杰美康机电
JUST MOTION CONTROL

JAND_P28/DB44 AC Servo Driver User Manual

JAND-15002-P28

JAND-7502-P28

JAND-4002-P28

JAND-2002-P28
JAND2002-20B-DB44
JAND15002-20B-DB44
JAND10002-20B-DB44
JAND10002-20B-DB44
JAND7502-20B-DB44
JAND4002-20B-DB44

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Preface

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Version	compile	Approved
V1. 2	RD	RD

Chapter I Safety Precautions

In order to prevent personal and property safety, please observe the following precautions and make the following marks for distinction:

 Danger	Indicates a high probability of death or major injury
 Attention	Indicates a high risk of minor injury or property damage
	Indicates a prohibited item

1.1 Receiving and installation precautions

 Danger: 1. Please use the driver and motor in the specified way, otherwise it will cause equipment damage or cause fire.

2. It is forbidden to use in places with severe water vapor, flammable gas, corrosive gas, etc., otherwise it will cause electric shock, fire, equipment damage, etc.

1.2 Wiring Precautions

 Danger: 1. Do not connect the driver power supply to the U, V, W motor output terminals, otherwise the driver will be damaged, which may cause personal injury or fire.

2. Please confirm that the connecting wires of the power supply and motor output terminals are locked, otherwise it may cause sparks and cause fire.

3, please correctly select the power cord and motor power extension line, to avoid the wire to withstand the current capacity is not enough to cause fire.

4. Please confirm that the driver shell and motor are grounded. Poor grounding may cause electric shock.

Note: 1. Please do not tie the motor power line and signal line together or pass through the same pipe to prevent interference with the signal.

2, signal line, encoder feedback extension line, please use multi-stranded shielded wire, strengthen anti-interference ability.

3. After the drive is powered off, there is still high voltage inside. Please do not touch the power terminal within 5 minutes, and confirm that the discharge indicator is off before operating.

4. Before power-on, please confirm whether the wiring is connected correctly.

1.3 Precautions for operation and operation

Danger: 1. Before the equipment is installed, please run it with no load to avoid accidents.

2. Do not allow untrained personnel to operate to prevent equipment damage and personal injury caused by misoperation.

3. During normal operation, please do not touch the radiator of the drive and its interior with your hands to prevent high temperature burns or electric shock.

Note: 1, please adjust the driver parameters, and then long-term test, to prevent the use of poor drivers and equipment.

2, please confirm the equipment start, emergency stop, close and other switches are effective and then run the equipment.

3. Please do not switch the power supply frequently.

1.4 Precautions for maintenance and inspection

1. During operation, it is forbidden to touch the inside of the driver and motor to prevent electric shock.

2、 Do not touch the power supply and power terminals within 5 minutes after the power supply is turned off to prevent electric shock.

3、 Do not change the connection line under the condition of power supply, so as to prevent electric shock or personal injury.

4、 Operation and routine maintenance must be carried out by trained professionals.

5、 Please do not disassemble and repair except our company personnel.

Chapter IIProduct Introduction

2.1 servo driver

2.1.1 General

JAND_P28/DB44 series universal servo driver is a high-performance AC servo unit developed by JMC. This series of servo driver adopts advanced DSP chip for motor control, large-scale programmable gate array (FPGA) and IPM power module, which has the characteristics of small size, high integration, stable performance and reliable protection. It has rich digital and analog I/O interfaces, can be used with a variety of host computer devices, and supports MODBUS communication protocol to facilitate networking. Through the optimized PID control algorithm, the position, speed, torque accuracy of the full digital control, with high precision, fast response and other advantages. Supports 17-bit and 23-bit high-precision absolute encoder motors to meet different customer performance requirements. Widely used in CNC machine tools, printing and packaging machinery, textile machinery, robots, automated production lines and other automation fields.

2.1.2 Main Features

1. Using DSP+FPGA dual-chip platform and optimized current loop design, the driver has the characteristics of high dynamic response, very short setting time, stable operation and small vibration when stopping.
2. With automatic gain adjustment module, users can choose the rigidity level according to their needs.
3. Built-in FIR filter and multi-notch filter can automatically identify and suppress mechanical vibration.
4. Built-in disturbance torque observer makes the actuator have strong anti-external disturbance ability.
5. With a variety of control modes to choose from, position control, speed control, torque control, can switch various control modes.
6. The position pulse input frequency is up to 1MHz, and supports multiple position command modes such as pulse + direction, orthogonal pulse, and double pulse.
7. With RS485 interface, support MODBUS communication, with multi-turn absolute encoder with memory function, it can be flexibly applied to manipulator and other industries.
8. There are programmable 5-way INPUT and 4-way OUTPUT ports, users can customize the input and output through parameter settings, and the application is flexible.

9. Supports 17-bit and 23-bit high-precision absolute encoders.
10. It has perfect protection functions such as overvoltage, undervoltage, overspeed, overload, excessive position deviation, encoder error, etc., and can remember 8 groups of historical fault information.
11. With rich monitoring items, users can select the desired monitoring items to monitor the operation status during use.
12. The driver can communicate with PC through MINI USB interface, which realizes simple and quick debugging of servo drive system.

2.1.3 Drive Specifications

1. Electrical specifications

Three-phase 220V class servo driver

Model: JAND***2-P28/DB44	100 (P28 only)	200	400	750	1500
Continuous input current Arms	1.1	1.9	3.2	6.7	8.8
Continuous output current Arms	0.91	1.6	2.8	5.5	8
Maximum output current Arms	2.9	5.8	9.6	16.9	19
Input power supply Vac	Single phase AC180-240V, 50/60Hz				Single phase/three phase 220Vac
Brake processing function	None (if external resistors are required)			Built-in braking resistor	

2. Basic specifications

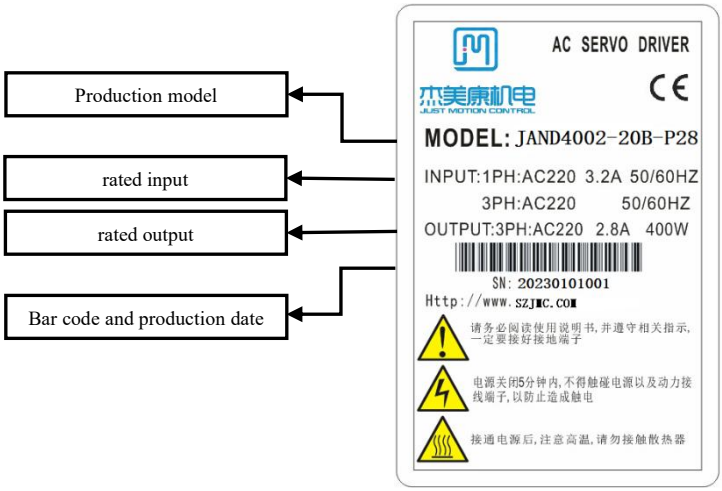
Item		Desc
control mode		single-phase full-wave rectifier IGBT PWM control sine wave current drive mode
Feedback		absolute encoder
Terms of Use	Temperature	Working temperature: 0~55℃ Storage: -25~85℃

	humidity	Work: 10% to 90%
	altitude	<1000m, above 1000 m, should be used in accordance with GB/T 3859.2-93 derating
	protection class	Protection class: IP10 Cleanliness: 2 No corrosive gas, flammable gas, no oil, water splash, dust, salt and less metal powder environment
performance	Speed adjustment range	1:6000
	steady speed accuracy	±0.01%: external load variation 0~100% ±0.01%: ±10% power input variation at 220V ±0.1%: Ambient ±25℃ (25℃)
	speed response frequency	2000Hz
	Torque control accuracy	±2%
input/output	Encoder frequency division pulse output (P28 Series without this output)	Phase A, Phase B differential output Z-phase differential output or open-collector output Frequency division pulse number: can be set arbitrarily
	P28 input signal	Number of points: 5 Functions: servo ON, alarm clearing, forward overtravel signal input, reverse overtravel signal input, control mode switching, P action command input, forward rotation side external torque limit, reverse rotation side external torque limit, gain switching input, zero position fixing input, command pulse prohibition input, encoder absolute value data request input, internal set speed switching input 1, internal set speed switching input 2, internal set speed switching input 3, position command clearing input, etc.
	P28	Number of points: 4

signal	output signal	Function: alarm output, band brake open output, servo ready output, positioning completion output, positioning approach output, speed consistent output, motor zero speed output, torque limit detection output, speed limit detection output, warning output, command pulse input magnification switching output
	DB44 input signal	Number of points: 8 Functions: servo ON, alarm clearing, forward overtravel signal input, reverse overtravel signal input, control mode switching, P action command input, forward rotation side external torque limit, reverse rotation side external torque limit, gain switching input, zero position fixing input, command pulse prohibition input, encoder absolute value data request input, internal set speed switching input 1, internal set speed switching input 2, internal set speed switching input 3, position command clearing input, etc.
	DB44 output signal	Number of points: 5 Function: alarm output, band brake open output, servo ready output, positioning completion output, positioning approach output, speed consistent output, motor zero speed output, torque limit detection output, speed limit detection output, warning output, command pulse input magnification switching output
display function		High voltage power indicator, 6-bit 8-segment LED
communication function	RS485	Support MODBUS protocol Axis address: set by parameter
	MINIUSB	Connect PC for debugging, USB communication
regeneration treatment		Built-in regenerative resistor or external regenerative resistor
protection function		Overvoltage, undervoltage, overcurrent, overload, etc.

2.1.4 Servo driver nameplate and model description

1、Description of nameplate contents



2. Model description:

JAND 400 2 - 20B - P28

JAND_P28 Series AC Servo Driver

Driver Power	
symbol	rated output
power	
100	100W
200	200W
400	**400W**
750	750W

Power supply voltage	
specification	
symbol	specification
1	Single phase

28PIN Wire Saving Terminals

Number of encoder lines	
symbol	Encoder support
20B	**17BC/M17BC/M23B**
M20B	M17BC/M23B(with

2.2 servo motor

2.2.1 General

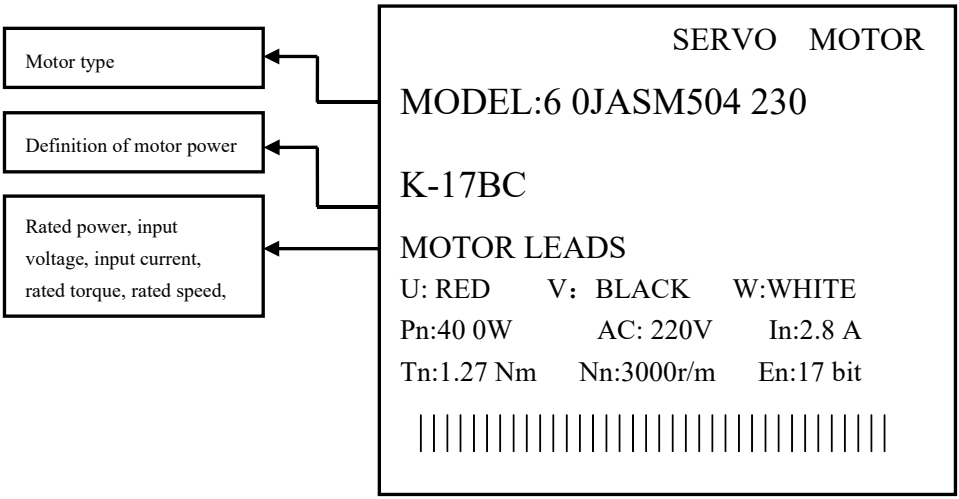
JAND-P28/DB44 series servo motor is a kind of high speed and high precision servo motor developed by JMC to meet the requirements of modern automatic control. This series of servo motor can control the speed and position accuracy very accurately, and can convert the voltage signal into torque and speed to drive the control object. This series of servo motor rotor speed is controlled by the input signal, and can respond quickly, in the automatic control system, used as the executive element, and has the electrical and mechanical time constant small, high linearity, starting voltage and other characteristics, can receive the electrical signal into the motor shaft angular displacement or angular velocity output, and can real-time feedback signal to the servo driver for adjustment, to achieve high-precision control.

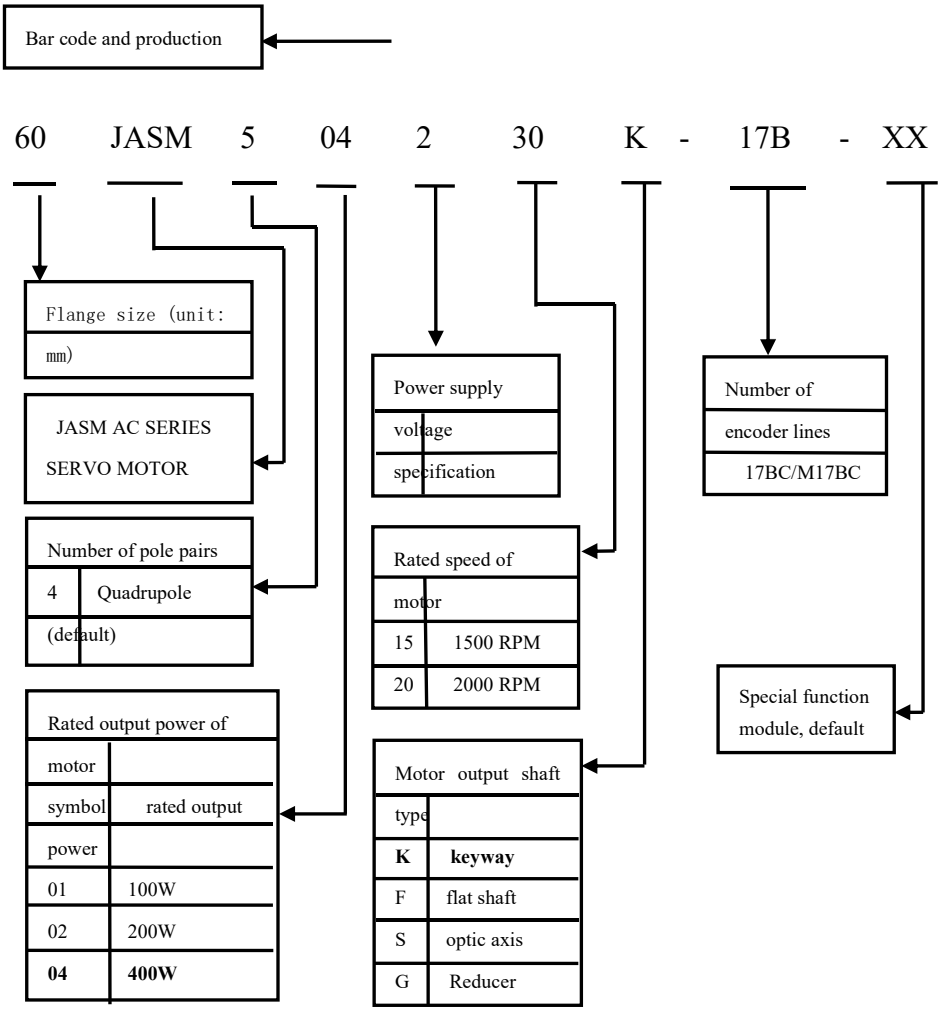
2.2.2 Main Features

1. high-energy magnetic force
2. Short time 300% overload capability
3. Flange size (mm): 40, 60, 80, 110, 130
4. Power: 0.1-1.5KW optional
5. Low noise, low heat, high precision, high speed, etc.

2.2.3 Servo motor nameplate and model description

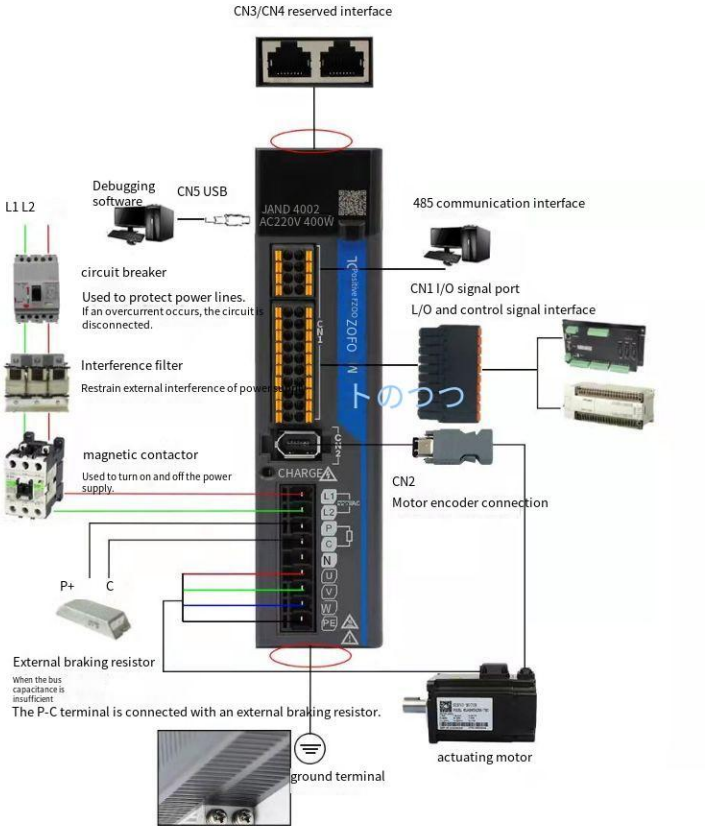
1. Description of nameplate content




Bar code and production
60 JASM 5 04 2 30 K - 17B - XX
Flange size (unit: mm)
JASM AC SERIES SERVO MOTOR
Number of pole pairs
4 Quadrupole
(default)
Rated output power of motor
symbol rated output power
01 100W
02 200W
04 400W
Power supply voltage specification
Rated speed of motor
15 1500 RPM
20 2000 RPM
Motor output shaft type
K keyway
F flat shaft
S optic axis
G Reducer
Number of encoder lines
17BC/M17BC
Special function module, default

2. the servo control system is connecte with that main power supply loop

2.3.1Wiring diagram

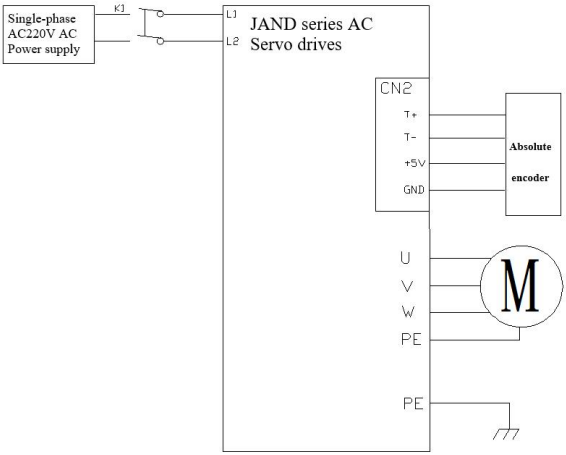


2.3. 2 DB44 SERVO CONTROL SYSTEM WIRING DIAGRAM

The servo drive is directly connected to the industrial power supply and does not use power isolation such as transformers. To prevent cross electric shock of servo system, use fuse or circuit breaker for wiring on input power supply. Since the servo drive does not have a built-in ground protection circuit, in order to make the system safer, please use a leakage circuit breaker for overload and short-circuit protection or a leakage circuit breaker for ground protection.

2.3. 3 Main power circuit connection

1、single-phase power connection



Note:

1. 200/400W drive power connections Connect L1/L2 as shown above

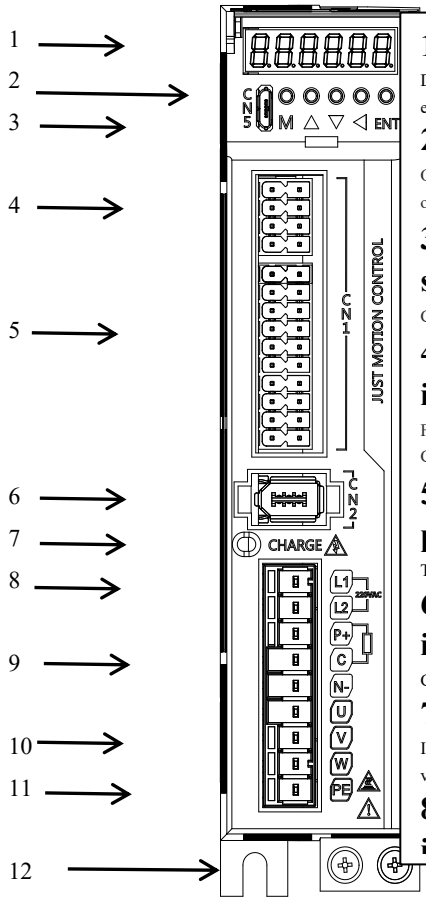
2. The power connection terminals of 750W driver are identified as L1/L2/L3, which are connected according to L1/L2, and L3 is an empty pin.

3. The 1500W drives L1/L2/L3 are all active connections, single or three phase connections are selected depending on the load power.

Chapter 3 Port Description and Wiring

3.1 Port distribution of the servo driver

3.1.1 JAND-P28 Port distribution of the servo driver



1.Panel LED display

Display servo driver status, alarm number, parameters, etc

2.Panel operation buttons

Operate the status,parameters and alarm infaomation of the drive by pressing buttons

3.USB Debug software(CN5)

Connect to debug software（USB communication）

4.485 communication interface(CN1)

For 485 communication,use the corresponding port in CH1

5.Input/output signal port(CN1)

The CH1 interface is defined in the label on the side

6.Encoder lines interface(CN2)

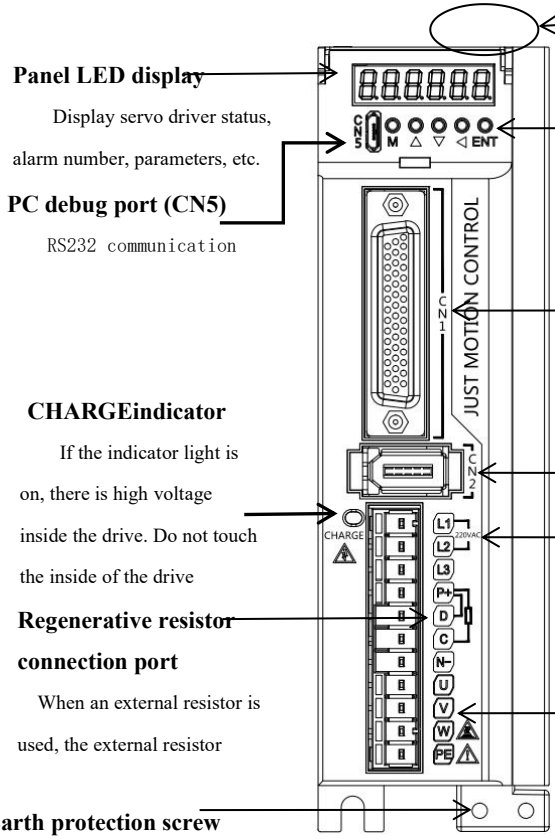
Connected motor encoder

7.CHARGE indicator light

If the indicator light is on, it indicates that there is high voltage inside the drive. Do not touch the

8.Driver power input(L1/L2)

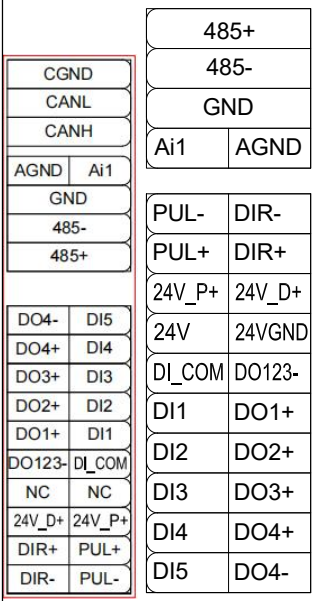
3.1.2JAND-DB44 Series Drive Port Distribution



3.2 Servo drive CN1 control port description

3.2.1JAND-P28 Servo Driver CN1 Control Port Definition

The upper control and driver connection interface is used for the upper computer to control the driver and the driver feedback output

CN1 pin schematic	mark number	definition	standard voltage
	485+	485 Signal +	485+
	485-	485signals-	485-
	GND	signal ground	signal ground
	Ai1	analog control positive	±10VDC input
	AGND	analogously	simulatively
	24V_P+	24V pulse input positive	24V signal
	PUL+	5V pulse input positive	5V signal
	PUL-	pulse negative	pulse negative
	24V_D+	24V direction input positive	24V signal
	DIR+	5V direction input positive	5V signal
	DIR-	negative direction	negative direction
	24V	24V output (used as external I/O)	Maximum allowable output current 100mA
	24VGND	24V output ground (used as external I/O)	Maximum allowable output current 100mA
	DI_COM	input common	24V/GND
	DI1	Digital Input 1	GND/24V
	DI2	Digital Input 2	GND/24V
	DI3	Digital Input 3	GND/24V
	DI4	Digital Input 4	GND/24V

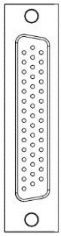
100W	**200/400/750/1500W**	**DI5**	Digital Input 5	GND/24V
		DO123-	Digital Output 123 Common Negative	GND
		DO1+	Digital Output Port 1 Positive	DO1+ high terminal
		DO2+	Digital Output Port 2 Positive	DO2+ high terminal
		DO3+	Digital Output Port 3 Positive	DO3+ high terminal
		DO4+	Digital Output Port 4 Positive	DO4+ high terminal
		DO4-	Digital Output Port 4 Negative	DO4-Low terminal

Note:

1. For the custom function setting of digital input (DI) and output (DO) ports, please refer to**the parameter description in Chapter 8**.

3.2.1JAND-DB44 Servo Driver CN1 Control Port Definition

The upper control and driver connection interface is used for the upper computer to control the driver and the driver feedback output



Definition of each pin**of CN1**terminal:

pin number	label	definition	Description
1	DO4+	digital output positive	Custom output port
2	DO3-	Digital Output Negative	Custom output port
3	DO3+	digital output positive	Custom output port
4	DO2-	Digital Output Negative	Custom output port
5	DO2+	digital output positive	Custom output port
6	DO1-	Digital Output Negative	Custom output port
7	DO1+	digital output positive	Custom output port

8	DI4-	Digital Input Negative	Custom Input Port
9	DI1-	Digital Input Negative	Custom Input Port
10	DI2-	Digital Input Negative	Custom Input Port
11	COM+	common input	High level 24V active
12	DI6-	Digital Input Negative	Custom Input Port
13	OZ+	Encoder Z phase positive output	
14	24V GND	+24V ground	
15	+5V	+5V output (for external I/O)	Maximum allowable output current: 150mA
16	GND	digitally	
17	+24V	+24V output (for external I/O)	Maximum allowable output current: 150mA
18	T_REF	Torque analog control positive	
19	GNDA	simulatively	
20	V_REF	Speed analog control positive	
21	OA+	Encoder Phase A Positive Output	
22	OA-	Encoder Phase A Negative Output	
23	OB-	Encoder Phase B Negative Output	
24	OZ-	Encoder Z phase negative output	
25	OB+	Encoder Phase B Positive Output	
26	DO4-	Digital Output Negative	Custom output port
27	DO5-	Digital Output Negative	Custom output port
28	DO5+	digital output positive	Custom output port
29	GND	digitally	
30	DI8-	Digital Input Negative	Custom Input Port
31	DI7-	Digital Input Negative	Custom Input Port
32	Empty		
33	DI5-	Digital Input Negative	Custom Input Port
34	DI3-	Digital Input Negative	Custom Input Port
35	24V PULS+/ 24V SIGN+	24V pulse and direction positive (24 pulse and direction share this pin)	High level 24V active
36	HPUL-	high-speed pulse negative	
37	SIGN+	positive direction	High level 5V active
38	HPUL+	high speed pulse positive	

39	SIGN-	negative direction	Low 0V active
40	HSIGN-	high speed direction negative	
41	PULS+	pulse positive	High level 5V active
42	HSIGN+	High speed heading	
43	PULS-	pulse negative	Low 0V active
44	OCZ	Encoder Z phase open collector output	

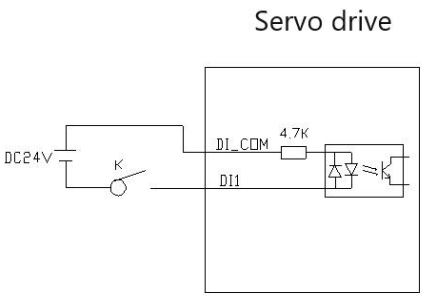
Note:

1, CN1 terminal wiring, 24V PULS+ and PULS+ share PULS-, 24V SIGN+ and SIGN+ share SIGN-, the only difference is a 24V high input, a 5V high input.

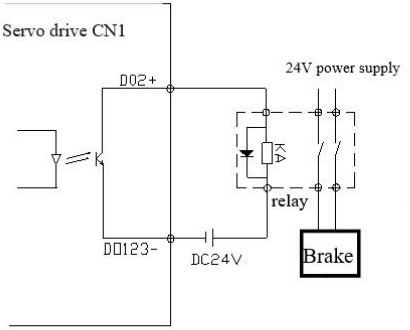
2. For the custom function setting of digital input (DI) and output (DO) ports, please refer to**Chapter 8 Parameter Description** for setting.

3.2. 3 JAND-P28 Servo DriverCN1 Control Port Connection Description

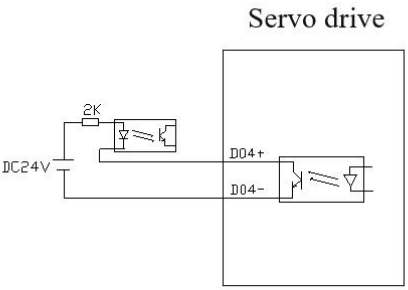
The digital inputsDI (DI1-DI5) can be connected using switch, relay, open collector transistor circuits. (See 8.2.7 P06-xx I/O parameter description for the function setting of input I/O port)



The digital outputDO (DO1-DO4) outputs can be connected to relays, optocouplers, etc. Wherein, D01-D03 is the common negative terminal (**DO123-**) output circuit (as shown on the left of the figure below) , and DO4 is the optocoupler output (equivalent to a switch with polarity). Power supply voltage range**5-24V**. (See 8.2.7 P06-xx I/O parameter description for the function setting of output I/O port)

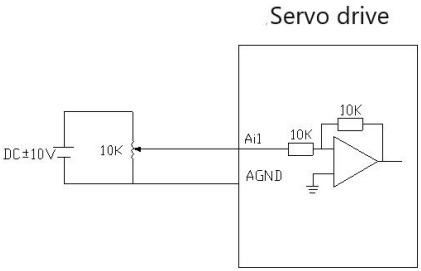


control relay



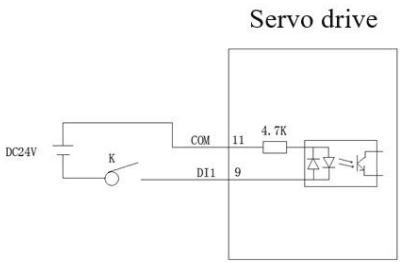
Controlled optical coupler

Effective voltage range of speed and torque control analog quantity control input (**-10V~10VDC**), command value corresponding to this voltage range can be set by following parameters: P06-40 speed analog command input gain,P06-43 torque analog command input gain. Please read the detailed description of parameters for specific setting methods.

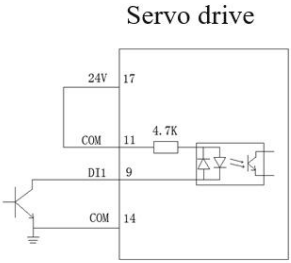


3.2. 4 JAND-DB44 Servo DriverCN1 Control Port Connection Description

The digital inputsDI (DI1-DI8) can be connected using switch, relay, open collector transistor circuits. Power can be supplied from either the drive's internal power supply or an external power supply. (See 8.2.7 P06-xx I/O parameter description for the function setting of input I/O port)



Use an external power input

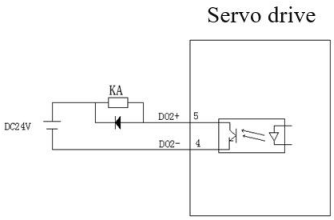


Use internal power input

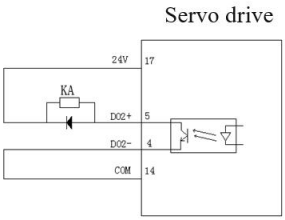
Use external power input

Use internal power input

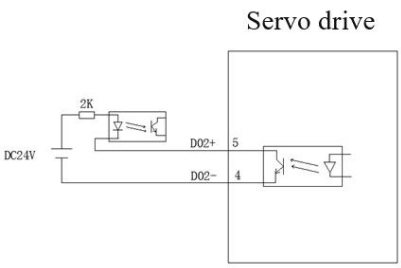
Digital OutputsDO(DO1-DO5) Outputs can be connected to relays, optocouplers, etc. You can use the power supply provided inside the drive or you can use an external power supply. When using the internal power supply, drive the internal 24V power supply can only provide 150mA current, when the load is greater than 150mA, please be sure to use the external power supply, the supply voltage range is**5-24V**. (See 8.2.7 P06-xx I/O parameter description for the function setting of output I/O port)

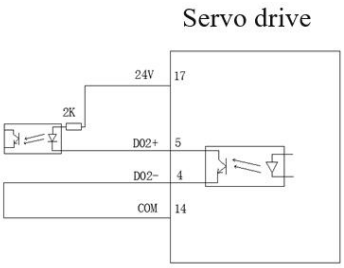


(Relay)Use external power



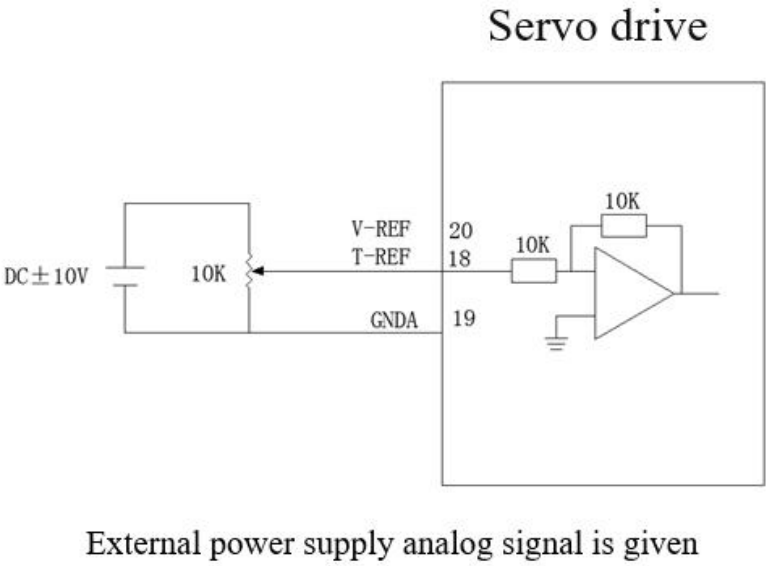
(Relay)Use internal power





(optocoupler) using external power supply (optocoupler) using internal power supply

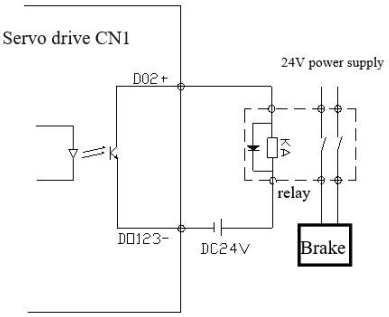
Effective voltage range of speed and torque control analog quantity control input (**-10V~10V**), command value corresponding to this voltage range can be set by following parameters: P06-40 speed analog command input gain,P06-43 torque analog command input gain. Please read the detailed description of parameters for specific setting methods.



