

# PREFACE

This manual applies to Wecon VD2 series servo drives.

In order to use this series of servo drive equipment correctly, please read this manual carefully in advance and save it for later use.

In the course of use, if you have any doubts about the function and performance of this equipment, please contact our technicians for relevant assistance and use this equipment smoothly.

The company's products are constantly improving and upgrading, the contents of this manual are subject to change without notice.

This book is suitable for introductory and use reference books for elementary and intermediate readers. At the same time, all interpretation rights of this book belong to our company.



## CAUTION

The danger caused by failure to operate as required may result in serious injuries or even death.



## WARNIN

Due to the danger caused by failure to operate as required, it may cause moderate or minor injuries, and equipment damage.

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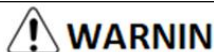
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## Chapter 1 Safety reminder

### 1.1 Safety Precautions

This section explains the important items that users must observe, such as product confirmation, storage, transportation, installation, wiring, operation, inspection, and disposal. Please follow the steps required by this manual for trial operation.



◆ After the power is turned off for more than 5 minutes and the power indicator light goes out, use a multimeter to confirm that the voltage across the high-voltage capacitor has fallen to a safe voltage, and then disassemble and assemble the driver, otherwise it may cause electric shock due to residual voltage.

◆ Never touch the inside of the servo drive, otherwise it may cause electric shock.

◆ Please insulate the connection part of the power terminal, otherwise it may cause electric shock.

◆ The grounding terminal of the servo drive must be grounded, otherwise it may cause electric shock.

◆ Please install the servo drive, servo motor, and external braking resistor on non-combustible materials, otherwise it may cause a fire.

◆ Between the power supply and the main circuit power supply of the servo drive (three-phase L1, L2, L3), be sure to connect an electromagnetic contactor and a non-fuse circuit breaker, otherwise when the equipment fails, the large current may not be cut off. This may cause a fire.

◆ In the servo drive and servo motor, please do not mix with oil, grease and other flammable foreign objects and screws, metal pieces and other conductive foreign objects, otherwise it may cause a fire.

◆ When the servo motor is connected to the machine, if an operation error occurs, it will not only cause damage to the machine, but also sometimes cause personal safety accidents.

◆ Do not damage or pull the cable forcefully, do not subject the cable to excessive force, or place heavy objects underneath, otherwise electric shock may occur, causing the product to stop operating or burn out.

Do not use the brake of the brake motor for normal braking, otherwise it may cause a malfunction.

◆ Except for the designated operator, do not set up, disassemble and repair the equipment, otherwise it may cause electric shock or injury.

◆ Do not remove the cover, cables, connectors and optional accessories while the power is on, otherwise it may cause electric shock.

◆ Please install a stop device on the machine side to ensure safety.

◆ Please take measures to ensure that personal safety will not be endangered when restarting, otherwise it may cause injury.

◆ Do not modify this product, otherwise it may cause personal injury or mechanical damage.

## 1.2 Precautions for storage and handling



Please keep and install in the following environment:

- Places without direct sunlight;
- Places where the ambient temperature does not exceed product specifications;
- Places where the relative humidity does not exceed product specifications;
- A place where condensation will not occur due to rapid changes in temperature;
- Places free of corrosive gas and flammable gas;
- No combustibles nearby;
- Places with less dust, dust, salt and metal powder;
- Places where there is no splash of water, oil, medicine, etc.;
- Places where vibration or shock will not affect the product (places that exceed product specifications);
- Places that will not be exposed to radiation;

Storage or installation in environments other than the above may cause product failure or damage:

- Please use the correct method for handling according to the weight of the product;
- Do not hold the motor cable or motor shaft for transportation;
- When operating the servo unit and servo motor, please pay attention to sharp parts such as the corners of the equipment.

## 1.3 Precautions during installation



Do not install this product in a place where water may splash or in an environment prone to corrosion;

Be sure to comply with the requirements of the installation direction, otherwise it may cause equipment failure;

When installing, please make sure to keep the specified distance between the servo drive and the inner surface of the electric cabinet and other machines, otherwise it may cause fire or equipment failure;

Do not apply excessive impact, otherwise it may cause equipment failure;

Do not sit on the product or place heavy objects on it, otherwise it may cause personal injury;

Do not use this product near flammable gases and combustibles, otherwise there may be a risk of electric shock or fire;

Do not block the suction and exhaust ports, and do not allow foreign objects to enter the product, otherwise it may cause equipment failure or fire due to aging of internal components;

## 1.4 Precautions when wiring



### CAUTION

Do not connect the three-phase power supply to the output terminals U, V, W of the servo drive, otherwise it may damage the equipment or cause a fire;

Please connect the output U, V, W of the servo drive and the U, V, W of the servo motor directly. Do not use the electromagnetic contactor during the connection, otherwise it may cause abnormal operation or malfunction of the equipment;

When the DO output terminal is connected to the relay, please pay attention to the polarity of the freewheeling diode, otherwise the driver may be damaged and the signal cannot be output normally;

Please fix the power terminal and the motor terminal firmly, otherwise it may cause a fire hazard;

Do not connect the 220V servo unit directly to the 380V power supply;

Do not pass the power line and signal line through the same pipe or bundle them together. When wiring, the power line and signal line should be separated by more than 30cm;

Use twisted-pair shielded cables for signal cables and encoder cables, and the shielding layer should be grounded at both ends;

The wiring length of the signal input line is recommended to be within 3M, and the wiring length of the encoder is recommended to be within 15M;

When using in the following places, please take adequate shielding measures:

When interference occurs due to static electricity;

Places where strong electric or magnetic fields are generated;

Places where there may be radiation;

When checking the job, first make sure that the CHARGE indicator is off.



During the trial run, to prevent accidents, please run the servo motor without load (not connected to the drive shaft), otherwise it may cause injury.

◆When the servo motor is running, do not touch its rotating parts, otherwise it may cause injury.

Be sure to set the correct moment of inertia ratio, otherwise it may cause vibration.

When it is installed on the supporting machine and starts to run, please set the user parameters that are consistent with the machine in advance. If you start running without parameter setting, it may cause the machine to lose control or malfunction.

◆When installing on the supporting machinery and starting operation, please put the servo motor in a state where it can be stopped urgently at any time, otherwise it may cause injury.

When using a servo motor on a vertical axis, please install a safety device to prevent the workpiece from falling under alarms, overtravel, etc. In addition, please set the servo lock stop setting when overtravel occurs, otherwise the workpiece may fall in the overtravel state.

Since extreme user parameter adjustments and setting changes can cause the servo system to become unstable, please never make settings, otherwise it may cause injury.

When an alarm occurs, reset the alarm after removing the cause and ensuring safety, and restart operation, otherwise it may cause injury.

◆Except for special purposes, do not change the maximum speed value (P1-10). If you change it carelessly, it may damage the machine or cause injury.

◆When the power is turned on and within a period of time after the power is cut off, the heat sink of the servo drive, external braking resistor, servo motor, etc. may experience high temperature. Please do not touch it, otherwise it may cause burns.

◆If the power supply is restored after an instantaneous power failure occurs during operation, the machine may restart suddenly, so please do not approach the machine, and press the stop button when the power is off, and operate after the power supply is stable.



## 1.6 Precautions during maintenance and inspection



### CAUTION

- ◆ The power on and off operations should be performed by professional operators.
- ◆ When testing the insulation resistance of the drive, please cut off all connections with the drive first, otherwise it may cause the drive to malfunction.
- ◆ Do not use gasoline, alcohol, acidic and alkaline detergents to avoid discoloration or damage to the casing.
- ◆ When replacing the servo drive, please transfer the user parameters of the servo drive to be replaced to the new servo drive before restarting operation, otherwise the machine may be damaged.
- ◆ Do not change the wiring when the power is on, otherwise it may cause electric shock or injury.
- ◆ Do not disassemble the servo motor, otherwise it may cause electric shock or injury.

## Chapter 2 Product information

### 2.1 Servo drive products

#### 2.1.1 Servo drive model naming

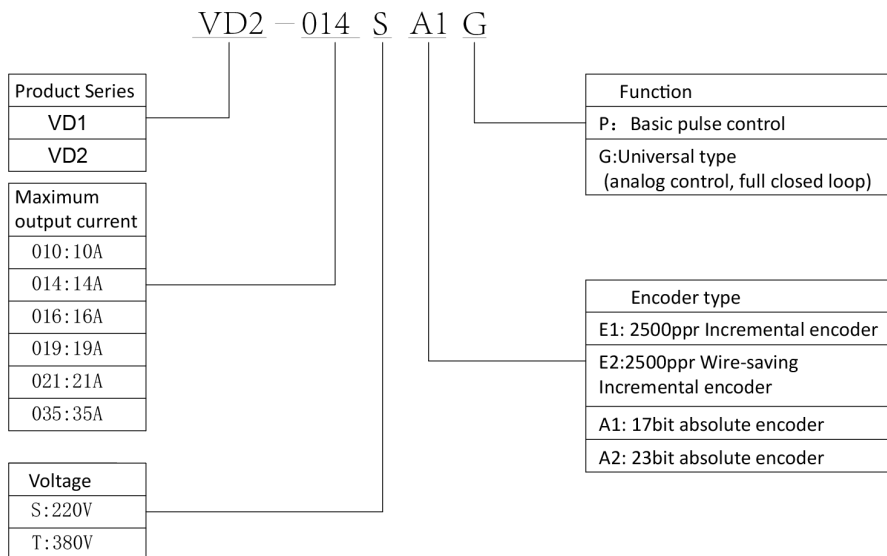
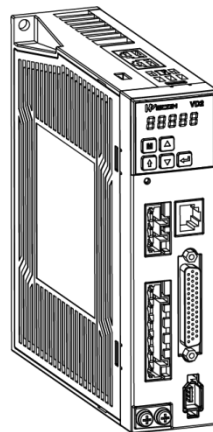
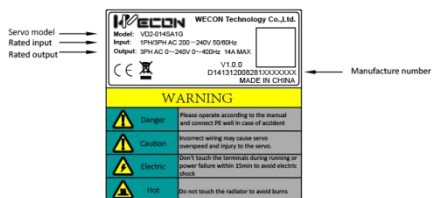


Figure 2.1 Servo drive naming

Type A drive:



Type B drive:

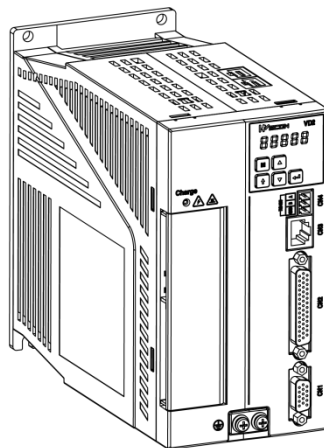
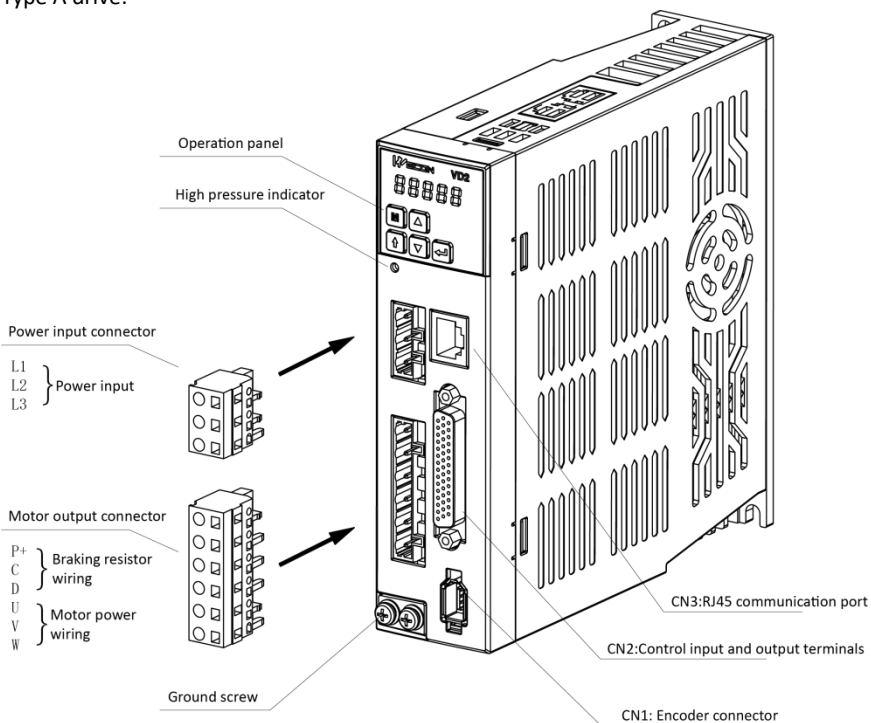


