Safety precautions

Before storing, installing, wiring, operating, inspecting or repairing the product, users must be familiar with and follow the following

The following are important precautions to ensure safe use of this product.

 **Danger Improper operation may cause danger and result in personal injury.**

 **Be aware that incorrect operation may cause danger, personal injury, and damage to the equipment.**

 **Strictly prohibited actions are prohibited and may result in damage to the device or inability to use it.**

---

1. Occasions of use

 **Danger**
1. Do not expose the product to water vapor, corrosive gas, or flammable gas. Otherwise, it may cause electric shock. **Or fire.** **2. Do not use the product in places exposed to direct sunlight, dust, salt or metal powder. 3. Do not use** **the product in places exposed to water, oil or medicine dripping.**

2. Wiring

 **Danger**
1. Please ground the ground terminal reliably. Improper grounding may cause electric shock or fire. **2. Do not connect the 220V drive power supply to the 380V power supply. Otherwise, it may cause equipment damage, electric shock or fire.** **3. The motor output terminals U, V, W and the motor wiring terminals U, V, W must be connected one by one. Otherwise, the** **The machine may exceed the speed limit and cause equipment damage and casualties.** **4. Please tighten the power supply and motor output terminals, otherwise it may cause fire.**

3. Operation

Notice

1. Before the mechanical equipment starts to operate, it must be adjusted to the appropriate parameter setting value. If the appropriate setting value is not adjusted, 2. Before starting operation, please confirm whether the emergency switch can be activated at any time to stop the machine. 3. Please test whether the servo motor is operating normally without load first, and then connect the load to avoid unnecessary 4. Do not frequently turn the power on and off, otherwise it may cause overheating inside the driver.

4. Run

prohibit

1. When the motor is running, do not touch any rotating parts, otherwise it may cause casualties. 2. When the equipment is running, do not touch the driver and motor, otherwise it may cause electric shock or burns. 3. When the equipment is running, do not move the connecting cables, otherwise it may cause personal injury or equipment damage.

5. Maintenance and inspection

prohibit

1. Do not touch the inside of the driver and its motor, otherwise it may cause electric shock.

2. When the power is on, it is prohibited to disassemble the driver panel, otherwise it may cause electric shock.

3. Do not touch the wiring terminals within 5 minutes after the power is turned off, otherwise the residual high voltage may cause electric shock. 4. Do not change the wiring or disassemble the servo motor when the power is on, otherwise it will cause electric shock.

6. Scope of Use

Notice

The products covered in this manual are for general industrial use. Please do not use them in devices that may directly endanger personal safety.

Table of contents

Chapter 1 Product Inspection and Installation

1.1 Product Inspection

This product has been fully functional tested before leaving the factory to prevent product malfunctions due to negligence during delivery.

Please check the following items carefully after unpacking:

- **Check whether the servo drive and servo motor models are the same as the ones you ordered.**
- **Check whether the servo drive and servo motor have been damaged or scratched during transportation.**

Do not connect the wires to supply power.

- **Check whether there are any loose components in the servo driver and servo motor. Check whether there are any loose screws or not.**

Tight or falling off.

- **Check whether the servo motor rotor shaft can be rotated smoothly by hand. A motor with a brake cannot be rotated directly.**
- **Check whether the servo operating instructions are included.**
- **Check whether the driver accessories are included in the package.**

If there is any discrepancy between the product contents and the product description, please contact the agency where you purchased the product.

1.2 Product front panel

This panel description is applicable to models: TSD (TSE drive panel has the same functions)

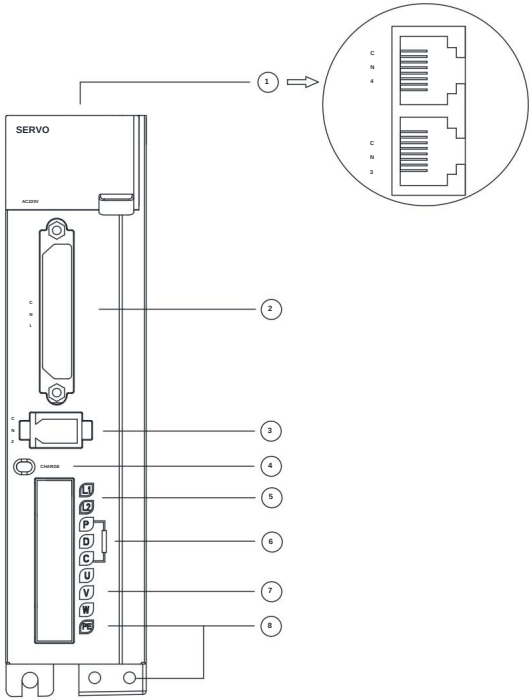


Figure 1.1 Servo drive front panel introduction

Terminal No. Name	Functional Description
ÿ CN3, CN4 485 communication terminals.	
ÿ CN1 ÿ	Input and output control signal terminals.
CN2 ÿ L1,	Encoder signal terminal, connected to the motor encoder.
L2	AC220V main power input terminal.
ÿ CHARGE	Bus voltage indicator. Used to indicate that the bus capacitor is in a charged state. Indicator When it is on, even if the main circuit power is turned off, the capacitor inside the servo unit may still have electricity. Therefore, do not touch the power terminal when the light is on to avoid electric
ÿ P,D,C,	shock. Braking resistor
ÿ U,V,W ÿ PE	connection terminal. Servo motor connection terminal. Connect the U, V,
	W phases of the servo motor. Grounding terminal. Connect to the power supply and motor grounding terminals for gro

1.3 Servo Installation

Method1.3.1 Driver Installation Method

- **Installation direction**

The normal installation direction of the servo drive is vertical.

- **Installation and fixation**

When installing, tighten the two M4 fixing screws at the rear of the servo drive.

- **Grounding**

Please make sure to ground the driver ground terminal, otherwise there may be a risk of electric shock or interference causing erroneous operation.

- **Line routing requirements**

When wiring the drive, please route the cables downward (see the figure below) to prevent liquids from flowing into the drive along the cables when attached to the cables.

- **Installation interval**

For the installation distances between the drivers and other devices, please refer to Figure 1.3. Note that the minimum dimensions are indicated on the figure.

To ensure the performance and life of the driver, please leave sufficient installation distance as much as possible.

Heat dissipation

The servo drive adopts natural cooling and forced heat dissipation.

- **Installation precautions**

When installing the electrical control cabinet, prevent dust or iron filings from entering the servo drive.

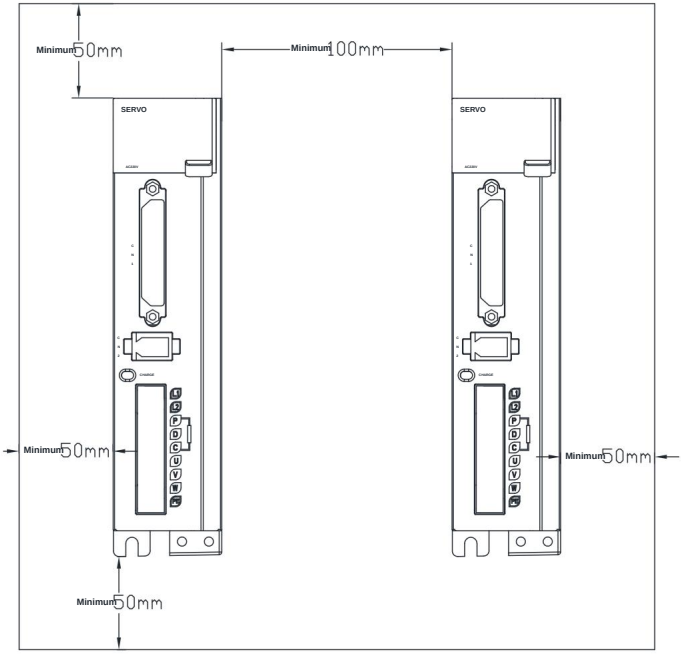


Figure 1.3 Installation interval

1.3.2 Installation environment conditions

• Working environment temperature: 0~40ÿ; Working environment humidity: below 80% (no condensation). • Storage environment temperature: -40~50ÿ; Storage environment humidity: below 80% (no condensation).

• Vibration: less than 0.5G.

• A well-ventilated place with little moisture and dust. • An environment without corrosive, flammable gas, oil gas, cutting fluid, cutting powder, iron powder, etc. • A place without water vapor and direct sunlight.

1.3.3 Motor Installation Method •

Horizontal installation: To prevent liquids such as water and oil from flowing into the motor from the motor outlet, place the cable outlet at Below.

• Vertical installation: If the motor shaft is installed upward and a reducer is attached, please pay attention to prevent the oil in the reducer from The dirt penetrates into the motor through the motor shaft.

• The extension of the motor shaft must be sufficient. If the extension is insufficient, the motor will easily vibrate when it moves. • When installing or removing the motor, do not hit the motor with a hammer, otherwise the motor shaft and encoder may be damaged.

1.3.4 Definition of motor rotation direction

The definition of motor rotation direction described in this manual is: facing the motor shaft, the rotating shaft rotates counterclockwise (CCW) for positive rotation. Rotating the shaft clockwise (CW) is reverse rotation.

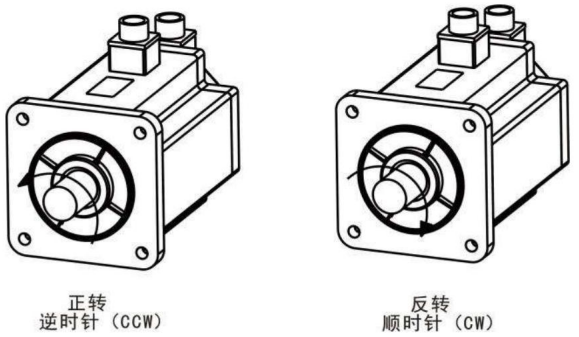


Figure 1.4 Definition of motor rotation direction

Chapter 2 Servo Specifications

2.1 TSD Servo Drive Specifications

model	TSD-040	TSD-075
Output Power	0.05KW~0.4KW	0.75KW~1KW
Main circuit input Power supply	Single Phase AC220V-15%~+10% 50/60Hz	
Control method	0: Position control mode; 1: Speed control mode; 2: Torque control mode; 3: Position and speed mixed mode Combined control mode; 4: Position torque mixed control mode; 5: Speed torque mixed control mode	
Protection function: overspeed/main power supply overvoltage/undervoltage/overcurrent/overload/encoder abnormality/control power supply		
abnormality/position deviation monitoring function: speed/current position/command pulse accumulation/position deviation/motor torque/motor current/operating		
Control Input	1: Servo enable 2: Alarm clear 3: CCW drive disable 4: CW drive disable 5: Deviation counter clear 6: Command pulse disable 7: CCW torque limit 8: CW torque limit	
Control output	Servo ready/servo alarm/positioning completed/mechanical brake	
energy consumption braking	supports built-in and	
Applicable load	external less than 3 times of motor inertia	
Display Operation	5-digit LED digital tube display, 4 operation buttons	
Communication	RS485	
Position Control	Input method	0: Pulse + direction
		1: CCW/CW pulse
		2: A/B two-phase orthogonal pulse
		3: Internal position control
	Input Electronics Gear Ratio	Gear ratio numerator: 1-32767 Gear
		ratio denominator: 1-32767

2.2 TSE Servo Drive Specifications

model	TSE-040	TSE-075	TSE-100
Output power 0.05KW~0.4KW		0.75KW	0.75KW-1KW
Main circuit Input power source	Single Phase AC220V-15%~+10% 50/60Hz		
Control method	0: Position control mode; 1: Speed control mode; 2: Torque control mode; 3: Position speed control mode 4: Position torque mixed control mode; 5: Speed torque mixed control mode Mode		
Protection function: overspeed/main power supply overvoltage/undervoltage/overcurrent/overload/encoder abnormality/control power supply			
abnormality/position deviation monitoring function: speed/current position/command pulse accumulation/position deviation/motor torque/motor current/operating			
Control Input	1: Servo enable 2: Alarm clear 3: CCW drive disable 4: CW drive disable 5: Deviation counter cleared 6: Command pulse prohibited 7: CCW torque limit 8: CW torque limit		
Control output	Servo ready/Servo alarm/Positioning completed/Mechanical brake		
Dynamic braking	Support built-in and external		
applicable load	Less than 3 times of the motor		
display operation	inertia 5-digit LED digital tube display, 4 operation buttons		
communication mode	RS485		
Position Control	Input method	0: Pulse + direction	
		1: CCW/CW pulse	
		2: A/B two-phase orthogonal pulse	
		3: Internal position control	
	Input Electronics Gear Ratio	gear ratio numerator: 1-32767	
		Gear ratio denominator: 1-32767	

2.3 TSD servo motor and servo drive adaptation table

Flange	model	power (IN)	Speed (rpm)	Adapter driver	Matching Encoder
60	60ST-CJ101330L5	400	3000	TSD-040	17-bit single turn absolute Pair Encoder
80	80ST-CJ102430L5	750	3000	TSD -075	
80	80ST-CJ103330L5	1000 3000		TSD -075	

2.4 TSE servo motor and servo drive adaptation table

Flange	model	Rate (IN)	Speed (rpm)	Adapter driver	Matching coding Device
60	60ST-CJ101330L5	400	3000	TSE-040	17-bit single-turn absolute Value Encoder
80	80ST-CJ102430L5	750	3000	TSE-100	
80	80ST-CJ102430L5A-B (Rated current 3.3A)	750	3000	TSE-075	

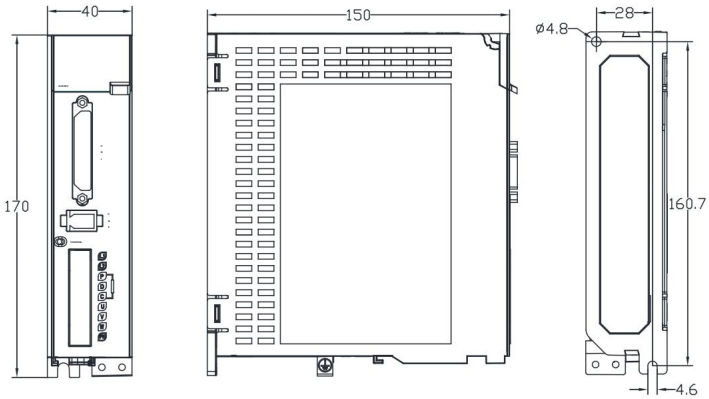
2.5 TSE Servo Drive Selection Table

Driver model 485 Communication function		Z signal	Analog voltage input function	Pulse function
TSEA040	none	none	none	have
TSEA075	none	none	none	have
TSEA100	none	none	none	have
TSEB040	have	have	have	have
TSEB075	have	have	have	have
TSEB100	have	have	have	have

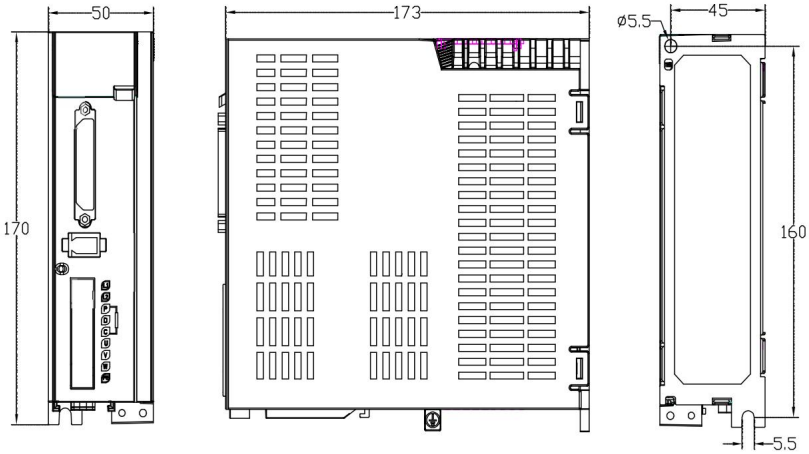
Chapter 3 Driver and Motor Dimensions

3.1 Driver Dimensions

TSD-040 Dimensions

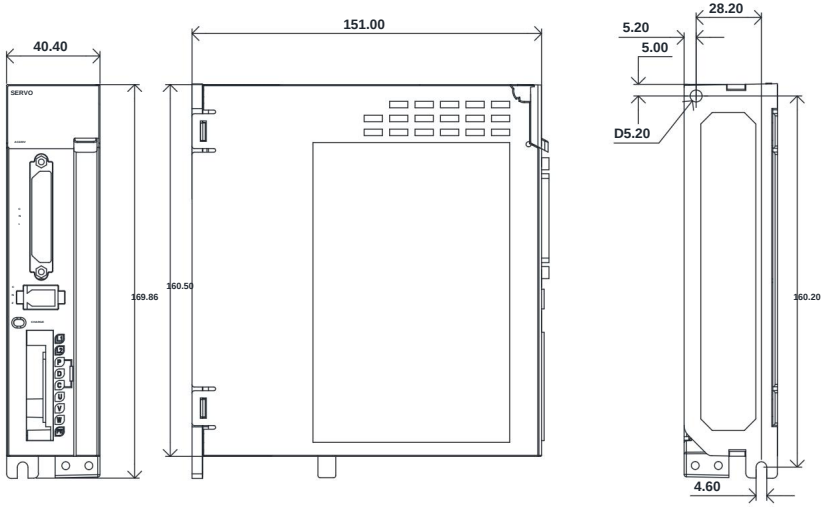


TSD-075 Dimensions

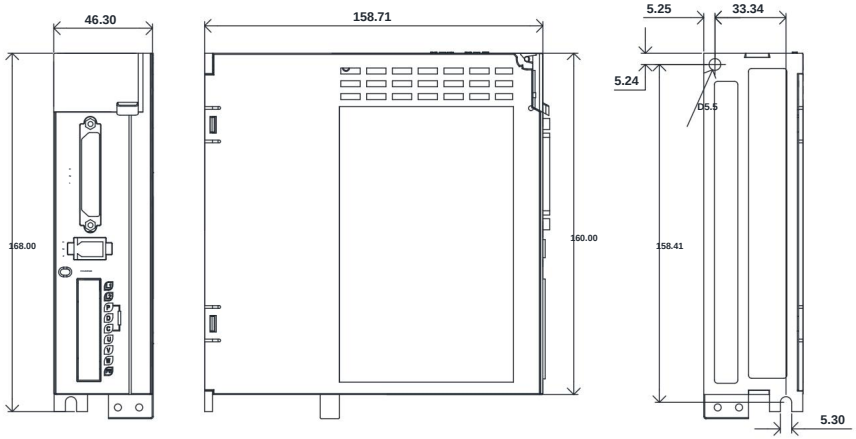


ÿTSD-040 driver does not have a cooling fan.

TSE-040 Dimensions:



TSE-075/TSE-100 Dimensions:



ÿ TSE-040 driver does not have a cooling fan.