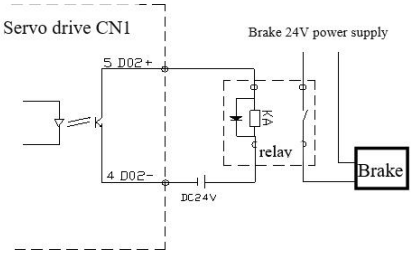
External power supply analog signal is given

External power supply analog signal setting

3.2. 5 Schematic diagram of control connection of band brake



P28 Schematic diagram of servo driver brake



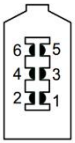
DB44 Schematic diagram of servo driver brake

Note: 1. DO 2+/D123-in CN1 controls the relay coil for the factory contracting brake function of P28 driver, and the relay switch controls the contracting brake coil.

2. DB44 driver factory contracting brake function is controlled byDO2(pin 5 and pin 4) in CN1, and relay switch controls contracting brake coil.

3. It is recommended that the contracting brake coil be powered by a separate power supply.

3.3 Drive CN2 Encoder Port Description

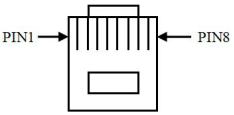


pin number	label	Definition	Note:
1	+5V	Output 5V power supply	
2	GND	Output power ground	
3	NC	None	
4	NC	None	
5	T+	Bus encoder T+	Bus type drive special
6	T-	Bus encoder T-	Bus type drive special

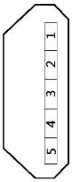
3.4 Drive CN3/CN4 Port Description

pin number	label	Definition
PIN1	CANH	CNAH(for bus servo)
PIN2	CANL	CNAL(for bus servo)
PIN3	CGND	CGND(bus servo dedicated)
PIN4	reserve	reserve
PIN5	reserve	reserve
PIN6	GND	reserve
PIN7	485-	Reserved (for 485 communication, please use the corresponding port of CN1)
PIN8	485+	Reserved (for 485 communication, please use the corresponding port of

		CN1)



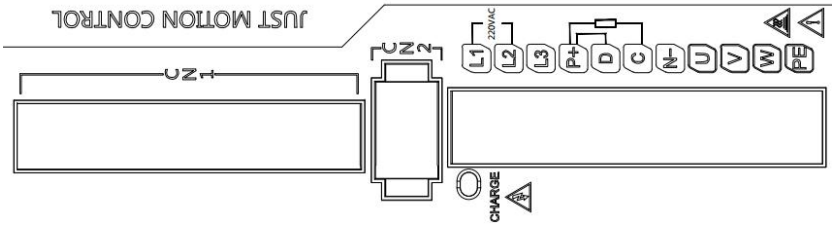
3.5 Drive CN5 Port Description



pin number	label	Definition
1	V Bus	Power supply 5V
2	D-	Data-
3	D+	Data +
4	ID	Empty
5	GND	land

Note: CN5 is a standard Micro USB interface, and the port is connected to the upper computer using a standard Micro USB cable.

3.6 Description of power supply and motor power line port



label	Definition	Note:

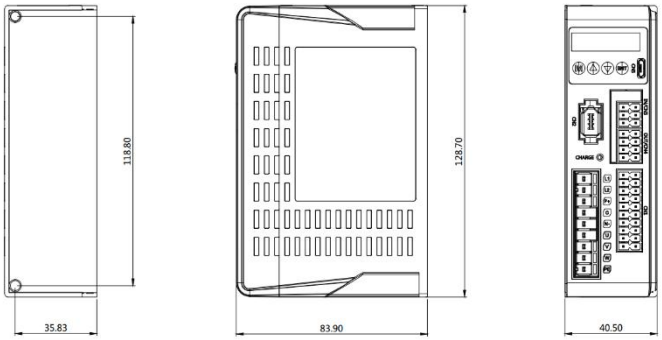
L1、L2（200/400W)	Main circuit power input terminal	Single phase 220V AC, connected to**L1/L2** port
L1、L2、L3（750W)	Main circuit power input terminal	Single-phase 220V AC, connected to**L1/L2** port, L3 is empty pin
L1、L2、L3（1500W)	Main circuit power input terminal	Single/Three phase 220V AC to**L1/L2/L3** port
U、V、W	Motor power line connection end	Connect the motor power line (connect the corresponding interface according to the power line mark)
P+、D、C	regenerative resistor connection	When using the built-in regenerative resistor, short-circuit P+ and D (our 750W and above drivers have built-in regenerative resistors) When using an external resistor, disconnect the P+ and D short wires, and connect both ends of the resistor to the P+ and C terminals
PE Ground Port	Drive Protected Ground Port	Connect the ground wire of power supply and motor

Note:

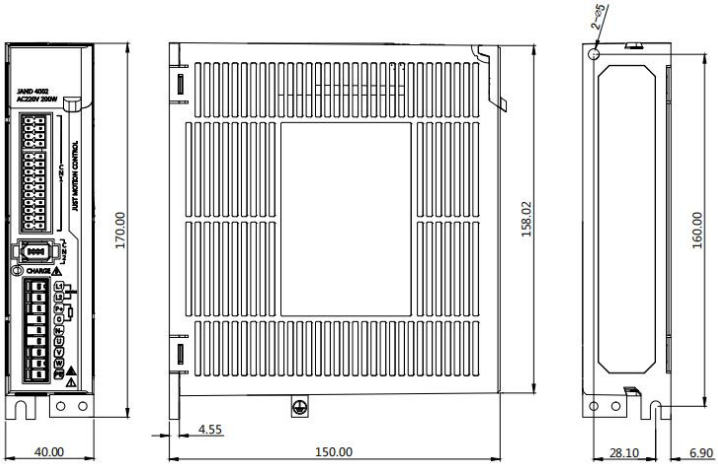
1. Be sure to connect the electromagnetic contactor between the power supply and the main circuit power supply of the servo driver, so that the power supply can be cut off in case of failure of the servo driver to prevent fire caused by excessive current.
2. When the feedback energy exceeds the absorption capacity of the capacitor**, E.402** overvoltage alarm will occur. In this case, external regenerative resistance shall be connected, and P00-30~P00-35 shall be set to corresponding values. See**8.2 Parameter Analysis Description** for details.

Chapter IV Installation Instructions

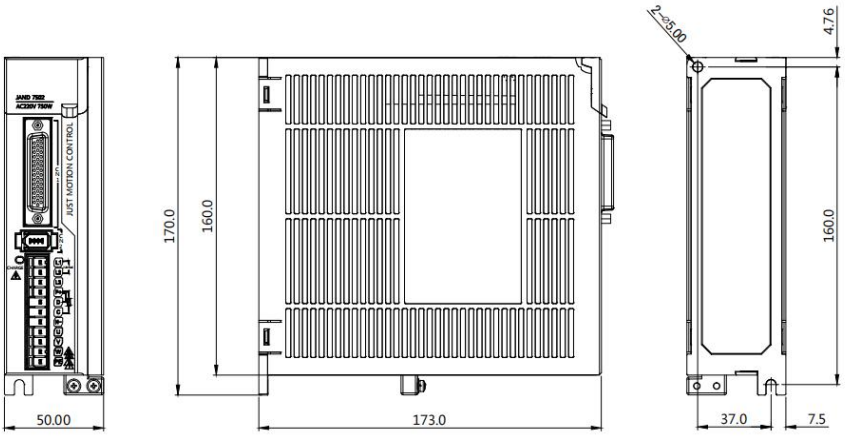
4.1 Installation size



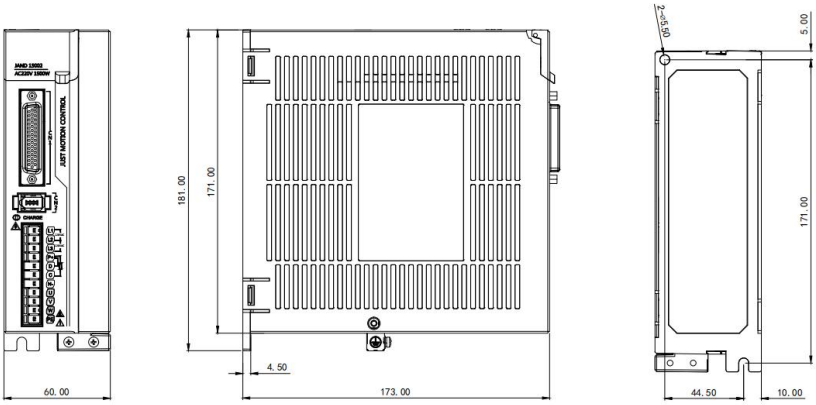
100WAC servo driver in mm



400W/**200W**AC servo driver (unit: mm)



750WAC servo driver in mm



1500WAC servo driver in mm

Note:

The normal installation direction of the servo driver must be vertical and upright, with the top facing up to facilitate heat dissipation.

2, the driver should be installed to ensure that the equipment is well ventilated, there are multiple drives in the cabinet in parallel to ensure that the distance between each other is not less than 5CM.

3, in order to ensure the safety of use, be sure to drive the ground protection terminal and equipment protection to a good connection!

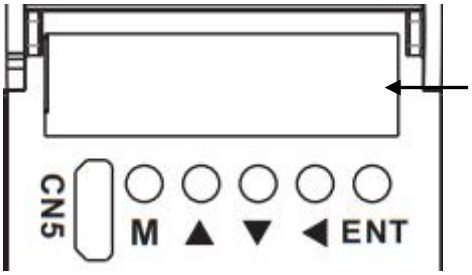
4.2 Installation and use environment

The installation and use environment has a direct impact on the normal operation and service life of the product, so the following conditions must be met:

1. Working environment temperature: 0~55℃; Working environment humidity:1 0%~ 9 0%(no condensation).
2. Storage environment: -20℃~+85℃; storage environment humidity:90%or less (no condensation).
3. Vibration: 0.5G or less.
4. Prevent rain dripping or wet environment.
5. Avoid exposure to sunlight.
6. Prevent oil mist and salt erosion.
7. Protection against corrosive liquids, gases, etc.
8. Prevent the intrusion of dust, cotton wool and metal fines.
9. Keep away from radioactive materials and combustibles.
10. Space shall be reserved around the driver placement position in the cabinet to facilitate loading, unloading and maintenance.
11. Pay attention to the air flow inside the cabinet. If necessary, install an external fan to enhance the air flow and reduce the ambient temperature of the drive to facilitate heat dissipation; The long-term working temperature is below 55℃.
12. Try to avoid the vibration source nearby, and install damping device such as vibration absorber or anti-vibration rubber gasket.
13. If there is an electromagnetic interference source nearby, the power supply and control circuit of the driver are susceptible to interference and cause misoperation. A noise filter can be added or various effective anti-interference measures can be taken to ensure the normal operation of the driver (the noise filter will increase the leakage current, and an isolation transformer needs to be installed at the input end of the driver power supply).

Chapter V Panel Display Description and Settings

5.1 Introduction to the functions of each part of the panel



JAND series AC servo panel adopts six-digit LED digital tube to display the status; 5-bit key input command, specific key functions are as follows:

panel key label	Definition	Note:
M	M key	Function switch and cancel exit
▲	UP key	Display change, value increment function
▼	DOWN key	Display change, value reduction function
◀	LEFT key	shift function Used to switch high/low display in parameter mode
ENT	ENT key	Determine or save function

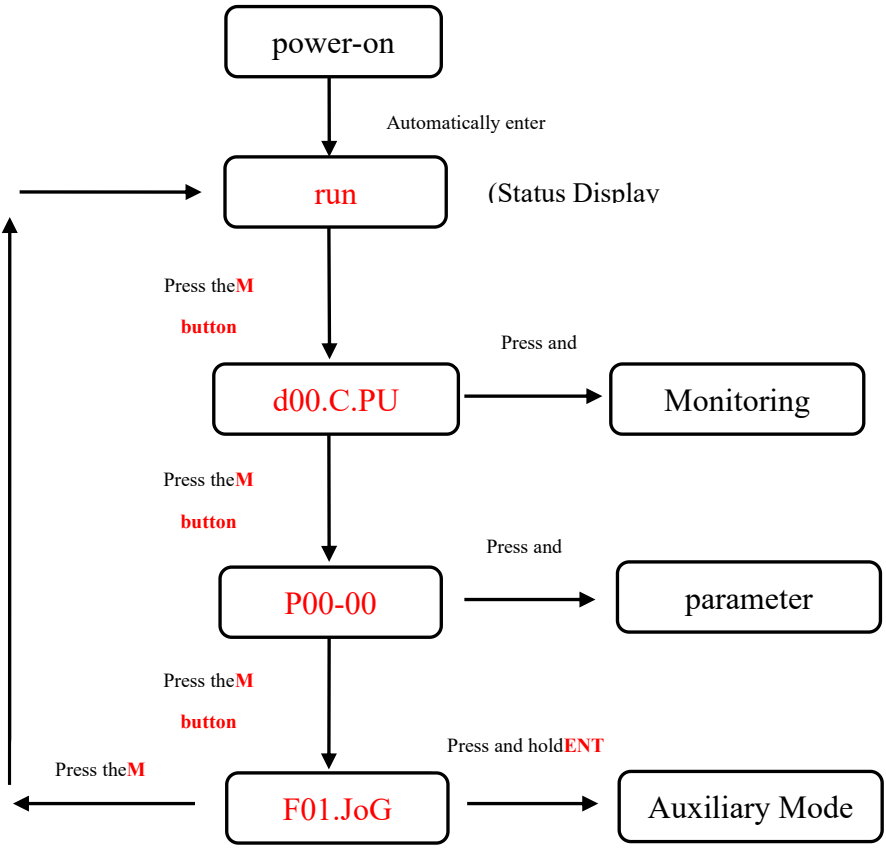
Remarks:

ENT keylong press indicates OK or save function.

In the monitoring and parameter interface, press and hold the UP/DOWN**key** to quickly flip.

5.2 Operation mode switching process

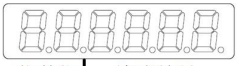
JAND_P28 series AC servo has four function modes, namely status display mode, monitoring mode, parameter setting mode and auxiliary mode. The switching process between them is as follows:



Note: After entering the mode setup by pressing**the ENT key**, you can exit the mode selection by pressing the**M key**

5.3 status display

The display judgment is as follows:



Status display bit data meaning:

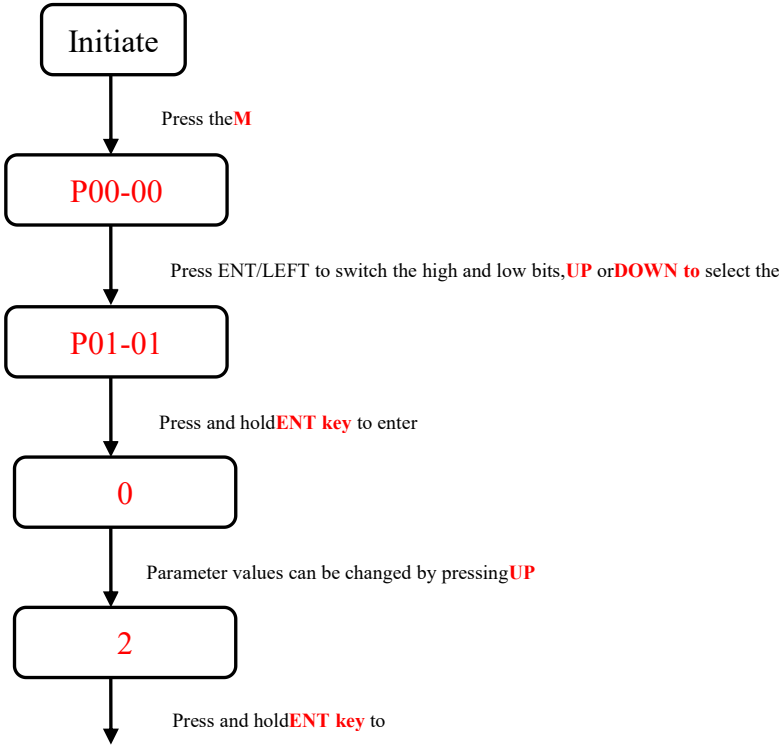
display	implication	display	implication
	Power-on display of control circuit power supply		Main circuit power ready display
	Speed and torque control: consistent speed display Position control: positioning completion display		Rotation Check Out Display
	baseblock display Servo OFF state lights up, ON state goes out		Speed and torque control: speed command input Position control: displayed in command pulse input

Status display abbreviation symbol meaning:

display	implication
	Servo not ready (power supply not powered)
	Servo ready (servo motor not energized)
	In servo enable state (servo motor is energized)
	Indicates that the**input port of forward overtravel signal** is in effective state, and the motor forward rotation command is invalid
	Indicates that the**reverse overtravel signal input** port is in the active

	state, and the motor reverse command is invalid
FinSh	Servo-related operations completed correctly
SY_on	The servo is in the enabling state and cannot be operated. The servo can be operated after the enabling state is turned off.
no_oP	Invalid value entered, servo does not perform current operation
LocKd	The relevant parameters of the servo are locked and can be operated only after unlocking
E-501	Servo fault display, please refer to Chapter 9 for fault definition

5.4 Parameter setting writing and saving method

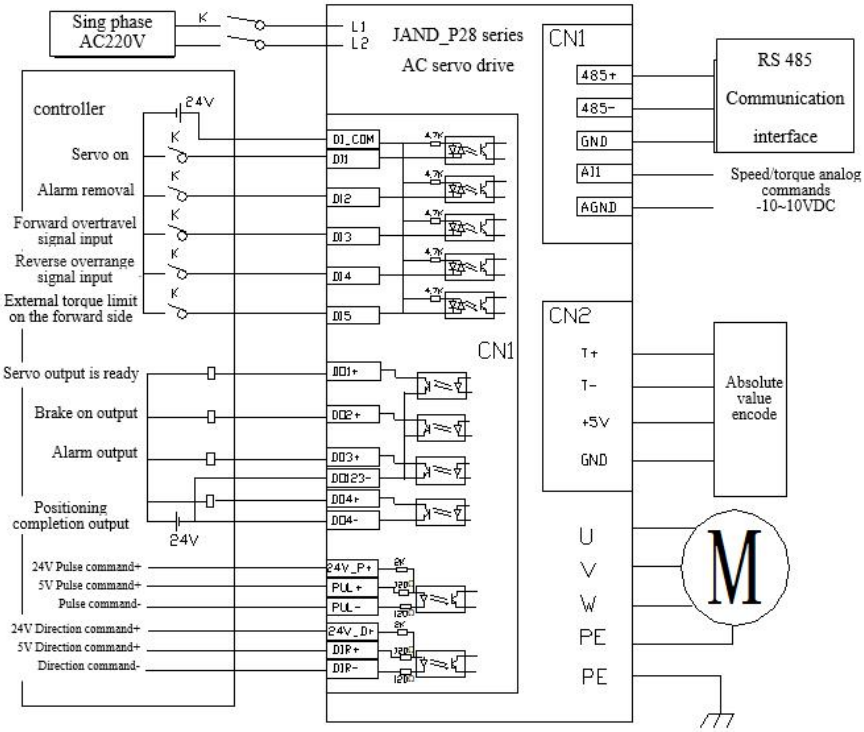


P01-01Displ

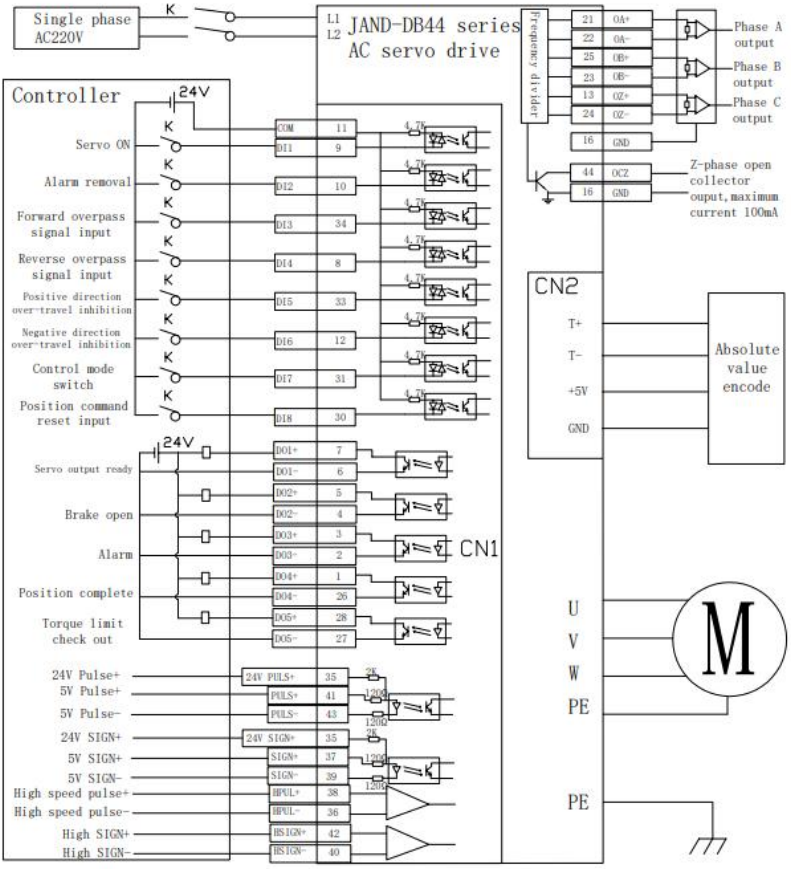
Chapter VI Control Mode and Setting

6.1 position control

6.1.1 Position control wiring diagram



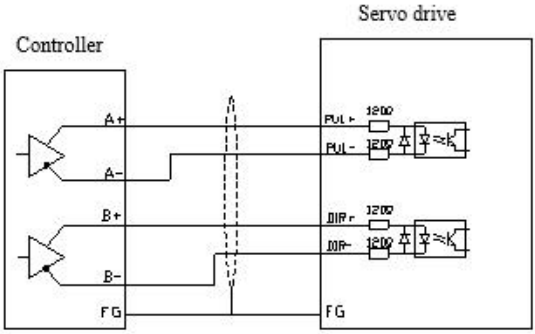
JAND-P28 Position Control Wiring Diagram



JAND-DB44 Series Position Control Wiring Diagram

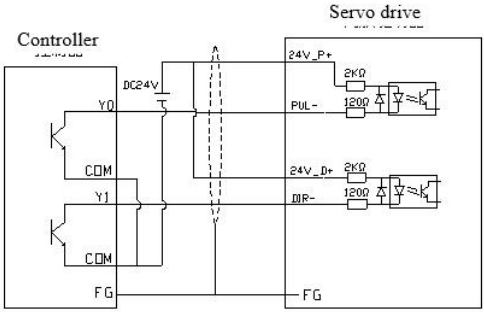
6.1.2 JAND-P28 Position Control Wiring Diagram

Position control commands are commonly differential signals, open-collector signals. It is recommended to use twisted pair shielded wire for position signal connection line to improve anti-interference ability. In general, the single-chip controller system uses this position control wiring method. The maximum input pulse frequency for this type of control is 500KHz



Differential signal input

Description of open collector input mode at controller end: The single-ended input mode can use either the power supply provided inside the drive or an external power supply. However, do not use dual power inputs to avoid damage to the drive. Under normal circumstances, PLC controller systems use this position control wiring method



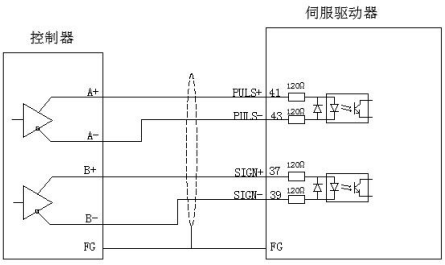
Open collector input

NOTE: When using a 24V signal, connect the 24V port

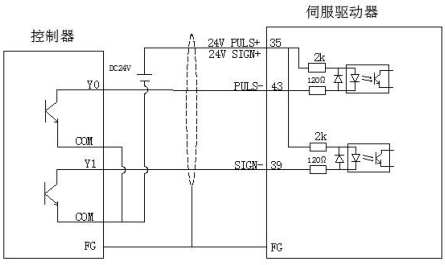
The pulse command input can accept both differential signal inputs and open collector inputs. The differential signal input receives a maximum frequency of 500K and the open collector input receives a maximum frequency of 200K.

6.1.3JAND-DB44 Position Control Wiring Diagram

Description of differential signal mode at controller end: Direction + pulse input is divided into: 5V, 24V signal input mode, using twisted pair connection, can improve anti-interference ability. In general, the single-chip controller system uses this position control wiring method. The maximum input pulse frequency for this type of control is 500KHz



Differential signal input



open-collector input

Description of open collector input mode: The single-ended input mode can use either the power supply provided inside the drive or an external power supply. However, do not use dual power inputs to avoid damage to the drive. Under normal circumstances, PLC controller systems use this position control wiring method
The pulse command input can be divided into differential signal input and open collector input. The differential signal input receives a maximum frequency of 500K and the open collector input receives a maximum frequency of 200K.

6.1.4 Position Control Mode Parameter Description

1,motor and driver control parameters

Param Code	Name	setting range	setting	Note:
P01-01	Control mode setting	0-5	0	0: Position mode 1: Speed Mode 2: Torque mode 3: Speed, torque 4: Position, Speed 5: position, torque
P03-00	Location Command Source	0-3	0	0: pulse command 1: Reserved 2: Bus instruction 3: Built-in

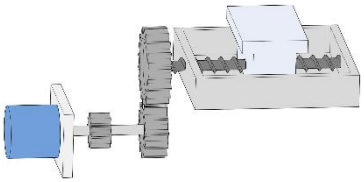
				multi-segment position
P03-01.0	command pulse mode	0-3	1	0: Quadrature pulse command 1: direction + pulse command 2 or 3: Double pulse command
P03-03.0	instruction pulse negation	0-1	0	instruction pulse negation
P03-09	Number of command pulses for one rotation of motor	0-1073741822	10000	Set according to user requirements See**8.2 Parameter Description for**details
P03-40	Molecule of electronic gear 1	1-1073741822	64	Set according to user requirements See**8.2 Parameter Description for**details
P03-42	Denominator of electronic gear 1	1-1073741822	1	
P03-15	Excessive position deviation setting	0-1073741822	90000	Set according to user requirements
P03-25	The number of pulses output by the absolute value motor in one rotation	1-65535	2500	Set according to user requirements

2. Gain parameters

Please refer to the**parameter adjustment**in**chapter 7** for adjustment

6.1.5 Example of electronic gear ratio calculation

1、ball screw drive



Assumptions:

(1) Mechanical parameters: reduction ratio R is 2/1, lead screw is 10mm

(2) Absolute encoder position ring resolution per turn:8388608

(3) Load displacement corresponding to 1 position command (command unit) is required: 0.001mm

Then:

From (1) and (3), the value of position command (command unit) required for 1 revolution of lead screw (10mm movement of table) can be obtained:

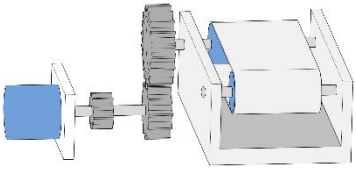
$$\frac{10}{0.001}=10000$$

The electronic gear ratio is: (B is numerator, A is denominator)

$$\frac{B}{A}=\frac{8388608}{10000}\times\frac{2}{1}=\frac{1048576}{625}$$

Last parameter P03-40 set to 1048576, P03-42 set to 625

2、pulley drive



Assumptions:

(1) Mechanical parameters: reduction ratio R: 5/1, pulley diameter: 0.2m(pulley circumference: 0.628m)

(2) Absolute encoder position ring resolution per turn:8388608

(3) Load displacement corresponding to 1 position command (command unit) is required: 0.000005m

Then:

From (1) and (3), the value of position command (command unit) required for one rotation of pulley (load) can be obtained:

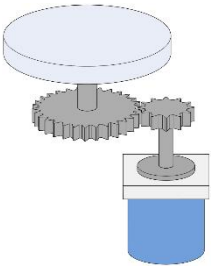
$$\frac{0.628}{0.000005}=125600$$

The electronic gear ratio is: (B is numerator, A is denominator)

$$\frac{B}{A}=\frac{8388608}{125600}\times\frac{5}{1}=\frac{262144}{785}$$

Finally parameter P03-40 is set to 262144 and P03-42 is set to 785

3、rotating load



Assumptions:

(1) Mechanical parameters: the reduction ratio R is 10/1, and the rotation angle of the load shaft is 360°

(2) Absolute encoder position ring resolution per turn:8388608

(3) Load displacement corresponding to 1 position command (command unit): 0.01°

Then:

From (1) and (3), the position command (command unit) value required for one rotation of the load can be obtained:

$$\frac{360}{0.01}=36000$$

The electronic gear ratio is: (B is numerator, A is denominator)

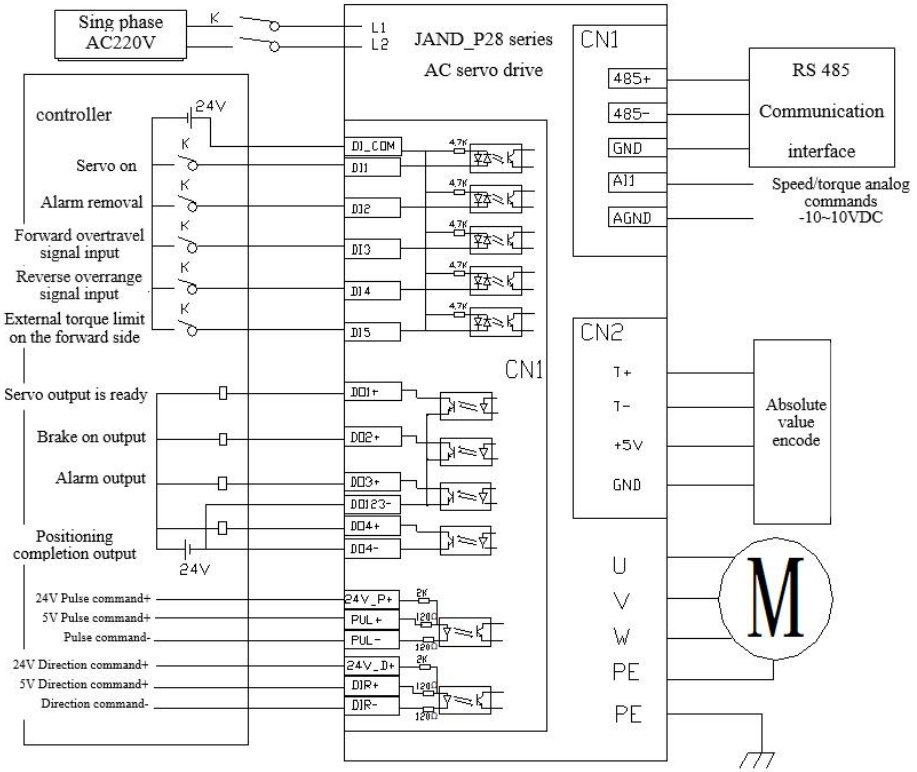
$$\frac{B}{A}=\frac{8388608}{36000}\times\frac{10}{1}=\frac{524288}{225}$$

Finally parameter P03-40 is set to 524288 and P03-42 to 225

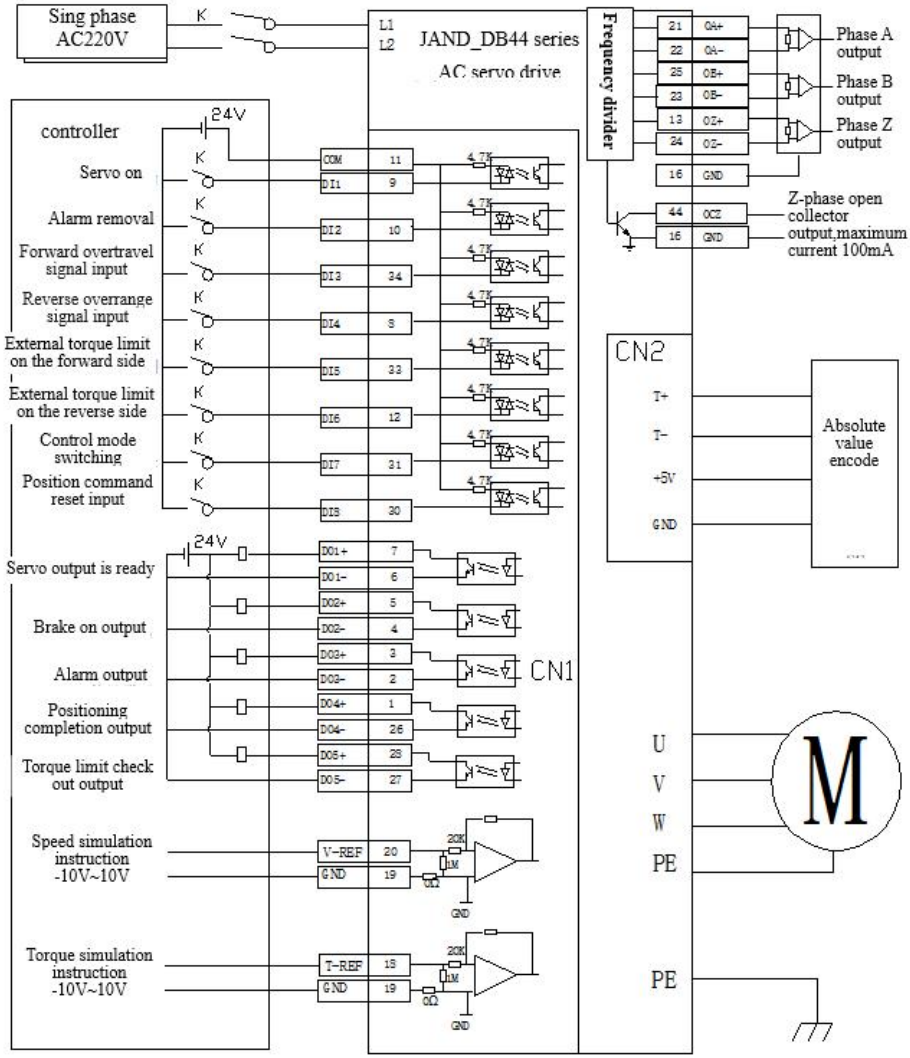
Note: If the position command value required for calculating one rotation is an integer, it is recommended to directly set P03-09(number of command pulses for one rotation of the motor).

