, the speed is SET by the key.	—	0
P03.02	Encoder is zeroed in	The encoder zero adjustment function is used by the motor manufacturer.	—	0
P03.03	Open loop run	Open loop operation mode is used by motor manufacturers.	0～1	0
P03.04	Analog channel zero offset automatic adjustment	① Set whether the analog channel automatic adjustment function can be enabled, the driver will automatically correct the zero drift voltage of the analog channel; ② The adjusted zero drift value will be automatically stored in the corresponding function codes (P02.02 and P02.07).	0～1	0
P03.05	Keep	—	—	—
P03.06	Servo forced enablement	Set to 0: SON is determined by IO port input signal; Set to 1: SON will be forced to be ON (independent of the input signal).	0～1	0
No	Name	Function	Parameter range	default
P03.07	Drive parameter reset	Set 1: Restore all parameters to factory Settings. Set 2: Only related parameters of the drive motor are restored to factory Settings; Note: Power off restart effect	0～2	0
P03.08	Driver fan switch	Set 0, fan off, set 1, fan on. For factory test use.	0～1	0
P03.09	Encoder reset	Set 0: send and receive data normally; Setting 1: Reset all errors reported by the encoder (the setting is valid after disabling); Setting 2: Reset the encoder circle number and all errors (the setting is valid after disabling).	1～2	0
P03.10	Analog speed instruction minimum speed	Used as the minimum speed limit, i.e., take-off speed, for analog speed control. When the analog speed instruction is lower than this speed, the motor will not operate.	0～3000	0
P03.11	Mechanical brake release delay	When enabled, the time set by the motor brake delay is released.	0～30000	100
P03.12	Servo enable holding time	When the enabling is turned off, the motor coil delay time is set and then the power is lost.	0～30000	100
P03.13	Pulse instruction filter selection	Set 1: Receiving pulse frequency 0-300KHZ; Set 2: Receiving pulse frequency 0-180KHZ; Set 3: Receiving pulse frequency 0-140KHZ; Set 4: Receiving pulse frequency 0-120KHZ; Setting the appropriate filter level of pulse instruction can effectively prevent interference. The filtering level is higher than the actual pulse frequency received	1～4	1
P03.14	Servo failure lower axle arm switch	Manufacturer test, users do not need to change.	0～1	0

P03.15	Encoder alarm selection	Set 0: all encoder alarms are applied; Set 1: Only use encoder battery alarm; Set 2: Only use the coding state alarm; Set 3: Only use encoder communication alarm; Setting 4: Application of encoder battery alarm and status alarm; Set 5: Application of encoder battery alarm and communication alarm; Set 6: Application encoder status alarm and communication alarm	0~6	5
P03.16	Speed reaches the allowable deviation value	When the DO port associated with the speed reaches the output function. (P13 group selection). When the actual running speed of the motor is within the range of P01.08 speed arrival value ± (P03.16 value), the DO port output is ON, regardless of the direction of rotation.	0-6000	10
P03.17	Torque reaches the allowable deviation value	When the torque associated with the DO port reaches the output function. (P13 group selection). When the actual running torque of the motor is within the range of P09.05 torque arrival value ± (P03.17 value), the DO port output is ON to distinguish the direction of rotation.	0-600	5

4.2.5 **P09** group parameters detailed description

No	Name	Function	Parameter range	default
P09.00 ~ P09.12 are motor communication control parameters that can be read and written				
P09.00	Communication control start and stop	Set to 1, the communication control mode starts; Set to 0, the communication control mode stops; After all parameters are set, set to 1, which is equivalent to the start button, and set to 0, which is equivalent to the stop button. In communication position mode, when the motor completes the target pulse number will jump to 0.	0～1	0
P09.01	4 bits higher in pulse number of communication operation (X10000)	Set the high number of operating pulses in the communication position mode, and set 1 to represent the number of 10000 pulses. In the communication position mode, set the total pulse =P09.01*10000+P09.02.	-32767～32767	0
P09.02	Pulse number of communication operation is 4 bits lower	Set the low position of operating pulse number in communication position mode, and set 1 to represent 1 pulse number. In communication position mode, set the total pulse =P09.01*10000+P09.02.	-9999～9999	0
P09.03	Communication location mode speed	Set the motor running speed in communication position mode.	0～6000	0
P09.04	Communication speed mode speed	Set the motor running speed in communication speed mode.	-6000～6000	0
P09.05	Communication Torque Mode Torque	Set the motor operating torque in communication torque mode.	-600～600	0
P09.06	Communication location mode speed	Set to 0; positioning based on the relative coordinates of the current position Set to 1; positioning based on the absolute coordinates of the origin	0～1	—
P09.09	Communication control start and stop mode	Set to 0; panel trigger (P09.00) Set to 1; external DI trigger (TX-start-stop)	0～1	—
P09.10	Keep	—	—	—
P09.11	Keep	—	—	—
P09.12	EEPROM Storage	Set 1, save the communication setting parameters to the power outage holding area, and the return value 2 is successfully saved. Remarks: The parameter values set by the communication are saved in the temporary storage area, and the parameter values restore to the values before modification after power off. If this parameter is set to 1, the modified parameter value will be written into the EEPROM power-off holding area, and the parameter value will not be lost after power off.	0～2	
P09.13 ~ P09.33 are motor running state parameters read only and cannot be written				