3.2 Motor size

• Installation dimensions of 60 flange motor (see Figure 3.2 and Table 3-1)

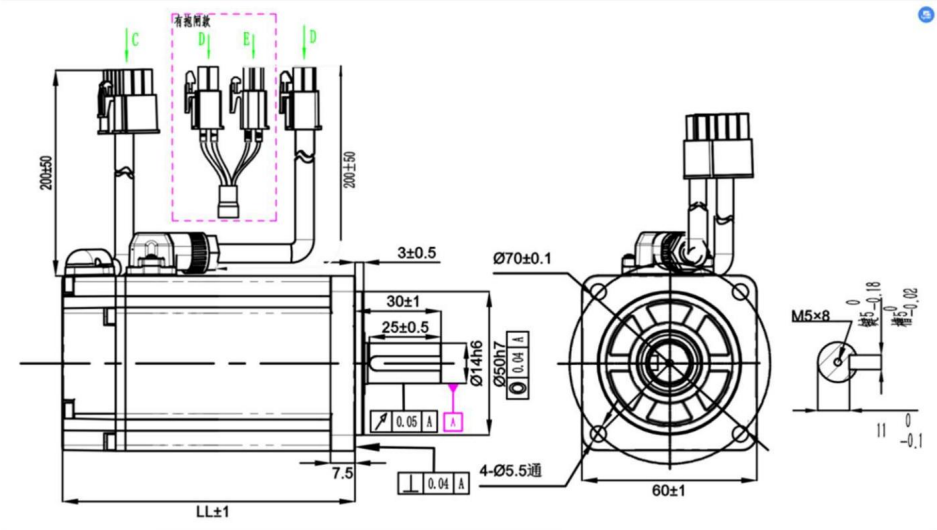


Figure 3.2 60 motor and Table 3-1

model	LL (mm) Brake		Encoder
60ST-CJ101330L5	96	none	17-bit single-turn absolute value
60ST-CJ101330L5Z	134	have	17-bit single-turn absolute value

• 80 flange motor installation dimensions (see Figure 3.3 and Table 3-2)

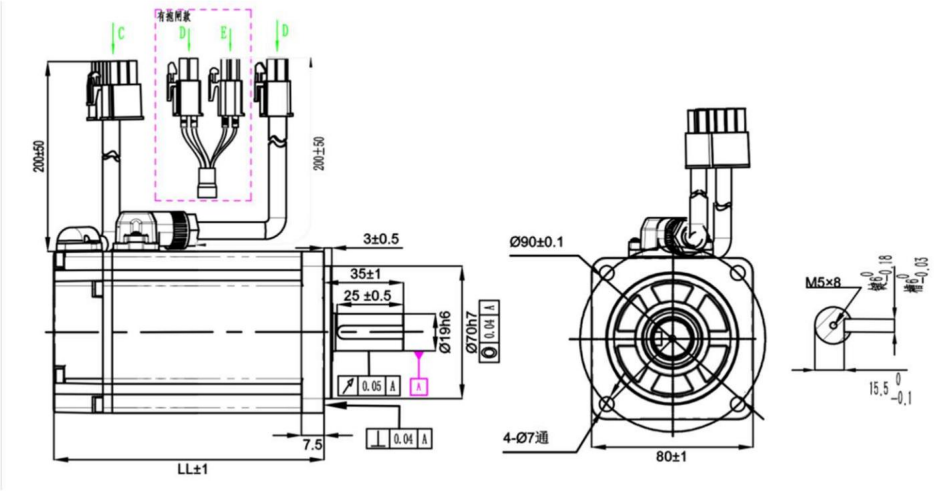


Figure 3.3 80 motor and Table 3-2

model	LL (mm) Brake		Encoder 17-
80ST-CJ102430L5	106	none	bit single-turn absolute
80ST-CJ102430L5Z	145	have	value 17-bit single-turn absolute value

Chapter 4 Driver System Wiring and Composition

4.1 Servo system wiring 4.1.1

Servo drive wiring diagram

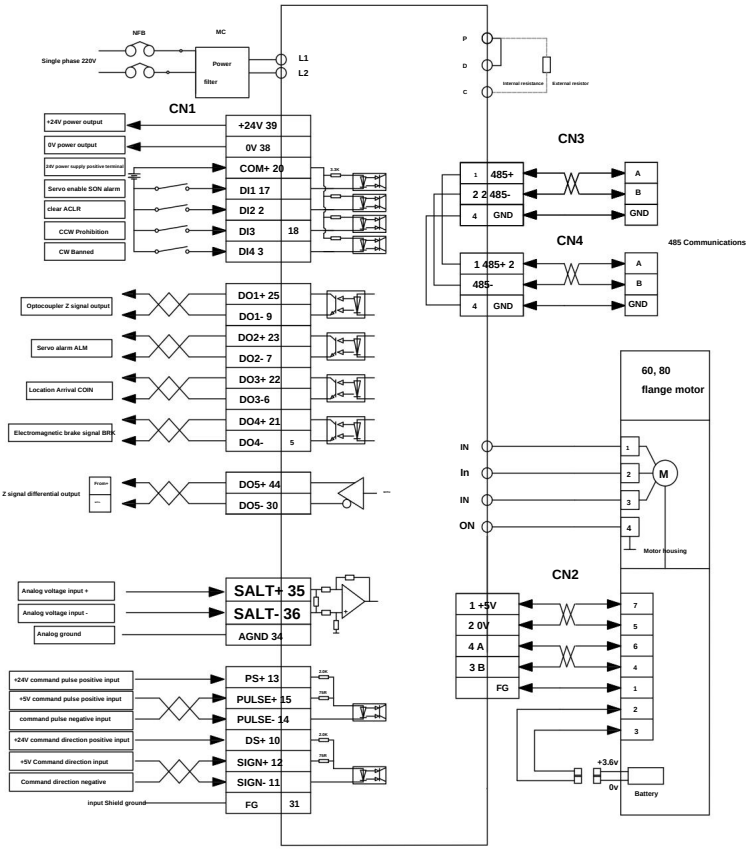


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Figure 4.1 Servo system wiring diagram

4.1.2 Wiring Instructions

Wiring precautions: ÿ

Cable length, control line length within 3m, encoding line length within 20m. ÿ Check whether the

power supply of L1 and L2 is connected to single-phase 220VAC. Do not connect to 380VAC power supply. ÿ The phase

sequence of the motor output U, V, W terminals must correspond to the corresponding terminals of the driver. If the connection is

wrong, the motor may not rotate or may run away. You cannot use the method of replacing the three-phase terminals to reverse the motor. This is di

ÿ

Since the servo motor flows through high-frequency switching current, the leakage current is relatively large. The motor

ground terminal must be connected to the servo drive ground

terminal PE and grounded well. ÿ The direction of the diode used for absorption installed in the output signal relay must

be connected correctly,

otherwise it will cause malfunction and fail to output the signal. ÿ To prevent erroneous operation caused by noise,

please add insulation transformers and noise filters to the power supply. ÿ Please keep the power line (motor line, power line, etc.) and

Wire,

Do not place them in the same wiring

conduit. ÿ Please install a non-fuse circuit breaker to cut off the external power supply in time

when the driver fails. ÿ Because the servo driver has a large-capacity electrolytic capacitor inside, even if the power is

cut off, there is still high voltage in the internal circuit. After cutting off the power, wait at least 5 minutes before touching the driver and

4.1.3 Wire specifications

Connection Terminals	symbol	Wire specifications
Main circuit power	L1, L2	1.5~4mm2
supply motor connection	UÿVÿW	1.5~4mm2
terminal ground terminal	⏚	1.5~4mm2
Control signal terminal	CN1	ÿ0.14mm2(AWG26), including shielded wire
Encoder signal terminal	CN2	ÿ0.14mm2(AWG26), including shielded wire
Braking resistor terminals	PÿD/PÿC	1.5~4mm2

ÿ The encoder cable must use twisted pair. If the encoder cable is too long (>20mm), it will cause

The encoder power supply is insufficient, and its power and ground wires can be connected by multi-wires or use thick wires.

4.2 Servo drive main circuit connection 4.2.1

Introduction to main circuit terminals

Figure 4.3 Main circuit terminal pin layout

name	Terminal Symbols	Detailed description
Main circuit power input terminals L1, L2	single-phase 220VAC -15%~+10%, 50/60Hz	
Braking resistor terminals	P, D	When using the internal braking resistor, short-circuit P and D.
	PýC	When using an external braking resistor, short-circuit P and D and disconnect them. Connect the external braking resistor wires between P and C respectively.
Motor connection terminals	U, V, W	are connected to the U, V, W phases of the servo motor.
	⏚	The driver ground terminal is connected to the power supply and motor ground terminal. catch.

ÿ The factory default internal braking resistor connection method is: P and D are short-circuited.

4.2.2 Braking resistor wiring instructions

If the internal braking resistor is used, the driver needs to short-circuit P and D, that is, it can be used normally according to the factory state.

When using an external braking resistor, you must first remove the short circuit between P and D, and then connect the external braking resistor across P and C.

Precautions for wiring the brake resistor:

ÿ Do not make the resistance less than the minimum allowable resistance of 30ÿ, otherwise it will cause the driver to alarm or damage the driver; ÿ Please install the external brake resistor on non-combustible materials such as metal.

4.3 CN1 control signal terminal

4.3.1 Description of CN1 control signal terminal

CN1 control signal terminal provides the signal required to connect with the upper controller, using DB44 socket, signal package include:

ÿ 4 programmable inputs ÿ 4 programmable outputs ÿ Analog command input ÿ Command pulse input

4.3.2 CN1 terminal connector pinout

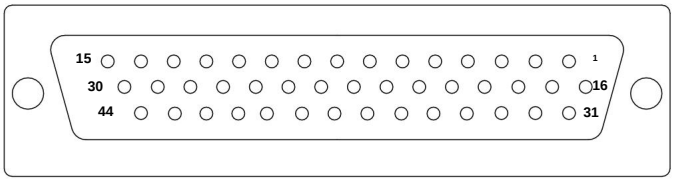


Figure 4.5 Driver CN1 terminal pin diagram

4.3.3 Description of position command input signal

Signal Name Pin Number			Function
Position pulse Rush instruction	PULSE+	15	High-speed photoelectric isolation input, parameter PA14 sets the working mode: ÿ Pulse + direction ÿ CCW/CW pulse ÿ A, B two-phase orthogonal pulse input ÿ Internal position control input
	PULSE-	14	
	SIGN+	12	
	SIGN-	11	
	PS+	13	External 24V power input interface for command pulse/direction
	DS+	10	

The command pulse output circuit on the host device side can be selected from two types: differential driver output or open collector output.

The maximum input frequency and minimum pulse width are shown in the following table:

Pulse mode	Maximum frequency (pps)	Minimum pulse width (us)

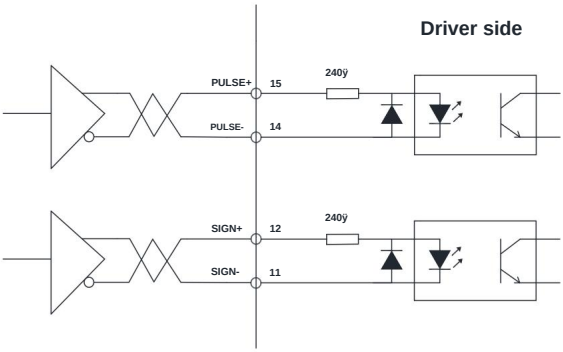
	500k	1
Differential open collector	200k	2.5

ÿ If the pulse width output by the host device is less than the minimum pulse width value, the driver will receive pulse errors. ÿ The ports between PULS+ and PULS- and between SIGN+ and SIGN- only support signal levels below 5V.

Input, if the signal exceeds 5V, an external resistor must be connected in series, otherwise the driver will be damaged.

Pulse command input circuit diagram

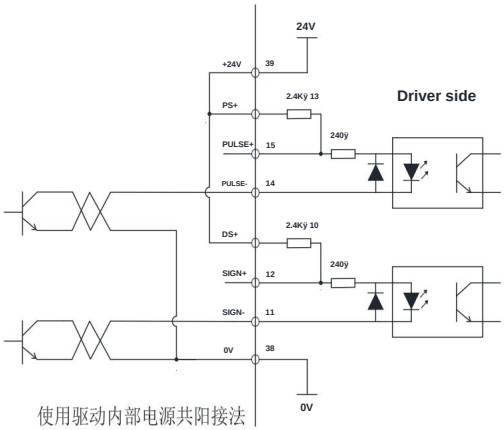
1) When using differential mode



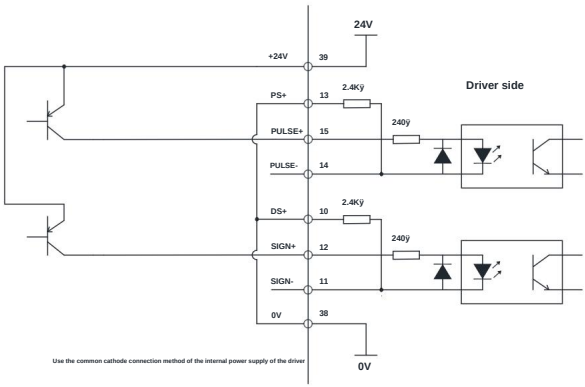
2) When the collector is open

A) When using the servo drive's internal 24V power supply:

ÿ Common anode connection, such as Mitsubishi PLC.



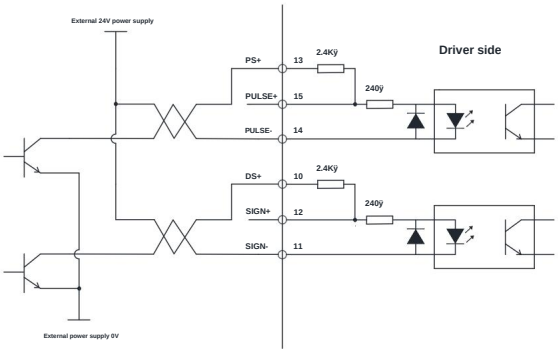
ÿ Common cathode connection: for example: Siemens PLC.



B) When using an external power

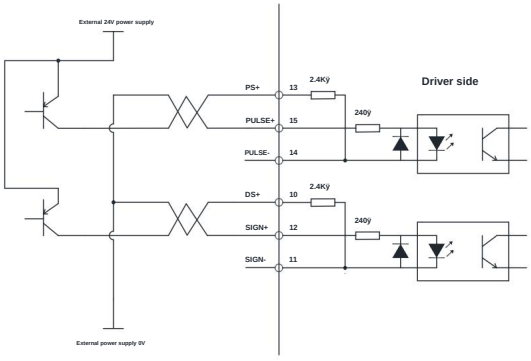
supply: Solution 1: Use the internal resistor of the driver (recommended

solution) ÿ Common anode connection:



Use external power supply common anode connection

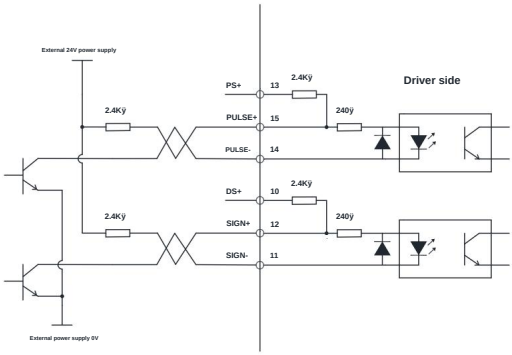
ÿ Common cathode connection:



Use external power supply common cathode connection

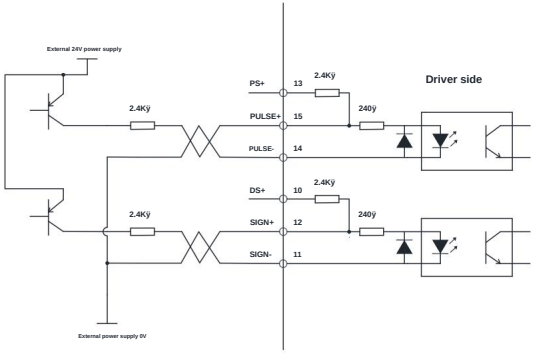
Solution 2: Use external resistors of the driver.

ÿ Common anode connection:



Use external power supply common anode connection

ÿ Common cathode connection:



Use external power supply common cathode connection

4.3.4 Description of digital input and output signals

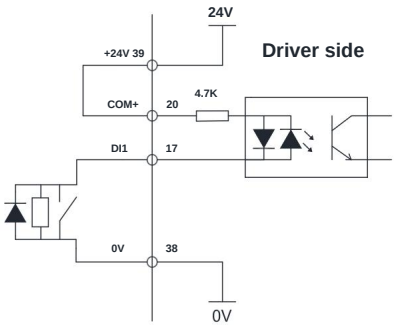
Signal Name	Pin Number	Default Function 17 Servo	illustrate
number enter	DI1	Enable 2 Alarm Clear	Opto-isolated input, programmable function, set by P3 group parameter Note: COM+ port It is a common anode or common cathode interface, and the input level is 12V-24Vÿ
	DI2	Forward Drive	
	DI3	18 prohibit	
	DI4	3 Reverse drive prohibit	
	PULSE-	14 In position mode (Internal location mode) and non In position mode	
	PULSE+	15	
	PS+	13	
	SIGN-	11	
	SIGN+	12	

	DS+	10		
	COM+ 20		Digital input signal Public terminal	
Digital Output	DO1+ 25		Z signal output	Opto-isolated output, programmable function, set by P3 group parameters Numbers P3-20~P3-23 are defined.
	DO1-	9		
	DO2+ 23		Alarm output	
	DO2-	7		
	DO3+ 22		Positioning completed	
	DO3-	6		
	DO4+ 21		Electromagnetic brake	
	DO4-	5		
Internal Isolation Power Output	0V	38 Internal 0V Internal isolated 24V power output, voltage range		
	+24V	39 Internal 24V 20V~28V, maximum output current 100mA.		

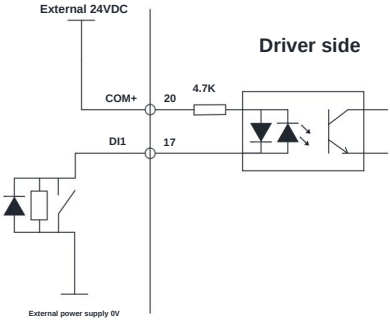
ÿDigital input circuit diagram

Take DI1 as an example. The interface circuits of DI1~DI4 are the same. 1) When the host device is a relay output

A) When using the internal 24V power supply of the servo drive:

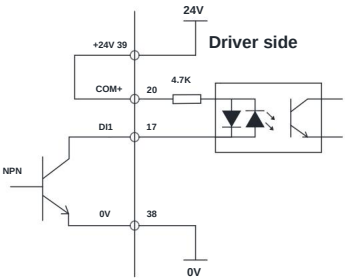


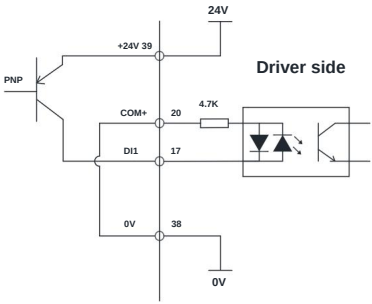
B) When using an external 24V power supply:



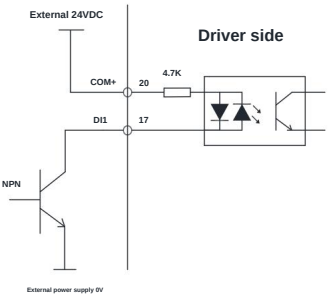
2) When the host device is open collector output

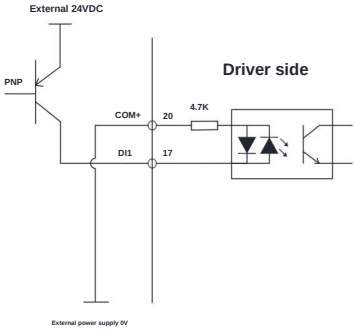
A) When using the servo drive's internal 24V power supply:





B) When using an external 24V power supply:





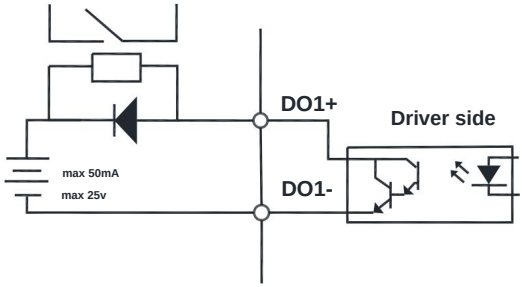
ÿ Note:

Mixing of PNP and NPN inputs is not supported.

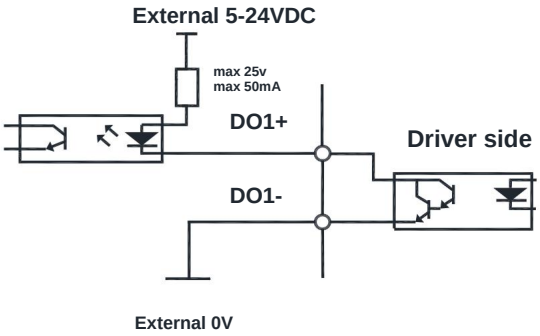
ÿDigital output circuit diagram

Take DO1 as an example. The interface circuits of DO1~DO4 are the same. 1)

When the host device is a relay input:



2) When the host device is optocoupler input:



When the host device is a relay, be sure to connect a freewheeling diode, otherwise the DO port may be damaged or strong signal interference may occur.

The maximum allowable voltage and current capacity of the internal optocoupler output circuit of the servo drive are as follows:

Voltage: DC30V

Current: DC50mA

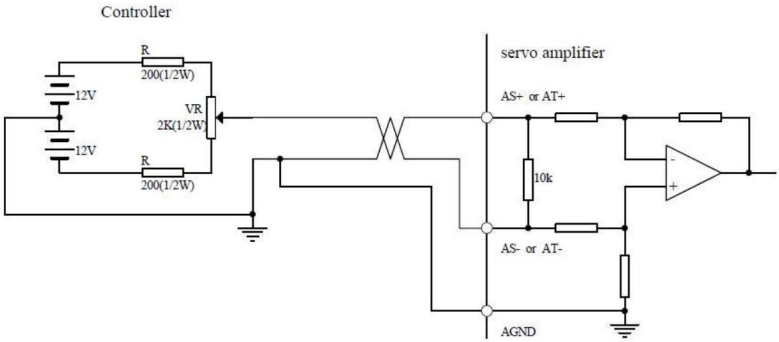
4.3.5 Description of analog command signal

Signal Name	Pin number	Function

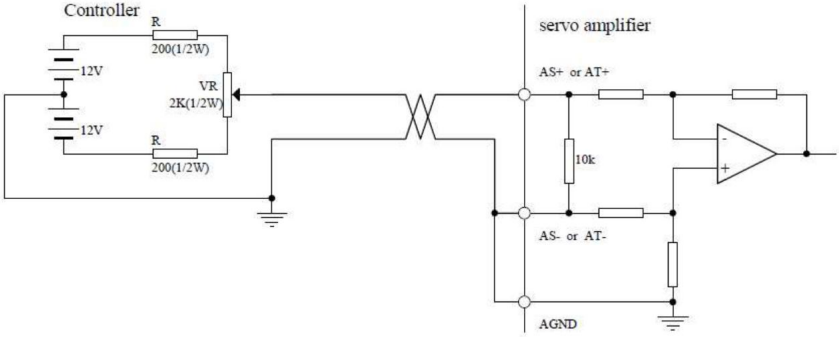
Simulation finger Command input	AS+ÿAT+	35	
	AS-ÿAT-	36	Speed/rotation speed analog input, range: -10V~+10V.
	AGND	34	

Schematic diagram of pulse command input interface

There are two connection methods: differential input and single-ended input. Differential input is recommended. Speed and torque share one analog Input, input range: -10V~+10V, input impedance is about 10Kÿ. It is normal for analog input to have zero offset, which can be Parameters are compensated. 1) When analog differential input



2) When analog single-ended input



4.3.6 Brake Wiring Instructions The

brake is used to prevent the servo motor shaft from moving when the servo drive is not in operation, so that the motor remains in position.