6.2 speed control

6.2.1 Speed Control Wiring Diagram



JAND-P28 Speed control wiring diagram



JAND-DB44 Speed control wiring diagram

6.2.2 Speed Control Mode Parameter Description

1, motor and driver control parameters

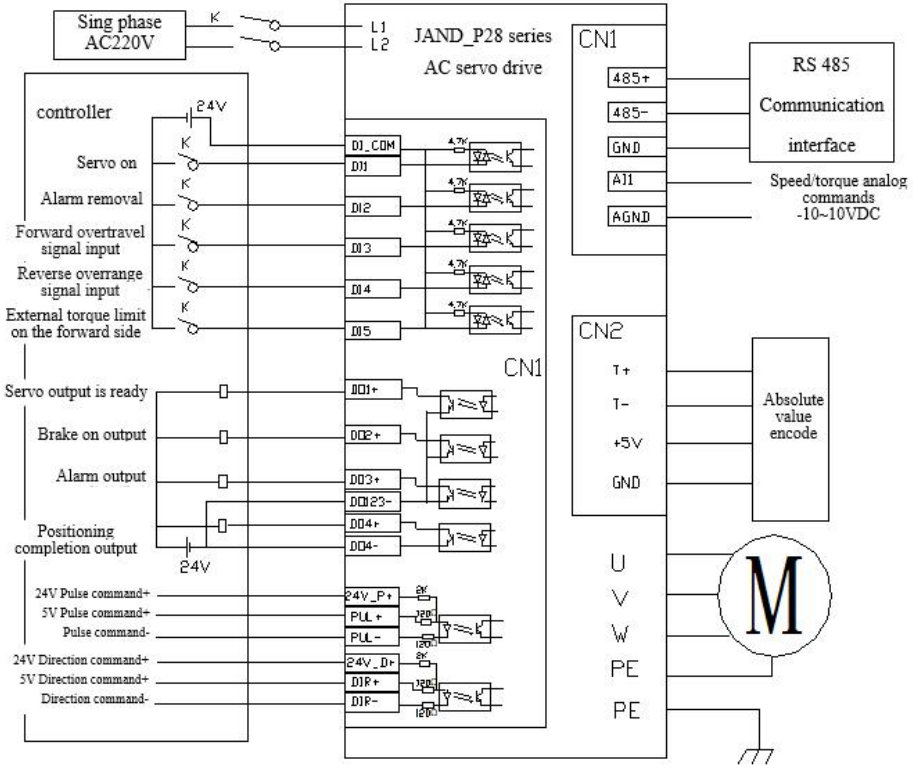
Param Code	Name	setting range	setting	Note:
P01-01	Control mode setting	0-5	1	0: Position mode 1: Speed Mode 2: Torque mode 3: Speed, torque 4: Position, Speed 5: position, torque
P04-00	Speed command source	0-3	0	0: External analog command 1: Set value of P04-02 2: Bus command 3: Internal multi-speed
P04-02	digital speed setpoint	-6000-6000	0	When P04-00 is set to 1, P04-02 is the speed setting
P04-06	forward speed limit	0-6300	6000	limiting forward speed
P04-07	reverse speed limit	-6300-0	-6000	limiting reverse speed
P06-05.0	Speed analog command selection	0-1	0	Select AI1 interface as input (P28 only)
P06-40	Speed analog command input gain	10-2000	300	Set according to user requirements See**8.2 Parameter Description for**details

2. Gain parameters

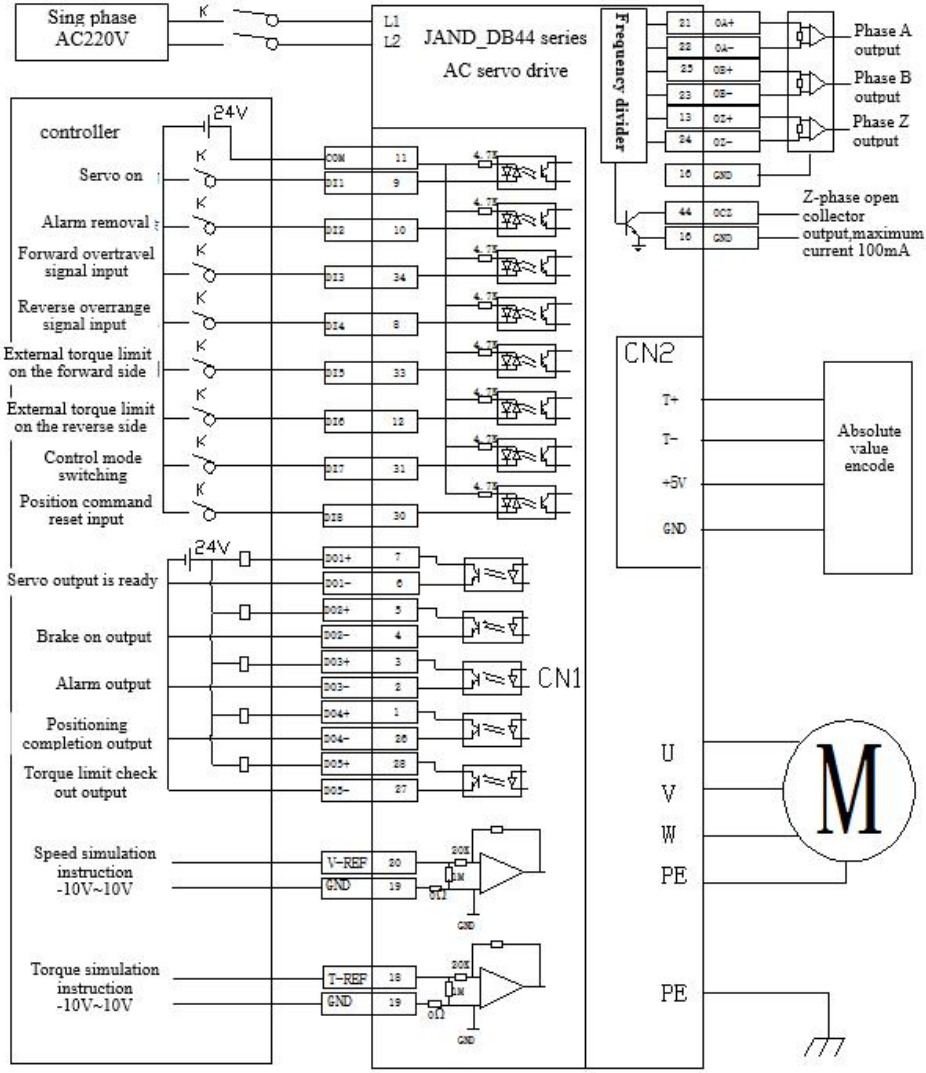
Please refer to the**parameter adjustment**in**chapter 7** for adjustment

6.3 torque control

6.3.1 Torque Control Wiring Diagram



JAND-P28 Torque control wiring diagram



JAND-DB44 Torque control wiring diagram

6.3.2 Torque Control Mode Parameter Description

1, motor and driver control parameters

Param Code	Name	setting range	setting	Note:
P01-01	Control mode setting	0-5	2	0: Position mode 1: Speed Mode 2: Torque mode 3: Speed, torque 4: Position, Speed 5: position, torque
P05-00	torque command source	0-3	0	0: analog command 1: set value of P05-03 2: bus command 3: built-in multi-stage torque
P05-01	Speed Limit Source Settings	0-3	1	0: Speed analog command 1: Set value of P05-02 2: Bus command 3: Built-in multi-speed
P05-02	Torque mode speed limit setpoint	0-6000	1000	Sets the maximum speed of the motor in torque mode. Valid when P05-01 is 1
P05-10	Internal forward torque limit	0-300	200	Limit forward torque value
P05-11	internal reverse torque limit	-300-0	-200	Limit reverse torque value
P06-05.1	Torque simulation command selection	0-1	1	Select AI1 interface as input (P28 only)
P06-43	Torque analog command input gain	0-100	10	Set according to user requirements See**8.2 Parameter Description for**details

2. Gain parameter related to torque control command

Please refer to the**parameter adjustment**in**chapter 7** for adjustment

Chapter VII Trial Operation and Parameter Adjustment

7.1 Commissioning

7.1.1 Pre-Run Testing

In order to avoid damage to the servo driver or mechanism, please remove all loads of the servo motor before operation, and carefully check whether the following precautions are normal, and then power on for no-load test; After the no-load test is normal, the load of the servo motor can be connected for the next test.

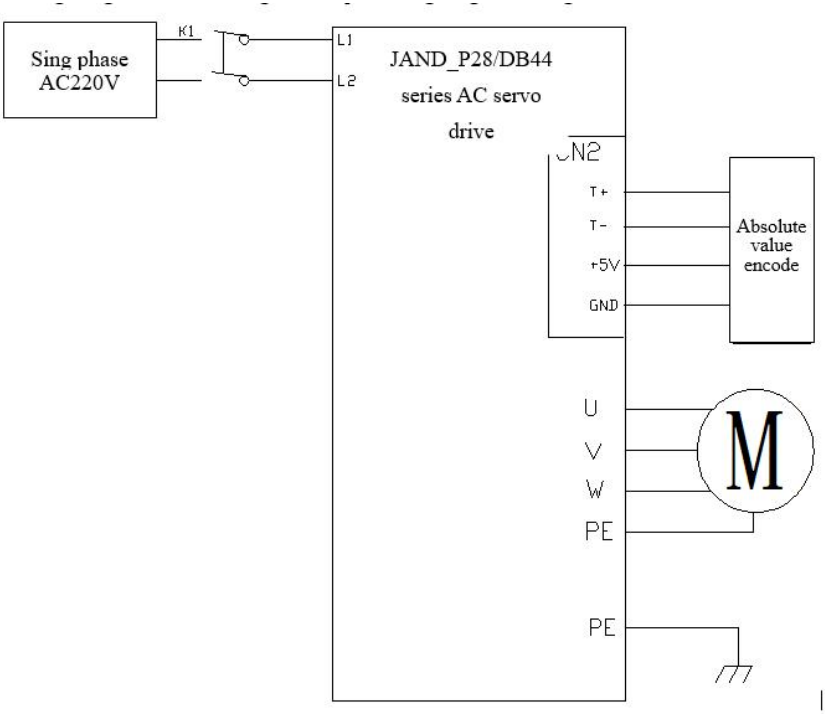
Notes:

Test before power-on	1、 Check the servo drive for visible visual damage 2、 Insulation treatment shall be applied to the connection part of the wiring terminal 3、 Look inside the drive for foreign objects 4、 Servo drives, motors and external regenerative resistors must not be placed on combustible objects 5、 To avoid failure of electromagnetic brake, please check whether the power circuit can work normally by immediately stopping and cutting off the power circuit 6、 Confirm whether the external power supply voltage of servo driver meets the requirements 7、 Confirm whether the motor U, V, W power line, encoder line and signal line are connected correctly (label and IFU confirmation)

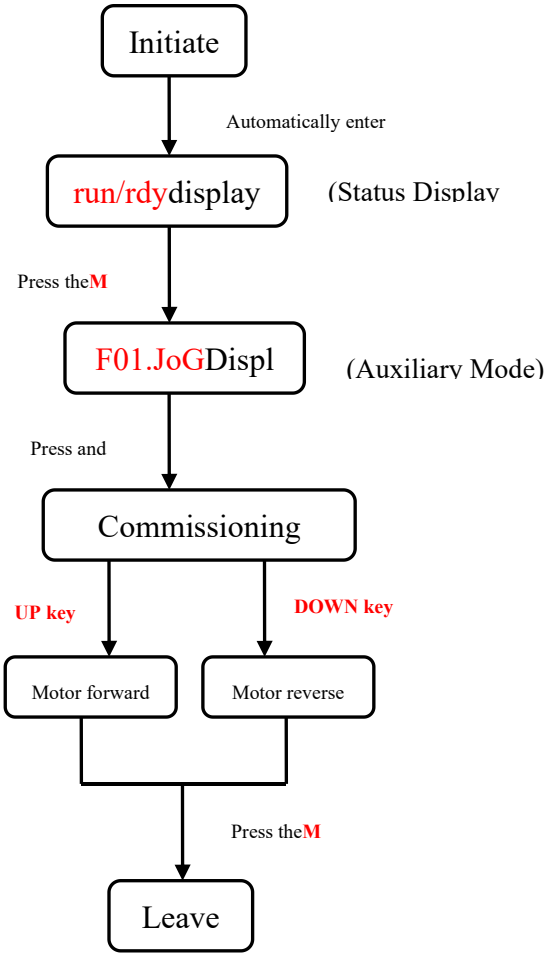
Detection at power-up	1、 When the servo driver is powered up, do you hear the sound of relay action 2、 Whether the power indicator and LED display of servo driver are normal 3、 Confirm whether the parameters are set correctly. There may be unexpected actions depending on the mechanical characteristics Do not make excessive and extreme adjustments to parameters 4、 Whether the servo motor is self-locking 5、 Please contact the manufacturer if the servo motor vibrates or makes excessive sound during operation

7.1.2 No-load commissioning test

1, JoG mode no-load test run, the user can not need to connect additional wiring, for safety reasons, JoG no-load speed test, please fix the motor base, to prevent motor speed changes caused by the reaction force caused by danger. The following is a simple wiring diagram in JoG mode:


Sing phase
AC220V
K1
L1
L2
JAND_P28/DB44
series AC servo
drive
CN2
T+
T-
+5V
GND
Absolute
value
encode
U
V
W
PE
M
PE

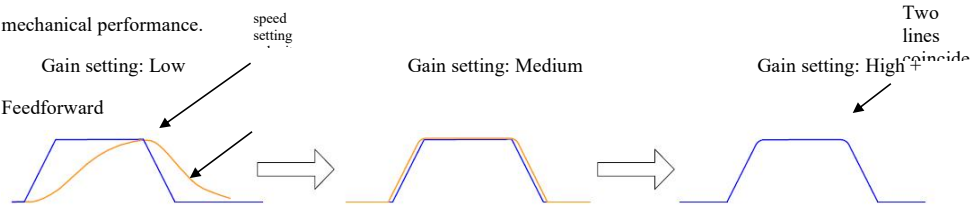
2. Select JoG mode for trial operation according to the following flow chart



Note:F01.JOG running speed is set by parameter P04-01

7.2 parameter adjustment

According to the equipment requirements, after selecting the appropriate control mode, the servo gain parameters need to be adjusted reasonably. The servo driver can drive the motor quickly and accurately, and maximize the mechanical performance.



Position loop gain: 800 Position loop gain: 1600 Position loop gain: 1600

Speed loop proportional gain: 400 Speed loop proportional gain: 600 Speed loop proportional gain: 600

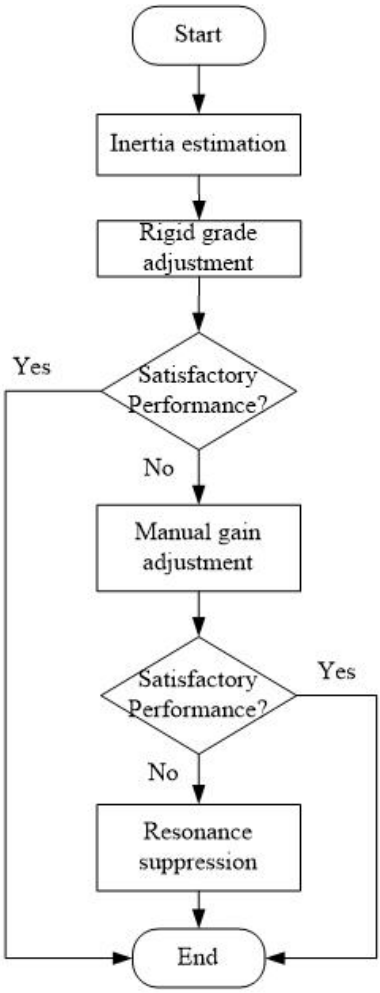
Speed loop integration time constant: 1000 Speed loop integration time constant: 1000 Speed loop integration time constant: 1000

Speed Feedforward Gain: 0 Speed Feedforward Gain: 0 Speed Feedforward Gain: 50

Load inertia ratio: 100 Load inertia ratio: 100 Load inertia ratio: 100

The servo gain is adjusted by several loop parameters (position loop, velocity loop, filter, etc.), which affect each other. Therefore, the gain setting needs to be balanced and adjusted according to certain rules.

The process of gain adjustment can be performed as shown in the following figure:



Calculate the device inertia ratio for input to P01-04
Or perform auxiiary function F19_JL measurements

Setting P01-02 to 1 or 2
According to the requirements,increase the p01-03 parameter value step , and when the operation noise occurs, reduce the parameter value of 2 levels

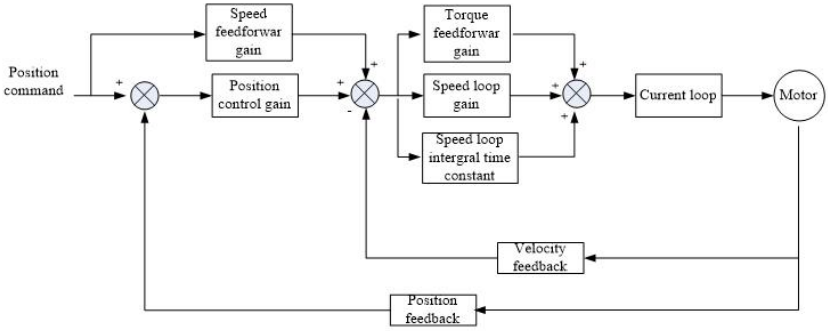
Setting P01-02 to 0, enter manual gain Adjustment mode

7.3 manual gain adjustment

7.3.1 Basic parameters

When the automatic gain adjustment fails to achieve the desired effect, the gain can be manually fine-tuned to optimize the effect.

The servo system consists of three control loops, and the basic control block diagram is as follows:



The gain adjustment shall follow the sequence of inner loop and outer loop, first set the load moment of inertia ratio P01-04, then adjust the gain of speed loop, and finally adjust the gain of position loop.

Speed loop gain: the setting value can be increased as much as possible under the condition of no vibration and no noise, which can improve the speed following performance and speed up the positioning time.

Speed integral constant: the smaller the set value, the faster the integral speed and the stronger the integral effect. If the value is too small, it is easy to produce vibration and noise.

paramete r code	Name	setting range	sett ing	Say it. Ming
P01-02.0	Real-time automatic adjustment mode	0-4	0	0: Manually adjust the rigidity. 1: Standard mode automatically adjusts rigidity. In this mode, parameters P02-00, P02-01, P02-10, P02-11, P02-13, P02-14, P08-20 and P08-21 will be automatically set

				according to the rigidity level set in P01-03, and manual adjustment of these parameters will not work. The following parameters are set by the user: P02-03 (speed feedforward gain), P02-04 (speed feedforward smoothing constant). 2: Positioning mode automatically adjusts rigidity. In this mode, parameters P02-00, P02-01, P02 - 10, P02-11, P02-13, P02-14, P08-20 and P08-21 will be automatically set according to the rigidity level set in P01-03, and manual adjustment of these parameters will not work. The following parameters will be fixed and cannot be changed: P02-03 (speed feedforward gain): 30% P02-04 (speed feedforward smoothing constant): 50 3: Automatically adjust rigidity 2. In this mode, parameters P02-00, P02-01, P02-10, P02-11, P02-13 will be automatically set according to the rigidity level set in P01-03. The following parameters are set by the user: P02-03 (speed feedforward gain), P02-14 (speed integral constant 2), P08-20 (torque command filter constant 1), P08-21 (torque command filter constant 2) 4: Automatic adjustment, depending on parameters P01-05, P01-06
P01-03	Real-time automatic adjustment of stiffness settings	0-31	13	Built-in 32 kinds of gain parameters, when P01-02 is set to 1, 2, 3 when the effect. Can be directly called according to the actual situation, the larger the set value, the stronger the rigidity.
P02-00	Position Control Gain 1	0-20000	400	▸ The larger the setting value, the higher the gain, the greater the rigidity, and the smaller the position lag. However, if the value is too large, the system will oscillate and overshoot. ▸ Increase the value as much as possible without shock.

				▸ Gain at rest.
P02-01	Position Control Gain 2	0-20000	400	▸ The larger the setting value, the higher the gain, the greater the rigidity, and the smaller the position lag. However, if the value is too large, the system will oscillate and overshoot. ▸ Increase the value as much as possible without shock. ▸ Gain during exercise.
P02-03	velocity feedforward gain	0-100	30	The larger the parameter value of the feedforward gain of the speed loop, the smaller the position tracking error of the system and the faster the response. However, if the feedforward gain is too large, the position loop of the system will be unstable, and it is easy to produce overshoot and oscillation.
P02-04	velocity feedforward smoothing constant	0-6400	50	This parameter is used to set the speed loop feedforward filter time constant. The larger the value, the greater the filtering effect, but at the same time the phase lag increases.
P02-10	Speed Proportional Gain 1	1-20000	400	▸ The higher the setting value, the faster the speed response. The parameter value is set according to the load situation. ▸ Increase the value as much as possible without shock. ▸ Gain at rest.
P02-11	Velocity integral constant 1	10-51200	2000	▸ Integral time constant of speed regulator. The smaller the setting value, the faster the integral speed and the greater the stiffness. If it is too small, it is easy to produce vibration and noise. ▸ Reduce the value of this parameter as much as possible when the system does not oscillate. ▸ This parameter is for steady state response.
P02-13	Speed Proportional Gain 2	1-20000	400	▸ The higher the setting value, the faster the speed response. The parameter value is set according to the load situation. ▸ Increase the value as much as possible without shock.

				▸ Gain during exercise.
P02-14	Velocity integral constant 2	10-51200	2000	▸ Integral time constant of speed regulator. The smaller the setting value, the faster the integral speed and the greater the stiffness. If it is too small, it is easy to produce vibration and noise. ▸ Reduce the value of this parameter as much as possible when the system does not oscillate. ▸ This parameter is for steady state response.

7.3.2 gain switching

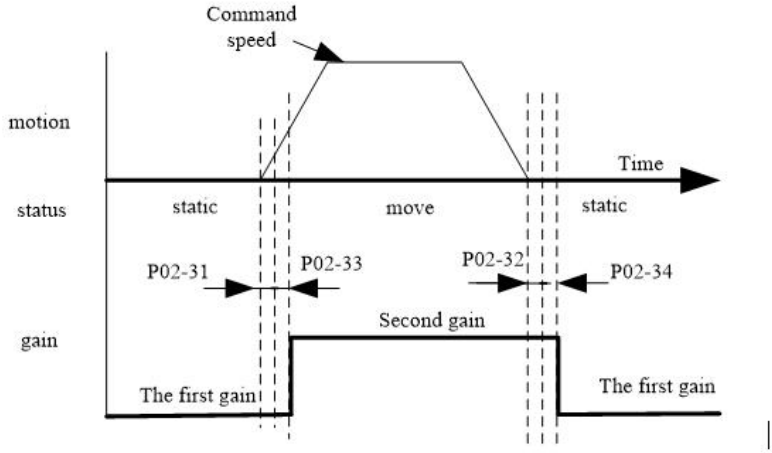
The gain switching function can be triggered by the internal status of the servo or by the external DI port and is only active in position control and speed control modes. Gain switching is used to:

Switch to a lower gain when the motor is at rest (servo enabled) to suppress vibration;

Switch to a higher gain when the motor is running (servo enabled) to shorten the positioning time;

switch to a higher gain in a motor run state to obtain better command following performance;

Depending on the use case, an external signal is used to switch between different gain settings.



Related parameters

parameter	Name	setting	factory	Unit of	Effective

code		range	setting	Measure	time
P02-30.0	Gain switching setting	0-1	0	---	Effective immediately
P02-30.1	Gain switching mode	0-9	0	---	Effective immediately
P02-31	Gain switching time 1	0-60000	100	ms	Effective immediately
P02-32	Gain switching time 2	0-60000	800	ms	Effective immediately
P02-33	Gain Switching Latency 1	0-60000	1000	ms	Effective immediately
P02-34	Gain Switching Latency 2	0-60000	100	ms	Effective immediately

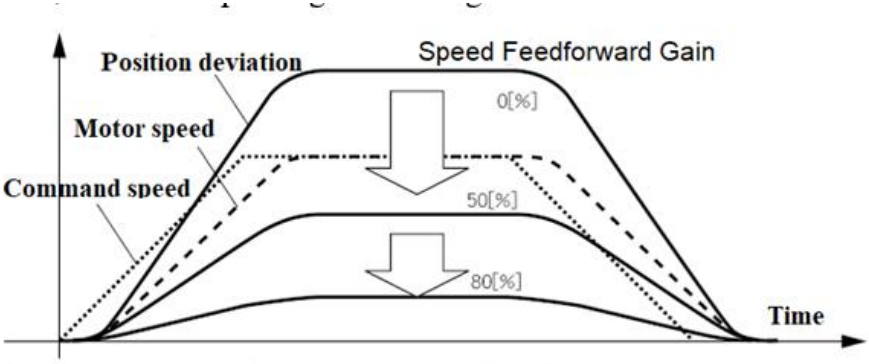
7.3.3 feedforward function

Speed feedforward: During position control, the required speed control command is calculated from the position command and added to the output of the position regulator to reduce the position deviation and improve the response of the position control.

Torque Feedforward: The required torque command is calculated from the speed control command and added to the speed regulator output to improve the speed control response.

A. Speed Feedforward Usage Operation

With the speed feedforward smoothing constant set to 50 (0.5 ms), gradually increase the speed feedforward gain to meet the system requirements. However, too large velocity feedforward gain will cause position overshoot, which will prolong the setting time.



B. Torque Feedforward Usage Operation

Under the condition that the torque feedforward smoothing constant is set to 50, the torque feedforward gain is gradually increased to meet the system requirements.

Related parameters

Param Code	Name	setting range	leave the factory setting	Unit of Measure	Entry into force Time
P02-03	velocity feedforward gain	0-100	30	1%	Effective immediately
P02-04	velocity feedforward smoothing constant	0-6400	50	0.01ms	Effective immediately
P02-19	torque feedforward gain	0-200	0	1%	Effective immediately

P02-20	torque feedforward smoothing constant	0-6400	80	0.01ms	Effective immediately

7.3.4 resonance suppression

Too high stiffness and too fast response of servo system may cause resonance of mechanical system, which can be improved by reducing the gain of control loop. it is also possible to suppress resonance by use a low-pass filter and a trap without reduce that gain.

1. Resonance frequency detection

The resonance frequency of the mechanical system can be observed by monitoring the items d26.1.Fr and d28.2.Fr

2. Torque command low-pass filter (P08-20, P08-21)

The low-pass filter is used when the vibration frequency will shift, and it can have better effect when it is used for high frequency vibration. By setting the time constant of the filter, the resonance is attenuated near the resonance frequency. However, the low-pass filter will make the system phase lag, bandwidth reduction, phase margin reduction easily lead to loop oscillation. Therefore, it can only be used in high-frequency vibration occasions.

Filter cutoff frequency (Hz)= 1/(2*pi*P08-20(ms)*0.001)

Param Code	Name	setting range	leave the factory setting	Unit of Measure	Entry into force Time
P08-20	Torque command filter constant	0-2500	100	0.01ms	Effective immediately
P08-21	the second torque command filt constant	0-2500	100	0.01ms	Effective

					immediat ely

3. Notch filter

Notch filters are used when the system resonance frequency is fixed. The notch filter can suppress mechanical resonance by reducing the gain at a specific frequency. After setting the notch filter correctly, the vibration can be effectively suppressed, and the servo gain can be continuously increased. The servo is internally provided with a plurality of wave traps, and the first and second wave traps can be automatically set internally or manually input parameters. Other traps can only be set manually.

A. adaptive notch mode

When the self-tuning function is used, and P 08-25.0, P08-25.1 are set to1, the servo system will automatically identify the current resonance frequency through the adaptive notch filter function module, and automatically configure the notch filter parameters.

B. Manually perform frequency identification and set trap parameters

The auxiliary function of the driver can be used to identify the vibration frequency and set the parameters of the trap. Note: This function is only to scan the maximum amplitude point of each frequency of the machine. This function scans out frequencies even if the machine itself does not have a mechanical resonance point. Use steps:

a) Confirm whether the first trap and the second trap allow setting. This can be determined by looking at parameter P08-24. if both that first trap and the second trap are enable. then the parameters of the first or second trap need to be set to the third trap and the correspondingP 08-24. 0/1 is set to0. This means that the first/second trap can be reset.

b) Turn off the servo enable so that the servo is in the off enable state. Then the auxiliary function F 21 is executed

c) After the auxiliary function of F 21 is performed, the driver will give a certain excitation to the motor to trigger the mechanical resonance. The identified vibration frequency is then displayed on the drive LED.

d) If the frequency identification is correct, press and hold the Enter key, the driver will automatically set the current frequency parameter to the first/second trap, and set the corresponding P 08-24.0/1 to 1 to start the trap.

Related parameters

Param Code	Name	Note:

P08-51	sweep torque amplitude	Setting range:1-300 sweep torque amplitude

C. Use the auxiliary function to identify the resonant frequency and set the trap parameters during machine operation

The auxiliary function of the driver can be used to identify the vibration frequency and set the parameters of the trap. The difference from the function of the previous point is that in the B item, when the mechanical off is enabled, the driver itself is excited to identify the resonance. Item C refers to the occurrence of resonance during normal operation of the machine, and identify the frequency. Use steps:

a) Confirm whether the first trap and the second trap allow setting. This can be determined by looking at parameter P08-24. if both that first trap and the second trap are enable. then the parameters of the first or second trap need to be set to the third trap and the correspondingP 08-24. 0/1 is set to0. This means that the first/second trap can be reset.

b)Then perform auxiliary functionF22

c) After the F22 auxiliary function has been performed, the drive enters the frequency identification state for 10 s. During this time, the device is operated, and when a resonance point occurs, the driver will recognize it and display it on theLED. The sensitivity of frequency identification depends on parametersP02-51, P02-52.

d) If the frequency identification is correct, press and hold the Enter key, the driver will automatically set the current frequency parameter to the first/second trap, and set the corresponding P 08-24.0/1 to 1 to start the trap.

Related parameters

Param Code	Name	Note:
P02- 51	Vibration detection sensitivity	Setting range: 50-500
P02- 52	Vibration detection level	Setting range: 0-5000 This parameter sets the vibration detection sensitivity of the adaptive notch filter. The smaller the parameter value, the more sensitive the detection sensitivity is

D. Manually set trap parameters

a) The resonance frequency of the mechanical system can be observed by monitoring the items d26.1.Fr and d28.2.Fr.

b) Input the resonance frequency observed in the previous step into the trap parameters, and input the width level and depth level of the set of traps at the same time.

c) If the vibration is suppressed, it means that the trap is working. Continue to increase the gain, and repeat the previous 2 steps when new vibrations occur.

d) If the vibration cannot be eliminated for a long time, please turn off the servo enable in time.

E. notch width rating

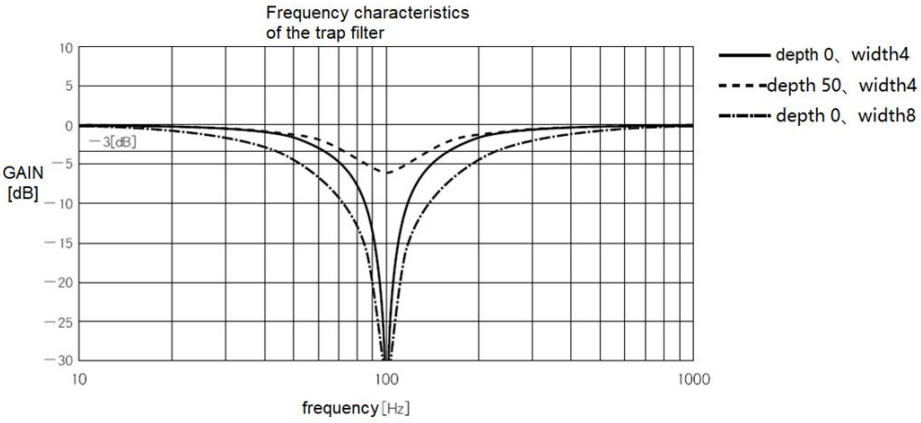
F. Strap width level = Strap width / center frequency of the notch filter

the notch width represent that frequency bandwidth over which the amplitude decay rate is-3 db relative to the notch cent frequency

G. notch depth rating

Strap depth level=output value/input value

At notch depth level 0, the input is completely rejected at the center frequency; At a depth level of 100, the input passes completely at the center frequency.



Related parameters

Param Code	Name	Note:
P08-30	Notch filter 1 frequency	Setting range: 300-5000, unit: Hz Center frequency of trap 1 When set to 5000, the trap is not valid
P08-31	Notch filter 1 width	Setting range:50-1000 Notch width class for Notch 1 is the ratio of the width to the center frequency
P08-32	Notch filter 1 Depth	Setting range:0-1000 Notch depth level for Notch 1 The ratio between the input and the output is given for the center frequency of the trap The larger this parameter, the smaller the notch depth and the weaker the effect

Relevant parameters of notch filter

Param Code	Name	setting range	leave the factory setting	Unit of Measure	Entry into force Time
P08-24.0	First trap enable	0-1	0	---	Effective immediately
P08-24.1	Second trap enable	0-1	0	---	Effective immediately
P08-30	Notch Filter 1 Frequency	50-5000	5000	HZ	Effective immediately
P08-31	Notch Filter 1 Width	50-1000	70	0.01	Effective immediate

					ly
P08-32	Notch Filter 1 Depth	0-1000	0	0.001	Effective immediately
P08-33	Notch Filter 2 Frequency	50-5000	5000	HZ	Effective immediately
P08-34	Notch Filter 2 Width	50-1000	70	0.01	Effective immediately
P08-35	Notch Filter 2 Depth	0-1000	0	0.001	Effective immediately
P08-36	Notch Filter 3 Frequency	50-5000	5000	HZ	Effective immediately
P08-37	Notch filter 3 width	50-1000	70	0.01	Effective immediately
P08-38	Notch Filter 3 Depth	0-1000	0	0.001	Effective immediately

* Note: No. 1 and No. 2 traps need P 08-24 enabled to function. The third trap only needs to set the frequency parameter to work.

