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# CHAPTER 1 PRODUCT INFORMATION

## 1.1 Servo drive

### 1.1.1 Drive nameplate description

Model Description:

SD300   P   -   2S   -   3R0  
 ①            ②                    ③                    ④

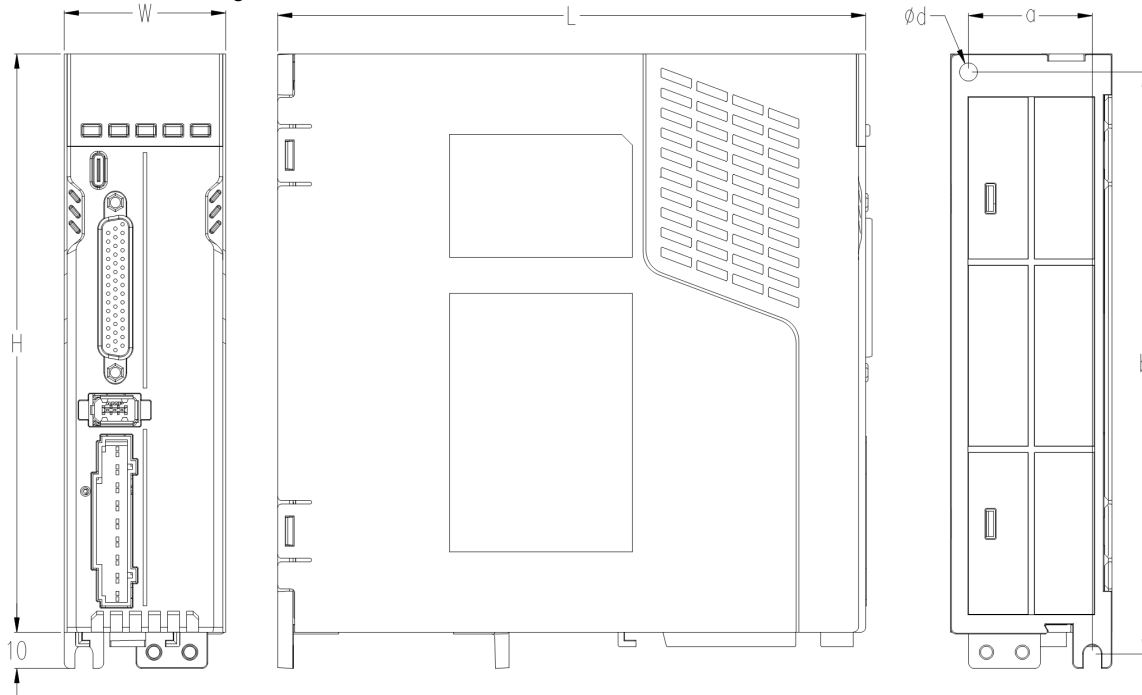
① Product Name SD300: General series servo drive	④ Rated output current 220V:        1R8: 1.8A 3R0: 3.0A 5R5: 5.5A 7R6: 7.6A  380V:        5R4: 5.4A 8R5: 8.5A 012: 12A 017: 17A 021: 21A 025: 25A
② Product Type P: Pulse control type	
③ Voltage Level 2S: Single phase 220V 2T: Three phase 220V 4T: Three phase 380V	

### 1.1.2 Drive model list

Size	Model	Input voltage	Adapted motor power kW	Rated current (A)	Max current (A)
A	SD300P-2S-1R8	Single phase 220V	0.2	1.8	5.6
	SD300P-2S-3R0		0.4	3	8.8
	SD300P-2S-5R5		0.75	5.5	11.3
B	SD300P-2T-7R6	Three-phase 220V	1	7.6	17
	SD300P-4T-5R4	Three-phase 380V	1.5	5.4	12.7
C	SD300P-2T-012	Three-phase 220V	1.5	12	32
	SD300P-4T-8R5	Three-phase 380V	2	8.5	17
	SD300P-4T-012		3	12	28
D	SD300P-4T-017	Three-phase 380V	5	17	35
	SD300P-4T-021		6	21	39
	SD300P-4T-025		7.5	25	50

### 1.1.3 Drive product size

◆ Dimensional diagram:

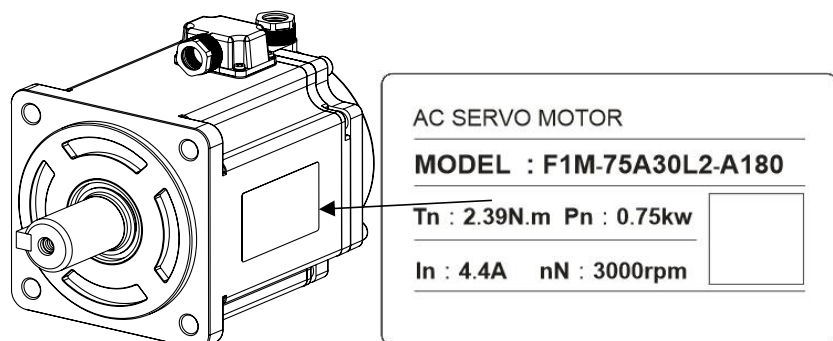


◆ Size Chart

Size	Product size (mm)					
	L	W	H	a	b	d
A	166	45	160	34.5	161	5
B	172	66	167	54.5	157.2	5
C	170	83	167	71.5	157.2	5
D	230	85	250	73.5	240.2	5.5

## 1.2 Servo motor

### 1.2.1 Motor nameplate description



◆ Model Description:

F1 M - 40A 30 L 1 - A1 60  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①Product Series F1 : F1 series motor F2 : F2 series motor	④Rated Speed 15 = 1500 rpm 20 = 2000 rpm 25 = 2500 rpm 30 = 3000 rpm	⑦Encoder Type A : Magnetic Encoder B : Optical encoder  1 : 17bit single turn 2 : 17bit mult turn 4 : 23bit mult turn
②Rotor Inertia M: Medium inertia	⑤Input Voltage L : AC220V H : AC380V	⑧Motor Flange 40 : 40 flange 60 : 60 flange 80 : 80 flange 13 : 130 flange 18 : 180 flange
③Rated Power(W) A: x 10 B: x 100 eg. : 40A=400W .....	⑥Brake 1 : without brake 2 : with brake	

### 1.2.2 Motor model list

Motor models	Rated output kW	Voltage	Rated torque N.m	Rated current A	Rated speed/maximum speed rpm
F1M-20A30L□-B460	200W	220V	0.64	1.7	3000/6000
F1M-40A30L□-B460	400W	220V	1.27	2.5	3000/6000
F1M-60A30L□-B460	600W	220V	1.91	3.6	3000/6000
F1M-75A30L□-B480	750W	220V	2.39	4.4	3000/6000
F1M-10B30L□-B480	1000W	220V	3.18	5.8	3000/6000
F1M-85A15L□-B413	850W	220V	5.41	4.6	1500/3000
F1M-85A15H□-B413	850W	380V	5.41	3.1	1500/3000
F1M-13B15L□-B413	1300W	220V	8.28	7.7	1500/3000
F1M-13B15H□-B413	1300W	380V	8.28	5.1	1500/3000
F1M-18B15L□-B413	1800W	220V	11.46	9.8	1500/3000

Motor model table (continued):

Motor specifications and models	Rated output kW	Voltage	Rated torque N.m	Rated current A	Rated speed/maximum speed rpm
F1M-18B15H□-B413	1800W	380V	11.46	6.3	1500/3000
F1M-23B15L□-B413	2300W	220V	14.64	12.4	1500/3000
F1M-23B15H□-B413	2300W	380V	14.64	8.5	1500/3000
F1M-30B15H□-B413	3000W	380V	14.64	8.5	1500/3000
F1M-30B15H□-B418	3000W	380V	19.1	11.6	1500/3500
F1M-45B15H□-B418	4500W	380V	28.65	16.6	1500/3500
F1M-55B15H□-B418	5000W	380V	35	21.4	1500/3500
F1M-75B15H□-B418	7500W	380V	47.76	26.7	1500/3500

## 1.3 Cable

### 1.3.1 Power cable model description

LPG - 0 075 0 - 3.0 - G

①                      ②                      ③                      ④                      ⑤                      ⑥

① Motor power cable LPG: General 4-core power LPB: Power cable with brake	④ Motor side plug type 0: 4-core Amp head 1: SC-MC6S (Gecko Head) 2: 6P-core aviation head
② Drive Side Plug Type 0: U-shaped type terminal 1: Needle type terminal	⑤ Cable length 3.0: 3m 5.0: 5m 10.0: 10m ....
③ Wire diameter(mm <sup>2</sup> ) 050: 0.5 075: 0.75 100: 1.0 150: 1.5 250: 2.5 ....	⑥ Cable type G: General Cable H: Super High-flex Cable(Bend endurance over 10 million cycles)

### 1.3.2 Encoder cable model description

LEG - 0 0 - 3.0 - G

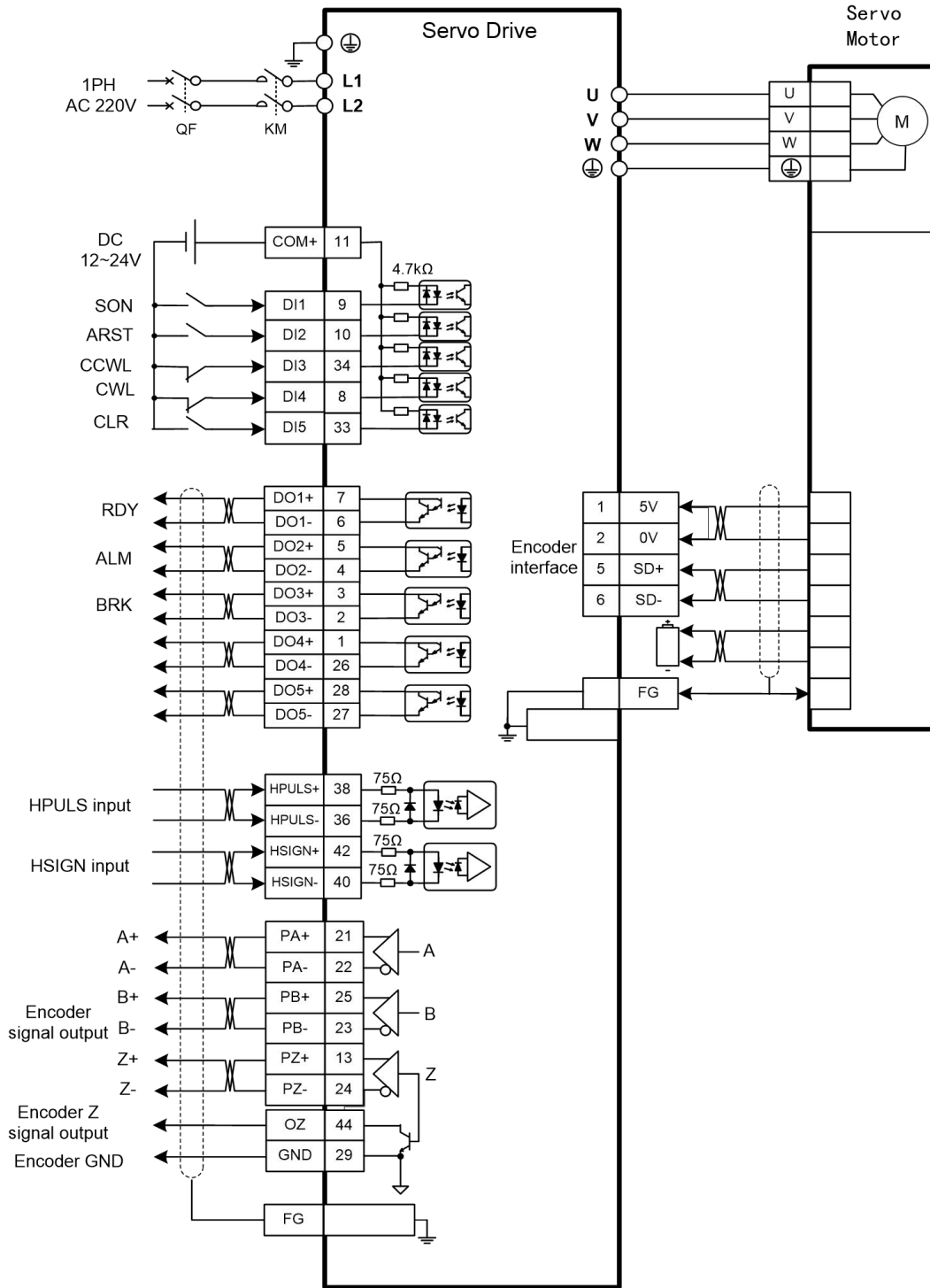
①                      ②                      ③                      ④                      ⑤