Figure 2.2 Servo drive nameplate

## 2.1.2 The composition of the servo drive

Type A drive:



## Type B drive:

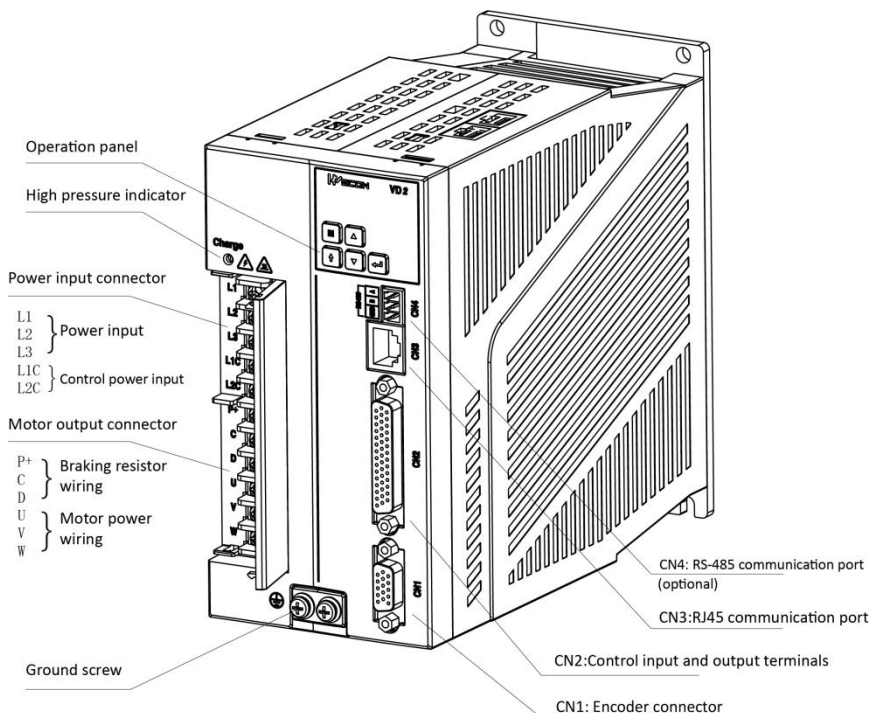
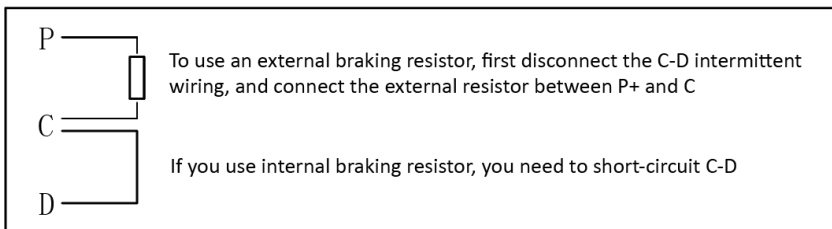


Figure 2.3 The composition of the servo drive

Note: When using external braking resistor or internal braking resistor, special short-circuit processing is required, as shown in the figure below:



Drive model	VD2 Series Servo Drive
Main circuit power supply	Use single-phase 200V~240VAC 50/60Hz power supply below 750W;
	1.0 kW ~2.6 kW can use single-phase 220VAC or three-phase 220VAC. It is recommended to use three-phase 220VAC power supply;
	Above 2.3kw (inclusive), three-phase 220VAC power supply is required.
Control power Note 1	Single phase 200V~240VAC 50/60Hz
Braking method	Built-in braking resistor, external braking resistor can be connected

### 2.1.3 Electrical specifications of the servo drive

(Note 1: Only B-type drives support independent power supply for control power, and A-type drives do not have a separate control power supply)

## 2.2 Servo Motor Products

### 2.2.1 Servo motor model naming

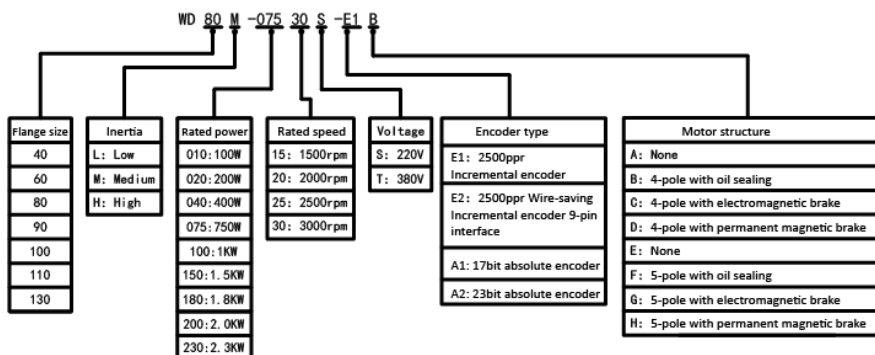


Figure 2.4 Servo motor naming

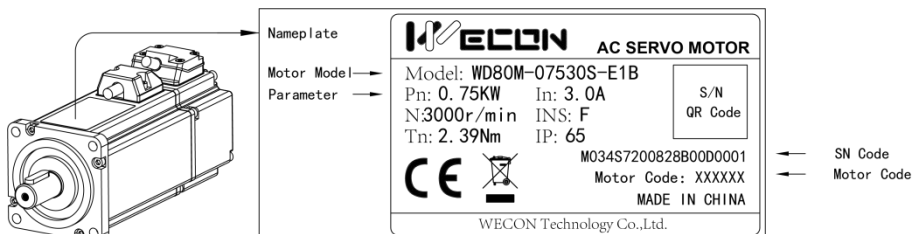


Figure 2.5 Servo motor nameplate

### 2.2.2 The composition of the servo motor

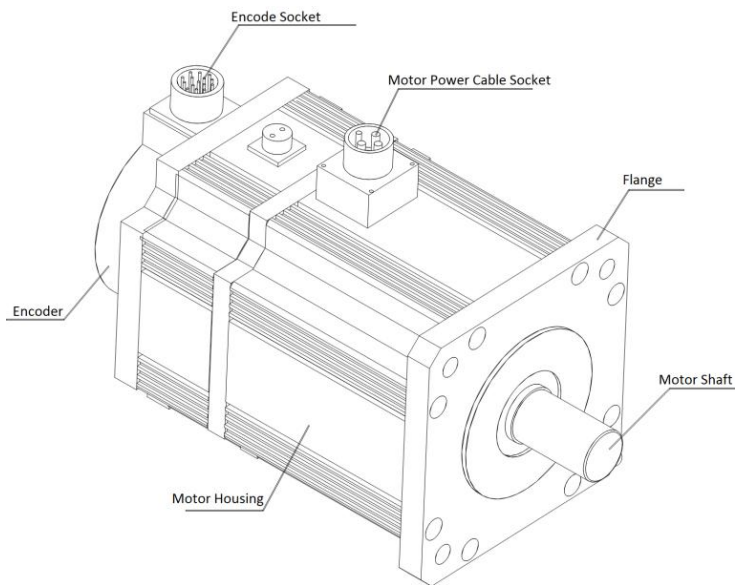


Figure 2.6 The motor composition of 1.0KW-2.3KW

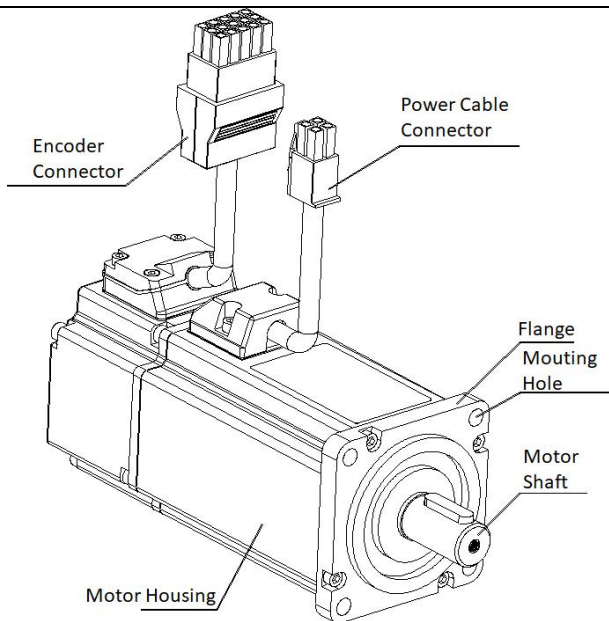


Figure 2.7 Motor composition of 400W-750W

### 2.2.3 Servo motor electrical specifications

Weighing motor model	Flange size	rated power (KW)	Rated torque (N.m)	Voltage (V)	Rated speed (rpm)	Encoder type
WD60M-02030S-A1X	60	0.2	0.64	220	3000	17bit absolute value
WD60M-04030S-A1X	60	0.4	1.27	220	3000	17bit absolute value
WD80M-07530S-A1X	80	0.75	2.39	220	3000	17bit absolute value
WD80M-10025S-E1X	80	1.00	4	220	2500	2500 line incremental
WD80M-11030S-E1X	80	1.10	3.5	220	3000	2500 line incremental
WD110M-18030S-E1X	110	1.80	6	220	3000	2500 line incremental
WD130M-10025S-E1X	130	1.00	4	220	2500	2500 line incremental
WD130M-15015S-E1X	130	1.50	10	220	1500	2500 line incremental
WD130M-15025S-E1X	130	1.50	6	220	2500	2500 line incremental
WD130M-18025S-E1X	130	1.80	6	220	3000	2500 line incremental
WD130M-20025S-E1X	130	2.00	7.7	220	2500	2500 line incremental
WD130M-23015S-E1X	130	2.30	15	220	1500	2500 line incremental



## Chapter 3 Servo drive and motor installation

### 3.1 Servo drive installation

#### 3.1.1 Dimensions (Unit: mm)

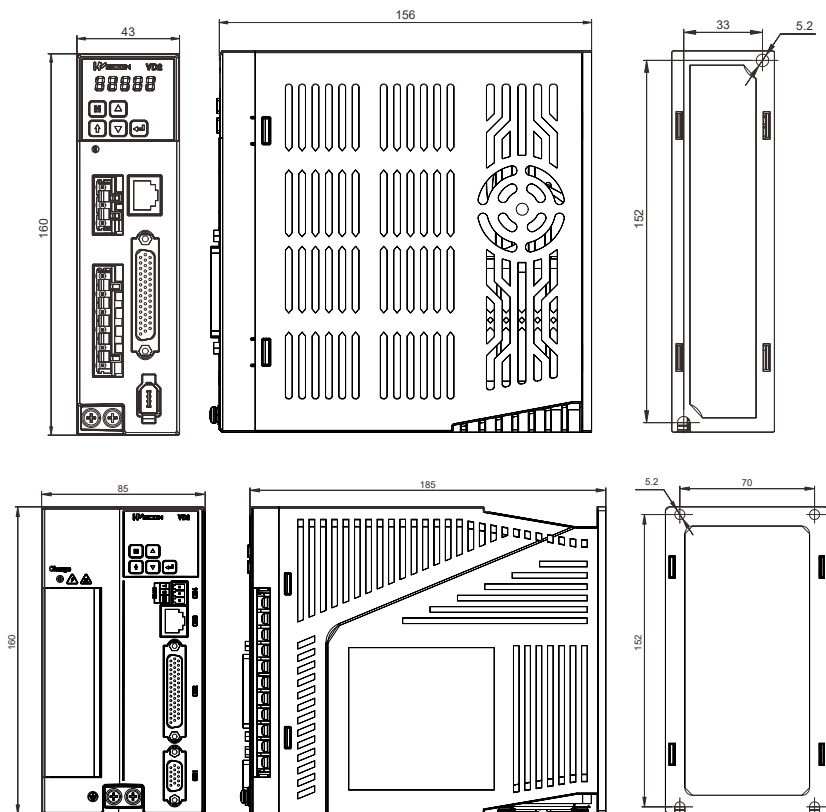


Figure 3.1 Servo drive installation dimension drawing

#### 3.1.2 Installation site

- 1、 Please install it in an installation cabinet free from sunlight and rain;
- 2、 In a place without vibration;
- 3、 Please do not install in an environment with high temperature, humidity, dust and metal dust;
- 4、 Do not use this product near corrosive and flammable gas environments such as hydrogen sulfide, chlorine, ammonia, sulfur, chlorinated gas, acid, alkali, salt, etc., or combustible materials;

### 3.1.3 Installation Environment

The installation environment of the servo drive has a direct impact on the normal function of the drive and its service life. Therefore, the installation environment of the servo drive must meet the following conditions:

Project	Instruction
Ambient temperature	-10℃~40℃ (no freezing)
Use environment humidity	-20%~90%RH (no condensation)
Storage temperature	-20℃~60℃
Storage humidity	-20%~90%RH (no condensation)
Protection level	IP65
Vibration	Less than 0.5G (4.9m/s <sup>2</sup> ), 10~60Hz (non-continuous operation)
Power Systems	TN system*

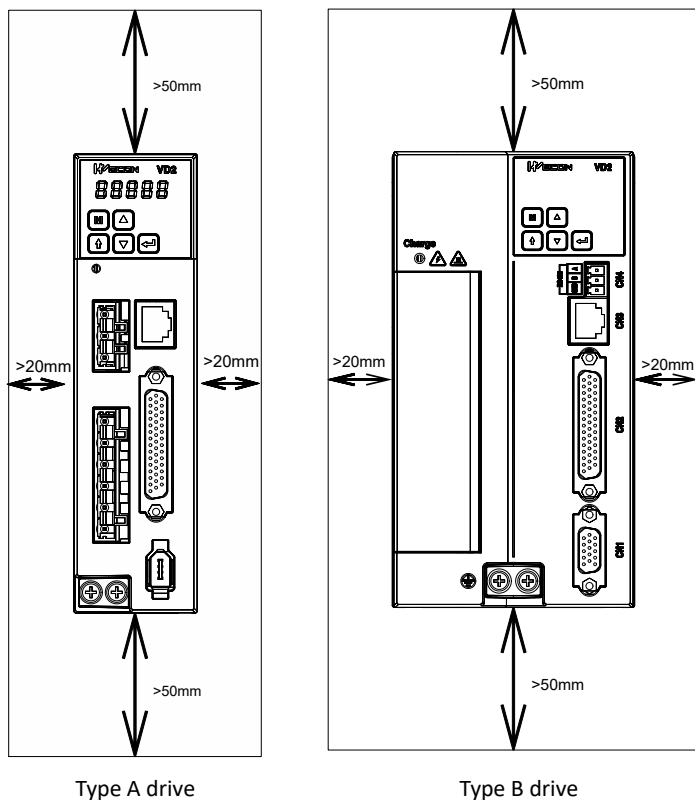
\*: The neutral point of the power system is directly connected to the earth, and the exposed metal components are connected to the earth through a protective grounding conductor.

### 3.1.4 Installation matters

#### 1. Installation specifications

In order to have a good cooling cycle effect, ensure that there is enough ventilation space around it when installing the servo drive. Please be sure to comply with the installation standards in the control cabinet shown in the figure below, otherwise the drive may malfunction.

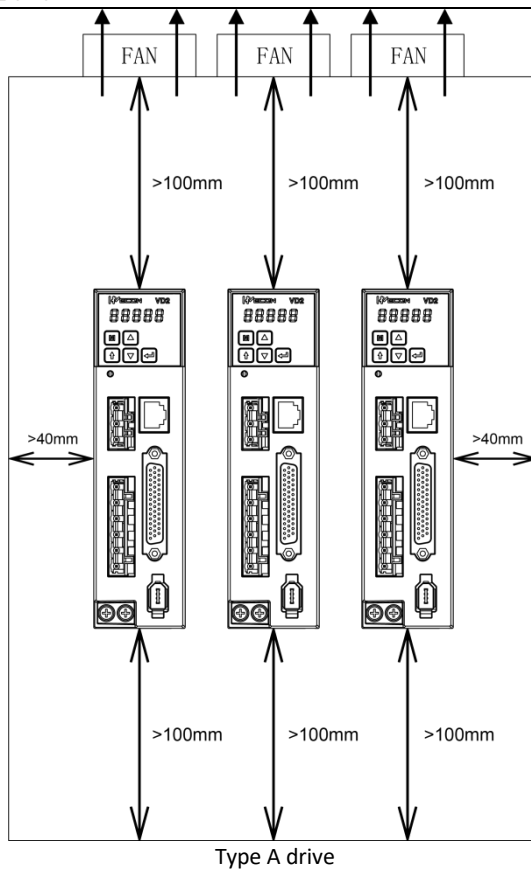
Typical minimum installation size: see (a).

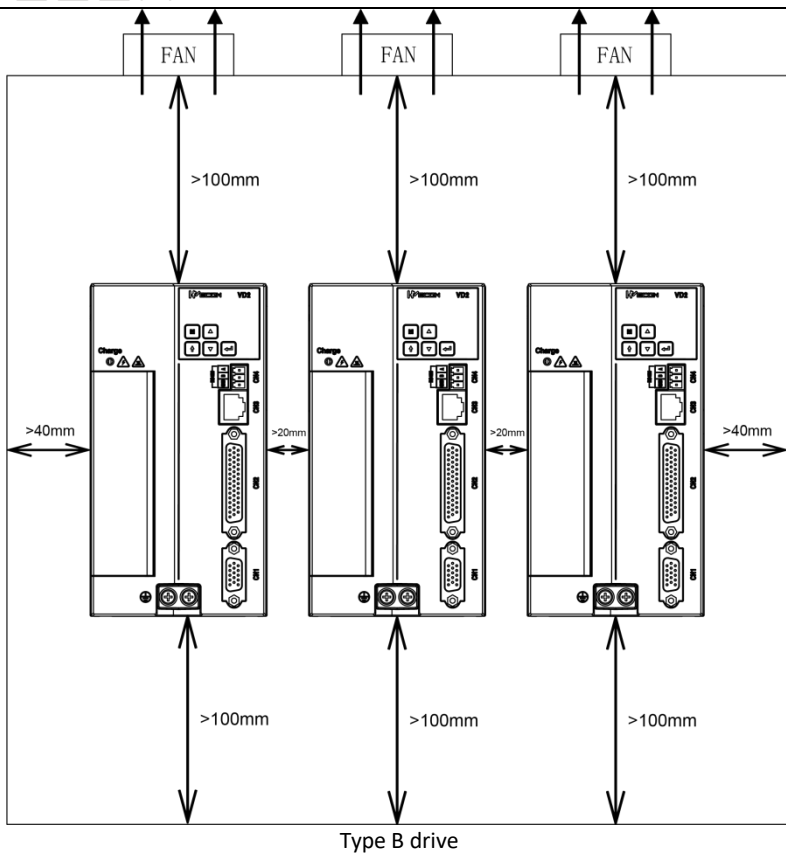


(a) Minimum installation size

## 2. Parallel installation

When multiple units are installed in parallel, the minimum distance between each other is 20mm, and the distance between each other is at least 100mm (as shown in Figure b). To prevent temperature rise, a cooling fan can be placed on the upper part. If you need a smaller spacing installation, please consult our company.





(b) Parallel installation size

### 3. Installation direction

When installing the servo drive, please face the front of the servo drive (panel control interface) to the operator so that the servo drive is perpendicular to the wall.

## 3.2 Servo motor installation

### 3.2.1 Dimensions (unit: mm)

#### Installation dimensions of 60 flange servo motor

specification	60 flange series motor	
Rated torque (N.m)	0.64	1.27
L without brake (mm)	85	92
L with brake (mm)	99.5	116.5

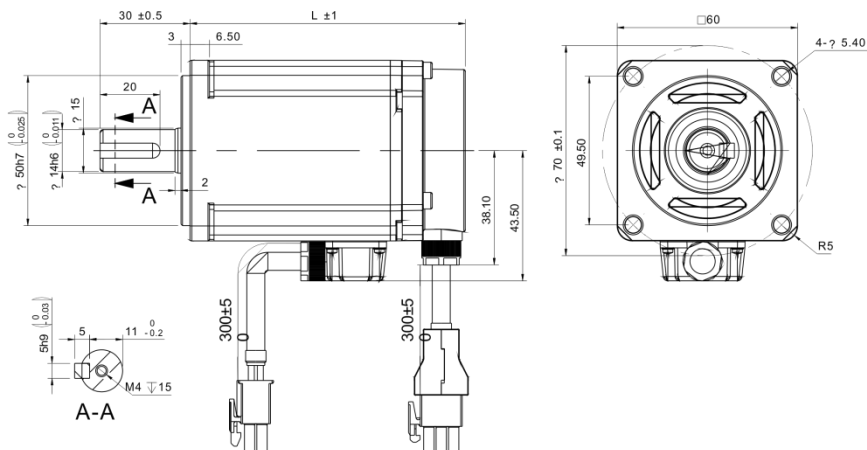


Figure 3.2 Installation dimension drawing of 60 flange servo motor

#### 80 flange servo motor installation dimensions

specification	80 flange series motor			
Rated torque (N.m)	1.3	2.4	3.5	4
L without brake (mm)	124	151	179	191
L with brake (mm)	166	193	221	233

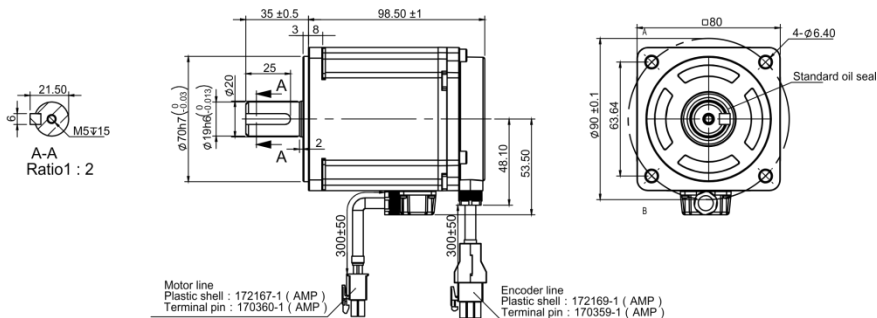


Figure 3.3 Installation dimension drawing of 80 flange servo motor

### 110 flange servo motor installation dimensions

specification	110 flange series motor
Rated torque (N.m)	6
L without brake (mm)	219
L with brake (mm)	293

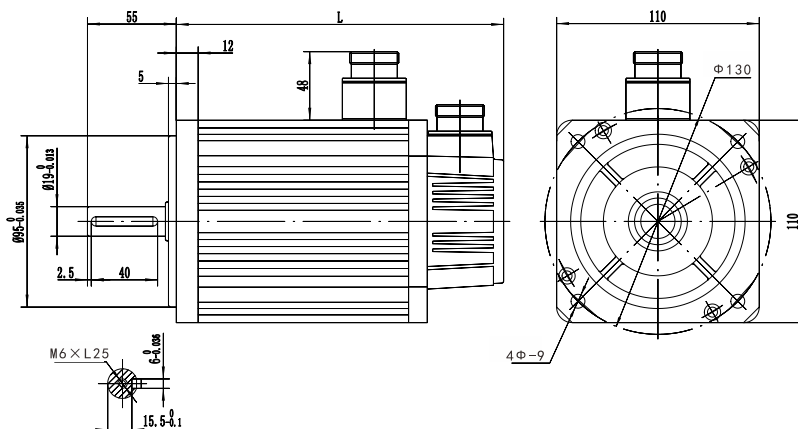


Figure 3.4 Installation dimension drawing of 110 flange servo motor

### 130 flange servo motor installation dimensions

specification	130 flange series motor								
Rated torque (N.m)	4	5	6	7.7	10			15	
					1000rp m	1500rp m	2500rp m	1500rp m	2500rp m
LA without brake (mm)	166	171	179	192	213		209	241	231
LA with brake (mm)	223	234	242	255	280		276	308	298

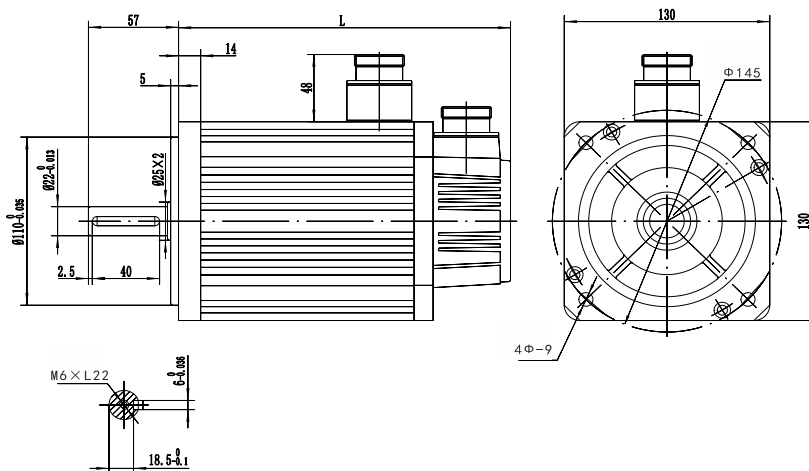


Figure 3.5 Installation dimension drawing of 130 flange servo motor

### 3.2.2 Installation site

- 1、Do not use the motor near corrosive, flammable gas environment, combustible materials, etc., such as hydrogen sulfide, chlorine, ammonia, sulfur, chlorinated gas, acid, alkali, salt, etc.;
- 2、Do not remove the oil seal in places where there is grinding fluid, oil mist, iron powder, cutting, etc.;
- 3、Do not use the motor in a closed environment. Closed environment will cause high temperature of the motor and shorten the service life;
- 4、Keep away from heat sources such as stoves.