A mechanism that prevents the moving parts of a machine from moving due to its own weight or external forces.

Brake signal circuit diagram

Brake wiring The connection of the brake input signal has no polarity, and the user needs to prepare a 24V power supply.

The standard wiring example of the brake power supply is as follows:

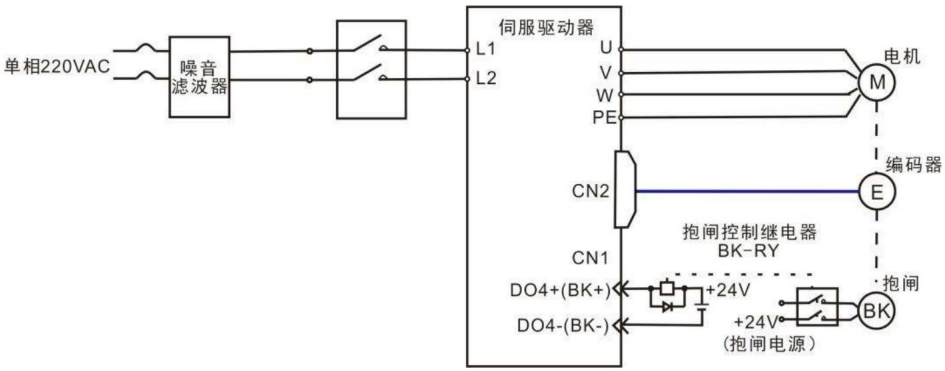


Figure 4.6 Brake signal wiring diagram

Note: ÿ

The brake mechanism built into the servo motor is a fixed dedicated mechanism that is not powered on and cannot be used.

For braking purposes, it is only used to keep the servo motor in a stopped state.

ÿ The brake coil has no polarity. ÿ After the

servo motor stops, the servo on signal (Servo On) should be turned off. ÿ When the motor with a built-in brake

is running, the brake may make a clicking sound, but it has no functional effect. ÿ When the brake coil is energized (brake open state),

magnetic flux leakage may occur at the shaft end and other parts.

Please be careful when using instruments such as magnetic sensors near motors.

ÿ The brake is prohibited from sharing power with other electrical appliances to prevent voltage or

The current decreases, eventually causing the brake to malfunction.

ÿ It is recommended to use cables with a diameter of 0.5mm² or above.

4.4 CN2 encoder signal terminal 4.4.1

CN2 terminal plug diagram CN2

encoder signal terminal and motor encoder connection diagram.

The terminal for connecting the encoder uses a 1394 socket, and its appearance and pin distribution are as follows:

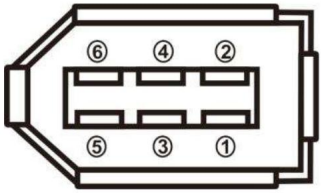


Figure 4.7 CN2 encoder signal terminal

4.4.2 Encoder terminal signal description

Signal Name		Pin number	Function
Encoder signal power supply	5V	1	The encoder uses a 5V power supply (provided by the driver). The cable is
	0V	2	To prevent the encoder voltage from decreasing when the The source and ground wires can be connected in multiple wires or with thick wires.
Absolute encoder communication positive terminal SD+		4	Absolute encoder communication positive terminal
Absolute encoder communication negative terminal SD-		3	Absolute encoder communication negative terminal
Empty Edge	NC	5.	Retention
Empty Edge	NC	6.	Retention
Shielded wire protection ground plug metal shell connected to the encoder wire shield			

4.5 CN3 and CN4 communication interface

4.5.1 Communication port wiring diagram

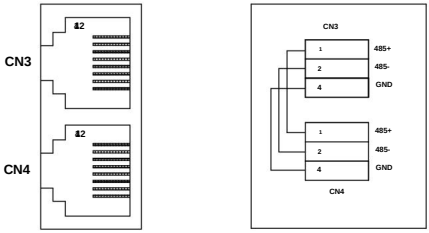


Figure 4.8 Communication port wiring diagram

4.5.2 Communication port pin definition

Pin No. CN3		name	CN4	name
1	RS485+	RS485 communication	RS485+	RS485 communication
2	RS485 -	interface	RS485 -	interface
3	NC	Vacant	NC	Empty Edge
4	GND	end 485 Signal area	GND	485 Signal area
5	NC	Empty Edge	NC	Empty Edge
6	NC	Empty Edge	NC	Empty Edge
7	NC	Empty	NC	Empty Edge
8	NC	end Empty end	NC	Empty Edge

Notice:

ÿ It can be connected to a PC or host controller via a dedicated serial cable. It is forbidden to plug or unplug it while it is powered on.

ÿ It is recommended to use twisted pair or shielded wire with a length of less

than 2 meters. ÿ When multiple machines are connected in series, CN3 is connected to CN4 of the previous driver, and CN4 is

connected to CN3 of the next driver. ÿ When using RS485 bus communication, when the 485 signal ground of the host computer is connected to the earth (PE

Please connect the PE terminal of the host computer to the driver terminal by a reasonable grounding method.

It is forbidden to connect the host computer 485 signal ground to the driver 485 signal ground (GND). Otherwise

Possible damage to the driver

4.5.3 485 communication network connection instructions

When 485 communication networking is used, the connection cables for multiple servo drives in parallel are as follows:

When using RS485 communication, the connection example between the GND terminal of the host device and the GND terminal of the servo drive is as follows:

As shown in the figure:

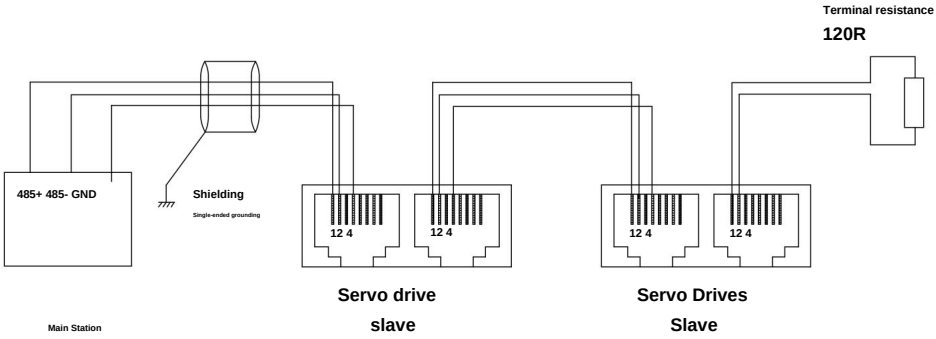


Figure 4.11 Schematic diagram of 485 communication connection

Note: ÿ

PLC has built-in 485 communication terminal resistor. ÿ It is

recommended to ground the shield layer at one end. ÿ Do not connect

the GND terminal of the host device to the 0V terminal of the servo drive, otherwise it will be damaged.

machine.

4.6 Anti-interference measures for power wiring

To suppress interference, please take the following measures:

ÿ The length of the command input cable should be less than 3m, and the encoder cable should be less than 20m. ÿ For

grounding wiring, use thick wire as much as possible. (2.0mm² or more)

ÿ Please use a noise filter to prevent radio frequency interference. Use in a civilian environment or in an environment with strong power interference.

ÿ To prevent erroneous operation caused by electromagnetic interference, you

can use the following treatment methods: 1) Install the host device and noise filter as close to the servo drive as

possible. 2) Install surge suppressors on the coils of relays, solenoids, and electromagnetic contactors. 3) Separate

strong current lines from weak current lines when wiring, and keep a distance of more than 30cm. Do not put them in

the same pipe or

4) Do not share the

power supply with welding machines, electrical discharge machining devices, etc. If there is a high-frequency generator nearby, please

Install a noise filter on the input side.

4.6.1 Anti-interference wiring example and grounding

treatment 1. Anti-interference wiring example

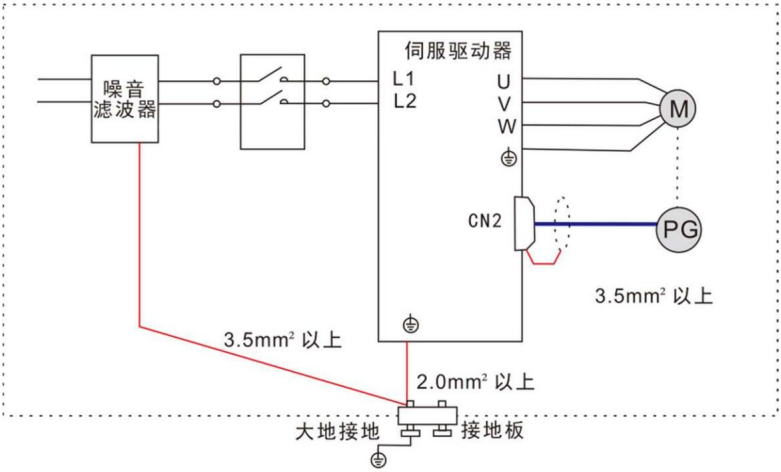


Figure 4.12 Anti-interference wiring example

ÿ For the outer box connection wire used for grounding, use a thick wire of 3.5mm² or more, and braided copper wire

is recommended. ÿ When using a noise filter, please follow the precautions described in the following "How to use the noise filter".

2. Grounding

To avoid possible electromagnetic interference problems, please ground as follows.

1) For grounding of the servo motor

housing, please connect the grounding terminal of the servo motor with the grounding terminal PE of the servo drive and connect the PE terminal to the

2) Grounding of the encoder cable shielding layer

Please ground both ends of the motor

encoder cable shielding layer.

4.6.2 How to use the noise filter

To prevent interference from the power line and reduce the impact of the servo drive on other sensitive devices, please adjust the input current according to the size of the input current.

Use appropriate noise filters at the power input. In addition, please install noise filters at the power lines of peripheral devices as needed.

Please observe the following precautions when installing and wiring the noise filter to avoid weakening the actual use effect of the filter.

ÿ Please lay out the noise filter input and output wiring separately. Do not put them in the same pipe or bundle them together.

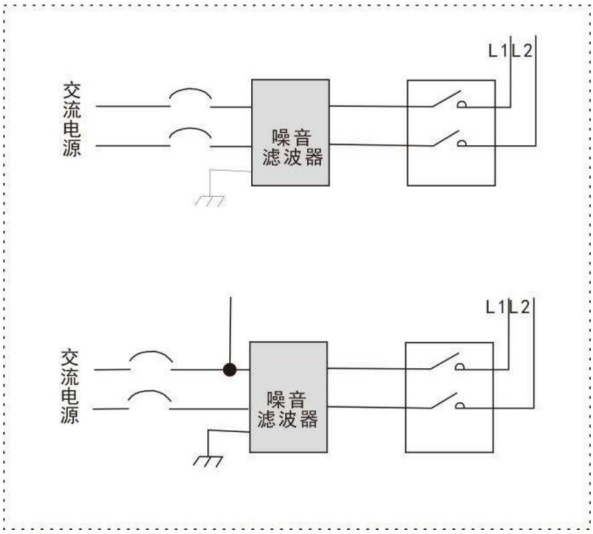


Figure 4.13 Example of separate wiring for noise filter input and output

ÿ Separate the ground wire of the noise filter from its output power wire.

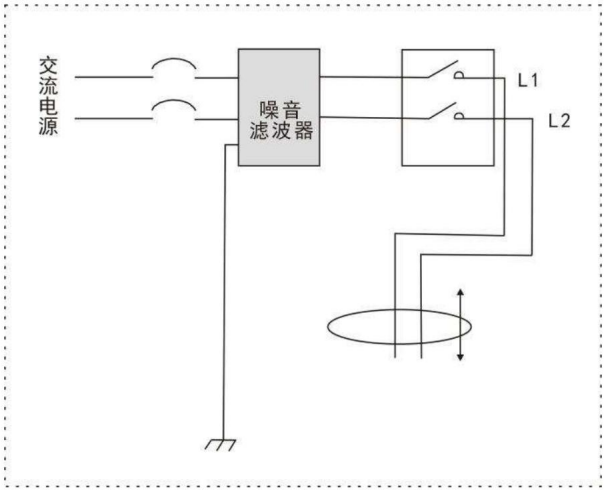


Figure 4.14 Schematic diagram of the separation of the noise filter ground wire and the output wiring

ÿ The noise filter should be grounded separately using a thick wire that is as short as possible. Do not share the same ground wire with other grounding devices.

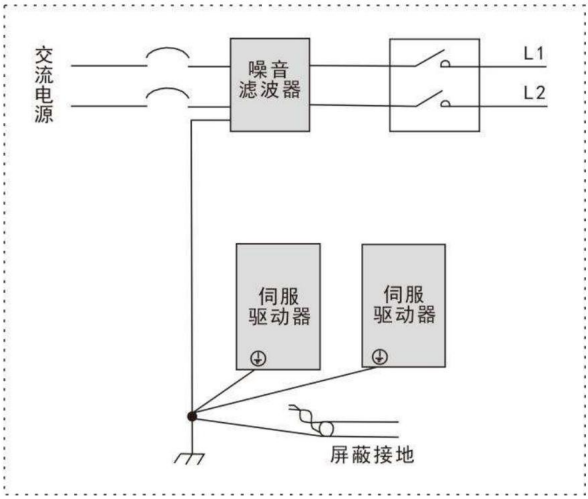


Figure 4.15 Schematic diagram of single-point grounding

ÿ Grounding of the noise filter installed in the control cabinet.

When the noise filter and the servo drive are installed in the same control cabinet, it is recommended to fix the filter and the servo drive in the sam

On a metal plate, ensure that the contact part is conductive and has good overlap, and ground the metal plate.

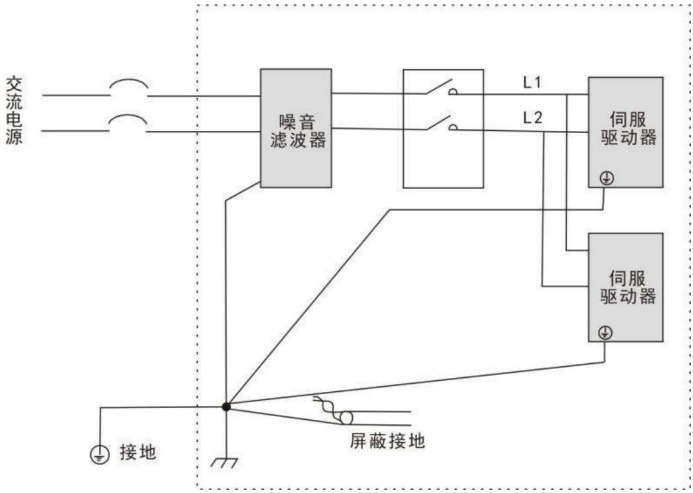


Figure 4.16 Schematic diagram of noise filter ground wire processing

Chapter 5 Operation Mode and Control Wiring Diagram

According to the command mode and operation characteristics of the servo drive, it can be divided into three operation modes: position control operation mode, Speed control operation mode and torque control operation mode, etc. ÿ

Position control mode generally determines the displacement of movement by the number of pulses, and the external input pulse frequency determines the rotation Since the position mode can strictly control the position and speed, it is generally used in positioning devices. It is the most widely used control mode for servo applications, mainly used in manipulators, placement machines, engraving and milling, CNC machine tools, etc. ÿ Speed control mode is to control the rotation speed through analog quantity setting, digital quantity setting, and communication setting, and is mainly us Some constant speed occasions. For example, in engraving and milling machine applications, the host computer adopts position control mode and the servo drive adopts speed control mode. ÿ The torque control mode controls the torque size through analog quantity setting, digital quantity setting, and communication setting. It is ma In winding and unwinding devices that have strict requirements on the material's stress, such as winding devices or fiber optic pulling equipment, etc. In control situations, the torque setting should be changed at any time according to the change of winding radius to ensure that the force on the material will not change with the winding. The radius changes.

5.1 Position Control Mode 5.1.1

Position Mode Description

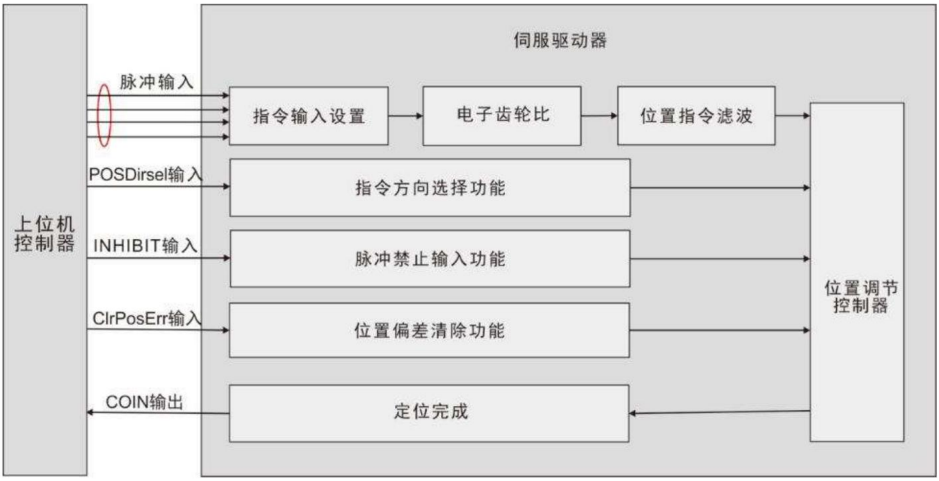


Figure 5.1 Block diagram of position control mode

Position mode is a common working mode of servo drives. Its main usage steps are as follows: 1) Correctly connect the power supply of the servo main circuit and control circuit, as well as the motor power line and encoder line.

If the display on the panel shows " r 0 ", it means that the servo power supply and encoder wiring are correct. 2) Press the button to perform the servo JOG test run to confirm whether the motor can operate normally. 3) Refer to Figure 5.2 for wiring instructions to connect the pulse direction input and pulse command input in the CN1 terminal and the re DI/DO signals, such as servo enable, alarm clear, positioning completion signal, etc. 4) Perform position mode related settings. Set the DI/DO used according to the actual situation. 5) Enable the servo and control the rotation of the servo motor by sending position commands through the host computer. First, make the motor rotate at a low speed, and confirm whether the rotation direction and electronic gear ratio are normal, and then adjust the gain.

5.1.2 Position Mode Wiring

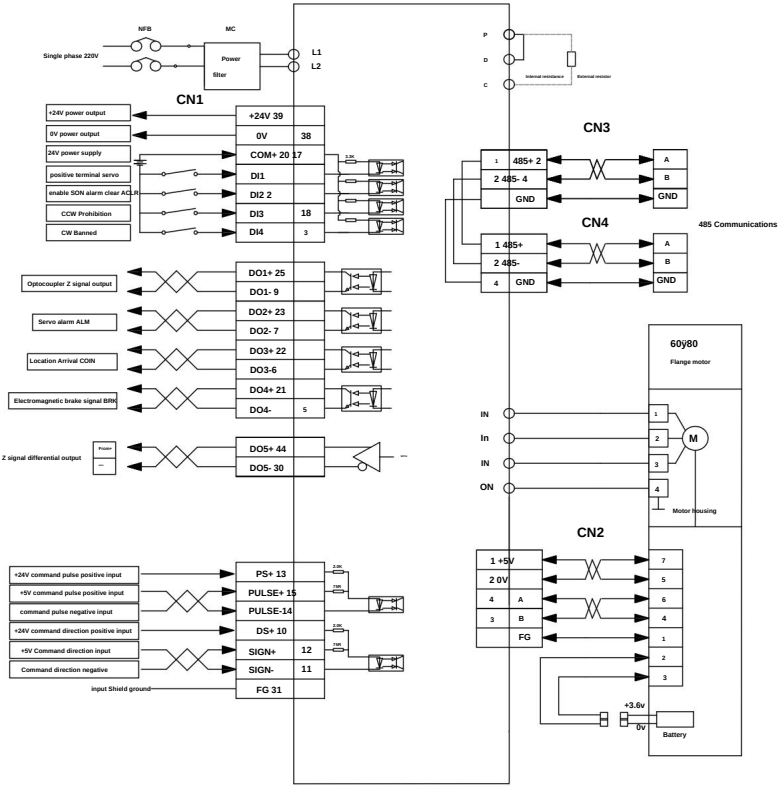


Figure 5.1.2 Position mode wiring diagram

The internal +24V power supply voltage range is 20V~28V, and the maximum operating current is 100mA.

24V power supply, please connect the external power supply +24V to pin 20 (COM+).