P09.13	Current motor speed	For user communication to read the current real-time speed of the motor.	-6000～6000	—
P09.14	Current position is 4 bits higher（X10000）	For users to read real-time motor encoder feedback position high. Position feedback value =P09.15*10000+P09.14 The position feedback value is based on the encoder unit.	-32767～32767	—
No	Name	Function	Parameter range	default
P09.15	Current position is 4 digits lower	For users to read the real-time feedback position of the motor encoder. Position feedback value =P09.15*10000+P09.14 The position feedback value is based on the encoder unit.	-9999～9999	—
P09.16	Position instruction is 4 bits higher（X10000）	For user communication to read the real-time position instruction received by the driver. Number of position instruction pulses =P09.16*10000+P09.17 Position instructions are based on encoder units.	-32767～32767	—
P09.17	Position instruction is 4 bits lower	It is used for user communication to read the real-time position instruction high level received by the driver. Number of position instruction pulses =P09.16*10000+P09.17 Position instructions are based on encoder units.	-9999～9999	—
P09.18	Position deviation is 4 bits higher（X10000）	For user communication to read driver deviation counter real-time follow the low value of the difference. Position deviation =P09.18*10000+P09.19 The deviation value is based on the encoder unit.	-32767～32767	—
P09.19	Position deviation is 4 bits lower	For user communication to read driver deviation counter real-time follow the low value of the difference. Position deviation =P09.18*10000+P09.19 The deviation value is based on the encoder unit.	-9999～9999	—
P09.20	Current motor torque	For users to read the real time torque percentage of the motor communication.	-300～300	—
P09.21	Current motor current	For users to communicate and read the real-time current of the motor (unit 0.1A).	0～32767	—
P09.22	Current bus voltage	For users to read real-time bus voltage of the driver communication.	0～32767	—
P09.23	Current control mode	For user communication to read the current control mode of the drive.	0～11	—
P09.24	Current position pulse frequency	Non-effect	—	—
P09.25	Current speed instruction	For user communication to read the current speed instruction value of the driver.	-6000～6000	—
P09.26	Current torque instruction	For user communication to read the current torque instruction value of the driver.	-600～600	—
P09.27	Number of turns in the current absolute position	For users to read the absolute position of the motor rotor turns.	-32767～32767	—
P09.28	Current absolute lap position is 4bit higher（X10000）	For users to read the absolute position of the rotor in a single turn of the motor. Absolute position of single-turn motor =P09.28*10000+P09.29	0～13	—
P09.29	Current absolute lap position is 4bit lower	For users to read the absolute position of the rotor in a single turn of the motor. Absolute position of single-turn motor =P09.28*10000+P09.29	0～9999	—
P09.30	Alarm code	For user communication to read the current alarm state of the drive. Alarm code meaning refer to the alarm list.	0～34	—
P09.31	Enter the terminal state DI1/ DI2/ DI3/ DI4	For user communication to monitor the current input terminal status of the driver. DI1/ DI2/ DI3/ DI4	0～15	—
P09.32	Enter the terminal state DI5/ DI6/ DI7	For user communication to monitor the current input terminal status of the driver. DI5/ DI6/ DI7	0～15	—
P09.33	Output terminal state DO1/ DO2/ DO3/ DO4/DO5	For user communication to monitor the current state of the output terminal of the driver. DO1/ DO2/ DO3/ DO4/DO5	0～31	—
P09.34	Encoder status bit	For user communication to monitor the current encoder status of the driver.	0～32	—
P09.35	Encoder battery status bit	For user communication to monitor the current encoder battery state of the driver.	0～3	—

4.2.6 **P12** group parameters detailed description

No	Name	Function	Parameter range	default
P12.00	Predefined origin trigger mode	Set 0: use the panel button to trigger (or communication trigger); Set 1: trigger using external I/O;	0～1	0
P12.01	Predefined origin panel button trigger	Set 0: not triggered Set 1: trigger the origin definition (the origin definition is automatically set to 0)	0～1	0
P12.02	Return to the origin trigger mode selection	Set 0: Use the panel button to trigger Set 1: power on to enable automatic return to the origin Set 2: Use external I/O to trigger	0～2	0
P12.03	Return to the origin mode of motion	Set 0: linear mode Set 1:0-360° in single-turn cycle mode, and return to predefined origin position in single-turn (optimal direction) Set 2:0-360° in single-turn cycle mode, and return to predefined origin position in single-turn (CW direction) Set 3:0-360° in single-turn cycle mode, and return to predefined origin position in single-turn (CCW direction) Set 4: return to the mechanical origin position (CCW direction) Set 5: return to the mechanical origin position (CW direction)	0～5	0
P12.04	Velocity of return to origin	Set the motor running speed in the origin mode.	0～3000	120
P12.05	Return to the origin panel button triggered	Set 0: stop returning to the origin Set 1: Trigger back to the origin (automatically set to 0 after completion of return to the origin)	0～1	0
P12.06	The integral part of the engineering unit coefficient	Coefficient of engineering= (P12.06*1000+P12.07)/1000	-	-
P12.07	Engineering unit coefficient after the decimal three	Coefficient of engineering= (P12.06*1000+P12.07)/1000	-	-
P12.08	Origin offset and software limit setting value unit selection	Set 0: instruction pulse unit (based on the calculation result of servo electronic gear ratio, the factory default 1000 motor rotates 360°) Set 1: Engineering unit (set based on user's proportional coefficient) Set 2: number of motor turns + Angle Set 3: Encoder unit (based on encoder resolution)	-	-
P12.09	The origin is offset 4 bits higher（X10000）	Origin offset =P12.09*10000+P12.10 Offset values are selected based on P12.08 units.	-32767～32767	0
P12.10	The origin is offset 4 bits lower	Origin offset =P12.09*10000+P12.10 Offset values are selected based on P12.08 units.	-9999～9999	0
P12.11	Software limit mode	Set 0: Not on Set 1: Linear mode	0～1	0
P12.12	The negative limit of software based on origin is 4 bits high (X10000)	Negative limit based on origin =P12.12*10000+P12.13 Limit values are selected based on P12.08 units. When the negative limit is equal to 0 based on the origin, the negative limit is invalid.	-32767～0	0
P12.13	The negative limit of the software based on the origin is 4 bits lower	Negative limit based on origin =P12.12*10000+P12.13 Limit values are selected based on P12.08 units. When the negative limit is equal to 0 based on the origin, the negative limit is invalid.	-9999～0	0
P12.14	The positive limit of software based on the origin is 4 bits high (X10000)	Based on the positive limit of origin =P12.14*10000+P12.15 Limit values are selected based on P12.08 units. When the positive limit based on the origin is equal to 0, the positive limit is invalid.	0～32767	0
P12.15	The software based on the origin is 4 bits lower than the positive limit	Based on the positive limit of origin =P12.14*10000+P12.15 Limit values are selected based on P12.08 units. When the positive limit based on the origin is equal to 0, the positive limit is invalid.	0～9999	0
P12.16 ~ P12.24 are motor running state parameters read only and cannot be written				

P12.16	4 bits higher relative encoder position of motor based on origin (X10000)	Relative encoder position based on origin =P12.16*10000+P12.17	-32767～32767	—
P12.17	The motor is 4 bits lower relative to the encoder position based on the origin	Relative encoder position based on origin =P12.16*10000+P12.17	-9999～9999	—
P12.18	The motor is 4 bits higher relative to the command pulse position based on the origin（X10000）	Relative instruction pulse position based on origin =P12.18*10000+P12.19	-32767～32767	—
P12.19	The motor is 4 bits lower relative to the command pulse position based on the origin	Relative instruction pulse position based on origin =P12.18*10000+P12.19	-9999～9999	—
P12.20 P12.21 P12.22 P12.23	Relative feedback encoder position based on origin (64-bit data)	-9223372036854775807~ 922337203685475807	$-2^{64}\sim2^{64}$	—
P12.24 ～ P12.27	Relative feedback instruction pulse based on origin (64-bit data)	-9223372036854775807~ 922337203685475807	$-2^{64}\sim2^{64}$	—

