Contents

Chapter I Overview

1.1 Product Introduction

JXS808is a new generation of high-performance digital closed-loop stepper servo driver. It combines the advantages of servo system and stepper system, and runs close to a multi-stage servo.The more advanced current control algorithm makes the vibration and noise of the motor disappear; The position closed loop is added to prevent the motor from losing step.

The drive voltage is AC 50-80VAC, which is suitable for all types of two-phase hybrid closed-loop stepper motors with current below 8.0A. It has automatic half-current, self-check, overvoltage, undervoltage and overcurrent protection functions.

1.2 Product Features

The characteristics of JXS series hybrid servo system are comparedwith our CWDS series hybrid servo system:

★ Encoder output interface is added to enable the upper computer to better track the actual running position of the motor.

★ The pulse input smoothing filter is added to buffer the input signal without acceleration and deceleration.

★ Micro-step subdivision is added to make the operation smoother.

★ Integrate two control modes, power angle control mode and vector control mode.

★ The power angle control mode has fast response and does not need to adjust the rigidity, but the heating and noise are relatively large.

★ The vector control mode adds high-speed torque compensation, with small heat and low noise. Like the general AC servo, the optimal control effect can be achieved for different equipment without adjusting parameters.

1.3 Main Application Fields

JXS808 is a low-cost, high-performance servo system, suitable for all kinds of large and medium-sized automation equipment and instruments. It is particularly effective in equipment with low cost, low vibration, low noise, high accuracy and high speed that users expect. It is more suitable for lower rigid loads such as belt drive mechanism than traditional servo.

Chapter II Installation

2.1 Storage and Installation Environment

Servo drive, servo motor storage environment requirements (see table 2.1):

Project	JX Series drives	Matching servo motor
Temperature	-20~80℃	-25~70℃
Humidity	90%RH below (no condensation)	80%RH below (no condensation)
Atmospheric Environment	Indoor (no exposure) non-corrosive gases, flammable gases, oil or dust, etc.	Indoor (no exposure) non-corrosive gases, flammable gases, oil or dust, etc.
Elevation	Altitude below 1000m	Altitude below 2500m
Vibration	Less than 0.5G (4.9m/s^2) 10-60Hz (Discontinuous operation)	
Protection Grade	IP00 (No protection)	IP65

Table 2.1

Servo drive, servo motor installation environment requirements (see table 2.2):

Project	JX Series drives	Matching servo motor
Temperature	0~55 ℃ (No freeze)	-25~40 ℃ (No freeze)
Humidity	90%RH below(no condensation)	90%RH below(no condensation)
Atmospheric Environment	Indoor (no exposure) non-corrosive gas, easy to gas oil or dust, etc.	Indoor (no exposure) of non-corrosive gases, flammable gases, oil or dust, etc
Elevation	Altitude below 1000m	Altitude below 2500m
Vibration	Less than 0.5G (4.9m/s^2) 10-60Hz (Discontinuous operation)	
Protection Grade	IP00 (No protection)	IP65

Table 2.2

2.2 Servo Drive Installation

Attention

- The servo drive must be installed in a well-protected power distribution cabinet.
- The servo drive must be installed in the required direction and isolation, and ensure good heat dissipation conditions.
- Do not install on or near flammable objects to prevent fire.

The user can install by the backplane or panel mounting, and the installation direction is perpendicular to the mounting orientation. In order to ensure good heat dissipation conditions, a large interval should be set aside as far as possible in the actual installation.