5.1.3 Parameters that need to be adjusted in position control

mode ÿ Gain and smoothing filter parameter adjustment

Required parameters	Parameter Description	Parameter Value	Factory default value
PA4	Control mode selection	0	0
PA9	Position proportional gain	1-1000	80
PA19	Position command smoothing filter	0-1000×0.1ms	100
PA100	Command filter selection	0-1	0

ÿ DI input related parameter adjustment

Required parameters	Parameter Description	Parameter Value	Factory default value
PA11	The number of command pulses for the motor to rotate 1 circle	0-30000	10000
PA12	Position command pulse electronic gear first numerator	1-32767	0
PA13	Position command pulse electronic gear denominator	1-32767	10000
PA14	Position command pulse input mode	0-3	0
PA15	Position command pulse direction is reversed	0-1	0
PA59	Command pulse effective edge	0-1	0
PA77	Position command pulse electronic gear ratio second numerator	1-32767	0
PA78	Position command pulse electronic gear ratio third numerator	1-32767	0
PA79	Position command pulse electronic gear ratio fourth numerator	1-32767	0
PA80	Command direction signal effective level	0-1	0
PA81	Command pulse PULS signal filtering	0-15	4
PA82	Command pulse SIGN signal filtering	0-15	4

ÿ DO output related parameter adjustment

Required parameters	Parameter Description	Parameter Value	Factory default value

PA16	Positioning completion range	0-3000 pulses	130
PA17	Position out-of-tolerance range detection	0-30000×100 Pulse 6000	
PA18	Position error invalid	0-1	0
PA83	CWL, CCWL direction prohibition mode	0-1	0
PA84	Positioning completion hysteresis	0-32767	65
PA85	Positioning proximity range	0-32767	6500
PA86	Positioning proximity hysteresis	0-32767	650

ÿInput and output terminal related parameter adjustment

Required parameters	Parameter Description	Parameter Value	Factory default value
PA55	Input terminal effective level control word	0000-1111	0000
PA57	Output terminal effective level control word	0000-1111	0000
PA58	IO input terminal debounce time constant	1-20ms	2
P3-0	Digital input DI1 function	0-99	1
P3-1	Digital input DI2 function	0-99	2
P3-2	Digital input DI3 function	0-99	3
P3-3	Digital input DI4 function	0-99	4
P3-15	Digital input DI forced valid 1	00000000-11111111 00000000	
P3-16	Digital input DI forced valid 2	00000000-11111111 00000000	
P3-17	Digital input DI forced valid 3	00000000-11111111 00000000	
P3-20	Digital output DO1 function	0-99	18
P3-21	Digital output DO2 function	0-99	3
P3-22	Digital output DO3 function	0-99	5
P3-23	Digital output DO4 function	0-99	8

ÿ Internal position Pr mode position command description and related parameters

The source of the Pr position command is the 8 groups of built-in position command registers using parameters (P4-2, P4-3) - (P4-23, P4-24).

With external I/O (CN1, POS0-POS 2 and CTRG), one of the eight groups can be selected as the position command.

make:

Location Order	POS2	POS1	POS0	CTRG		Corresponding parameters	illustrate	Movement Speed register
P1	0	0	0	ÿ		P4-2 Number of turns (+/-30000)		P4-4
						P4-3 Pulse (+/-max cnt)		(V1)
P2	0	0	1	ÿ		P4-5 Number of turns (+/-30000)		P4-7
						P4- 6 pulses (+/-max cnt)		(V2)
P3	0	1	0	ÿ		P4-8 Number of turns (+/-30000)		P4-10
						P4-9 Pulse (+/-max cnt)		(V3)
P4	0	1	1	ÿ		P4-11 Number of turns (+/-30000)		P4-13
						P4-12 pulse (+/-max cnt)		(V4)
P5	1	0	0	ÿ		P4-14 Number of turns (+/-30000)		P4-16
						P4-15 Pulse (+/-max cnt)		(V5)
P6	1	0	1	ÿ		P4-17 Number of turns (+/-30000)		P4-19
						P4-18 Pulse (+/-max cnt)		(V6)
P7	1	1	0	ÿ		P4-20 Number of turns (+/-30000)		P4-22
						P4-21 Pulse (+/-max cnt)		(V7)
P8	1	1	1	ÿ		P4-23 Number of turns (+/-30000)		P4-25
						P4-24 Pulse (+/-max cnt)		(V8)

The status of POS0-2: 0 represents the contact is open, 1 represents the contact is closed.

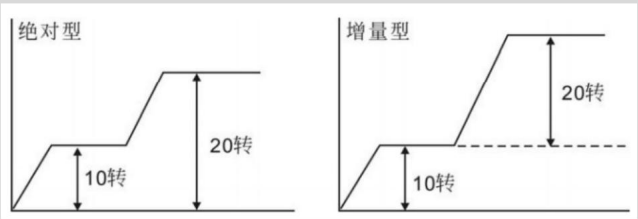
CTRG

ÿ represents the moment when the circuit changes from open circuit (0) to open circuit (1). max represents the command pulse for the motor to make one revolution.

Absolute position registers are widely used, which is equivalent to a simple program control.

The above table can be used to easily complete periodic operation. For example, position command P1 = 10 revolutions, P2 = 20

Transfer, first release the position



5.2 Speed Control Mode

5.2.1 Speed Mode Description

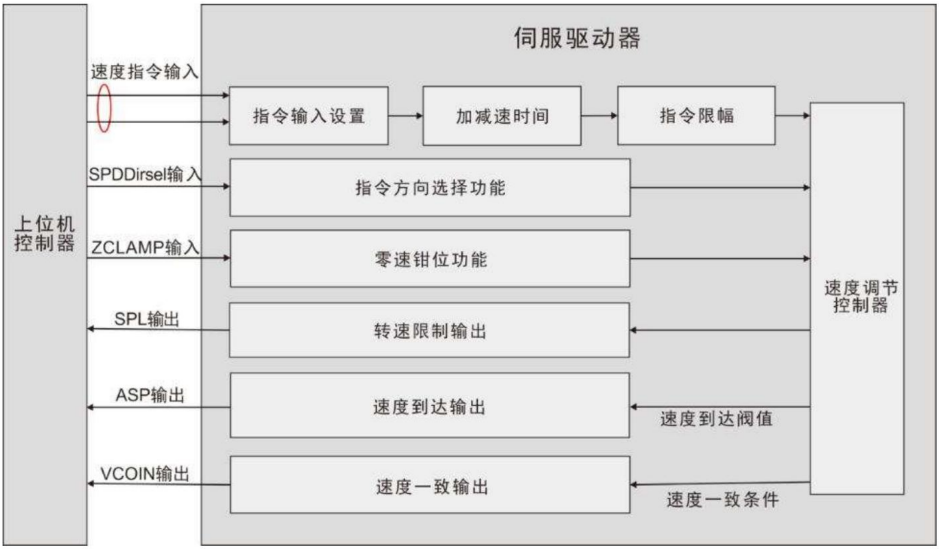


Figure 5.3 Speed control mode block diagram

The main steps of using speed mode are as follows:

1) Connect the power supply of the servo main circuit and control circuit, as well as the motor power line and encoder line correctly.

If **the display on the panel shows "r 0", it means that the servo power supply and**

encoder wiring are correct. 2) Press the button to perform the servo JOG test run to confirm

whether the motor can operate normally. 3) Refer to Figure 5.4 for wiring instructions to connect the required DI/DO signals in the CN1 terminal, such as servo enab

Positioning completion

signal, etc. 4) Set the speed mode. Set the DI/DO used according to the actual situation. 5) Servo enable,

control the servo motor to rotate by sending position instructions through the host computer. First, make the motor rotate at a low speed and make sure

Confirm whether the rotation direction and electronic gear ratio are normal, and then adjust the gain.

5.2.2 Speed Mode Wiring

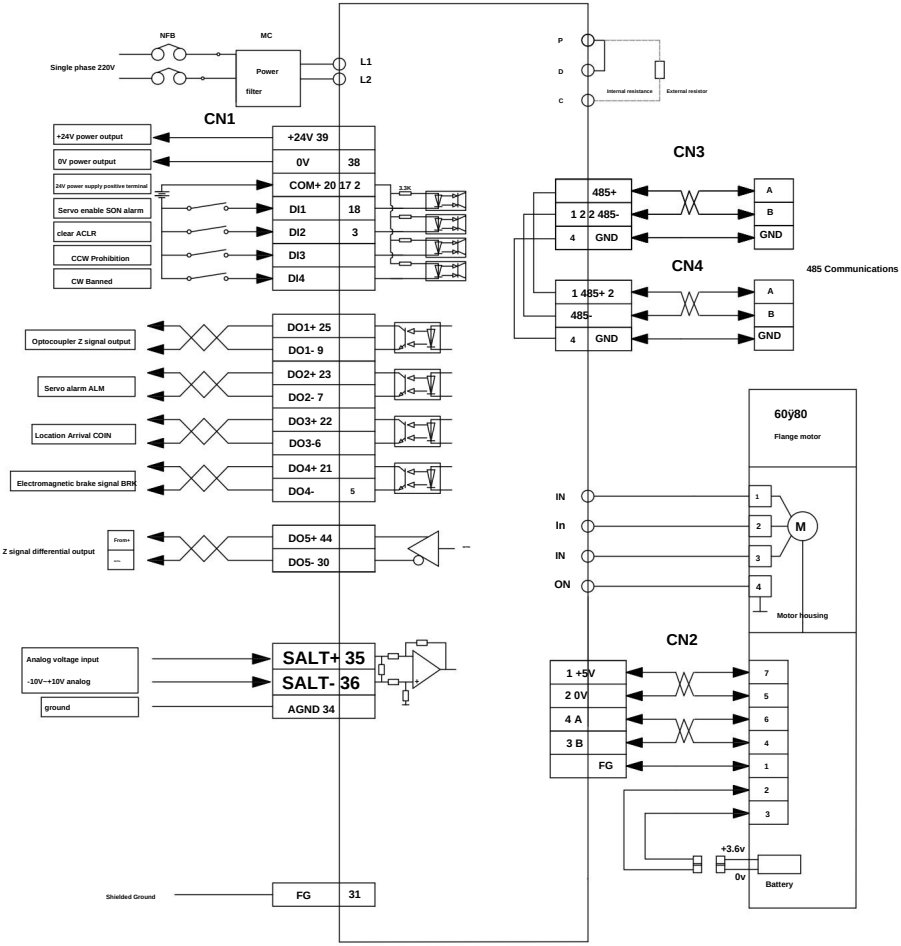


Figure 5.4 Speed mode wiring diagram

5.2.3 Parameters that need to be adjusted in speed control mode

ÿ Relevant parameters that need to be adjusted for speed control mode

Required parameters	Parameter Description	Parameter Value	Factory default value
PA4	Control mode selection	1	0
PA5	Speed proportional gain	5-2000Hz	150
PA6	Velocity integral constant	1-1000ms	75
PA22	Internal and external speed command selection	0-5	0
PA24	Internal speed 1	-6000-6000rpm	100
PA25	Internal Speed 2	-6000-6000rpm	500
PA26	Internal speed 3	-6000-6000rpm	1000
PA27	Internal Speed 4	-6000-6000rpm	2000
PA28	Arrival speed	0-3000rpm	3000
PA40	Acceleration time constant	1-10000ms	100
PA41	Deceleration time constant	1-10000ms	100
PA42	S-type acceleration and deceleration time constant	0-1000ms	0
PA43 analog speed command input gain 10-3000r/min/v			300
PA44 Analog speed command direction is reversed		0-1	0
PA45 analog speed command zero offset compensation		-5000-5000	0
PA46 Analog speed command filter		1-300Hz	300
PA75	Zero speed detection point	0-1000rpm	10
PA76	Speed consistent setting value	0-1000rpm	10
PA87	Arrival speed difference	0-5000r/min	30
PA88	Arrival speed polarity	0-1	0
PA92	Zero speed detection hysteresis	0-1000rpm	5

5.3 Torque Control Mode

5.3.1 Torque Mode Description

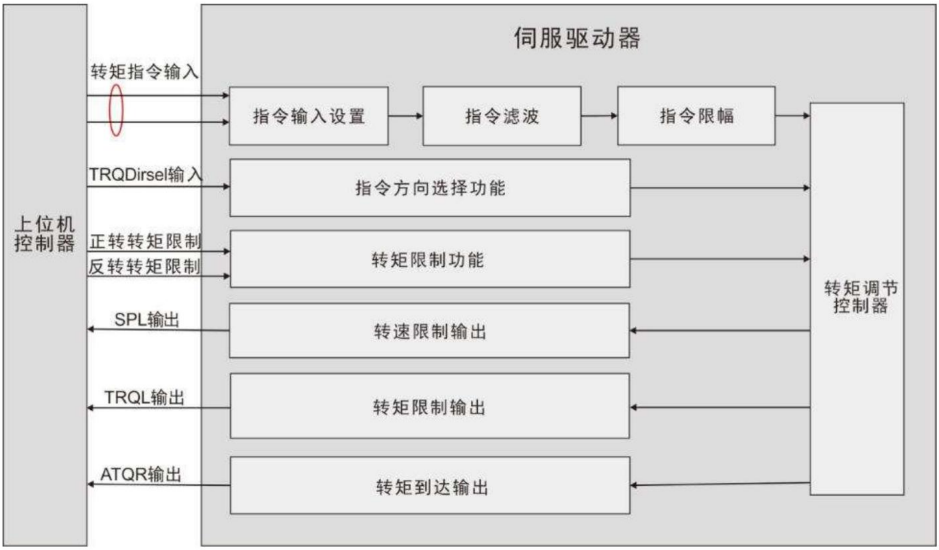


Figure 5.5 Torque control mode block diagram

The main steps of using the torque mode are as follows:

1) Correctly connect the power supply of the servo main circuit and control circuit, as well as the motor power line and encoder line.

If **the display on the panel shows "r 0", it means that the servo power supply and**

encoder wiring are correct. 2) Press the button to perform the servo JOG test run to confirm

whether the motor can operate normally. 3) Refer to Figure 5.6 for wiring instructions to connect the required DI/DO signals in the CN1 terminal, such as servo enab

Positioning completion

signal, etc. 4) Perform torque mode related settings. Set the DI/DO used according to the actual situation.

5) Servo enable, and control the servo motor to rotate by sending position commands through the host computer. First, make the motor rotate at a low speed and m

Confirm whether the rotation direction and electronic gear ratio are normal, and then adjust the gain.

5.3.2 Torque mode wiring

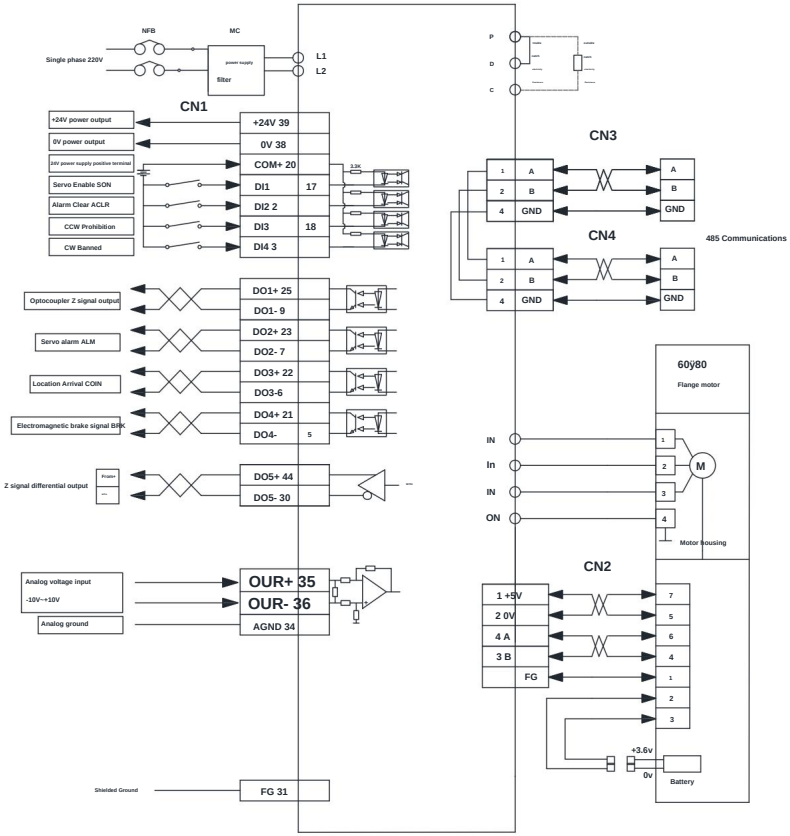


Figure 5.6 Torque mode wiring diagram

5.3.3 Parameters that need to be adjusted in speed control mode

Parameters that need to be adjusted in torque control mode

Required parameters	Parameter Description	Parameter Value	Factory default value
PA4	Control mode selection	2	0
PA29 analog torque command input gain can be set as required			30
PA32	Internal and external torque command selection	0-2	0

PA33 Analog torque command input direction reverse		0	0
PA39 Analog torque command zero offset compensation		0	0
PA50	Speed limit in torque control	Set as needed	Rated speed
PA64	Internal torque 1	-300-300	0
PA65	Internal torque 2	-300-300	0
PA66	Internal torque 3	-300-300	0
PA67	Internal torque 4	-300-300	0
PA83	Prohibition	0-1	0
PA89	Torque	-300%-300%	100
PA90	Reach torque differential	0%-300%	5
PA91	Arrival torque polarity	0-1	0

5.4 Origin return function and related parameter

description 5.4.1 Related setting parameters

Required parameters	Parameter Description	Parameter value	factory default
P4-32 Origin detector type and search direction setting		0-5	0
P4-33 Setting of short distance movement method to reach the origin		0-2	0
P4-34	Origin trigger start mode	0-2	0
P4-35	Origin stop mode setting	0-1	0
P4-36	The first stage high speed origin return speed setting	1-2000 rpm	1000
P4-37	The second stage low speed origin return speed setting is 1-500 r/min		50
P4-38	Origin return offset number of circles	+/-30000	0
P4-39	Origin return offset pulse number	+/-max cnt	0

5.4.2 Description of origin return mode (must be used in internal position mode) A. Origin

trigger start mode (P4-34)

The origin trigger start mode is divided into two categories: automatic execution of origin return function and contact trigger origin return

function: P4-34 = 0: turn off the origin return function. When P4-34 is set to 0, the origin return function is turned off regardless of other setting values.

Can not start.

P4-34=1: Automatically execute the origin return function when the power is turned on. This function is only used for power and servo startup.

It is effective only once, that is, it is used under the working condition that the servo does not need to repeatedly return to the origin during operation.

To omit an input contact for performing return to origin.

P4-34=2: The SHOM input contact triggers the origin return function. When setting this function, the input pin must be

Any register in the function planning register (P3-0 to P3-3) is set to the SHOM trigger origin input function.

During the service operation, the SHOM contact can be triggered at any time to execute the origin return function.

B. Origin detector type and search direction setting (P4-32)

The origin detector can use the left or right limit switch as the origin reference point, or an additional detector (such as

When the servo motor moves within one revolution, the Z pulse can also be set.

Chong is the origin reference point.

P4-32=0: Search for the origin in the forward direction, and use the CCWL limit input point as the rough reference point of the origin.

After completing the origin positioning, CCWL will switch to the limit input function. Subsequent re-triggering will generate a limit warning.

When the input point is used as a rough reference point of the origin, it is recommended to set the return to find the Z pulse (P4-33=0) as the precise mechanical origin.

point.

P4-32=1: Reverse the direction to find the origin, and use the CWL limit input point as the rough reference point of the origin.

After completing the origin positioning, CWL will switch to the limit input function. Subsequent re-triggering will generate a limit warning.

When the input point is used as a rough reference point of the origin, it is recommended to set the return to find the Z pulse (P4-33=0) as the precise mechanical origin.

point.

P4-32=2: Search for the origin in the forward direction and use ORGP (external detector input point) as the reference of the origin

At this time, the precise mechanical origin can be set to return to search (P4-33 = 0) or not return to search (P4-33 = 1) Z phase pulse

When the Z-phase pulse is not used as the mechanical origin, the positive edge of ORGP can also be set as the mechanical origin (P4-33=2).

P4-32=3: Reverse the direction to find the origin and use ORGP (external detector input point) as the reference of the origin

At this time, the precise mechanical origin can be set to return to search (P4-33 = 0) or not return to search (P4-33 = 1) Z phase pulse

When the Z-phase pulse is not used as the mechanical origin, the positive edge of ORGP can also be set as the mechanical origin (P4-33=2).

P4-32=4: Directly search for the single-turn absolute position zero point in the forward direction. This function is usually used for servo motors with only one turn.

For motion control within the rotation range, no external detection switch is required.

P4-32=5: Reverse the direction to directly find the single-turn absolute position zero point. This function is usually used for servo motors with only one

For motion control within the rotation range, no external detection switch is required.

C. Setting of short distance movement method to reach the origin (P4-33)

P4-33=0: After finding the reference origin, the motor turns back and searches for the nearest single-turn absolute position zero point at the second speed.

The mechanical origin.

P4-33=1: After finding the reference origin, the motor switches to the second speed and continues to search for the nearest single-turn absolute position.

The zero point is used as the mechanical origin.

P4-33=2: Find the rising edge of the detector ORGP as the mechanical origin and stop according to deceleration, applicable to P4-32

The value is 2 and 3; or when the single-turn absolute position zero point is found and the system stops according to deceleration, it is applicable to the value of P4-32 4 and 5

Settings.

D. Origin stop mode setting (P4-35)

P4-35=0: After the origin detection is completed, the motor decelerates and pulls back to the origin.

After the detection signal is received, the motor decelerates and stops, and then moves to the mechanical origin position at the second speed.

P4-35=1: After the origin detection is completed, the motor decelerates and stops in the forward direction. The origin is obtained in the second speed operation.

After the detection signal, the motor decelerates and stops. The position overrun after stopping is no longer corrected, and the mechanical origin position will not be affected by

The position varies depending on the amount of excess.