4.2.7 P13 group parameters detailed description

No	Name	Function	Parameter range	default
P13.00	Input terminal DI1	Enter function options: Let 00: FUN00 have no No_effect Set 01: FUN01 servos enable SON Set 02: FUN02 to trigger Home_Start back to the origin Set 03: FUN03 external origin switch Home_Switch Set 04: FUN04 CCW drive to disable FSTP Set 05: FUN05 CW driver to disable RSTP Set 06: FUN06 instruction pulse disables INH Set 07: FUN07 alarm to clear ALM_S Set 08: FUN08 pulse deviation counter to clear CLE Let 09: FUN09 CCW external torque limit FIL Set 10: FUN10 CW external torque limit RIL Set 11: FUN11 multiplexes the DI function 1.Control mode: (P00.04=11) PosCmd_EN is enabled for multi-segment positions 2.Control mode: (P00.04=8/9/10) Enable TXCmd_EN for communication instruction during communication control Let 12: FUN12 multi-bit instruction CMD1 Let 13: FUN13 multi-bit instruction CMD2 Let 14: FUN14 multi-bit instruction CMD3	0～22	01
P13.01	Input terminal DI2		0～22	02
P13.02	Input terminal DI3		0～22	04
P13.03	Input terminal DI4		0～22	05
P13.04	Input terminal DI5		0～22	06

P13.05	Input terminal DI6	Let 15: FUN15 multi-bit instruction CMD4 Let 16: FUN16 multi-speed instruction SC1 Let 17: FUN17 multi-speed instruction SC2 Set 18: FUN18 to switch to pulse position mode MOD1 Set 19: FUN19 to internal speed mode MOD2 Set 20: FUN20 to the external analog speed mode MOD3 Let 21: FUN21 switch to external analog torque mode MOD4 Set 22: FUN22 feedback position clear (predefined origin)Set_Home	0～22	07
P13.06	Input terminal DI7		0～22	08
P13.07	Output terminal DO1	Output function options: Set 00: FUN00 has no effect No-effect Set 01: FUN01 Servo alarm ALM Set 02: FUN02 position reaches Pos_ Reach Set 03: FUN03 speed reaches Spd_ Reach Set 04: FUN04 torque reaches Trq_ Reach Let 05: FUN05 keep Remain Set 06: FUN06 mechanical brake release BRK Set 07: FUN07 to return to the original to complete Home_A Set 08: FUN08 Servo is ready to SRDY Set 09: FUN09 keeps Remain Set 10: FUN10 keep Remain	0～10	01
P13.08	Output terminal DO2		0～10	02
P13.09	Output terminal DO3		0～10	06
P13.10	Output terminal DO4		0～10	07
P13.11	Output terminal DO5		0～10	08

4.2.8 **P14** group parameters detailed description

No	Name	Function	Parameter range	default
P14.00	Multi-segment position operation mode	Set 0: single cycle operation; Set 1: Cycle cycle operation; Set 2: DI switching operation; ● Single-cycle operation: multi-stage enable ON, the motor runs from the starting section, Automatically switch to the next section after running... End segment run complete After the automatic stop. The waiting time can be set between segments. Each segment can be Set acceleration and deceleration time. If the multi-bit function is enabled OFF, the running is paused. ● cycle cycle operation; Multi-segment enable ON, motor from the start segment Run, automatically switch to the next section after running... Terminal section After the row is complete, the loop continues from the starting segment, segment to segment The waiting time can be set, and the acceleration and deceleration time can be set for each section. multitier If OFF is enabled, the running is paused. ● DI switchover run: Associate CMD1 with external DI, CMD2,CMD3,CMD4, first combine the number of input	0～2	0

<table>
<tr><td></td><td></td><td>confirmation segments, and then more segments
Bit enable ON, motor operation corresponding to the number of segments, between segments
There is a waiting period, depending on the time when the multi-bit is enabled
Set acceleration and deceleration time. If the segment bit is enabled OFF, the running is paused.
The combination relationship is as follows:
<table>
<tr><th>CMD4</th><th>CMD3</th><th>CMD2</th><th>CMD1</th><th>Segments</th></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>1</td></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>2</td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>3</td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>4</td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>5</td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>6</td></tr>
<tr><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>7</td></tr>
<tr><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>8</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>9</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>10</td></tr>
<tr><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>11</td></tr>
<tr><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>12</td></tr>
<tr><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>13</td></tr>
<tr><td>ON</td><td>ON</td><td>OFF</td><td>ON</td><td>14</td></tr>
<tr><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td>15</td></tr>
<tr><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>16</td></tr>
</table></td><td></td><td></td></tr>
<tr><td>P14.01</td><td>Number of end points of position instruction</td><td>Sets the total number of segments of a position instruction</td><td>1～16</td><td>1</td></tr>
<tr><td>P14.02</td><td>Allowance treatment</td><td>Set 0: Continue running the unfinished segment (pause to the second segment, resume from the third segment)
Set 1: restart from the start</td><td>0～1</td><td>0</td></tr>
<tr><td>P14.03</td><td>unit of time</td><td>Set 0：ms Set1：s</td><td>0～1</td><td>0</td></tr>
<tr><td>P14.04</td><td>Displacement instruction type selection</td><td>Set 1: absolute displacement instruction
Set 2: based on the origin displacement instruction</td><td>1～2</td><td>1</td></tr>
<tr><td>P14.05</td><td>Run start segment</td><td>Sets the start segment number of the run</td><td>1～16</td><td>1</td></tr>
<tr><td>P14.06</td><td>Running instruction source</td><td>Set 0: Panel multi-bit enable (P14.07)
Set 1: PosCmd_EN is enabled for the DI multi-segment bits</td><td>0～1</td><td>0</td></tr>
<tr><td>P14.07</td><td>Panel trigger</td><td>Set 0: stop
Set 1: Start</td><td>0～1</td><td>0</td></tr>
<tr><td>P14.08</td><td>Current position segment</td><td>Display current segment number (communication read only)</td><td>1～16</td><td>—</td></tr>
<tr><td>P14.09</td><td>Keep</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>P14.10</td><td>Keep</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>P14.11</td><td>Keep</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>P14.12</td><td>The First segment moves the lower 4 bits</td><td rowspan="2">Section 1 displacement=P14.12*10000+P14.13
The amount of displacement is based on the command pulse unit.</td><td>-32767～32767</td><td>1</td></tr>
<tr><td>P14.13</td><td>The First segment moves the lower 4 bits</td><td>-9999～9999</td><td>0</td></tr>
<tr><td>P14.14</td><td>Maximum operating speed of the first displacement</td><td>Set the maximum operating speed of the first displacement motor.</td><td>1～6000</td><td>200</td></tr>
<tr><td>P14.15</td><td>The first displacement acceleration and deceleration time</td><td>Set the acceleration and deceleration time of the first section of displacement motor.</td><td>0～32767</td><td>200</td></tr>
<tr><td>P14.16</td><td>Waiting time after the first displacement is completed</td><td>Set the waiting time after the first segment of displacement is completed.</td><td>0～10000</td><td>08</td></tr>
<tr><td>P14.17</td><td>The second moving displacement is 4 high (X10000)</td><td rowspan="2">Section 2 displacement = P14.17*10000+P14.18 The displacement is based on the command pulse unit.</td><td>-32767～32767</td><td>1</td></tr>
<tr><td>P14.18</td><td>The second segment</td><td>-9999～9999</td><td>0</td></tr>
</table>