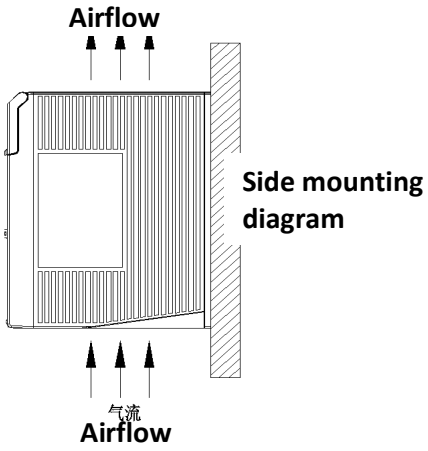


Diagram 2-3 Drive installation method diagram

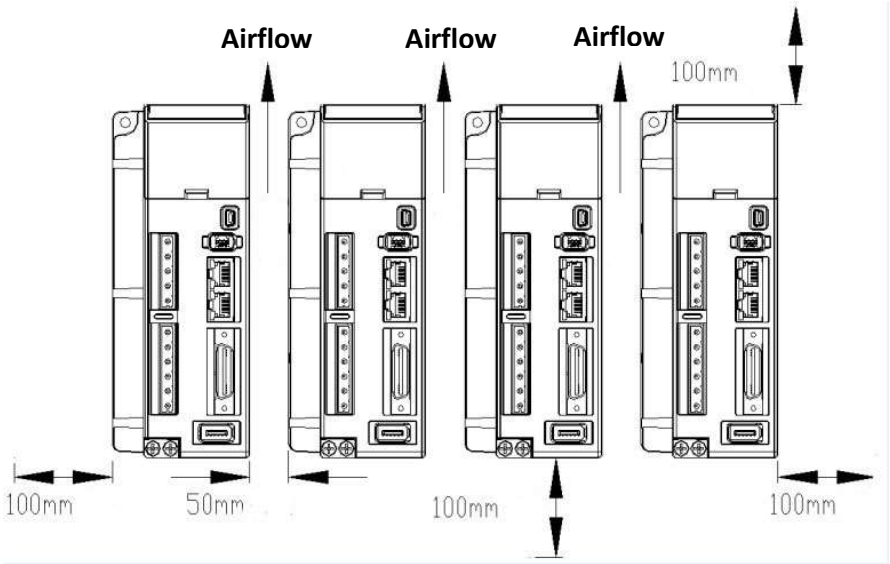


Diagram 2-4 Drive installation interval diagram

2.3 Naming Rules

JX S 80 8

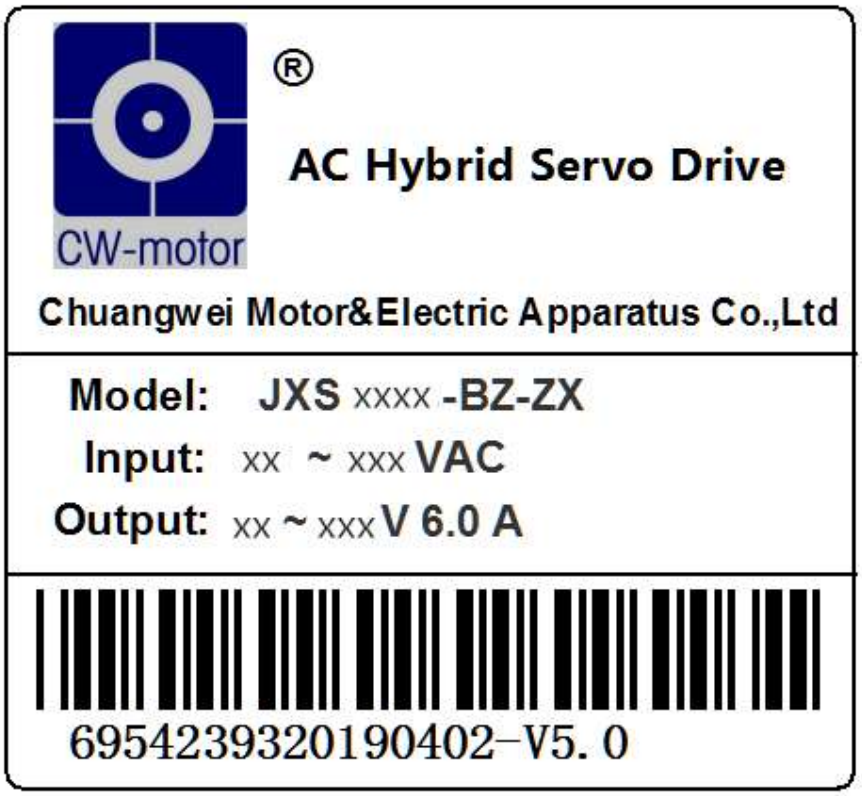
Mark	Definition
JX	Product serial number

Mark	Definition
S	Servo stepper driver

Mark	50	60	80	110	220
Power Vin	50VDC	60VDC	80VAC	110VAC	220VAC

Mark	6	8
Max Vout	6A	8A

Nameplate example



Chapter III Wiring

Warning
● Those involved in wiring or inspection must have sufficient capacity to do so. ● Wiring and inspection must be carried out 5 minutes after the power supply is cut off to prevent electric shock.
Be careful
● The terminals must be connected according to their voltage and polarity to prevent equipment damage or personnel injury. ● Drives and servo motors must be well grounded.
Attention
● A+, A -, B+and B - are connected with the motor winding and cannot bereversed. ● Cables and conductors must be secured and avoid proximity to the drive radiator and motors, so as to avoid the insulation performance being reduced due to heat.

