

AC SERVO SYSTEM FOR MOTION CONTROL INDUSTRY

HSD-E6-20/30



AUCTECH Automation

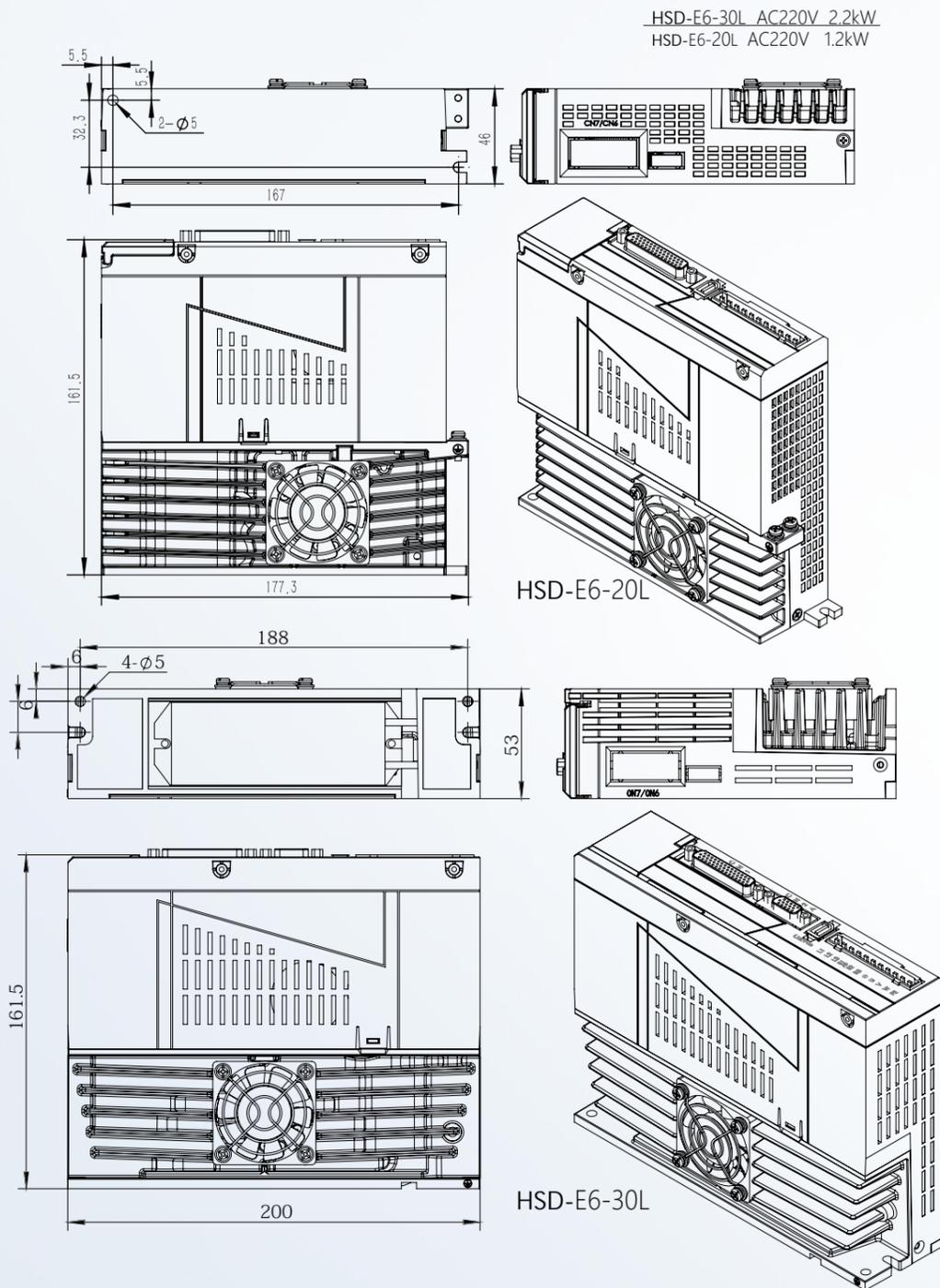
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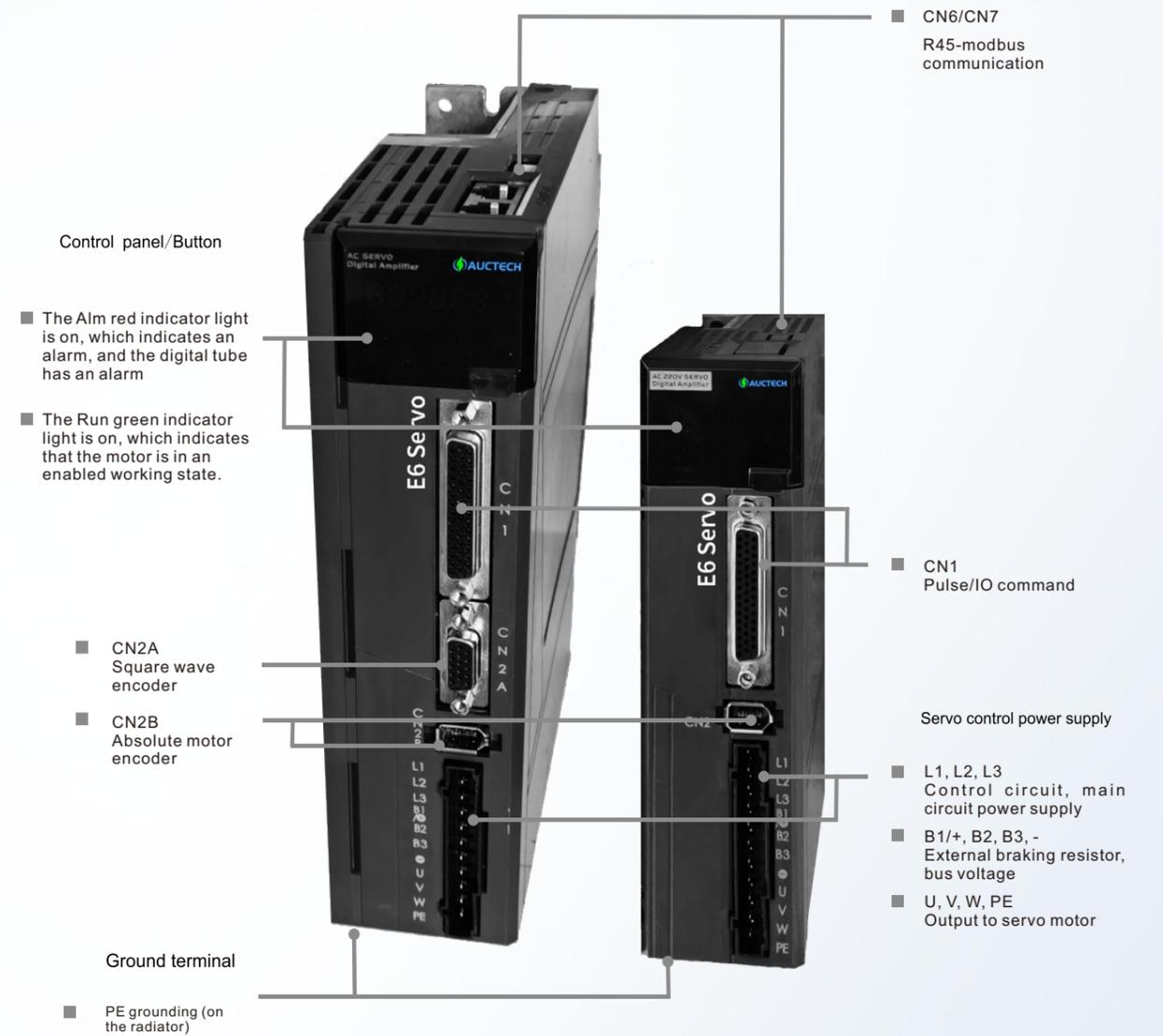
Model Selection