	moves the lower 4 bits			
P14.19	The maximum operating speed of the second displacement	Set the maximum operating speed of the Second displacement motor.	1～6000	200
P14.20	Displacement acceleration and deceleration time of the second stage	Set the acceleration and deceleration time of the second section of displacement motor.	0～32767	200
P14.21	Waiting time after the second displacement is completed	Set the waiting time after the second segment of displacement is completed.	0～10000	08
P14.22	The third moving displacement is 4 high (X10000)	Section 3 displacement = P14.22*10000+P14.23. The displacement is based on the command pulse unit.	-32767～32767	4
P14.23	The third segment moves the lower 4 bits		-9999～9999	0
P14.24	The maximum operating speed of the third displacement	Set the maximum operating speed of the third displacement motor.	1～6000	200
P14.25	Displacement acceleration and deceleration time of the third stage	Set the acceleration and deceleration time of the third section of displacement motor.	0～32767	200
P14.26	Waiting time after the third displacement is completed	Set the waiting time after the third segment of displacement is completed.	0～10000	08
P14.27	The fourth moving displacement is 4 high (X10000)	Set the displacement of the fourth paragraph (pulse number) =P14.27*10000+P14.28	-32767～32767	1
P14.28	The fourth segment moves the lower 4 bits		-9999～9999	0
P14.29	The maximum operating speed of the fourth displacement	Set the maximum operating speed of the fourth displacement motor.	1～6000	200
P14.30	Displacement acceleration and deceleration time of the fourth stage	Set the acceleration and deceleration time of the fourth section of displacement motor.	0～32767	200
P14.31	Waiting time after the fourth displacement is completed	Set the displacement of the 5th paragraph (pulse number) =P14.32*10000+P14.33	0～10000	08
P14.32	The fifth moving displacement is 4 high (X10000)		-32767～32767	1
P14.33	The fifth segment moves the lower 4 bits	Section 5 displacement=P14.32*10000+P14.33 The displacement is based on the command pulse unit.	-9999～9999	0
P14.34	The maximum operating speed of the fifth displacement	Set the maximum operating speed of the fifth displacement motor.	1～6000	200
P14.35	Displacement acceleration and deceleration time of the fifth stage	Set the acceleration and deceleration time of the fifth section of displacement motor.	0～32767	200
P14.36	Waiting time after the fifth displacement is completed	Set the waiting time after the fifth segment of displacement is completed.	0～10000	08
P14.37	The sixth moving displacement is 4 high (X10000)	Set the displacement of the 6th paragraph (pulse number) =P14.37*10000+P14.38	-32767～32767	1
P14.38	The sixth segment moves the lower 4 bits		-9999～9999	0
P14.39	The maximum	Set the maximum operating speed of the sixth displacement	1～6000	200

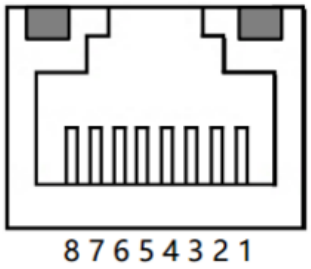
	operating speed of the sixth displacement	motor.		
P14.40	Displacement acceleration and deceleration time of the sixth stage	Set the acceleration and deceleration time of the sixth section of displacement motor.	0～32767	200
P14.41	Waiting time after the sixth displacement is completed	Set the waiting time after the sixth segment of displacement is completed.	0～10000	08
P14.42	The seventh moving displacement is 4 high (X10000)	Set the displacement of section 7 (pulse number) =P14.42*10000+P14.43	-32767～32767	1
P14.43	The seventh segment moves the lower 4 bits		-9999～9999	0
P14.44	The maximum operating speed of the seventh displacement	Set the maximum operating speed of the seventh displacement motor.	1～6000	200
P14.45	Displacement acceleration and deceleration time of the seventh stage	Set the acceleration and deceleration time of the seventh section of displacement motor.	0～32767	200
P14.46	Waiting time after the seventh displacement is completed	Set the waiting time after the seventh segment of displacement is completed.	0～10000	08
P14.47	The eighth moving displacement is 4 high (X10000)	Section 8 displacement=P14.47*10000+P14.48 The displacement is based on the command pulse unit.	-32767～32767	1
P14.48	The eighth segment moves the lower 4 bits		-9999～9999	0
P14.49	The maximum operating speed of the eighth displacement	Set the maximum operating speed of the eighth displacement motor.	1～6000	200
P14.50	Displacement acceleration and deceleration time of the eighth stage	Set the acceleration and deceleration time of the eighth section of displacement motor.	0～32767	200
P14.51	Waiting time after the eighth displacement is completed	Set the waiting time after the eighth segment of displacement is completed.	0～10000	08
P14.52	The Ninth moving displacement is 4 high (X10000)	Section 9 displacement=P14.52*10000+P14.53 The displacement is based on the command pulse unit.	-32767～32767	1
P14.53	The Ninth segment moves the lower 4 bits		-9999～9999	0
P14.54	The maximum operating speed of the Ninthdisplacement	Set the maximum operating speed of the ninth displacement motor.	1～6000	200
P14.55	Displacement acceleration and deceleration time of the Ninth stage	Set the acceleration and deceleration time of the ninth section of displacement motor.	0～32767	200
P14.56	Waiting time after the Ninth displacement is completed	Set the waiting time after the ninth segment of displacement is completed.	0～10000	08
P14.57	The tenth moving displacement is 4 high (X10000)	Section 10 displacement=P14.57*10000+P14.58 The displacement is based on the command pulse unit.	-32767～32767	1
P14.58	The tenth segment moves the lower 4 bits		-9999～9999	0
P14.59	The maximum operating speed of the tenth displacement	Set the maximum operating speed of the tenth displacement motor.	1～6000	200
P14.60	Displacement acceleration and deceleration time of the tenth stage	Set the acceleration and deceleration time of the tenth section of displacement motor.	0～32767	200
P14.61	Waiting time after the tenth displacement is	Set the waiting time after the tenth segment of displacement is completed.	0～10000	08