The JXS808 has three control ports and two strong current ports. The three control ports are CN1, CN2 and CN3. CN1 includes control signal port and alarm output port; CN2 is the encoder signal port; CN3 is a serial port. Strong current port is divided into power port and motor port. Please refer to the following instructions for wiring of all interfaces to ensure accurate wiring.

3.1 Signal Input and Output interface CN1

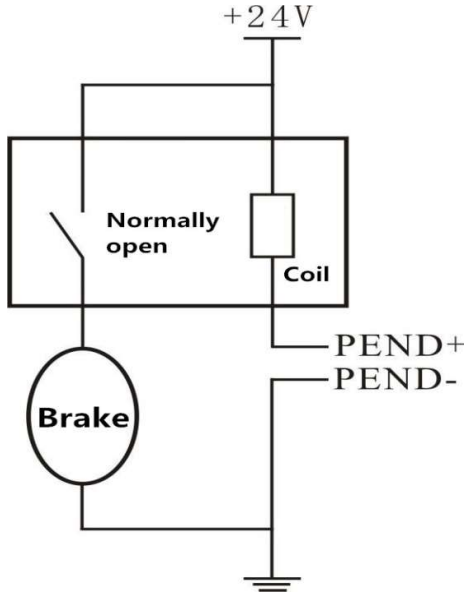
Control signal input		
Pin number	name	explain
CN1-3	PUL+	Pulse positive input
CN1-4	PUL-	Pulse negative input
CN1-5	DIR+	Direction positive input
CN1-6	DIR-	Direction negative input
CN1-11	ENA+	Enable positive input,usually not connected (enable state)
CN1-12	ENA-	Enable negative input,usually not connected (enable state)

Encoder signal output		
CN1-23	A+	Encoder signal outputA+
CN1-24	A-	Encoder signal outputA-
CN1-25	B+	Encoder signal outputB+
CN1-26	B-	Encoder signal outputB-
CN1-27	Z+	Encoder signal outputZ+
CN1-28	Z-	Encoder signal outputZ-

When the driver gives an alarm, it will change the status of the alarm output port. The "Pend" port is normally closed, and it is normally open after the alarm;"ALM" port is normally open and normally closed after alarm. The user can connect the "Pend" or "ALM" portaccording to the alarm input type of the controller or control card, and start the alarm of the controller or control card under the driver alarm to make the processing pause.

Alarm signal output		
Pin number	name	explain
CN1-7	ALM+	Alarm signal:OCdoor positive output, normally open
CN1-8	ALM-	Alarm signal:OCdoor negative output, normally open
CN1-9	PEND+	Alarm signal:OCdoor positive output, normally closed
CN1-10	PEND-	Alarm signal:OCdoor negative output, normally closed

Brake wiring：To PEND for example, Direct brake connection 24V，Will cause the drive to power on later than the brake when powering up，Z axis will fall off the knife；When power is off，Driver power outage earlier than break, Z axis will also fall off the knife. And after the drive alarm, Motor without lock current，Cause Z axis to fall off the knife to table to damage the operating platform.



The right figure is the schematic diagram of the brake wiring，The driver is powered on and off, and will be synchronized with the brake,Which will be locked after the alarm signal.

3.2 Encoder InterfaceCN2

The encoder interface can be directly connected to the driver and motor by using the company's adapter cable. To ensure stable signal transmission, tighten the screws at both ends of the port.

Encoder Signal Output Port CN2		
Pin Number	**Symbol**	**Interpretation**
22	+5V	5V output
23	A+	Encoder differential signal A+
24	A-	Encoder differential signal A-
25	B+	Encoder differential signal B+
26	B-	Encoder differential signal B-
27	Z+	Encoder differential signal Z+
28	Z+	Encoder differential signal Z-
30	GND	Signal ground

3.3 PowerInterface

name	explain	colour	
A+	PhaseAmotor winding+	Blue	Make sure the wiring color corresponds to the port
A-	PhaseAmotor winding-	Yellow	
B+	PhaseBmotor winding+	Black	
B-	PhaseBmotor winding-	Red	
L	Input power supply	50-80VAC	
N	Input power supply		
PE	Grounding	Ensure reliable grounding	
Make sure the wiring color corresponds to the port			

Figure 3-1Power PortConnection

3.4 Position Control Mode Wiring

Detailed description of signal interface: the interface circuit inside JXS808 stepper motor driver adopts optical coupling signal isolation, and R in the figure is external current-limiting resistance. The connection method is differential connection method with good anti-interference performance.