① Encoder cable LEG: Universal absolute encoder cables LEB: Battery-powered absolute encoder cables	④ Cable length 3.0: 3m 5.0: 5m 10.0: 10m ...
② Drive side plug type 0:1394 plug 1:DB15 plug 2:DB9 plug	⑤ Cable type G: General Cable H: Super High-flex Cable (Bend endurance over 10 million cycles)
③ Motor side plug type 1:SC-MC7S (Gecko Head) 2:10P-core aviation plug	

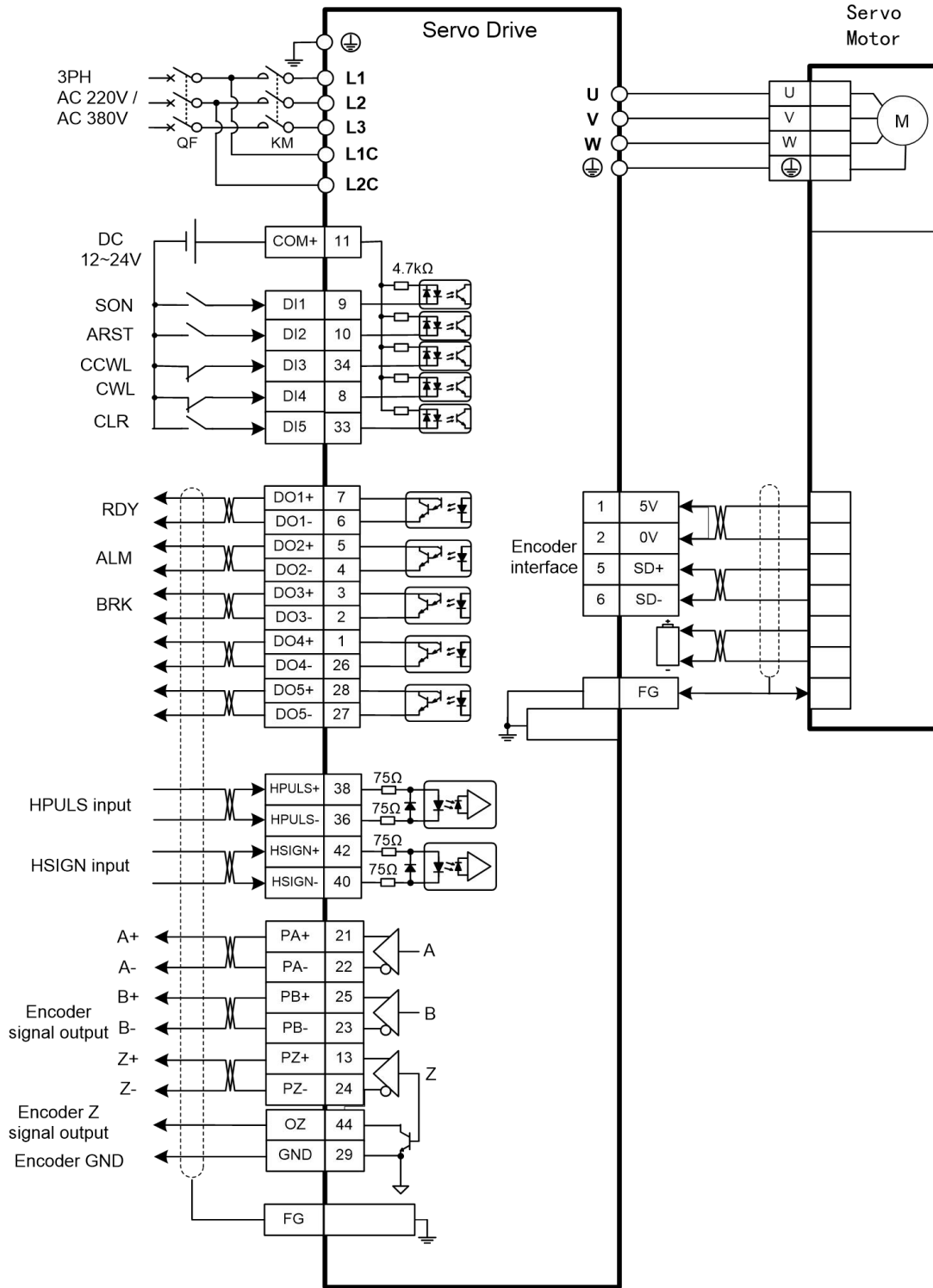
# CHAPTER 2 TERMINALS AND WIRING

## 2.1 System wiring diagram

◆SD300P-2S single phase 220V:

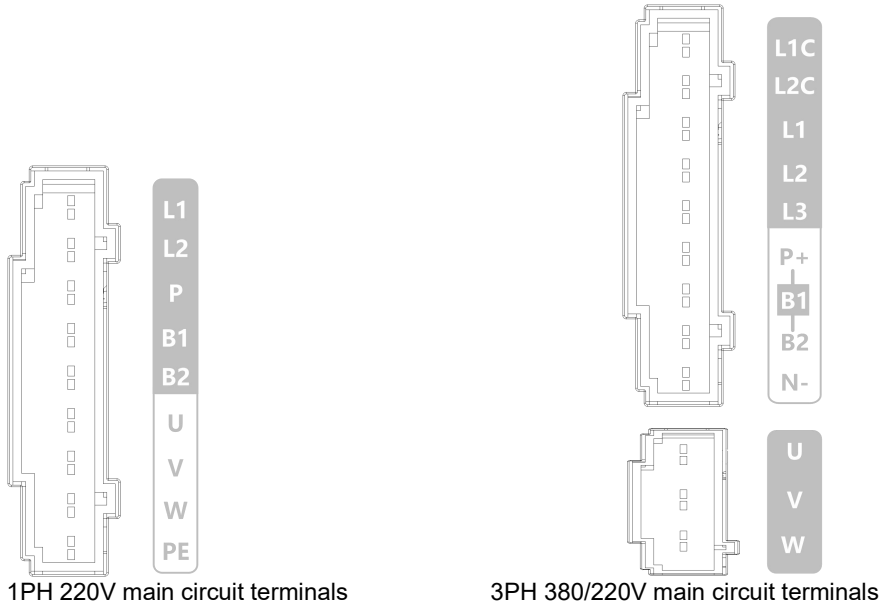


- ◆SD300P-2T 3PH 220V (L1, L2,L3), When used as a single-phase, connect any two of L1, L2, and L3:
- ◆SD300P-4T 3PH 380V (L1, L2,L3):



## 2.2 Terminal distribution and description

### 2.2.1 Main circuit terminals



**Terminal function description:**

Name	Terminal symbol	Model	Detailed description
The main circuit Power terminal	L1, L2	SD300P-2S	To connect external AC power: Single phase 220VAC -15% ~ +10% 50/60Hz
	L1, L2, L3	SD300P-2T	To connect external AC power: Three-phase 220VAC -15% ~ +10% 50/60Hz
	L1, L2, L3	SD300P-4T	To connect external AC power: Three phase 380 VAC -15% ~ +10% 50/60Hz
Control power terminal	L1C, L2C	SD300P-2T	1PH 220VAC
		SD300P-4	1PH 380VAC
Brake resistor terminals	P, B1, B2	SD300P-2S SD300P-2T SD300P-4T	Connect the external brake resistor between P and B1. Before use, disconnect B1 and B2. Default configuration is short circuit between B1 and B2, use internal brake resistor.
Motor connection terminal	U, V, W	SD300 all series	Output to motor U VW power

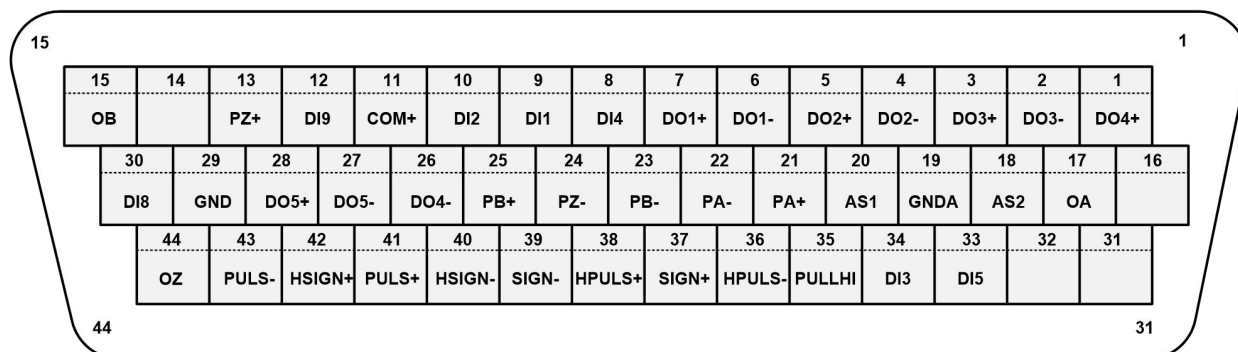
◆ The factory default connection method of internal brake resistor: B1 and B2 are short-circuited.



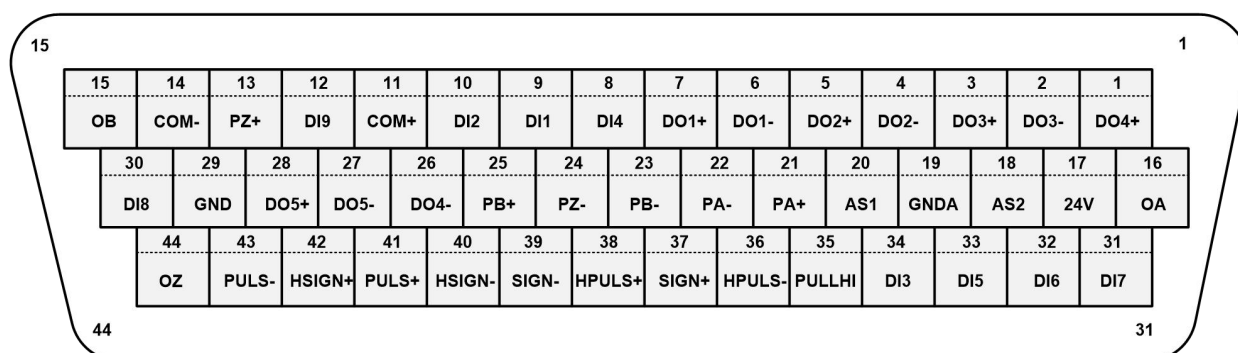
## 2.2.2 Control terminal

Control terminal diagram:

### ◆SIZE A:



### ◆SIZE B/C/D:



### Terminal function description :

Signal name	Pin number	Terminal description	Function Description
Universal digital input	DI1	9	Digital input 1
	DI2	10	Digital input 2
	DI3	34	Digital input 3
	DI4	8	Digital input 4
	DI5	33	Digital input 5
	DI6	31	Digital input 6
	DI7	32	Digital input 7
	DI8	30	Digital input 8
	DI9	12	Digital input 9
COM+	11	Digital input common	Universal digital input terminal, COM+ is the input common terminal and needs to be used with an external 24V power supply. ◆ If DI is low (0V) and valid, COM+ is connected to the external DC power supply (12V~24V); ◆ If DI is high (12V~24V) and valid, then COM+ is connected to the corresponding signal reference ground
Universal digital output	DO1+, DO1-	7, 6	Digital output 1±
	DO2+, DO2-	5, 4	Digital output 2±
	DO3+, DO3-	3, 2	Digital output 3±
	DO4+, DO4-	1, 26	Digital output 4±
	DO5+, DO5-	28, 27	Digital output 5±
Encoder signal input	PULS+/HPULS+	38/41	Pulse input positive
	PULS-/HPULS-	36/43	Pulse input negative
	SIGN+/HSIGN+	37/42	Direction input is positive
	SIGN-/HSIGN-	39/40	Direction input negative
	PULLHI	35	Pulse input common terminal
			◆ As a position command input terminal (valid only in position mode); ◆ Input frequency: Low speed: 500kHz (differential), 200kHz (collector). High speed: differential mode 1M

SD300P Series Servo Drive

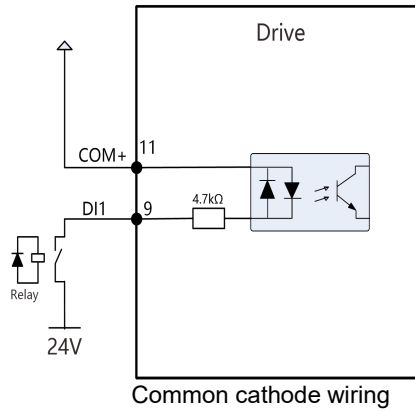
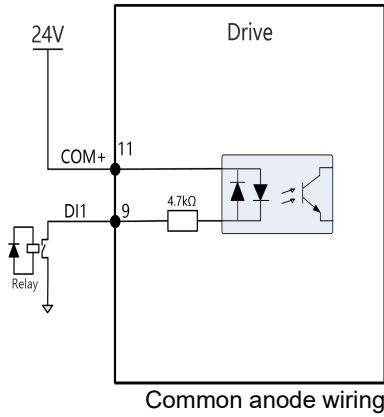
				◆High/low speed can be switched through F05.01	
Encoder signal output	PA+, PA-	21, 22	Encoder A phase differential output	◆The output A-phase pulse and B-phase pulse are still orthogonal. During forward rotation, phase A leads B phase by 90°, and during reverse rotation, B phase leads phase A by 90°; ◆Can be divided by any integer; ◆The output signal is not isolated.	
	PB+, PB-	25, 23	Encoder B-phase differential output		
	PZ+, PZ-	13, 24	Encoder Z phase differential output		
	OA	17	Encoder A phase open drain output		Output the open-drain signal of A phase without isolation.
	OB	15	Encoder B phase open drain output		Output B phase open-drain signal without isolation.
	OZ	44	Encoder Z phase open drain output		Output the Z-phase open-drain signal without isolation.
Analog input	AS1	20	Analog input 1	Its output function definition can be set, and its range and offset settings can be set.	
	AS2	18	Analog input 2		
	GND A	19	Analog signal ground		
Other	GND	29	internal power ground	internal power ground	
Power output	+24V	17	24V Power (SIZE B/C/D)	24V power output	
	COM-	14			

## 2.3 Terminal wiring

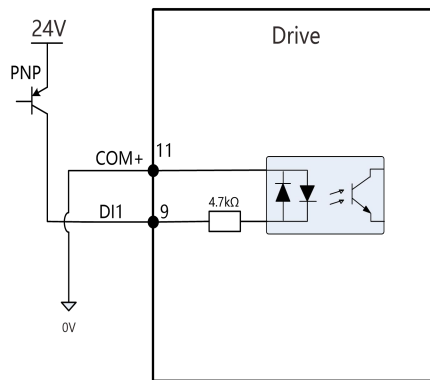
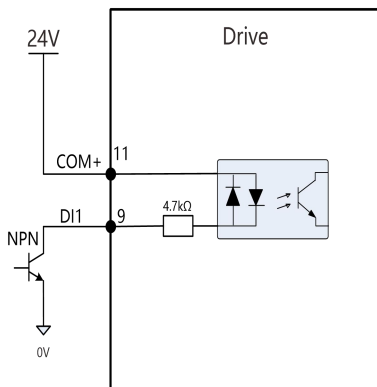
### 2.3.1 Universal input terminal wiring

Take DI 1 as an example: the interface circuits from DI 2 to DI9 are the same

- ◆ Universal wiring:



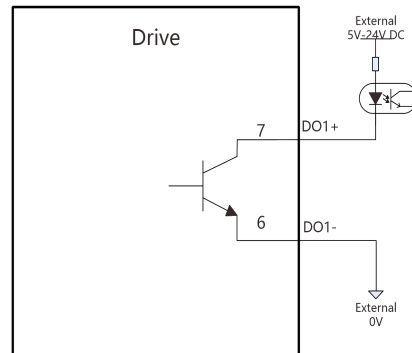
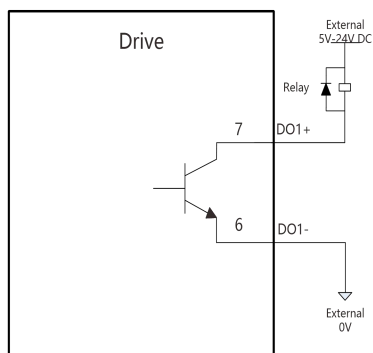
- ◆ When the upper device is collector output, the wiring diagram is as follows:



Note: Mixed use of PNP and NPN inputs is not supported.

### 2.3.2 Universal output terminal wiring

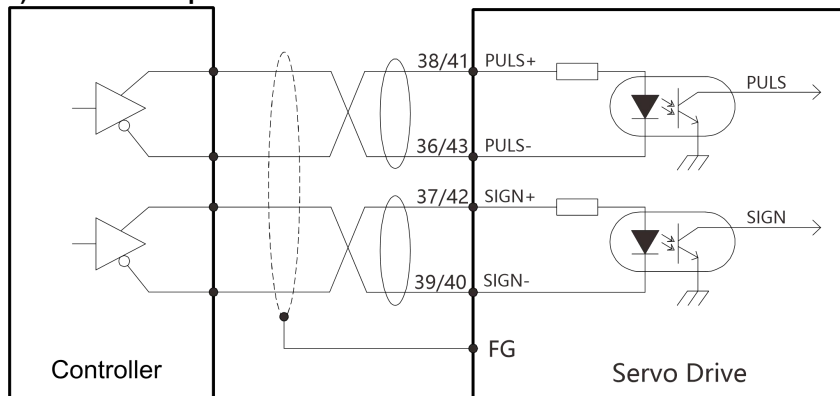
Take DO1 as an example: the electrical circuits of the DO2 to DO5 interfaces are the same.



The upper device is a relay. The upper device is an optocoupler input.

### 2.3.3 pulse input terminal wiring

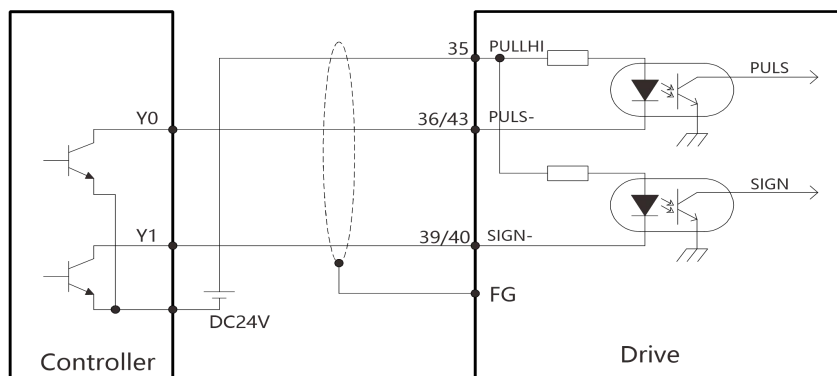
**1) Differential input:**



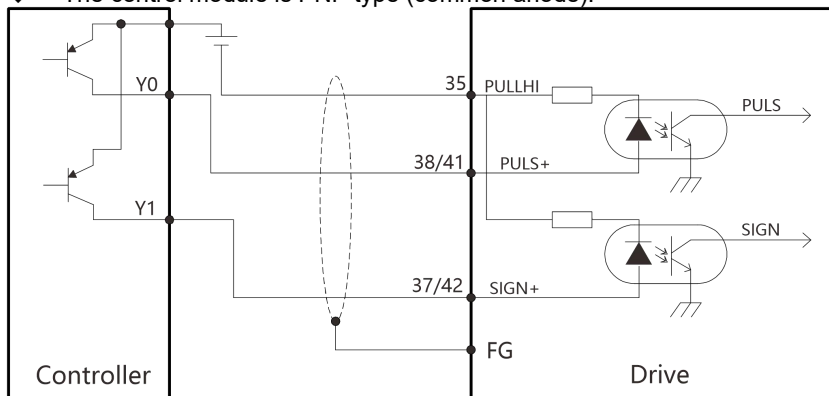
- ◆ Differential pulse input signal voltage  $\pm 5V$ , maximum frequency 500 K Hz;
- ◆ This signal transmission method has the best anti-noise ability, and it is recommended to use this connection method first.

**2) Open collector mode 1:**

- ◆ The control module is NPN type (common cathode):



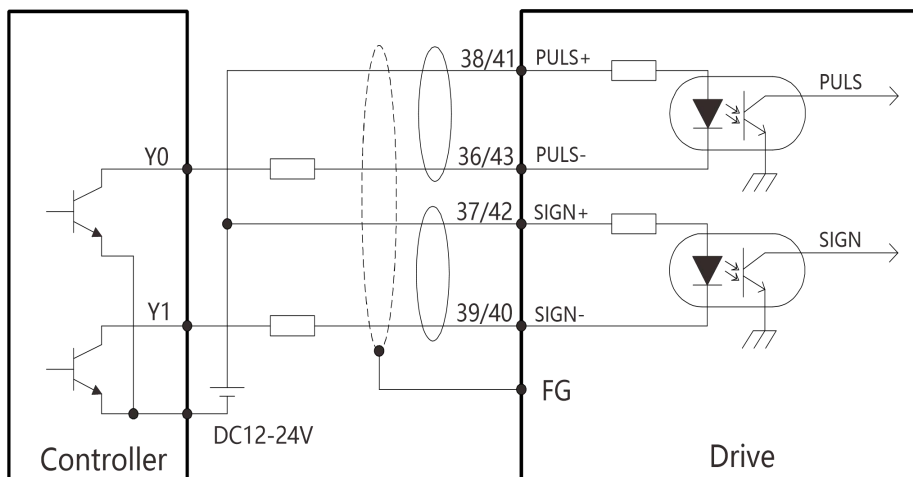
- ◆ The control module is PNP type (common anode):



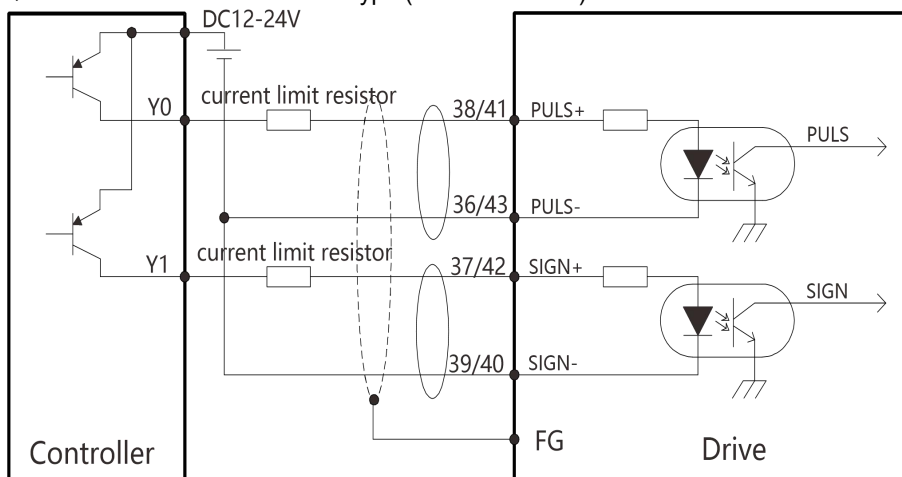
\*Note: The maximum input pulse frequency is 200kHz; user-prepared 24V power supply, no need to connect current limiting resistor. Generally, most Japanese PLC are of NPN type, while European PLC are mostly of PNP type.