	completed			
P14.62	The eleventh moving displacement is 4 high (X10000)	Section 11 displacement=P14.62*10000+P14.63 The displacement is based on the command pulse unit.	-32767～32767	1
P14.63	The eleventh segment moves the lower 4 bits		-9999～9999	0
P14.64	The maximum operating speed of the eleventh displacement	Set the maximum operating speed of the eleventh displacement motor.	1～6000	200
P14.65	Displacement acceleration and deceleration time of the eleventh stage	Set the maximum operating speed of the eleventh displacement motor.	0～32767	200
P14.66	Waiting time after the eleventh displacement is completed	Set the waiting time after the eleventh segment of displacement is completed.	0～10000	08
P14.67	The twelfth moving displacement is 4 high (X10000)	Section 12 displacement=P14.67*10000+P14.68 The displacement is based on the command pulse unit.	-32767～32767	1
P14.68	The twelfth segment moves the lower 4 bits		-9999～9999	0
P14.69	The maximum operating speed of the twelfth displacement	Set the maximum operating speed of the twelfth displacement motor.	1～6000	200
P14.70	Displacement acceleration and deceleration time of the twelfth stage	Set the maximum operating speed of the twelfth displacement motor.	0～32767	200
P14.71	Waiting time after the twelfth displacement is completed	Set the acceleration and deceleration time of the twelfth section of displacement motor.	0～10000	08
P14.72	The thirteenth moving displacement is 4 high (X10000)	Section 13 displacement=P14.72*10000+P14.73 The displacement is based on the command pulse unit.	-32767～32767	1
P14.73	The thirteenth segment moves the lower 4 bits		-9999～9999	0
P14.74	The maximum operating speed of the thirteenth displacement	Set the maximum operating speed of the thirteenth displacement motor.	1～6000	200
P14.75	Displacement acceleration and deceleration time of the thirteenth stage	Set the acceleration and deceleration time of the thirteenth section of displacement motor.	0～32767	200
P14.76	Waiting time after the thirteenth displacement is completed	Set the waiting time after the thirteenth segment of displacement is completed.	0～10000	08
P14.77	Thefourteenth moving displacement is 4 high (X10000)	Section 14 displacement=P14.77*10000+P14.78 The displacement is based on the command pulse unit.	-32767～32767	1
P14.78	The fourteenth segment moves the lower 4 bits		-9999～9999	0
P14.79	The maximum operating speed of the fourteenth displacement	Set the maximum operating speed of the fourteenth displacement motor.	1～6000	200
P14.80	Displacement acceleration and deceleration time of the fourteenth stage	Set the acceleration and deceleration time of the fourteenth section of displacement motor.	0～32767	200
P14.81	Waiting time after the fourteenth displacement is completed	Set the waiting time after the fourteenth segment of displacement is completed.	0～10000	08

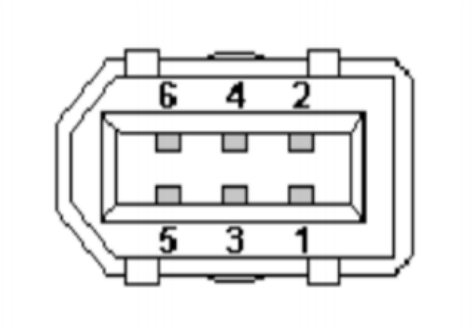
P14.82	Thefifteenth moving displacement is 4 high (X10000)	Section 15 displacement=P14.82*10000+P14.83 The displacement is based on the command pulse unit.	-32767～32767	1
P14.83	The fifteenth segment moves the lower 4 bits		-9999～9999	0
P14.84	The maximum operating speed of the fifteenth displacement	Set the maximum operating speed of the fifteenth displacement motor.	1～6000	200
P14.85	Displacement acceleration and deceleration time of the fifteenth stage	Set the acceleration and deceleration time of the fifteenth section of displacement motor.	0～32767	200
P14.86	Waiting time after the fifteenth displacement is completed	Set the waiting time after the fifteenth segment of displacement is completed.	0～10000	08
P14.87	Thesixteenth moving displacement is 4 high (X10000)	Section 16 displacement=P14.87*10000+P14.88 The displacement is based on the command pulse unit.	-32767～32767	1
P14.88	The sixteenth segment moves the lower 4 bits		-9999～9999	0
P14.89	The maximum operating speed of the sixteenth displacement	Set the maximum operating speed of the sixteenth displacement motor.	1～6000	200
P14.90	Displacement acceleration and deceleration time of the sixteenth stage	Set the acceleration and deceleration time of the sixteenth section of displacement motor.	0～32767	200
P14.91	Waiting time after the sixteenth displacement is completed	Set the waiting time after the sixteenth segment of displacement is completed.	0～10000	08

Chapter 5 Communication Control

5.1 Communication interface



KD202、KD203、KD205



KD210、KD305、KD310、KD315

communication interface	485A send pin	485B receive pin	GND Pin
RJ45 net opening	4	5	3
1394 socket	6	5	2
The communication distance of the twisted shielded wire can be up to 500m, and the normal use is recommended within 300m.			

5.2 P11 group communication parameters detailed description

No	Name	Function	Parameter range	default
P11.00	Baud rate	Set 1，2400bps； Set 2，4800bps； Set 3，9600bps； Set 4，19200bps； Set 5，38400bps； Set 6，57600bps； When communicating master-slave control, the baud rate setting of the servo slave station must be consistent with that of the master station.	1～6	3
P11.01	Station No.	In communication master-slave control, the communication station number of the servo slave station is the unique identification to distinguish the control objects.	1～255	1
P11.02	checkout	Set0，None Set1，Odd Set2，Even When communicating with master slave control, the calibration mode of servo slave station must be set in accordance with that of master station.	0~2	0
P11.03	Delayed response	Servo receives communication request, delay setting time to return data	0-1000	5

Note: This product has 8 data bits and 1 stop bit by default. The user controller needs to set 8 data bits and 1 stop bit.

5.3 communication protocol

The servo driver is embedded with the standard Modbus RTU communication protocol, which supports the operation of single or multiple parameters read and write by the Modbus RTU master station. When the controller with Modbus protocol is successfully connected with the servo driver, the controller can directly set the parameters of the servo driver, read the state and other operations.

When the servo driver is in the communication control mode, the controller can modify the operating instruction parameters in real time to change the motor running position, speed, torque, etc. Modbus RTU protocol has a variety of bus commands, and the servo driver supports three of the most commonly used commands. These three commands can satisfy the controller to control the servo driver in all directions. Specific function codes are shown in the following table.

CMD	Function code meaning
03H	Read single or consecutive parameter registers
06H	Write a single parameter register
10H	Write to successive parameter register

In order to facilitate the Modbus controller to read and write the parameters of the driver, the driver corresponds the parameter number to the Modbus address of the corresponding device. The parameter P00.00 of the driver corresponds to the address 40001 in the Modbus, that is, the address of register 0 with the address offset from 40001. The rest will be postponed. For example, parameter P01.03 is the maximum speed limit parameter, then this parameter corresponds to register address No. 103, whose Modbus address is offset from 40001. Operation results of data whose Modbus address is (40001+103) correspond to parameter No. P01.03.

Read single or multiple registers (03H code)

The following request frame reads P09.13 (feedback speed) data from a drive whose address (station number) is 01. Parameter P09.13 address 913 (convert hex 0391H).