The HSD-E6 full series servo is widely used in economic servo systems for automated transmission for packaging, conveying and shearing and so on, with characteristics such as small size, low power consumption, stability and reliability.

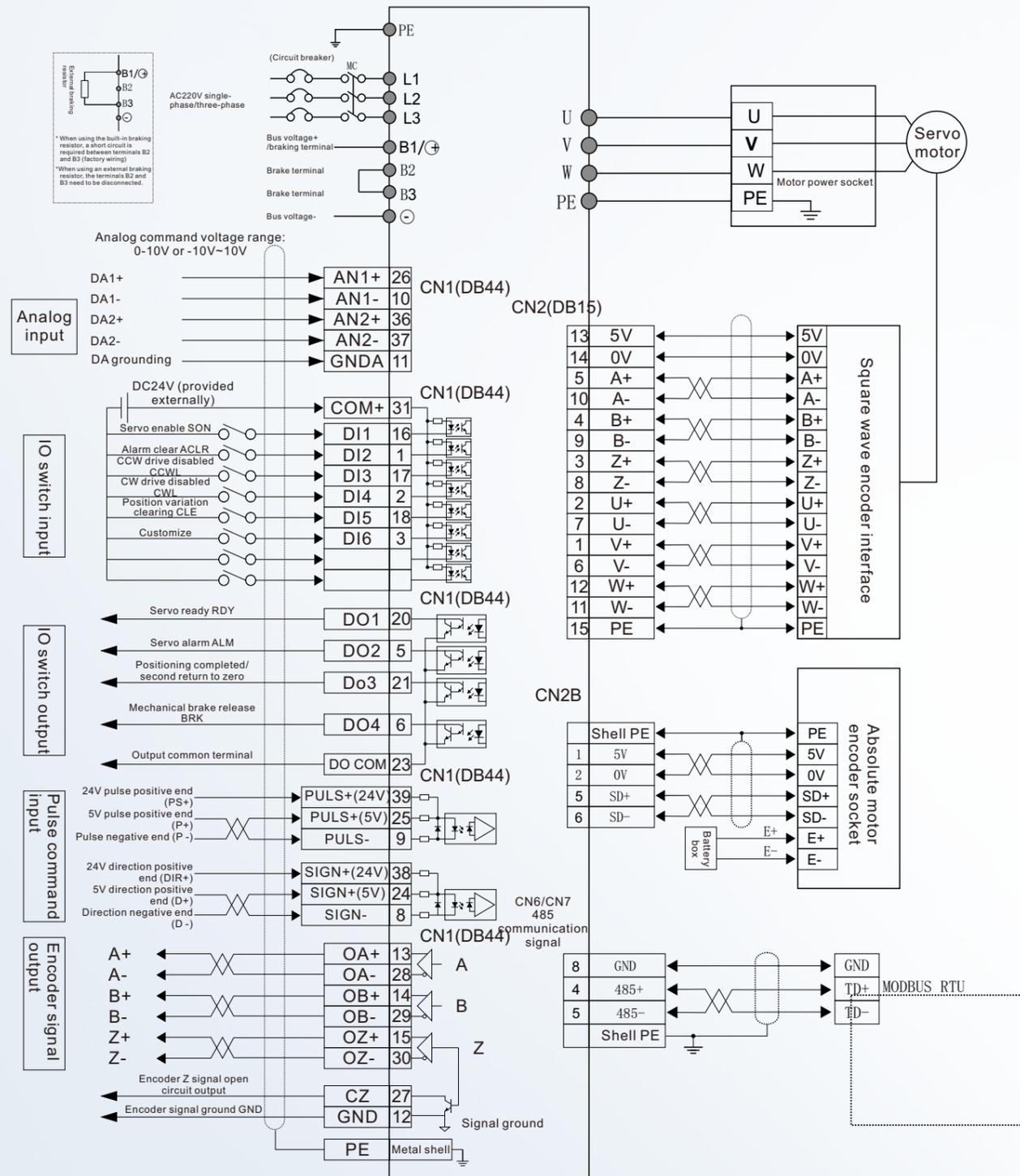


Interface Definition

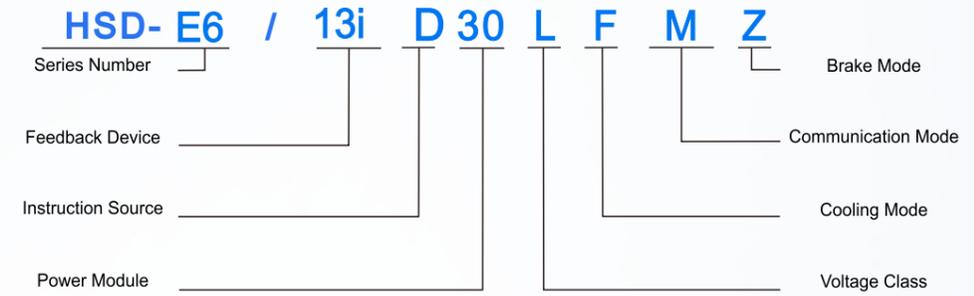
One-board design	Overheat/overvoltage/overload protection
R45-Modbus communication	I/O customization
Separate the heat dissipation duct	Vibration suppression
Low power consumption	Small size and economic type