**3) Open collector mode 2:**

- ◆ The control module is NPN type (common cathode)



- ◆ The control module is PNP type (common anode)



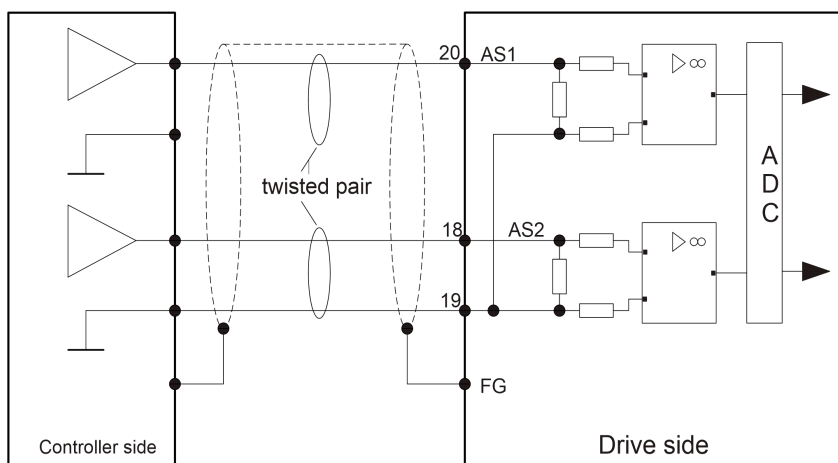
\*Note: The input pulse frequency is 200kHz; the user's own 12~24V power supply requires an external current-limiting resistor. The size of the current-limiting resistor is selected according to the table:

DC 12V	1kΩ , 1 / 4W
DC 24V	2kΩ , 1 / 2W

Resistance value calculation formula:

$$(V_{DC} - 1.5) / (R + 150) = 10 \text{ mA}$$

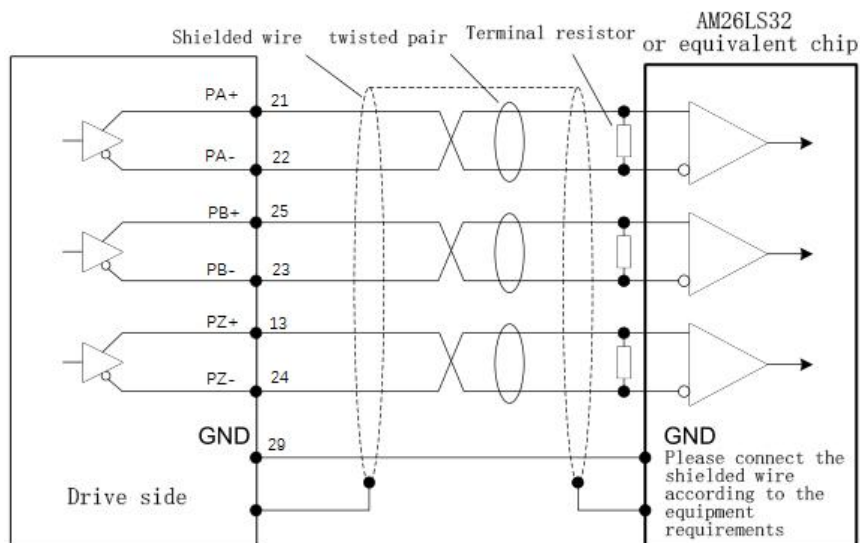
### 2.3.4 Analog input terminal wiring



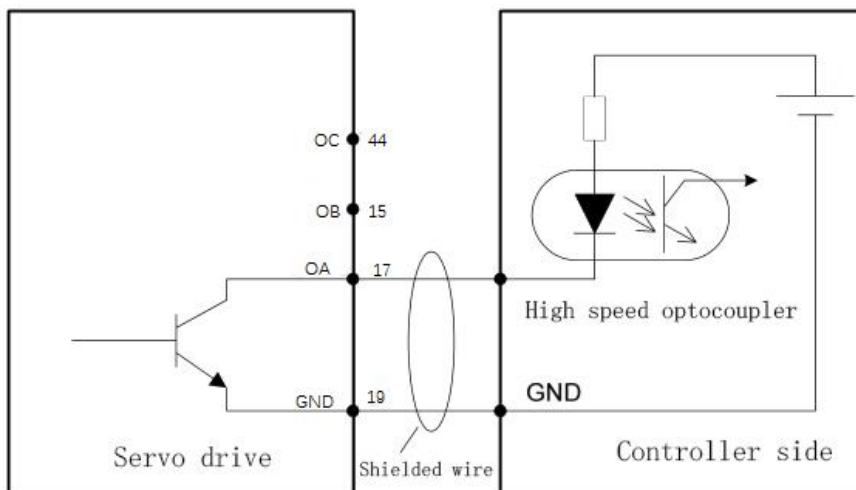
- Two analog input circuits, AS1 and AS2 have an accuracy of 12 bits. Input impedance 10kΩ; input voltage range -10V~+10V .

### 2.3.5 Encoder signal frequency division output

1) Differential output mode

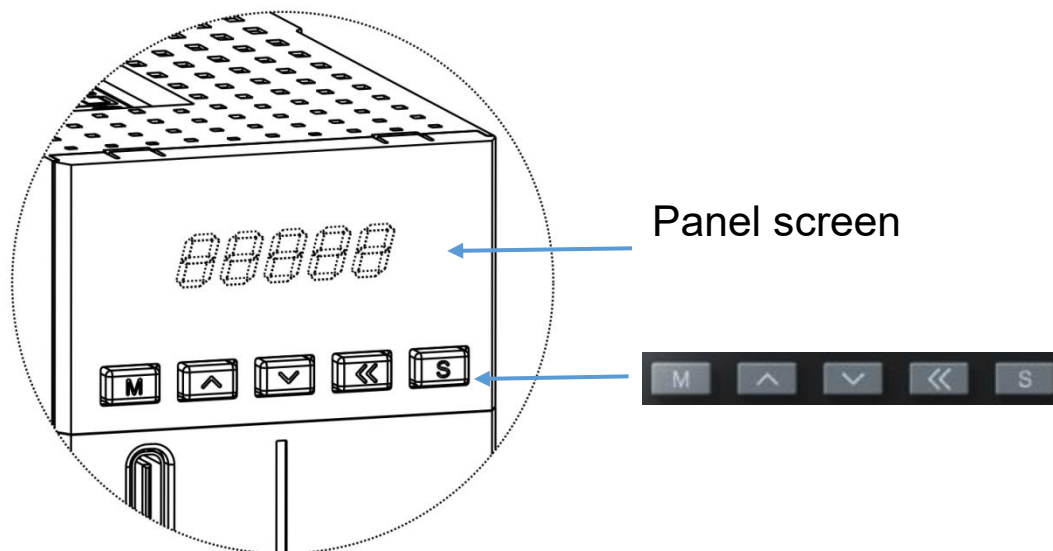


## 2) Open collector output mode:








- The A, B, and Z phases of the encoder all provide differential output and open collector output signals.
- For differential output signals, it is recommended that users use AM26C32 or equivalent differential receiving chips, and be sure to add a terminal matching resistor of approximately 220Ω.
- For open-collector output A, B, Z phase signals, since the signal pulse width is very narrow, the user needs to use a high-speed optocoupler to receive this signal.
- Both output circuits are not isolated.

# CHAPTER 3 OPERATION AND DISPLAY



The panel of the SD300P servo drive consists of a display (5-digit 8-segment LED digital tube) and 5 buttons. It can be used for various displays, parameter settings, user password settings and general function execution of the servo drive.

Taking parameter setting as an example, the general functions of the keys are as shown in the following table:

Name	Picture	General functions
MODE key		Switch between modes. Return to the previous menu.
UP key		Increase the number of flashing digits of the LED digital tube.
DOWN key		Reduce the number of blinking digits of the LED digital tube.
SHIFT key		Change the LED digital tube flash bit. View the high-order value of data longer than 5 digits.
SET key		Enter the next level menu. Execute commands such as storing parameter settings.



# CHAPTER 4 PARAMETER SUMMARY

## F00 Servo motor parameters

Parameter	Function	Range	Default	Unit	Effective method
F00.08	Encoder type	0: Encoder automatic recognition 1: Tamagawa Absolute Value Encoder	0	-	Power on again
F00.11	Rated current	0.1~400.0	2.7	A	Power on again
F00.12	Rated torque	0.1~400.0	1.3	Nm	Power on again
F00.13	Maximum torque percentage	0~1000	300	%	Power on again
F00.14	Rated speed	1~10000	3000	rpm	Power on again
F00.15	Maximum speed percentage	0~300	200	%	Power on again
F00.16	Moment of inertia	0.001~32.767	0	10 <sup>-3</sup> kgcm <sup>2</sup>	Power on again
F00.17	Number of motor pole pairs	1~50	5	-	Power on again
F00.18	Stator phase resistance	0.01~327.67	1.72	Ω	Power on again
F00.19	Stator phase inductance Lq	0.01~327.67	5.8	mH	Power on again
F00.20	Stator phase inductance Ld	0.01~327.67	5.8	mH	Power on again
F00.21	Line back electromotive force coefficient	1~32767	33	V/KRPM	Power on again
F00.28	Encoder zero offset	-360.0~360.0	123	°C	Power on again
F00.31	Encoder resolution	4~31	23	-	Power on again
F00.56	Motor rotation direction	0: UVW sequence 1: UWV sequence	0	-	Power on again
F00.57	Encoder multi-turn number	0-24	0	-	Power on again
F00.58	Motor 1 parameter source	0: Parameter table 1: Read from the encoder	1	-	Power on again

## F01 Drive parameters

Parameter	Function	range	Default	Unit	Effective method
F01.00	MCU software version	-	-	-	show
F01.02	Servo drive model	-	-	-	show
F01.30	Rated DC voltage	1-3000	300	V	Power on again
F01.31	Current sensor gain	1~20000	2048	1/A	Power on again
F01.32	IPM maximum current	0.1~400.0	5.0	A	Power on again
F01.33	IPM overload detection point	0 ~100	95	%	Power on again
F01.34	IPM overload detection filter time constant	0~32767	60	s	Power on again
F01.35	IPM dead time	1.0~10.0	2.0	us	Power on again
F01.36	IPM minimum pulse width	0.0~20.0	4.0	us	Power on