Request frame format:

Format	From the station address	Function code	High starting address	Starting address low	Read high number	Read number low	CRC check high position	CRC check low position
	1byte	1byte	2byte		2byte		2byte	
Eg	01H	03H	03H	91H	00H	01H	CRC checkout	

If read successfully, reply frame format: if the feedback speed is 0

Format	From the station address	Function code	Data byte length	High starting address	Starting address low	CRC check high position	CRC check low position
	1byte	1byte	1byte	2byte		2byte	
Eg	01H	03H	02H	00H	00H	CRC checkout	

Write a single register (06H code)

The following request frame indicates that the speed value is written from the address (station number) of 01 to the drive P09.04 (operation speed in communication speed mode). Parameter P09.04 address 904 (convert hexadecimal 0388H). Write speed 500 (convert hexadecimal 01F4H).

Request frame format:

Format	From the station address	Function code	Write address high	Write address low	Write data high	Write data low	CRC check high position	CRC check low position
	1byte	1byte	2byte		2byte		2byte	
Eg	01H	06H	03H	88H	01H	F4H	CRC checkout	

If read successfully, reply frame format:

Format	From the station address	Function code	Is written to address high	Is written to address Low	data is written high	data is written Low	CRC High	CRC Low
	1byte	1byte	2byte		2byte		2byte	
Eg	01H	06H	03H	88H	01H	F4H	CRC checkout code	

Write multiple registers consecutively (10H code)

The following request frame indicates that the operation pulse value is written from the communication address (station number) of 01 to drives P09.01 (X10000, 4 bits higher for the operation pulse number in communication position mode) and P09.02 (4 bits lower for the operation pulse number in communication position mode). Parameter P09.01 address 901 (converted hexadecimal 0385H).

P09.01 write 1 (convert hexadecimal 0001H); P09.02 write 5000 (convert hexadecimal 1388H).

Request frame format:

Format	From the station address	Function code	Write the starting address high	Write the starting address low	Write a high number of contiguous addresses	Writes the low number of contiguous addresses	Number of bytes written	starting address data is high	starting address data is low	Start address +1 data high	Start address +1 data Low	CRC high	CRC low
	1byte	1byte	2byte		2byte		1byte	2byte		2byte		2byte	
Eg	01H	10H	03H	85H	00H	02H	04H	00H	01H	13H	88H	CRC	

If the contiguous address is written successfully, reply frame format:

Format	From the station address	Function code	Is written to address high	Is written to address low	High number of contiguous addresses written	Low number of contiguous addresses written	CRC high	CRC low
	1byte	1byte	2byte		2byte		2byte	
Eg	01H	06H	03H	88H	01H	F4H	CRC check code	

5.4.1 Communication position control mode

Workflow Process Definition Language
Modbus_RTU protocol 485 half duplex communication control servo according to the number of pulses and speed positioning operation.
Object Directory

Register address	Name	Parameter range	Unit	factory default
4	Control mode selection	0～10	—	0
900	Start stop	0～1	—	0
901	number of pulses in communication position mode is 4 bits higher	-32767～32767	Pulse（*10000）	0
902	number of pulses in communication position mode is 4 bits lower	-32767～32767	Pulse	0
903	Operation speed of communication position mode	0～3000	r/min	0

For example：

Suppose the control motor performs 11000 pulse positioning controls at the running speed of 100r/min (the total number of pulses in operation is 11000 =1*10000+1000)。

If the total number of pulses is positive, the rotation is positive; if the total number of pulses is negative, the rotation is reversed. Assuming the slave station number is 1, the Modbus_RTU command controls as follows;

※Start and stop (address 900), which should be set to 1 after all parameters are set, is equivalent to the start button, and set to 0 is equivalent to the stop button. In the internal position mode, when the motor completes the target pulse number, the motor stops, and the address 900 is automatically set to 0.

1:Set the operating mode to internal location mode: change P00.04 to 8 on the panel, or write 8 on the address 4。

The host sends data to the servo 01 06 00 04 00 08 C9 CD

2:Set the number of pulses to run: address 901 and 902 write the number of pulses you want to run。

Set the operating pulse count four lower: the host sends data to the servo 01 06 03 86 03 E8 68 D9

Set the operating pulse number four higher: the host sends data to the servo 01 06 03 85 00 01 59 A7

3:Set the running speed: address 903 write speed value 100。

The host sends data to the servo 01 06 03 87 00 64 38 4C 4:Start/stop running:

address 900 write 0 stop, write 1 start.

Start location: the host sends data to the servo 01 06 03 84 00 01 08 67

Stop location: the host sends data to the servo 01 06 03 84 00 00 C9 A7

5.4.2 Communication speed control mode

Workflow Process Definition

The user can control the servo at the set speed through MODBUS_RTU protocol 485 half duplex communication.

Object Directory

Register address	Name	Parameter range	Unit	factory default
4	Control mode selection	0～10	—	0
900	Start stop	0～1	—	0
904	Communication speed mode running speed	-3000～3000	r/min	0

For Example

If the control motor runs at 100r/min in positive rotation. (904 running speed is positive, it is positive, the target speed is negative, it is reverse). Assuming that the slave station number is 1, the Modbus 485 command is controlled as shown in the table below；

※Start and stop (address 900) should be set to 1 after all parameters are set, which is equivalent to the start button. Set it to 0, which is equivalent to the stop button. In speed mode, set 1 to run, and set 0 to stop。

1:Set the operating mode to communication speed mode: change P00.04 to 9 on the panel, or write 9 on the address 4。

The host sends data to the servo 01 06 00 04 00 09 08 0D

2:Set communication speed mode running speed: correspondence address 904 write speed value 100。

The host sends data to the servo 01 06 03 88 00 64 08 4F

3:Start/stop running: communication will write address 900 0 to stop, write 1 to start。Start: the host sends data to the servo 01 06 03 84 00 01 08 67

Stop: The host sends data to the servo 01 06 03 84 00 00 C9 A7

5.4.3 Communication torque control mode

Workflow Process Definition

The user can control the servo by modbus_RTU protocol 485 half duplex communication at the set torque operation.

Object Directory

Register address	Name	Parameter range	Unit	factory default
4	Control mode selection	0～10	—	0
900	Start stop	0～1	—	0
905	Communication Torque Mode Operating Torque	-300～300	%	0
208	Maximum speed limit for torque control	0～4000	r/min	2500

For example：

If the control motor runs at 30% of the rated torque, the maximum speed limit is 500. (If 905 operating torque is positive, it is positive; if 905 operating torque is negative, it is reverse). Assuming that the slave station number is 1, the Modbus 485 command is controlled as shown in the table below:

※Start and stop (address 900) should be set to 1 after all parameters are set, which is equivalent to the start button. Set it to 0, which is equivalent to the stop button. In torque mode, set 1 to run and set 0 to stop.