Connection Diagram



Model Selection



Series Number

Classified by Features of Product and Profession

HSD-DO series: Standard Universal Servo

HSD-C7 series: Cutting precision servo

HSD-M7 series: Synchronous High-speed Spindle Servo

HSD-A7 series: Inductive Asynchronous Servo

HSD-F7 series: Common Bus Multi-axis Servo

HSD-E7 series: Economy specific servo

HSD-G7 series: Special servo for grinding

HSD-C8 series: Precision cutting application servo

HSD-C12 series: Dual axis bus application servo

HSD-E6 series: Automation application servo

Feedback Device

1000:2500C/T; 13i: 17bit; 23i: 23bit; R: Resolver

B: biss protocol;

C: Magnetic type

H: Heidenhain; N: Nikon

Instruction Source

c: Functions of Position/Speed/Torque

a: Bus-based Protocol

d: Double Pulses

Power Module

30: 30A; 100:100A;

Voltage Class

L: single-phase/three-phase 220V

H: three-phase 380V

B: three-phase 220V

Cooling Mode

W: Natural cooling; F: Air cooling; S: Liquid cooling

Communication Mode

W: None

M: Modbus

M2: MECHATROLINK II

M3: MECHATROLINK III

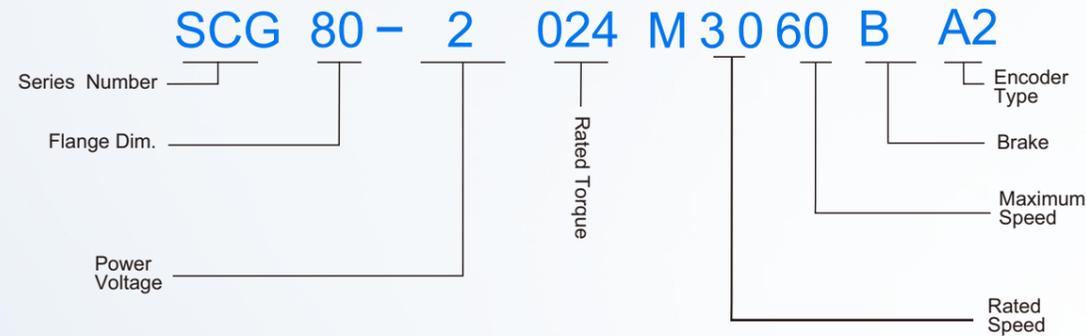
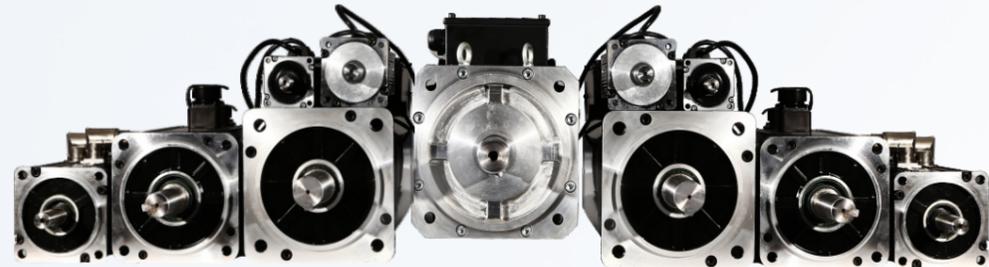
C: CANOPEN

E: ETHERNET CAT

Brake Mode

W: Built-in braking; Z: External braking

Model Selection



Series Number

SCG Series Servo motor

Flange Dim.