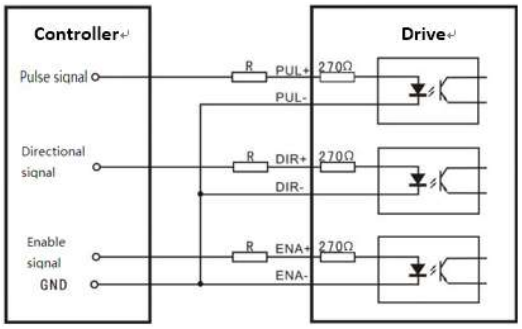


Fig. 3-2 co-cathode connection method

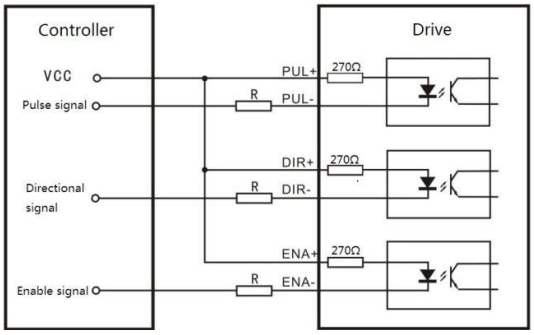


Fig. 3-3 co-anode connection method

Signal amplitude	External current limiting resistor R
5V	Do not add
12V	680 Omega
24V	1.8K Omega