5.5 Check before operation

Please first disconnect the load connected to the servo motor, the coupling connected to the servo motor shaft and its related accessories.

Connect the load only after the servo motor can work normally under load to avoid unnecessary danger.

ÿ Before operation, please check and ensure that:

1) There is no obvious damage on the appearance of the servo

drive; 2) The wiring terminals have been insulated; 3)

There are no conductive objects such as screws or metal sheets, or flammable objects inside the drive, and there are no conductive foreign objects at the wiring

ports; 4) The servo drive or external brake resistor is not placed on flammable objects; 5) The wiring is

completed and connected correctly.

ÿ The wiring of the driver power supply, auxiliary power supply, grounding terminal, etc. is correct; the wiring of each control signal cable is correct; each limit switch,

The protection signals are wired correctly.

1) The enabling switch is in the OFF state; 2) The power

supply circuit is cut off and the emergency stop alarm circuit remains open; 3)

The voltage reference applied to the servo drive is correct.

ÿ When the controller does not send a run command signal, power on the servo drive. Check and ensure that: 1) the servo motor can rotate normally

without vibration or excessive running sound; 2) all parameters are set correctly. Unexpected actions may

occur depending on the mechanical characteristics. Do not set extreme parameters excessively.

number;

3) There is no abnormality in the bus voltage indicator light and digital tube display.

Chapter 6 Operation and Display Interface

6.1 Driver Panel Description 6.1.1 Panel

Composition The panel

consists of 5 LED digital tube displays and 4 buttons, which can be used , , , SET keys, used to display the system to control various states, set parameters, etc. The operation is hierarchical, and is expanded layer by layer from the main menu.

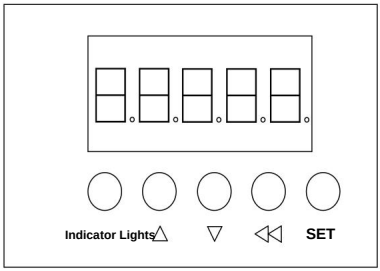


Figure 6.1 Driver panel display interface

6.1.2 Button Description

symbol	name	Function
▲	Add Key	Increase the sequence number or value; long press has a repeat effect
▼	Decrease key	Decrease the sequence number or value; long press has a repeat effect
◀	Escape key	Menu exit; operation cancel
SET	Confirm key	Operation confirmation

6.2 Main Menu

The first level is the main menu, which has 8 operation modes. Use the , keys to change the mode. Press the SET key to enter the second level and execute

For specific operation, press the button to return to the main menu from the second layer.

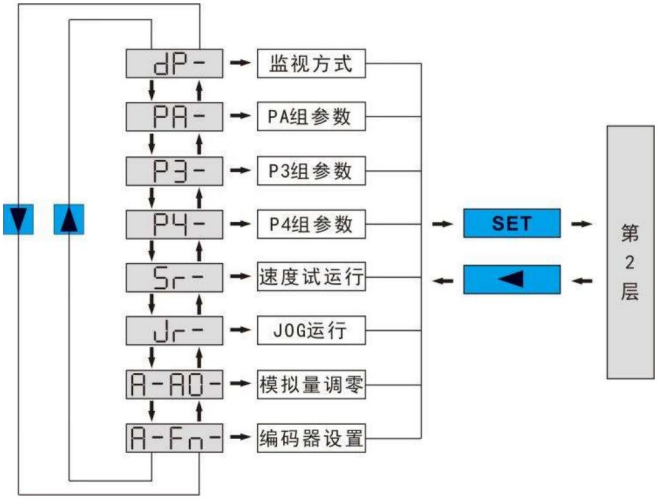


Figure 6.2 Main menu operation diagram

6.3 Parameter Setting Process

Parameters are represented by parameter segment + parameter number, the hundreds digit is the segment number, and the tens and ones digits are the parameter number. For example, for parameter PA53,

The segment number is "PA", the parameter number is "53", and the display shows "PA-53".

Select parameter setting "P-" in the main menu, and press SET key to enter parameter setting mode. First, use keys to select

After selecting a parameter section, press SET to enter the parameter number selection of that section. Then, use the and keys to select the parameter number.

After selecting, press SET key to display the parameter value.

Use the keys to modify the parameter value. Press the or key once to increase or decrease the parameter by 1. Press and hold the or key to increase or decrease ,

the parameter continuously. When the parameter value is modified, press the SET key, and the decimal point of the rightmost LED digital tube lights up and

Flashes twice, the modification is complete, and the modified value will be immediately reflected in the control (some parameters need to be saved and then reloaded).

electricity to work).

6.4 Monitoring Status Content

The first level is used to select the operation mode. There are 8 modes in total. Use the ▲ and ▼ keys to change the mode. Press the SET key to enter the mode. Enter the second layer of the selected method and press the ◀ key to return to the first layer from the second layer.

Select "dp- " in the first layer and press SET key to enter monitoring mode. There are 23 display states. Use the ▲ and ▼ keys to select the desired display mode, and then press the SET key to enter the specific display state.

Monitoring Mode Operation Monitoring	Example	illustrate
P-SPd	r 1000	Motor speed 1000r/min
P-PoS	04580	Current location 124580
P-PoS.	P. 12	
P-CPo	C4581	Position command 124581
P-CPo.	C. 12	
P-EPo	E 4	Position deviation 4 pulses
P-EPo.	E. 0	
P-tr9	t 0.70	Motor torque 70%
P- I	I 2.3	Motor current 2.3A
P-Cnt	Cnt 0	Current control mode 0: Position control mode
P- CS	r. 500	The speed corresponding to the analog input in speed mode is 500 rpm.
P- Ct	t 0.50	In torque mode, the analog input corresponds to 50% of the torque.
P-APo	A3265	The absolute rotor position is 3265.
P-APo.	A. 0	
P- In	n IIII	Input Terminals
P-oUt	oUt.IIII	Output Terminals
P-UdC	UC336	Bus voltage 336V

P-Err		Err 4	Alarm No. 4
P- rL		rL-on	Relay open state
		rL.-oF	Relay closed state
		rL-Er	Relay alarm status
P- rn		rn - on	The main circuit is operating normally
		rn.-oF	Main circuit not charged
		rn-CH	The main circuit is charged but the servo is not enabled
		rn-Er	Main circuit alarm
P- US		U-on	Bus voltage is normal
		U-.LoU	Bus voltage is too low
		U-Err	Existence alarm
P- AS		43210	Motor absolute position 876543210
P- AS.		A.8765	

6.5 Analog Zero Adjustment

After using this operation, the driver automatically detects the analog zero offset and writes the zero offset value into parameter PA39 (or PA45). This operation has saved the zero bias parameters into EEPROM, so there is no need to perform parameter writing operation again.

First select analog value zeroing "A-A0" and press SET key to enter. Then select speed analog value zeroing by, "A-SPd" or torque analog zero adjustment "A-Trq", press and hold the SET key for more than 3 seconds after selecting the operation, and wait for the display After pressing "donE", the operation is activated. After completion, press the button again to return to the menu selection state.

6.6 Encoder Selection Select "F-

res" to reset the encoder and set the encoder multi-turn information to zero.

By setting the value, the single-turn information can be cleared to achieve the purpose of setting the origin; select "F-clr" to clear the encoder Alarm operation: Alarm No. 53 caused by battery failure can be cleared by this operation. After selecting the operation, press and hold the SET key for 3 seconds. After the display shows "donE", the operation is activated. After completion, press the key again to return to the menu selection state.

6.7 Parameter Default Restoration Please

use the default parameter (factory parameter) function when the following situations occur: • The

parameters are adjusted randomly and the system cannot

work properly. The steps to restore the

default parameters are as follows: 1. Connect the motor to the drive. After power-on, the drive will automatically read the motor parameters and

automatically match the motor model. 2.

Change the password (PA0) to 385. 3. Enter the parameter management and perform the following operations:

Restore all parameters to default values. Parameters modified by the user are also restored to factory default values. Press the key to return to

In the main menu, use and to select "PA-" mode, press SET to enter the second level operation interface, and then press

, Set PA-0 to 385, and then press SET to enter the third layer interface.

Save. Next, press the key to return to the "PA-0" interface, then press the "PA-1" key, and press the SET key to enter.

Motor model, then press to set to DEF-, press and hold the SET button for 5 seconds, and after the LED indicator flashes several times, the motor

model, complete the default parameter saving. Finally, power on again to take effect.

Chapter 7 Parameter Function Description

7.1 PA Group Parameters

sequence Number	name	Function	Parameter range	factory value
0	password	1. The user password is 315. 2. The model code is 385. This	0-9999	315
1 Model code		parameter is read-only and cannot be modified. Drive automatic identification Motor model, no need to select.	40-80	Motor decision Certainty
2 Software version		The software version number can be viewed but cannot be modified.		
3	initial Display Status	0: Display motor speed; 1: Display the lower 5 digits of the current position; 2: Display the upper 5 digits of the current position; 3: Display the lower 5 digits of the position command (command pulse accumulation); 4: Display the high 5 digits of position command (command pulse accumulation); 5: Display the lower 5 digits of position deviation; 6: Display the upper 5 digits of position deviation; 7: Display the motor torque; 8: Display the motor current; 9: Current control mode; 10: Display the current temperature; 11: Display the speed command; 12: Display the torque command; 13: Display the lower 5 digits of the absolute position of the rotor in one revolution; 14: Display the upper 5 digits of the absolute position of the rotor in one revolution; 15: Display the input terminal status; 16: Display the output terminal status; 17: Display the encoder input signal; 18: Display the main circuit bus voltage value; 19: Display the alarm code; 20: Display the logic chip version number; 21: Display the relay pull-in status; 22: Display the running status; 23: Display the external voltage status; 24: Display the lower 5 digits of the absolute value position;	0-25	0

		25: Display the absolute value position in the upper 5 digits.		
4	Control mode selection	This parameter can be used to set the control mode of the drive: 0: Position control mode; 1: Speed control mode; 2: Torque control mode; 3: Position-speed mixed control mode; 4: Position-torque mixed control mode; 5: Speed-torque mixed control mode; 6: Encoder zeroing mode. 1. Set the	0-6	0
5	Speed proportional gain	proportional gain of the speed loop regulator. 2. The larger the setting value, the higher the gain and the greater the stiffness. The value is determined according to the specific servo drive system model and load conditions. In general, the larger the load inertia, the larger the setting value. big. 3. Under the condition that the system does not produce oscillation, try to set it as	Parameter number 5-2000 Hz	150
6	Velocity integral constant	large as possible. 1. Set the integral time constant of the speed loop regulator. 2. The smaller the setting value, the faster the integral speed, and the better the system resists deviation. The stronger it is, the greater the stiffness is, but too small will easily cause overshoot.	1-1000 ms	75
7	Torque filter	1. Set the torque command filter characteristics. 2. Used to suppress the resonance caused by torque. 3. The smaller the value, the lower the cutoff frequency and the vibration generated by the motor. If the load inertia is large, you can reduce Too small a value will cause slow response and may cause Oscillate. 4. The larger the value, the higher the cutoff frequency and the faster the response. If you want a higher torque response, you can increase the setting value	20-500% 100	
8	Speed detection filter Device	appropriately. 1. Set the speed detection filter characteristics. 2. The smaller the value, the lower the cutoff frequency and the less noise the motor generates. If the load inertia is large, the setting value can be appropriately reduced. If the value is too small, the response will be slow and may cause oscillation. 3. The larger the value, the higher the cutoff frequency and the faster the speed feedback response. If a higher speed response is required, the setting can be appropriately increased. value.	20-500% 100	
9	Position 1. Set the proportional gain of the position loop regulator.		1-1000	80

<table>
<tr><td></td><td>Proportional gain 2. The larger the setting value, the higher the gain and the greater the stiffness.</td><td>Under the condition of the rate command pulse, the position lag is smaller. But the value is too
3. The parameter value
depends on the specific servo drive system model and load.
1. Set the number</td><td></td><td></td></tr>
<tr><td>11</td><td>The motor rotates 1
Command pulse of circle
number</td><td>of command pulses equivalent to one revolution of the motor. 2.
When this setting value is 0, PA-12 (position command pulse frequency division)
PA-13 (position command pulse frequency division denominator) is valid.</td><td>0-30000 10000</td><td></td></tr>
<tr><td>12</td><td>Position command pulse
Electronic gear first
molecular</td><td>1. Set the position command pulse frequency division (electronic
gear). 2. In position control mode, by adjusting the PA12 and PA13 parameters
The settings can be easily matched with various pulse sources.
Achieve the user's ideal control resolution (ie angle/pulse).
3. P×G=N×C×4ÿ
P: number of pulses of input command; G: electronic gear ratio; G=minute
Numerator/denominator of frequency division N: number of motor rotations; C: photoelectric encoder
Encoder line number/turn, in this system C=2500.
4. For example, when the input command pulse is 6000, the servo motor rotates
One circle G = (N × C × 4) / P = (1 × 2500 × 4) / 6000 = 5 / 3, so the
parameter PA12 is set to 5, and PA13 is set to 3. 5.
The electronic gear numerator of the command pulse is determined by Gear1 and Gear2.
The denominator is set by parameter PA13. The combinations are as follows:
<table>
<tr><th colspan="2">DI signal {Note}</th><th rowspan="2">Command pulse electronic gear denominator</th></tr>
<tr><th>Gear 2 Gear 1</th><th></th></tr>
<tr><td>0</td><td>0 First molecule (parameter PA12) 1 Second</td></tr>
<tr><td>0</td><td>molecule (parameter PA 77)</td></tr>
<tr><td>1</td><td>0 Third molecule (parameter PA 78) 1 Fourth</td></tr>
<tr><td>1</td><td>molecule (parameter PA 79)</td></tr>
</table>
Note: 0 means OFF, 1 means ON.</td><td>0-32767</td><td>0</td></tr>
<tr><td>13</td><td>Position command pulse
Electronic gear denominator</td><td>See parameter PA12.</td><td>1-32767 10000</td><td></td></tr>
<tr><td>14</td><td>Position command pulse
Input
method</td><td>1. Set the input form of the position command pulse. 2.
Set it to one of the three input modes through parameters: 0:
Pulse + direction; 1: CCW
pulse/CW pulse;</td><td>0-3</td><td>0</td></tr>
</table>

		2: A, B two-phase orthogonal pulse input; 3: Internal position input. Note: CCW is viewed from the axial direction of the servo motor, counterclockwise. The needle direction is defined as positive; CW is from the servo motor The machine is viewed from the axial direction and rotates clockwise, which is defined as reverse rotation. Towards.		
15	Command pulse direction Negation	Set to: 0: normal; 1: Position command pulse direction is	0-1	0
16	Positioning completion range	reversed. 1. Set the positioning completion pulse range under position control. 2. This parameter provides the driver judgment under position control mode. The basis for whether positioning is completed. When the number of remaining pulses is less than or equal to the setting value of this parameter, Digital output DO COIN (positioning completed) ON, no 3. The comparator has a hysteresis function. Set by parameter PA84 Set.	0-30000 pulse	130
17	Position tolerance range Detection	1. Set the position deviation alarm detection range. 2. In position control mode, when the position deviation counter When the value exceeds this parameter, the driver will give a position alarm. police.	0-30000 ×100 pulse	6000
18	Position error invalid	Set to: 0: Position out-of-tolerance alarm detection is valid; 1: Position out-of-tolerance alarm detection is invalid, stop detecting position Out-of-tolerance	0-1	0
19	Position command smoothing filter	error. 1. Smooth filter the command pulse in exponential form The value indicates the time constant. 2. The filter will not lose the input pulse, but the command will appear. 3. This filter is used when: (1) the upper controller has no acceleration and deceleration function; (2) the electronic gear frequency division is large (>10); (3) the command frequency is low. 4. The motor has step jumps and is unstable when running.	0-1000× 0.1ms	100

<table>
<tr><td></td><td></td><td>5. When set to 0, the filter does not work. Set to:</td><td></td><td></td></tr>
<tr><td>20</td><td>Drive inhibit input invalid</td><td>0: CCW and CW inputs are disabled.
When the disable switch (FSTP) is ON, CCW drive is allowed; when
When the CCW drive prohibition switch (FSTP) is OFF, the CCW direction
The torque of the forward direction is kept at 0; the same is true for CW.
If the drive prohibition is OFF, a drive prohibition input error will occur.
False alarm;
1: Cancel CCW, CW input prohibition. Regardless of CCW,
What is the status of the CW drive prohibition switch?
At the same time, if CCW and CW drives are prohibited
If both are OFF, there will be no drive prohibit input error alarm.
police.</td><td>0-1</td><td>1</td></tr>
<tr><td colspan="2">21 JOG operation speed</td><td>Set the operation speed of JOG operation.</td><td>0-6000 rpm</td><td>100</td></tr>
<tr><td colspan="2">22 Speed command source</td><td>When speed control is used, set the source of the speed command.
Definition: 0: Analog speed command is input by analog port AS+ and AS-.
1:
Internal speed command, determined by SP1 and SP2 input by DI.
Certainly:
<table>
<tr><th colspan="2">DI signal {Note}</th><th rowspan="2">Speed command</th></tr>
<tr><th>SP2</th><th>SP1</th></tr>
<tr><td>0</td><td>0</td><td>Internal speed 1 (parameter PA24)</td></tr>
<tr><td>0</td><td>1</td><td>Internal speed 2 (parameter PA25)</td></tr>
<tr><td>1</td><td>0</td><td>Internal speed 3 (parameter PA26)</td></tr>
<tr><td>1</td><td>1</td><td>Internal speed 4 (parameter PA27)</td></tr>
</table>
2: Analog speed command + internal speed command:
<table>
<tr><th colspan="2">DI signal {Note}</th><th rowspan="2">Speed command</th></tr>
<tr><th>SP2</th><th>SP1</th></tr>
<tr><td>0</td><td colspan="2">0 Analog speed command</td></tr>
<tr><td>0</td><td>1</td><td>Internal speed 2 (parameter PA25)</td></tr>
<tr><td>1</td><td>0</td><td>Internal speed 3 (parameter PA26)</td></tr>
</table></td><td>0-5</td><td>0</td></tr>
</table>

		1 1 Internal speed 4 (parameter PA27) Note: 0 means OFF, 1 means ON. 3: JOG speed command, perform JOG operation hour, Need to be set. 4: Keyboard speed command, keyboard speed adjustment (Sr) operation , needs to be set. 5: IO terminal controls the inching operation.		
23	Maximum speed limit	Set the maximum speed limit of the servo motor. 1. It is independent of the direction of rotation. 2. If the set value exceeds the rated speed, the actual maximum speed limit Speed is rated speed.	0- 6000r/m in	5000
24	Internal speed 1	1. Set internal speed 1. 2. Speed control mode (PA22=0), when SP1 OFF, When SP2 is OFF, internal speed 1 is selected as the speed reference. make.	-6000- 6000 rpm	100
25	Internal Speed 2	1. Set internal speed 2. 2. In speed control mode (PA22=0), when SP1 is ON and SP2 is OFF, select internal speed 2 as the speed. 1. Set	-6000- 6000 rpm	500
26	Internal speed 3	internal speed 3. 2. In speed control mode (PA22=0), when SP1 is OFF, When SP2 is ON, internal speed 3 is selected as the speed command.	-6000- 6000 rpm	1000
27	internal Speed 4	1. Set internal speed 4. 2. In speed control mode (PA22=0), when SC1 is ON, When SC2 is ON, internal speed 4 is selected as the speed command.	-6000- 6000 rpm	2000
28	arrive speed	1. When the motor speed exceeds this parameter, the digital output DO ASP (Speed reached) ON, otherwise OFF. 2. The comparator has a hysteresis function, which is set by parameter PA87. Set. 3. With polarity setting function: PA88 PA28 Comparator	0-3000 rpm	3000

<table>
<tr><td></td><td></td><td>
<table>
<tr><td>0</td><td>>0 Speed is not direction specific</td></tr>
<tr><td rowspan="2">1</td><td>>0 Only detect forward speed <0 Only</td></tr>
<tr><td>detect reverse speed</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>29</td><td>Analog torque indicator
Let input gain</td><td>1. Set the analog torque input voltage and the actual motor operation
The proportional relationship between torque.
2. The unit of the setting value is 0.1v/100%. 3.
The default value is 30, corresponding to 3v/100%, that is, input 3v</td><td>10-100
(0.1v/
100%)</td><td>30</td></tr>
<tr><td>30</td><td>User torque overload
Alarm value</td><td>1. Set the user torque overload value,
which is the rated torque.
Percentage, torque limit value is not direction-dependent, both positive and negative directions are available
2. When
PA31>9, when the motor torque>PA30, keep
If the duration is >PA31, the driver will alarm, and the alarm number is
Err-29, the motor stops. After the alarm occurs, the driver must
Re-power on to clear the</td><td>1-300</td><td>300</td></tr>
<tr><td>31</td><td>User torque overload
Alarm detection time</td><td>alarm. 1. User torque overload detection time, in
milliseconds. 2. When set to zero, the user torque overload alarm will not work.</td><td>0-32767</td><td>0</td></tr>
<tr><td>32</td><td>Torque command source</td><td>In torque control, set the source of torque command:
0: Analog torque command, input by analog port AS+, AS-. 1:
Internal
torque command, input by DI TRQ1,
TRQ2 Decision:
<table>
<tr><th colspan="2">DI signal {Note}</th><th rowspan="2">Torque command</th></tr>
<tr><th>TRQ2</th><th>TRQ1</th></tr>
<tr><td>0</td><td>0</td><td>Internal torque 1 (parameter PA64)</td></tr>
<tr><td>0</td><td>1</td><td>Internal torque 2 (parameter PA65)</td></tr>
<tr><td>1</td><td>0</td><td>Internal torque 3 (parameter PA66)</td></tr>
<tr><td>1</td><td>1</td><td>Internal torque 4 (parameter PA67)</td></tr>
</table>
2: Analog torque command + internal torque command:
<table>
<tr><th colspan="2">DI signal {Note}</th><th rowspan="2">Torque command</th></tr>
<tr><th>TRQ2</th><th>TRQ1</th></tr>
<tr><td>0</td><td>0</td><td>Analog torque command</td></tr>
<tr><td>0</td><td>1</td><td>Internal torque 2 (parameter PA65)</td></tr>
<tr><td>1</td><td>0</td><td>Internal torque 3 (parameter PA66)</td></tr>
</table></td><td>0-1</td><td>0</td></tr>
</table>