80: 80mm
130: 130mm

Rated Torque

Three-dig number x0.1N.m

Rated/Maximum Speed

15:1500rpm 20:2000rpm
30:3000rpm 50:5000rpm
60:6000rpm

Power Voltage

2: AC220V
4: AC380V

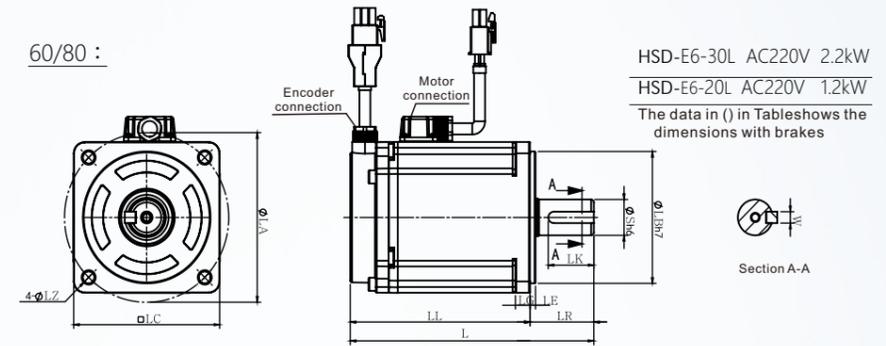
Brake

B: With brake

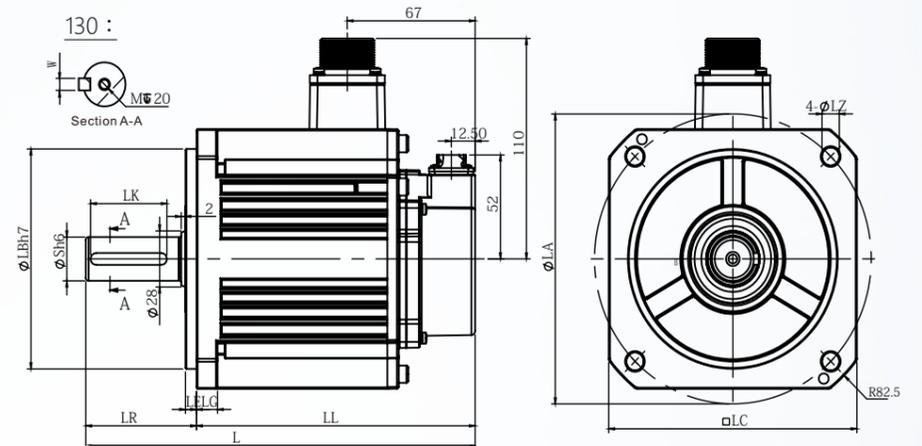
Encoder Type

A: 23-bit absolute
A2: 17-bit absolute

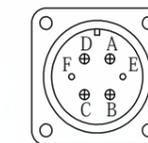
60/80 :



130 :



Power line 18-6Z socket



Encoder wire CMV1-R10P socket



Power line						
Socket number	A	B	C	D	E	F
Definition of winding	U	V	W	PE	/	/

Encoder feedback line										
Socket number	1	2	3	4	5	6	7	8	9	10
Signal Definition	/	E-	E+	SD-	OV	SD+	5V	/	/	PE
Cable color	/	White	Brown	Yellow	Black	Blue	Red	/	/	Shield

Adaptive drive	Motor model	L	LL	LR	LE	LG	LC	LA	LZ	φS	LB	W	LK
HSD-E6-20L	SCG80-2-024M**50	167(197)	132(162)	35	3	10	80	90	6	19	70	6	25
HSD-E6-20L	SCG80-2-033M**50	185(218)	150(183)	35	3	10	80	90	6	19	70	6	25
HSD-E6-30L	SCG130-2-054M**30	212(234)	155(177)	57	6	12	130	145	8.5	22	110	6	40
HSD-E6-30L	SCG130-2-084M**30	232(254)	175(197)	57	6	12	130	145	8.5	22	110	6	40

Incremental motor code

Model code	Adaptive drive (AC220V)	Adaptive motor	Power (Kw)	Rated current (A)	Rated torque (Nm)
25/28	HSD-E6-30L	SCG80-2-024M**30-A2	0.75	4.2	2.4
26/29	HSD-E6-30L	SCG80-2-033M**30-A2	1.0	4.2	3.3
35	HSD-E6-30L	SCG110-2-040M**30-A2	1.2	5	4
36	HSD-E6-30L	SCG110-2-050M**30-A2	1.5	6	5
38	HSD-E6-30L	SCG110-2-060M**30-A2	1.8	8	6
44	HSD-E6-30L	SCG130-2-040M**25-A2	1	4	4
45	HSD-E6-30L	SCG130-2-050M**25-A2	1.3	5	5
46	HSD-E6-30L	SCG130-2-060M**25-A2	1.5	6	6
47	HSD-E6-30L	SCG130-2-077M**20-A2	1.6	6	7.7
48	HSD-E6-30L	SCG130-2-077M**25-A2	2.0	7.5	7.7
49	HSD-E6-30L	SCG130-2-100M**15-A2	1.5	6	10
50	HSD-E6-30L3	SCG130-2-100M**25-A2	2.6	10	10

Note: Model code 28/29 matches with the photoelectric incremental line-less encoder;

! Safety Precautions

- I. Personnel safety**
- This product is a high-voltage and high current product, ensuring that personnel are in a safe area of the movement mechanism when powered on.
 - This product is a high voltage and high current product. Incorrect operation may cause accidents such as arc burns and electric shock.
 - It is prohibited to operate, make the wiring and power on without following the instructions.
- II. Workplace safety**
- This product is a high voltage and high current product. It is prohibited to use it with electricity in place with flammable or corrosive gases, otherwise it may cause fire and explosion.
 - It is prohibited to use it with electricity in places where flammable and explosive materials fall, as it may cause fire and explosion.
 - It is prohibited to use in high humidity, with water vapor, metal powder, etc., as it may cause dangerous situations such as electric shock to oneself and others and other hazards.
- III. Product and equipment safety**
- This product is a high-voltage and high current product, and incorrect connection can cause product damage.
 - The PE terminal must be grounded to ensure reliable grounding.
 - The L series of this product is suitable for AC220V power supply; The H series is suitable for AC380V power supply, and they should not be connected incorrectly.
 - Products U, V, and W should be connected to the motor as output. Do not connect to input power.
 - Products U, V, and W are three-phase outputs. Do not connect them in the wrong order, wrong order may cause motor overspeed, equipment damage, and overcurrent damage to this product.
 - Tighten all terminals and select all wiring specifications strictly according to power.
 - Do not distribute power or touch terminals when the driver is powered on.
 - Do not touch the terminals within 5 minutes of power outage.
 - Do not touch the motor or cables while the motor is running to prevent accidental injuries such as burns and sprains.

Display and operation

The panel operation

Panel consists of 6 LED digital tube displays and 4 keys "▲", "▼", "◀", "SET", a red light "Alm" and a green light "Run", and is used to display various system states, set parameters, etc.

The operation is a hierarchical operation, and is described as follows:

◀ Key represents the backward, exit, and cancel of the hierarchy, and long press for 1 second to shift.

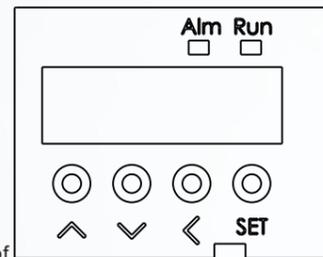
SET Key represents advancing, entering, and confirming the hierarchy.

▲, ▼ Keys represent increasing or decreasing the order number or numerical values.

The red indicator light Alm lights up, indicating an alarm, and the digital tube also displays an alarm

The green indicator light Run lights up, indicating that the motor is in an enabled working state. When the decimal in the bottom right corner of the digital tube lights up, it indicates that the current parameter value is in a modified state.