## SD300P Series Servo Drive

					again
F01.37	PWM cycle time	20.00~300.00	125.00	us	show
F01.40	Overcurrent detection point	1~32767	16380	-	Power on again
F01.41	Continuous times of overcurrent detection	1~10000	10	-	Power on again
F01.42	Power board maximum current	0.1~400.0	2.7	A	Power on again
F01.43	Power board adapts to power	0.01~300.00	1.50	KW	Power on again
F01.44	Power board rated current	0.1~400.0	0.7	A	Power on again
F01.45	Bus voltage protection action time	0.01~40.00	3.00	s	Power on again
F01.51	Is dynamic braking onboard?	0-1	0	-	show
F01.52	Onboard NTC type	0~255	0	-	show
F01.53	Power board current sampling bootsnotch filter	0-1	0	-	show
F01.54	Power board NTC temperature alarm point	50~125	120	-	Power on again
F01.60	Current loop gain	1-600	110	Hz	Power on again
F01.61	Current loop integration time constant	1-1000	10	%	Power on again
F01.63	Overload characteristic point	1-1000	200	%	Power on again
F01.64	Overload characteristic point duration	1~30000	10	ms	Power on again
F01.65	IIT thermal overload point	0-300	112	%	Power on again
F01.66	IIT thermal overload detection filter time constant	0-32767	3000	s	Power on again
F01.67	Moment of inertia unit multiple	1~10000	1	-	Power on again
F01.68	Inductance unit multiple	1~10000	1	-	Power on again
F01.70	Open loop run speed	0~3000	60rpm	rpm	Power on again
F01.71	Open loop run current	0~100	20	%	Power on again
F01.72	Encoder to zero current	0-500	50	%	Power on again
F01.73	Encoder to zero point high speed	1-3000	50	-	Power on again
F01.74	Encoder is slow to zero	1 ~1000	7	-	Power on again
F01.76	Encoder counting maximum error	0~10000	25	pulse	Power on again
F01.77	Encoder disconnection detection times	1~1000	35	-	Power on again
F01.78	Encoder Z signal loss detection turns	0 ~300	3	rpm	Power on again
F01.80	Voltage during power board self-test	0~1000	310	V	Power on again
F01.81	Power board AD sampling value conversion voltage coefficient	0~3000	32	-	Power on again
F01.83	Fan temperature point	25~125	50	°C	Effective immediately

## F02 Basic control parameters

Parameter	Function	Range	Default	Unit	Effective method
F02.00	Control mode selection	0: Position mode 1: Speed mode 2: Torque mode 3: Position/speed mode 4: Position/torque mode 5: Speed/torque mode	0	-	Effective immediately
F02.01	Absolute value system selection	0: Single turn absolute mode 1: Multi turn absolute mode 2: Incremental mode	0	-	Power on again
F02.03	Output pulse phase	0: A ahead of B 1: A lags behind B	0	-	Power on again
F02.09	Delay from brake output ON to command reception	0-1000	0	ms	Effective immediately
F02.10	In static state, the delay from brake output OFF to motor enable OFF	0-2000	150	ms	Effective immediately
F02.11	Rotation state, speed when brake output is OFF	0-3000	100	rpm	Effective immediately
F02.12	Rotation state, delay from servo enable OFF to brake output OFF	0-2000	0	rpm	Effective immediately
F02.22	Built-in brake resistor rated power	2-10000	-	W	Power on again
F02.23	Built-in brake resistor value	10-750		$\Omega$	Power on again
F02.25	Brake resistor settings	0: Use built-in braking resistor 1: Use an external braking resistor	0	-	Effective immediately
F02.26	Rated power of external braking resistor	1-10000	-	W	Power on again
F02.27	External brake resistor value	1-750	-	$\Omega$	Power on again
F02.30	user password	0-9999	0	-	Power on again
F02.31	System parameter initialization	0: No operation 1: Restore factory settings 2: Clear fault records	0	-	Power on again
F02.32	Panel default display function	0-99	0	-	Effective immediately
F02.40	CWL, CCWL direction prohibition method	0: Limit the torque in this direction to 0 1: Prohibit pulse input in this direction	0	-	Effective immediately
F02.41	Speed/torque corresponding analog channel selection	0: AS1 channel and AS2 channel correspond to speed command and torque command respectively 1: AS1 channel and AS2 channel correspond to torque command and speed command respectively	0	-	Effective immediately
F02.44	Acceleration and deceleration time in stop mode	0-10000	1000	ms	Effective immediately
F02.55	Regenerative brake voltage	1-1000	-	-	Power on again
F02.56	Maximum peak brake power	5-10000	-	W	Power on again
F02.57	Maximum average brake power	5-10000	-	W	Power on again
F02.58	Peak brake power detection filter time constant	0-32767	-	10ms	Power on again
F02.59	Average brake power detection	0-32767		s	Power on

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	filter time constant				again
F02.61	Dynamic brake action wait time	30-1000	100	ms	Effective immediately
F02.62	Dynamic brake action speed	0-100	50	%	Effective immediately
F02.64	Dynamic brake mode	0: Dynamic braking is invalid 1: Dynamic braking takes effect	0	%	Power on again
F02.69	Position deviation clear method	0: DI signal high level 1: DI signal rising edge	0	-	Effective immediately
F02.70	emergency shutdown mode	0: Motor stops freely 1: Control the motor to decelerate and stop according to the deceleration time set in F02.44	0	-	Effective immediately
F02.97	Ignore drive ban	0: CWL enable, CCWL enable 1: CWL enable, CCWL disable 2: CWL disable, CCWL enable 3: CWL disable, CCWL enable	3	-	Effective immediately
F02.98	Force drive enable ON	0: Driver enable ON controlled by other conditions 1: Force the driver to enable ON	0	-	Effective immediately

## F03 Digital input/output parameters

Parameter	Function	Range	Default	Unit	Effective method
F03.00	DI1 terminal function selection	<b>When set to a negative number, the terminal is inverse logic.</b> DI terminal functions are as follows: FunIN.1 : Servo enable FunIN.2: Fault and warn reset FunIN.3: Gain switching FunIN.10: Mode switch 1 FunIN.11: Mode switch 2 FunIN.12: Zero position fixed enable FunIN.13: Zero instruction FunIN.14: Forward overtravel switch FunIN.15: Reverse overtravel switch FunIN.16: Forward external torque limit FunIN.17: Reverse external torque limit FunIN.18: Forward jog FunIN.19: Reverse jog FunIN.24: Electronic gear selection FunIN.27: Command direction setting FunIN.31: home switch FunIN.32: home return enable FunIN.34: Emergency shutdown FunIN.35: Clear position deviation FunIN.37: Pulse command prohibited FunIN.41: Set the current position as the home FunIN.43: Internal speed selection 1 FunIN.44 : Internal speed selection 2 FunIN.46: Internal torque selection 1 FunIN.47: Internal torque selection 2 FunIN.49 : Proportional control	1	-	Effective immediately
F03.01	DI2 terminal function selection		2	-	Effective immediately
F03.02	DI3 terminal function selection		14	-	Effective immediately
F03.03	DI4 terminal function selection		15	-	Effective immediately
F03.04	DI5 terminal function selection		35	-	Effective immediately
F03.05	DI6 terminal function selection		0	-	Effective immediately
F03.06	DI7 terminal function selection		0	-	Effective immediately
F03.07	DI8 terminal function selection		0	-	Effective immediately
F03.08	DI9 terminal function selection		0	-	Effective immediately
F03.10	DI1 input filter time	0.1~100.0	2.0	ms	Effective immediately
F03.11	DI2 input filter time	0.1~100.0	2.0	ms	Effective immediately
F03.12	DI3 input filter time	0.1~100.0	2.0	ms	Effective immediately

F03.13	DI4 input filter time	0.1~100.0	2.0	ms	Effective immediately
F03.14	DI5 input filter time	0.1~100.0	2.0	ms	Effective immediately
F03.15	DI6 input filter time	0.1~100.0	2.0	ms	Effective immediately
F03.16	DI6 input filter time	0.1~100.0	2.0	ms	Effective immediately
F03.17	DI8 input filter time	0.1~100.0	2.0	ms	Effective immediately
F03.18	DI9 input filter time	0.1~100.0	2.0	ms	Effective immediately
F03.20	DI function is forced to be valid 1	Bit0: FunIN. 0 is meaningless Bit1: FunIN.1(SON) Bit2: FunIN.2(ALM RST) Bit3: FunIN.3(GAIN SEL) Bit4: FunIN. 4 is meaningless	0000	-	Effective immediately
F03.21	DI function is forced to be valid 2	00000~11111 (meaningless)	0000	-	Effective immediately
F03.22	DI function is forced to be valid 3	Bit0: FunIN.10(M1-SEL) Bit1: FunIN.11(M2-SEL) Bit2: FunIN.12(ZCLAMP) Bit3: FunIN.13(INHIBIT) Bit4: FunIN.14(P-OT)	0000	-	Effective immediately
F03.23	DI function is forced to be valid 4	Bit0: FunIN.15(N-OT) Bit1: FunIN.16(P-CL) Bit2: FunIN.17(N-CL) Bit3: FunIN.18 meaningless	0000	-	Effective immediately
F03.24	DI function is forced to be valid 5	00000~11111(meaningless)	0000	-	Effective immediately
F03.25	DI function is forced to be valid 6	Bit0: FunIN.25 meaningless Bit1: FunIN.26 meaningless Bit2: FunIN.27(DIR-SEL) Bit3: FunIN.28 meaningless Bit4: FunIN.29 meaningless	0000	-	Effective immediately
F03.26	DI function is forced to be valid 7	Bit0: FunIN.30 meaningless Bit1: FunIN.31(HomeSwitch) Bit2: FunIN.32(HomingStart) Bit3: FunIN.33 meaningless Bit4: FunIN.34(EmergencyStop)	0000	-	Effective immediately
F03.27	DI function is forced to be valid 8	Bit0: FunIN.35(ClrPosErr) Bit1: FunIN.36 meaningless Bit2: FunIN.37(PulseInhibit) Bit3: FunIN.38 meaningless Bit4: FunIN.39 meaningless	0000	-	Effective immediately
F03.28	DI function is forced to be valid 9	Bit0: FunIN.40 meaningless Bit1: FunIN.41 meaningless Bit2: FunIN.42 meaningless Bit3: FunIN.43(SP1) Bit4: FunIN.44(SP2)	0000	-	Effective immediately
F03.29	DI function is forced to be valid 10	Bit0: FunIN.45(SP3) Bit1: FunIN.46(TRQ1) Bit2: FunIN.47(TRQ2) Bit3: FunIN.48 meaningless Bit4: FunIN.49(PC)	0000	-	Effective immediately
F03.30	DI function is forced to be valid 11	00000~11111 (meaningless)	0000	-	Effective immediately
F03.31	DI function is forced to be valid 12	00000~11111 (meaningless)	0000	-	Effective immediately