		1 1 Internal torque 4 (parameter PA67) Note: 0 means OFF, 1 means ON.		
33	Analog torque indicator Reverse the input direction	Inverts the polarity of the analog torque input.	0-1	0
34	Internal CCW transfer Moment Limit	1. The setting value is a percentage of the rated torque. For example, If the setting value is twice the rated torque, the setting value is 200. 2. This limit is valid at any time. 3. If the setting value exceeds the maximum overload capacity allowed by the system force, the actual torque limit is the maximum overload allowed by the system	0-300% 300	
35	Internal CW Torque limit	1. The setting value is a percentage of the rated torque. For example, 2 times of the rated torque, the setting value is -200. 2. This limit is valid at any time. 3. If the setting value exceeds the maximum overload capacity allowed by the system force, the actual torque limit is the maximum overload allowed by the system	-300-0% -300	
36	External CCW to Moment Limit	1. The setting value is a percentage of the rated torque. For example, 1 times the rated torque, the setting value is 100. 2. Only when the CCW torque limit input terminal (CCWL) is ON 3. When the limit is effective, the actual torque limit is the system allowed torque. Maximum overload capacity, internal CCW torque limit, external CCW torque limit is the minimum of the three.	0-300% 100	
37	External CW torque limit system	Set the external torque limit value of the servo motor in the CW direction. 1. The setting value is a percentage of the rated torque. For example, 1 times the rated torque, the setting value is -100. 2. Only when the CW torque limit input terminal (CWL) is ON 3. When the limit is effective, the actual torque limit is the system allowed torque. Maximum overload capacity, internal CW torque limit, external The CW torque limit has the smallest absolute value among the three.	-300-0% -100	
38	temperature Alarm value	Set the drive temperature to the upper limit alarm value.	200-1350	

39	Analog torque indicator Zero bias compensation	Zero offset compensation for analog torque input.	-2000- 2000	0
40	Acceleration time constant	The setting value indicates the acceleration time of the motor from 0-1000r/min. 1. The acceleration and deceleration characteristics are linear. 2. Only used for speed control and internal position control. Other control modes are	1- 10000ms	100
41	Deceleration time constant	invalid. The setting value indicates the deceleration time of the motor from 1000-0r/min. between. 1. The acceleration and deceleration characteristics are linear. 2. Only used for speed control and internal position control. Other control methods are	1- 10000ms	100
42	S-shaped acceleration and deceleration Interval constant	invalid. To start and stop the motor smoothly, set an S-shaped acceleration and deceleration curve. Line part time.	0- 1000ms	0
43	Analog speed indicator Let input gain	Set the analog speed input voltage and the actual motor speed The proportional relationship between the degrees.	10-3000 r/min/v	300
44	Analog speed indicator Reverse the direction	Inverts the polarity of the analog speed input. 1. When set to 0, the analog speed command is positive, the speed The direction is CCW. 2. When set to 1, the analog speed command is positive, the speed Direction is CW.	0-1	0
45	Analog speed indicator Zero bias compensation	Zero offset compensation for analog speed input.	-5000- 5000	0
46	Analog speed indicator Let the filter	1. Low pass filter for analog speed input. 2. The larger the setting, the faster the response speed to the speed input analog value. The faster the signal noise is, the smaller the setting is, and the faster the response is. The slower the speed, the smaller the impact of signal noise.	1-1000 Hz	300
47	Motor stop timing Mechanical brake action set up	1. Define the mechanical brake action (input Output BRK changes from ON to OFF) until the motor current is cut off Delay time. 2. This parameter should not be less than the delay time of the mechanical brake (Tb) to avoid slight displacement or working drop of the motor.	0-200× 10ms	0

<table>
<tr><td>48</td><td>Motor running time
Mechanical brake action
set up</td><td>1. Define the time from motor current cut off to mechanical
Delay of braking action (output terminal BRK changes from ON to OFF)
time.
2. This parameter is used to slow down the motor from high speed rotation.
After the speed reaches a low level, the mechanical brake is activated to avoid damage.
Brakes.
3. The actual action time is when PA48 or the motor decelerates to
The time required for PA49 value is the minimum of the two.</td><td>0-200×
10ms</td><td>50</td></tr>
<tr><td>49</td><td>Motor running time
Mechanical brake action
speed</td><td>1. Define the time from when the motor current is cut off to when the mechanical
Brake action (output terminal BRK changes from ON to OFF) speed
Degree value.
2. The actual action time is PA48 or the motor decelerates to PA49
The minimum value is taken when the motor speed</td><td>0-3000
rpm</td><td>100</td></tr>
<tr><td>50</td><td>Torque control speed
Degree Limit</td><td>is controlled.
2. It
can prevent overspeed under light load.</td><td>0-5000
rpm</td><td>3000</td></tr>
<tr><td colspan="2">53 Servo forced enable</td><td>Set to: 0:
Enable signal is controlled by SON input by DI; 1:
Software forced enable. 1.</td><td>0-1</td><td>0</td></tr>
<tr><td>55</td><td>Input terminal valid
Level control word</td><td>Set input terminal to reverse. The terminal that is not reversed is switched on.
It is effective when the switch is closed and invalid when the switch is disconnected;
It is invalid when the switch is closed and valid when the
switch is open. 2. It is represented by a 4-bit binary number. The bit 0 represents
The output terminal is not inverted, 1 represents the output terminal is inverted
The
input terminals represented by binary numbers are as follows:
<table><tr><th>3</th><th>2</th><th>1</th><th>0</th></tr><tr><td>DI4</td><td>DI3</td><td>DI2</td><td>DI1</td></tr></table>
0: high level is valid;
1: Low level is valid.</td><td>0000-
1111</td><td>0000</td></tr>
<tr><td>57</td><td>Output terminal effective
Level control word</td><td>1. Set the output terminal to be reversed. The reversed terminal is turned on and off.
The definition of stop is exactly the opposite of the
standard definition. 2. Expressed as a 4-bit binary number, the output represented by 0</td><td>0000-
1111</td><td>0000</td></tr>
</table>

		The terminal is not inverted, and the output terminal represented by 1 is inverted. The input terminal represented by the binary number is as follows: 3 2 1 0 DO4 DO3 DO2 DO1 0: High level is valid; 1: Low level is valid. 1. De-		
58	IO input terminal Debounce time number	jitter filter time for input terminal. 2. The smaller the value, the faster the terminal input response. 3. The larger the value, the better the terminal input anti-interference performance, but The response	1-20ms	2
59	Command pulse effective edge	becomes slower. Set to: 0: Pulse rising edge is valid; 1: Pulse falling edge is valid.	0-1	0
60 Soft reset		0: Soft reset is invalid; 1: Soft reset is valid, the system will restart. Set	0-1	0
61 System alarm cleared		to: 0: System alarm clear is invalid; 1: System alarm clear is valid.	0-1	0
62 Encoder selection		4: Single-turn absolute encoder; 5: Multi-turn absolute encoder.	4-5	By motor Decide
63 Load inertia ratio		1. Set the load inertia ratio of the corresponding motor inertia. 2. The setting value is: =((load inertia + moment of inertia)/moment of inertia)×100.	1-500	100
64 Internal torque 1		In torque control mode (PA4=2), when TRQ1 OFF When TRQ2 is OFF, internal torque 1 is selected as the torque command.	-300-300	0
65 Internal torque 2		In torque control mode (PA4=2), when TRQ1 ON TRQ2 OFF, internal torque 2 is selected as the torque command.	-300-300	0
66 Internal torque 3		In torque control mode (PA4=2), when TRQ1 is OFF and TRQ2 is ON, internal torque 3 is selected as the torque command.	-300-300	0
67 Internal torque 4		In torque control mode (PA4=2), when TRQ1 ON TRQ2 ON, internal torque 3 is selected as the torque command.	-300-300	0
71	MODBUS Slave Address	MODBUS communication slave address value.	1-254	1

72	MODBUS Baud rate	MODBUS communication baud rate.	48-1152 ×100	96
73	MODBUS Communication protocol selection	Set to: 0ÿ8ÿNÿ2ÿMODBUS, RTU)ÿ 1ÿ8ÿEÿ1ÿMODBUS, RTU)ÿ 2ÿ8ÿOÿ1ÿMODBUS, RTU)ÿ 3: 8, N, 1 (MODBUS, RTU). This parameter determines the communication protocol. The number 8 represents the data to be transmitted. The number of bits is 8; the letters N, E, and O represent parity: N: indicates that this bit is not used; E: indicates an even bit; O: indicates an odd bit. The number 1 or 2 indicates that the communication bit is 1 or 2 bits.	0-3	0
74	Communication error handling	When the communication signal is wrong, select: 0: continue to run; 1: alarm and	0-1	0
75	Zero speed detection point	stop running. 1. When the motor speed is lower than this parameter, the digital output DO ZSP (zero speed) is ON, otherwise it is OFF. 2. When the ZCLAMP of the digital input DI is ON, the speed	0-1000 rpm	10
76	Consistent speed Setting Value	When the command value is lower than this value, the speed command value is forced to zero. When the difference between the actual speed and the command speed is less than this setting, UCO2N (speed consistency) of digital output DO is ON, otherwise OFFÿ	0-1000 rpm	10
77	Position command pulse Electronic gear ratio second	See parameter PA12 for details.	0-32767	0
78	molecular position command pulse Electronic gear ratio The third molecule	See parameter PA12 for details.	0-32767	0
79	Position command pulse Electronic gear ratio fourth	See parameter PA12 for details.	0-32767	0
80	numerator command direction input Effective level	Set to 0: high level positive direction;	0-1	0

		1: Low level positive		
81	Command pulse PULS signal filtering	direction. 1. Digitally filter the pulse input PULS signal. The larger the value, the larger the filtering time constant. 2. Maximum pulse input frequency at default value 500kHz(kpps), the larger the value, the higher the maximum pulse input frequency 3. Used to filter out noise on the signal line to avoid counting errors. If the movement is inaccurate due to inaccurate counting, Increase the parameter value appropriately. 4. After the parameter is modified, it must be saved and the power must be turned on again to be effective.	0-15	4
82	Command pulse SIGN Signal filter Wave	1. Digitally filter the pulse input SIGN signal. The larger the filter time constant is, the larger the filter time constant is. 2. The maximum pulse input frequency is the default value. 500kHz(kpps), the larger the value, the higher the maximum pulse input frequency. 3. Used to filter out noise on the signal line to avoid counting errors. If the movement is inaccurate due to inaccurate counting, Increase the parameter value appropriately. 4. After the parameter is modified, it must be saved and the power must be turned on again to be effective.	0-15	4
83	CWL, CCWL Direction prohibited Mode	1. When the machine hits the mechanical limit switch, CWL is triggered. When CCWL is restricted, this parameter is used to select the prohibition method. Parameter meaning: 0: limit the torque in this direction to 0; 1: prohibit pulse input in this direction.	0-1	0
84	Positioning completion hysteresis	1. Set the pulse range for positioning completion under position control. 2. When the remaining pulse number in the position deviation counter is less than or equal to When the digital output DO is equal to the setting value of this parameter, COIN (positioning completed) is ON, otherwise it is OFF. 3. The comparator has a hysteresis function, which is set by parameter PA85. Set.	0-32767 pulse	65
85	Positioning proximity range	1. Set the positioning approach pulse range under position control. 2. When the remaining pulse number in the position deviation counter is less than or equal to When the value of this parameter is equal to the value set by this parameter, the NEAR (Near positioning) ON, otherwise OFF.	0-32767 pulse	6500

<table>
<tr><td></td><td></td><td>3. The comparator has a hysteresis function, which is set by parameter PA86.
4. Used for the host computer to accept when positioning is about to be completed
The NEAR signal prepares for the next step. General parameter values
It must be larger than the positioning completion range.</td><td></td><td></td></tr>
<tr><td colspan="2">86 For details on positioning approach hysteresis, please refer to the description of parameter PA85.</td><td></td><td>0-32767
pulse</td><td>650</td></tr>
<tr><td>87 Arrival speed hysteresis</td><td></td><td>1. When the motor speed exceeds this parameter, the digital output DO
ASP (speed reached) is ON, otherwise it is OFF.
2. The comparator has a hysteresis function.
3. With polarity setting function:
<table><tr><th>PA88</th><th>PA28</th><th>Comparator</th></tr><tr><td>0</td><td></td><td>> 0 Speed is not divided by</td></tr><tr><td rowspan="2">1</td><td></td><td>direction > 0 Only detects forward</td></tr><tr><td></td><td>speed < 0 Only detects reverse speed</td></tr></table></td><td>0-5000
rpm</td><td>30</td></tr>
<tr><td colspan="2">88 Refer to the description of parameter PA87 for reaching speed</td><td></td><td>0-1</td><td>0</td></tr>
<tr><td>89 Arrival torque</td><td></td><td>polarity. 1. When the motor torque exceeds this parameter, the digital output DO
ATRQ (torque arrival) is ON, otherwise it is OFF. 2.
The comparator has a hysteresis function, which is set by parameter PA90.
3. With polarity setting function:
<table><tr><th>PA91</th><th>PA89</th><th>Comparator</th></tr><tr><td>0</td><td></td><td>> 0 Torque is not direction</td></tr><tr><td rowspan="2">1</td><td></td><td>specific > 0 Only detects forward torque</td></tr><tr><td></td><td><0 Only detect reverse torque</td></tr></table></td><td>-300%-
300%</td><td>100</td></tr>
<tr><td>90 Reaching torque hysteresis</td><td></td><td>1. When the motor torque exceeds this parameter, the digital output DO
ATRQ (torque arrival) is ON, otherwise it is OFF. 2.
The comparator has a hysteresis function, which is set by parameter PA90.
3. With polarity setting function:
<table><tr><th>PA91</th><th>PA89</th><th>Comparator</th></tr><tr><td>0</td><td></td><td>> 0 Torque is not direction-</td></tr><tr><td rowspan="2">1</td><td></td><td>dependent > 0 Only detects forward</td></tr><tr><td></td><td>torque < 0 Only detects reverse torque</td></tr></table></td><td>0-300%</td><td>5</td></tr>
<tr><td>91 Arrival torque polarity</td><td></td><td>1. When the motor torque exceeds this parameter, the digital output DO
ATRQ (torque arrival) is ON, otherwise it is OFF. 2.
The comparator has a hysteresis function, which is set by parameter PA90.</td><td>0-1</td><td>0</td></tr>
</table>

<table>
<tr><td></td><td></td><td>3. With polarity setting function:
<table><tr><th>PA91</th><th>PA89</th><th>Comparator</th></tr><tr><td>0</td><td colspan="2">> 0 Torque is not direction-</td></tr><tr><td rowspan="2">1</td><td>dependent</td><td>> 0 Only detects forward</td></tr><tr><td>torque</td><td>< 0 Only detects reverse torque</td></tr></table></td><td></td><td></td></tr>
<tr><td>92</td><td>Zero speed detection hysteresis</td><td>1. When the motor speed is lower than this parameter, the digital output DO
ZSP (zero speed) is ON, otherwise it is OFF. 2.
The comparator has a hysteresis</td><td>0-1000
rpm</td><td>5</td></tr>
<tr><td>93</td><td>Thermal overload capacity</td><td>0: Default 1. function. 1: Enhanced</td><td>0-1</td><td>0</td></tr>
<tr><td>94</td><td>Electromagnetic brake
Open delay time</td><td>Set the delay time for the electromagnetic brake to open.
2. When the system changes from the disabled state to the enabled state, define
The motor current is turned on until the electromagnetic brake is released (DO output
Terminal BRK ON) delay time.</td><td>0-200
ms</td><td>0</td></tr>
<tr><td>95</td><td>Motor encoder
resolution</td><td>Encoder resolution, the default is 2 to the 17th power = 131072,
The setting value is 17. Please modify it with caution, otherwise the wrong setting will lead to
This parameter</td><td>10-32</td><td>17</td></tr>
<tr><td>96</td><td>Motor pole pairs</td><td>indicates the number of motor pole pairs. Please modify it carefully, otherwise it will cause an error.
Incorrect settings may result in runaway.</td><td>1-360</td><td>5</td></tr>
<tr><td>97</td><td>Maximum
occupancy</td><td>The offset angle between the encoder zero position and the motor zero position is determined by the motor.
Certainly.</td><td>0-3600</td><td>216</td></tr>
<tr><td>99</td><td>of the motor zero offset angle brake
Empty ratio</td><td>Maximum duty cycle setting when braking.</td><td>5-90</td><td>50</td></tr>
<tr><td>100</td><td>Position loop
Filter selection</td><td>Set to: 0:
Digital moving average filter; 1:
Exponential smoothing filter.</td><td>0-1</td><td>0</td></tr>
<tr><td>101</td><td>Position
loop feedforward gain</td><td>Feedforward can reduce the position tracking error during position control.
When set to 100, the position will follow the command pulse of any frequency.
The tracking error is always 0.</td><td>0-100</td><td>0</td></tr>
<tr><td>102</td><td>Position loop feedforward filter
Wave time constant</td><td>Position loop feedforward filtering increases the stability of the feedforward control.</td><td>0-500</td><td>100</td></tr>
<tr><td>103</td><td>Z Signal width</td><td>Adjust the Z signal pulse width</td><td>1-200</td><td>50</td></tr>
<tr><td>108</td><td>Multi-lap information error
Alarm detection</td><td>0: Enable multi-turn error alarm 1:
Disable multi-turn error alarm</td><td>0-1</td><td>0</td></tr>
</table>

7.2 P3 Group Multi-Function Terminal Series

Parameters7.2.1 P3 Group Series Parameters List

P series drivers all have 4 input terminals and 4 output terminals. The terminal input can be changed through the P3 series parameters.

Output definition value, complete various input and output definitions. (Input terminal default low level is valid)

parameter	name	scope	Factory value
P3-0	Digital input DI1 function	0-99	1
P3-1	Digital input DI2 function	0-99	2
P3-2	Digital input DI3 function	0-99	3
P3-3	Digital input DI4 function	0-99	4
P3-4	Digital input DI5 function	0-99	0
P3-5	Digital input DI6 function	0-99	0
P3-13 sets the lower 16 bits of the current position value coordinates		-32768 - 32767	0
P3-14 sets the high 16 bits of the current position value coordinates		-32768 - 32767	0
P3-15 Digital input DI forced valid 1		00000000-11111111 00000000	
P3-16 Digital input DI forced valid 2		00000000-11111111 00000000	
P3-17 Digital input DI forced valid 3		00000000-11111111 00000000	
P3-18 Digital input DI forced valid 4		00000000-11111111 00000000	
P3-19 Digital input DI forced effective 5		00000000-11111111 00000000	
P3-20	Digital output DO1 function	0-99	18

P3-21	Digital output DO2 function	0-99	3
P3-22	Digital output DO3 function	0-99	5
P3-23	Digital output DO4 function	0-99	8
P3-30	Virtual input terminal control	0-2	0
P3-31	Virtual input terminal status value	00000000-11111111 00000000	
P3-32	Motor position, command position, position difference, single Circle absolute position display mode	0: Motor resolution display increase quantity; 1: Motor resolution display absolute for location; 2: Host computer (PA-11) Resolution display increments; 3: Host computer (PA-11) Resolution shows absolute position;	0
P3-33	Virtual output terminal status value	0000-1111	0000
P3-34	Reset zero encoder multi-turn data	0-1	0
P3-35	Clear encoder fault alarm	0-1	0
P3-36 Current position is single-turn position zero point (Effective when P3-34 is set to 1)		0-1	0
P3-37 0: Single-turn + multi-turn position overall 64-bit data 1: Divided into single-turn position and multi-turn position		0-1	0
P3-38	Virtual IO input DI1 function	0-99	0
P3-39	Virtual IO input DI2 function	0-99	0
P3-40	Virtual IO input DI3 function	0-99	0
P3-41	Virtual IO input DI4 function	0-99	0
P3-42	Virtual IO input DI5 function	0-99	0
P3-43	Virtual IO input DI6 function	0-99	0
P3-44	Virtual IO input DI7 function	0-99	0

P3-45	Virtual IO input DI8 function	0-99	0

Notice:

1. When P3-30=0, the IO input is determined by DI1 ~ DI4. The number of input IO is 4, corresponding to parameters P3-0 ~ P3-3ÿ

2. When P3-30=1, the IO input is determined by the corresponding bit of virtual IOP3-31. The number of input IO is 8, and the corresponding parameter is P3-38~P3-45ÿ

3. When P3-30=2, IO input is determined by DI1~DI4 and P3-31, and the number of input IO is 12, corresponding to parameter P3-0~P3-3 ÿ P3-38~P3-45ÿ

7.2.2 DI Function List Input

terminal (the 4 terminals corresponding to the parameters of group P3 are P3-0, P3-1, P3-2, and P3-3) definition value.