If the Alm red light is on and the alarm number "Err - xx" is flashing, it is drive alarm, it is necessary to power off and investigate the cause of the alarm in a timely manner.



Parameter management mode operation

EE--SET	Saving parameters	→	SET	Press for more than 3 seconds
EE--RD	Reading parameters	→	SET	Press for more than 3 seconds
EE--BA	Backing up parameters	→	SET	Press for more than 3 seconds
EE--RS	Restoring backups	→	SET	Press for more than 3 seconds
EE--DEF	Restoring default value	→	SET	Press for more than 3 seconds

Setting method for restoring default value

Step	Panel display	Key	Operation
1	EE0000	▲▼SET	Press the ◀ key twice to select the function. If the parameter number is not displayed as EE, press ▲▼.
2	EE0000	▲▼SET	Press the SET key and then press the ◀ key to display "EE-DEF".
3	EE0000	▲▼SET	Press and hold the SET key for 3 seconds, then display "FINISH"

Setting method for parameter saving

Step	Panel display	Key	Operation
1	EE0000	▲▼SET	Press the ◀ key twice to select the function. If the parameter number is not displayed as EE, press ▲▼.
2	EE0000	▲▼SET	Press the SET key and then press the ◀ key to display "EE-SET".
3	EE0000	▲▼SET	Press and hold the SET key for 3 seconds, then display "FINISH"

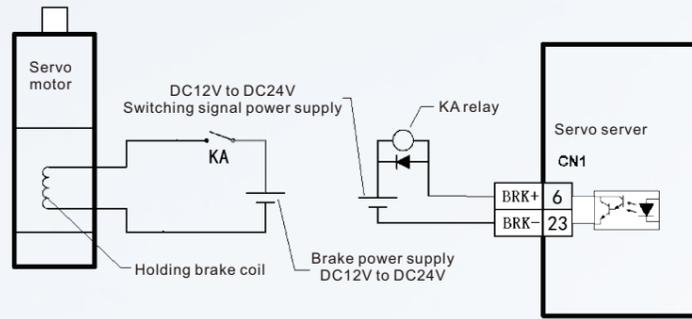
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- Due to continuous product updates, any changes are subject to change without prior notice.
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Operation of JOG jog running mode (Jr --)

Step	Panel display	Key	Operation
1	PA0000	▲▼SET	Press the ◀ key twice to select the function. If the parameter number does not display as "PA", press ▲▼.
2	PA0000	▲▼SET	Press the SET key and then press the ◀ key to display as "PA-4".
3	PA0000	▲▼SET	Press the SET key to set the value "0" to "3" by pressing ▲▼, press SET key to confirm.
4	PA0000	▲▼SET	Press the ◀ key to select the function.
5	PA0050	▲▼SET	Press the ◀ key to display "PA-53".
6	PA0000	▲▼SET	Press the SET key to set the value "0" to "1", press SET key to confirm.
10	PA0000	▲▼SET	Press the ◀ key twice to select the ◀ key function, press the ◀ key to select "Jr", and press the SET key to confirm.
11	PA0000	▲▼SET	Press the ◀ key to perform forward and reverse rotation of the motor.

DP-SPD	Motor speed	→ r1000	--1000 rpm
DP-POS	Low position of current position	→ P 9999	--9999 pulses
DP-POS.	High position of current position	→ P. 11	--110000 pulses
DP-CPO	Low position of positioncommand	→ C 9999	--9999 pulses
DP-CPO.	High position of positioncommand	→ C. 22	--220000 pulses
DP-EPO	Low position of position deviation	→ E 9	--9 pulses
DP-EPO.	High position of position deviation	→ E 0	-0 pulse
DP-TRQ	Motor torque (%)	→ T 60	--Motor torque 70%
DP-I	Motor current (A)	→ I 2.15	--Motor current 2.15A
DP-ABS	Single turn low position,	→ 1072	--1072 pulses
DP-ABS.	Single turn high position	→ 13	--13 * 10000 pulses
DP-ABM	Multiple turns absolute position	→ 65536	--65536 turns
DP-CS	Speed command	→ r.35	--Speed command 35 rpm
DP-Ct	Torque command	→ t.70	--torque command 20%
DP-APO	Increment encoder rotor absolute position	→ A 2500	--2500 pulses
DP--IN	Input terminal state	→ Inhl1hl	--input terminal status
DP-Out	Output terminal state	→ outl1hl	-- output terminal status
DP-COD	Encoder UVW input	→ codlh	--encoder signal
DP-rn	Operating status	→ rn-on	--motor is running
DP-Err	Alarm mode	→ Err39	--Err 39
DP-PLS	External pulse count low position	→ P 9999	--9999 pulses
DP-PLS.	External pulse count high position	→ P. 11	--110000 pulses
DP-Frq	External pulse real-time frequency	→ 100000	--100khz
DP-dir	Cw or ccw direction	→ cw	--cw direction
DP-EId	Encoder bit monitoring	→ 17	-- encoder bit
DP-pn	DC bus real-time voltage	→335	--335
DP-pn.	Highest voltage	→339	--339
DP-rES	Digital tube display monitoring	→ 888888	--digital tube incomplete display

Servo motor holding brake wiring diagram



Motor pin number	Motor pin identification	Function description
1	DC+	DC power supply positive pole DC24V+
2	DC-	DC power supply negative pole 0V
3	PE	Shell ground