Chapter 8 Parameters and Functions

8.1 Parameter List

P00-xx indicates motor and driver parameters

P01-xx Main Control Parameters

P02-xx indicates gain class parameter

P03-xx indicates position parameter

P04-xx indicates speed parameter

P05-xx indicates torque parameter

P06-xx indicates I/O parameters

P08-xx indicates advanced function parameters

The tag numbers0,**1**,**2** and**3** represent the tag numbers of the current parameter code value, and the tag numbers are sorted as**3210**; the tag numbers without values represent the entire parameter value

Parameter code	**Bit number**	**name**	**unit**	**Parameter range**	**leave the factory**	**Setting mode**	**Effective time**

P00-00		Motor number		0-2000	2000	Operation setting	Restart takes effect
P00-01		Rated speed	rpm	1-12000		Operation setting	Restart takes effect
P00-02		Rated torque	0.01Nm	1-65535		Operation setting	Restart takes effect
P00-03		rated current	0.01A	1-65535		Operation setting	Restart takes effect
P00-04		rotary inertia	0.01kgcm2	1-65535		Operation setting	Restart takes effect
P00-05		Motor pole logarithm	logarithm	1-50		Operation setting	Restart takes effect
P00-06		Current motor number		0-0		Operation setting	Restart takes effect
P00-07	0	Encoder _ type		0-1	one	Operation setting	Restart takes effect
	one	Encoder _ Shielded Overheat Alarm		0-1	one	Operation setting	Restart takes effect
	2	Encoder _ Shielded		0-1	one	Operation	Restart

		Multi-Circle Alarm				setting	takes effect
	three	Encoder _ Shielded Battery Alarm		0-1	one	Operation setting	Restart takes effect
P00-08		Encoder zero offset		0-360	0	Operation setting	Restart takes effect
P00-09		rated voltage	V	1-600		Operation setting	Restart takes effect
P00-10		rated power	0.01kW	1-65535		Operation setting	Restart takes effect
P00-11		Maximum torque	0.01Nm	1-65535		Operation setting	Restart takes effect
P00-12		maximum speed	rpm	1-12000		Operation setting	Restart takes effect
P00-13		stator resistance	1mΩ	1-65535		Operation setting	Restart takes effect
P00-14		Stator inductance Lq	0.01mH	1-65535		Operation setting	Restart takes effect
P00-15		Stator inductance Ld	0.01mH	1-65535		Operation setting	Restart takes

							effect
P00-16		Linear back emf coefficient	0.01mV/krpm	1-65535		Operation setting	Restart takes effect
P00-17		Electrical constant	0.01ms	1-65535		Operation setting	Restart takes effect
P00-18		Mechanical constant	0.01ms	1-65535		Operation setting	Restart takes effect
P00-19		Current gain percentage	%	10-500		Operation setting	Restart takes effect
P00-20		Monitoring display when power is turned on.		0-100	100	Operation setting	Restart takes effect
P00-23		Slave station ID setting		1-255	one	Operation setting	be effective immediately
P00-24	0	Baud rate selection of 485 communication		0-7	2	Operation setting	be effective immediately
	one	485 communication parity check mode		0-3	one	Operation setting	be effective immediately

P00-26		Modbus response delay	0.1ms	0-100	one		
P00-30		Brake resistance setting		0-2	one	Operation setting	be effective immediately
P00-31		External braking resistance power	1W	1-65535	40	Operation setting	be effective immediately
P00-32		External braking resistance value	0.1 Ω	1-65535	300	Operation setting	be effective immediately
P00-33		Built-in braking resistor power	1W	1-65535	40	Operation setting	be effective immediately
P00-34		Built-in braking resistance value	0.1 Ω	1-65535	four hundred	Operation setting	be effective immediately
P00-35		Resistance heat dissipation coefficient	1%	1-100	20	Operation setting	be effective immediately
P00-39	0	Three-phase power supply input selection		0-1	0	Operation setting	Restart takes effect

	one	Electrical signal shielding on RST		0-1	0	Operation setting	Restart takes effect
P00-40		Temperature compensation setting	degree	-20-20	0	Operation setting	be effective immediately
P00-41		Over temperature alarm setting	degree	0-150	100	Operation setting	be effective immediately
P00-42		Overtemperature warning setting	degree	0-150	100	Operation setting	be effective immediately
P00-43		Fan startup temperature setting	degree	0-150	60	Operation setting	be effective immediately
P00-44	0	Fan fault setting		0-1	0	Operation setting	Restart takes effect
	one	Abnormal fault setting for communication with FPGA (E.052)		0-1	0	Operation setting	Restart takes effect
	2	Regeneration abnormal alarm (E.430)		0-1	0	Operation setting	Restart takes effect

	three	Soft start resistor overload fault setting (E.435)		0-1	0	Operation setting	Restart takes effect
P00-46	0	DB overload fault setting (E.436)		0-1	0	Operation setting	Restart takes effect
	one	Fault Settings for Motor Out of Control Detection (E.421)		0-1	0	Operation setting	Restart takes effect
	2	U-phase current feedback abnormality (E.071)		0-1	0	Operation setting	Restart takes effect
	three	W phase current feedback abnormality (E.072)		0-1	0	Operation setting	Restart takes effect
P00-47	0	Setting of Off-line Fault of Motor Power Line (E.305)		0-1	0	Operation setting	Restart takes effect
	one	Abnormal fault setting of FPGA clock (E.069)		0-1	0	Operation setting	Restart takes effect
P00-50		Motor locked-rotor protection time	ms	10-60000	500	Operation setting	be effective immediately
P00-51		Overload warning value	%	0-100	100	Operation setting	be effective immediatel

							y
P00-52		Undervoltage alarm voltage value	V	10-500	one hundred and eighty	Operation setting	Restart takes effect
P00-55		Overload reference value	%	50-200	115	Operation setting	Restart takes effect
P00-56		Motor overload time percentage	%	10-100	100	Operation setting	Restart takes effect
P00-80		Carrier setting		0-2	0	Operation setting	Restart takes effect
P01-00	0	Direction of rotation		0-1	0	Operation setting	Restart takes effect
P01-01	0	control model		0-6	0	Operation setting	Restart takes effect
P01-02	0	Adjust selection		0-4	0	Operation setting	Restart takes effect
P01-03		Stiffness grade		0-31	13	Operation setting	Restart takes effect
P01-04		Load moment of inertia ratio	%	0-20000	300	Operation setting	be effective

							immediatel y
P01-05	0	Mute adjustment selection		0-1	0	Operation setting	Restart takes effect
	on e	Self-adjusting type		0-2	0	Operation setting	Restart takes effect
	2	Static current base gain		0-8	eight	Operation setting	Restart takes effect
P01-06	0	Self-adjusting value		0-7	four	Operation setting	be effective immediatel y
	on e	Self-adjusting load value		0-2	one	Operation setting	be effective immediatel y
P01-10		Vibration detection selection		0-2	0	Operation setting	be effective immediatel y
P01-11		Vibration detection sensitivity	%	50-500	100	Operation setting	be effective immediatel y
P01-12		Vibration detection level	rpm	0-5000	50	Operation	be

						setting	effective immediately
P01-13		Detection amplitude of residual vibration	0.1%	1-3000	four hundred	Operation setting	be effective immediately
P01-20	0	Servo OFF and stop method in case of Gr.1 fault		0-2	0	Operation setting	Restart takes effect
	one	Stop method in case of Gr.2 failure		0-2	0	Operation setting	Restart takes effect
	2	Stop method when overtravel.		0-4	0	Operation setting	Restart takes effect
	three	Stop method in forced stop.		0-2	0	Operation setting	Restart takes effect
P01-21		Stop torque of deceleration in case of emergency stop, fault and over-travel.	%	0-350	300	Operation setting	be effective immediately
P01-22		Slow down downtime in case of emergency stop, fault and over-travel.	ms	0-60000	0	Operation setting	be effective immediately
P01-29		Delay from brake opening to	ms	0-500	100	Operation	be

		command reception				setting	effective immediately
P01-30		At rest, the brake is OFF and the motor is not energized.	ms	0-500	100	Operation setting	be effective immediately
P01-31		Rotating state, speed threshold when brake is OFF	rpm	0-6000	100	Operation setting	be effective immediately
P01-32		Rotation state, delay from servo OFF to brake OFF	ms	0-1000	50	Operation setting	be effective immediately
P01-35		Z signal level width	0.1ms	1-1000	50	Operation setting	be effective immediately
P02-00		Position loop gain	0.1/s	10-20000	four hundred	Operation setting	be effective immediately
P02-01		Second position loop gain	0.1/s	10-20000	four hundred	Operation setting	be effective immediately
P02-03		Velocity feedforward gain	%	0-100	30	Operation	be

						setting	effective immediately
P02-04		Velocity feedforward filtering time	0.01ms	-6400	50	Operation setting	be effective immediately
P02-10		Velocity loop gain	0.1Hz	10-20000	four hundred	Operation setting	be effective immediately
P02-11		Velocity loop integration time parameter	0.01ms	15-51200	2000	Operation setting	be effective immediately
P02-13		Second speed loop gain	0.1Hz	10-20000	four hundred	Operation setting	be effective immediately
P02-14		The second speed loop integration time constant	0.01ms	15-51200	51200	Operation setting	be effective immediately
P02-19		Torque feedforward gain	%	-200	0	Operation setting	be effective immediately
P02-20		Torque feedforward filtering	0.01ms	-6400	50	Operation	be

		time				setting	effective immediately
P02-21		Friction compensation gain	%	10-1000	100	Operation setting	be effective immediately
P02-22		Second friction compensation gain	%	10-1000	100	Operation setting	be effective immediately
P02-23		Friction compensation coefficient	%	0-100	0	Operation setting	be effective immediately
P02-24		Friction compensation frequency compensation	0.1Hz	0-10000	0	Operation setting	be effective immediately
P02-25		Friction compensation gain compensation	%	1-1000	100	Operation setting	be effective immediately
P02-30	0	Gain switching setting		0-1	0	Operation setting	be effective immediately
	on	Gain switching setting		0-9	five	Operation	be

	e					setting	effective immediately
P02-31		Gain switching time 1	ms	0-60000	100	Operation setting	be effective immediately
P02-32		Gain switching time 2	ms	0-60000	eight hundred	Operation setting	be effective immediately
P02-33		Gain switching latency 1	ms	0-60000	1000	Operation setting	be effective immediately
P02-34		Gain switching latency 2	ms	0-60000	100	Operation setting	be effective immediately
P02-40	0	Mode switch function selection		0-4	0	Operation setting	be effective immediately
P02-41		Mode switch torque command threshold	1%	0-350	200	Operation setting	be effective immediately
P02-42		Mode switch speed	rpm	0-6000	0	Operation	be

		command threshold				setting	effective immediately
P02-43		Mode switch acceleration threshold	1rpm/s	0-30000	0	Operation setting	be effective immediately
P02-44		Mode switch position deviation threshold	Instruction unit	0-10000	0	Operation setting	be effective immediately
P02-50		Torque command added value	%	-100-100	0	Operation setting	be effective immediately
P02-51		Positive torque compensation value	%	0-100	0	Operation setting	be effective immediately
P02-52		Negative direction torque compensation value	%	0 - -100	0	Operation setting	be effective immediately
P02-53		Viscous friction compensation value	%	0-100	0	Operation setting	be effective immediately
P02-57		Low frequency vibration		0-1	0	Operation	be

		suppression setting				setting	effective immediately
P02-58		Low frequency vibration frequency 1	0.1Hz	10-2000	eight hundred	Operation setting	be effective immediately
P02-59		Low frequency resonance setting 1	%	10-1000	100	Operation setting	be effective immediately
P02-60	0	Model tracking control selection		0-1	0	Operation setting	be effective immediately
	one	Vibration suppression selection		0-1	0	Operation setting	be effective immediately
P02-61		Model tracking control gain	0.1/s	10-20000	500	Operation setting	be effective immediately
P02-62		Gain compensation of model tracking control	0.1%	500-2000	1000	Operation setting	be effective immediately
P02-63		Model tracking control bias	0.1%	0-10000	1000	Operation	be

		(forward direction)				setting	effective immediately
P02-64		Model Tracking Control Bias (Reverse Direction)	0.1%	0-10000	1000	Operation setting	be effective immediately
P02-65		Vibration suppression 1 frequency a	0.1Hz	10-2500	500	Operation setting	be effective immediately
P02-66		Vibration suppression 1 frequency b	0.1Hz	10-2500	700	Operation setting	be effective immediately
P02-67		Model tracking control speed feedforward compensation	0.1%	0-10000	1000	Operation setting	be effective immediately
P02-68		Second model tracking control gain	0.1/s	10-20000	500	Operation setting	be effective immediately
P02-69		Gain compensation of second model tracking control	0.1%	500-2000	1000	Operation setting	be effective immediately
P02-70		Speed vibration suppression		0-0x1121	0x0010	Operation	be

		setting				setting	effective immediately
P02-71		Velocity vibration suppression frequency	0.1Hz	10-20000	1000	Operation setting	be effective immediately
P02-72		Speed vibration suppression frequency 2	0.1Hz	10-20000	1000	Operation setting	be effective immediately
P02-73		Speed vibration suppression gain compensation	%	1-1000	100	Operation setting	be effective immediately
P02-74		Velocity damping attenuation gain	%	0-300	100	Operation setting	be effective immediately
P02-75		Velocity damping attenuation gain 2	%	0-300	100	Operation setting	be effective immediately
P02-76		Time parameter 1 compensation of speed vibration suppression filter	0.01ms	0-1000	0	Operation setting	be effective immediately
P02-77		Time parameter 2	0.01ms	0-1000	0	Operation	be

		compensation of speed vibration suppression filter				setting	effective immediately
P02-88		Current control gain value	%	20-500	100	Operation setting	be effective immediately
P03-00	0	Position instruction setting		0-4	0	Operation setting	Restart takes effect
P03-01	0	Command pulse shape		0-3	one	Operation setting	Restart takes effect
P03-02	0	Over-travel signal eliminates residual position deviation.		0-1	0	Operation setting	be effective immediately
P03-03	0	Position instruction reversal		0-1	0	Operation setting	Restart takes effect
	one	Inversion of effective level of instruction pulse		0-1	0	Operation setting	Restart takes effect
P03-04		Instruction pulse filtering		0-2000	0	Operation setting	be effective immediately
P03-05		Positioning completion		0-2	0	Operation	be

		output condition				setting	effective immediately
P03-06		Positioning completion threshold	Instruction unit	0-65535	seven	Operation setting	be effective immediately
P03-07		Positioning approach threshold	Instruction unit	0-65535	60000	Operation setting	be effective immediately
P03-09		Number of position instructions for one rotation of the motor		0-1073741823	ten thousand	Operation setting	Restart takes effect
P03-15		Alarm value of excessive position deviation	Instruction unit	0-1073741823	90000	Operation setting	be effective immediately
P03-17		Average moving time of position command	0.1ms	0-10000	0	Operation setting	be effective immediately
P03-18		Time parameter of first-order low-pass filtering for position instruction	0.1ms	0-65535	0	Operation setting	be effective immediately
P03-23		Denominator of frequency division output pulse		0-1073741823	0	Operation setting	be effective

		number					immediatel y
P03-25		Frequency division output pulse number		1-65535	2500	Stop setting	Restart takes effect
P03-26	0	Frequency division output pulse phase sequence inversion		0-1	0	Stop setting	Restart takes effect
P03-30		Warning value of excessive position deviation	%	10-100	100	Operation setting	be effective immediatel y
P03-31		Alarm value of servo ON position deviation is too large	Instruction unit	0-107374182 3	90000	Operation setting	be effective immediatel y
P03-33		Warning value of excessive servo ON position deviation	%	10-100	100	Operation setting	be effective immediatel y
P03-34		Overshoot detection value	%	0-100	100	Operation setting	be effective immediatel y
P03-40		Electronic gear molecule 1		1-107374182 3	64	Stop setting	Restart takes effect
P03-42		Denominator 1 of electronic		1-107374182	one	Stop	Restart

		gear		3		setting	takes effect
P03-44		Electronic gear molecule 2		1-1073741823	64	Stop setting	Restart takes effect
P03-46		Electronic gear denominator 2		1-1073741823	one	Stop setting	Restart takes effect
P04-00	0	Speed command selection setting		0-5	0	Stop setting	Restart takes effect
P04-01		JOG speed command set value	rpm	0-6000	0	Operation setting	be effective immediately
P04-02		Speed command digital setting value	rpm	-6000-6000	0	Operation setting	be effective immediately
P04-04		Zero-speed clamping speed threshold	rpm	0-6000	30	Operation setting	be effective immediately
P04-05		Overspeed threshold	rpm	0-6300	6300	Operation setting	be effective immediately
P04-06		Forward speed limit	rpm	0-6300	6000	Operation	be

						setting	effective immediately
P04-07		Reverse speed limit	rpm	-6000-0	-6000	Operation setting	be effective immediately
P04-10		Zero speed detection value	rpm	0-2000	30	Operation setting	be effective immediately
P04-11		Motor rotation detected speed value	rpm	0-2000	20	Operation setting	be effective immediately
P04-12		Speed reaches signal threshold	rpm	0-2000	30	Operation setting	be effective immediately
P04-14		Speed command acceleration time	ms	0-10000	0	Operation setting	be effective immediately
P04-15		Speed command deceleration time	ms	0-10000	0	Operation setting	be effective immediately
P04-30		Internal set speed 1	rpm	-6000-6000	0	Operation	be

						setting	effective immediately
P04-31		Internal set speed 2	rpm	-6000-6000	0	Operation setting	be effective immediately
P04-32		Internal set speed 3	rpm	-6000-6000	0	Operation setting	be effective immediately
P04-33		Internal set speed 4	rpm	-6000-6000	0	Operation setting	be effective immediately
P04-34		Internal set speed 5	rpm	-6000-6000	0	Operation setting	be effective immediately
P04-35		Internal set speed 6	rpm	-6000-6000	0	Operation setting	be effective immediately
P04-36		Internal set speed 7	rpm	-6000-6000	0	Operation setting	be effective immediately
P04-37		Internal set speed 8	rpm	-6000-6000	0	Operation	be

						setting	effective immediatel y
P05-00	0	Torque command selection setting		0-5	0	Stop setting	Restart takes effect
P05-01		Torque control speed limit source setting		0-3	one	Operation setting	be effective immediatel y
P05-02		Torque control speed limit value	rpm	0-6000	1000	Operation setting	be effective immediatel y
P05-03		Torque command digital set value	%	-300-300	0	Operation setting	be effective immediatel y
P05-05		Torque limiting source setting		0-3	0	Operation setting	be effective immediatel y
P05-06		Output delay of torque limit detection signal	ms	0-10000	0	Operation setting	be effective immediatel y
P05-10		Positive internal torque limit	%	0-350	200	Operation setting	be effective

							immediatel y
P05-11		Anti-internal torque limitation	%	-350-0	-200	Operation setting	be effective immediatel y
P05-12		Positive external torque limit	%	0-350	200	Operation setting	be effective immediatel y
P05-13		Anti-external torque limitation	%	-350-0	-200	Operation setting	be effective immediatel y
P05-14		Internal set torque 1	%	-300-300	0	Operation setting	be effective immediatel y
P05-15		Internal set torque 2	%	-300-300	0	Operation setting	be effective immediatel y
P05-16		Internal set torque 3	%	-300-300	0	Operation setting	be effective immediatel y
P05-17		Internal set torque 4	%	-300-300	0	Operation setting	be effective

							immediatel y
P06-00		Effective DI function allocation at power-on 1		0-n.FFFF	0	Operation setting	Restart takes effect
P06-01		Effective DI function allocation at power-on 2			0	Operation setting	Restart takes effect
P06-05	0	Speed simulation instruction selection		0-1	0	Operation setting	Restart takes effect
	on e	Torque simulation instruction selection		0-1	0	Operation setting	Restart takes effect
P06-11	01	DI1 Terminal Settings-Function Selection		00-1E	01	Operation setting	Restart takes effect
	2	DI1 Terminal Settings-Logic Selection		0-4	one	Operation setting	Restart takes effect
P06-12	01	DI2 Terminal Settings-Function Selection		00-1E	02	Operation setting	Restart takes effect
	2	DI2 Terminal Settings-Logic Selection		0-4	2	Operation setting	Restart takes effect
P06-13	01	DI3 Terminal Settings-Function Selection		00-1E	03	Operation setting	Restart takes

						effect
	2	DI3 Terminal Settings-Logic Selection	0-4	one	Operation setting	Restart takes effect
P06-14	01	DI4 Terminal Settings-Function Selection	00-1E	04	Operation setting	Restart takes effect
	2	DI4 Terminal Settings-Logic Selection	0-4	one	Operation setting	Restart takes effect
P06-15	01	DI5 Terminal Settings-Function Selection	00-1E	07	Operation setting	Restart takes effect
	2	DI5 Terminal Settings-Logic Selection	0-4	one	Operation setting	Restart takes effect
P06-21	01	DO1 Terminal Settings-Function Selection	00-13	03	Operation setting	Restart takes effect
	2	DO1 Terminal Settings-Logic Selection	0-1	one	Operation setting	Restart takes effect
P06-22	01	DO2 Terminal Settings-Function Selection	00-13	02	Operation setting	Restart takes effect
	2	DO2 terminal setting-logic selection	0-1	one	Operation setting	Restart takes effect

P06-23	01	DO3 Terminal Settings-Function Selection		00-13	01	Operation setting	Restart takes effect
	2	DO3 terminal setting-logic selection		0-1	one	Operation setting	Restart takes effect
P06-24	01	DO4 Terminal Settings-Function Selection		00-13	04	Operation setting	Restart takes effect
	2	DO4 Terminal Settings-Logic Selection		0-1	one	Operation setting	Restart takes effect
P06-40		Speed value corresponding to analog 1V	rpm	0-2000	300	Stop setting	be effective immediately
P06-41		AI1 filtering time constant	0.01ms	0-2500	10	Operation setting	be effective immediately
P06-42		AI1 bias	mV	-9999-9999	0	Operation setting	be effective immediately
P06-43		Torque value corresponding to analog 1V	%	0-100	10	Stop setting	be effective immediately

P06-46		AI1 dead zone	mV	0-9999	0	Operation setting	be effective immediately
P08-00	0	Offline inertia identification mode		0-n.xxx1	0	Operation setting	be effective immediately
	one	On-line inertia identification mode		0-n.xx1x		Operation setting	be effective immediately
P08-01		Inertia identification inertia initial value	1%	0-20000	300	Operation setting	be effective immediately
P08-02		Inertia identification running laps	0.1 lap	5-1000	30	Operation setting	be effective immediately
P08-03		Maximum speed of inertia identification	rpm	10-2000	eight hundred	Operation setting	be effective immediately
P08-04		Acceleration time of inertia identification	ms	20-800	100	Operation setting	be effective immediately

P08-05		Waiting time after single inertia identification is completed	ms	50-10000	1000	Operation setting	be effective immediately
P08-06		Program JOG mode		0-5	0	Operation setting	be effective immediately
P08-07		Program JOG moving distance	0.1 lap	1-2000	30	Operation setting	be effective immediately
P08-09		Program JOG moving speed	rpm	1-10000	500	Operation setting	be effective immediately
P08-10		Program JOG acceleration and deceleration time	ms	2-10000	100	Operation setting	be effective immediately
P08-11		Program JOG waiting time	ms	0-10000	100	Operation setting	be effective immediately
P08-12		Program JOG movement times	time	0-10000	one	Operation setting	be effective immediately

P08-15	0	Automatically adjust inertia setting		0-n.xxx1	one	Operation setting	be effective immediately
	one	Automatic adjustment mode setting		0-n.xx3x	three	Operation setting	be effective immediately
P08-16		Automatically adjust the maximum gain	0.1Hz	100-7000	3000	Operation setting	be effective immediately
P08-17		Velocity observer gain	Hz	10-500	500	Operation setting	be effective immediately
P08-18		Velocity observer coefficient	%	0-500	150	Operation setting	be effective immediately
P08-20		Time parameters of the first torque command filter in the first paragraph	0.01ms	0-2500	100	Operation setting	be effective immediately
P08-21		Time parameters of the second torque command filter in the first paragraph	0.01ms	0-2500	100	Operation setting	be effective immediately

P08-22		The second torque in the second paragraph commands the filter frequency.	Hz	100-5000	5000	Operation setting	be effective immediately
P08-23		Q value of the second torque command filter in the second paragraph	0.01ms	50-100	50	Operation setting	be effective immediately
P08-24	0	First notch filter selection		0-1	one	Operation setting	be effective immediately
	one	Second notch filter selection		0-1	one	Operation setting	be effective immediately
	three	Selection of friction compensation function		0-1	one	Operation setting	be effective immediately
P08-25	0	Adaptive notch filter 1 mode setting		0-1	one	Operation setting	be effective immediately
	one	Adaptive notch filter 2 mode setting		0-1	one	Operation setting	be effective immediately

P08-30		Paragraph 1 trap frequency	Hz	50-5000	5000	Operation setting	be effective immediately
P08-31		Width of the first notch filter	0.01	50-1000	70	Operation setting	be effective immediately
P08-32		Depth of the first notch filter	0.001	0-1000	0	Operation setting	be effective immediately
P08-33		Paragraph 2 trap frequency	Hz	50-5000	5000	Operation setting	be effective immediately
P08-34		Width of the second notch filter	0.01	50-1000	70	Operation setting	be effective immediately
P08-35		Section 2 trap depth	0.001	0-1000	0	Operation setting	be effective immediately
P08-36		Paragraph 3 trap frequency	Hz	50-5000	5000	Operation setting	be effective immediately

P08-37		Width of the third notch filter	0.01	50-1000	70	Operation setting	be effective immediately
P08-38		Depth of the third notch filter	0.001	0-1000	0	Operation setting	be effective immediately
P08-51		Sweep torque amplitude	%	1-300	15	Operation setting	be effective immediately

Note:

1:**The tag**identifiers**0**, **1**, **2** and**3** represent the tag of the current parameter code value, and the tag sequence is**3210**; the tag without value represents the entire parameter value

2:Most of the factory values in the parameter table are the same, but some A/B axes are different from each other. Use/to distinguish between A and B axes. The value before/represents the factory of A axis, and the value after/represents the factory of B axis.

8.2 Parameter Description

Parameter Code	Bit Number	Name	Unit	Parameter Range	Default Setting	Setting Method
P00-07	0	Encoder (Type)		0-1	1	Running & setting
	1	Encoder (Disable overheat alarm)		0-1	1	Running & setting
	2	Encoder (Disable multi-turn alarm)		0-1	1	Running & setting
	3	Encoder (Disable battery alarm)		0-1	1	Running & setting

Note: As shown in the above figure, the red box indicates**the tag number**identification of the parameter,

where**0**, **1**, **2** and**3** represent the tag number of the current parameter value, and the tag number sequence is**3210**

8.2.1 P00-xx motor and driver parameters

Param Code		Name	Note:
P00-00		Motor No.	Factory set, no need to set 0: P00-00 to P00-19 active 2000: Absolute encoder motor, P00-01 to P00-19 are automatically recognized by the drive
P00-01		Rated speed of motor	Setting range: 1-6000, unit: rpm Factory set, no need to set
P00-02		Rated torque of motor	Setting range: 1-65535, unit: 0.01N.M According to the setting of the distribution machine, it has been set at the factory
P00-03		Rated current of motor	Setting range: 1-65535, unit: 0.01A According to the setting of the distribution machine, it has been set at the factory
P00-04		Motor moment of inertia	Setting range: 1-65535, unit: 0.01 kg.cm ^{2} According to the setting of the distribution machine, it has been set at the factory
P00-05		Number of pole pairs	Setting range: 1-31, unit: antipode According to the setting of the distribution machine, it has been set at the factory
P00-07	0	Encoder-Type	Setting range: 0-1 0: incremental encoder; 1: absolute value encoder;
	1	Encoder-Overheat Alarm	Setting range: 0-1 0: Turn on the overheat alarm 1: Turn off overheat alarm
	2	Encoder-Multiturn Alarm	Setting range: 0-1 0: Turn on multi-turn alarm (multi-turn absolute encoder) 1: Turn off multi-turn alarm (single-turn absolute encoder)
	3	Encoder-Battery	Setting range: 0-1 0: Battery alarm on (multiturn absolute encoder)

	Alarm	1: Turn off battery alarm (single-turn absolute encoder)
P00-08	encoder zero offset	Setting range: 0-360° According to the setting of the distribution machine, it has been set at the factory
P00-09	Rated voltage	According to the setting of the distribution machine, it has been set at the factory
P00-10	rated power	According to the setting of the distribution machine, it has been set at the factory
P00-11	maximum torque	According to the setting of the distribution machine, it has been set at the factory
P00-12	maximum speed	According to the setting of the distribution machine, it has been set at the factory
P00-13	stator resistance	According to the setting of the distribution machine, it has been set at the factory
P00-14	stator inductance Lq	According to the setting of the distribution machine, it has been set at the factory
P00-15	Stator inductance Ld	According to the setting of the distribution machine, it has been set at the factory
P00-16	linear back EMF coefficient	According to the setting of the distribution machine, it has been set at the factory
P00-17	electrical constant	According to the setting of the distribution machine, it has been set at the factory
P00-18	mechanical constant	According to the setting of the distribution machine, it has been set at the factory
P00-19	Current gain percentage	According to the setting of the distribution machine, it has been set at the factory
P00-20	Power-on interface display setting	Setting range:0-100, default 100 Set according to customer display requirements When set to 100, the drive displays the operational status when it powers up The set value of other parameters shall be set according to the serial number of the monitoring item list (Chapter 8.3

			For example, when the customer needs to drive and display the motor speed d08.F.SP at power-on, the parameter is set to 8
P00-23		Slave ID setting	Setting range: 0-255, default 1 Slave ID setting during Modbus communication
P00-24	0	Modbus communication baud rate	Setting range: 0-7, default 2 0:2400 1:4800 2:9600 3:19200 4:38400 5:57600 6:115200 7:256000
P00-24	1	485 communication parity check mode	Set range 0-3, default 0 0: no check, 2 stop bits 1: even parity, 1 stop bit 2: Odd parity, 1 stop bit 3: No check, 1 stop bit
P00-26		Modbus communication response delay	Setting range: 0-100, unit. 01 mS。Default 0 When the parameter is set to 0, the response is made according to the standard communication. When the parameter is set to have a value, the response time of Modbus communication is made according to the set time
P00-30		Braking resistor setting	Setting range: 0-2 0: No regenerative resistor used 1: Use built-in regenerative resistor 2: Use external regenerative resistor
P00-31		Power of external braking resistor	Setting range: 1-65535, unit: 1W Set correctly according to the external braking resistance power, such as: Set to 40, resistor power is 40W
P00-32		Resistance value of external braking resistor	Setting range: 1-65535, unit: 0.1 ohm Set correctly according to the resistance value of the external braking resistor
P00-33		Built-in braking resistance power	Setting range: 1-65535, unit: 1W Set the correct power according to the built-in braking resistor, e.g.: Set to 40, resistor power is 40W

P00-34		Resistance of built-in braking resistor	Setting range: 1-65535, unit: 0.1 ohm Set correctly according to the value of the built-in braking resistor
P00-35		heat dissipation coefficient of resistance	Setting range: 1-100, unit: % Set reasonably according to the heat dissipation conditions of the resistor. If the heat dissipation conditions are good, the value can be set appropriately. When the setting value is large, the allowable energy of resistor regeneration increases, and it is not easy to report regeneration overload.
P00-39	0	Three-phase power input selection	Setting range: 0-1 0: Single power input 1: Three-phase power input (phase loss alarm AL400 will be generated when phase loss occurs)
	1	Electrical signal shielding on RST	Setting range: 0-1 0: power-on judgment signal for normal use 1: shield power-on signal
P00-40		Temperature Compensation Settings	Setting range: -20-20, unit: degree centigrade Correction of deviation of d24.Ath from actual temperature by parameter value
P00-41		Overtemperature alarm setting	Setting range: 1-150, unit: degree centigrade Alarm when radiator temperature reaches set value E.440
P00-42		Overtemperature warning setting	Setting range: 1-150, unit: degree centigrade Overtemperature warning when radiator temperature reaches set value
P00-43		Fan startup temperature setting	Setting range: 1-150, unit: degree centigrade The fan starts when the radiator temperature reaches the set value
P00-44	0	Fan Fault Settings	Setting range: 0-1 0: Close fault 1: Fault allowed
	1	Communication with FPGA abnormal fault setting (E.052)	Setting range: 0-1 0: Close fault 1: Fault allowed
	2	Regeneration abnormal alarm (E.430)	Setting range: 0-1 0: Close fault 1: Fault allowed

	3	Soft start resistor overload fault setting (E.435)	Setting range: 0-1 0: Close fault 1: Fault allowed
P00-46	0	DB overload fault setting (E.436)	Setting range: 0-1 0: Close fault 1: Fault allowed
	1	Motor runaway detection fault setting (E.421)	Setting range: 0-1 0: Close fault 1: Fault allowed
	2	Abnormal u-phase current feedback (E.071)	Setting range: 0-1 0: Close fault 1: Fault allowed
	3	Abnormal w-phase current feedback (E.072)	Setting range: 0-1 0: Close fault 1: Fault allowed
P00-47	0	Motor power line off line fault setting (E.305)	Setting range: 0-1 0: Close fault 1: Fault allowed
	1	FPGA clock exception fault setting (E.069)	Setting range: 0-1 0: Close fault 1: Fault allowed
P00-50		Motor locked-rotor protection time	Setting range: 0-60000Unit: ms Set the time to trigger the AL410 alarm protection formotor locked-rotor
P00-51		overload warning value	Setting range: 0-100Unit: % Set the overload warning threshold as a percentage of the overload warning time. When 60% is set, overload alarm is triggered when overload accumulation reaches 60% of overload alarm.
P00-52		Undervoltage alarm voltage value	Setting range: 0-500 units: V Setundervoltage alarm threshold