### 3.2.3 Installation Environment

The installation environment of the servo motor has a direct impact on the normal function of the motor and its service life. Therefore, the installation environment of the servo motor must meet the following conditions:



project	Instruction
Ambient temperature	-10℃~40℃ (no freezing)
Use environment humidity	-20%~90%RH (no condensation)
Storage temperature	-20℃~60℃
Storage humidity	-20%~90%RH (no condensation)
Protection level	IP65
Vibration	Less than 0.5G (4.9m/s <sup>2</sup> ), 10~60Hz (non-continuous operation)

### 3.2.4 Installation Precautions

Project	Instruction
Rust inhibitor	Before installation, please wipe clean the "anti-rust agent" on the shaft extension end of the servo motor, and then do the relevant anti-rust treatment.
Encoder note	<ul style="list-style-type: none"> <li>● When installing a pulley on a servo motor shaft with a keyway, use a screw hole at the shaft end. In order to install the pulley, first insert the double-headed nail into the screw hole of the shaft, use a washer on the surface of the coupling end, and gradually lock it into the pulley with a nut;</li> <li>● For the servo motor shaft with keyway, use the screw hole on the shaft end to install;</li> <li>● For shafts without keyways, friction coupling or similar methods are used;</li> <li>● When removing the pulley, use the pulley remover to prevent the bearing from being strongly impacted by the load;</li> <li>● To ensure safety, install a protective cover or similar device in the rotating area, such as a pulley installed on the shaft.</li> </ul>
centering	When linking with the machine, please use a coupling and keep the axis of the servo motor and the axis of the machine in a straight line
Installation direction	Servo motor can be installed in horizontal or vertical direction
Oil and water countermeasures	<p>When using in a place with dripping water, please use it after confirming the protection level of the servo motor. When using it in a place where oil dripping on the shaft penetration part, do not remove the oil seal of the servo motor.</p> <p>Service conditions of servo motor with oil seal:</p> <ul style="list-style-type: none"> <li>● When using, please make sure the oil level is lower than the lip of the oil seal;</li> <li>● The oil seal can be used in a state of good splashing degree of oil foam;</li> <li>● When the servo motor is installed vertically upwards, please be careful not to accumulate oil on the oil seal lip.</li> </ul>

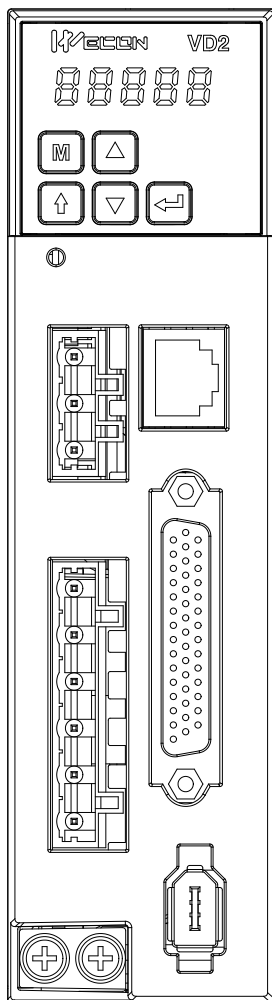
Cable stress	Do not "bend" the wire or apply "tension" to it, especially the core diameter of the signal wire is 0.2mm or 0.3mm. During the wiring process, do not make it too tight.
Processing of the connector part	<p>Regarding the connector part, please note the following:</p> <ul style="list-style-type: none"> <li>● When connecting the connector, please confirm that there is no foreign matter such as garbage or metal pieces in the connector;</li> <li>● When connecting the connector to the servo motor, be sure to connect it from the side of the main circuit cable of the servo motor first, and the grounding of the main line cable must be reliably connected. If you connect one side of the encoder cable first, the encoder may malfunction due to the potential difference between PEs;</li> <li>● When connecting, please make sure the pin arrangement is correct;</li> <li>● The connector is made of resin, please do not apply impact to avoid damage to the connector;</li> <li>● Do not apply stress to the connector part while carrying the cable while the cable is connected. If stress is applied to the connector part, the connector may be damaged.</li> </ul>

## Chapter 4 Wiring

### 4.1 Main circuit wiring

#### 4.1.1 Servo drive terminal

Type A schematic diagram of main circuit terminals;



Type B main circuit terminal diagram;

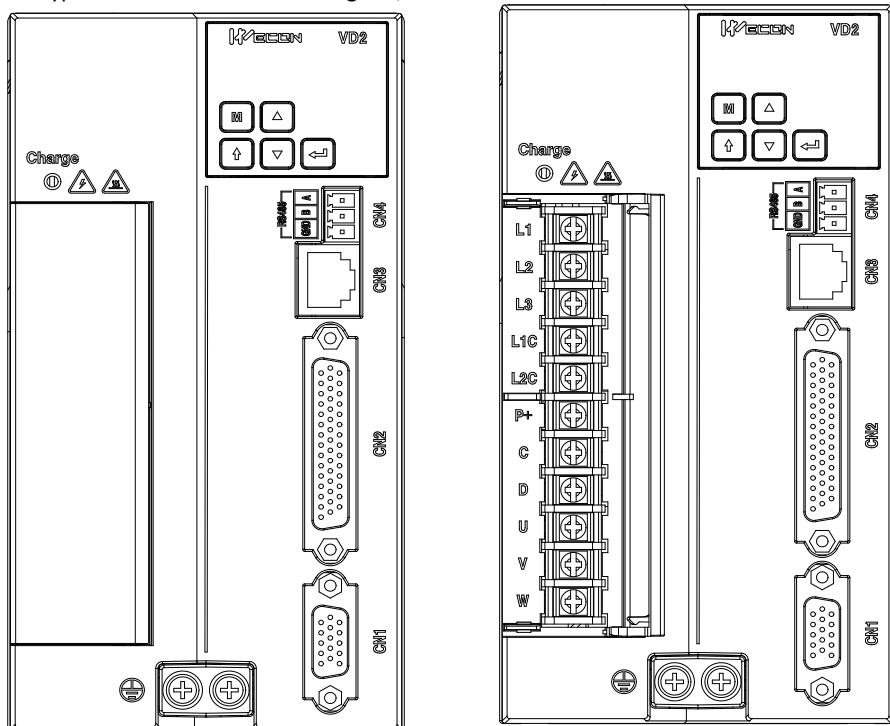
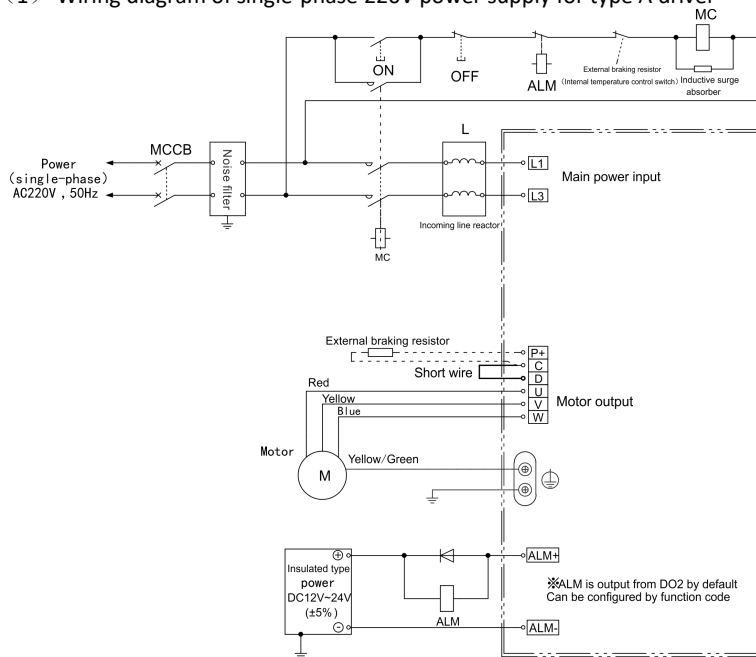


Figure 4.1 Schematic diagram of main circuit terminals

Terminal number	Terminal name	Terminal function
L1	Power input terminal	Connect three-phase 220VAC input power; Single-phase 220VAC input is connected to L1 and L3.
L2		
L3		
L1C	Control power input terminal	Connect any two-phase or single-phase power in the three-phase power supply.
L2C		
P+	Braking resistor terminal	<ul style="list-style-type: none"> <li>Use internal braking resistor: short-circuit C-D (factory default)</li> <li>Use external braking resistor: please disconnect the short wire between C-D, and then connect the external braking resistor between P+ and C;</li> </ul>
C		
D		
U	Motor power line terminal	Connect with the U, V, W of the motor to supply power to the motor.
V		
W		
Ground terminal	Ground terminal	Grounding treatment of the servo drive.

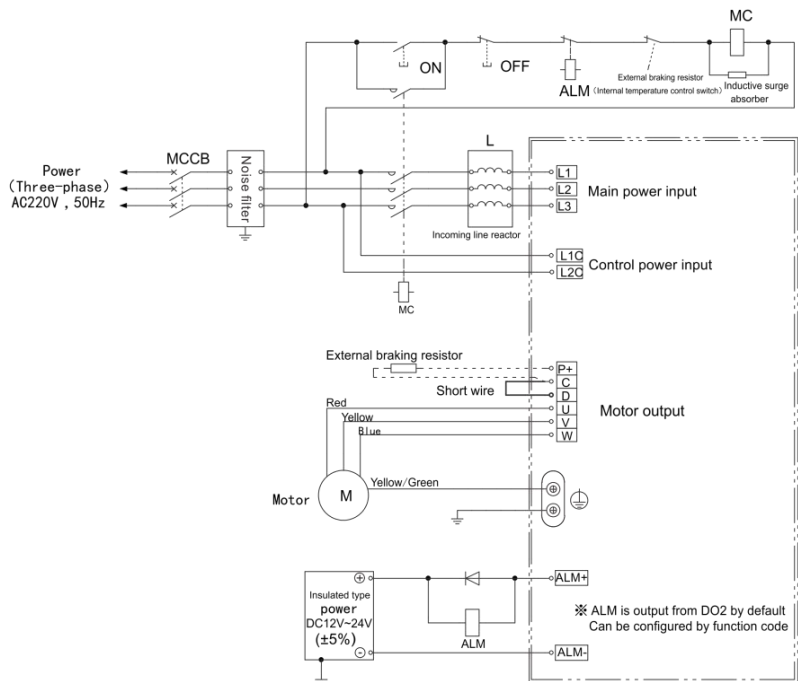
#### 4.1.2 Example diagram of power supply wiring

(1) Wiring diagram of single-phase 220V power supply for type A driver





## (2) Wiring diagram of three-phase 220V main circuit of B-type driver



## 4.2 Servo drive and servo motor power line connection

### 4.2.1 Definition of Rectangular Plug Power Line Sequence

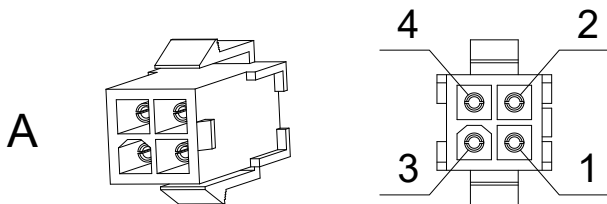


Figure 4.2 Appearance of power line

Pin number	Signal name	Colour
1	U	red
2	V	yellow
3	W	blue

#### 4.2.2 Definition of aviation plug power line sequence

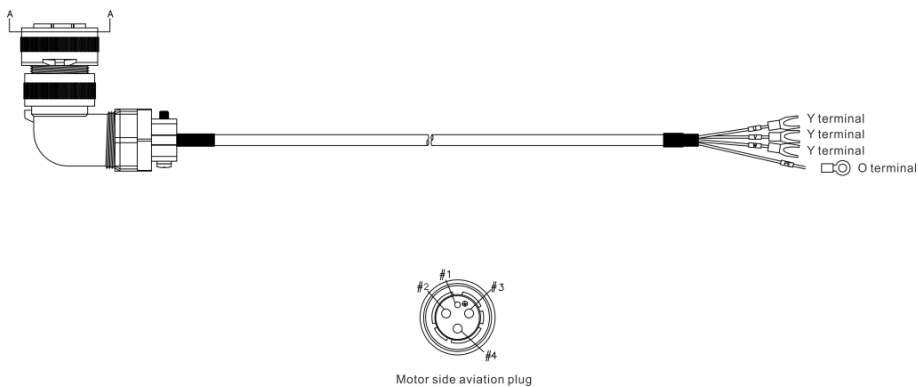


Figure 4.3 Appearance of aviation plug power cord

Aviation plug pin number	Signal name	Cable color	Driver side terminal
2	U	Red	U-shaped terminal
4	V	Yellow	U-shaped terminal
3	W	Blue	U-shaped terminal
1	PE	Yellow/Green	Screw terminal