1.Set the operating mode to communication torque mode: change P00.04 to 10 on the panel, or write 10 on the address 4

The host sends data to the servo 01 06 00 04 00 0A 48 0C

2.Set communication torque mode operation torque: communication address 905 write the torque value of 30%

The host sends data to the servo 01 06 03 89 00 1E D8 6C

3.Set the maximum speed of communication torque mode: communication will address 208 write the maximum speed value of 500

The host sends data to the servo 01 06 00 D0 01 F4 88 24

4.Start/stop running: communication will write address 900 0 to stop, write 1 to start

Start：The host sends data to the servo 01 06 03 84 00 01 08 67

Stop：The host sends data to the servo 01 06 03 84 00 00 C9 A7

Chapter 6 Alarm and Handling

6.1 Alarm list

The servo driver has a variety of protection functions. When the fault is detected after power on, the servo driver will stop the motor running, and the alarm code will be displayed on the operation panel **Er-xx**。You can also go to the D-Err menu，View the current alarm code. Users can refer to the relevant contents of this chapter according to the alarm code to understand the cause of the fault and troubleshoot the fault.

6-1 Alarm list

Alarm code	Alarm name	Content	Reset method
-	Normal		Power-off reset, ARM_RST
1	Over speed	servo motor speed exceeds the set value	Power-off reset, ARM_RST
2	Main circuit over voltage	main circuit supply voltage is too high	Power-off reset, ARM_RST
3	main circuit under voltage	Main circuit power supply voltage is too low	Power-off reset, ARM_RST
4	Position error	position deviation counter exceeds the set value	Power-off reset, ARM_RST
5	Motor overheating	Motor temperature is too high	Power-off reset, ARM_RST
6	Speed amplifier saturation failure	speed regulator saturates for a long time	Power-off reset, ARM_RST
7	Driver disable exception	CCW and CW drive are OFF	Power-off reset, ARM_RST
8	Position deviation counter overflow	absolute value of the position deviation counter is greater than 2^30	Power-off reset, ARM_RST
9	Encoder failed	Encoder signal error	Power-off reset
10	Control under voltage of power supply	Control power supply 15V is low	Power-off reset
11	IPM module failure	IPM Intelligent module fault	Power-off reset
12	Over current	Excessive motor current	Power-off reset
13	overload	Ac servo drive unit and motor overload (instantaneous overheating)	Power-off reset, ARM_RST
14	Braking fault	Brake circuit fault	Power-off reset
15	Encoder count error	Encoder count exception	Power-off reset
16	Motor thermal overload	Electrical and mechanical heating value exceeds the set value (I2t test)	Power-off reset
19	Thermal reduction	system was reset by heat	Power-off reset
20	EEPROM error	EEPROM error	Power-off reset
23	IU,IV Current sampling anomaly	IU,IV Current sampling anomaly	Power-off reset
25	Bus soft startup timeout	Bus soft startup timeout	Power-off reset
30	encoder Z pulse is lost	Encoder Z pulse error	Power-off reset
31	Encoder UVW signal error	Encoder UVW signal error or mismatch with encoder	Power-off reset
32	Illegal encoder UVW signal	UVW signals exist at all high or all low levels	Power-off reset

	encoding		
33	The matching motor code does not exist	Wrong motor code set	Power-off reset
34	EEPROM is not written properly. Procedure	EEPROM is written frequently	Power-off reset

The reset mode is power off reset, indicating that after troubleshooting, the driver can only be powered off and reset again. If the reset mode is DI reset, it indicates that after the fault is rectified, you can use the DI terminal associated alarm reset function (ALM_RST),DI input ON reset alarm.

6.2 Alarm processing method

6-2 Alarm processing method

Alarm code	Alarm name	Run status	Reason	Handling method
1	Overspeed	Appears when the control power is switched on	Control board failure	Change driver
			Motor encoder failure	Change motor
		Occurs during motor operation	Input instruction pulse frequency is too high	Correctly set the input instruction pulse
			Acceleration/deceleration time constant is too small	Increase the acceleration/deceleration time constant
			Input electronic gear ratio is too large	Setting up correctly
			Motor encoder failure	Change motor
			Bad encoder cable	Change Encoder cable
			Servo system is unstable, causing overshoot	Reset the relevant gain
		Motor appears when it is just started	Excessive load inertia	①Reduce the load inertia ②Replace high-power drives and motors
			Encoder zero error.	① Replace the servo motor ② Please reset the encoder zero
			① The motor U, V, W leads are connected wrong ② The encoder cable lead is connected wrong	Correct connection
2	Overvoltage of main circuit	Appears when the control power is switched on	Circuit board fault	Change driver
		Appears when the main power is switched on	①The power supply voltage is too high ② The power supply voltage waveform is abnormal	Check the power supply
		Occurs during motor operation	Brake resistance wiring disconnected	rewiring
			Damaged brake transistor or brake resistor	Change driver
			Brake circuit capacity is insufficient	① Reduce the start and stop frequency ② Increase the acceleration/deceleration time constant ③ Reduce the torque limit value and load inertia ④ Replace high-power drives

				and motors
3	Main circuit undervoltage	Appears when the main power is switched on	● Circuit board failure ● Power supply insurance damage ● Soft start circuit failure ● The rectifier is damaged	Change driver
			①Low Ignition Power Supply ②Temporary power outage of more than 20mS	Check the power supply
		Occurs during motor operation	Power supply capacity is not enough, or instantaneous power loss	Check the power supply
			Radiator overheating	Check the load
4	Position error	Appears when the control power is switched on	Circuit board fault	Change driver
		Connect the main power supply and control line, input instruction pulse, motor does not rotate	①The motor U, V, W leads are connected wrong ②The encoder cable lead is connected wrong	Correct connection
			Encoder failed	Change motor
			Set position out of tolerance detection range is too small	Increase the detection range of position out of tolerance
			Position proportional gain is too small	Increase mana gain
			Lack of torque	① Check the torque limit value ② Reduce the load capacity ③ Replace high-power drives and motors
			Command pulse frequency is too high	reducing work frequency
Alarm code	Alarm name	Run status	Reason	Handling method
5	Motor Overheating	Appears when the control power is switched on	Circuit board fault	Change driver
			①Cable bolt ②Temperature relay in motor is damaged	①Check cable ②Check mtoor
		Occurs during motor operation	Motor overloaded.	①Reduce load, reduce start/stop frequency ②Reduced torque limit and associated gain ③Replace high-power drives and motors
			Motor internal failure	Change driver
6	Speed amplifier saturation failure	Occurs during motor operation	Motor was mechanically jammed	Check the mechanical part of the load
			Load is too large	①Reduce the load