Gain related parameters

Parameter number	Parameter name	Functions in detail	Parameter range [default]
5	Speed proportional gain	a. Enhancer rigidity, set the proportional gain of the speed turn regulator; b. the larger the setting value, the higher the gain and the greater the rigidity. The parameter values are determined according to the specific servo drive system model and load, in general, the larger the load inertia, the larger the setting value; c. set as large a value as possible under the condition that the system does not oscillate;	10~2000 [150]
6	Velocity Integration Time Constant	a. Set the integration time constant of the speed turn regulator; b. it can inhibit motor overshoot, the smaller the setting value, the faster the integration speed; too small, to produce overshoot, too big, response slows down; c. set according to the specific drive model and load inertia, the larger the load inertia, the larger the setting value;	1~5000 [100]
7	Torque filters	a. De-noise, set torque command filter characteristics; b. the larger the value, the smaller the cut-off frequency, the smaller the vibration and noise generated by the motor. Too large a value results in a slower response.	20~3000 [40]
8	Speed Detection Filter	a. de-noising, set speed detection filter characteristics; b. the larger the value, the smaller the cut-off frequency and the less noise the motor produces. Too large a value results in a slower response.	20~3000 [40]
9	Position proportional gain	a. Set the proportional gain of the position turn regulator; b. the larger the setting value, the higher the gain, the greater the rigidity, and the smaller the positional hysteresis under the same frequency command pulse condition. However, too large a value may cause oscillation or overshoot; c. the parameter values are determined according to the specific servo drive system model and load conditions;	1~500 [80]
60	Current loop proportional gain	The drive automatically adjusts this parameter according to the specifications of the motor being read.	100~5000 [600]
68	Speed proportional gain factor	The drive automatically adjusts this parameter according to the specifications of the motor being read; this parameter is a factor of the PA5 parameter; Servo motor gain = PA5*PA68;	0~1000 [100]
88	Position Proportional Gain Factor	The position proportional gain is PA9*PA88:	20~300 [100]
93	Speed proportional gain factor scaling factor	Speed proportional gain PA5*PA93:	20~300 [100]
94	Current loop proportional gain scaling factor	Current loop proportional gain PA60*PA94:	20~300 [100]
98	Current loop integration time constant scaling factor	Current loop integration time constant PA61*PA98:	20~300 [100]

Gain related parameters

12	Position Command Pulse Frequency Division numberator	a. If the system is programmed to travel 5mm (5000 pulses), one motor revolution is required: $PA12 = \frac{\text{Pulse numerator}}{\text{Pulse denominator}} = \frac{\text{Actual feedback}}{\text{Command pulse}}$ $= \frac{\text{Motor encoder wire number (2500 wires)} \times \text{frequency doubling number (4)}}{\text{Command pulse number (5000)}}$	1~32767 [1]
13	Position command pulse frequency division denominator	b. If the motor is directly connected to the screw, the screw pitch is 6 mm: $PA12 = \frac{10}{5000} = \frac{2}{1}$ $PA13 = \frac{10}{\text{Screw pitch (6)}} = \frac{5}{3}$ Note: CNC machines can be set up more intuitively by referring to b. Gear ratio range: 1/100≤G≤100	1~32767 [1]
14	Position command pulse input method	Three pulse input forms can be set: 0: Pulse + symbol; 1: CCW pulse/CW pulse; 2: Two phase quadrature pulse input;	0~2 [0]
15	Position command pulse direction reversal	0: Default direction; 1: The direction is reversed;	0~1 [0]
19	Position command smoothing filter	Mainly for when the host has no acceleration or deceleration and does not have an exponential form of acceleration or deceleration, this parameter smoothes the command pulse and optimizes the acceleration and deceleration. This filter does not lose pulses; there may be a delay in execution speed.	0~3000 [0]
36	Command pulse signal filter coefficient	PA4=0, valid for position control The higher the setting value, the stronger the immunity to command pulses and the smaller the received pulse frequency, and it may also display as unable to receive pulses. Adjustments can be made for pulse and direction signal timing speed -up or lags.	0~3 [1]
37	Command Direction Signal Filter coefficient	PA4=0, valid for position control Adjustments can be made for pulse and direction signal timing speed -up or lags.	0~3 [0]
74	Receiving pulse frequency doubling switching	Servo Drive Received Pulse Frequency Doubling Factor Switching 0: PA12/PA13 are 1/1 servo receiving 10,000 pulses/turn; 1: PA12/PA13 is 1/1 servo receiving 131072 pulses/turn; 2: Setting the pulse number setting via PA110, PA111	0~2 [2]
110	Specified single-turn pulse low position	At default parameters Pa12/pa13, electronic gear ratio = 1/1 and PA74=2. The servo receives PA110+PA111*10000 pulses to run 1 turn. Note that the electronic gear ratio and customized pulse functions are in effect at the same time.	0~9999 [0]
111	Specified single-turn pulse high position		0~13 [1]

Multi-function terminal selection

Parameter number	Parameter name	Functions in detail	Parameter range [Default]
42	Multi-function output terminals	0: Alarm 15 active/1: Alarm 15 blocked; [0001] 0: Selection of second return to zero/1: positioning selection completed; [0010] 0: at torque, PA50 parameter limits maximum speed/1: at torque, second analogue limits the maximum speed; [0100]	0000~1111 [0001]
53	Forced ON input for the low 4-bit input terminal	The following functions can be turned on and off by changing the parameters 0 and 1 without using an external circuit, PA53 and PA54 are operated in the same way. SON: servo enable; [0001] A-CLR: Alarm clear; [0010] FSTP: CCW driver disabled; [0100] RSTP: CW drive disabled; [1000]	0000~1111 [0000]
57	Output terminal logical reversal	With the change of parameters 0 and 1, achieve the reversal of function (i.e. the original external switching output circuit is reversed, normally open to normally closed, normally closed to normally open.) SRDY: servo ready; [0001] ALM: servo alarm; [0010] COIN: positioning completed/speed arrival; [0100] BRK: Motor holding brake; [1000]	0000~1111 [0010]

Torque Mode Parameters

29	Analogue torque command input gain	a. Setting the proportionality between the analogue torque input voltage and the actual motor running torque; b. The unit of setting value is 0.1V/100%; c. The default value is 50, which corresponds to 5V/100%, i.e. the input 5V voltage produces 100% of the rated torque;	10~100 [50]
33	Torque command direction reversal	Reverse the polarity of the analogue torque input. 0: When the analogue torque command is positive, the torque direction is CCW; 1: When the analogue speed command is positive, the torque direction is CW;	0~1 [0]
38	External torque limitation	PA4 = 6, when pin 14 or 15 of CN1 is connected with 0V: CCW, CW Torque Percentage Limit; Forward and Reverse are effective at the same time. PA38 is less than set values of PA34 and PA35.	0~300 [100]
39	Analogue torque command zero drift compensation	The amount of zero-drift compensation for analogue torque inputs, i.e. positive and negative offsets.	-5000~5000 [0]
50	Speed limit under torque control	a: For torque control: corresponds to the maximum speed limit. Note: Prone to overspeed when unloaded; b: For torque control: revolution corresponding to 10V and the second analogue is switched by PA42 to limit the maximum revolution;	1~5000 [2500]