## 4.3 Encoder connection terminal CN1 wiring

### 4.3.1 Rectangular plug encoder pin and wire sequence definition

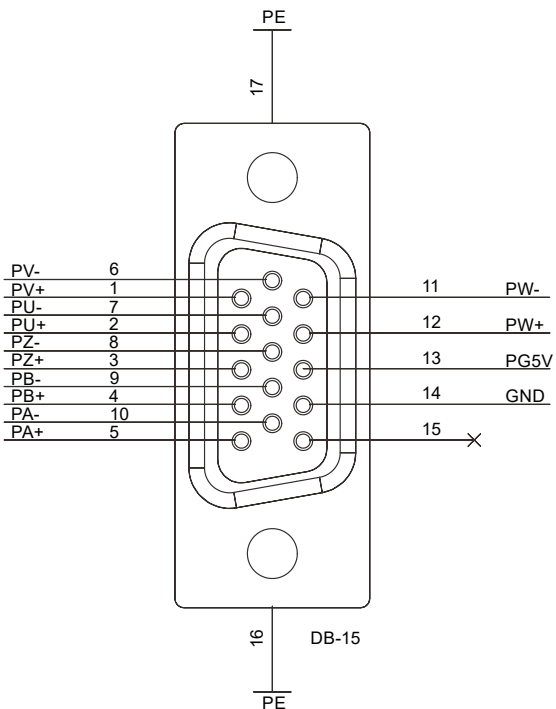


Figure 4.5 Outline drawing of encoder connection terminal CN1 Please update the outline drawing of encoder connection terminal.

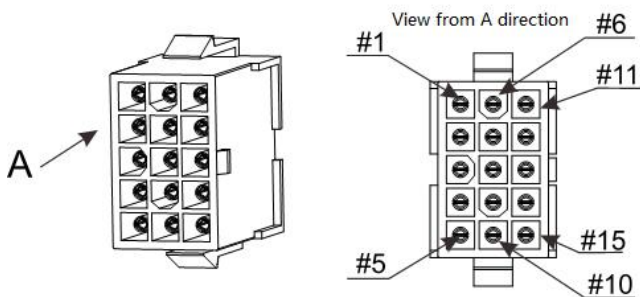


Figure 4.6 Connection terminal of CN1 lead wire

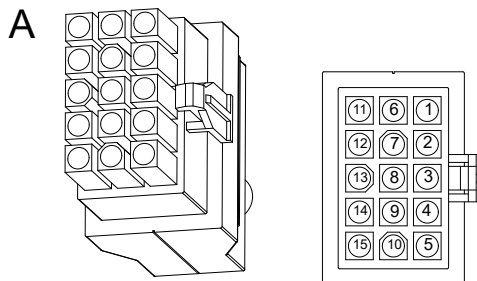


Figure 4.7 Motor encoder lead wire connection terminal

Motor side pin number	Signal name	Cable color	CN1 terminal pin number
1	PE	Shielded wire	shell
2	5V	red	13
3	GND	Red/black	14
9	A+	blue	5
13	A-	Blue/black	10
4	B+	Green	4
14	B-	Green/black	9
7	Z+	Yellow	3
5	Z-	Yellow/black	8
6	U+	Brown	2
8	U-	Brown/black	7
10	V+	Purple	1
12	V-	Purple/black	6
11	W+	Gray	12
15	W-	Gray/black	11

#### 4.3.2 Aviation plug encoder pin and wire sequence definition

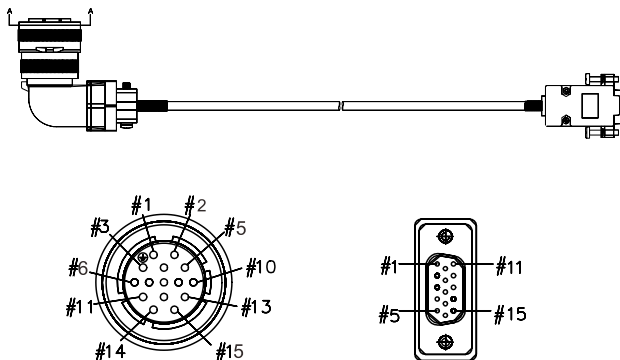


Figure 4.8 Appearance of aviation plug encoder cable

Aviation plug pin number	Signal name	Cable color	CN1 terminal pin number
1	PE	Shielded wire	shell
2	5V	red	13
3	GND	Red/black	14
5	A+	blue	5
8	A-	Blue/black	10
4	B+	Green	4
7	B-	Green/black	9
6	Z+	Yellow	3
9	Z-	Yellow/black	8
10	U+	Brown	2
13	U-	Brown/black	7
11	V+	Purple	1
14	V-	Purple/black	6
12	W+	Gray	12
15	W-	Gray/black	11
None	None	None	
None	None	None	
None	None	None	

#### 4.3.3 Absolute encoder terminal pin

Motor side pin number	Signal name	CN1 terminal pin number
1	-	-
2	-	-
3	PE	Shell
4	SD+	5
5	SD-	6
6	-	-
7	5V	1
8	GND	2
9	-	-

## 4.4 Driver input and output control terminal CN2 wiring

### 4.4.1 CN2 pin distribution diagram

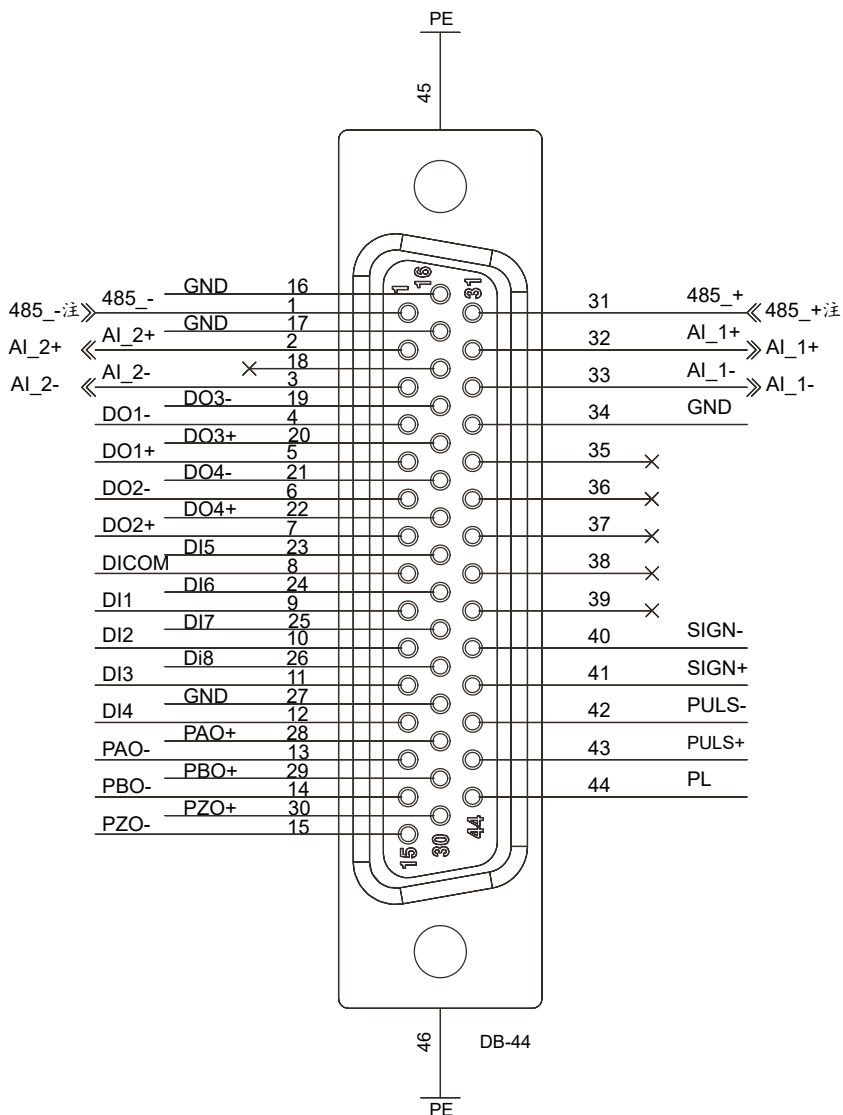
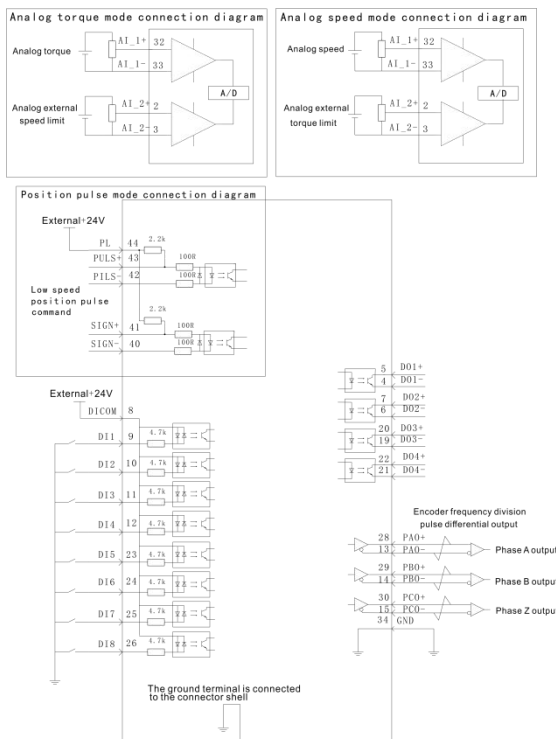


Figure 4.9 The pin layout of the driver input and output terminals CN2

Pin number	Signal name	Pin number	Signal name	Pin number	Signal name
1	485_-	16	GND	31	485_+
2	AI_2+	17	GND	32	AI_1+
3	AI_2-	18	-	33	AI_1-
4	DO1-	19	DO3-	34	GND
5	DO1+	20	DO3+	35	-
6	DO2-	21	DO4-	36	-
7	DO2+	22	DO4+	37	-
8	DICOM	23	DI5	38	-
9	DI1	24	DI6	39	-
10	DI2	25	DI7	40	SIGN-
11	DI3	26	DI8	41	SIGN+
12	DI4	27	GND	42	PULS-
13	PAO-	28	PAO+	43	PULS+
14	PBO-	29	PBO+	44	PL
15	PZO-	30	PZO+		

#### 4.4.2 Wiring diagram of each mode



#### 4.4.3 Position command input signal

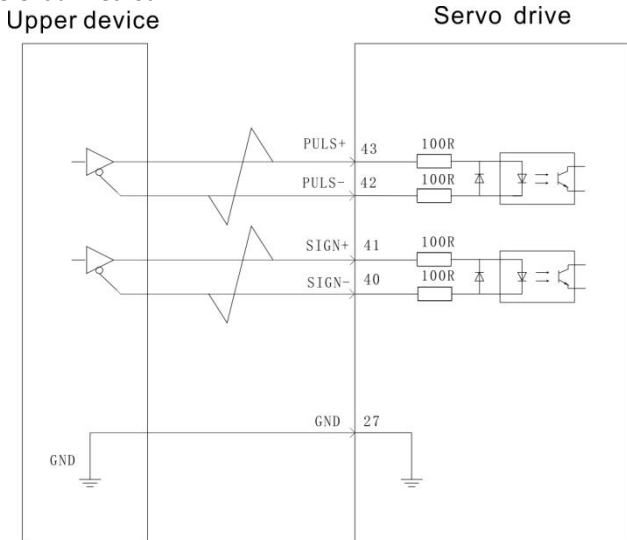
Pin number	Signal name	Features
43	PULS+	Low-speed pulse input mode: differential input, open collector. There are three types of input pulse: ① Direction + pulse (positive logic); ② CW/CCW; ③ A, B phase quadrature pulse (4 times frequency).
42	PULS-	
41	SIGN+	
40	SIGN-	External power input interface for command pulse.
44	PL	

The command pulse and symbol output circuit on the host device side can be selected from two types of differential output or open collector output. The maximum input frequency is shown in the following table:

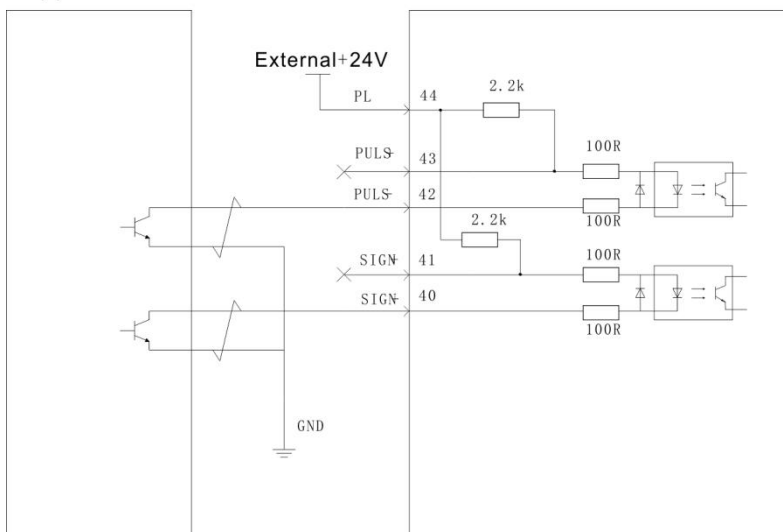
Pulse method	Difference	Open collector
Maximum frequency	500K	200K

#### Low-speed pulse command input

##### (1) Differential method

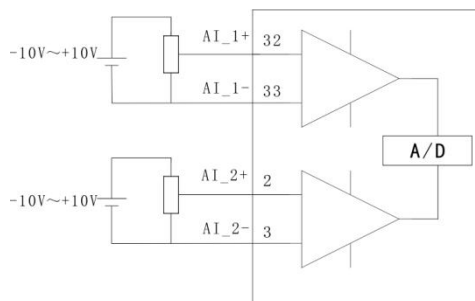


## (2) Open collector method Upper device



### 4.4.4 Analog input signal

Pin number	Signal name	Features
32	AI_1+	AI_1 analog input signal, resolution 12 bits, input voltage range: -10V~+10V.
33	AI_1-	
2	AI_2+	AI_2 analog input signal, resolution 12 bits, input voltage range: -10V~+10V.
3	AI_2-	
17	GND	Analog input signal ground.
34	GND	

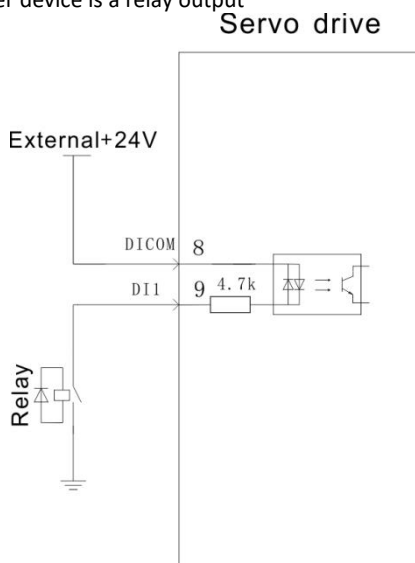


#### 4.4.5 Digital input and output signal

Pin number	Signal name	Default function
9	DI1	Servo enable
10	DI2	Alarm clear
11	DI3	Forward drive prohibited
12	DI4	Reverse drive prohibited
23	DI5	Instruction negation
24	DI6	Command pulse prohibited input
25	DI7	Unused
26	DI8	Unused
8	DICOM	Power input terminal (12-24V)
4	DO1-	Rotation detection
5	DO1+	
6	DO2-	Alarm
7	DO2+	
19	DO3-	Servo ready
20	DO3+	
21	DO4-	Positioning completed
22	DO4+	

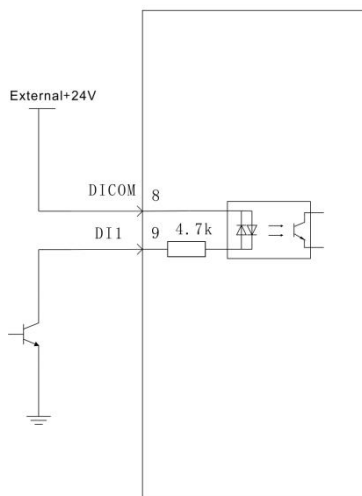
##### (1) Digital input circuit

(A) When the upper device is a relay output





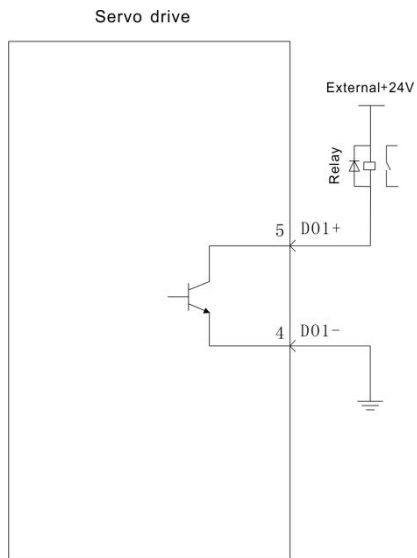
(B) When the upper device is open collector output  
Servo drive



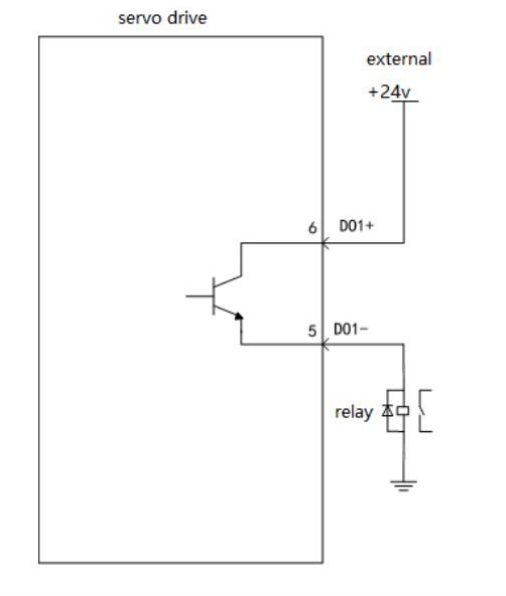
## (2) Digital output circuit

(A) When the upper device is a relay input

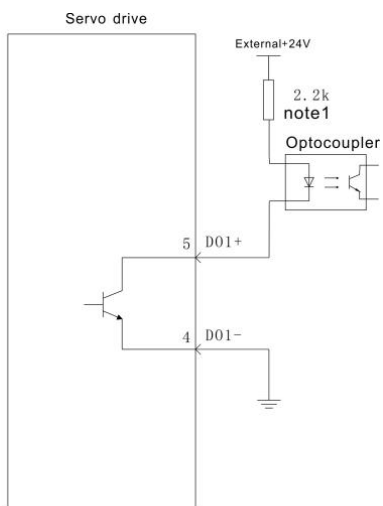
(PNP)



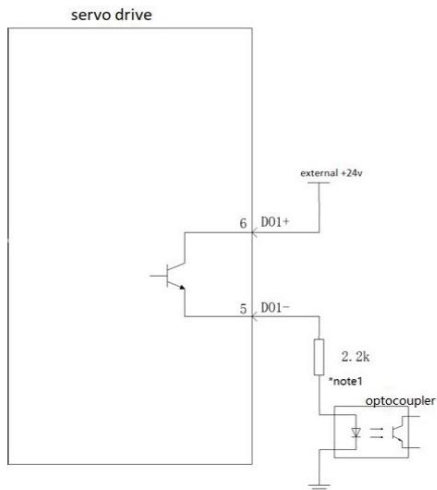
(NPN)



(B) When the upper device is optocoupler input  
(PNP)



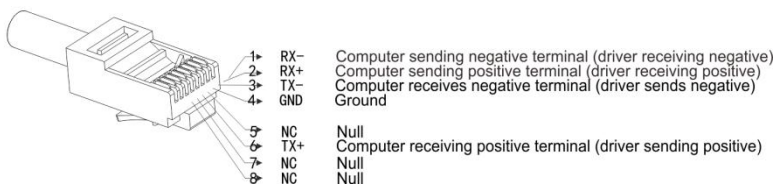
(Note 1: The maximum current should not exceed 50mA)



## 4.5 Communication port CN3/CN4 wiring

### 4.5.1 Communication connector pin definition

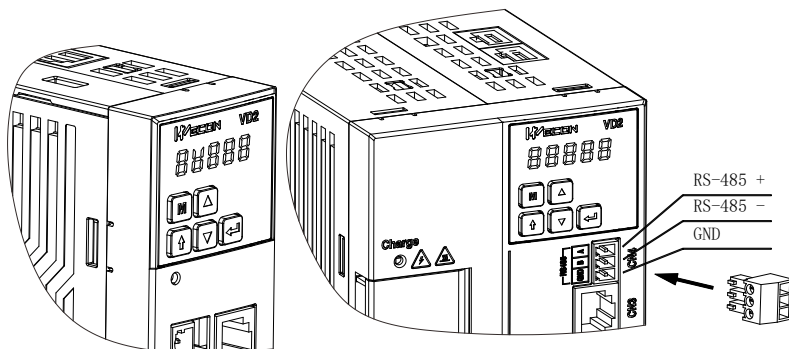
#### (1) Pin definition of CN3



Pin	Name	Features
1	RX-	Computer sending negative terminal (driver receiving negative)
2	RX+	Computer sending positive terminal (driver receiving positive)
3	TX-	Computer receives negative terminal (driver sends negative)
4	GND	Ground terminal
5	NC	Null

6	TX+	Computer receiving positive terminal (driver sending positive)
7	NC	Null
8	NC	Null

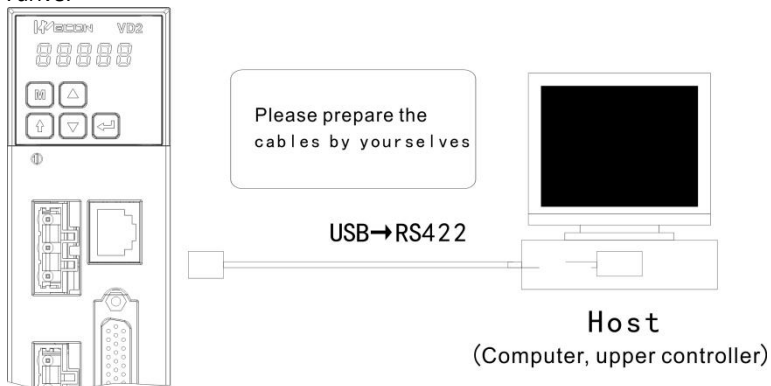
## (2) Pin definition of CN4



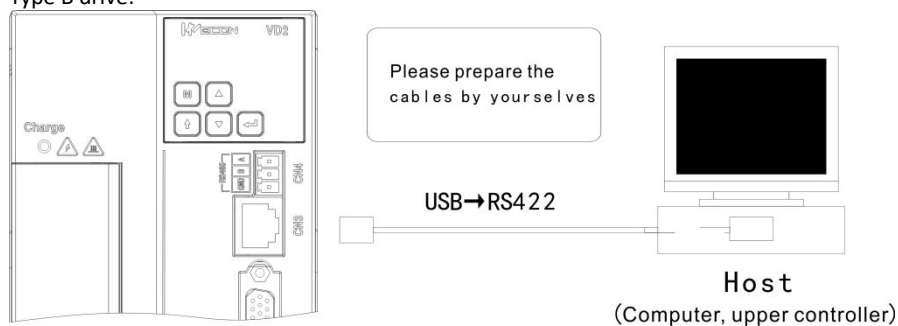
### 4.5.2 Communication with PC

PC and driver communicate with RS-422 through CN3 (RJ45 port) interface.