P00-55	overload reference value	Setting range: 50-200 units: % Set the initial threshold of the overload alarm curve, and when it is lower than the reference value, the motor can run for a long time without triggering the overload alarm.
P00-56	Motor overload time percentage	Setting range: 10-100 units: % Set overload protection time curve percentage

8.2.2 P01-xx Main Control Parameters

<table>
<tr><th>Param Code</th><th>Name</th><th>Note:</th></tr>
<tr><td>P01-00</td><td>direction of rotation</td><td>Setting range: 0-1
0: counterclockwise is positive direction
1: Clockwise is positive direction</td></tr>
<tr><td>P01-01</td><td>Control mode setting</td><td>Setting range: 0-5
0: Position control mode
1: Speed control mode
2: Torque control mode
3: Speed and torque control mode. To switch using one of the external input ports in CN1, set the selected DI portinput port function selection to 5 (control mode switching). The control mode can be switched by controlling the logic state of the port.
<table>
<tr><td>terminal logic</td><td>control mode</td></tr>
<tr><td>effective</td><td>velocity mode</td></tr>
<tr><td>invalid</td><td>torque mode</td></tr>
</table>
4: Position and speed control mode. To switch using one of the external input ports in CN1, set the selected DI portinput port function selection to 5 (control mode switching). The control mode can be switched by</td></tr>
</table>

<table>
<tr><td></td><td></td><td>controlling the logic state of the port.
<table><tr><td>terminal logic</td><td>control mode</td></tr><tr><td>effective</td><td>location mode</td></tr><tr><td>invalid</td><td>velocity mode</td></tr></table>5: Position and torque control mode. To switch using one of the external input ports in CN1, set the selected DI portinput port function selection to 5 (control mode switching). The control mode can be switched by controlling the logic state of the port.
<table><tr><td>terminal logic</td><td>control mode</td></tr><tr><td>effective</td><td>location mode</td></tr><tr><td>invalid</td><td>torque mode</td></tr></table></td></tr>
<tr><td>P01-02</td><td>Real-time automatic adjustment mode</td><td>Setting range: 0-4
0: Manually adjust the rigidity.
1: Standard mode automatically adjusts rigidity. In this mode, parameters P02-00, P02-01, P02-10, P02-11, P02-13, P02-14 and P08-20 will be automatically set according to the rigidity level set in P01-03, and manual adjustment of these parameters will not work. The following parameters are set by the user:
P02-03 (speed feedforward gain), P02-04 (speed feedforward smoothing constant).
2: Positioning mode automatically adjusts rigidity. In this mode, parameters P02-00, P02-01, P02 - 10, P02-11, P02-13, P02-14 and P08-20 will be automatically set according to the rigidity level set in P01-03, and manual adjustment of these parameters will not work. The following parameters will be fixed and cannot be changed:
P02-03 (speed feedforward gain): 30.0%
P02-04 (speed feedforward smoothing constant): 0.50
3: Automatically adjust rigidity 2. In this mode, parameters P02-00, P02-01, P02-10, P02-11, P02-13 will be automatically set according to the rigidity level set in P01-03.
The following parameters are set by the user: P02-03 (speed feedforward</td></tr>
</table>

			gain), P02-14 (speed integral constant 2), P08-20 (torque command filter constant 1), P08-21 (torque command filter constant 2) 4: Automatic adjustment, depending on parameters P01-05, P01-06
P01-03		Real-time automatic adjustment of stiffness settings	Setting range:0-31 Built-in 32 kinds of gain parameters, when P01-02 is set to 1, 2, 3 when the effect. Can be directly called according to the actual situation, the larger the set value, the stronger the rigidity.
P01-04		ratio of moment of inertia	Setting range:0-20000, unit: 1% Set the load inertia ratio of the corresponding motor as follows: P01-04= load inertia/motor moment of inertia For this inertia ratio, use the value after F19.J-L automatic inertia identification, and write the identified value into the parameter
P01-05	0	Mute adjustment selection	Setting range:0-1 0: Turn offmute adjustment 1: Turn onmute adjustment
	2	Quiescent Current Base Gain	Setting range:0-8 The smaller the value, the smaller the current gain at low loads. 0: corresponds to 20%, 8 corresponds to 100%.
P01-06	0	self-adjusting value	Setting range:0-7 it work when P01-02 is set to 4, that higher the value, the more rigid it is.
P01-06	1	Self-adjusting load value	Setting range:0-2, when P01- 0 - 2 is set to 4, it will take effect The larger the value, the more the model loads
P01-10		Vibration detection selection	Setting range:0-2 0: No vibration detection (E.520 alarm off) 1: Warning after vibration detection (close A. 911 Warning 2: Alarm after vibration detection
P01-11		Vibration detection sensitivity	Setting range:50-500, unit: % Percentage based on P02-52
P01-12		Vibration detection level	Setting range: 0-5000 Unit: rpm Vibration detection level base

P01-13		Residual vibration detection amplitude	Setting range: 1-3000 Unit: 0.1% Based on the positioning completion threshold
P01-20	0	Servo OFF and stop method when Gr.1 fault occurs	Setting range: 0-2 **It is necessary to confirm whether the driver has DB hardware circuit** 0: Stop the motor by DB, then hold DB. 1: Stop the motor through DB, then release DB. 2: Do not use DB, stop freely
	1	Stopping method in case of Gr.2 fault	0: Use the settings in P01- 20.nX. 1: Set the torque to decelerate and shut down according to P01-21, and then follow the setting in P01- 20.nX after shutdown. 2: Decelerate and shut down according to P01-22 deceleration time, and then follow the setting in P01- 20.nX
P01-20	2	Stopping method in case of overtravel	0: Use the settings in P01- 20.nX. 1: Set the torque according to P01-21 to decelerate and stop, and lock the servo after stopping. 2: Set the torque according to P01-21 to decelerate and shut down, and enter the free running state after shutdown. 3: Stop the machine according to the deceleration time of P01-22, and lock the servo after the machine is stopped. 4: Decelerate and shut down according to the deceleration time of P01-22, and enter into free running state after shutdown
	3	Stop method when forced stop	0: Use the settings in P01- 20.nX. 1: Set the torque to decelerate the shutdown according to P01-21, and use the setting in P01- 20.nX after shutdown. 2: Decelerate and stop according to P01-22 Deceleration Time, and use the setting in P01- 20.nX after stopping.
P01-21		Stop torque at emergency stop, fault and over travel	Setting range:0-350 Unit: % Set the deceleration stop torque in case of emergency stop, fault and overtravel
P01-22		E-stop, fault,	Setting range:0-60000 Unit: ms

	deceleration shutdown time in case of overtravel	E-stop, fault, deceleration shutdown time in case of overtravel
P01-29	Brake open to command reception delay	Setting range:0-500 Unit: ms Delay time from brake opening to command reception
P01-30	Static state, delay from brake OFF to motor de-energized	Setting range:0-500 Unit: ms Enable On: After the enable command is executed, the driver will receive the position command after P01-30. Enable off: when the motor is in static state, the time from the closing of the contracting brake to the non-energized state of the motor after the enable off instruction is executed.
P01-31	Rotation Status, Brake OFF Speed Threshold	Setting range:0-6000, unit: rpm The motor speed threshold when the output of the contracting brake is valid when the motor is in the rotating state. Below this threshold, the output command of the band brake is valid; otherwise, the output command of the band brake is valid after waiting for P01-32 time.
P01-32	Rotation state, servo OFF to brake OFF delay	Setting range:0-1000, unit: ms The maximum waiting time for the output of the contracting brake when the motor is in the rotating state at the closing enabling time.
P01-35	Z signal width setting	Setting range:0-1000, unit: 0.1ms Default width when set to 0 When there is a value, the Z signal width is in the set time unit

8.2.3 P02-xx Gain Class Parameters

Param Code	Name	Note:
P02-00	Position Control Gain 1	Setting range:0-20000, unit: 0.1/S ‣ The larger the parameter value of the proportional gain of the position loop regulator, the higher the gain proportion, the greater the stiffness, the smaller the position tracking error and the faster the response. But too

		large parameters are easy to cause vibration and overshoot. ‣ This parameter is for steady state response.
P02-01	Position Control Gain 2	Setting range:0-20000, unit: 0.1/S ‣ The larger the parameter value of the proportional gain of the position loop regulator, the higher the gain proportion, the greater the stiffness, the smaller the position tracking error and the faster the response. But too large parameters are easy to cause vibration and overshoot. ‣ This parameter is for dynamic response.
P02-03	velocity feedforward gain	Setting range:0-100, unit: 1% The larger the parameter value of the feedforward gain of the speed loop, the smaller the position tracking error of the system and the faster the response. However, if the feedforward gain is too large, the position loop of the system will be unstable, and it is easy to produce overshoot and oscillation.
P02-04	velocity feedforward smoothing constant	Setting range:0-64.00, unit: 0.01ms This parameter is used to set the speed loop feedforward filter time constant. The larger the value, the greater the filtering effect, but at the same time the phase lag increases.
P02-10	Speed Proportional Gain 1	Setting range: 10-20000, unit: 0.1Hz ‣ Increasing the speed proportional gain value can improve the speed response, but too large is easy to produce vibration and noise. ‣ Increase the value of this parameter as much as possible under the condition that the system does not produce oscillation. ‣ This parameter is for static responses.
P02-11	Velocity integral constant 1	Setting range: 15-51200, unit: 0.01ms ‣ The integral time constant of speed regulator, the smaller the set value, the faster the integral speed and the greater the stiffness, too small is easy to produce vibration and noise. ‣ In the case of no oscillation of the system, reduce the value of this parameter as much as possible. ‣ This parameter is for steady state response.

P02-13	Speed Proportional Gain 2	Setting range: 10-20000, unit: 0.1Hz ‣ Increasing the speed proportional gain value can improve the speed response, but too large is easy to produce vibration and noise. ‣ Increase the value of this parameter as much as possible under the condition that the system does not produce oscillation. ‣ This parameter is for dynamic response.
P02-14	Velocity integral constant 2	Setting range: 15-51200, unit: 0.01ms ‣ The integral time constant of speed regulator, the smaller the set value, the faster the integral speed and the greater the stiffness, too small is easy to produce vibration and noise. ‣ In the case of no oscillation of the system, reduce the value of this parameter as much as possible. ‣ This parameter is for dynamic response.
P02-19	torque feedforward gain	Setting range: 0-200, unit: 1% Set the current loop feedforward weighting value. This parameter adds the differential of the speed command to the current loop after weighting.
P02-20	torque feedforward smoothing constant	Setting range:0-6400, unit: 0.01ms This parameter is used to set the torque feedforward filter time constant.
P02-21	friction compensation gain	Setting range:10-1000, unit: 0.1% Parameters for responsiveness to external disturbances are set. The higher the setting value, the better the response to external disturbance. If the effect is not sufficient, increase the setting value of friction compensation gain by 10% within the range where no vibration occurs. However, if the device has a resonant frequency, the setting value is too high, which may cause vibration.
P02-22	the second friction compensation gain	Setting range:10-1000, unit: 0.1% Parameters for responsiveness to external disturbances are set. The higher the setting value, the better the response to external disturbance. If the effect is not sufficient, increase the setting value of friction compensation gain by 10% within the range where no vibration occurs. However, if the device has a resonant frequency, the

			setting value is too high, which may cause vibration.
P02-23		friction compensation coefficient	Setting range:0-100, unit: 1% Sets the parameters for the friction compensation effect. The higher the setting value, the better the effect, but the setting value is too high, and the response is more prone to vibration. Normally, set the setting value below95%
P02-24		Friction compensation frequency compensation	Setting range:0-10000, unit: 0.1Hz This parameter is used for friction compensation frequency compensation
P02-25		Friction compensation gain compensation	Setting range:1-1000, unit: % This parameter is used for friction compensation gain compensation
P02-30	0	Gain switching setting	0: No gain switching. 1: Automatically switch gain according to conditions
P02-30	1	Gain switching setting	Setting range:0-9 Set the conditions for switching the first gain (P02-00, P02 - 10, P02-11, P08-20) and the second gain (P02-01, P02-13, P02-14, P08-21 0: Positioning completion output signal ON 1: Positioning completion output signal OFF 2: Positioning approach output signal ON 3: Positioning approach output signal OFF 4: Position command filter output =0 and command pulse input OFF

<table>
<tr><td></td><td></td><td></td><td>5: Position command pulse input ON
6: Gain switching IO input active
7: Zero speed status is valid
8: Motor rotation state
9: Speed consistent state</td></tr>
<tr><td>P02-31</td><td></td><td>Gain switching time 1</td><td>Setting range:0-60000 Unit: 1ms
the second group gain switch time is set by switching that first group gain</td></tr>
<tr><td>P02-32</td><td></td><td>Gain switching time 2</td><td>Setting range:0-60000 Unit: 1ms
the switch time of that first group gain is set by the second group gain</td></tr>
<tr><td>P02-33</td><td></td><td>Gain Switching Latency 1</td><td>Setting range: 0- 1000.0, unit: ms
the wait time for that first group of gain switch is set when the switching condition is reach</td></tr>
<tr><td>P02-34</td><td></td><td>Gain Switching Latency 2</td><td>Setting range: 0-1000.0, unit: ms
the second group gain switch wait time is set when that switching condition is reach</td></tr>
<tr><td>P02-40</td><td>0</td><td>Mode switch function selection</td><td>Setting range:0-4
Set the conditions of PI control and P control of speed loop
<table>
<tr><th>Value</th><th>judging condition</th><th>Notes</th></tr>
<tr><td>0</td><td>torque command</td><td>When torque command is less than P02-41 set threshold, it is PI control; if it is greater than P02-41 set threshold, it is P control</td></tr>
<tr><td>1</td><td>speed command</td><td>When the speed command is less than the threshold set by P02-42, it is PI control, and when it is greater than the threshold, it is P control</td></tr>
<tr><td>2</td><td>acceleration</td><td>When the acceleration is less than the threshold set in P02-43, it is PI control, and when it is greater than the threshold, it is P control</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td><table>
<tr><td>3</td><td>position deviation</td><td>When the position deviation is less than the threshold set by P02-45, it is PI control, and when it is greater than the threshold, it is P control</td></tr>
<tr><td>4</td><td>modeless switch</td><td>The speed loop keeps PI control and does not switch any more</td></tr>
</table></td></tr>
<tr><td>P02-41</td><td>Mode switch torque command threshold</td><td>Setting range:0-350, unit: 1%
When P02-40.0=0, when the torque command is less than the set value, drive PI control, and when it is greater than the set value, drive P control.</td></tr>
<tr><td>P02-42</td><td>Mode switch speed command threshold</td><td>Setting range:0-6000, unit: rps
When P02-40.0=1, when the speed command is less than the set value, the driver PI controls, and when it is greater than the set value, the driver P controls.</td></tr>
<tr><td>P02-43</td><td>Mode switch acceleration threshold</td><td>Setting range:0-30000, unit: 1rps/s
When P02-40.0=2, when the acceleration is less than the set value, the driver PI controls, and when it is greater than the set value, the driver P controls.</td></tr>
<tr><td>P02-44</td><td>Mode switch position deviation threshold</td><td>Setting range:0-10000, unit: 1 instruction unit
When P02-40.0=3, when the position deviation is less than the set value, the driver PI controls, and when it is greater than the set value, the driver P controls.</td></tr>
<tr><td>P02-50</td><td>torque command addition value</td><td>Setting range: -100-100, unit: 1%
Valid in position control mode. This value is added to the torque setpoint for vertical axis static torque compensation.</td></tr>
<tr><td>P02-51</td><td>Positive direction torque compensation value</td><td>Setting range: -100-100, unit: 1%
Valid in position control mode. Used to compensate for positive static friction</td></tr>
<tr><td>P02-52</td><td>Negative direction torque compensation value</td><td>Setting range: -100-100, unit: 1%
Valid in position control mode. for compensating the opposite static friction</td></tr>
<tr><td>P02-53</td><td>viscous friction</td><td>Setting range:0-100, unit: 1%</td></tr>
</table>

		compensation value	
P02-57		Low frequency vibration suppression setting	Setting range:0-1 0: P02-58, P02-59 invalid 1: Effective In position mode, it is used to suppress the machine shaking caused by positioning.
P02-58		Low frequency vibration frequency 1	Setting range: 10-2000 Unit: 0.1Hz
P02-59		Low frequency resonance setting 1	Setting range: 1 0-1000 Unit: %
P02-60	0	model following control selection	Setting range:0-1 0: Do not use model tracking 1: Using Model Tracking
	1	vibration suppression selection	Setting range:0-1 0: No vibration suppression 1: Vibration suppression (P02-65,P02-65 active)
P02-61		model following control gain	Setting range: 1 0-20000 Unit: 0.1/s When P02-60.0=1, increasing the model following control gain increases the responsiveness and shortens the positioning time. The responsiveness of the servo system depends on this parameter
P02-62		model following control gain compensation	Setting range: 500-2000 Unit: 0.1% Increasing the gain compensation of the model following control improves the response and shortens the positioning time.
P02-63		Model tracking control bias (forward direction)	Setting range: 1 0-1000 Unit: 0.1% When the response is different between forward and reverse, use the following parameters to fine-tune. If the set value is decreased, the response becomes slow, but overshoot is less likely to occur.
P02-64		Model tracking control bias	Setting range: 1 0-10000 Unit: 0.1% When the response is different between forward and reverse, use the

		(reverse direction)	following parameters to fine-tune. If the set value is decreased, the response becomes slow, but overshoot is less likely to occur.
P02-65		Vibration Suppression 1 Frequency A	Setting range: 1 0-2500 Unit: 0.1Hz Vibration Suppression 1 Frequency A. P02-60-1 works when enabled
P02-66		Vibration Suppression 1 Frequency B	Setting range: 1 0-2500 Unit: 0.1Hz Vibration Suppression 1 Frequency B. P02-60-1 works when enabled
P02-67		Speed feedforward compensation of model following control	Setting range: 1 0-10000 Unit: 0.1% If the overshoot still occurs even if the model tracking control gain, the model tracking control bias (forward direction) and the model tracking control bias (reverse direction) are adjusted, it can be improved by adjusting this parameter. If the set value is decreased, the response becomes slow, but overshoot is less likely to occur.
P02-68		second model following control gain	Setting range: 1 0-20000 Unit: 0.1/s When P02− 60.0=1, increasing the second model following control gain increases the responsiveness and shortens the positioning time. The responsiveness of the servo system depends on this parameter
P02-69		the second model follow control gain compensation	Setting range: 500-2000 Unit: 0.1% Increasing the gain compensation of the model following control improves the response and shortens the positioning time.
P02-70	0	Speed vibration suppression setting	Setting range:0-1 0: Nospeed suppression 1:Speed vibration suppression
P02-71		velocity damping frequency	Setting range: 10-20000 Unit: 0.1Hz Set speed vibration suppression frequency
P02-72		Speed suppression frequency 2	Setting range: 10-20000 Unit: 0.1Hz Set speed vibration suppression frequency 2
P02-73		velocity damping	Setting range: 0 - 1000 Unit: 1%

	gain compensation	
P02-74	velocity damping gain	Setting range: 0 - 300 Unit: 1% The larger the value, the stronger the vibration suppression effect
P02-75	Speed Vibration Suppression Attenuation Gain 2	Setting range: 0 - 300 Unit: 1% The larger the value, the stronger the vibration suppression effect
P02-76	Compensation of time parameter 1 of speed vibration suppression filter	Setting range: 0 - 1000 Unit: 0.01ms
P02-77	Compensation of time parameter 2 of speed vibration suppression filter	Setting range: 0 - 1000 Unit: 0.01ms
P02-88	Current control gain value	Setting range:0-100, unit: 1% This parameter is the current gain adjustment factor

8.2.4 P03-xx Position Parameters

Param Code		Name	Note:
P03-00		Location Command Source	0: pulse command 1: Reserved 2: Bus command 3: Built-in multi-segment position
P03-01	0	command pulse shape	0: Quadrature pulse command (90° phase difference two-phase pulse) 1: direction + pulse command 2 or 3: Double pulse command (CW+CCW)
P03-02	0	Overtravel signal clears residual position	0: Overtravel signal does not clear residual position deviation 1: Overtravel signal clears residual position deviation

		deviation	
P03-03	0	instruction pulse negation	Used to adjust the pulse instruction counting direction 0: Normal. 1: Direction reversed
	1	instruction pulse active level negation	0: rising edge count 1: falling edge count
P03-04		instruction pulse filter	Setting range:0-2000 Unit: 0.1us Instruction pulse filter width setting, filter width = set value *0.1(us)
P03-05		Positioning completion output condition	0: Position deviation is less than P03-06 set value 1: The position deviation is less than the set value of P03-06, and the filtered position command is 0. 2: Position deviation is less than P03-06 set value, and the command after position command is 0
P03-06		Positioning completion range	Setting range: 0-65535 units: instruction unit It is used to set the threshold value of the output signal of positioning completion, and the set value is the command unit (refer to parameters P03-09, P03-40 and P03-42). The positioning completion range is used as the judgment basis of position gain setting in the one-key self-setting function.
P03-07		Positioning proximity threshold	Setting range: 0-65535 units: instruction unit It is used to set the threshold value of positioning approach output signal, and the set value is the command unit (refer to parameters P03-09, P03-40 and P03-42).
P03-09		Number of command pulses for one rotation of motor	Setting range: 0-1073741823 Used to set the number of command pulses for one rotation of the motor. When this parameter is set to 0, P03-40 and P03-42 parameters are valid.
P03-15		Excessive position deviation setting	Setting range: 0-1073741823 Unit: Command Unit Set the pulse number of allowable deviation, and alarm E.501 when exceeding the set value; Not detected when set to 0
P03-17		position command	Setting range: 0-10000 Unit: 0.1ms

		moving average time	Set the time constant of the position command smoothing filter, moving average filter.
P03-18		Position command first-order low-pass filter time parameter	Setting range: 0-65535 Unit: 0.1ms Sets the time constant of the position command smoothing filter, a first-order low-pass filter.
P03-23		Denominator of the number of divided output pulses	Setting range:0-1073741823 When P03-23 is equal to 0, the frequency division pulse number =P03-25*4 ; When P03-23 is not equal to 0, the number of divided pulses =2^23*P03-25/P03-23.
P03-25		Frequency division output pulse number	Setting range: 0-65535 Set the absolute value of the motor rotation, A, B frequency pulse output quantity. For example, if the setting value is 2500, the A and B signals output 2500 pulses each time the motor rotates one turn
P03-26	0	Frequency division output pulse phase sequence inversion	is use for adjusting that phase sequence of the frequency division output pulse 0: Normal. 1: Direction reversed
P03-30		Excessive position deviation warning value	Setting range:0-100 Unit: % Excessive position deviation warning value =P03-30 set value *P03-15, warning occurs when the set value is exceeded A.900
P03-31		Excessive servo ON position deviation alarm value	Unit: Command UnitSetting Range: 0-1073741823 Set the pulse number of allowable deviation when servo is ON, if it exceeds the set value, it will alarm E.503, and it will not be detected when it is set to 0
P03-33		Servo ON position deviation excessive warning value	Setting range:0-100 Unit: % Excessive servo ON position deviation warning value = set value *P03-31, warning A.901 occurs when the set value is exceeded
P03-34		overshoot detection value	Setting range:0-100 Unit: % Overshoot detection threshold = P03-34* P03-06.

		The overshoot detection value will be used as the judgment basis of position gain setting in one-button self-setting function.
P03-40	Molecule of electronic gear 1	See**6.1.4 Example of Electronic Gear Ratio Calculation Method for**explanation Note: Encoder numerator is 8388608
P03-42	Denominator of electronic gear 1	
P03-44	Molecule of electronic gear 2	See**6.1.4 Example of Electronic Gear Ratio Calculation Method for**explanation Note: Encoder numerator is 8388608
P03-46	Denominator of electronic gear 2	

8.2.5 P04-xx Speed Parameter

Param Code	Name	Note:
P04-00	Speed command selection setting	0: analog quantity command 1: Set value of P04-02 2: Bus command 3: Built-in multi-speed
P04-01	JOG Speed Command Setpoint	Setting range:0-6000 , unit: rpm Set JOG running speed
P04-02	Speed command digital setpoint	Setting range:-6000-6000, unit: rpm When P04-00 is set to 1, P04-02 is the speed setting
P04-04	Zero speed clamp speed threshold	Setting range: 0-6000, unit:rpm Sets the speed command threshold that triggers the zero speed position clamp function
P04-05	overspeed threshold	Setting range: 0-6300, unit:rpm Set the allowable maximum speed value, exceeding the set value will cause**E.420** overspeed alarm
P04-06	forward speed limit	Setting range: 0-6300, unit:rpm Limit motor forward speed value

<table>
<tr><td>P04-07</td><td>reverse speed limit</td><td>Setting range: -6300-0, unit:rpm
Limit motor reverse speed value</td></tr>
<tr><td>P04-10</td><td>Zero speed detection value</td><td>Setting range: 0-2000, unit:rpm
the zero speed detection threshold value is set, and when that rotate speed of the motor is lower than the threshold value, thezero speed detection signal can be output through the output port</td></tr>
<tr><td>P04-11</td><td>Motor rotation detection speed value</td><td>Setting range: 0-2000, unit:rpm
Set the motor rotation detection threshold, the motor speed is higher than the value can be displayed through the LED panel status</td></tr>
<tr><td>P04-12</td><td>Speed reaches signal threshold</td><td>Setting range: 0-2000, unit:rpm
Set the threshold value of the speed consistent signal, and when the difference between the motor speed and the command speed is within the threshold value, output the "speed arrival detection" signal through the output port</td></tr>
<tr><td>P04-14</td><td>speed command acceleration time</td><td>Setting range: 0-10000, unit:1ms/1000rpm
Set acceleration at speed control</td></tr>
<tr><td>P04-15</td><td>Speed command deceleration time</td><td>Setting range: 0-10000, unit:1ms/1000rpm
Set deceleration at speed control</td></tr>
<tr><td>P04-30

P04-37</td><td>Internal speed setting 1-8</td><td>Setting range: -6000-6000, unit:rpm
Parameters P04-30 to P04-37 set the speed of internal speed 1 to internal speed 8, respectively
The internal speed switching method is as follows:
P04-00 is set to 3 when the speed loop is controlled.
The corresponding input port functions are defined as 0D, 0E, 0F
Example: Use input signal ports DI3, DI4 and DI5, and define I/O port functions as 0D, 0E and 0F respectively (see P06- 11 parameter description for function definition), and realize speed switching operation set by corresponding parameters through I/O level combination.
<table>
<tr><td>DI3</td><td>DI4</td><td>DI5</td><td>action parameter</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>P04-30</td></tr>
</table>
</td></tr>
</table>

		1	0	0	P04-31	
		0	1	0	P04-32	
		1	1	0	P04-33	
		0	0	1	P04-34	
		1	0	1	P04-35	
		0	1	1	P04-36	
		1	1	1	P04-37	

8.2.6 P05-xx Torque Parameters

Param Code	Name	Note:
P05-00	Torque command selection setting	0: analog quantity command 1: Set value of P05-03 2: Bus command 3: Built-in multi-stage torque
P05-01	Torque Control Speed Limit Source Settings	0: Speed analog quantity command 1: Set value of P05-02 2: Bus command 3: Built-in multi-speed
P05-02	Torque control speed limit	Setting range: 0-6000 Unit:rpm Set the maximum motor speed in torque mode to prevent mechanical damage due to excessive motor speed in no-load mode Torque control mode active
P05-03	Torque command digital setpoint	Setting range:-300-300, unit: % When P05-00 is set to 1, P05-03 is the digital torque setpoint
P05-05	Torque Limiting Source Settings	0: Internal/external torque setting P05-10,5-11 or P05-12,05-13 1: Torque analog command amplitude limiting, and P05- 10, 05 -11 or P05- 12, 05 -13 are superimposed at the same time 2: Torque analog command amplitude limiting, which takes effect only when PCL and NCL are valid. Superpose P05-10,05-11 or P05-12,05-13 simultaneously

<table>
<tr><td>P05-06</td><td>Torque limit detection signal output delay</td><td>Setting range: 0-10000, unit: ms
Set signal delay time in DO port outputtorque limit</td></tr>
<tr><td>P05-10</td><td>Forward internal torque limit</td><td>Setting range: 0-350 units: 1% rated torque
Limit motor forward output, 100 means 1 times torque, 300 means 3 times torque
When the torque output reaches the limit value,the torque limit signal can be output through the DO port</td></tr>
<tr><td>P05-11</td><td>Reverse internal torque limit</td><td>Setting range: -350-0 units: 1% rated torque
Limit the reverse output of the motor. Set 100 to represent 1 times torque and 300 to represent 3 times torque.
When the torque output reaches the limit value,the torque limit signal can be output through the DO port</td></tr>
<tr><td>P05-12</td><td>Forward external torque limit</td><td>Setting range: 0-350 units: 1% rated torque
This function is switched using one of the external input ports in CN1, setting the selected DI portinput port function selection to 7 (positive external torque limit value). The control mode can be switched by controlling the logic state of the port.
<table>
<tr><td>terminal logic</td><td>torque limiting value</td></tr>
<tr><td>effective</td><td>External clipping value P05-12</td></tr>
<tr><td>invalid</td><td>Internal clipping value P05-10</td></tr>
</table>
If the DI function is not assigned, the system defaults to P05-10 for torque clipping
When the torque output reaches the limit value,the torque limit signal can be output through the DO port</td></tr>
<tr><td>P05-13</td><td>Reverse external torque limit</td><td>Setting range: 0-350 units: 1% rated torque
This function is switched using one of the external input ports in CN1, setting the selected DI portinput port function selection to 8 (reverse external torque limit value). The control mode can be switched by controlling the logic state of the port.</td></tr>
</table>

<table>
<tr><td></td><td></td><td>
<table>
<tr><td>terminal logic</td><td>torque limiting value</td></tr>
<tr><td>effective</td><td>External clipping value P05-13</td></tr>
<tr><td>invalid</td><td>Internal clipping value P05-11</td></tr>
</table>
If the DI function is not assigned, the system defaults to P05-11 for torque clipping
When the torque output reaches the limit value,the torque limit signal can be output through the DO port</td></tr>
<tr><td>P05-14
~
P05-17</td><td>Internal setting torque 1 to 4</td><td>Setting range: -300-300, unit:% rated torque
Parameters P05-14 to P05-17 set internal torque 1 to internal torque 4, respectively
The internal speed switching method is as follows:
P05-00 is set to 3 when the torque loop is controlled.
The corresponding input port functions are defined as11, 12
Example: Use input signal ports DI3, DI4. I/O port functions are defined as 11 and 12 respectively (see P06- 11 parameter description for function definition), and torque switching operation corresponding to parameter setting is realized through I/O level combination.
<table>
<tr><th>DI3</th><th>DI4</th><th>action parameter</th></tr>
<tr><td>0</td><td>0</td><td>P05-14</td></tr>
<tr><td>1</td><td>0</td><td>P05-15</td></tr>
<tr><td>0</td><td>1</td><td>P04-16</td></tr>
<tr><td>1</td><td>1</td><td>P04-17</td></tr>
</table></td></tr>
</table>

8.2.7 P06-xx I/O Parameters

parameter code	Name	Note:
P06-00	Power-up active DI	Setting range: 00-ffff Factory setting: 0

<table>
<tr><td></td><td>function assignment 1</td><td>Table 1 Corresponding relationship between setting value and corresponding power-on forced effective input function
<table>
<tr><td>set value</td><td>Power-on active function</td></tr>
<tr><td>n.xxx1</td><td>0x01: Servo Enable</td></tr>
<tr><td>n.xxx2</td><td>0x02: Alarm cleared</td></tr>
<tr><td>n.xxx4</td><td>0x03: Forward Overtravel</td></tr>
<tr><td>n.xxx8</td><td>0x04: Reverse Overtravel</td></tr>
<tr><td>n.xx1x</td><td>0x05: Control mode switching</td></tr>
<tr><td>n.xx2x</td><td>Undefined</td></tr>
<tr><td>n.xx4x</td><td>0x07: Positive external torque limit value switching</td></tr>
<tr><td>n.xx8x</td><td>0x08: Reverse external torque limit value switching</td></tr>
<tr><td>n.x1xx</td><td>0x09: Gain switching</td></tr>
<tr><td>n.x2xx</td><td>0x0A: Zero lock</td></tr>
<tr><td>n.x4xx</td><td>0x0B: Pulse command input disabled</td></tr>
<tr><td>n.x8xx</td><td>Undefined</td></tr>
<tr><td>n.1xxx</td><td>0x0D: Speed Multi-Segment Selection 1</td></tr>
<tr><td>n.2xxx</td><td>0x0E: Speed multi-segment selection 2</td></tr>
<tr><td>n.4xxx</td><td>0x0F: Speed multi-segment selection 3</td></tr>
<tr><td>n.8xxx</td><td>0X10: Position residual instruction clear</td></tr>
</table></td></tr>
<tr><td>P06-01</td><td>Power-up active DI function assignment 2</td><td>Setting range: 00-ffff Factory setting: 0
Table 2 Corresponding relationship between set value and corresponding power-on forced effective input function
<table>
<tr><td>set value</td><td>Power-on active function</td></tr>
<tr><td>n.xxx1</td><td>0X11: Torque multi-stage selection 1</td></tr>
<tr><td>n.xxx2</td><td>0X12: Torque multi-stage selection 2</td></tr>
<tr><td>n.xxx4</td><td>0x13: Gantry synchronization enable</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>n.xxx8</td><td>0x14: Gantry alignment reset signal</td></tr>
<tr><td>n.xx1x</td><td>0x15: Home switch signal</td></tr>
<tr><td>n.xx2x</td><td>0x16: Return to home start signal</td></tr>
<tr><td>n.xx4x</td><td>0X17: Speed simulation command negated</td></tr>
<tr><td>n.xx8x</td><td>0X18: Torque simulation command negated</td></tr>
<tr><td>n.x1xx</td><td>0X19: External alarm signal</td></tr>
<tr><td>n.x2xx</td><td>0X1A: Emergency stop input signal</td></tr>
<tr><td>n.x4xx</td><td>0X1B: Probe 1 input signal</td></tr>
<tr><td>n.x8xx</td><td>0X1C: Probe 2 input signal</td></tr>
<tr><td>n.1xxx</td><td>0X1D: Pole detection request signal</td></tr>
<tr><td>n.2xxx</td><td>0X1E: Position command negated signal</td></tr>
</table>
</td></tr>
<tr><td rowspan="2">P06-05</td><td>0</td><td>Speed analog command selection</td><td>0: Use Ain_1 (Speed Analog Command Interface)
1: Use Ain_2 (torque simulation command interface)</td></tr>
<tr><td>1</td><td>Torque simulation command selection</td><td>0: Use Ain_2 (torque simulation command interface)
1: Use Ain_1 (Speed Analog Command Interface)</td></tr>
<tr><td>P06-11</td><td>01</td><td></td><td>Setting range: 00-1E Factory setting: 1 Servo ON
0x00: none 0x01: servo enable 0x02: alarm clear 0x03: forward overtravel 0x04: reverse overtravel 0x05: control mode switch
0x06: P control command input
0x07: Forward external torque limit value switch
0x08: Reverse external torque limit value switch
0x09: Gain switch
0x0A: Zero lock
0x0B: Pulse command input disable
0x0D: Speed multi-segment selection 1
0x0E: Speed multi-segment selection 2</td></tr>
</table>