Speed Mode Related Parameters

22	Internal and external speed selection	0: Takes the internal speed; 1: Take external analogue (-10V to +10V); 2: Take external analogue (0 to +10V; pins 14 and 15 control positive and negative);	0~2 [1]
24	Internal speed 1	When PA4=1, PA22=0: When CNISC1 pin is OFF and SC2 pin is OFF, internal speed 1;	-3000~3000 [0]
25	Internal speed 2 /zero setting current	a. When PA4=1, PA22=0: Internal speed 2 when CNISC1 pin is ON and SC2 pin is OFF; b. When PA4=4, set the motor zero current percentage;	-3000~3000 [100]
26	Internal speed 3	When PA4=1, PA22=0: When CNISC1 pin is OFF and SC2 pin is ON, for internal speed 3	-3000~3000 [300]
27	Internal speed 4	When PA4=1, PA22=0: When CNISC1 pin is ON and SC2 pin is ON, for internal speed 4	-3000~3000 [-100]
28	Speed of arrival	Non-positional mode: When the motor speed is greater than this setting value, COIN: ON, otherwise OFF. This parameter is only for motor speed judgement, does not have direction.	0~3000 [500]
40	Acceleration time constant	The set value is to indicate the acceleration time of the motor from 0 to 1000r/min. The linear acceleration and deceleration characteristics are only used in the speed control mode. If the host has acceleration and deceleration characteristics, this parameter should be set to 1.	1~10000 [100]
41	Deceleration time constant	The set value is to indicate the deceleration time of the motor from 1000 to 0r/min. Linear acceleration and deceleration characteristics are used only in the speed control mode. If the host has acceleration and deceleration characteristics, this parameter should be set to 1.	1~10000 [100]
44	Reverse direction of analogue speed command	Reverse polarity for analogue speed inputs 0: When the analogue speed command is positive, the speed direction is CCW; 1: When the analogue speed command is positive, the speed direction is CW;	0~1 [0]
45	Zero drift compensation for analogue speed command	The amount of zero-drift compensation for the analogue speed input, i.e. positive and negative offsets. The value of this parameter is automatically changed and saved during analogue auto-zeroing.	-5000~5000 [0]
46	Analogue speed command filter	Low-pass filter for analogue speed inputs. The larger the setting, the faster the response to the speed input analogue, more noisy; the smaller the setting, the slower the response and the less noise;	0~1000 [300]
49	Analogue voltage threshold speed control	For speed control: set the analogue positive and negative voltage threshold values.	1~5000 [0]

485 Communication Related Parameters

80	485 communication shaft address	a. For 485 communication modbus protocol, it represents address: 1, 2, 3..... b. For machine tools, when reading absolute position, it corresponds to: X-axis, Y-axis, Z-axis.....	1~32767 [1]
81	485 communication baud rate	Corresponding baud rates: 0: 4800; 1: 9600; 2: 19200; 3: 38400; Data bit is 8; stop bit is 1; RTU format; maximum reading length is 10;	0~3 [2]
82	485 communication Parity Selection	0: odd parity; 1: even parity; 2: no parity	0~2 [0]
99	Multi-turn Encoder Clear	1: Multi-turn encoder battery loss of power alarm is cleared 2: Multi-turn encoder undergoes multi-turn clearing, and 485 reading position zero point is set	0~10 [0]

485 position reading for adaptive multi-turn motors

MODBUS address	Meaning of a parameter	Unit	Reading and writing	Description
500	Current position	Low 16-bit pulse	R	With multi-turn absolute value motor, read the current position
501	Current position	High 16-bit pulse	R	
Parameter address	Parameter name	Unit	Range	default value
PA99	Multi-turn encoder clearing	1: Battery loss of power alarm is cleared 2: Multi-turn clearing and set to zero point	0~2	0

Description: All PA parameter modbus addresses are decimal parameter numbers. Example: PA99 modbus address is decimal 99. The address after 500 is communication specific without corresponding PA parameters, and the format is in decimal.