Define value	symbol	Function	Functional analysis
0	NULL	No function	input state has no effect on the system.
1	SON	Servo Enable	Servo enable input terminal. OFF: The servo drive cannot be used and the motor does not pass current; ON: The servo drive is enabled and the
2	ARST	alarm clear	motor passes current. Alarm clear input terminal: If there is an alarm, if the alarm can be cleared, input rising edge (OFI Note: Only some alarms can be cleared.
3	CCWL	Forward drive disabled	1. CCW drive prohibition input terminal: OFF: Forward (CCW) rotation is prohibited; ON: Forward (CCW) rotation is allowed. 2. Used for mechanical limit travel protection, the function is controlled by pa Note that the PA-20 default value ignores this function. If you need to enable this function, PA-20 needs to be modified: (1) When PA-20 is 0, the input prohibition function is valid, CCW is No Prohibited from being controlled by PA-83; (2) When PA-20 is 1, the input prohibition function is invalid, CCW is No Prohibited Not controlled by PA-83.

			3. When the prohibition function is valid (PA-20 is 0): (1) When PA-83 is 0, the forward torque limit is 0 and the forward pulse is not limited. (2) When PA-83 is 1, the input of positive pulse is prohibited.
4	CWL reverse drive prohibition		1. CW drive prohibition input terminal: OFF: Forward (CW) rotation is prohibited; ON: Forward (CW) rotation is allowed. 2. Used for mechanical limit travel protection, the function is controlled by parameter PA-20. Note that the default value of PA-20 is to ignore this function. If you need to enable this function, Need to modify PA-20: (1) When PA-20 is 0, the input prohibition function is valid. The prohibition is controlled by PA-83; (2) When PA-20 is 1, the input prohibition function is invalid. The prohibition is not controlled by PA-83. 3. When the prohibition function is valid (PA-20 is 0): (1) When PA-83 is 0, the reverse torque limit is 0, and the reverse pulse is not limited. (2) When PA-83 is 1, the reverse pulse input is prohibited.
5	TCCW Forward torque limit		OFF: CCW direction torque is not limited by PA-36 parameters; ON: CCW direction torque is limited by PA-36 parameters. Note: Regardless of whether TCCW is valid or invalid, CCW direction torque is still limited. Parameter PA-34 Limit.
6	TCW Reverse torque limit		OFF: CW direction torque is not limited by PA-37 parameters; ON: CW direction torque is limited by PA-37 parameters. Note: Whether TCW is valid or invalid, CW direction torque is still limited. Parameter PA-35 limit. When
7	ZCLAMP Zero speed clamp		the following conditions are met, the zero speed clamp function is enabled (the speed is forced to zero): Condition 1: Speed control mode (PA4=1), when external speed is selected (PA22=0); Condition 2: ZCLAMP ON; Condition 3: Speed command is lower than parameter PA-75. When any of the above conditions is not met, normal speed control is
8	CZERO Zero instruction		performed. Under speed or torque control, the speed or torque command is: OFF: normal command;

			ON: Zero command.
9	CINV instruction inversion		Under speed or torque control, the speed or torque commands are: OFF: normal command; ON: Invert the command.
10	SP1 Speed selection 1		In speed control mode (PA4=1), when internal speed is selected
11	SP2 Speed Selection 2		(PA22=1), SP1 and SP2 are combined to select different internal speeds: SP2=OFF SP1=OFF: Internal speed 1 (parameter PA-24) SP2=OFF SP1=ON: Internal speed 2 (parameter PA-25) SP2=ON SP1=OFF: Internal speed 3 (parameter PA-26) SP2=ON SP1=ON: Internal speed 4 (parameter PA-27)
13	TRQ1 Torque selection 1		In torque control mode (PA4=2), when internal torque is selected
14	TRQ2 Torque selection 2		(PA32=1), TRQ1, TRQ2 combination selects different internal torques: TRQ2=OFF TRQ1=OFF: Internal torque 1 (parameter PA-64) TRQ2=OFF TRQ1=ON: Internal torque 2 (parameter PA-65) TRQ2=ON TRQ1=OFF: Internal torque 3 (parameter PA-66) TRQ2=ON TRQ1=ON: Internal torque 4 (parameter PA-67) When PA-4
16 CMODE		Composite mode control Mode Settings	is set to 3, 4, or 5, it is in mixed control mode. The control mode can be switched through this input terminal: (1) When PA-4 is 3, CMODE OFF, it is position mode; CMODE ON, it is speed mode; (2) When PA-4 is 4, CMODE OFF, it is position mode; CMODE ON, it is torque mode; (3) When PA-4 is 5, CMODE OFF, it is speed mode; CMODE ON, it is torque mode.
18	GEAR1 Electronic gear selection 1		When PA-11 is 0, GEAR1 and GEAR2 are used to select
19	GEAR2 Electronic gear selection 2		The numerator of the same electronic gear ratio: GEAR2=OFF GEAR1=OFF: Numerator 1 (parameter PA-12) GEAR2=OFF GEAR1=ON: Numerator 2 (parameter PA-77) GEAR2=ON GEAR1= OFF: Numerator 3 (parameter PA-78) GEAR2=ON GEAR1=ON ÿ Numerator 4 (parameter PA-79)
20	CLR Position deviation clear		In position control mode, the position deviation counter is cleared input terminal.
21	INH Pulse input disable		In position control mode, position command pulse prohibition terminal: OFF: command pulse input is valid; ON: command pulse input is prohibited.

<table>
<tr><td>22</td><td>JOGP Forward Jog</td><td></td><td>In speed mode, when PA22=5, this signal is turned on and the motor moves in the positive direction. The speed is set by PA21. Note: When this signal is connected with the reverse jog function at the same time, the jog function is invalid.</td></tr>
<tr><td>23</td><td>JOGN Reverse jog</td><td></td><td>In speed mode, when PA22=5; this signal is turned on, the motor reverses Forward jog, the speed is set by PA21. Note: When this signal is connected with the forward jog at the same time, the jog function is invalid.</td></tr>
<tr><td>27</td><td>HOLD</td><td>Internal position control Command to stop</td><td>In internal position register mode, when this signal is on, the motor will stop Operation (can only be used when internal position mode PA-14=3).</td></tr>
<tr><td>28</td><td>CTRG</td><td>Internal position command trigger</td><td>In internal position register mode, select internal position register control After the command (POS0-2), this signal is triggered, and the motor moves according to the internal position Register command operation. When the digital output zero speed signal (ZSPD=1) After that, the next internal position command will be accepted.</td></tr>
<tr><td>29</td><td>POS0</td><td>Internal location Command selection 0</td><td rowspan="2">The relationship corresponding to the internal position selection is:
<table><tr><th>Location Order</th><th>POS2</th><th>POS1</th><th>POS0</th><th>CTRG</th><th></th><th>correspond parameter</th></tr><tr><td>P1</td><td>0</td><td>0</td><td>0</td><td>ÿ</td><td>P4-2
P4-3</td></tr><tr><td>P2</td><td>0</td><td>0</td><td>1</td><td>ÿ</td><td>P4-5
P4-6</td></tr><tr><td>P3</td><td>0</td><td>1</td><td>0</td><td>ÿ</td><td>P4-8
P4-9</td></tr><tr><td>P4</td><td>0</td><td>1</td><td>1</td><td>ÿ</td><td>P4-11
P4-12</td></tr><tr><td>P5</td><td>1</td><td>0</td><td>0</td><td>ÿ</td><td>P4-14</td></tr></table></td></tr>
<tr><td>30</td><td>POS1</td><td>Internal position command selection 1</td></tr>
</table>

<table>
<tr><td rowspan="8">31</td><td rowspan="8">POS2</td><td rowspan="8">Internal position
command selection 2</td><td></td><td></td><td></td><td></td><td></td><td>P4-15</td></tr>
<tr><td rowspan="2">P6</td><td rowspan="2">1</td><td rowspan="2">0</td><td rowspan="2">1</td><td rowspan="2">ÿ</td><td>P4-17</td></tr>
<tr><td>P4-18</td></tr>
<tr><td rowspan="2">P7</td><td rowspan="2">1</td><td rowspan="2">1</td><td rowspan="2">0</td><td rowspan="2">ÿ</td><td>P4-20</td></tr>
<tr><td>P4-21</td></tr>
<tr><td rowspan="2">P8</td><td rowspan="2">1</td><td rowspan="2">1</td><td rowspan="2">1</td><td rowspan="2">ÿ</td><td>P4-23</td></tr>
<tr><td>P4-24</td></tr>
<tr><td colspan="3">33 SHOM starts returning to origin</td><td colspan="5">In the internal position register mode, the origin needs to be searched. After this signal is turned on,
Start the origin search function (please refer to the setting of P4-34).</td></tr>
<tr><td colspan="3">34 ORGP Return to the origin</td><td colspan="5">In the internal position register mode, this signal is turned on when searching for the origin.
The servo then takes this point as the origin (please refer to parameter P4-32).
set up).</td></tr>
</table>

7.2.3 DO Function List Output

terminal (the four terminals corresponding to the P3 group parameters are P3-20, P3-21, P3-22, and P3-23) definition values:

Define value symbol		Function	Functional analysis
1	ON	Forced output ON is always effective.	
2	RDY Servo ready		OFF: The servo main power supply is off or there is an alarm; ON: The servo main power supply is normal and there is no alarm.
3	ALM	Call the police	OFF: Alarm; ON: No alarm. In speed and torque
4	ZSP	Zero speed	control, OFF: Motor speed is higher than parameter PA-75 (regardless of direction); ON: The motor speed is lower than parameter PA-75 (regardless of direction).
5	COIN positioning completed		In position control, OFF: position deviation is greater than parameter PA-16; ON: position deviation is less than parameter PA-16. In
6	ASP speed reaches		speed and torque control, OFF: motor speed is lower than parameter PA-28; ON: motor speed is higher than parameter PA-28. It has polarity setting function, refer to the description of parameter PA-28.
7	ATRQ torque reaches		OFF: the motor torque is lower than parameter PA-89;

			ON: The motor torque is higher than the parameter PA-89. It has the polarity setting function, refer to the description of parameter PA-89.
8	BRK Electromagnetic brake		OFF: electromagnetic brake is applied; ON: Electromagnetic brake is released.
9	RUN Servo is running		OFF: The servo motor is not powered on and is running; ON: The servo motor is powered on and is running. In
10	NEAR Positioning proximity		position control, OFF: The position deviation is greater than parameter PA-85; ON: The position deviation is less than parameter PA-85.
11	TRQL Torque limiting		OFF: The motor torque has not reached the limit value; ON: The motor torque has reached the limit value. The torque limit method is determined by parameters PA-34, PA-35, PA-36, PA-37.
12	SPL speed limited		In torque control, OFF: the motor speed does not reach the limit value; ON: the motor speed reaches the limit value. The speed limit method is set by parameter PA-50.
13	VCOIN speed consistent		OFF: The absolute value of the difference between the actual speed and the command speed is greater than PA76ÿ ON: The absolute value of the difference between the actual speed and the command speed is less than PA76.
15	HOME Return to origin completed		OFF: When origin return is not completed, no signal is output; ON: Signal output when origin return is completed.
16	CMDOK	Internal Position Commands Finish	OFF: When the internal position command is not completed or the internal position command is not When stopped, no signal is output; ON: When the internal position command is completed or the internal position command stops When the time set by P4-1 is reached, the signal is output.
18	SALTY	Z signal output	OFF: When the Z signal is invalid, no signal is output; ON: When the Z signal is valid, the signal is output.

7.2.4 DI forced effective

There are five parameters (P3-15, P3-16, P3-17, P3-18, P3-19) in the P3 group parameters that can set the digital input DI is mandatory.

(1) The corresponding function of P3-15 is represented by 8 bits of binary:

Digital Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
ÿÿ CZERO ZCLAMP TCW TCCW CWL CCWL ARST SON							

(2) The corresponding function of P3-16 is represented by 8 bits of binary:

Digital Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Function CMODE NULL TRQ2 TRQ1 NULL SP2						SP1	CINV

(3) The corresponding function of P3-17 is represented by 8 bits of binary:

Digital Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Function NULL JOGN JOGP INH				CLR GEAR2 GEAR1 NULL			

(4) The corresponding function of P3-18 is represented by 8 bits of binary:

Digital Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Function NULL POS2 POS1 POS0 CTRG HOLD NULL NULL							

(5) The corresponding function of P3-19 is represented by 8 bits of binary:

Digital Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
ÿÿ NULL NULL NULL NULL NULL NULL ORGP SHOM							

Parameter meaning:

Any one of the 5 parameters	Corresponding	Functional Results
0	functions	OFF (invalid)
	Not planned	Determined by the signal
1	Planned Not planned or Planned	ON (forced to be effective)

ÿ Planned means the parameter has been selected by the input terminals in P3-0~P3-3, and the opposite is true for unplanned.

7.3 P4 Group Internal Position Command Parameters

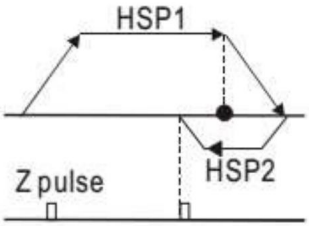
Serial number	name	Function	Parameter range	Factory value
P4-0	Internal position refers to Command control mode	0: absolute position command; 1: Relative position command. 1.	0-1	0
P4-1	Internal position Order to complete the number Output Delay	When the internal position command is completed or the internal position command stops When the internal position is output after the delay time set by P4-1 2. When the P4-1 delay time is set to 0, the DO signal is zero. When the speed detection (ZSPD) is set to 1, the trigger signal will be accepted again. 3. When the P4-1 delay time is not set to 0, the DO signal Set to 1 when the internal position command is completed (CMDOK) to accept The internal position command triggered by the DI signal command trigger (CTRG) make.	0-200 ms	0
P4-2	Internal position refers to Let 1 be the position Lap number setting	Set the number of position circles for the first segment's internal position.	-30000-30000	0
P4-3	Internal location Instruction 1 bit Pulse in the loop Number setting	1. Set the position pulse number of the first internal position. 2. Internal position command 1 = the set value of the first internal position turns. +The setting value of the number of internal position pulses in the first segment. (Max is the number of pulses set for one motor revolution, please refer to the settings of PA-11 PA-12 PA-13).	+/- max.cnt /rev	0

P4-4	Internal position refers to Command control 1 Movement speed setting	Set the moving speed of internal position command control 1.	0-5000 rpm	1000
P4-5	Internal position refers to Let 2 be the position Lap number setting	Set the number of position circles for the second segment's internal position.	-30000-30000	0
P4-6	Internal location Instruction 2 bits Pulse in the loop Number setting	1. Set the position pulse number of the second internal position. 2. Internal position command 2 = the set value of the second internal position turns + The setting value of the number of internal position pulses in the second stage.	+/- max cnt /rev	0
P4-7	Internal position refers to Command control 2 Movement Speed set up	Set the moving speed of internal position command control 2.	0-5000 rpm	1000
P4-8	Internal position refers to Let 3 be the position Lap number setting	Set the number of position circles for the inner position of the third segment.	-30000-30000	0
P4-9	Internal location Instruction 3 bits Pulse in the loop Number setting	1. Set the position pulse number of the third internal position. 2. Internal position command 3 = the set value of the third internal position turns +3rd segment internal position pulse number setting value.	+/- max cnt /rev	0
P4-10	Internal position refers to Command control 3 Movement speed setting	Set the moving speed of internal position command control 3.	0-5000 rpm	1000

P4-11	Internal position refers to Let 4 be the position Lap number setting	Set the number of position circles for the 4th segment inner position.	-30000-30000	0
P4-12	Internal location Instruction 4 bits Pulse in the loop Number setting	1. Set the position pulse number of the 4th internal position. 2. Internal position command 4 = the set value of the 4th internal position turns +The setting value of the number of internal position pulses in the 4th segment.	+/-30000 cnt /rev	0
P4-13	Internal position refers to Command control 4 Movement speed setting	Set the moving speed of internal position command control 4.	0-5000 rpm	1000
P4-14	Internal position refers to Let 5 be the position Lap number setting	Set the number of position circles for the inner position of the 5th segment.	-30000-30000	0
P4-15	Internal location Instruction 5 bits Pulse in the loop Number setting	1. Set the position pulse number of the 5th internal position. 2. Internal position command 5 = the set value of the 5th internal position turns + The setting value of the internal position pulse number of the 5th segment.	+/-30000 cnt /rev	0
P4-16	Internal position refers to Command control 5 Movement speed setting	Set the moving speed of internal position command control 5.	0-5000 rpm	1000
P4-17	Internal position refers to Let 6 be the position Lap number setting	Set the number of position circles for the inner position of the 6th segment.	-30000-30000	0

P4-18	Internal location Instruction 6 bits Pulse in the loop Number setting	1. Set the position pulse number of the 6th internal position. 2. Internal position command 6 = the setting value of the 6th internal position turns +6th internal position pulse number setting value.	+/- max.cnt /rev	0
P4-19	Internal position refers to Command control 6 Movement speed setting	Set the moving speed of internal position command control 6.	0-5000 rpm	1000
P4-20	Internal position refers to Let 7 be the position Lap number setting	Set the number of position circles for the inner position of the 7th segment.	-30000- 30000	0
P4-21	Internal location Instruction 7 bits Pulse in the loop Number setting	1. Set the number of position pulses for the 7th segment internal position. 2. Internal position command 7 = the 7th internal position circle setting value + The setting value of the number of internal position pulses in the 7th segment.	+/- max.cnt /rev	0
P4-22	Internal position refers to Command control 7 Movement Speed set up	Set the moving speed of internal position command control 7.	0-5000 rpm	1000
P4-23	Internal position refers to Let 8 be the position Lap number setting	Set the number of position circles for the internal position of the 8th segment.	-30000- 30000	0
P4-24	Internal position refers to Let 8 be the position Number of pulses in a circle set up	1. Set the position pulse number of the 8th internal position. 2. Internal position command 8 = the set value of the 8th internal position turns +The setting value of the internal position pulse number of the 8th segment.	+/- max.cnt /rev	0

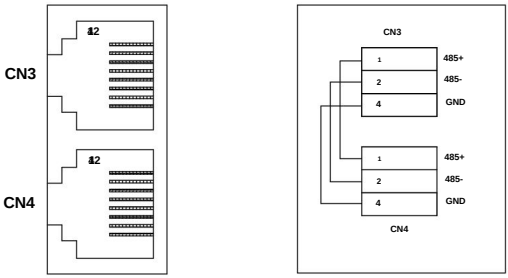
P4-25	Internal position refers to Command control 8 Movement speed setting	Set the moving speed of internal position command control 8.	0-5000 rpm	1000
P4-32	Origin detector Types and Find Direction Setting	0: Return to origin in the forward direction, CCWL is used as the return origin; 1: Reverse direction origin return, CWL is used as the return origin; 2: Forward direction origin return, ORGP is used as the origin return 3: Reverse direction origin return, ORGP is used as the return origin 4: Directly find the single-turn absolute position zero point for returning to the original position 5: Reverse and directly find the single-turn absolute position zero point to return to the original 0:	0-5	0
P4-33	Arrived at the origin Short distance movement Mode setting	After finding the reference origin, return to find the single-turn absolute position zero point As the mechanical origin; 1: After finding the reference origin, do not return, and search forward for the single-circle absolute Position zero point as the mechanical origin; 2: Find the reference origin (ORGP rising edge or single-turn absolute position After setting the zero point as the mechanical origin, the machine decelerates and stops.	0-2	0
P4-34	Origin trigger start mode	0: Disable the origin return function; 1: Automatically execute the origin return function when the power is turned on; 2: Trigger the origin return function by the origin search function (SHOM) input contact. Point regression function.	0-2	0
P4-35	Origin stop mode setting	0: After the origin detection is completed, the motor decelerates and pulls back to the origin; 1: After the origin detection is completed, the motor decelerates and stops in the forward direction end.	0-1	0
P4-36	The first high speed Origin return speed Degree setting (HSPD1)	Set the first high-speed origin return speed.	1-2000 rpm	1000

				
P4-37	Second stage low speed Origin return speed Degree setting (HSPD2)	Set the second low-speed origin return speed.	1-500 rpm	50
P4-38	Origin regression bias Number of circles ÿHOF1ÿ	Set the number of origin return offset circles.	-30000- 30000	0
P4-39	Origin regression bias Shift pulse number ÿHOF2ÿ	1. Set the number of origin return offset pulses. 2. When the parameter functions HOF1 and HOF2 are set to zero, the origin will The origin return mode is defined as single-turn absolute position zero point or ORGP. If the setting value is not zero, the origin will be based on the single Absolute position zero point or ORGP plus one pulse offset HOF1 x 10000+HOF2 is used as the new origin.	+/- max.cnt /rev	0

Chapter 8 MODBUS Communication Description

8.1 Hardware connection

8.1.1 Communication port wiring diagram



Inside the CN3 and CN4 interfaces

Wiring is parallel

8.1.2 Communication port pin definition

Pin No. CN3		name	CN4	name
1	RS485+	RS485 communication	RS485+	RS485 communication
2	RS485 -	interface	RS485 -	interface
3	NC	Vacant	NC	Empty Edge
4	GND	end 485 Signal area	GND	485 Signal area
5	NC	Vacant	NC	Empty Edge
6	NC	end Vacant end	NC	Empty Edge
7	NC	Empty	NC	Empty Edge
8	NC	end Empty end	NC	Empty Edge

8.2 Communication parameter settings

parameter	name	scope	Default value
PA-71 (Note 1)	Drive ID	1ÿ254	1
PA-72 (Note 2)	MODBUS communication baud rate 48ÿ1152×100		96
PA-73 (Note 3)	MODBUS communication protocol selection	0ÿ2	0

***Note 1: When using RS-485 communication, the station number of the servo drive must be set to a different value by this parameter.**

The setting range of the station number is 1~254, and the default value is 1. This station number represents the absolute address of this drive in the communication network.