P06-11	01	DI1 Terminal Setup-Function Selection	0x0F: Speed multi-segment selection 3 0X10: Position residual command clear 0X11: Torque multi-segment selection 1 0X12: Torque multi-segment selection 2 0x13: Gantry synchronization enable 0x14: Gantry alignment reset signal 0x15: Home switch signal 0x16: home point return start signal 0X17: speed simulation instruction negated 0X18: torque simulation instruction negated 0X19: external alarm signal 0x1A: emergency stop input signal 0X1B: probe 1 input signal 0X1C: probe 2 input signal 0X1D: magnetic pole detection request signal 0X1E: position instruction negated signal note: low-speed terminal, the effective level can be confirmed only if it exceeds 3.2ms
P06-11	2	DI1 Terminal Setup-Logic Select	0: active low (optocoupler off) 1: Active high (optocoupler on) 2: falling edge valid 3: rising edge is valid 4: rising and falling edges are valid
P06-12 P06-12	01	DI2 Terminal Setup-Function Selection	See P06-11.01
	2	DI2 terminal setting-logic selection	See P06-11.2
P06-13	01	DI3 Terminal Setup-Function Selection	See P06-11.01

	2	DI3 Terminal Setup-Logic Select	See P06-11.2
P06-14	01	DI4 Terminal Setup-Function Selection	See P06-11.01
	2	DI4 Terminal Setup-Logic Select	See P06-11.2
P06-15	01	DI5 Terminal Setup-Function Selection	See P06-11.01
	2	DI5 Terminal Setup-Logic Select	See P06-11.2
P06-21	01	DO1 Terminal Setup-Function Selection	Setting range: 0-13, factory setting: 3 Servo ready for output 0x00: None 0x01: Servo alarm 0x02: Band brake output 0x03: Servo ready 0x04: Position arrived 0x05: Proximity 0x06: Speed arrival detected 0x07: Zero speed detection 0x08: Moment Limit 0x09: Speed Limit 0x0A: Servo warning 0x0B: Reserved 0x0C: electrical zero return complete 0x0D: Return to zero complete 0x0E: In forward overtravel 0x0F: In reverse overtravel 0x10: Enable state 0x11: Dynamic Braking 0x12: Motor rotation detected 0x13: Gain 1 active 0x14: Z signal output
	2	DO1 terminal setting-logic selection	0: DO is off when status is valid 1: DO is turned on when the status is valid
P06-22	01	DO2 Terminal	See P06-21.01

		Settings-Function Selection	
	2	DO2 terminal setting-logic selection	See P06-21.2
P06-23	01	DO3 Terminal Setup-Function Selection	See P06-21.01
	2	DO3 terminal setting-logic selection	See P06-21.2
P06-24	01	DO4 Terminal Settings-Function Selection	See P06-21.01
	2	DO4 terminal setting-logic selection	See P06-21.2
P06-40		Speed value corresponding to speed analog quantity 1V	Setting range: 10-2000, unit:1rpm/V Sets the coefficient between the analog command and the speed control command input by CN1 Example: 500 represents 500 revolutions per minute per V
P06-41		AI1 filter time constant	Setting range:0-2500, unit: 0.01ms Sets the analog command filter time factor for the AI1 input
P06-42		AI1 Bias	Setting range: -9999-9999, unitV Sets the analog command zero offset for the AI1 input
P06-43		Torque value corresponding to torque analog quantity 1V	Setting range: 0-100, unit:1% Sets the coefficient between the analog command and the speed control command input by AI1 For example: 30 represents 30% of rated torque per V
P06-46		AI1 analog deadband	Setting range: 0-9999 unit:mv Set the dead zone voltage value of speed analog command. When the analog quantity is set within the positive and negative value range, the system defaults to zero

8.2.8 P08-xx Advanced Function Parameters

parameter code		Name	Note:
P08-00	0	Off-line inertia identification mode	Setting range:0-1 0: Default mode (set according to P08-03, P08-04 parameters) 1: Internal setting mode (P08-03, P08-04 automatic setting)
	1	On-line inertia identification mode	Setting range:0-1
P08-01		inertia identification inertia initial value	Setting range:0-20000, unit: 1% initial value of inertia identificationby set inertia
P08-02		Inertia identification of motor rotation turns	Setting range:5-1000, unit: 0.1 turn Setinertia to identify the value of motor rotation circle
P08-03		inertia identification maximum speed	Setting range: 10-2000, unit: rpm Set inertia to identify maximum running speed
P08-04		inertia identification acceleration time	Setting range: 20-800, unit: ms Set the acceleration and deceleration time of the motor during inertia identification
P08-05		Waiting time after single inertia identification	Setting range: 50-10000, unit: ms Waiting time after single inertia identification

P08-06		Program JOG mode	Setting range: 0-5 0:(waiting time P08-11-> forward movement P08-07)* number of movements P08-12 1:(waiting time P08-11-> reverse movement P08-07)* number of movements P08-12 2:(waiting time P08-11-> forward movement P08-07)* number of movements P08-12->(waiting time P08-11-> reverse movement P08-07)* number of movements P08-12 3:(waiting time P08-11-> reverse rotation movement P08-07)* number of movements P08-12->(waiting time P08-11-> forward rotation movement P08-07)* number of movements P08-12 4:(waiting time P08-11-> forward movement P08-07-> waiting time P08-11-> reverse movement P08-07)* number of movements P08-12 5:(waiting time P08-11-> reverse movement P08-07-> waiting time P08-11-> forward movement P08-07)* number of movements P08-12
P08-07		Program JOG Move Distance	Setting range: 1-2000, unit: 0.1 turn Number of turns per step when setting program JOG
P08-09		Program JOG moving speed	Setting range: 1-10000, unit: rpm Set the maximum speed of movement when program JOG is running
P08-10		PROGRAMME JOG ACCELERATION DECELERATION TIME	Setting range: 2-10000, unit: ms Set the acceleration and deceleration time during program JOG operation
P08-11		Program JOG Wait Time	Setting range: 0-10000, unit: ms Set program JOG run wait time
P08-12		Number of program JOG moves	Setting range: 0-10000, unit: Time Set the number of program JOG moves
P08-15	0	Auto Adjust Settings 0	Setting range:0-1 0: Self-timing, inertia identification

			1: Self-timing, no inertia identification
P08-15	1	Auto Adjust Settings 1	Setting range:0-3 0, 1: Standard mode, model tracking is turned off 2: Positioning mode: turn on end vibration suppression, turn on model tracking, model tracking speed compensation 100% 3: Positioning mode, pay attention to overshoot: Turn on end vibration suppression, turn on model tracking, model tracking speed compensation 90%
P08-16		Automatic adjustment of maximum gain	Setting range: 100-7000, unit: 0.1Hz During auto-tuning, search for the maximum value of the gain.
P08-17		velocity observer gain	Setting range: 10-500, unit: Hz The higher the setting, the greater the bandwidth of the speed observer, and at 500, the observer is disabled
P08-18		velocity observer coefficient	Setting range: 0-500, unit: % The larger the set value, the greater the torque effect of the speed observer
P08-20		Torque Command Filter Constant 1	Setting range:0-2500, unit: 0.01ms Torque command filtering time constant 1, when the motor is running in the case of howling, the value can be set appropriately large.
P08-21		Torque command filter constant 2	Setting range:0-2500, unit: 0.01ms Torque command filtering time constant 2, when the motor is running in the case of howling, the value can be appropriately set to large.
P08-22		2nd Segment 2nd Torque Command Filter Frequency	Setting range: 100-5000, unit: Hz Second Order Torque Command Filter Frequency
P08-23		Second stage second torque command	Setting range:50-100, unit: 0.01 Q value of second-order torque command filter

		filter Q value	
P08-24	0	First trap selection	Setting range:0-1 0: the first trap is not active, 1: first trap active
	1	Second trap selection	Setting range:0-1 0: 2nd trap invalid 1: second trap active
	3	Friction compensation function selection	Setting range:0-1 0: Invalid 1: Effective
P08-25	0	Adaptive Notch 1 Mode Settings	Setting range:0-1 0: Invalid 1: Allow the drive to automatically set the first trap
	1	Adaptive Notch 2 Mode Settings	Setting range:0-1 0: Invalid 1: Allows the drive to automatically set the second trap
P08-30		Notch Filter 1 Frequency	Setting range: 300-5000, unit: Hz Center frequency of trap 1. **P 08 -24.0 needs to be set to enable to be effective** When set to 5000, the trap is not valid
P08-31		Notch Filter 1 Width	Setting range: 50-1000 Unit: 0.01 Notch width class for Notch 1 is the ratio of the width to the center frequency
P08-32		Notch Filter 1 Depth	Setting range:0-99 Notch depth level for Notch 1 The ratio between the input and the output is given for the center frequency of the trap The larger this parameter, the smaller the notch depth and the weaker the effect
P08-33		Notch Filter 2 Frequency	Same as P08-30. **P08-24.1 needs to be set to enable to be effective**

P08-34	Notch Filter 2 Width	Same as P08-31
P08-35	Notch Filter 2 Depth	Same as P08-32
P08-36	Notch Filter 3 Frequency	Same as P08-30
P08-37	Notch filter 3 width	Same as P08-31
P08-38	Notch Filter 3 Depth	Same as P08-32
P08- 51	sweep torque amplitude	Setting range: 1- 300 This setting is used as the maximum value of the sweep torque when the auxiliary function F 22 is executed.

8.3 List of Monitoring Items

Display sequence number	Display Item	Note:	Unit of Measure
d00.C.PU	position command pulse sum	This parameter can monitor the number of pulses sent by the user to the servo driver, so as to confirm whether there is pulse loss	instruction unit
d01.F.PU	Position feedback pulse summation	This parameter monitors the number of pulses fed back by the servo motor. The unit is consistent with the unit of the user input command	instruction unit
d02.E.PU	Position deviation pulse number	This parameter monitors the number of pulses of position lag during servo operation. The unit is consistent with the unit of the user input command	instruction unit
d03.C.PE	Position given pulse sum/ Feedback pulse of gantry motor	This parameter monitors the number of pulses the user sends to the servo drive. Unit: When using absolute value motor, each turn is calculated as8388608.	encoder unit
d04.F.PE	Position feedback pulse sum/	This parameter monitors the number of pulses fed back by the servo motor. Unit: When using absolute value motor, each turn is calculated as8388608.	encoder unit

d05.E.PE	Number of position deviation pulses/ gantry pulse deviation	This parameter monitors the number of pulses of position lag during servo operation. Unit:8388608per turn when using absolute motors .	encoder unit
d06.C.Fr	Pulse command input frequency	This parameter monitors the external pulse command input frequency	0.1KHz
d07.C.SP	speed command	This parameter can monitor the given speed of the servo when the servo motor is running	rpm
d08.F.SP	actual speed	This parameter can monitor the actual speed of the servo motor when it is running	rpm
d09. C.tQ	torque command	This parameter can monitor the servo set torque when the servo motor is running	%
d10. F.tQ	actual torque	This parameter can monitor the torque feedback when the servo motor is running	%
d11.AG.L	average torque	This parameter monitors the average torque of the servo motor over the past 10 seconds	%
d12.PE.L	peak torque	This parameter monitors the peak torque of the servo motor after power-up	%
d13.oL	cumulative load factor	This parameter can monitor the load rate of the drive. When the load rate exceeds 100, the drive will alarm overload.	%
d14.rG	regenerative load factor	This parameter can monitor the load rate of regenerative resistor. When it exceeds 100, the driver will alarm regenerative overload.	%
d15.PE.S	actual speed peak	This parameter can monitor the peak speed of the servo motor after power-on	rpm
d16.I.Io	Input IO Status	This parameter monitors the input port status of CN1. The upper vertical bar represents high level (optocoupler off), and the lower vertical bar represents low level optocoupler on. The corresponding relationship with the input port is that the vertical bars of the operation panel from right to left correspond to DI1-DI5 respectively	binary system
d17.o.Io	Output IO Status	This parameter monitors the output port status of CN1. The upper vertical bar represents that the optocoupler is on, the lower vertical bar represents that the optocoupler is off, and the corresponding	binary system

		relationship with the output port is that the four vertical bars from right to left of the operation panel respectively correspond to DO1-DO4	
d18.AnG	Motor mechanical angle	This parameter can monitor the mechanical angle of the motor. One rotation is 360 degrees	0.1 degree
d19.HAL	electrical angle	Phase sequence position of incremental encoder motor Electrical angle of absolute encoder	0.1 degree
d20.ASS	Absolute encoder single turn value	This parameter can monitor the feedback value of the absolute encoder, and the value changes from 0 to8388607after one rotation	decimal system
d21.ASH	Absolute encoder multiturn value	This parameter monitors the number of revolutions of the multi-turn absolute encoder motor	decimal system
d22.J-L	inertia ratio	This parameter can monitor the real-time inertia of the load carried by the motor	%
d23.dcp	Main circuit voltage (DC value)	This parameter can monitor the DC voltage value of the main circuit	V
d24.Ath	Drive Temperature	This parameter monitors the drive temperature	degree centigrade
d25.tiE	cumulative running time	This parameter monitors the drive run time in: second	second
d26.1.Fr	Resonance frequency 1	This parameter monitors the resonance frequency 1, the high frequency resonance frequency	Hz
d28.2.Fr	Resonance frequency 2	This parameter monitors the resonant frequency 2, the low frequency resonant frequency	Hz
d29.cn	Current Control Mode	This parameter can monitor the current control mode. Refer to parameter P01-01 for specific corresponding relationship	
d30.Ai1	Input voltage of Ai1 port	This parameter monitors the Ai1 input voltage value	0. 001V
d31.Ai2	Input voltage of Ai2 port	This parameter monitors the Ai2 input voltage value (not available for P28 series)	0.001V
d32.c.Er	Number of abnormal communication of encoder	This parameter can monitor the number of abnormal communication of encoder after power-on	

d33.H	Hardware model (hardware information)	This parameter monitors the drive model (hardware power information)	
d34.H1	Hardware Version	This parameter monitors the hardware version number	
d35.S1	Software Version	This parameter monitors the software version First 2 digits: FPGA version; Last 2 digits: ARM version	
d36.C.PU	position command pulse sum	This parameter monitors the sum of the position command pulses (accumulated after power-up)	instruction unit
d37.F.PU	Position feedback pulse summation	This parameter monitors the sum of the position feedback pulses (accumulated after power-up)	instruction unit
d3 8. P. Er	Parameter number of value exception	This parameter can querythe abnormal parameter number when alarm 1 07	
d39.A du	Advanced Functional Exception Code	This parameter can query the warning code when performing advanced functional exceptions	

8.4 auxiliary function

Display Item	Functions	Operation
F01.JoG	JOG Commissioning	1. Press the**M key**on the operation panel to switch to the auxiliary mode**F****, operate the**Up/Down key** to**F01.JoG**, and press the**ENT key** to enter the Jog working mode. The default Jog speed is 30rpm (**P04-01 sets the JOG running speed**). 2. Press the **Up key**, and the motor will rotate forward at the speed of 30r/min; When the **Down key** is pressed, the motor reverses at a speed of 30r/min. 4. Press the**M key to** exit Jog mode.
F02.run	Force Enable Run Speed Mode	1. Press the**M key**of the operation panel to switch to the auxiliary mode**F****, operate the**Up/Down key** to**F02.run**, and press the**ENT key** to enter the operation mode.

		2. Press the**Up key** to rotate the motor forward. Press**the Up key for a**long timeto increase the motor speed. Press the**Down key** to rotate the motor backward. Press**the Down key for a**longtime to increase the motor speed. 3. Press the**M key to** exit the mode.
F03.Ai1	Analog input 1 automatic zero drift calibration (VCMD)	1. Press the**M key**of the operation panel to switch to the auxiliary mode**F****, operate the**Up/Down key** to**F03.Ai1**, press the**ENT key**,**and of.Ai1**will be displayed. 2. Press and hold the**ENT key**until**finsh** flashes, completing the Ai1 zero drift auto-calibration. 3. Press the**M key to** exit the mode.
F04.Ai2	Analog input 2 automatic zero drift calibration (TCMD)	1. Press the**M key**of the operation panel to switch to the auxiliary mode**F****, operate the**Up/Down key** to**F04.Ai2**, press the**ENT key**,**and of.Ai2**will be displayed. 2. Press and hold the**ENT key**until**finsh** flashes, completing the Ai2 zero drift auto-calibration. 3. Press the**M key to** exit the mode
F05.Ai3	Automatic zero drift compensation of current sensor	Same as**F03.Ai1** **Note:**the servo must be in the off enable state when performing this function, otherwise**the finsh**flashing page will not appear and the automatic calibration cannot be completed
F06.En0	Absolute encoder fault clearing	This auxiliary function must be operated in the non-enabled state as follows 1. Press the**M key**of the operation panel to switch to the auxiliary mode**F****, operate the**Up/Down key** to**F06.En0**, press the**ENT key**, and**clr.Ft**will be displayed. 2. Press and hold the**ENT key**until**finsh** flashes to clear the absolute encoder fault. 3. Press the**M key to** exit the mode.
F07.En1	Multi-turn value clearing of absolute value encoder	This auxiliary function must be operated in the non-enabled state as follows 1. Press the**M key**of the operation panel to switch to the auxiliary mode**F****, operate the**Up/Down key** to**F07.En1**, press the**ENT key**,**clr.EH**will be displayed. 2. Press and hold the**ENT key**until**finsh** flashes, which means the multi-turn value clearing of absolute encoder is completed. 3. Press the**M key to** exit the mode.
F10.ini	Restore factory settings	This auxiliary function must be operated in the non-enabled state as follows 1. Enter the factory reset interface: press the**M key**on the operation panel to switch to the auxiliary mode**F****, operate the**Up/Down key** to**F10.ini**, and

<table>
<tr><td></td><td></td><td>press theENT key to enter
2. Select the parameter range to be restored: input the corresponding code according to the following table, and select the parameter range to be restored. Press and hold theENT keyuntil a progress bar appears untilfinsh flashes, completing the factory reset.<table><tr><td>Code</td><td>implication</td></tr><tr><td>51</td><td>Restore Level 1 Privilege Parameters (Application Parameters)</td></tr><tr><td>52</td><td>Restore level 2 privilege parameters (application parameters + motor parameters)</td></tr><tr><td>55</td><td>Restore all parameters (including hidden parameters)</td></tr></table></td></tr>
<tr><td>F11.Err</td><td>Fault log shows</td><td>1. Press theM keyon the operation panel to switch to the auxiliary modeF**, operate theUp/Down key toF11.Err, and press theENT key to display the past 8 times of historical fault information. The number on the left is F 0, which represents the most recent failure
2. Press the Up keyto display past faults one by one. PressENT key for along timeto display the fault occurrence time. Refer to d25.tiE for time coordinate.
3. Press theM key to exit the mode.
Note:The fault occurred during multiple power-up and power-down within 30 minutes may have a 30-minute deviation in its recording time.</td></tr>
<tr><td>F12.clr</td><td>Alarm record clearing</td><td>1. Press theM keyof the operation panel to switch to the auxiliary modeF**, operate theUp/Down key toF12.clr, press theENT key, the panel displaysclr.Er, and press theENT key to clear the alarm information recorded inF11.Err.
2. Press theM key to exit the mode.</td></tr>
<tr><td>F13.unL</td><td>Operation authority setting</td><td>1. Press theM keyof the operation panel to switch to the auxiliary modeF**, operate theUp/Down key toF13.unL, and press theENT key to edit the operation authority. 0: Parameters cannot be modified;1: Parameters can be modified (except system parameters); 2: All visible parameters can be modified; Set the value of 0,1, and save when power is off. When setting 2, it will not be saved after power failure.
2. Press theM key to exit the mode.</td></tr>
<tr><td>F14. out</td><td>Force output port level</td><td>1. Press the M key of the operation panel to switch to the auxiliary mode F**, and operate the Up/Down key to F14. out, press ENT key to force output port level through Up/Down key. The corresponding relation with the output port is that the four vertical bars of the operation panel from right</td></tr>
</table>

		to left respectively correspond to DO1-DO4 2. Press the**M key to** exit the mode.
F17.rES	software reset	1. Press the**M key**of the operation panel to switch to the auxiliary mode**F****, operate the**Up/Down key** to**F17.rES**, press the**ENT key**, the panel displays rESEt, and press the**ENT key** to perform software reset. 2. Press the**M key to** exit the mode.
F18.PJG	Program JOG	1. Press the M key on the operation panel to switch to the auxiliary mode **F****, operate the **Up/Down key** to **F18.PJG**, and press the **ENT key** to execute the program J OG function. 2. Press the**UP key** or**DOWN key**, and the motor will operate according to the operating conditions set in P08-06~ P08-12. 3. Press the**M key to** exit the mode. **Note: this mode can only be operated underrdy, otherwise the driver will alarm A.905**
F19.J-L	Load inertia ratio measurement	1. Press the**M key**of the operation panel to switch to the auxiliary mode**F****, operate the**Up/Down key** to**F19.J-L**, press the**ENT key to enter the** load inertia measurement function, the panel displays 1.00, and press**the ENT key for a long time,** the panel displays**-1.00** 2. Press the**UP key**, the motor will run back and forth according to the number of turns set by P08-02, the maximum speed set by P08-03, the acceleration and deceleration time set by P08-04 and the waiting time set by P08-05, until the flashing load inertia ratio appears. 3. Press ent to save directly to P01-04, or record the value to exit and write to parameter P01-04 4. Press the**M key to** exit the mode **Note: this mode can only be operated underrdy, otherwise the driver will alarm A.905**
F21.Fft	Identification of resonant frequency (commanded internally in the driver)	1. Press the M key of the operation panel to switch to the auxiliary mode **F**,** and operate the **Up/Down key** to **F21.** Fft, press **ENT key to** identify resonance frequency (command is sent from driver); Long press **ENT key** panel display-F.00, press UP or DOWN **key,** the driver will automatically detect the resonance frequency, the number is the frequency 2. Pressing ent will save directly to P08-30, or record the value to exit and write to parameter P08-30 3. Press the**M key to** exit the mode **Note: this mode can only be operated underrdy, otherwise the driver will alarm A.905**

F22.Fr	Detect resonant frequency (in customer operation)	1. Press the M key of the operation panel to switch to the auxiliary mode **F**,** and operate the **Up/Down key** to **F22.** Fr, press**ENT key to enter the** detection of resonance frequency (customer operation), the panel displays-F.00, press UP or DOWN**key, the** panel displays F flashing, the driver will detect the resonance frequency within 20S, the number is the frequency 2. Pressing ent will save directly to P08-30, or record the value to exit and write to parameter P08-30 3. Press the**M key to** exit the mode **Note: this mode can only be operated whenthe device is running**

Chapter IX Fault Analysis and Treatment

9.1 Fault alarm information table

Alarm Type	serial number code	Alarm content
hardware failure	E.051	EEPROM parameter abnormal
	E.052	FPGA communication exception
	E.053	initial failure
	E.054	operation timeout
	E.060	Hardware match exception
	E.061	Abnormal motor and driver combination
	E.063	overcurrent detection
	E.064	Motor overcurrent detection
	E.068	Driver DC bus overcurrent detection
	E.069	FPGA clock exception
	E.071	Abnormal detection of phase U current
	E.072	Abnormal detection of phase W current
	E.100	Abnormal parameter combination
	E.102	DI port assignment exception
	E.106	Abnormal setting of divider output
	E.107	parameter anomaly
	E.108	Parameter setting out of range
	E.120	Servo ON command invalid alarm
	E.121	External input alarm signal
	E.305	Motor cable broken
	E.400	Loss of phase in power line

operational failure	E.401	undervoltage
	E.402	overvoltage
	E.410	instantaneous overload
	E.412	sustained overload
	E.420	Motor overspeed
	E.421	out-of-control detection
	E.430	regeneration anomaly
	E.431	regenerative overload
	E.435	surge current limit resistor overload
	E.436	DB overload
	E.440	Drive Temperature Abnormal
	E.501	Excessive position deviation
	E.503	Excessive position deviation when servo is ON
	E.510	The gantry position deviation is too large
	E.511	Gantry shaft alarm
	E.520	vibration alarm
	E.521	Self-adjusting vibration alarm
Encoder failure	E.620	Encoder off line
	E.621	Encoder built-in data mismatch
	E.622	Encoder built-in data verification error
	E.641	Encoder overheating (inside encoder)
	E.643	Encoder battery voltage fault (encoder internal)
	E.644	Encoder multi-turn data exception (inside encoder)
	E.645	Encoder Multiturn Count Overflow (Encoder Internal)
	E.646	Encoder communication failure
	E.649	Encoder communication CRC failure
Warning	A.900	Excessive position deviation
	A.901	Excessive position deviation when servo is ON

	A.905	Auxiliary (F**) function cannot be executed when servo is ON
	A.910	overload
	A.911	vibration
	A.912	Abnormal temperature of control board
	A.913	Drive Temperature Abnormal
	A.920	regenerative overload
	A.921	DB overload
	A.923	Servo unit internal fan stops
	A.930	Encoder Battery Low Voltage
	A.941	Parameter changes that require power reconnection
	A.942	EEPROM write failure
	A.950	overtravel
	A.960	Input terminal duplicate definition
	A.971	undervoltage
	A.995	Advanced accessibility dysfunction

9.2 Fault alarm cause and treatment

E.051: EEPROM Parameter Abnormal

Fault alarm reason	Fault alarm check	disposal measures
Servo unit EEPROM data exception	Perform factory initialization (F10.INI)	If it persists, replace the drive

E.052: FPGA Communication Exception

Fault alarm reason	Fault alarm check	disposal measures
Abnormal power-on initialization of main control MCU	Power back on	Alarm is switched off by setting parameter Pn044 If it persists, replace the drive

E.053: Initialization Failure

Fault alarm reason	Fault alarm check	disposal measures
Power-on initialization failure of	Power back on	If it persists, replace the drive

master MCU		

E.054: Operation Timeout

Fault alarm reason	Fault alarm check	disposal measures
operation timeout	Power back on	If it persists, replace the drive

E.060: Hardware mismatch error

Fault alarm reason	Fault alarm check	disposal measures
Hardware mismatch error	Perform factory initialization (F10.INI)	If consistently, contact manufacturer

E.061: Motor and drive combination anomaly

Fault alarm reason	Fault alarm check	disposal measures
The servo unit does not match the servo motor model	Check whether the servo unit supports the motor	Replace the servo unit matching the motor

E.063: Overcurrent detection

Fault alarm reason	Fault alarm check	disposal measures
Short circuit between U,V and W	Is there a short circuit in the U,V,W wiring Is there a short circuit between B 1 and B 3	correct wiring If there is no alarm, check the power line and motor for short circuit
Damaged drive	Disconnect the U,V,W cables on the drive and enable the drive	If the U,V,W connections are disconnected and the startup drive still alarms, replace the drive

E.064: Motor overcurrent detection

Fault alarm reason	Fault alarm check	disposal measures
Short circuit between U,V and W	Is there a short circuit in the U,V,W wiring Is there a short circuit between B 1 and B 3	correct wiring If there is no alarm, check the power line and motor for short circuit
Damaged drive	Disconnect the U,V,W cables on the drive and enable the drive	If the U,V,W connections are disconnected and the startup drive still alarms, replace the drive

E.068: Driver DC Bus Overcurrent Detection

Fault alarm reason	Fault alarm check	disposal measures
U,V,W short to earth PE	Check for correct wiring Try to remove the motor power line	Correct wiring, replace motor wire and motor. If it persists, replace the drive

E.069: FPGA Clock Exception

Fault alarm reason	Fault alarm check	disposal measures
FPGA clock exception	FPGA clock exception	P00-47.1 Set 0 to turn off alarm If it persists, replace the drive

E.071: U-phase current detection abnormality

Fault alarm reason	Fault alarm check	disposal measures
Abnormal sampling data of current sensing device	Check whether the UVW wiring is correct and the connection is reliable	correct wiring P00-46.2 Set 0 to turn off alarm If it persists, replace the drive

E.072: Abnormal detection of phase W current

Fault alarm reason	Fault alarm check	disposal measures
Abnormal sampling data of current sensing device	Check whether the UVW wiring is correct and the connection is reliable	correct wiring P00-46.3 Set 0 to turn off alarm If it persists, replace the drive

E.100: Abnormal parameter combination

Fault alarm reason	Fault alarm check	disposal measures
Parameter setting error	Check the set parameters	Set parameters correctly If it always appears, initialize the parameters

E.102: DI Port Assignment Exception

Fault alarm reason	Fault alarm check	disposal measures
At least 2 input ports have the same function selection	Check input port function selection parameters (P06-11, P06-12...)	Set parameters correctly Perform parameter initialization and power on again

E.106: Abnormal setting of frequency division pulse output

Fault alarm reason	Fault alarm check	disposal measures
Divided pulse output parameter	Check the divided pulse output	Correct setting of frequency

setting out of range	setting parameters. P03-25	division pulse output parameters Bus encoder P03-25 65535 Drive Power Back On

E.107: Abnormal parameters

Fault alarm reason	Fault alarm check	disposal measures
parameter anomaly	Check whether the parameter range is reasonable	Set parameters correctly Execute parameter initialization

E.108: Parameter setting out of range

Fault alarm reason	Fault alarm check	disposal measures
Parameter setting out of range	Check whether the parameter range is reasonable	Set parameters correctly Execute parameter initialization

E.120: Servo ON command invalid alarm

Fault alarm reason	Fault alarm check	disposal measures
When servo is ON, power supply input ports L1, L2 and L3 are not supplied with power	Check wiring and input voltage	Check wiring Drive Power Back On

E.121: External input alarm signal

Fault alarm reason	Fault alarm check	disposal measures
External input alarm signal	Check whether there is signal input at the external input port and whether the relevant parameters of I/O port are correct	Correct use of external input alarm IO signals

E.305: Broken motor cable

Fault alarm reason	Fault alarm check	disposal measures
Motor cable broken	Check whether the UVW wiring is correct and the connection is reliable	Ensure UVW wiring is correct and reliable P00-47.0 Set 0 to turn off alarm

E.400: Power cord phase loss

Fault alarm reason	Fault alarm check	disposal measures
Main circuit input power line phase loss	Check whether the main circuit input L1,L2 and L3 are connected	Make sure that the wiring is correct and that the correct voltage source or voltage regulator is used in series P00-39.0 Open phase alarm can be turned off

E.401: Undervoltage

Fault alarm reason	Fault alarm check	disposal measures
The input voltage of the main circuit is lower than the rated voltage value or there is no input voltage	Check whether the main circuit input L1,L2,L3 wiring is correct, and the voltage value is how many volts. The bus voltage can be monitored via d23.dcp	Make sure that the wiring is correct and that the correct voltage source or series regulator is used P00-52 Alarm threshold can be modified

E.402: Overvoltage

Fault alarm reason	Fault alarm check	disposal measures
Main circuit input voltage is too high	Use voltmeter to test whether the input voltage of main circuit is correct	Use the correct voltage source or series regulator
The regenerative resistor is not connected or the type selection of the regenerative resistor is incorrect	Check that the appropriate regeneration resistor is connected	Properly connected matching regenerative resistors
Incorrect parameter settings	Confirm that the parameter settings of P00-30~P00-34 are consistent with the resistor connection mode	Correct setting of parameters and external regenerative resistance
Drive hardware failure	Overvoltage alarm still occurs when the input voltage is determined to be correct	Please send it back to the dealer or the original factory for maintenance

E.410: Instantaneous overload

Fault alarm reason	Fault alarm check	disposal measures
The machine is stuck when the	Check mechanical connections for	Adjust the mechanical structure

motor is started	binding	
P00-50 Parameter setting is unreasonable	Check P00-50 parameter value	Set P00-50 parameters correctly
Drive hardware failure	Confirm that the mechanical part is normal and still alarm	Please send it back to the dealer or the original factory for maintenance

E.412: Sustained overload

Fault alarm reason	Fault alarm check	disposal measures
Continuous use beyond the drive rated load	Can be monitored via d13.oL. in monitor mode	Change to a higher power motor or reduce the load
Improper setting of control system parameters	1. Whether the mechanical system is installed 2. Acceleration setting constant is too fast 3. Whether the gain parameters are set correctly	1. Adjust the gain of control loop 2. Acceleration and deceleration setting time slows down
Motor wiring error	Check U, V, W wiring	correct wiring

E.420: Overspeed

Fault alarm reason	Fault alarm check	disposal measures
Input speed command too high	Check whether the input signal is normal	Adjust the frequency of the input signal
Unreasonable setting of overspeed judgment parameters	Check whether P04-05 (overspeed alarm value) is set properly	Set P04-05 correctly (overspeed alarm value)

E.421: Out of control detection

Fault alarm reason	Fault alarm check	disposal measures
Motor power lines U,V,W wiring error	Check wiring	correct wiring
Incorrect motor parameter setting	Check P00-05; and whether the encoder parameters are set correctly	Set parameters correctly Set P00-46.1 to 0 to close runaway detection

E.430: Regeneration Abnormal

Fault alarm reason	Fault alarm check	disposal measures
Wrong selection of regenerative resistor or no external regenerative resistor	Check the connection of the regenerative resistor	If the connection is normal, return the drive to the factory for repair P00- 44.2 canbe set to 0 to turn off the alarm
Parameter setting error	Please confirm theparameter setting ofP00-30~P00-34	Set parameter values correctly

E.431: Regeneration Overload

Fault alarm reason	Fault alarm check	disposal measures
Wrong selection of regenerative resistor or no external regenerative resistor	Check the connection condition of the regenerative resistor and whether the resistance and power of the regenerative resistor are suitable	Select the appropriate regenerative resistor
Incorrect parameter setting	Confirm whether the parameters P00-30~P00-35 are correct	Set parameter values correctly

E.435: Surge current limiting resistor overload

Fault alarm reason	Fault alarm check	disposal measures
Frequent power-up of drive power supply		P00-44 can be set to turn off the alarm