Figure 3-4 Typical connection

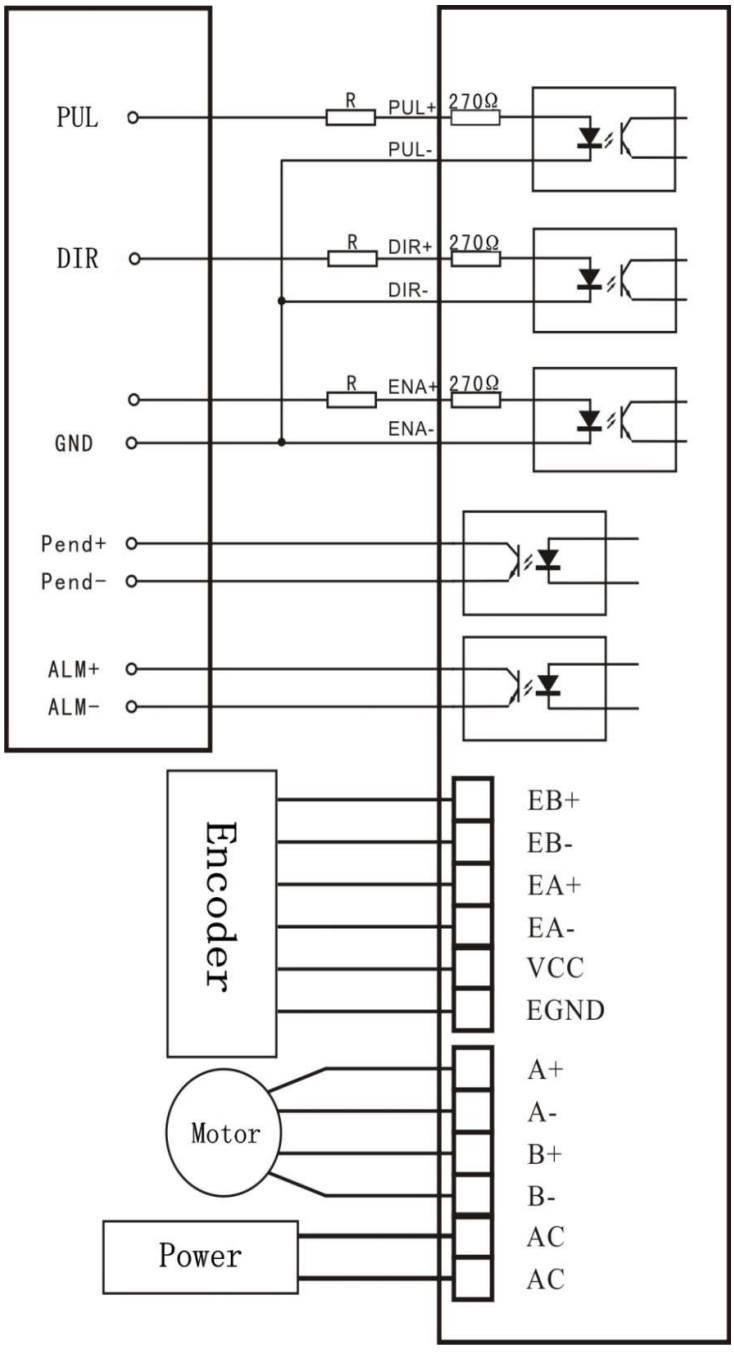


Figure3-5Torque and speed control mode standard wiring

ChapterIV Parameters and Settings

There are two ways to set the JXS808driver parameters: one is to connect the driver and the computer through the serial port and set them on the upper computer; The second is to manuallyset parameters on the drive panel.

The internal factory parameters of the driver are the optimal parameters. Generally, the user only needs to set the drive subdivision and the motor running direction. Please refer to the following instructions for specific parameter settings and parameter functions.

4.1 Parameter Introduction

Enter the parameter setting interface(PR-DP), press the "SET" key to enter the parameter number selection, and select the parameters that the customer needs to display on the main interface.The parameters corresponding to the parameter number are defined in the following table:

Display settings table				
Parameter number	Parameter definition	Initial value	Parameter range	Parameter description
dP-00	Total number of pulses	0	-	Number of pulses received by the driver
dP-01	Pulsedeviation	0	-	Synchronous pulsedeviation

Enter the parameter setting interface (PR-SE), press the "SET" key to enter the parameter number selection, and set the relevant parameters of motor operation. Parameter numbers and definition default factory values are shown in the table below:

Parameter setting table				
Parameter number	Parameter definition	Default	Parameter range	remarks
PR-000	Driverprogramversion	40	-	System default
PR-001	Current loop gain	45	0-100	-
PR-002	Position loop gain	110	0-100	-

PR-003	High-speed torque compensation	5	0-10	-
PR-004	Open and closed loop operation current	60	0-100	-
PR-005	direction	0	0-1	0：PUL+DIR 1:Double pulse
PR-006	Micro-step subdivision enable	0	0-1	0: Not enabled 1: Enable
PR-007	Pulse mode	0	0-1	0: rising edge 1: falling edge
PR-008	subdivision	8	4-256	Multiplying by200is the number of pulses per revolution
PR-009	Position deviation alarm number	200	0-65535	Alarm error
PR-010	Control operation mode	1	0-1	0:Power angle control mode 1:Vector control mode
PR-011	ALMpolarity	0	0-1	0: Normally open 1: Normally closed
PR-012	PENDpolarity	1	0-1	0: Normally open 1: Normally closed
PR-013	Start locking current	70	0-100	Start locking current
PR-014	Encoder enable	0	0-1	0: Enable encoder 1: Encoder not enabled
PR-015	Single and double pulse	0	0-1	0:Pulse+direction 1:double pulse
PR-016	Pulse smoothing filtering enable	0	0-1	0: Not enabled 1: Enable
PR-017	Current sampling filtering enable	0	0-1	0: Not enabled 1: Enable
PR-018	Current filtering timeconstant	180	0-256	-

PR-019	Speed feedforward	100	0-1000	-
PR-020	Speed filter enable	0	0-1	0: Not enabled 1: Enable
PR-021	Speed filtering timeconstant	180	0-256	-
PR-022	Speed loop gain	100	0-1000	-
PR-023	Velocity loop integration time constant	100	1-1000	-
PR-024	Open and closed loop pulse smoothing filter time constant	0	0-2000	-
PR-025	Speed loop update frequency	5	0-100	-
PR-026	Position loop update frequency	5	0-100	-
PR-027	Pure closed-loop pulse smoothing filter time constant	0	0-128	-
PR-028	Speed loop high speed gain	100	0-1000	-
PR-029	Position loop highspeed gain	110	0-1000	-
PR-030	Maximum output torque	90	0-100	-
PR-031	En setting	0	0-1	0:locked, pulse input prohibited 1:Power off
PR-032	start delay	1	1-20	-

See 4.2 for detailed parameter functions

4.2 Parameter Function

PR-00	Parameter name	Default	Parameter range
	Driver program version	40	-
The drive program versioncannot be changed by default.			