Repeated station number setting will result in abnormal communication.

*Note 2: This parameter is used to select the baud rate of RS-485 communication. The selected communication baud rate must be consistent with the upper controller.

Parameter meaning: Select

96×100, the

baud rate is 9600. In addition, the RS-485

communication protocol must be consistent with the communication protocol of the upper controller. The specific setting values are as follows:

8ÿNÿ2ÿMODBUSÿRTUÿ

The number 8 indicates that the data to be transmitted is 8 bits; the letter N indicates that the parity bit is not used; the number 2 indicates that the end bit is

2ÿ

*Note 3: Use this parameter to select the RS-485 communication protocol. The selected communication protocol must be consistent with the communication protocol of the upper controller.

The specific setting values are as follows:

0ÿ8ÿN , 2ÿMODBUSÿRTUÿ

1ÿ8ÿE , 1ÿMODBUSÿRTUÿ

2ÿ8ÿO , 1ÿMODBUSÿRTUÿ

3ÿ8ÿNÿ1ÿMODBUS, RTU)

The number 8 represents that the data to be transmitted is 8 bits; the letters N, E, and O represent the parity bit, and N means that this bit is not used.

E means 1 even bit, O means 1 odd bit; the number 1 means the end bit is 1, the number 2 means the end bit is

2ÿ

8.3 Communication Protocol

When using RS-485 serial communication, each servo drive must be pre-set in the parameters.

The computer or host controller communicates with the corresponding servo drive according to the station number. The communication baud rate needs to refer to the host controller.

Here MODBUS uses the RTU (Remote Terminal Unit) mode.

Mode.

Communication data structure:

STX	The minimum time interval with the previous frame is 3.5
ADR	characters Communication
CMD	address: 1 byte Command code: 1 byte
DATA(0)	Data content: Nword=2Nbyte, Nÿ=100
.....	
DATA(n-1)	
CRC	Check code: 2 bytes.
End1	The minimum time interval with the next frame is 3.5 character times.

The items in the communication data format box are described as follows:

1. STX (communication start)

The minimum time interval with the previous frame is 3.5 character times.

2. ADR (Correspondence Address)

The legal communication address range is between 1 and 254, as shown below:

Servo drive communicates: ADR=10H

3. CMD (command name) and DATA (data character)

The format of the data characters depends on the command code. Commonly used command codes are described as follows:

(1) Command code 03H, read N words (16 bits).

For example: read two parameters continuously from parameter No. 5 of the servo drive with station No. 01H.

命令信息：

ADR	01H
CMD	03H
起始数据位置	00H(高字节)
	05H(低字节)
数据数	00H(高字节)
	02H(低字节)
CRC Low	D4H(高字节)
CRC High	0AH(低字节)

回应信息：

ADR	01H
CMD	03H
数据数（以byte计算）	04H
5号参数内容	00H(高字节)
	96H(低字节)
6号参数内容	00H(高字节)
	4BH(低字节)
CRC Low	5AH(高字节)
CRC High	28H(低字节)

(2) Command code 06H, write 1 parameter. For

example: write 100 (0064H) to parameter 5 of the servo drive with station number 01H.

命令信息：

ADR	01H
CMD	06H
起始数据位置	00H(高字节)
	05H(低字节)
数据内容	00H(高字节)
	64H(低字节)
CRC Low	98H(高字节)
CRC High	20H(低字节)

回应信息：

ADR	01H
CMD	06H
起始数据地址	00H(高字节)
	05H(低字节)
数据内容	00H(高字节)
	64H(低字节)
CRC Low	98H(高字节)
CRC High	20H(低字节)

4. CRC frame check calculation:

Check calculation steps: Step

1: Initialize a 16-bit register with a content of FFFFH, called the CRC register. Step 2: Perform an XOR

operation on the first character of the command information and the low byte of the 16-bit CRC register.

Calculate and store the result back to the

CRC register. Step 3: Check the least significant bit (LSB) of the CRC register. If this bit is 0, shift it right by one bit; if this bit is

1, the CRC register value is shifted right by one bit and then XORed with A001H.

Step 4: Return to step 3 until step 3 has been executed 8 times, then go to step 5. Step 5: Repeat

steps 2 to 4 for the next byte of the command information until all bytes have completed the above steps.

The above process is performed, and the content of the CRC register is the CRC frame check.

Note: After calculating the CRC frame check, in the command information, you must first fill in the low bit of the CRC, and then fill in the

The high bit of CRC.

For example: read 2 parameters in succession from parameter No. 5 of the servo drive with station No. 01H.

To the last byte of data

The final content of the calculated CRC register is 0AD4H, and its command information is as follows.

Yes: Byte D4H shall

be transmitted before byte 0AH.

ADR	**01H**
CMD	**03H**
Starting data position	**00H (high byte)**
	05H (low byte)
Number of data	**00H (high byte)**
	02H (low byte)
CRC Low	**D4H (high byte)**
CRC High	**0AH (low byte)**

5. End1 Communication ends:

The minimum time interval with the next frame is 3.5 character times.

8.4 Writing and reading parameters

8.4.1 Writing PA group parameters

For all PA parameters of the servo drive, please refer to the corresponding chapters of the manual. Each parameter uses a 16-bit data table.

The communication address of each parameter is determined by the parameter number, and the address is 16 bits. For example, the address of parameter

1 (PA-0) is 0X0000, parameter 2 (PA-1) is 0X0001, and the same applies to other parameters.

8.4.2 Writing P3 group parameters

For all P3 parameters of the servo drive, please refer to the corresponding chapters of the manual. Each parameter uses a 16-bit data table.

The communication address of each parameter is determined by the parameter serial number, and the address is 16 bits. For example, the address of the parameter

1 (P3-0) is represented by 0x0100H, parameter 16 (P3-15)

is represented by 0x010FH, and the same applies to other parameters.

8.4.3 Writing P4 group parameters

For all P4 parameters of the servo drive, please refer to the corresponding chapters of the manual. Each parameter uses a 16-bit data table.

The communication address of each parameter is determined by the parameter serial number, and the address is 16 bits. For example, the address of the parameter

1 (P4-0) is represented by 0x0200H, parameter 16 (P4-15)

is represented by 0x020FH, and the other parameters are represented by the same analogy.

8.4.4 Parameter format description for writing and reading parameters

The parameter format that can be written and read via communication (for status reading, please refer to Section 1.5):

The parameters to be read and written must be decimal integers, which are marked with a decimal notation on the drive display panel and in the instruction manual.

The parameters of the number point are magnified by the corresponding multiples during the reading and writing operations to make them decimal integers.

Parameters displayed in binary format are actually used during read and write operations with their decimal equivalents.

The details are as follows. For details on the change of each parameter in the PA group, please refer to the corresponding chapter of the

PA serial number	display value	parameter in the manual:	Communication operation value change method
1	315	315	constant
63	1.00	100	Magnify 100 times
57	0100 (binary) All	4(decimal)	Binary to decimal

parameters described in the parameter section can be read and written via communication. For details, please refer to the corresponding

Parameter description.

8.4.6 Parameter temporary storage and temporary storage address

According to customer needs, during the operation of the driver, the parameter values need to be continuously updated to ensure

To improve the life of EEPROM and speed up program execution efficiency, a parameter temporary storage function is added. Use the corresponding temporary storage address to

When modifying parameters, the parameters can be modified but not saved. After the drive is powered on again, the parameters will return to the initial value.

as follows:

The communication address for storing the positive torque limit value is 0x0022. When using this address to modify the parameter to 200, the parameter

Save in EEPROM, after the drive is powered off, the parameter is 200 and not lost; while the communication of the forward torque limit value is temporarily stored

The address is 0x00A2. When the torque limit value is changed to 200 using this address, the parameter value will be set and it will take effect immediately.

After power on again, the initial value will be restored to 300.

The communication address of the PA group parameters is detailed in the parameter description section of the driver manual.

The communication address for temporary storage is the address offset 0x0080 for saving parameters, as follows:

(1) The communication address of the storage parameter of the forward torque limit value is 0x0022. After the offset is 0x0080, the forward torque limit value

The communication address of the temporary storage parameter of the control value is 0x00A2.

(2) The communication address of the reverse torque limit value is 0x0023. After the offset is 0x0080, the reverse torque limit

The communication address of the temporary storage parameter of the control value is 0x00A3.

Note: The temporary address can only be written, not read. If you need to read, please use the address before the offset.

8.4.5 Status Quantity Monitoring

The internal state of the servo drive can be read through the RS-485 communication port, but cannot be written.

The data is stored in 16-bit format, and the value is accurate to the decimal place. When it is read out through the communication port, the value is multiplied by 10.

100 times magnification. This situation is the same as the parameter reading part, and the assembly order of the relevant state quantities is as follows:

Communication address (hexadecimal)	describe
1000H	Motor
1001H	speed Current position (pulse) low
1002H	16 bits Current position (pulse)
1003H	high 16 bits Position command
1004H	(pulse) low 16 bits Position
1005H	command (pulse) high 16 bits
1006H	Position deviation (pulse) low 16
1007H	bits Position
1008H	deviation (pulse) high 16 bits Motor torque Motor current
1009H	Current control mode
100AH	Current
100BH	temperature
100CH	Speed
100DH	command Torque command Low 16 bits of
100EH	absolute rotor position in one revolution High 16
100FH	bits of absolute rotor
1010H	position in one
1011H	revolution Input terminal
1012H	status Output terminal status Encoder input signal Main circuit bus voltage value
1013H	Alarm code
1014H	Logic chip version
1015H	number Relay closure
1016H	status
1017H	Operation status
1018H	External voltage status 15bit~0bit
1019H	of absolute position value 31bit~16bit
101AH	of absolute position value 47bit~32bit of absolute position value

101BH	63bit~48bit of absolute position value

Chapter 9 Fault Codes

Fault symbol	Fault name	Fault content
--	Normal	1
Overspeed	2	The servo motor speed exceeds the set value.
Main circuit overvoltage	3	The main circuit power supply voltage
Main circuit undervoltage		is too high. The main circuit power
4	Position out of	supply voltage is too low. The position deviation counter value
tolerance	5 Driver overheat	exceeds the set value. The drive temperature is too high.
6	Speed amplifier saturation fault	Speed regulation saturated for a long time
7	Driver disabled abnormality	CCW/CW drive inhibit input is OFF
8	The position deviation counter overflows.	The absolute value of the position deviation count exceeds 230.
11	IPM module fault 13 Driver	IPM intelligent module failure
overload	14 Braking fault 18	Servo drive and motor overload (instantaneous
Relay switch fault	19	overheating) Brake
Braking delay error		circuit failure The actual state of the relay is
		inconsistent with the control state Pulse input when the brake is not open
20	EEPROM error	EEPROM Error
21	FPGA module failure 23 Current	FPGA module malfunction
acquisition circuit failure	29 User	Current acquisition circuit
torque overload alarm		failure Motor load exceeds the value and duration set by the user
38	Read and write encoder EEPROM Communication	The encoder line is not connected properly or the encoder interface circuit is faulty.
failed	39 Data CRC check error	The motor encoder has not yet written data, all are 0
40	Unsupported model	The driver does not support this motor model
41	Need to switch motor model	The current motor and the selected drive model are inconsistent.
42	AC input voltage is too low 47 Main	AC input voltage is too low
circuit voltage is too high when powered on	Main circuit voltage is too high when powered on 50 Encoder	
communication fault	The drive has not established a communication connection with the encoder 51 Encoder	
communication abnormality	After the encoder establishes communication, an interruption occurs and the connection is disconnected	

52 Encoder battery voltage low alarm	Encoder battery voltage low alarm, information is not lost but needs to be replaced as soon as possible
53 Encoder battery voltage error alarm	Encoder battery voltage error alarm, storage information has an error, Encoder reset required
54 Encoder error alarm	The encoder is not a battery alarm, but the encoder needs to be reset. The
55 CRC check error for 3 consecutive times	CRC check of the data received by the encoder communication has errors for 3 consecutive times. error
56 MODBUS frame too long error	The received MODBUS frame data is too long
57 MODBUS communication format abnormal	Communication parameter setting is improper or the address or value is incorrect
58 Single-turn position value error	The single-turn position offset value stored in the drive exceeds the encoder resolution
59 Encoder reports CF error	Encoder continuously reports CF domain error, encoder needs to be reset

Chapter 10 Alarm Processing Methods

Alarm code	Alarm Name	Appears when the	reason	Treatment
1	Speeding	control power is turned on in the running state	1. Control circuit board failure. 2. Encoder failure. Input	1. Replace the servo driver. 2. Replace the servo motor.
		Motor operation Appear during the process	command pulse frequency is too high. Correctly set input command pulse. Acceleration/deceleration	
			time constant is too small. The speed overshoot is too	Increase the acceleration/deceleration time constant.
			large. The input electronic gear ratio is	Correct setting.
			too large. The encoder	Replace the servo
			is faulty. The encoder cable is defective.	motor. Replace the encoder
			The servo system is unstable, causing over Tune.	cable. 1. Reset the relevant gain value. 2. If the gain cannot be set to an appropriate value, the load inertia ratio is reduced.
		Motor just started Appears when moving	The load is too large.	1. Reduce the load. 2. Replace with a higher power drive and 1. Replace
			1. Encoder zero point error. 2. Motor UVW leads are connected incorrectly. 3. Encoder cable leads are connected incorrectly.	the servo motor. 2. Ask the manufacturer to readjust the encoder zero point. 3. Connect the wires correctly.

Alarm code	Alarm Name	Appears when the	reason	Treatment
2	Main circuit Overpressure	control power is turned on in the running state	Circuit board failure.	Replace the servo drive.
		Connect the main power Occurs when source	1. The power supply voltage is too high. 2. The power supply voltage waveform is	Check the power supply.
		The motor has been running Appear in the process	abnormal. The brake resistor wiring is	Rewire.
			disconnected. 1. The brake transistor is damaged. 2. The internal brake resistor is damaged.	Replace the servo drive.
			Insufficient brake circuit capacity.	1. Reduce the start and stop frequency. 2. Increase the acceleration and deceleration time constants. 3. Reduce the torque limit value. 4. Reduce the load inertia. 5. Replace the drive with a higher power. Motor.
3	Main circuit Undervoltage	Connect the main power Occurs when source	1. Circuit board failure. 2. Power fuse failure. 3. Soft start circuit failure. 4. Rectifier failure. 1. Low power supply voltage.	Replace the servo drive.
			2. Temporary power outage lasting more than 20ms.	Check the power supply.
		The motor has been running Appear in the process	1. Insufficient power supply capacity. 2. Momentary	Check the power supply.
			power failure. Radiator overheating.	Check the load conditions.

Alarm code	Alarm Name	In operation	reason	Treatment
4 Position out of tolerance		state, turn on the control power Occurs when source	Circuit board failure.	Replace the servo drive.
		Connect the main power supply and control lines, Input pulse pointer The motor does not Rotate or reverse	1. Encoder zero point changes. 2. Encoder failure.	1. Re-adjust the encoder zero point. 2. Replace the servo motor.
		The motor has been running Appear in the process	The position error detection range is set to be small.	Increase the position error detection range.
			The position proportional gain is too small.	Increase the gain
			Insufficient torque.	value. 1. Check the torque limit value. 2. Reduce the load capacity. 3. Replace with a higher power drive and Motor.
			The command pulse frequency is	Reduce frequency.
			too high. The encoder zero	Readjust encoder zero point.
5	Drive overheat	Drive operation Appear during the process	point changes. 1. Circuit board failure. 2. The driver temperature is too high.	1. Reduce the drive temperature. 2. Replace the servo drive. 1.
6	Speed Amplification Saturation Fault	The motor has been running Appear in the process	1. The load is too heavy. 2. The motor is mechanically stuck.	Reduce the load. 2. Replace the drive with a higher power. Motor. 3. Check the load mechanical part.
7	Driver disabled exception		CCW / CW drive inhibit input The sub are disconnected.	Check the wiring.
8	Position deviation Counter overflow		1. The motor is mechanically stuck. 2. The input command pulse is abnormal.	1. Check the load mechanical part. 2. Check the command pulse. 3. Check whether the motor is running according to the command Rush and turn.

Alarm code	Alarm Name	In operation	reason	Treatment
11	IPM Module Block Fault	state, turn on the control power Occurs when source	Circuit board failure.	Replace the servo drive.
		The motor has been running Appear in the process	1. The power supply voltage is too low. 2. Overheating.	1. Check the drive. 2. Re-energize the drive. 3. Replace the drive.
			Short circuit between UV and W of the driver. Check the wiring. Poor	
			grounding. Correct grounding. Motor insulation damage. Replace the	
			motor. 1. Add line filter. 2. Stay away from interference sources.	
			Being disturbed.	
13 Overload		Turn on the control power Occurs when source	Circuit board failure.	Replace the servo drive.
		The motor has been running Appear in the process	Operation exceeding rated torque.	1. Check the load. 2. Reduce the start and stop frequency. 3. Reduce the torque limit value. 4. Replace with a higher power drive and Motor.
			The holding brake is not on.	Check holding brake. 1. Adjust
			The motor oscillates unsteadily.	gain. 2. Increase acceleration/deceleration time. 3. Reduce load inertia.
			1. One phase of UVW is disconnected. 2. Encoder connection error.	Check the wiring.
14 Brake failure			1. Braking circuit failure. 2. The PD shorting piece is not connected	1. Replace the driver; 2. Check the connector;

Call the police Code	Alarm Name	Running status	reason	Treatment
18	Relay Switch failure		Relay is damaged.	Return to factory for repair.
19	Braking delay Not open		PA94 parameter value is set too large, control The pulse comes, but the brake has not been opened yet.	Reduce the value of parameter PA94.
20	EEPROM error		The chip or circuit board is damaged.	1. Replace the servo drive. 2. After repair, you must reset the Driver model (see PA10), and then restore to default
21	FPGA module fault current		The FPGA module is not functioning properly.	Parameters. Replace the drive.
23	acquisition circuit Fault		The current acquisition circuit is faulty.	Replace the servo drive.
29	user torque overload alarm		1. The parameters of PA30 and PA31 are unreasonable. 2. Unexpected heavy load occurs.	1. Modify the parameters. 2. Repair the machine.
38	read and write encoder EEPROM communication fail		1. Encoder cable is not connected properly 2. Encoder interface circuit failure 3. Encoder does not refresh code	1. Check the wiring. 2. Contact the manufacturer.
39	Data CRC check mistake		The motor encoder has not yet written data. All are 0.	Write the motor parameters of the corresponding model into Enter the encoder.
40	Unsupported model		The drive does not support this motor model. Use a matching motor. The current	
41	Need to switch motor model		motor and drive have selected models. Inconsistent.	Manually switch the model to the current model.
42	AC Input Voltage is too low	When power is off Runtime	1. Normal. 2. The external AC voltage input is too low.	Check AC220V input.
47	Main circuit at power on Voltage is too		1. The external AC voltage input is too high. 2. The main circuit is faulty.	1. Check the AC220V input. 2. Replace the drive.
50	high Encoder communication		The drive and encoder have not established communication After the	Connect the encoder cable and reconnect.
51	fault Encoder communication abnormality		encoder communication is established, Now interrupted, disconnected.	Connect the encoder cable and reconnect electricity.

Call the police Code	Alarm Name	Running status	reason	Treatment
52	Encoder battery Insufficient pressure alarm		Encoder battery voltage low alarm, The information is not lost but needs to be replaced	Replace the encoder battery.
53	Encoder battery Pressure error alarm		as soon as possible. Encoder battery voltage error alarm, An error has occurred in the stored information. To reset the encoder.	The encoder battery is exhausted and must replace.
54	Encoder Error Alarm		Encoder non-battery alarm, but need To reset the encoder.	Reset the encoder.
55	CRC check continuous 3 errors		Data received by MODBUS communication CRC verification fails 3 times in a row	Replace the drive.
56	MODBUS frame Long Error		1. The communication protocol does not match. 2. Interference occurs.	1. Check the frame length. 2. Add line filters and keep away from interference.
57	MODBUS Communication Format abnormal		1. The communication parameters are set incorrectly. 2. The communication address or value	Replace the drive.
58	single lap Position value error		is incorrect. The single-turn position stored in the drive is offset. The value exceeds the encoder resolution.	Restart the system by powering on again.
59	Encoder Report CF Error		The encoder continuously reports CF domain errors. The encoder needs to be reset.	Reset the encoder.