Type A drive:



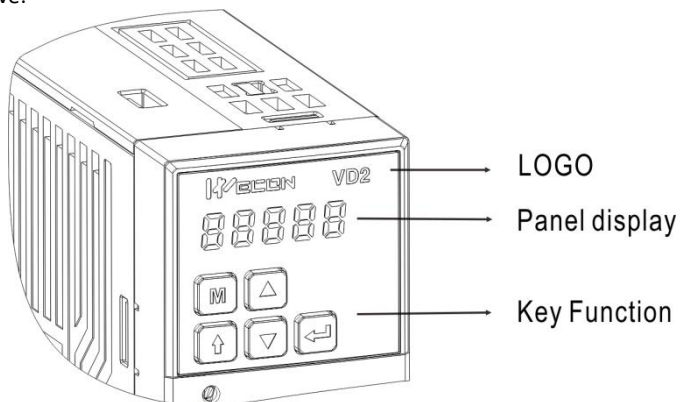
Type B drive:



## Chapter 5 panel

### 5.1 Panel composition

Type A drive:



Type B drive:

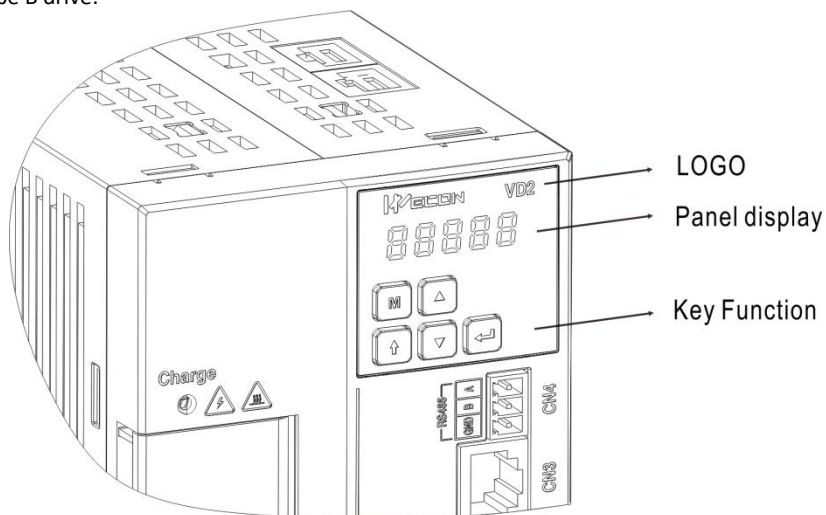







Figure 5.1 Schematic diagram of the appearance of the panel

Icon	Name	Regular function
	mode	Switch between modes Return to the previous menu
	Up (increase)	Increase the blinking value of the LED digital tube
	Down (decrease)	Decrease the blinking value of the LED digital tube
	Shift	Change the blinking position of the LED nixie tube
	Enter (OK)	Enter the next menu Execute commands such as storing parameter settings

When the servo drive is running, the panel can be used for the status display, parameter display, fault display and monitoring display of the servo.

Status display: display the current operating status of the servo drive.

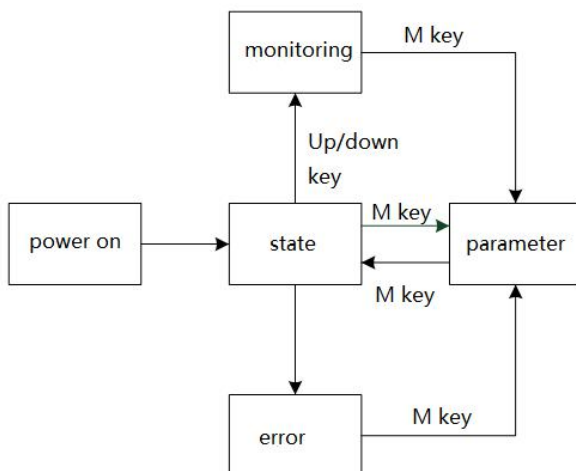
Parameter display: display the function codes corresponding to different functions and the set values of the function codes.

Fault display: display the fault code of the servo drive.

Monitoring display: display the operating parameter values of the servo drive to be observed.

## 5.2 Panel display

### 5.2.1 Display switch




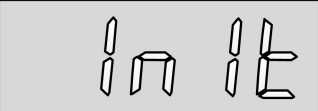
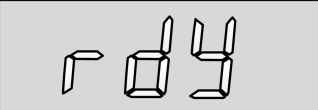

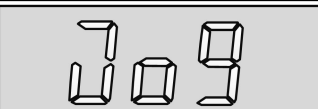
Description:

(1)When the power is turned on, the panel of the servo drive first enters the status display mode.

(2)When the operation fails, when the panel switches from the parameter mode to the status mode, the panel displays in the fault display mode instead of the status display mode.

(3)The status display mode can be switched to the parameter display through the mode key, and the parameter display enters the monitoring display by pressing the mode key, and then switches in turn.

### 5.2.2 Status Display

display	Show occasion	Meaning
	Servo drive is powered on within one second	Servo drive is in initialization state
	Very short time after displaying "88888"	Indicates initialization is complete
	One second after the servo drive is powered on, the servo is ready	The servo is in a ready state, waiting for the enable signal from the servo drive
	Set the servo enable signal S-ON to ON	The servo is in a running state, waiting for the command from the servo or the upper computer
	Jog the servo	Servo is in the state of jog operation


### 5.2.3 Parameter display

(1) Parameter group display

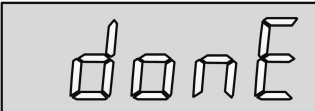
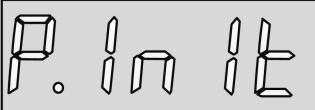
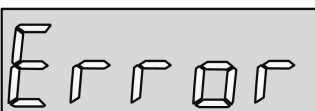
Parameter display is the display of different function codes. The format of function codes is PXX.YY, where PXX represents the group number of the function code, and YY represents the group number of the function code.



Display	Name	Content
PXX.YY	Function code group	XX: Function code group number YY: Number in the function code group

Display	Name	Content
	Control mode, the function code is P00.01	00: Function code group number 01: Number in the function code group

## (2) Parameter setting display

Display	Name	Content
	Parameter set successfully	It means that the parameter value has been set and stored in the servo drive (Done)
	Use system parameter initialization function	The drive is in the process of parameter restoration to factory settings
	When entering the JOG mode, a fault occurs or the parameter setting exceeds the limit (or setting is not allowed)	Prompt that there is a failure when entering JOG mode, return to the previous menu

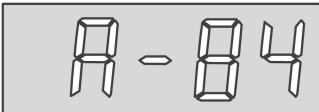
### 5.2.4 Fault display

The panel can display current and historical faults and warning codes. For analysis and troubleshooting of faults and warnings, please refer to "Chapter 7 Faults".

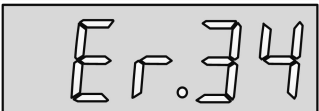
When a single fault or warning occurs, the current fault or warning code is displayed immediately; when multiple faults or warnings occur, the fault code with the highest fault level is displayed.

When a fault occurs, when switching from the auxiliary function to the parameter display function, the corresponding fault or warning code will be displayed, and the current fault and warning code and the past five fault and warning codes will be viewed through the monitor display on the panel.

### 5.2.5 Warning display

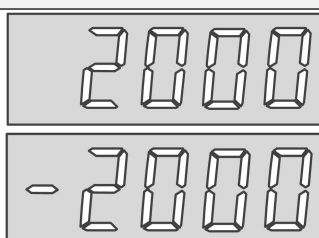
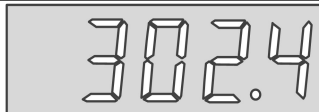
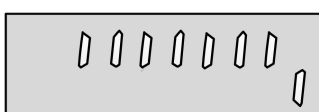
Display	Name	Content
	Parameter modification that needs to be powered on again	Modified the parameters that need to be re-powered on


### 5.2.6 Fault display

Display	Name	Content
	Motor overload protection	Motor overload protection

### 5.2.7 Monitor display

After the servo drive is powered on or the servo enable is ON, you can press the "up/down" key to enter the monitor display mode.

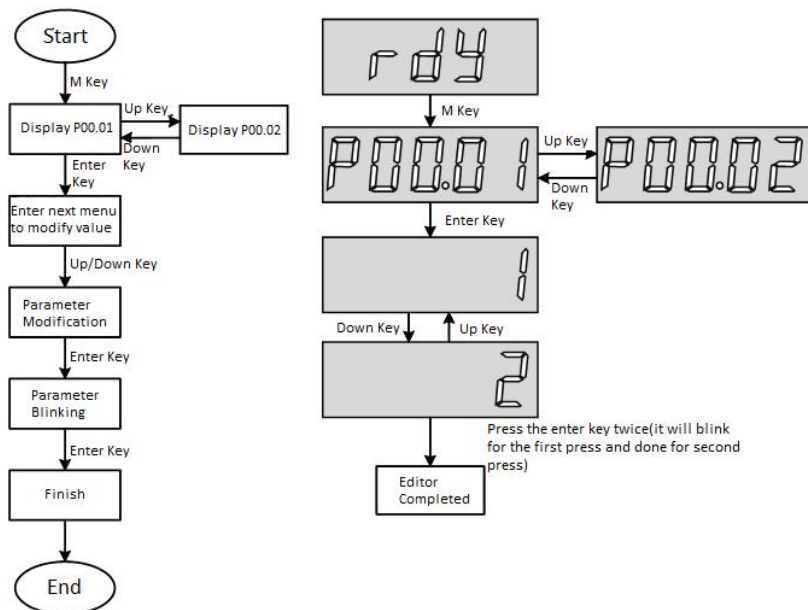
Display	Surveillance number	Name	Unit	Meaning
	U0-02	Servo motor speed	rpm	Indicates the actual operating speed of the servo motor, expressed in decimal.
	U0-31	bus voltage	V	Represents the voltage value between P+ and- of the drive, DC bus voltage
	U0-17	Input signal status	-	Indicates the level status corresponding to the 8 DI terminals, the upper half of the LED light indicates high level, and the lower half light

				indicates low level
	U0-19	Output signal status	-	Indicates the level status corresponding to the 6 DO terminals, the upper half of the LED light indicates high level, and the lower half light indicates low level

## 5.3 Panel operation

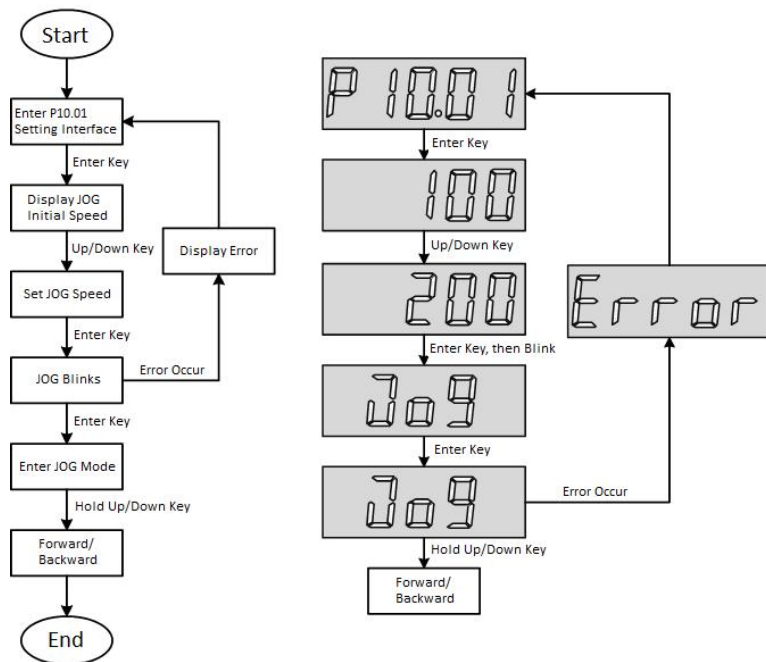
### 5.3.1 Parameter setting

Parameter display, take P0-1 as an example for parameter setting, and change the control mode of the servo drive from position control mode to speed control mode.



### 5.3.2 Jog operation

In the trial operation of the servo motor and the trial operation of the servo drive, you can use the jog operation function, the operation steps:

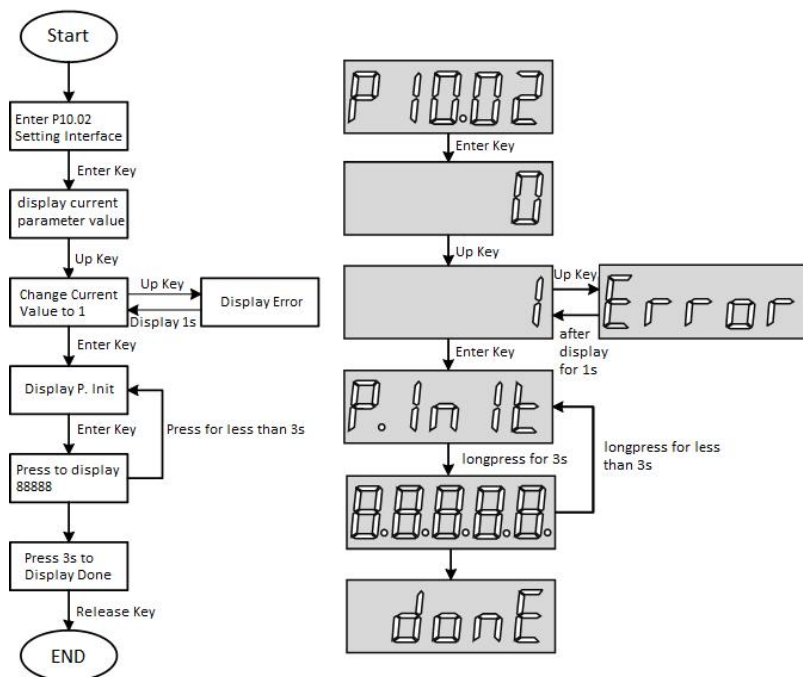


Step description:

- (1) After power on, adjust the function code to P10.01.
- (2) Press the "Enter" key to enter the next menu to set the JOG jog speed.
- (3) After the JOG jog speed is completed, press the "OK" button, the panel displays JOG in a flashing state, press the "OK" button again to enter the JOG mode.
- (4) Long press the "up" and "down" keys to realize the forward and reverse rotation of the motor.
- (5) Press the "Mode" key to exit the JOG mode.