PR-01	Parameter name	Default	Parameter range
	Current loop gain	45	0-100
Change the parameter reasonably according to the motor model and load size.			

PR-02	Parameter name	Default	Parameter range
	Position loop gain	110	0-100
The higher the set value, the higher the speed responsiveness, and the higher the servo rigidity, but the easier the vibration. Please change the setting value from low to high while confirming the action.			

PR-03	Parameter name	Default	Parameter range
	High-speed torque compensation	5	0-10
The factory setting is default and cannot be modified			

PR-04	Parameter name	Default	Parameter range
	Openandclosed loopinitial current	60	0-100
Initial current setting in open and closed loop operation mode.This parameter affects the critical moment.At and below the critical moment, the current changes in this current range and the moment is constant.When the critical torque is exceeded, the system will automatically compensate the current to increase the torque according totheload change.			

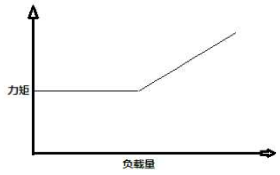
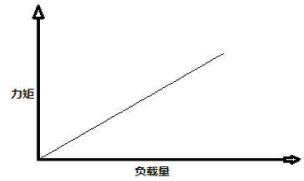
R-05	Parameter name	Default	Parameter range
	direction	0	0-1
According to the motor running direction requirements, change the parameterand save tochange the motor direction.			

PR-06	Parameter name	Default	Parameter range
	Micro-step subdivision enable	0	0-1
0: Not enabled;1: Enable. Under the condition of low subdivision and lowpulse, enabling this function can effectively increase the smoothness of motor.operation.			

PR-07	Parameter name	Default	Parameter range
	Pulse mode	0	0-1
0: Rising edge;1: Falling edge. Select the pulse recognition mode according to the given pulse mode of the system board.			

PR-08	Parameter name	Default	Parameter range
	Subdivision	8	4-256
Subdivision multiplied by200is the number of pulses per second of the control motor.(Motor step angle is 1.8 °)			

PR-09	Parameter name	Default	Parameter range
	Position deviation alarm value	200	0-65535
When the deviation between the actual rotor pulse number andthe control pulse number exceeds the parameter setting value, the driver will alarm and stop working, and the alarm code is Err-03.			

PR-10	Parameter name	Default	Parameter range
	Control operation mode	1	0-1
0:power angle control mode;1:Vectorcontrol mode. ***This parametercantake effectonly afterpower off and restart***			
 Under the power anglecontrol mode,when the load is less thanacertainamount, the set torque is used for operation;When the load exceeds a certain limit, the program compensates the current to increase		 Undervectorcontrol mode,thecurrentstarts from the initial default minimum value, and gradually increases with the increase of load.Changing the parameter affects the kvalueofthe curve.	

PR-11	Parameter name	Default	Parameter range
	ALMpolarity	0	0-1
0: normally open; 1: Normally closed.(Potential can be changed as required)			

PR-12	Parameter name	Default	Parameter range
	PENDpolarity	1	0-1
0: normally open; 1Normally closed.(Potential can be changed as required)			

PR-13	Parameter name	Default	Parameter range
	Start locking current	70	1-100
Locking current when the motor is running			

PR-14	Parameter name	Default	Parameter range
	Encoder enable	0	0-1
0: Enable encoder;1: Encoder is not enabled. Change this parameter to change the motor to step mode, which can be used to eliminate the servo system alarm Err-03fault			

PR-15	Parameter name	Default	Parameter range
	Double pulse	0	0-1
0： PUL+DIR； 1:Double pulse.			

PR-16	Parameter name	Default	Parameter range
	Pulse smoothing filter enable	0	0-1
0: Not enabled;1: Enable. Set the control pulse signal given by the system board to make the motor run more smoothly.			

PR-17	Parameter name	Default	Parameter range
	Torquefilter enable	0	0-1
0: Not enabled;1: Enable.			

PR-18	Parameter name	Default	Parameter range
	Torquefiltering time constant	180	0-256
Set the time constant of the delay filter in the current command part to suppress the vibration caused by distortion resonance.			

PR-19	Parameter name	Default	Parameter range
	Speed feed-forward	100	0-1000
Increase the feed-forward gain to meet the increased dynamic system response, while reducing the position and speed errors. This will improve the control performance of the machine, and the service life of the machine will be longer due to the smooth operation.			