E.436: DB Overload

Fault alarm reason	Fault alarm check	disposal measures
Motor driven by external force (rdy state)	Confirm running status	Do not use excessive external force to push P00- 46 can be set to turn off the alarm
DB, the rotational energy is greater than the DB resistance capacity	Check motor running speed Evaluate whether the load inertia is too large	Reduce servo motor command speed Reduce the load moment of inertia Reduce the number of DB stops

E.440: Radiator Overheated

Fault alarm reason	Fault alarm check	disposal measures
Drive internal temperature above P00-41 setpoint	Check that the drive is in good thermal condition	Improve the heat dissipation condition of the drive. If the alarm

		still occurs, please return the drive to the factory for maintenance.
Overheat alarm threshold setting is too small	Check parameter P00- 41	Set P00- 41

E.501: Excessive positional deviation

Fault alarm reason	Fault alarm check	disposal measures
Too large position deviation, too small setting parameter	Confirm parameter setting of P0 3-15 (excessive position deviation setting)	Increase the setting of P0 3-15 (excessive position deviation setting)
Gain value set too small	Confirm whether the gain parameters are set reasonably	Readjust the gain class parameters correctly
Internal torque limit set too small	Confirm internal torque limit value	Readjust the internal torque limit correctly
Excessive external load	Check external load	Reduce the load or replace the high-power motor

E.503: Excessive position deviation when servo is ON

Fault alarm reason	Fault alarm check	disposal measures
Excessive position deviation when servo is ON	Confirmparameter settingof P03-30, P03-31 and P0 3-3 3	Correctly set relevant parameters
Gain value set too small	Confirm whether the gain parameters are set reasonably	Readjust the gain class parameters correctly
Internal torque limit set too small	Confirm internal torque limit value	Readjust the internal torque limit correctly
Excessive external load	Check external load	Reduce the load or replace the high-power motor

E.510: Excessive gantry position deviation

Fault alarm reason	Fault alarm check	disposal measures
The gantry position deviation is too large	Confirm P03-53 parameter setting	Set parameter values correctly
Gain value set too small	Confirm whether the gain parameters are set reasonably	Readjust the gain class parameters correctly
Internal torque limit set too small	Confirm internal torque limit value	Readjust the internal torque limit correctly

Excessive external load	Check external load	Reduce the load or replace the high-power motor

E.511: Gantry shaft alarm

Fault alarm reason	Fault alarm check	disposal measures
Two-axis drives, P 00-39, have an axis associated alarm set and one axis alarm.	Check whether each axis gives an alarm	Perform alarm (other alarms) troubleshooting
Two-axis drive, open gantry function, one of the axis alarm	Check whether each axis gives an alarm	Perform alarm (other alarms) troubleshooting

E.520: Vibration Alarm

Fault alarm reason	Fault alarm check	disposal measures
Abnormal vibration of motor speed detected	Confirm the abnormal sound of the motor and the speed and torque waveform during operation.	Reduce the motor speed. Or reduce the speed loop gain (P02-10)
The value of the moment of inertia ratio (P01-04) is larger than the actual value or varies greatly	Confirm the load moment of inertia ratio	Set the appropriate ratio of moment of inertia (P01-04) P01-10 can be set to turn off the alarm

E.521: Self-adjusting vibration alarm

Fault alarm reason	Fault alarm check	disposal measures
The motor vibrates greatly when using the adjustment-free function (factory setting)	Confirm the waveform of the motor speed.	Decrease the load moment of inertia ratio below the allowable value, or increase the tuning value of the adjustment free value setting (Fn200), or decrease the gain value.
Motor vibration is high when performing advanced auto tuning, single parameter tuning, EasyFFT	Confirm the waveform of the motor speed.	The processing method described in the operation procedure for implementing each function

E.620: Encoder Off Line

Fault alarm reason	Fault alarm check	disposal measures
Bus encoder communication	Check Encoder Wiring	correct wiring

failure		

E.621: Encoder built-in data mismatch

Fault alarm reason	Fault alarm check	disposal measures
Encoder read/write exception	Check the encoder wiring.	correct wiring
Abnormal motor parameter setting	Correctly set the motor parameters of P00-00~ P00-19	Set parameters correctly

E.622: Encoder built-in data check error

Fault alarm reason	Fault alarm check	disposal measures
Encoder built-in data verification error	Check Encoder Wiring Verify encoder shield wire is properly connected	If the connection is normal, return the drive to the factory for repair

E.641: Encoder overheating (encoder internal)

Fault alarm reason	Fault alarm check	disposal measures
Encoder overheating (inside encoder)	Check encoder temperature	If the temperature is normal, the alarm can be cleared by F06.EN0 Modify parameter P00-07.2 Alarm Off

E.643: Bus Encoder Battery Failure

Fault alarm reason	Fault alarm check	disposal measures
Low external battery voltage when bus encoder is set to multi-turn absolute value	Check the voltage of the external battery of the encoder and confirm that it is higher than 3.0V	When the battery voltage is lower than 3.0V, replace the battery. Alarm cleared above 3V using auxiliary function F06.EN0 Alarm can be switched off via parameter P00-07

E.644: Bus Encoder Multi-turn Exception

Fault alarm reason	Fault alarm check	disposal measures
Bus encoder turns out of range	The number of turns can be monitored through the monitoring mode d21.ASH, and the multi-turn absolute motor cannot rotate in one direction for a long time.	Clear the multi-turn value using the command F07.En1

E.645: Bus Encoder Multiturn Overflow Fault

Fault alarm reason	Fault alarm check	disposal measures
Bus encoder turns out of range	The number of turns can be monitored through the monitoring mode d21.ASH, and the multi-turn absolute motor cannot rotate in one direction for a long time.	Alarm can be cleared via F06.EN0 Clear the multi-turn value using the command F07.En1 Alarm can be switched off via parameter P00-07

E.646: Encoder communication failure

Fault alarm reason	Fault alarm check	disposal measures
Encoder communication failure	Check Encoder	Correct installation of encoder

E.649: Encoder Communication CRC Failure

Fault alarm reason	Fault alarm check	disposal measures
Encoder communication CRC failure	Check Encoder	Correct installation of encoder

A.900: Excessive positional deviation

Fault alarm reason	Fault alarm check	disposal measures
Excessive position deviation warning	Confirm parameter setting of P03-15/P03-30 (excessive position deviation setting)	Increase P03-15/P03-30 (excessive position deviation setting) setting
Gain value set too small	Confirm whether the gain parameters are set reasonably	Readjust the gain class parameters correctly
Internal torque limit set too small	Confirm internal torque limit value	Readjust the internal torque limit correctly
Excessive external load	Check external load	Reduce the load or replace the high-power motor

A.901: Excessive position deviation when servo is ON

Fault alarm reason	Fault alarm check	disposal measures
Excessive position deviation when servo is ON	Confirm P03-31/P03-33 parameter setting	Increase P03-31/P03-33 setpoint
Pulse command frequency is too high when servo is ON	Pulse command frequency is too high when servo is ON	Reduce the pulse command frequency when servo is ON

A.905: FN function cannot be executed when servo is ON

Fault alarm reason	Fault alarm check	disposal measures
FN function cannot be executed when servo is ON	FN function cannot be executed when servo is ON	Perform FN function with SV-OFF

A.910: Overload warning

Fault alarm reason	Fault alarm check	disposal measures
overload warning	Can be monitored via d13.oL. in monitor mode	Increase P00-51 (overload warning value) appropriately
Improper setting of control system parameters	1. Whether the mechanical system is installed 2. Acceleration setting constant is too fast 3. Whether the gain parameters are set correctly	1. Adjust the gain of control loop 2. Increase the acceleration and deceleration time
Motor wiring error	Check U, V, W wiring	correct wiring

A.911: Vibration Warning

Fault alarm reason	Fault alarm check	disposal measures
Abnormal vibration of motor speed detected	Confirm the abnormal sound of the motor and the speed and torque waveform during operation.	Reduce the motor speed. Or reduce the speed loop gain (P02-10)
The value of the moment of inertia ratio (P01-04) is larger than the actual value or varies greatly	Confirm the load moment of inertia ratio	Set the appropriate ratio of moment of inertia (P01-04) P01-10 can be set to turn off the alarm

A.912: Abnormal Control Board Temperature

Fault alarm reason	Fault alarm check	disposal measures
Abnormal temperature of control board	Check Drive Temperature Does the cooling fan work properly	improve heat dissipation condition of that drive Drive temperature still alarms under normal conditions, replace the drive

A.913: Abnormal Drive Temperature

Fault alarm reason	Fault alarm check	disposal measures
Overtemperature warning set too low	Confirm whether parameter P00-42 is set properly	Set P00-42 correctly
Drive Temperature Abnormal	Drive temperature monitoring can be performed via d24.Ath in monitor mode	improve heat dissipation condition of that drive Drive temperature still alarms under normal conditions, replace the drive

A.920: Regeneration Overload Warning

Fault alarm reason	Fault alarm check	disposal measures
Wrong selection of regenerative resistor or no external regenerative resistor	Check the connection condition of the regenerative resistor and whether the resistance and power of the regenerative resistor are suitable	Select the appropriate regenerative resistor
Incorrect parameter setting	Confirm whether the parameters P00-30~P00-35 are correct	Set parameter values correctly

A.930: ABSOLUTE ENCODER BATTERY FAULT

Fault alarm reason	Fault alarm check	disposal measures
ABSOLUTE ENCODER BATTERY FAULT	Check the voltage of the external battery of the encoder and confirm that it is higher than 3.0V	Battery voltage is lower than 3.0V, replace battery Clear with command F06.En0 if higher

A.941: Parameter changes require power off and restart to take effect

Fault alarm reason	Fault alarm check	disposal measures
After modifying the parameters, the parameters shall take effect after re-powering on	After modifying the parameters, the parameters shall take effect after re-powering on	Power off and restart

A.960: Input Terminal Duplicate Definition

Fault alarm reason	Fault alarm check	disposal measures
Input terminal duplicate definition	Check whether there is signal input at the external input port and whether the relevant parameters of	Correctly set relevant parameters

	I/O port are correct	

A.971: Undervoltage warning

Fault alarm reason	Fault alarm check	disposal measures
The input voltage of the main circuit is lower than the rated voltage value or there is no input voltage	Check whether the main circuit input L1,L2,L3 wiring is correct, and the voltage value is how many volts. The bus voltage can be monitored via d23.dcp	Make sure that the wiring is correct and that the correct voltage source or voltage regulator is used in series P00-52 Alarm threshold can be modified or alarm can be turned off

Chapter X Communication

10.1 Modbus communication parameter setting

parameter code	Name	Description
P00-23	slave address	Setting range: 0-255, default 1 Set according to equipment requirements
P00-24.0	Modbus	Setting range: 0-7, default 2

	communication baud rate	0：2400 1：4800 2：9600 3：19200 4：38400 5：57600 6：115200 7：25600
P00-24.1	check mode	Setting range: 0-3, default 0 0: no check, 2 stop bits 1: even parity, 1 stop bit 2: Odd parity, 1 stop bit 3: No check, 1 stop bit
P00-26	Modbus communication response delay	Setting range: 0-100, default 0 When the parameter is set to 0, the response is made according to the standard communication. When the parameter is set to have a value, the response time of Modbus communication is made according to the set time

10.2 Modbus communication supports reading and writing parameter setting

Support reading monitoring project address list

monitoring item	Definition	Unit of Measure	Decimal communication address (double address, high order first)
d00.C.PU	position command pulse sum	instruction unit	2100-2101

d01.F.PU	Position feedback pulse summation	instruction unit	2102-2103
d02.E.PU	position deviation	instruction unit	2104-2105
d03.C.PE	position command pulse sum	encoder unit	2106-2107
d04.F.PE	Position feedback pulse summation	encoder unit	2108-2109
d05.E.PE	position deviation	encoder unit	2110-2111
d06.C.Fr	input pulse speed	Kpps	2112
d07.C.SP	speed command	rpm	2113
d08.F.SP	actual speed	rpm	2114
d09.C.tq	torque command	%	2115
d10.F.tq	actual torque	%	2116
d11.AG.L	average load factor	%	2117
d12.PE.L	actual peak torque	%	2118
d13.oL	cumulative load factor	%	2119
d14.rG	regenerative load factor	%	2120
d15.PE.S	actual speed peak	rpm	2121
d16.I.Io	input signal monitor	binary system	2122
d17.o.Io	output signal monitoring	binary system	2123
d18.AnG	mechanical angle	0.1 degree	2124
d19.HAL	electrical angle	0.1	2125

		degree	
d20.ASS	Absolute encoder position within one turn		2126-2127
d21.ASH	Absolute encoder turns		2128
d22.J-L	inertia ratio	1%	2129
d23.dcp	DC bus voltage value	1Vdc	2130
d24.Ath	Drive Temperature	degree centigrade	2131
d25.tiE	cumulative running time	second	2132-2133
d26.1.Fr	Vibration frequency 1	Hz	2134
d28.2.Fr	**Vibration Frequency 2 (End Jitter Frequency)**	Hz	2136
d29.cn	Current Control Mode		2137
d30.Ai1	Speed command input value	0.001V	2138
d31.Ai2	Torque command input value	0.001V	2139
d32.c.Er	Number of abnormal communication of encoder		2140
d33.H1	Hardware model (hardware information)		2141
d34.H2	Hardware Version		2142
d35.S1	Software Version		2143
d36.C.PU	position command pulse sum	instruction unit	2144-2145
d37.F.PU	Position feedback pulse summation	instruction unit	2146-2147
Current			2180

Fault Number			

Note: 1. All parameters support 485 reading. Refer to parameter code for parameter read-write address: For example, p 03 -09, read and write addresses are decimal 309

2. Parameter write reference drive permission settings. For example, if the current permission level of the drive is 1, parameters higher than permission 1 cannot be written. Parameter writing is not saved when power is off.

10.3 Overview of Modbus Communication Protocol

10.3.1 Introduction

The Nexus Monitor communicates with other devices using the RTU transfer mode of the AEG Modicon Modbus protocol. This communication applies to both RS-232 and RS-485 standards.

RS-232 communication requires a single connection between a Nexus Monitor and one other device, using only channel 1 of the Nexus Monitor.

RS-485 supports multiple Nexus monitors connected to a single network and is a two-wire connection up to 115200 baud with ports 1-4 available.

10.3.2 Communication Package

Communication occurs between a Modbus master and one or more Nexus slaves. The master initiates all communication by sending a "request packet" to the designated slave, which replies with a "reply packet". The communication packet consists of a string of 8-bit bytes, as follows:

- Slave address, one byte
- Function code, one byte
- Data, N bytes, high byte first, low byte later
- CRC (RTC Error Detection Code), 2 bytes
- Dead time, 3.5 byte transfer time.

A maximum of 127 registers can be sent in a single communication packet.

10.3.3 Slave Addresses and Sending Requests

Each slave device on the communication bus has its own dedicated address and responds only to addresses addressed by the master. The packet returned to the master has the same address in the slave address field as the request packet. These addresses are programmable and range from 0 to 255.

Slave address 0 is a transfer command that allows the master to send the same packet to all devices at once. All slaves follow the packet's instructions but do not respond. The transfer request is only useful for functions 6 and 10, which represent the presetting of a single register and the presetting of multiple registers, respectively. See Tables 1.3 and 1.4.

10.4 function number

The function number of a packet tells the addressed slave what action to perform. Nexus supports the following Modus feature numbers.

Table 1.1 function number

function number		Desc
hexadecimal	decimal system	
03H	3	read hold register
06H	6	Preset a single register
10H	16	Preset multiple registers

10.4.1 Function No. 03: read hold register

This feature allows the master to read one or more parameter values (data registers) from a Nexus slave. This data register is a 16-bit value that is transmitted in the "Big Endian" format. The high byte is read first and the low byte is read later.

BIG-ENDIAN means that the low order bytes are arranged at the low end of memory and the high order bytes are arranged at the high end of memory

The master sends a packet defining a start register and the number of registers to read for

the slave. The slave responds with a packet containing the requested parameter values within the range specified in the original request.

In the following example, the master device requests a slave at 01 to send the values in two registers, the start register being 00001, and the slave replies with the values 3031H and 3037H from registers 00001 and 00002.

Host send format:

Slave Address Function No. Data Start Address Number of Data Read CRC

Slave sending format:

Slave Address Function Number Bytes Value of each data CRC

Table 1.2 Function Number 03 Example

host package definition	hexadecimal address	Slave Package Definition	hexadecimal address
slave address	01H	slave address	01H
function number	03H	function number	03H
Data start address high byte	00H	Number of bytes	04H
Data start address low byte	01H	Data 1 High Byte	30H
Register Number High Byte	00H	Data 1 Low Byte	31H
Register Number Low Byte	02H	Data 2 High Byte	30H
CRC Low Byte	95H	Data 2 Low Byte	37H
CRC High Byte	CBH	CRC Low Byte	F1H
		CRC High Byte	2AH

10.4.2 Function No. 06: Adjust a single register

This feature allows the master to modify a single register on the Nexus slave, the data register

is a 16-bit value, the high byte is transferred first, the low byte is transferred later. In the following example, the master device saves the value 0001H in register 57346 (E002) on the Nexus slave with address 01H.

Host send format:

Slave Address Function Number Data Start Address Data Value CRC

Slave sending format:

Slave Address Function Number Data Start Address Data Value CRC

Table 1.3 Function No. 6 Example

host package definition	hexadecimal address	Slave Package Definition	hexadecimal address
slave address	01H	slave address	01H
function number	06H	function number	06H
Data start address high byte	E0H	Data start address high byte	E0H
Data start address low byte	01H	Data start address low byte	01H
data high byte	00H	data high byte	00H
data low byte	01H	data low byte	01H
CRC Low Byte	2EH	CRC Low Byte	2EH
CRC High Byte	0AH	CRC High Byte	0AH

10.4.3 Function No. 10: adjustment register

This feature allows the master to modify a contiguous set of registers on the Nexus slave. The data register is a 16-bit value, with the high byte transferred first and the low byte transferred later.

In the following example, the master device stores the value 0001 H in register 57345, the value 0001 H in register 57346, and the value 0001 H in register 57347 in the Nexus slave with address 01H.

Host send format:

Slave Address Function Number Data Start Address Number of Modified Data First Data…… CRC

Slave sending format:

Slave Address Function Number Data Start Address Number of Modified Data CRC

10.4.4 Data start address

Hexadecimal range: 0000H-FFFFH

Decimal range: 0001-65535

For example, for some Scada software, to read the value in the save register, the address format should be 4 (XXXXX), where XXXXX is a decimal address.

Table 1.4 Function number 10 examples

host package definition	hexadecimal address	Slave Package Definition	hexadecimal address
slave address	01H	slave address	01H
function number	10H	function number	10H
Data start address high byte	E0H	Data start address high byte	E0H
Data start address low byte	01H	Data start address low byte	01H
Setpoint Number High Byte	00H	Setpoint Number High Byte	00H
Setpoint Number Low Byte	03H	Setpoint Number Low Byte	03H
Number of bytes	06H	CRC Low Byte	E6H
Data 1 High Byte	00H	CRC High Byte	08H
Data 1 Low Byte	01H		
Data 2 High Byte	00H		
Data 2 Low Byte	01H		
Data 3 High Byte	00H		
Data 3 Low Byte	01H		
CRC Low Byte	4DH		
CRC High Byte	46H		

10.5 dead time

If the Nexus slave is in a 3.5 byte transmit time (about 7ms at 4800 baud rate; 115200 baud rate is about 300us), it is considered that the data acceptance is completed. If the delay between the two bytes of the master is greater than this time, the slave considers it dead time. the conclusion from the dead time is that all unaddressed slaves must pay attention to new packets from the master.

10.6 Response of Exception Procedure

If the slave encounters an illegal command or other problem while executing the master command, it will send an exception response packet to the master. The exception response packet contains an error code to indicate the type of error.

The following table shows the error codes and the corresponding error types.

Table 1-5 Error Codes and Types

Error code	error type	Interpret
01	illegal function number	The slave does not support the function number in the request packet
02	illegal address	The slave does not recognize the address of the data area in the transmitted request packet
03	illegal data	The data mentioned in the transfer request packet is not supported by registers in the Nexus slave
06	Busy, reject package	The slave is busy performing a long operation and cannot receive the request packet

In the following example, the master device requests the value in register 00256 from the slave with address 01H, and the slave sends an error response message indicating that it is busy.

Table 1.6 Exception Response Example

Host Package Meaning	hexadecimal address	Slave Package Meaning	hexadecimal address
Addr	01H	Addr	01H

function number	03H	function number	03H
Data start address high byte	01H	Error code	06H
Data start address low byte	00H	CRC Low Byte	C1H
Number of Registers High Byte	00H	CRC High Byte	32H
Number of Registers Low Byte	01H		
CRC Low Byte	85H		
CRC High Byte	F6H		

Chapter 11 Instructions for Use of Special Functions

11.1 Absolute encoder use

11.1.1 Functional description

Using a servo motor with an absolute encoder, an absolute value detection system can be constructed by a host device. By means of the absolute value detection system, it is no longer necessary to perform the home point reset operation every time the power supply is turned on. This function reads the number of turns and position data of absolute encoder based on MODBUS communication, and the upper device performs processing control to realize the related functions of absolute encoder.

11.1.2 Basic setting and description of MODBUS-based communication servo

The system using absolute value encoder shall initialize the encoder battery alarm and rotation number data when it is put into use (F06.En0 clear encoder alarm; F07.En1 absolute encoder multi-turn value clearing). Because the motor body and the battery are disconnected before the first use, the encoder will have no battery alarm and loop memory function.

parameter code	Name	Note:
P00-23	slave address	Setting range: 0-255, default 1 Set according to equipment requirements
P00-24.0	Modbus communication baud rate	Setting range: 0-7, default 2 0：2400 1：4800 2：9600 3：19200 4：38400 5：57600 6：115200 7：25600
P00-24.1	check mode	Setting range: 0-3, default 0 0: no check, 2 stop bits 1: even parity, 1 stop bit 2: Odd parity, 1 stop bit 3: No check, 1 stop bit

11.1.3Absolute data address based on MODBUS communication

Content	Address: decimal	Notes
Absolute encoder position within one turn	2126-2127	Single-turn value range: 0-8388608

Absolute encoder turns	2128	Multi-turn value range: 0-65535

11.1.4 Alarm handling related to absolute encoder

Alarm Code	Fault alarm reason	Fault alarm check	disposal measures
E.643	Low external battery voltage when bus encoder is set to multi-turn absolute value	Check the voltage of the external battery of the encoder and confirm that it is higher than 3.0V	Replace the battery and clear the alarm with F06.EN0 (see chapter 8.4)
E.644 E.645	Abnormal reading of multi-lap data, or lap value exceeding ± 32768	Check d21.ASH (see chapter 8.3) multi-turn value	If the multiturn value is greater than 32767, clear the multiturn data via F07.EN1 (see chapter 8.4)
A.930	ABSOLUTE ENCODER BATTERY FAULT	Check voltage of external battery of encoder	Replace the battery and clear the alarm with F06.EN0 (see chapter 8.4)

11.1.5 Absolute Encoder Battery Replacement

To avoid absolute position data loss, replace the battery if the drive is in any of the following situations.

1. When the driver displays A.930, it represents the low battery voltage warning. The battery must be replaced in time to avoid the loss of absolute position data of the motor. After replacing the battery, use the auxiliary function F06.EN0 to clear the alarm

2. When the driver displays E.643, it indicates that the battery voltage is low, and the number of motor turns cannot be recorded normally when this alarm occurs, and the battery must be replaced immediately. After the battery is replaced, the alarm is cleared using the auxiliary function F06.EN0 after the battery is replaced, and the origin of the device must be verified. At the same time, use the auxiliary function F07.EN1 to clear the motor multi-turn data

Note: It isrecommended to replace the battery with the drive powered on to avoid loss of absolute position data

11.2 home reset function

11.2.1 Functional description

Origin: mechanical origin, which can indicate the position of origin switch or motor Z signal, and the specific setting is selected byP03-61.

Zero point: the positioning target point, which can be expressed as origin + offset(offset is set by P03-69).

WhenP03-69 is set to0, the zero point coincides with the origin.

The origin reset function refers to the function that the servo motor actively searches for zero point and completes positioning after the origin reset function is triggered when the servo enable is ON under the position control mode.

11.2.2 Basic setting and description of servo

P0 3-60	Return to origin enable control	Setting range: 0-6, default 0 Set origin regression mode and trigger signal source 0: Turn off the home reset function 1: Enable the home reset function by inputting the home reset start signal through DI 2: Enable the electrical zero return function by inputting the home reset start signal through DI 3: Start the home reset immediately after power-on 4: Start the home reset immediately 5: Start the electrical zero return command 6: Take the current position as the home point
P0 3-61	origin regression model	Setting range: 0-35, default 0 Set the control signal source of zero return direction, deceleration point and origin during origin return operation 0-35 Specific definitions Chapter 11.2.4 Description
P0 3-65	Speed when searching for home switch_High speed	Setting range: 0-3000, default 100 Set the origin to zero and search for the high speed value of the

		deceleration point signal. The motor is always running at high speed P03-65 when electrically zeroed.
P0 3-66	Speed when searching for home switch_low speed	Setting range: 0-1000, default 10 Set the low-speed speed value when searching for the origin when the origin returns to zero. The speed setting should be low enough to prevent mechanical shock during shutdown.
P0 3-67	Search for origin switch acceleration/deceleration time	Set the time when the motor changes from 0 to 1000rpm at the time of home reset. Unit:MS
P0 3-68	Maximum time limit for searching origin	Limit the total time of home reset, and alarm AL.551(home reset timeout fault) will occur if the time is exceeded.
P0 3-69	Mechanical origin offset	Setting range: -1073741823-1073741823, default:0 unit: instruction unit Set mechanical origin offset after origin reset
P06-11.01	DI1 Input Port Function Selection	DI1 set to 1, servo ON
P06-13.01	DI3 Input Port Function Selection	DI3 set to 3, positive overtravel signal input
P06-14.01	DI4 Input Port Function Selection	DI4 set to 4, reverse overtravel signal input
P06-12.01	DI2 Input Port Function Selection	DI2 set to 15, home switch signal
P06-15.01	DI5 Input Port Function Selection	DI5 set to 16, start signal of home reset
P06-21.01	DI6 Input Port Function Selection	DO1 is set to 0D, and the signal of home reset completion

11.2.3 Precautions for use of zero point reset

If the deceleration point signal is valid, the origin signal is valid without sufficient deceleration, which may lead to unstable final positioning. The displacement required for deceleration shall be fully considered, and then the deceleration point and the origin signal input position shall be set. The acceleration/deceleration time (P03-67) when searching for the origin and the speed_high speed (P03-65) when searching for the origin switch also affect the positioning stability, and therefore should be considered when setting.

11.2.4 Block diagram of zero-return operation

Each return to zero mode has different track curves. Users can select the return to zero mode by setting the return to zero mode P03-61 according to their own needs.

Return to zero mode 1

WhenP03-61 = 1, select return to zero mode 1:

Take the CW direction end of CCW direction limit as reference point, and take the first Z signal in CW direction as zero point.

The motor firstly moves in CCW direction at the speed of P03-65 returning to the mechanical origin. When the limit in CCW direction is effectively activated, the motor moves in CW direction in reverse direction after deceleration and stop according to P03-67. When the motor leaves the

limit in CCW direction, the first Z signal is the zero origin.

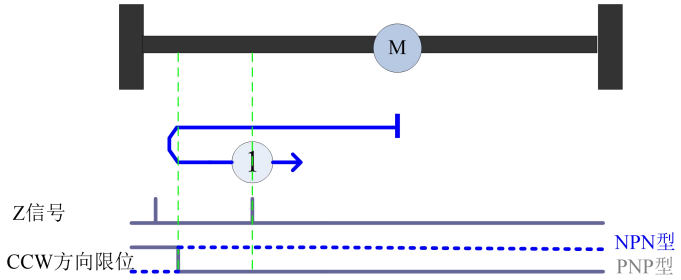


Figure 1 Return to zero mode-track diagram

Return to zero mode 2

WhenP03-61 = 2, select return to zero mode II:

Take the CCW direction end of CW direction limit as reference point, and take the first Z signal in CCW direction as zero point.

The motor firstly moves in CW direction at the speed of P03-65 returning to the mechanical origin. When the limit in CW direction is effectively activated, the motor moves in CCW direction in reverse direction after decelerating and stopping according to P03-67. When the motor leaves the limit in CW direction, the first Z signal is the zero origin.

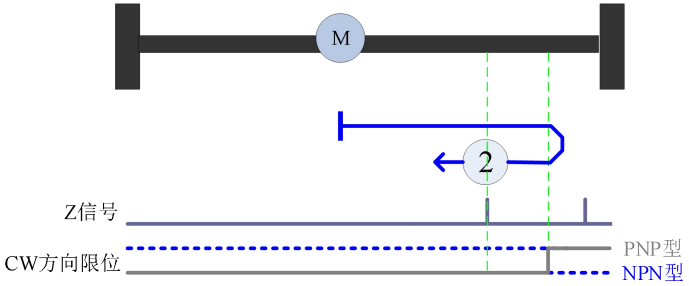


Figure 2 Schematic diagram of track of return to zero mode II

Return to zero mode3

WhenP03-61 = 3, select return to zero mode III:

Take the CCW direction end of HS limit as reference point, and the first Z signal in CCW direction as zero point.

The starting position is at theCCW direction side of HS limit: the motor firstly moves in CW direction at the speed of P03-65 returning to the mechanical origin. When HS limit is activated effectively, it will decelerate and stop according to the deceleration of P03-67, and then move in CCW direction in reverse direction. When it leaves HS limit, the first Z signal is the zero origin;

The starting position is onHS limit: the motor runs at low speed in CCW direction according to P03-66

, when leaving the HS limit, the first Z signal is the return to zero origin;

The starting position is at the CW direction side of HS limit: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin. When it encounters the CW limit, it will reverse to CCW direction. After it encounters the HS limit, it will continue to run in CCW direction. When leaving the HS limit, the first Z signal is the return to zero origin.

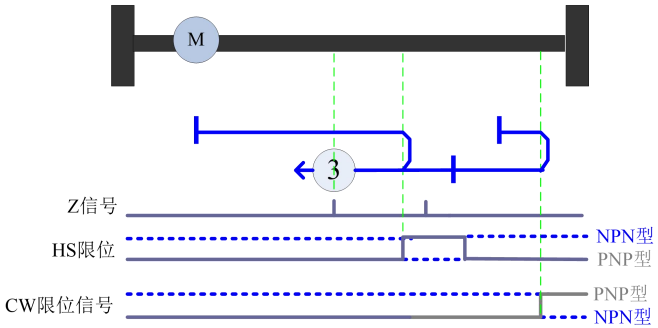


Figure III Schematic diagram of three tracks of zero return mode

Return to zero mode 4

WhenP03-61 = 4, select return to zero mode IV:

Take the CCW direction end of HS limit as reference point, and the first Z signal in CW direction as zero point.

The starting position is at the side of HS limit CCW direction: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin. When the HS limit is effectively activated, the motor decelerates according to the deceleration of P03-67, and it returns to the zero origin when it meets the first Z signal.

The starting position is on theHS limit: the motor runs at a low speed in CCW direction according to P03-66. After leaving the HS limit, the motor runs at a low speed in CW direction. When the HS limit signal is activated again, the first Z signal is the zero origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin, and when it encounters the CW limit, it will reverse to CCW direction, and when it encounters and then leaves the HS limit, it will run in CW direction at low speed. When the HS limit signal is activated again, the first Z signal is the zero origin;

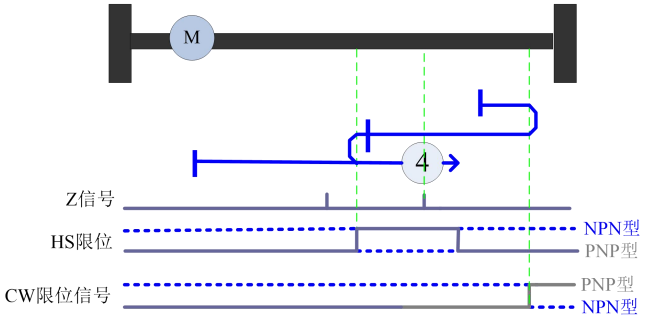


Figure 4 Schematic diagram of four tracks of zero return mode

Return to zero mode5

WhenP03-61 = 5, select return to zero mode 5:

Take the CW direction end of HS limit as reference point, and the first Z signal in CW direction as zero point.

The starting position is at theCCW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, and when encountering the CCW limit, it will reverse to CW direction. When the HS limit is activated, it will run at a reduced speed. After leaving the HS limit, the first Z signal is the zero origin;

The starting position is on theHS limit: the motor runs at low speed in CW direction according to P03-66, and when it leaves the HS limit, the first Z signal is the zero origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, and then decelerates to CW

square after activating HS limit. When leaving HS limit, the first Z signal is the zero origin;

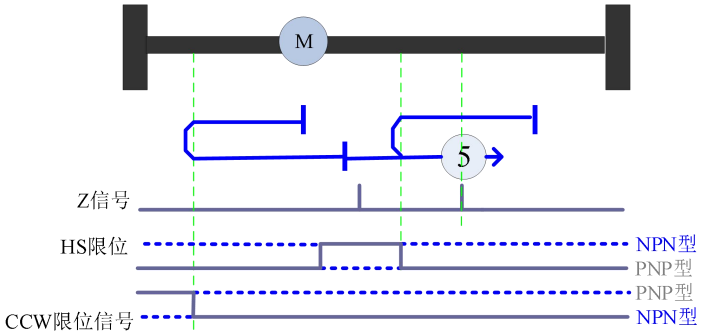


Figure 5 Schematic diagram of five tracks of return to zero mode

Return to zero mode6

WhenP03-61 = 6, select return to zero mode VI:

Take the CW direction end of HS limit as reference point, and the first Z signal in CCW direction as zero point.