				②Replace high-power drives and motors
7	FSTP	—	CCW 、 CW Drivers are forbidden to disconnect	Check the power supply for wiring and input terminals
8	Position deviation counter overflowed	—	①motor was mechanically jammed ②Input instruction pulse is abnormal	①Check the mechanical part of the load ②Check instruction pulse ③Whether the motor is operated by command pulse
9	Encoder Error	—	Encoder wiring error	Check the wiring
			Encoder damaged	Change motor
			Bad encoder cable	Change cable
			Encoder cable is too long, resulting in low power supply voltage of encoder.	① Shorten the cable ②Adopt multi-core parallel power supply
10	Excessive drive temperature	—	①The drive cooling fan does not rotate ②The drives are arranged too tightly ③The ambient temperature of the drive is too high	①Replace the servo driver ② Reasonably set the driver installation spacing ③Reasonable heat dissipation of the cabinet
11	Power module failure	Appears when the control power is switched on	Circuit board fault	Change driver
		Occurs during motor operation	①Low supply voltage ②overheating	①Power on reset ②Reasonable heat dissipation
			Short circuit between drive U, V, W	Check the wiring
			Imperfect earth	Change motor
			Motor insulation damage	Change motor
			Be disturbed	Add line filters, away from the source of interference
12	Over current	—	Short circuit between drive U, V, W	Check the wiring
			Imperfect earth	Correct grounding
			Motor insulation damage	Change motor
			Driver damaged	Change driver
13	overload	Appears when the control power is switched on	Circuit board fault	Change driver
		Occurs during motor operation	Run over rated torque	①Check the load ②Reduce the start and stop frequency ③Reduce the torque limit value ④ Replace the high-power driver and motor
			Keep the brakes closed	Check holding brake
			Motor oscillates unsteadily	①Adjust the gain ②Increase

				acceleration/deceleration time ③Reduce load inertia
			①Drives U, V, W are disconnected ②Encoder wiring error	Check the wiring
14	BRAKING FAULT	Appears when the control power is switched on	Circuit board fault	Change driver
		Occurs during motor operation	Brake resistance wiring disconnected	Rewiring
			Damaged brake transistor or brake resistor	Change driver
			Brake circuit capacity is insufficient	①Reduce the start-stop frequency ②Increase acceleration/deceleration time constant ③Reduce the torque limit value or load inertia ④ Change to a higher-power driver and motor
			Main circuit supply voltage is too high	Check main power supply
15	Encoder counting error	—	Encoder damaged	Change motor
			Encoder wiring error	Check the wiring
			Bad grounding, signal interference	Correct grounding
16	Motor thermal overload	Appears when the control power is switched on	Circuit board fault	Change driver
			Parameter setting error	Set relevant parameters correctly
		Occurs during motor operation	Long-term operation in excess of rated torque	①Check the load ②Reduce the start and stop frequency ③Reduce the torque limit value ④ Replace the high-power driver and motor
			Poor mechanical transmission	Check mechanical parts
19	Warm Reset	—	Input control power is unstable	Check control power
			Be disturbed	Add line filters, away from the source of interference
20	EEPROM Error	—	Chip or circuit board damage.	① Change driver ② After repair, the motor type code must be reset and the default parameters restored
23	A/D chip error	—	①Chip or circuit board damage ②Current sensor damaged	Change driver

25	Bus soft start timeout	Appears when the main power is switched on	①The main power supply is not connected or the wiring is bad ② Circuit board failure ③Soft start circuit failure ④The rectifier is damaged	Check power wiring （L1、L2、L3 or R、S、T）
30	Encoder Z pulse lost	—	①No Z pulse or encoder damage ②Bad cable or ③The cable shielding or the ground wire connection is poor ④The encoder interface circuit is faulty	①Replace the encoder ②Check the encoder interface circuit
31	Encoder UVW signal error	—	①The UVW signal of the encoder is damaged ②No Z pulse or encoder damage ③Bad cable ④Cable shielding or poor grounding connection ⑤The encoder interface circuit is faulty	①Replace the encoder ②Check the encoder interface circuit
32	Encoder UVW signal is illegally encoded	—	①The UVW signal of the encoder is damaged ②Bad cable ③The cable shielding or the ground wire connection is poor ④The encoder interface circuit is faulty	①Replace the encoder ②Check the encoder interface circuit
33	Motor code is not exist		The matching motor parameters are incorrect	Re-enter the correct motor code
34	EEPROM is not written properly		EEPROM is written frequently	Avoid frequent EEPROM operations

The reset mode is power-off reset, which means that after the fault is rectified, the alarm can only be generated by powering on the drive again.
The reset mode is DI reset, indicating that the DI terminal associated alarm reset function (ALM_RST) can be used after the fault is rectified, and DI input ON reset alarm.

6.2 Multi-turn absolute motor battery alarm and replacement method

6.2.1 Reasons and solutions for alerting ER30 and ER31

1. Multi-turn absolute motor relies on motor encoder to record position data. The motor encoder is powered by the servo drive through the encoder

The extension cable provides power, and the battery on the encoder extension cable provides power in the case of power loss of the driver. The battery life is recommended not to exceed 2 years.

2. The motor encoder needs to be reset in the following cases.
A:When the power driver is switched on for the first time, the alarm ER30 or ER31 (encoder battery failure) needs to be set P03.09= 2 to reset the encoder Fault, and power on again to cancel the alarm.
B: If the motor is separated from the encoder extension wire during use, the motor encoder loses data due to power loss position and alarms ER30 or ER31,
Need to set P03.09= 2 to reset the encoder fault, and re-power on to cancel the alarm.
C: Forcibly remove the battery in the case of drive power off, or disconnect the battery from the encoder line, motor encoder power loss position data loss and alarm
ER30 or ER31. Need to set P03.09=2 to reset the encoder fault, and re-power on to cancel the alarm.

6.2.2 Precautions for Replacing an encoder Battery

A: When do I need to replace the encoder battery?

1: The servo is in normal use, and the encoder cable has not been removed. If the alarm is ER30 or ER31, it indicates low battery voltage and reminds the user to replace it
Encoder battery, otherwise easy to lose or have lost encoder position data.
2: encoder battery leakage, damage, bulge and other situations need to replace the encoder battery in time to prevent the battery from abnormal power loss and loss of encoder position data.

B: Replace the encoder battery steps and precautions.

Replacement steps:
1: Replace the battery when the driver is powered up and the encoder cable is normally connected to the driver.
2: After the battery is removed, the driver will alarm ER30, and set P03.09=1 after the correct replacement.
Only reset the encoder alarm without clearing the encoder data, and re-power the alarm.
3; The preceding steps do not cause loss of encoder position data.
Note:
1: Recommended battery specifications: 3.6V 2500mAh.
2: Install a new battery pay attention to distinguish between positive and negative battery, generally red positive, black negative.
3: Abnormal replacement of battery or encoder abnormal power loss, alarm ER30 or ER31,
It is necessary to set P03.09=2 to reset the encoder alarm, reset the encoder fault, clear the encoder data, and re-power on to cancel the alarm.