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F03.32	DI function is forced to be valid 13	00000~11111 (meaningless)	0000	-	Effective immediately
F03.51	AS1 analog command filter time constant	0.20~50.00	0.2	ms	Power on again
F03.53	AS1 analog command dead zone	0~13000	0	mV	Power on again
F03.54	AS1 analog command zero offset compensation	-1500.0~1500.0	0.0	mV	Power on again
F03.56	AS2 analog command filter time constant	0.20~50.00	0.2	ms	Power on again
F03.58	AS2 analog command dead zone	0~13000	0	mV	Power on again
F03.59	AS2 analog command zero offset compensation	-1500.0~1500.0	0.0	mV	Power on again
F03.65	Analog speed command gain	10-3000	300	rpm/V	Effective immediately
F03.66	Analog torque command gain	1~300	30	%/V	Effective immediately
F03.70	DO1 terminal function selection	<b>When set to a negative number, the terminal is inverse logic.</b> DO terminal functions are as follows: FunOUT.1 : Servo ready output FunOUT.3: Zero speed FunOUT.6: Position completed FunOUT.7: Torque limit FunOUT.8: Speed limit FunOUT.9: Brake output FunOUT.10: warn output FunOUT.11: Fault output FunOUT.16: home return completed FunOUT.17: Electrical zero return output FunOUT.18: Torque arrival output FunOUT.19: Speed arrival output FunOUT.21: DB brake output FunOUT.26: Servo is running	0	-	Effective immediately
F03.71	DO2 terminal function selection		0	-	Effective immediately
F03.72	DO3 terminal function selection		0	-	Effective immediately
F03.73	DO4 terminal function selection		0	-	Effective immediately
F03.74	DO5 terminal function selection		0	-	Effective immediately
F03.80	DO output is forced to be valid	Bit0 : 1 (DO1 forces the output of Bit0 content from F03.82), 0 (DO1 output internal functional status) Bit1 : 1 (DO2 forces the output of Bit1 content from F03.82), 0 (DO2 output internal functional status) Bit2 : 1 (DO3 forces the output of Bit2 content from F03.82), 0 (DO3 output internal functional status) Bit3 : 1 (DO4 forces the output of Bit3 content from F03.82), 0 (DO4 output internal functional status) Bit4 : 1 (DO5 forces output of Bit4 content from F03.82), 0 (DO5 output internal functional status)	00000	-	Effective immediately
F03.82	DO output mandatory content	Bit0:1 (DO1 output 1), 0 (DO1 output 0) Bit1:1 (DO2 output 1), 0 (DO2 output 0) Bit2:1 (DO3 output 1), 0 (DO3 output 0) Bit3:1 (DO4 output 1), 0 (DO4 output 0) Bit4:1 (DO5 output 1), 0 (DO5 output 0)	00000	-	Effective immediately

## F05 Position control parameters

Parameter	Function	Range	Default	Unit	Effective method
F05.01	Pulse command input terminal selection	0: Low speed, single-ended input up to 200K, differential input up to 500K 1: High speed, differential input maximum frequency 1M	0	-	Power on again
F05.02	Number of position commands per motor rotation	1 ~1048576	10000	P/r	Power on again
F05.04	Position command exponential smoothing filter time	0~1000	0	ms	Power on again
F05.06	Position command linear filter time	0~256	0	ms	Power on again
F05.07	Electronic gear ratio 1 numerator	1 ~1073741824	1	-	Power on again
F05.09	Electronic gear ratio 1 denominator	1 ~1073741824	1	-	Power on again
F05.11	Electronic gear ratio 2 numerator	1 ~1073741824	1	-	Power on again
F05.13	Electronic gear ratio 2 denominator	1 ~1073741824	1	-	Power on again
F05.15	Command pulse input method	0: Pulse and direction 1: Forward and reverse pulse 2: Orthogonal pulse	0	-	Power on again
F05.17	Number of encoder pulse output lines	1 ~ 16384	2500	-	Power on again
F05.21	Position completion range	0~32767	10	P	Effective immediately
F05.22	Position proximity range	0~32767	500	P	Effective immediately
F05.23	Position completion return difference	0~32767	5	p	Effective immediately
F05.24	Position proximity return difference	0~32767	50	p	Effective immediately
F05.28	Home position delay	0~3000	50	ms	Effective immediately
F05.29	Home return completion signal delay	1~3000	100	ms	Effective immediately
F05.30	Home return enable mode	1: High level triggering of FunIN.32 signal input by DI 2: Triggered by the rising edge of FunIN.32 signal input from DI 3: Power on automatic execution	1	-	Effective immediately
F05.31	Home return action mode	0-37	1	-	Effective immediately
F05.32	High-speed search home switch signal speed	1~3000	500	r/min	Effective immediately
F05.33	Low speed search home switch signal speed	1~3000	50	r/min	Effective immediately
F05.34	Search the acceleration and deceleration time of the home	0~30000	0	ms	Effective immediately
F05.36	Offset of mechanical home	-1073741824 ~ 1073741824	0	pulse	Effective immediately
F05.38	A B pulse output selection	0: Encoder frequency division output	0	-	Power on again

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		1: Pulse command synchronous output			
F05.41	Z pulse output polarity selection	0: Positive polarity 1: Negative polarity	0	-	Power on again
F05.42	Z pulse output width selection	0: 1 times the pulse width of A 1: 4 times the pulse width of A	0	-	Power on again
F05.70	Command pulse input signal filter	0-31	0	-	Power on again
F05.72	Command pulse input direction signal polarity	0: SIGN positive 1: SIGN Reverse	0	-	Effective immediately
F05.73	Command pulse input signal logic	0: PULS positive, SIGN positive 1: PULS reverse, SIGN forward 2: PULS forward, SIGN reverse 3: PULS reverse, SIGN reverse	0	-	Power on again
F05.75	Command pulse input signal filter mode	0: Simultaneous filtering of PULS and SIGN signals 1: Only filter PULS signal, do not filter SIGN signal	0	-	Power on again

## F06 Speed control parameters

Parameter	Function	Range	Default	Unit	Effective method
F06.04	JOG speed setting value	0~7500	100	rpm	Effective immediately
F06.05	Speed command ramp acceleration time	0~30000	0	ms	Effective immediately
F06.06	Speed command ramp deceleration time	0~30000	0	ms	Effective immediately
F06.07	Maximum speed limit	0~7500	5000	rpm	Effective immediately
F06.15	Zero speed detection threshold	0~1000	10	rpm	Effective immediately
F06.18	Speed reaches signal threshold	-5000~5000	500	rpm	Effective immediately
F06.20	Zero speed detection hysteresis	0-1000	30	rpm	Effective immediately
F06.26	Speed arrival hysteresis	0-5000	30	rpm	Effective immediately
F06.27	Speed reaches polarity	0: F06.18>0 Speed detection regardless of direction 1: F06.18>0 only detects positive speed, F06.18<0 only detects negative speed	0	-	Effective immediately
F06.59	Speed command source	0: Analog speed command 1: Internal speed command 2: Analog speed command+internal speed command	0	-	Effective immediately
F06.60	Analog speed command direction	0: Analog positive voltage ->forward speed command, analog negative voltage ->reverse speed command 1: Analog positive voltage ->reverse speed command, analog negative voltage ->forward speed command	0	-	Effective immediately
F06.61	Analog speed command polarity	0: Both positive and negative analog voltages are valid 1: Only analog positive voltage is valid, negative voltage forces the speed command to be 0	0	-	Effective immediately



		2: Only analog negative voltage is valid, positive voltage forces the speed command to be 0			
F06.66	Speed detection filter time constant	0.01~50.00	2.00	ms	Effective immediately
F06.80	Internal speed 1	-5000~5000	0	rpm	Effective immediately
F06.81	Internal speed 2	-5000~5000	0	rpm	Effective immediately
F06.82	Internal speed 3	-5000~5000	0	rpm	Effective immediately
F06.83	Internal speed 4	-5000~5000	0	rpm	Effective immediately
F06.90	Zero fixed mode selection	0: The motor position is fixed at the moment when the function is turned on, and internal position control is connected at this time 1: When the function is turned on, the speed command is forced to be 0, but the internal control is still speed control	0	-	Effective immediately

## F07 Torque control parameters

Parameter	Function	Range	Default	Unit	Effective method
F07.05	Torque command filter time constant	0.01~50.00	1.00	ms	Effective immediately
F07.06	2nd torque command filter time constant	0.01~50.00	1.00	ms	Effective immediately
F07.07	Torque limit source	0: Internal/External Restrictions (F07.09~F07.12) 1: Analog limit 2: Internal torque command as a limitation	0	-	Effective immediately
F07.09	Internal forward torque limit	0-500	300	%	Effective immediately
F07.10	Internal reverse torque limit	-500~0	-300	%	Effective immediately
F07.11	External forward torque limit	0-500	100	%	Effective immediately
F07.12	External reverse torque limit	-500~0	-1.00	%	Effective immediately
F07.17	Speed limit source selection	0: Basic speed limit F07.62 1: Basic speed limit+analog speed command limit 2: Basic speed limit+internal speed command limit	0	-	Effective immediately
F07.59	Torque command source	0: Analog torque command 1: Internal torque command 2: Analog torque command+internal torque command	0	-	Effective immediately
F07.60	Analog torque command direction	0: Analog positive voltage is the forward torque command, analog negative voltage is the reverse torque command 1: Analog positive voltage is the	0	-	Effective immediately

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		reverse torque command, and analog negative voltage is the forward torque command			
F07.61	Analog torque command polarity	0: Both positive and negative analog voltages are valid 1: Only analog positive voltage is valid, negative voltage forces torque command to be 0 2: Only analog negative voltage is valid, positive voltage forces torque command to be 0	0	-	Effective immediately
F07.62	Speed limit during torque control	0 ~5000	3000	rpm	Effective immediately
F07.80	Internal torque 1	-300~300	0	%	Effective immediately
F07.81	Internal torque 2	-300~300	0	%	Effective immediately
F07.82	Internal torque 3	-300~300	0	%	Effective immediately
F07.83	Internal torque 4	-300~300	0	%	Effective immediately
F07.84	Torque reaches signal threshold	-300~300	0	%	Effective immediately
F07.85	Torque arrival return difference	0~300	5	%	Effective immediately
F07.86	Torque reaches polarity	0: F07.84>0 Speed detection regardless of direction 1: F07.84>0 only detects positive torque, F07.84<0 only detects negative torque	0	-	Effective immediately

## F08 Gain related parameters

Parameter	Function	Range	Default	Unit	Effective method
F08.00	Speed loop gain	1~3000	40	Hz	Effective immediately
F08.01	Speed loop integration time constant	1.0~1000.0	20.0	ms	Effective immediately
F08.02	Position loop gain	1~1000	40	1/s	Effective immediately
F08.03	2nd speed loop gain	1~3000	40	Hz	Effective immediately
F08.04	2nd speed loop integration time constant	1.0~1000.0	20.0	ms	Effective immediately
F08.05	2nd position loop gain	1~1000	40	1/s	Effective immediately
F08.06	2nd torque filter frequency	100-5000	5000	Hz	Effective immediately
F08.07	2nd torque filter quality factor	1~100	50	-	Effective immediately
F08.09	Gain switch selection	0: Fixed 1 <sup>st</sup> gain	0	-	Effective

		1: Fixed 2 <sup>nd</sup> gain 2: Determined by the FunIN.3 signal level input from DI 3: Command pulse frequency control 4: Pulse deviation control 5: Motor speed control			immediately
F08.10	Gain switch delay time	0~3000	5	ms	Effective immediately
F08.11	Gain switch level	0~32767	100	-	Effective immediately
F08.12	Gain switch time lag	0~32767	5	-	Effective immediately
F08.13	Position gain switch time	0~3000	5	ms	Effective immediately
F08.15	Load inertia ratio	0.0-200.0	1.0	times	Power on again
F08.18	Speed feedforward filter time constant	0-100	0	%	Power on again
F08.19	Speed feedforward gain	0-100	0	%	Power on again
F08.24	Speed loop PDFF control coefficient	0~100	100	%	Effective immediately
F08.38	speed observer gain	10~1000	120	Hz	Effective immediately
F08.39	Speed observer compensation coefficient	0~1000	150	%	Effective immediately
F08.40	Speed observer feedback speed source	0-1	0	-	Effective immediately
F08.42	Model tracking control switch	0: Invalid model tracking 1: Suitable for rigid loads 2: Reserved 3: Universal type	0	-	Effective immediately
F08.43	Model tracking control gain	10-2000	40	Hz	Effective immediately
F08.44	Model tracking control attenuation coefficient	50-200	100	-	Effective immediately
F08.46	Model tracking control speed compensation coefficient	0~100	100	%	Effective immediately
F08.47	Model tracking control forward deviation compensation coefficient	0-1000	100	%	Effective immediately
F08.48	Model tracking control reverse deviation compensation coefficient	0-1000	100	%	Effective immediately
F08.49	Model tracking control speed loop gain	1-3000	40	Hz	Effective immediately
F08.50	Model tracking control speed loop integral time constant	1.0-1000.0	20.0	ms	Effective immediately
F08.51	Model tracking control acceleration feedforward filter time	0.10~50.00	0.50	ms	Effective immediately
F08.52	Medium frequency vibration suppression 1 switch	0: Disable 1: Manually set the vibration frequency point 2: Automatic detection of vibration point frequency	0	-	Effective immediately