Troubleshooting

Alarm number	Alarm name	Operation state	Causes	Solution
1	Over-speed	When powered on	■ Drive or motor failure	■ Replacement of drives
		When enabled	■ Checking parameters	■ Check whether it is internally enabled or not
			■ Short circuit between motor U/W	■ Check motor wiring
			■ Encoder 0 bit deviation	■ Motor encoder zeroing
		During motor operation	■ Incorrect servo parameters	■ Restore servo parameters
			■ Short-circuit motor connector	■ Check whether there is water in the motor connector or not
■ Command speed is too fast	■ Reduce command speed			
2	main circuit overvoltage	When powered on	■ Unsteady acceleration and deceleration	■ Adjust acceleration and deceleration constants
			■ Excessive load	■ Reduce load
			■ High supply voltage	■ Reduce the power supply voltage
		During operation	■ Power supply waveform is not normal	■ Replacement of power supply
			■ Server failure	■ Replacement of servers
			■ Brake circuit failure	■ Check the braking resistor
3	main circuit Under-voltage	When powered on	■ Circuit board failure	■ Replacement of servers
			■ Soft-start circuit failure	■ Replacement of servers
			■ Main power supply voltage is too low	■ Change the power supply
		During operation	■ Insufficient transformer capacity	■ Increase the capacity of transformer
			■ Loose power supply wiring	■ Fasten connecting terminals
			■ Circuit board failure	■ Replacement of servers
4	The location is out of tolerance	During operation	■ Command speed are too fast	■ Reduce command speed
			■ Input voltage is too low	■ Check R/S/T power supply
			■ PA 17 parameter is too small	■ Appropriate increase in parameters
			■ Loose or overloaded wiring	■ Check and fasten the connecting wires
6	Motor stalling	During operation	■ The transmission part is stuck	■ Disengagement of mechanical parts
			■ Excessive load	■ Reduce load
			■ Motor failure	■ Replacement of motors
7	Exceptions of disabled	When powered on	■ Check parameters and wiring	■ PA20, CW and CWW wiring
9	Encoder Failure	When powered on	■ Encoder ABZ wiring disconnection	■ Incorrect wiring
			■ Damaged encoder	■ Fragile items, need to be replaced
			■ Encoder 5V voltage is low	■ Shorten the wire or change the driver
		During operation	■ Poor contact with CN2 plug	■ Fasten the CN2 plug
11	IPM module failure	When powered on	■ Hidden hazard of cable faulty soldering	■ Replacement of cables
			■ Circuit Board Chip Failure	■ Check for interference and replace the server
			■ Circuit board failure	■ Replacement of servers
			■ Short circuit between motor U/W	■ Check the wires and replace the motor
12	Overcurrent	When energized or in operation	■ Motor failure	■ Check the wires and replace the motor
			■ Poor power supply connection	■ Checking lines, anti-interference
			■ Short circuit between U/W	■ Check wiring and replace server
13	Overload	When powered on	■ Overload	■ Replacement with high-power drive motors
			■ Water ingress and motor damage	■ Replacement of motors
			■ Circuit board failure	■ Replacement of servers
		During operation	■ Excessive mechanical load	■ Reduce load
			■ Mechanical transmission is not smooth	■ Inspection of mechanical transmission components
			■ Short circuit between U/W	■ Check the cables
14	Brake failure	When powered on	■ The brake is not released.	■ Ensure stable power supply for the holding brake
			■ Circuit board failure	■ Replacement of servo
			■ Braking resistor failure	■ Check brake resistor wiring
		During operation	■ Insufficient brake capacity	■ Extend acceleration and deceleration time
			■ Excessive mechanical inertia	■ Reduction of mechanical inertia
			■ Incorrect U/W connection of encoder	■ Check connecting wires and make replacement
			■ Encoder power supply instability	■ Requires 5V to be stable
			■ Incorrect number of encoder wires	■ Adjustment number of wires corresponding to parameters

Alarm number	Alarm name	Operation state	Causes	Solution
16	Motor thermal overload	When powered on	■ Error in servo parameters	■ Restore factory values
		During operation	■ Poor mechanical transmission ■ Long overload time	■ Increase lubrication, reduce load ■ Smooth start/stop with load reduction
17	speed response failure	During operation	■ Excessive error for long time ■ Start -stop time is too short	■ Adjustment of parameter position feed -forward ■ Adjust acceleration and deceleration time
20	ROM Alarm	During operation	■ Parameter storage alarm	■ Restore parameters and replace servo
22	Bad D/A chip	When powered on	■ Replacement of the control board	■ Restore parameters and replace servo
29	Insufficient torque	During operation	■ Exceeding the set torque	■ Check parameters PA30, PA31
			■ Check motor type selection	■ Re-adaptation of motors
			■ Mechanical overload	■ Disconnect the load and try again
30 Note: Incremental encoder	Loss of encoder Z-pulse	During operation	■ Z-pulse is not present	■ Replacement of the encoder
			■ Cable welding wire error	■ Check the solder wires
			■ Voltage 5V is unstable	■ Shorten the wire to reduce attenuation
			■ Poor shielding, with interference	■ Good grounding of the shielding layer
31 Note: Incremental encoder	Disconnection of encoder U/W signal	When powered on	■ No UV Wsignal	■ Replacement of the encoder
			■ Cable U/W welding wire is disconnected	■ Check solder wires
			■ Voltage 5V is unstable	■ Shorten the wire to reduce attenuation
			■ Poor shielding, with interference	■ Good grounding of the shielding layer
32 Note: Incremental encoder	Angular misalignment of encoder U/W signal	When powered on	■ U/W pulse all 0, all 1	■ Replacement of the encoder
			■ Incorrect encoder type	■ Check the encoder model
			■ U/W misalignment of welding lines	■ Check solder wires
			■ Voltage 5V is unstable	■ Shorten the wire to reduce attenuation
			■ Poor shielding, with interference	■ Good grounding of the Good grounding of the shielding layer
35	communication error	When powered on	■ CRC verification error	■ Check communication parameters and connection lines of CN3 and the host
36	Bus encoder receiving error	When powered on	■ encoder wire disconnected	■ Fasten the encoder wire
			■ Encoder failure	■ Replacement of the encoder
			■ Encoder wire error	■ Replace with the correct encoder wire
37	Bus encoder data verification error	When powered on	■ encoder wire disconnected	■ Fasten the encoder wire
			■ Encoder failure	■ Replacement of the encoder
			■ Encoder wire error	■ Replace with the correct encoder wire
39	Bus encoder feedback disconnection	When powered on	■ encoder wire disconnected	■ Fasten the encoder wire
			■ Encoder failure	■ Replacement of encoder
			■ Incorrect encoder wire	■ Replace with correct encoder wire
			■ Replace with correct encoder wire	
40	Bus encoder battery loss of power	When powered on	■ Loose battery wire	
			■ Check battery wire	
			■ Battery life expires	
			■ Battery replacement	
42	Motor parameter reading error	When powered on	■ Incorrect encoder parameters	
			■ Replacement of the motor	
			■ Loose encoder wire	
			■ Replacement of encoder wire	
45	MODBUS communication abnormalities	When powered on	■ Detect the RS485 communication baud rate and parity bit settings; 2. Detect whether the station address setting for RS485 communication from the slave station is repeated or not; ■ 3. Detect whether the baud rate of the slave station is the same as that of the master station or not; 4. Whether the communication cable is shielded with double-ended shielding or not;	
		During operation	■ Detect RS485 communication baud rate and parity bit settings. ■ Detect whether the station address setting for RS485 communication from the slave station is repeated or not; ■ Detect whether the baud rate of the slave station is the same as that of the master station or not; 4. Whether the communication cable is shielded with double-ended shielding or not;	
95	Overcurrent detection	running	■ Excessive current occurs during operation ■ Check motor and power cables	
106	Power density overload	running	■ Drive is under heavy load for a long time	■ Reduce the load ■ Inspect the machinery