PR-20	Parameter name	Default	Parameter range
	Speed filter enable	0	0-1
0: Not enabled;1: Enable.			

PR-21	Parameter name	Default	Parameter range
	Speed filter time constant	180	0-1000
After the speed is detected, the time constant of the low-pass filter can be set. Increasing the set value can reduce the motor noise, but the responsiveness will also be reduced. Usually, the system default parameters are used.			

PR-22	Parameter name	Default	Parameter range
	Speed loop gain	100	0-1000
In order to improve the position loop gain to improve the overall responsiveness of the servo system, it is necessary to increase the speed loop gain. However, excessive setting will cause motor vibration.			

PR-23	Parameter name	Default	Parameter range
	Speed integral time constant	100	1-1000
Set the integral time constant of the speed loop. The smaller the set value, the faster the deviation will be close to zero when stopping.There is no integration effect at the set value of 1000.			

PR-24	Parameter name	Default	Parameter range
	Open and closed loop pulse smoothingfilter time constant	0	0-2000
When the parameter PR-10 is set to 0, it will take effect. In the open and closed loop operation mode, changing this parameter can adjust the pulse control signal given by the system to make the motor run more smoothly.			

PR-25	Parameter name	Default	Parameter range
	Speed loop update frequency	5	0-100
System default, only for factory settings, do not change.			

PR-26	Parameter name	Default	Parameter range
	Position ring update frequency	5	0-100
System default, only for factory settings, do not change.			

	Parameter name	Default	Parameter range
PR-27	Pure closed-loop pulse smoothingfilter time constant	0	0-128
The parameter PR-10 takes effect when it is set to 1. In the pure closed-loop operation mode, changing this parameter can set the pulse control signal given by the system to make the motor run more smoothly.			

	Parameter name	Default	Parameter range
PR-28	Speed loop high speed gain	100	0-1000
In the case of high-speed operation, change this parameter to suppress motor vibration. This parameter is used together with PR-22. It takes effect when the parameter is greater than or equal to parameter PR-22.			

	Parameter name	Default	Parameter range
PR-29	Position loop high-speed gain	110	0-1000
In the case of high-speed operation, change this parameter to suppress motor vibration. This parameter is used together with PR-02. It takes effect when the parameter is greater than or equal to parameter PR-02.			

	Parameter name	Default	Parameter range
PR-30	Maximum output torque	90	0-100
By default, the parameter is changed according to the motor power. It is only used for factory setting. Do not change it.			

PR-31	Parameter name	Default	Parameter range
	ENsetting	0	0-1
When the external input enable signalis set to 0, the motor is locked and the pulse does not respond.When the external input enable signal is set to1, the motor is powered off.			

PR-32	Parameter name	Default	Parameter range
	start delay	1	1-20
System default, only for factory settings, do not change.			

ChapterV Alarm and Processing

5.1 AlarmandSolution Measures

In case of an error, the drive protection function will stop the motor rotation and the corresponding error code will be automatically displayed on the front panel.

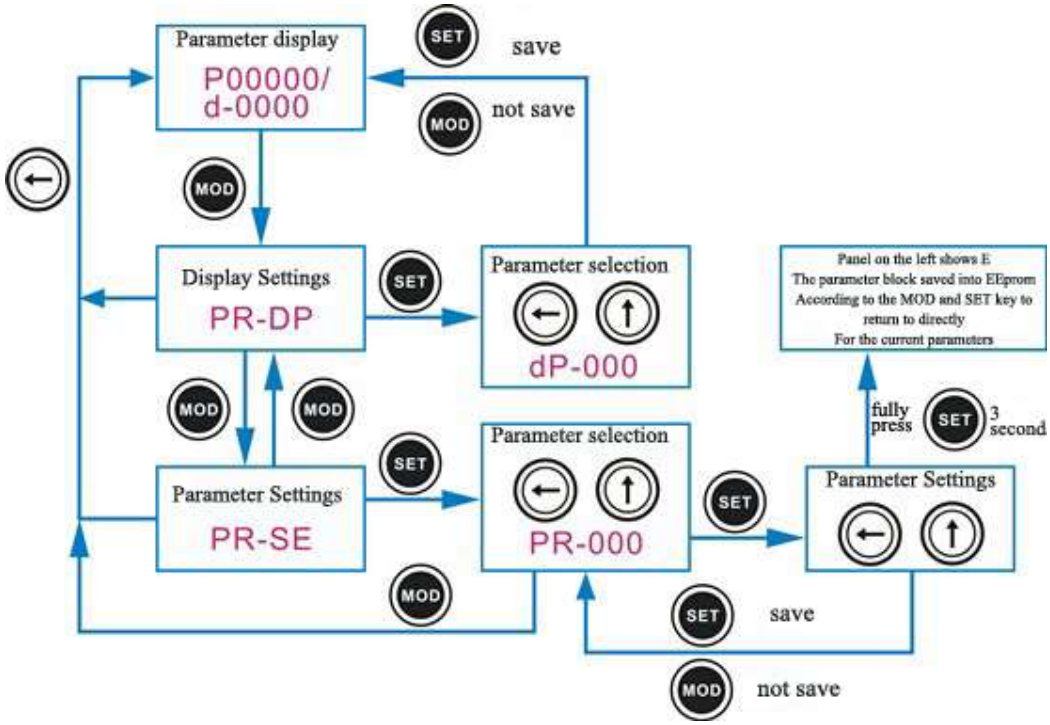
After the drive fails, the drive will be offline and the corresponding fault code will be displayed. Please refer to the fault table for troubleshooting. After the fault occurs, the drive needs to be powered on again for normal operation.