The starting position is at theside of HS limit in CCW direction: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin, and when it encounters the limit in CCW direction, it will reverse to CW direction. When HS limit is activated, it will decelerate. After leaving HS limit, it will run at low speed in CCW direction according to P03-66. When HS limit is activated, the first Z signal is the zero origin;

The starting position is onHS limit: the motor runs at low speed in CW direction according to P03-66. After leaving HS limit, the motor runs at low speed in CCW direction. After activating HS limit, the first Z signal is the zero origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, and after activating HS limit, the first Z signal is returning to the zero origin;

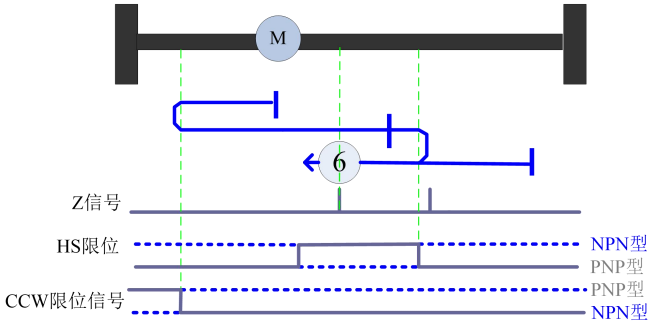


Figure 6 Schematic diagram of six tracks of zero return mode

Return to zero mode7

WhenP03-61 = 7, select return to zero mode VII:

Take the CCW direction end of HS limit as reference point, and the first Z signal in CCW direction as zero point.

The starting position is at theCCW direction side of HS limit: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin. When the HS limit is activated, the motor decelerates and moves in CCW direction. After leaving the HS limit, the first Z signal is returning to the zero origin;

The starting position is on theHS limit: the motor runs at low speed in CCW direction according to P03-66, and when it leaves the HS limit, the first Z signal is the zero origin;

The starting position is atthe CW direction side of HS limit: the motor firstly moves in CW direction at the speed of P03-65 returning to the mechanical origin; after the CW limit is activated, the motor decelerates and runs in CCW direction; after the HS limit is activated, the motor runs in CCW direction at a low speed according to the setting of P03-66; when it leaves the HS limit, the first Z signal is the zero origin;

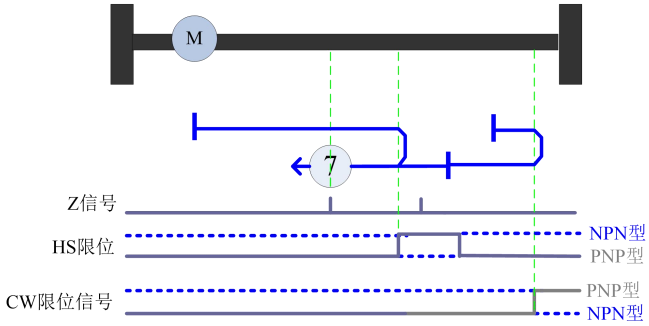


Figure 7 Schematic diagram of seven tracks of return to zero mode

Return to zero mode8

WhenP03-61 = 8, select return to zero mode 8:

Take the CCW direction end of HS limit as reference point, and the first Z signal in CW direction as zero point.

The starting position is at theCCW direction side of HS limit: the motor moves at the speed of P03-65 to return to the mechanical origin in the CW direction first, and after the HS limit is activated, the first Z signal is the return to the zero origin;

The starting position is onHS limit: the motor runs at low speed in CCW direction according to P03-66; when it leaves HS limit, it runs at low speed in CW direction according to P03-66 in reverse direction; the first Z signal after activating HS limit is the zero origin;

The starting position is atthe CW direction side of HS limit: the motor firstly moves in CW direction at the speed of P03-65 returning to the mechanical origin; after CW limit is activated, the motor decelerates to CCW direction; after HS limit is activated, the motor runs in CCW direction at high speed; after leaving HS limit, the motor runs in CW direction at low speed according to P03-66; after HS limit is activated, the first Z signal is the zero origin;

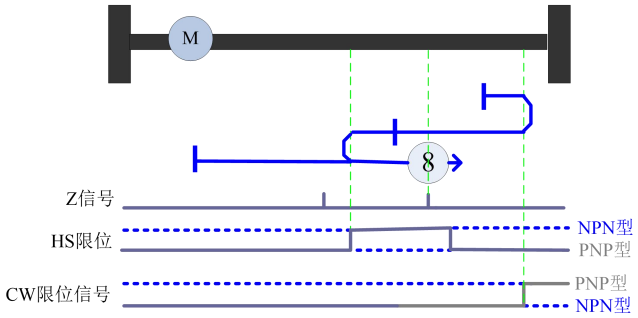


Fig. 8 Schematic diagram of eight tracks in zero return mode

Return to zero mode9

WhenP03-61 = 9, select return to zero mode 9:

Take the CW direction end of HS limit as reference point, and the first Z signal in CCW direction as zero point.

The starting position is at theside of HS limit CCW direction: the motor moves in CW direction at the speed of P03-65 returning to the mechanical origin. After the HS limit is activated and then left, the motor moves in CCW direction in reverse direction. When the HS limit is activated again, the first Z signal is the return to zero origin;

The starting position is onHS limit: the motor runs at low speed in CW direction according to P03-66; when it leaves HS limit, it runs at low speed in CCW direction according to P03-66 in reverse direction; the first Z signal after activating HS limit is the zero origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin. After CW limit is activated, the motor decelerates and moves in CCW direction. After HS limit is activated, the first Z signal is returning to the zero origin;

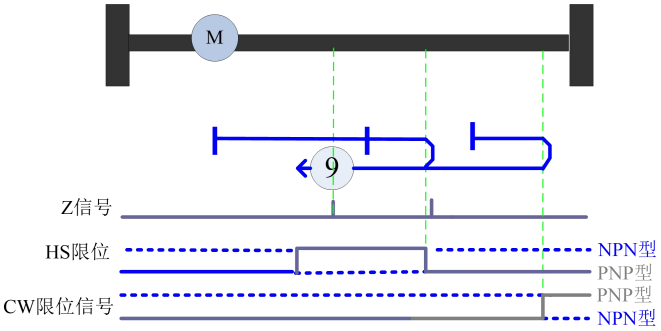


Figure 9 Schematic diagram of return to zero mode nine tracks

Return to zero mode10

WhenP03-61 = 10, select return to zero mode X:

Take the CW direction end of HS limit as reference point, and the first Z signal in CW direction as zero point.

The starting position is at theside of HS limit CCW direction: the motor moves in CW direction at the speed of P03-65 to return to the mechanical origin, and after the HS limit is activated and then left, the first Z signal is the return to the zero origin;

The starting position is on theHS limit: the motor runs at low speed in CW direction according to P03-66, and when it leaves the HS limit, the first Z signal is the zero origin;

The starting position is atthe CW direction side of HS limit: the motor firstly moves in CW direction at the speed of P03-65 returning to the mechanical origin; after CW limit is activated, the motor decelerates and runs in CCW direction; after HS limit is activated, the motor runs in CW direction in reverse direction; when the motor leaves HS limit, the first Z signal is the zero origin;

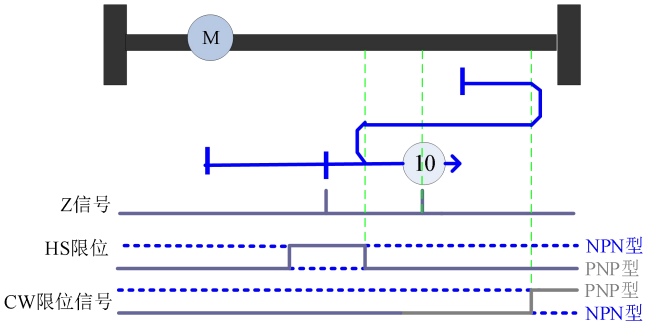


Figure 10 Return to zero mode ten track schematic diagram

Return to zero mode11

WhenP03-61 = 11, select return to zero mode 11:

Take the CW direction end of HS limit as reference point, and the first Z signal in CW direction as zero point.

The starting position is at theside of HS limit CCW direction: the motor moves in CCW direction at the speed of P03-65 returning to the mechanical origin. After the CCW limit is activated, the motor decelerates to move in CW direction. After the HS limit is activated and then left, the first Z signal is the zero origin;

The starting position is on theHS limit: the motor runs at low speed in CW direction according to P03-66, and when it leaves the HS limit, the first Z signal is the zero origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin. After activating HS limit, it moves in CW direction in reverse direction. When leaving HS limit, the first Z signal is the zero origin;

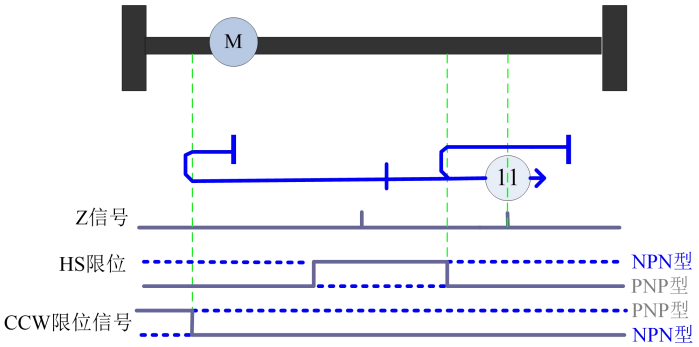


Figure 11 Schematic diagram of eleven tracks of return to zero mode

Return to zero mode12

WhenP03-61 = 12, select return to zero mode 12:

Take the CW direction end of HS limit as reference point, and the first Z signal in CCW direction as zero point.

The starting position is at theCCW direction side of HS limit: the motor firstly moves in CCW direction at the speed of P03-65 returning to the mechanical origin; after CCW limit is activated, the motor decelerates to move in CW direction; after HS limit is activated and then left, the motor moves in CCW direction at low speed; after HS limit is activated, the first Z signal is the zero origin;

The starting position is onHS limit: the motor runs at low speed in CW direction according to P03-66. After leaving HS limit, the motor runs at low speed in CCW direction. After activating HS limit, the first Z signal is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, and after activating HS limit, the first Z signal is returning to the zero origin;

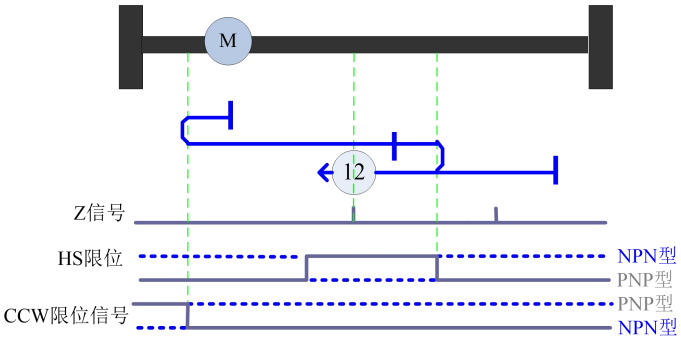


Fig.12 Schematic diagram of twelve tracks in return to zero mode

Return to zero mode13

WhenP03-61 = 13, select return to zero mode 13:

Take the CCW direction end of HS limit as reference point, and the first Z signal in CW direction as zero point.

The starting position is at theCCW direction side of HS limit: the motor moves in CCW direction at the speed of P03-65 to return to the mechanical origin. After the CCW limit is activated, the motor decelerates to move in CW direction. After the HS limit is activated, the first Z signal is the zero origin;

The starting position is onHS limit: the motor runs at low speed in CCW direction according to P03-66. After leaving HS limit, the motor runs at low speed in CW direction. After activating HS limit, the first Z signal is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, and then moves in CW direction at low speed after activating and leaving HS limit. After activating HS limit, the first Z signal is the zero origin;

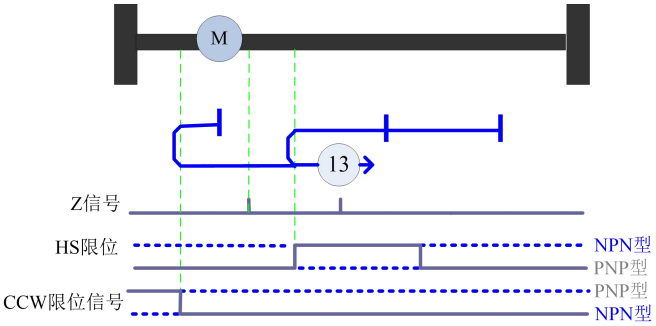


Figure 13 Schematic diagram of thirteen tracks of zero return mode

Return to zero mode14

WhenP03-61 = 14, select return to zero mode 14:

Take the CCW direction end of HS limit as reference point, and the first Z signal in CCW direction as zero point.

The starting position is at theCCW direction side of HS limit: the motor firstly moves in CCW direction at the speed of P03-65 returning to the mechanical origin; after CCW limit is activated, the motor runs in CW direction in reverse direction; after HS limit is activated, the motor runs in CCW direction in reverse direction at low speed according to P03-66; the first Z signal after leaving HS limit is the zero origin;

The starting position is on theHS limit: the motor runs at low speed in CCW direction according to P03-66, and when it leaves the HS limit, the first Z signal is the zero origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, and after activation and then leaving HS limit, the first Z signal is the zero origin;

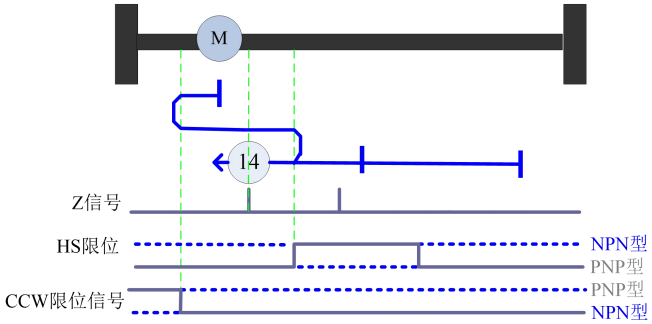


Fig.14 Schematic Diagram of Fourteenth Track of Return to Zero Mode

Return to zero mode15/16

The return to zero mode is reserved. When the return to zero mode is selected, there is no action.

Return to zero mode17

WhenP03-61 = 17, select return to zero mode 17:

The CW direction end limited in CCW direction is the zero point.

The starting position is on theCCW limit: the motor runs at low speed in CW direction according to P03-66, and stops when it leaves the CCW limit, which is the zero return origin;

The starting position is atthe CW direction side of CCW limit: the motor first moves at the speed of P03-65 to return to the mechanical origin in the CCW direction, after the re-CCW limit is activated, the motor runs at a low speed in the CW direction according to the setting of P03-66, and stops when it leaves the CCW limit, which is the zero return origin;

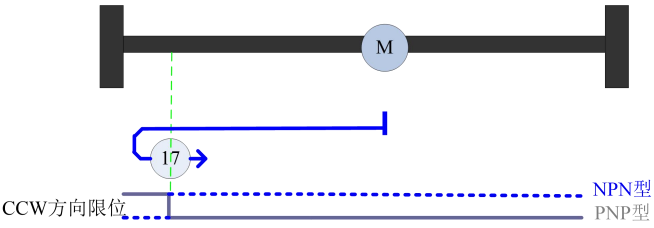


Fig.15 Schematic diagram of seventeen tracks in return to zero mode

Return to zero mode18

WhenP03-61 = 18, select return to zero mode 18:

The end in CCW direction limited by CW direction is zero point.

The starting position is on theCW limit: the motor runs at low speed in CCW direction according to P03-66, and stops when it leaves the CW limit, which is the zero return origin;

The starting position is at theside of CW limit in CCW direction: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin, and after activating CW limit again, it runs at low speed in CCW direction according to P03-66, and stops when it leaves CW limit, which is the zero return origin;

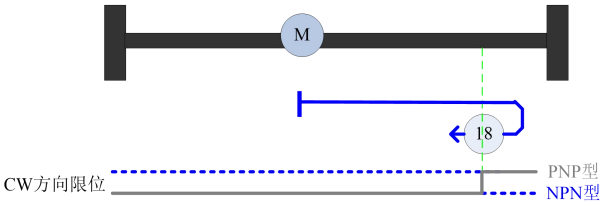


Figure 16 Schematic diagram of eighteen tracks of return to zero mode

Return to zero mode19

WhenP03-61 = 19, select return to zero mode 19:

Take the CCW direction end of HS limit as zero point.

The starting position is at theCCW direction side of HS limit: the motor first moves in CW direction at the speed of P03-65 to return to the mechanical origin, after the HS limit is activated, the motor runs at low speed in CCW direction according to P03-66, and stops when it leaves the HS limit, which is the zero origin;

The starting position is on theHS limit: the motor runs at low speed in CCW direction according to P03-66, and stops when it leaves the HS limit, which is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor firstly moves in CW direction at the speed of P03-65 returning to the mechanical origin; when the CW limit is activated, the motor moves in CCW direction in reverse; after the HS limit is activated, the motor decelerates and runs at low speed according to the setting of P03-66; when it leaves the HS limit, it stops; this point is the zero return origin;

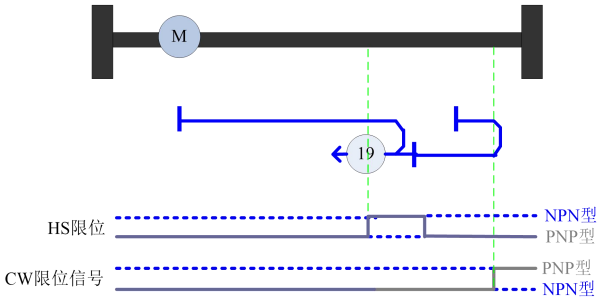


Figure 17 Schematic diagram of nineteen tracks of zero return mode

Return to zero mode20

WhenP03-61 = 20, select return to zero mode 20:

Take the CCW direction end of HS limit as zero point.

The starting position is at theside of HS limit CCW direction: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin, and stops when HS limit is activated, which is the zero return origin;

The starting position is on theHS limit: the motor runs at low speed in CCW direction according to P03-66, and runs in CW direction in reverse direction after leaving the HS limit. When the HS limit is activated again, it stops, and this point is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor firstly moves in CW direction at the speed of P03-65 returning to the mechanical origin. When CW limit is activated, the motor runs in CCW direction in reverse direction. After HS limit is activated, the motor decelerates and runs at low speed according to P03-66. When it leaves HS limit, it runs in CW direction in reverse direction. When HS limit is activated again, it stops. This point is the zero return origin;

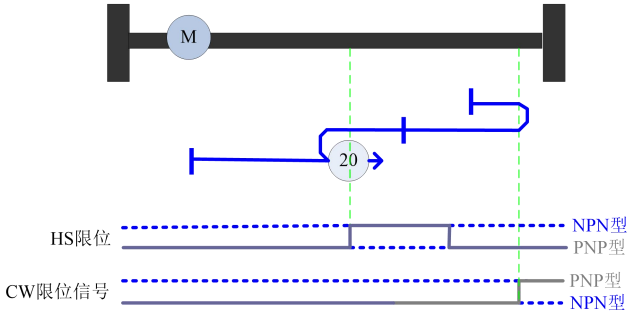


Figure 18 Schematic diagram of twenty tracks of zero return mode

Return to zero mode21

WhenP03-61 = 21, select return to zero mode 21:

Take the CW direction end of HS limit as zero point.

The starting position is at theCCW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, when CCW limit is activated, it runs in CW direction in reverse direction, after HS limit is activated, it decelerates and runs at low speed according to P03-66 setting, and stops when it leaves HS limit, this point is the zero origin;

The starting position is on theHS limit: the motor runs at low speed in CW direction according to P03-66, and stops when it leaves the HS limit, which is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, when the HS limit is activated, the motor runs at low speed in CW direction according to P03-66, and stops when it leaves the HS limit, which is the zero return origin;

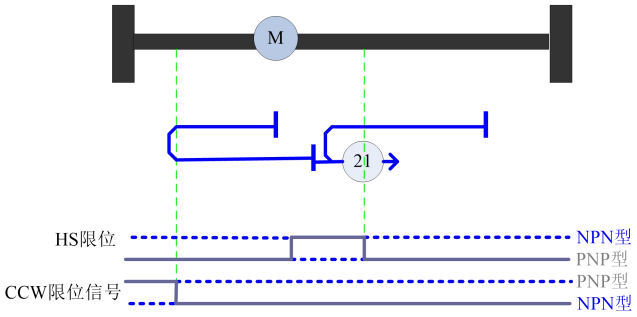


Fig.19 Schematic diagram of 21 tracks of return to zero mode

Return to zero mode22

WhenP03-61 = 22, select return to zero mode 22:

Take the CW direction end of HS limit as zero point.

The starting position is at theCCW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin. When the CCW limit is activated, the motor will run in CW direction in reverse. After the HS limit is activated, the motor will decelerate and run at low speed according to the setting of P03-66. After leaving the HS limit, the motor will run in CCW direction in reverse. When the HS limit is activated, the motor will stop. This point is the zero return origin.

The starting position is on theHS limit: the motor runs at a low speed in the CW direction according to P03-66. After leaving the HS limit, it runs in the CCW direction in the reverse direction. When the HS limit is activated, it stops. This point is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, and stops when HS limit is activated, which is the zero return origin;

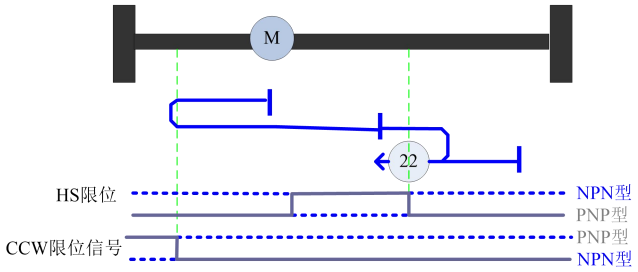


Fig.20 Schematic Diagram of Twenty-two Trajectories in Return to Zero Mode

Return to zero mode23

WhenP03-61 = 23, select return to zero mode 23:

Take the CCW direction end of HS limit as zero point.

The starting position is at theCCW direction side of HS limit: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin. After activating HS limit, it runs in CCW direction in reverse direction. When it leaves HS limit, it stops. This point is the zero return origin;

The starting position is on theHS limit: the motor runs at low speed in CCW direction according to P03-66, and stops when it leaves the HS limit, which is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor firstly moves in CW direction at the speed of P03-65 returning to the mechanical origin; when the CW limit is activated, the motor runs in CCW direction in reverse; when the HS limit is activated, the motor runs at a reduced speed; when the motor leaves the HS limit, the motor stops; this point is the zero return origin;

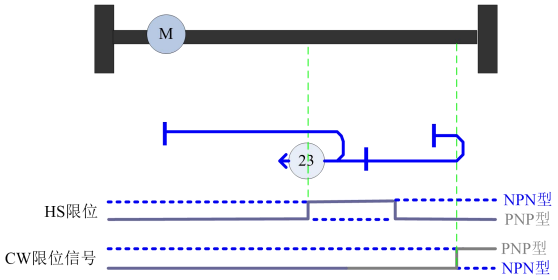


Figure 21 Schematic diagram of 23 tracks of return to zero mode

Return to zero mode24

WhenP03-61 = 24, select return to zero mode 24:

Take the CCW direction end of HS limit as zero point.

The starting position is at theside of HS limit CCW direction: the motor moves in CW direction at the speed of P03-65 returning to the mechanical origin, and stops when HS limit is activated, which is the zero return origin;

Starting position is onHS limit: it runs in CCW direction at low speed; when it leaves HS limit, it runs in CW direction in reverse direction; when HS limit is activated, it stops; this point is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor firstly moves in CW direction at the speed of P03-65 returning to the mechanical origin; when the CW limit is activated, the motor runs in CCW direction in reverse; when the HS limit is activated, the motor runs in CCW direction at reduced speed; when the motor leaves the HS limit, the motor runs in CW direction in reverse; when the HS limit is activated, the motor stops; this point is the zero return origin;

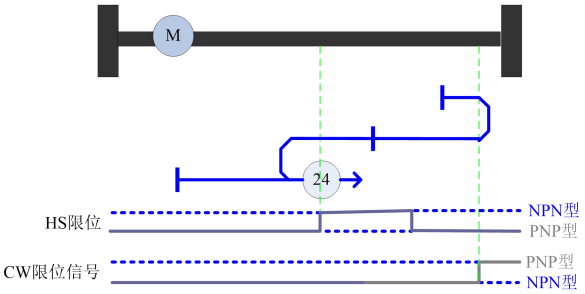


Fig.22 Schematic Diagram of Twenty-four Trajectories of Return to Zero Mode

Return to zero mode25

WhenP03-61 = 25, select return to zero mode 25:

Take the CW direction end of HS limit as zero point.

The starting position is at theCCW direction side of HS limit: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin. After activating HS limit and then leaving, the motor reversely moves in CCW direction at the low speed set by P03-66, and stops when HS limit is activated. This point is the zero return origin;

Starting position is onHS limit: run in CCW direction at low speed; after leaving HS limit, run in CCW direction in reverse direction according to P03-66 to set low speed; stop when HS limit is activated, and this point is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin, and when the CW limit is activated, the motor moves in CCW direction in reverse direction, and stops when HS is activated. This point is the zero return origin;

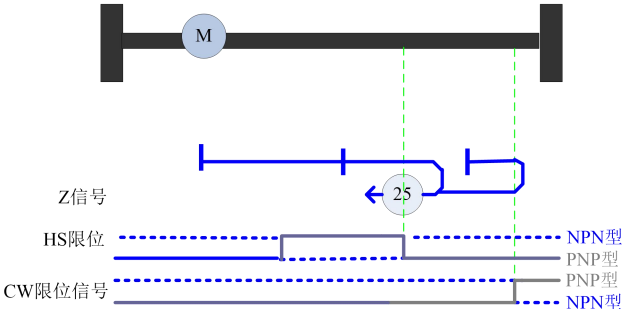


Figure 23 Schematic diagram of 25 tracks of return to zero mode

Return to zero mode26

WhenP03-61 = 26, select return to zero mode 26:

Take the CW direction end of HS limit as zero point.

The starting position is at theCCW direction side of HS limit: the motor first moves in CW direction at the speed of P03-65 returning to the mechanical origin, after activating HS limit, decelerate to move in CW direction, and stop when leaving HS limit, this point is the zero return origin;

The starting position is on theHS limit: it runs in the CW direction at low speed, and stops when it leaves the HS limit. This point is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor firstly moves in CW direction at the speed of P03-65 returning to the mechanical origin; after the CW limit is activated, the motor moves in CCW direction in reverse direction; after the HS limit is activated, the motor decelerates to move in CW direction, and stops when it leaves the HS limit; this point is the zero return origin;

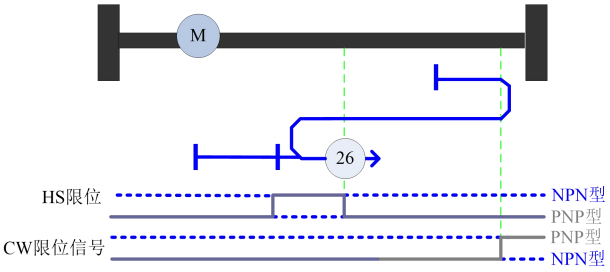


Fig.24 Schematic diagram of 26 tracks of zero return mode

Return to zero mode27

WhenP03-61 = 27, select return to zero mode 27:

Take the CW direction end of HS limit as zero point.

The starting position is at theside of HS limit in CCW direction: the motor firstly moves in CCW direction at the speed of P03-65 returning to the mechanical origin; after the CCW limit is activated, the motor moves in CW direction in reverse direction; after the HS limit is activated, the motor decelerates to move in CW direction, and stops when it leaves the HS limit; this point is the zero return origin;

The starting position is on theHS limit: it runs in the CW direction at low speed, and stops when it leaves the HS limit. This point is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor firstly moves in the CCW direction at the speed of P03-65 returning to the mechanical origin; after the CW limit is activated, the motor moves in the CCW direction in reverse; after the HS limit is activated, the motor decelerates to move in the CW direction, and stops when it leaves the HS limit; this point is the zero return origin;

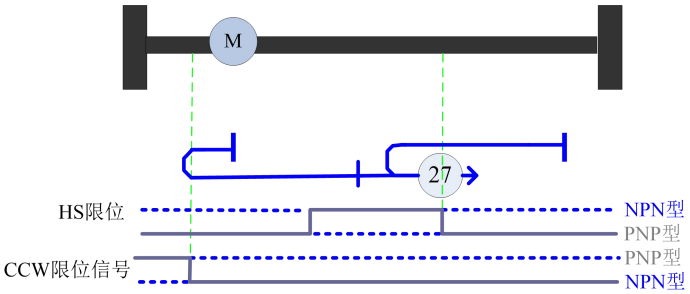


Fig.25 Schematic Diagram of Track 27 of Return to Zero Mode

Return to zero mode28

WhenP03-61 = 28, select return to zero mode 28:

Take the CW direction end of HS limit as zero point.

The starting position is at theCCW direction side of HS limit: the motor firstly moves in CCW direction at the speed of P03-65 returning to the mechanical origin; after the CCW direction limit is activated, the motor moves in CW direction in reverse direction; after the HS limit is activated, the motor decelerates to move in CW direction; after leaving the HS limit, the motor moves in CCW direction in reverse direction according to P03-66 to set the low speed; when the HS limit is activated again, the motor stops; this point is the zero return origin;

Starting position is onHS limit: run in CW direction at low speed, run in CCW direction in reverse direction after leaving HS limit according to P03-66 to set low speed, stop when HS limit is activated again, this point is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, and when the CW limit is activated, it runs in CCW direction in reverse direction, and stops when the HS limit is activated. This point is the zero return origin;

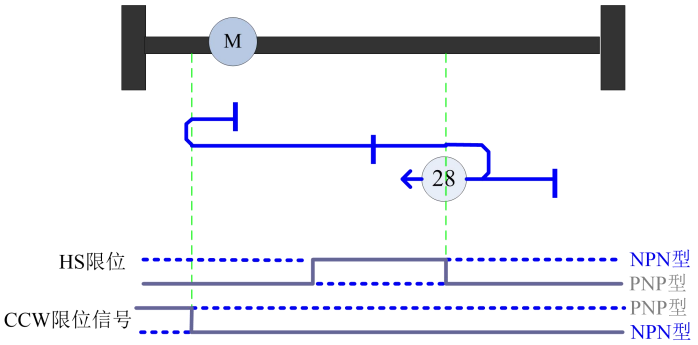


Figure 26 Schematic diagram of 28 tracks of return to zero mode

Return to zero mode29

WhenP03-61 = 29, select return to zero mode 29:

Take the CCW direction end of HS limit as zero point.

The starting position is at theside of HS limit in CCW direction: the motor firstly moves in CCW direction at the speed of P03-65 returning to the mechanical origin; after the CCW limit is activated, the motor moves in CW direction in reverse direction; when the HS limit is activated, the motor stops; this point is the zero return origin;

Starting position is onHS limit: run in CCW direction at low speed, run in CW direction in reverse direction after leaving HS limit according to P03-66 to set low speed, and stop when HS limit is activated again, this point is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, and after activating and then leaving HS limit, it decelerates to move in CW direction, and stops when HS limit is activated. This point is the zero return origin;

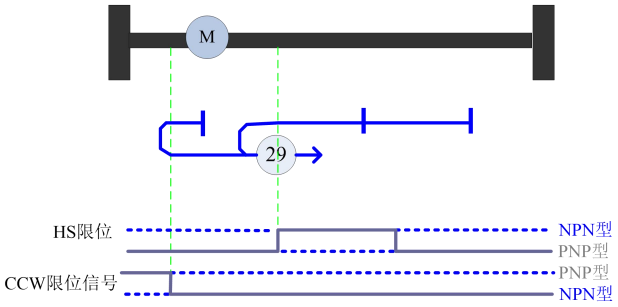


Figure 27 Schematic diagram of 29 tracks of return to zero mode

Return to zero mode30

WhenP03-61 = 30, select return to zero mode 30:

Take the CCW direction end of HS limit as zero point.

The starting position is at theCCW direction side of HS limit: the motor firstly moves in CCW direction at the speed of P03-65 returning to the mechanical origin; after the CCW direction limit is activated, the motor runs in CW direction in reverse direction; after the HS limit is activated, the motor runs in CCW direction in reverse direction at low speed according to P03-66; when the motor leaves the HS limit, it stops; this point is the zero return origin;

The starting position is on theHS limit: it runs in the CCW direction at low speed, and stops when it leaves the HS limit, which is the zero return origin;

The starting position is atthe CW direction side of HS limit: the motor first moves in CCW direction at the speed of P03-65 returning to the mechanical origin, after activating HS limit, it moves in CCW direction at low speed, and stops when leaving HS limit, and this point is the zero return origin;

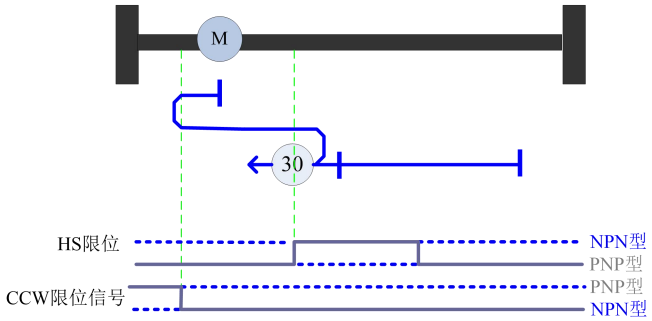


Figure 28 Return to zero mode 30 track schematic diagram

Return to zero mode31

The return to zero mode is reserved. When the return to zero mode is selected, there is no action.

Return to zero mode32

The return to zero mode is reserved. When the return to zero mode is selected, there is no action.

Return to zero mode33

WhenP03-61 = 33, select return to zero mode 33:

Take the first Z signal in CCW direction as zero point.

The motor runs in the CCW direction and stops when the first Z signal is found. This point is zero.

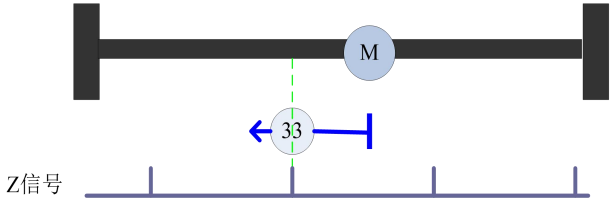


Figure 29 Return to zero mode 33 track diagram

Return to zero mode34

WhenP03-61 = 34, select return to zero mode 34:

Take the first Z signal in CW direction as zero point.

The motor runs in the CW direction and stops when the first Z signal is found. This point is zero.

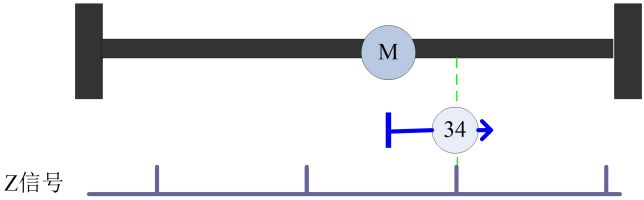


Figure 30 Return to zero mode 34 track diagram

Return to zero mode35

WhenP03-61 = 35, select return to zero mode 35:

Take the current point as the zero position.