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F08.53	Medium frequency vibration suppression 1 vibration frequency	50~2000	100	Hz	Effective immediately
F08.54	Medium frequency vibration suppression 1 damp coefficient	0 ~300	150	%	Effective immediately
F08.56	Medium frequency vibration suppression 1 compensation coefficient	1 ~1000	100	%	Effective immediately
F08.58	Medium frequency vibration suppression 2 switch	0: Disable 1: Manually set the vibration frequency point 2: Automatic detection of vibration point frequency	0	-	Effective immediately
F08.59	Medium frequency vibration suppression 2 vibration frequency	50~2000	100	Hz	Effective immediately
F08.60	Medium frequency vibration suppression 2 damp coefficient	0 ~300	150	%	Effective immediately
F08.61	Medium frequency vibration suppression 2 compensation coefficient	1 ~1000	100	%	Effective immediately

## F09 Automatically adjust parameters

Parameter	Function	Range	Default	Unit	Effective method
F09.01	Rigidity level selection	0-22	0	-	Effective immediately
F09.05	Inertia estimation mode	0: Disable inertia estimation 1: Reserved for manufacturer's use 2: Online inference mode	0	-	Effective immediately
F09.06	Inertia estimation gain level	0: Low gain 1: Medium gain 2: High gain	0	-	Effective immediately
F09.12	1st resonance notch filter frequency	50-5000	5000	Hz	Effective immediately
F09.13	1st resonance notch filter quality factor	1-100	7	-	Effective immediately
F09.14	1st resonance notch filter depth	0-60	0	dB	Effective immediately
F09.15	2nd resonance notch filter frequency	50-5000	5000	Hz	Effective immediately
F09.16	2nd resonance notch filter quality factor	1-100	7	-	Effective immediately
F09.17	2nd resonance notch filter depth	0-60	0	dB	Effective immediately
F09.18	3rd resonance notch filter frequency	50-5000	5000	Hz	Effective immediately
F09.19	3rd resonance notch filter quality factor	1-100	7	-	Effective immediately
F09.20	3rd resonance notch filter depth	0-60	0	dB	Effective immediately
F09.21	4th resonance notch filter frequency	50-5000	5000	Hz	Effective immediately

F09.22	The 4th resonance notch filter quality factor	1-100	7	-	Effective immediately
F09.23	4th Resonance notch filter Depth	0-60	0	dB	Effective immediately
F09.33	Friction Compensated Disturbance Observer Switch	0: Friction compensation disturbance observer closed 1: Friction compensation disturbance observer activated	0	-	Effective immediately
F09.34	Friction Compensated Disturbance Observer Gain	10~1000	100	-	Effective immediately
F09.35	Friction compensation disturbance observer compensation coefficient	0-1000	0	-	Effective immediately
F09.36	Friction Compensation Disturbance Observer Torque Coefficient	0-1200	400	Hz	Effective immediately
F09.38	End vibration suppression period	0~1000	0	ms	Effective immediately
F09.39	End vibration suppression compensation coefficient	1.0-100.0	1.0	-	Effective immediately
F09.44	End vibration detection filter frequency	10~2000	200	Hz	Effective immediately
F09.46	End vibration suppression mode	0: Disable vibration suppression function 1: Automatically detect vibration frequency, suitable for situations where inertia changes little 2: Automatically detect vibration frequency, suitable for situations where inertia always changes 3: Manually set the vibration frequency, suitable for situations where the vibration frequency is known	0	-	Effective immediately
F09.47	Minimum detection amplitude of end vibration	3~32767	5	P	Effective immediately
F09.55	Vibration detection alarm time	0 ~100	0	s	Effective immediately

## FOA Fault/protection parameters

Parameter	Function	Range	Default	Unit	Effective method
FOA.04	Overload protection detection gain	0-500	117	%	Effective immediately
FOA.08	Speeding detection percentage	0-400	140	%	Effective immediately
FOA.10	Excessive position deviation detection threshold	0.00-327.67	4.00	lock up	Effective immediately
FOA.25	Speed feedback display value filter time parameter	0.1~1000.0	80.0	ms	Power on again
FOA.36	Encoder multi-turn overflow fault selection	0: Detecting encoder multi turn overflow fault 1: Shielding encoder multiple loop overflow fault	1	-	Power on again

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FOA.50	Forward torque overload alarm threshold	0-300	300	%	Power on again
FOA.51	Reverse torque overload alarm threshold	-300 - 0	-300	%	Power on again
FOA.52	Torque overload alarm duration threshold	0-10000	0	10ms	Power on again
FOA.60	Protection detection program run cycle	5-100	5	ms	Power on again
FOA.61	Speed feedback monitoring value filter time parameter	0.0-300.0	2.0	ms	Power on again
FOA.62	Speed read value filter time parameter	0.1-300.0	0.1	ms	Power on again
FOA.63	Pulse command frequency detection filter time constant	0.1-1000.0	4.0	ms	Effective immediately
FOA.64	Current feedback monitor value filter time constant	1-3000	24	ms	Effective immediately
FOA.65	Torque feedback monitor value filter time constant	1-3000	24	ms	Effective immediately
FOA.66	Brake power feedback pre-detection filter time constant	1-3000	40	ms	Effective immediately
FOA.67	Average load rate feedback detection filter time constant	1-3000	30	ms	Effective immediately
FOA.68	Peak detection data statistics time	1-30	10	s	Power on again
FOA.70	Motor static speed detection threshold	0-1000	5	rpm	Power on again
FOA.72	Switch position control mode speed detection threshold	0-3000	15	rpm	Power on again
FOA.75	UVW phase loss detection enable switch	0: Do not detect phase loss 1: Detecting phase loss	0		Power on again

## FOb Monitored parameters

Parameter	Function	Range	Default	Unit	Effective method
FOB.00	Motor actual speed	-9999~9999	0	rmp	Display
FOB.01	Speed command	-9999~9999	0	rmp	Display
FOB.02	Internal torque command	-300-300	0	%	Display
FOB.03	Input signal monitor DI	0~65535	0	-	Display
FOB.05	Output signal monitor DO	0~65535	0	-	Display
FOB.07	Absolute position counter	-2147483648~2147483647	0	P	Display
FOB.09	Mechanical angle	0~65535	0	°	Display
FOB.12	Average load value	0-800	0	%	Display
FOB.13	Input instruction counter	-21474836482~147483647	0	P	Display
FOB.15	Encoder position deviation counter	-21474836482~147483647	0	P	Display
FOB.17	Feedback pulse counter	-21474836482~147483647	0	P	Display
FOB.21	Analog channel 1 voltage sampling value	- 10.00~10.00	0	V	Display
FOB.22	Analog channel 2 voltage sampling value	- 10.00~10.00	0	V	Display
FOB.24	Phase current effective value	0.0~6553.5	0	A	Display
FOB.26	Bus voltage value	0.0~6553.5	0	A	Display
FOB.27	Module humidity value	-20~200	0	°C	Display
FOB.33	Fault record	0: Current fault 1: Last fault 2: Last 2 fault ... 7: Last 7 fault	0	-	Effective immediately
FOB.34	Selected number of fault codes	~	0	-	Display
FOB.37	Motor speed at selected fault	-32767~32767	0	rpm	Display

FOB.38	Motor U-phase current at selected fault	-32767~32767	0	A	Display
FOB.39	Motor V-phase current at selected fault	-32767~32767	0	A	Display
FOB.40	Bus voltage at selected fault	0.0~6553.5	0	V	Display
FOB.41	Input terminal status at selected fault	0~65535	0	-	Display
FOB.43	Output terminal status at selected fault	0~65535	0	-	Display
FOB.53	Position deviation counter	-2147483648~2147483647	0	P	Display
FOB.55	Motor actual speed	-2147483648~2147483647	0	rpm	Display
FOB.58	Mechanical absolute position	-2147483648~2147483647	0	p	Display
FOB.60	Mechanical absolute position	-2147483648~2147483647	0	P	Display
FOB.64	Real-time input instruction counter	-2147483648~2147483647	0	-	Display
FOB.70	Absolute encoder revolutions	0~2147483647	0	P	Display
FOB.71	Position within 1 revolution of absolute encoder	0~2147483647	0	P	Display
FOB.77	Absolute value position	-2147483648~2147483647	0	P	Display
FOB.79	Absolute value position	-2147483648~2147483647	0	P	Display
FOB.87	Current absolute position	0~65535	0	P	Display
FOB.90	Firmware version date	-	-	-	Display
FOB.91	Encoder error count	0~65535	0	P	Display
FOB.92	Power board error count	0~65535	0	P	Display
FOB.98	U phase current sampling value	0 ~FFFF	0	-	Display
FOB.99	W phase current sampling value	0 ~FFFF	0	-	Display

## FOC Communication parameters

Parameter	Function	Range	Default	Unit	Effective method
FOC.00	Drive device address	1-32	1	-	Power on again
FOC.02	Modbus communication baud rate setting	1: 4800 2: 9600 3: 19200 4: 38400 5: 57600 6: 115200	2	-	Power on again
FOC.03	Modbus communication wave mode	0-2:Reserved 3: RTU, data length 8, no checksum, stop bit 1 4: RTU, data length 8, even parity check, stop bit 1 5: RTU, data length 8, odd parity, stop bit 1	3	-	Power on again

## F0d Auxiliary function parameters

Parameter	Function	Range	Default	Unit	Effective method
F0D.10	Analog channel zero adjustment	0: No action 1: Trigger analog channel AS1 to zero 2: Trigger analog channel AS2 to zero	0	-	Effective immediately
F0D.11	Speed 100% torque JOG run	0: No action 1: Trigger the motor to run at 100% rated torque at the set speed	-	-	Effective immediately
F0D.12	Speed 300% torque JOG run	0: No action 1: Trigger the motor to run at 300% rated torque at the set speed	-	-	Effective immediately
F0D.13	Speed test run	0: No action 1: Trigger the motor to switch back and forth between positive and	0	-	Effective immediately

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		negative rated speeds for operation 2: Trigger the motor to switch operation according to the internal set speed queue 1 3: Trigger the motor to switch operation according to the internal set speed queue 2			
F0D.20	Absolute encoder operation	0: No action 1: Trigger encoder fault reset operation 2: Trigger encoder fault reset and multi turn zeroing operation 3: Trigger parameter writing to encoder EEPROM operation	0	-	Effective immediately
F0D.24	Open loop run	0: No action 1: Trigger open-loop operation 2: Trigger open-loop test	0	-	Effective immediately
F0D.25	Encoder operates on zero	0: No action 1: Trigger encoder to zero operation	0	-	Effective immediately
F0D.29	Power board self-test	0: No action 1: Trigger power board self-test	0	-	Effective immediately