Please refer to the following table in case of abnormal operation of the motor. If it cannot be solved, please contact our technical support!

Phenomenon	Possible causes	Solutions
Motor does not rotate	The drive is not powered normally	Check whether the power supply is normal
	Drive cannot accept control number	Check the control signal circuit
	Drive not enabled	Enable signal is high or not connected
Alarm codeErr_00	Power supply voltage is toohigh	Check the supply voltage
Alarm codeErr_01	Power supply voltage is toolow	Check the supply voltage
Alarm codeErr_02	Over-currentprotection	The motor or driver is damaged orShort circuit of motor wire.Checkmotor and driver
Alarm codeErr_03	Motor out of step	The motor wire is wrongly connected or the encoder wire is wrongly connected.Restart after checking the

		line
	The acceleration time is too short and the motor is out of step	Extended acceleration time
	The power supply voltage is too low and the force is not enough	Increase supply voltage
Motorsteering error	Directionsetting error	Change direction setting
Inaccurate position	Subdivision error	Set correct subdivision
	Control signal is disturbed	Remove interference

5.2 Panel Display and Panel Operation



ChapterVI Power-on Operation

6.1 Preparation Before Operation

Note: There are two types of operation, the first is no-load test operation, and the second is loaded operation.

For safety, please make sure to carry out no-load test run first.

 Attention

- The drive and motormust be reliably grounded, and the PEterminalof the drivermust be reliably connected with the equipment grounding terminal.
- It is recommended that the driver power supply be provided by isolation transformer and power filter to ensure safety and anti-interference ability.
- Must check to confirm that the wiring is correct before the power supply.
- An emergency stop circuit must be connected to ensure that the power supply can be stopped immediately in the event of a fault.
- After the driver fault alarm, confirm that the fault has been eliminated before restarting.
- The drive and motor should not be touched for at least 5 minutes after power off to prevent electric shock.
- The drive and motor may have a high temperature rise after running for a period of time. Please prevent burns.

6.2 Wiring Inspection

Serial number	project	content

1	Wiring inspection	1. Power input power terminal, motor output power terminal, encoder input terminal CN2 and control signal terminal CN1must be connected correctly; The wiring must be firm. 2. There must be no short circuit between power input lines and motor output lines, and no short circuit with PE ground.
2	Power supply voltage check	1. Main power input L and N must be within the rated range.
3	Fixed position inspection	1. The motor and driver must be fixed firmly.
4	No-load inspection	1. The motor shaft must be free of mechanical load.
5	Control signal inspection	1. All control switches must be in the OFF state.

Table 6.1 Items to be checked before operation

6.3 Commissioning

After installation and wiring, check the following items before powering on:

- Are the power terminals connected correctly and reliably? Is the input voltage correct?
- Are the power cables and motor cables short-circuited or grounded?
- Are the encoder cables connected correctly?
- Are control signal terminals connected correctly? Is the polarity and size of the power supply correct?
- Are the drives and motors securely fastened?
- Is the motor shaft connected to a load?

ChapterVII Mechanical Parameters

Attachment:Outline and installation dimensions(unit: mm)

Pay attention to leaving more than10CMspace for heat dissipation.During installation, it should be tightly attached to the metal cabinet for heat dissipation.