# CHAPTER 5 DETAILED EXPLANATION OF GENERAL IO FUNCTIONS

## 5.1 Detailed explanation of universal input function

Signal name	Symbol	Applicable mode	Function code	Instructions for use
Servo enable	S - ON	ALL	FunIN.1	To reset a resettable fault, you need to turn off the servo enable signal before use this function.
Fault and warn reset	ALM - RST	ALL	FunIN.2	<ul style="list-style-type: none"> <li>◆ The driver will process it internally according to edge validity.</li> <li>◆ To reset a resettable fault, you need to turn off the servo enable signal (S - ON is set to OFF) before using this function.</li> <li>◆ Depending on the alarm type, the servo can continue to work after some alarms are reset.</li> </ul>
Gain switch	GAIN - SEL	ALL	FunIN.3	<p>When F08.09=1:</p> <ul style="list-style-type: none"> <li>◆ Invalid - speed control loop is PI control. ◆ valid - speed control loop is P control.</li> </ul> <p>When F08.09=2:</p> <ul style="list-style-type: none"> <li>◆ Invalid - fixed to the first group of gains. ◆ valid - fixed to the second set of gains.</li> </ul>
Mode switch 1	M1 - SEL	ALL	FunIN.10	Accord to the selected control mode (3, 4, 5), switch between speed, position and torque.
Mode switch 2	M2 - SEL	ALL	FunIN.11	Accord to the selected control mode (6), switch between speed, position and torque.
Zero fixed enable	ZCLAMP	ALL	FunIN.12	<ul style="list-style-type: none"> <li>◆ Valid - enable the zero position fix function.</li> <li>◆ Invalid - and disabled zero position fix function.</li> </ul>
zero instruction	INHIBIT		FunIN.13	<ul style="list-style-type: none"> <li>◆ Valid - command pulse input prohibited.</li> <li>◆ Invalid - command pulse input is allowed.</li> </ul>
Forward overtravel switch	CCWL	ALL	FunIN.14	<p>When the mechanical movement exceeds the movable range, the overtravel prevention function is entered:</p> <ul style="list-style-type: none"> <li>◆ Valid - reverse drive is prohibited.</li> </ul>
Reverse overtravel switch	CWL	ALL	FunIN.15	<ul style="list-style-type: none"> <li>◆ Invalid - allows reverse drive.</li> <li>◆ Valid mode: level</li> </ul>
Positive external torque limit	P - CL	ALL	FunIN.16	Accord to the selection of F07.07, the torque limit source is switched.
Anti-external torque limit	N - CL	ALL	FunIN.17	Accord to the selection of F07.07, the torque limit source is switched.
Forward jog	JOGCMD+	ALL	FunIN.18	<ul style="list-style-type: none"> <li>◆ Valid - Input accord to the given command.</li> <li>◆ Invalid - Run command stop input.</li> </ul>
Negative jog	JOGCMD-	ALL	FunIN.19	<ul style="list-style-type: none"> <li>◆ Valid - input in reverse direction according to the given command.</li> <li>◆ Invalid - Run command stop input..</li> </ul>
Electronic gear selection	GEAR_SEL	ALL	FunIN.24	<ul style="list-style-type: none"> <li>◆ Invalid - electronic gear ratio 1.</li> <li>◆ Valid - electronic gear ratio 2.</li> </ul>
Command direction setting	DIRS	ALL	FunIN.27	<ul style="list-style-type: none"> <li>◆ Invalid, the actual command direction is the same as the set position command direction.</li> <li>◆ Valid, the actual command direction is opposite to the set command direction.</li> </ul>
Home switch	HomeSwitch	ALL	FunIN.31	<ul style="list-style-type: none"> <li>◆ It is recommended to assign it to the fast DI terminal. If set to 2 (valid on rise edge), the driver will be forced to change to 1 (valid on high level) internally. If set to 3 (valid on falling edge), the drive will be forced to change to 0 (valid on low level) internally. If it is set to 4 (valid on both rise and falling edges), the driver will be forced to change to 0 internally (valid on low level)</li> </ul>
Home return enabled	HomingStart	ALL	FunIN.32	<ul style="list-style-type: none"> <li>◆ Invalid - prohibition.</li> <li>◆ Valid - enabled.</li> </ul>
Emergency	Emergency	ALL	FunIN.34	<ul style="list-style-type: none"> <li>◆ Valid - position lock after zero speed stop.</li> </ul>

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shutdown	Stop			◆ Invalid - has no impact on the current running status.
Clear position deviation	V_LmtSel	P	FunIN.36	◆ Valid - position deviation clear. ◆ Invalid - position deviation is not cleared. ◆ This DI function is recommended to be configured on the DI8 or DI9 terminal.
Internal speed limit source	V_LmtSel	S	FunIN.36	◆ Invalid - F07.19 is used as the internal forward/reverse speed limit value. ◆ Valid - F07.20 is used as the internal forward/reverse speed limit value.
Pulse command prohibited	PulseInhibit	P	FunIN.37	In position control mode, when the position command source is pulse command (F05.00=0): ◆ Invalid - can respond to pulse command. ◆ Valid - not responding to pulse command.
Set the current position as the home	HomeRecord	P	FunIN.41	◆ invalid - not trigger. ◆ Valid - trigger with current position as home.
Internal speed selection	SP1	S	FunIN.43	When speed control and speed limit, select internal speed ◆ 00: Internal speed 1 (F06.80) ◆ 01: Internal speed 2 (F06.82)
Internal speed selection	SP2	S	FunIN.44	◆ 10: Internal speed 3 (F06.82) ◆ 11: Internal speed 4 (F06.83)
Internal torque selection	TRQ1	T	FunIN.46	For torque control and torque limitation, select internal torque ◆ 00: Internal torque 1 (F07.80) ◆ 01: Internal torque 2 (F07.81)
Internal torque selection	TRQ2	T	FunIN.47	◆ 10: Internal torque 3 (F07.82) ◆ 11: Internal torque 4 (F07.83)
Proportional control	PC	S	FunIN.49	◆ Valid - speed loop P control ◆ Invalid - speed loop PI control

## 5.2 Detailed explanation of general output function

Signal name	Symbol	mode	Function code	Instructions for use
Servo is ready to output	S - RDY	ALL	FunOUT.1	The servo state is ready and can receive the S - ON valid signal: ◆ Valid - servo is ready. ◆ Invalid - servo is not ready.
Motor rotation output	TGON	ALL	FunOUT.2	◆ Invalid - the absolute value of the motor speed after filter is less than the setting value of function code F06.16. ◆ Valid - the absolute value of motor speed after filter reaches the setting value of function code F06.16.
zero speed	ZERO	ALL	FunOUT.3	◆ Invalid - When the difference between the motor's speed feedback and the given value is greater than the setting value of function code F06.15. ◆ Valid - when the difference between the motor's speed feedback and the given value is not greater than the setting value of function code F06.15.
consistent speed	V - CMP	ALL	FunOUT.4	During speed control, it is valid when the absolute value of the difference between the servo motor speed and the speed command is less than the F06.17 speed deviation setting value.
Positioning completed	COIN	P	FunOUT.5	During position control, the position deviation pulse is valid when it reaches the positioning completion range F05.21.
Positioning close to	NEAR	P	FunOUT.6	During position control, the position deviation pulse is effective when it reaches the position approach signal amplitude F05.22 setting value.
Torque limit	C - LT	T	FunOUT.7	Confirmation signal of torque limit: ◆ Valid - motor torque is limited. ◆ Invalid - motor torque is not limited.
RPM limit	v - LT	T	FunOUT.8	Confirmation signal of limited speed during torque control: ◆ Valid - motor speed is limited. ◆ Invalid - motor speed is not limited.
Brake output	BK	P	FunOUT.9	◆ Valid - close and release the brake. ◆ Invalid - start brake.
warning output	WARN	ALL	FunOUT.10	The warn output signal is valid. (turn on)
fault output	ALM	ALL	FunOUT.11	The status is valid when a fault is detected. (turn on when normal, disconnected when fault occurs)

Home return completed	HomeAttain	ALL	FunOUT.16	<ul style="list-style-type: none"> <li>◆ Valid - home return to zero.</li> <li>◆ Invalid - home does not return to zero.</li> </ul>
Electrical zero return output	ElecHome Attain	P	FunOUT.17	<ul style="list-style-type: none"> <li>◆ Valid - electrical home return to zero.</li> <li>◆ Invalid - electrical home does not return to zero.</li> </ul>
Torque reaches output	ToqReach	T	FunOUT.18	<ul style="list-style-type: none"> <li>◆ - The absolute value of effective torque reaches the set value.</li> <li>◆ - The absolute value of invalid torque is less than the set value.</li> </ul>
Speed reaches output	V-Arr	ALL	FunOUT.19	<ul style="list-style-type: none"> <li>◆ Valid - speed feedback reaches the set value.</li> <li>◆ Invalid - speed feedback does not reach the set value.</li> </ul>
DB brake output	DB	P.S.	FunOUT.21	<ul style="list-style-type: none"> <li>◆ Valid - dynamic brake relay is disconnected.</li> <li>◆ Invalid - dynamic brake relay is activated.</li> </ul>
Servo is running	RUN		FunOUT.26	<ul style="list-style-type: none"> <li>◆ Valid - servo enable ON</li> <li>◆ Invalid - servo enable OFF</li> </ul>

# CHAPTER 6 LIST OF FAULTS AND WARN

## 6.1 Category 1 (NO.1) fault table

Category 1 (NO.1) non-reset fault table

Show	Fault name	Fault type	Can it be reset?
Er.101	The servo internal parameters are abnormal.	NO.1	no
Er.102	Programmable logic fault	NO.1	no
Er.103	Programmable logic device check error	NO.1	no
Er.108	Parameter storage failure	NO.1	no
Er.109	Software security check error	NO.1	no
Er.120	Product match failure	NO.1	no
Er.124	Auxiliary encoder setting error	NO.1	no
Er.126	Power board communication failure	NO.1	no
Er.136	The data verification in the motor ROM is incorrect or the parameters are not stored.	NO.1	no
Er.201	Overcurrent 2	NO.1	no
Er.611	Over torque	NO.1	no
E r.627	Dynamic brake failure	NO.1	no
E r.653	Module temperature alarm	NO.1	no
Er.735	Encoder multi-turn count overflow	NO.1	no
Er.739	Encoder recognition error	NO.1	no
Er.740	Encoder interference	NO.1	no
Er.741	Pulse encoder signal error	NO.1	no
E r.742	Pulse encoder counting error	NO.1	no
E r.743	Pulse encoder Z signal lost	NO.1	no
Er.744	Encoder overspeed	NO.1	no
E r.745	Encoder overheating	NO.1	no
E r.800	Current sampling error	NO.1	no
Er.A33	Encoder data abnormality	NO.1	no
Er.A34	Encoder feedback verification exception	NO.1	no
E r.A35	Encoder frame data error	NO.1	no
Er.A36	Encoder EEPROM read error	NO.1	no
Er.207	D/Q axis current overflow fault	NO.1	yes
Er.400	Main circuit voltage overvoltage	NO.1	yes
Er.410	Main circuit voltage undervoltage	NO.1	yes
Er.500	Over speed	NO.1	yes
Er.610	Drive overload	NO.1	yes
Er.620	Motor overload	NO.1	yes
Er.650	Radiator overheated	NO.1	yes
Er.B00	Position deviation is too large	NO.1	yes
Er.B01	Position error overflow	NO.1	yes

## 6.2 Category 2 (NO.2) fault table

Show	Fault name	Fault type	Can it be reset?
Er.420	Main circuit electrical phase loss	NO.2	yes
Er.430	Control voltage undervoltage	NO.2	yes
Er.660	Excessive vibration	NO.2	yes
Er.731	Encoder battery failure	NO.2	yes
Er.939	Motor power cable is broken	NO.2	yes

## 6.3 Category 3 (NO.3) warn table

Show	Fault name	Fault type	Can it be reset?
Er.603	The signal for returning to zero and find the reference point exceeds the limit.	NO.3	yes
Er.604	Return to zero point Z signal exceeds the limit	NO.3	yes
Er.652	Module temperature warn	NO.3	yes
Er.730	Encoder battery warn	NO.3	yes
Er.920	Brake resistor overload	NO.3	yes
Er.924	Drain pipe overtemperature warn	NO.3	yes
Er.950	Forward overtravel warn	NO.3	yes
Er.952	Reverse overtravel warn	NO.3	yes
Er.954	Driver disabled exception	NO.3	yes