Display Error reason: please refer to Chapter 7 fault information according to the corresponding fault code.

### 5.3.3 Restore factory settings



Step description:

- (1) After power on, adjust the function code to P10.02.
- (2) Press the "Enter" key to enter the next menu to set the parameters.
- (3) After the parameter setting is completed, press the "OK" button to display P.init.
- (4) Long press the "Enter" button for 3s, the panel digital tube will gradually light up from left to right until it displays 88888.
- (5) When done is finally displayed, release the "Confirm" button to indicate that the factory settings are restored.

Display Error Reason: When the parameter value of P10.02 exceeds the set range (0~1), Error will be displayed.

## Chapter 6 Parameter

Wecon VD1 series servo drives provide rich monitoring display and setting display functions for the convenience of users. The specific display and setting areas are shown in the following table:

ID	Area name	Block	Section
1	Basic settings	P0	P0-1~ P0-27
2	Control parameters	P1	P1-1~ P1-33
3	Gain adjustment	P2	P2-1~ P2-12
4	Self-tuning parameters	P3	P3-1~ P3-8
5	Vibration suppression	P4	P4-1~ P4-10
6	Signal input and output	P5	P5-1~ P5-21
7	DI/DO configuration	P6	P6-1~ P6-33
8	Accessibility	P10	P10-1~ P10-5
9	Communication parameters	P12	P12-1~ P12-4
10	Virtual input terminal	P13	P13-1~ P13-8
11	Monitor display	U0	U0-1~U0-53
12	Warning display	U1	U1-1~U1-25
13	Device Info	U2	U2-1~U2-16

Notes on the content of the parameter table:

- (1) Description of parameter name  
When the parameter name is "reserved", it means that it is occupied by the system. Please do not configure this parameter.
- (2) Explanation of parameter unit  
When the unit of the parameter is marked as "—", it means that the parameter has no unit.
- (3) Description of control mode  
P: position mode control,  
S: Speed mode control,  
T: Torque mode control,  
A (ALL): Applicable to position mode control, speed mode control, and torque mode control.
- (4) When the parameter modification takes effect

## 6.1 Basic settings

function code	Name	Setting method	Effective time	Defaults	Range	Definition	Unit
P0-1	Control Mode	Stop setting	Power on again	1	1~3	1: Position control 2: Speed control 3: Torque control	-
P0-4	Rotate direction	Stop setting	Power on again	0	0~1	Forward rotation: looking at the motor shaft 0: Standard setting (CW is forward rotation) 1: Reverse mode (CCW is forward rotation)	-
P0-5	Servo OFF stop mode	Stop setting	Effective immediately	0	0~1	0: Free stop, motor shaft keeps free state; 1: Stop at zero speed, and the motor shaft remains free;	-
P0-9	Braking resistance setting	Stop setting	Effective immediately	0	0~3	0-Use built-in braking resistor; 1- Use external braking resistor and natural cooling; 2- Use external braking resistor and forced air cooling; (cannot be set) 3- No braking resistor is used, it is all absorbed by capacitor. (Cannot be set)	-
P0-10	Resistance	Stop setting	Effective	50	0~655	It is used to set the external braking	Ω

	of external braking resistor		immediately		35	resistor resistance of a certain model of drive.	
P0-11	External braking resistor power	Stop setting	Effective immediately	100	0~655 35	It is used to set the power of external braking resistor of a certain type of drive.	W
P0-12	Position pulse type selection	Stop setting	Power on again	0	0~5	0: direction + pulse (positive logic) 1: CW/CCW 2: A, B phase quadrature pulse (4 times frequency) 3: Direction + pulse (negative logic) 4: CW/CCW (negative logic) 5: A, B phase quadrature pulse (4 times frequency negative logic)	-
P0-13	Maximum position pulse frequency	Stop setting	Power on again	300	1~500	Set the maximum frequency of external pulse command	kHz
P0-14	Position pulse anti-interference level	Stop setting	Power on again	2	1~3	Set the anti-interference level of the external pulse command. 0: No filtering; 1: Filter time 128ns 2: Filter time 256ns 3: Filter time 512ns 4: Filter time 1.024us 5: Filter time 2.048us 6: Filter time 4.096us 7: Filter time 8.192us	-



						8: Filter time 16.384us 9: filter time 32.768us	
P0-16	Number of command pulses for one motor rotation	Stop setting	Power on again	10000	0~100 00	Set the number of command pulses per revolution of the motor. When the setting value is 0, [P0-17]/[P0-19] electronic gear 1/2 numerator, [P0-18]/[P0-19] electronic gear 1/2 denominator is valid.	Pul
P0-17	Electronic gear 1 molecule	Run settings	Effective immediately	1	1~327 67	Set the numerator of the first group of electronic gear ratio for position command division/multiplication. [P0-16] It is effective when the command pulse number of one motor rotation is 0.	-
P0-18	Electronic gear 1 denominator	Run settings	Effective immediately	1	1~327 67	Set the denominator of the first group of electronic gear ratio for position command division/multiplication. [P0-16] It is valid when the command pulse number of one motor rotation is 0.	-
P0-19	Electronic gear 2 molecules	Run settings	Effective immediately	1	1~327 67	Set the numerator of the second group of electronic gear ratio for position command division/multiplication. [P0-16] It is effective when the command pulse number of one motor rotation is 0.	-
P0-20	Electronic gear 2 denominator	Run settings	Effective immediately	1	1~327 67	Set the denominator of the second group of electronic gear ratio for position command	-

	r					division/multiplication. [P0-16] It is effective when the command pulse number of one motor rotation is 0.	
P0-21	Pulse frequency division output direction	Stop setting	Power on again	0	0~1	Quadrature encoding output. 0: When the motor rotation direction is CW, A leads B 1: When the motor rotation direction is CCW, A leads B	-
P0-22	The number of output pulses per revolution of the motor	Stop setting	Power on again	2500	0~2500	Quadrature encoding output. Set the number of output pulses of phase A and phase B each time the motor rotates. (If set to 0, it will be controlled by P0-26 and P0-27)	Pul
P0-23	Z pulse output OZ polarity	Stop setting	Power on again	0	0~1	0-Z pulse active high 1-Z pulse active low	-
P0-25	Basic settings	Position deviation limit (0~9999)	Shutdown setting	Power on again	0	0	9999
P0-26	Basic settings	Position deviation limit (x10000)	Shutdown setting	Power on again	6	0	9999
P0-27	Pulse output frequency division numerator	Stop setting	Power on again	1	1~2500	Quadrature encoding output (numerator/denominator format), used to set the numerator of the frequency division pulse output. (This function code is valid when P0-22 is set to 0)	-
P0-28	Pulse output	Stop setting	Power on again	1	1~2500	Quadrature encoding output (numerator/denominator format),	

	frequency division denominator					used to set the denominator of the frequency division pulse output. (This function code is valid when P0-22 is set to 1)	
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## 6.2 Control parameters

function code	Name	Setting method	Effective time	Defaults	Range	Definition	Unit
P1-1	Speed command source	Stop setting	Effective immediately	0	0~1	0: Internal speed command; 1: AI_1 analog input;	-
P1-2	Internal speed command 0	Run settings	Effective immediately	0	-3000~3000	Internal speed command 0 When DI input port: 15-INSPD3:0 14-INSPD2:0 13-INSPD1:0 Select this speed command to be effective.	rpm
P1-3	Accelerated Time	Run settings	Effective immediately	50	0~65535	Speed command from 0 acceleration to 1000rpm time	ms
P1-4	deceleration time	Run settings	Effective immediately	50	0~65535	The time for the speed command to decelerate from 1000rpm to 0;	ms
P1-7	Torque command source	Stop setting	Effective immediately	0	0~1	0: Internal torque command; 1: AI_1 analog input;	-

P1-8	Torque command keyboard setting value	Run settings	Effective immediately	0	-3000~3000	-300.0%~300.0%	0.10 %
P1-9	Source of speed limit in torque mode	Stop setting	Effective immediately	0	0~1	0: Internal forward and reverse limit 1: AI_2 analog input	-
P1-10	Maximum speed threshold	Run settings	Effective immediately	3000	0~5000	Set the maximum speed limit value, if it exceeds this value, an overspeed fault will be reported	rpm
P1-11	Warning speed threshold	Run settings	Effective immediately	2800	0~4500	Set the alarm speed threshold, if this value is exceeded, an overspeed warning will be reported	rpm
P1-12	Forward speed threshold	Run settings	Effective immediately	2500	0~3000	Set the positive speed limit value	rpm
P1-13	Reversal speed threshold	Run settings	Effective immediately	2500	0~3000	Set reverse speed limit value	rpm
P1-14	Torque limit source	Stop setting	Effective immediately	0	0~1	0: internal value 1: AI_2 analog input	-
P1-15	Forward torque limit	Run settings	Effective immediately	3000	0~3000	When [P1-14] selects internal torque limit, this function code value is used as the forward torque limit value	0.10 %
P1-16	Reverse torque limit	Run settings	Effective immediately	3000	0~3000	When [P1-14] selects internal torque limit, this function code value is used as the reverse	0.10 %

			y			torque limit value	
P1-19	Torque saturation timeout	Run settings	Effective immediately	1000	0~65535	When the torque is limited by the set value of [P-15] or [P-16] and exceeds this set time, the drive reports "abnormal torque saturation" fault; Note: When the value of this function code is set to 0, no torque saturation overtime fault detection will be performed, and this fault will be ignored;	ms
P1-21	Zero-speed clamp function selection	Run settings	Effective immediately	0	0~3	Set the zero-speed clamp function. In speed mode: 0: Force the speed to 0; 1: Force the speed to 0, and keep the position locked when the actual speed is less than [P1.22]; 2: When the speed command is less than [P1.22], force the speed to 0, and keep the position locked; 3: Invalid, ignore the zero-speed clamp input;	-
P1-22	Zero speed clamp speed threshold	Run settings	Effective immediately	20	0~1000	Set the speed threshold of the zero-speed clamp function	rpm
P1-23	Internal speed command 1	Run settings	Effective immediately	0	-3000~3000	Internal speed command 1 When DI input port: 15-INSPD3:0 14-INSPD2:0 13-INSPD1:1 When the speed command is selected, it is	rpm

						effective.	
P1-24	Internal speed command 2	Run settings	Effective immediately	0	-3000~3000	Internal speed command 2 When DI input port: 15-INSPD3:0 14-INSPD2: 1 13-INSPD1:0 When the speed command is selected, it is effective.	rpm
P1-25	Internal speed command 3	Run settings	Effective immediately	0	-3000~3000	Internal speed command 3 When DI input port: 15-INSPD3:0 14-INSPD2:1 13-INSPD1:1 When the speed command is selected, it is effective.	rpm
P1-26	Internal speed command 4	Run settings	Effective immediately	0	-3000~3000	Internal speed command 4 When DI input port: 15-INSPD3:1 14-INSPD2:0 13-INSPD1:0 Select this speed command to be effective.	rpm
P1-27	Internal speed command 5	Run settings	Effective immediately	0	-3000~3000	Internal speed command 5 When DI input port: 15-INSPD3:1 14-INSPD2:0 13-INSPD1:1 Select this speed command to be effective.	rpm
P1-28	Internal speed	Run settings	Effective immediately	0	-3000~3000	Internal speed command 6 When DI input port:	rpm

	command 6		y			15-INSPD3:1 14-INSPD2: 1 13-INSPD1:0 Select this speed command to be effective.	
P1-29	Internal speed command 7	Run settings	Effective immediately	0	-3000~3000	Internal speed command 7 When DI input port: 15-INSPD3:1 14-INSPD2: 1 13-INSPD1:1 Select this speed command to be effective.	rpm
P1-30	Delay from brake output ON to command reception	Run settings	Effective immediately	250	0~500	Set the delay time from when the brake (BRK-OFF) output is turned ON to when the servo drive allows to start receiving input commands. When the brake output (BRK-OFF) is allocated, this function code has no effect.	ms
P1-31	Static state, the brake output is OFF to the motor is not powered on	Run settings	Effective immediately	150	1~1000	When the motor is at a standstill, setting the brake (BRK-OFF) output OFF starts and the performance time until the servo drive enters the non-channel state. When the brake output (BRK-OFF) is not assigned, this function code has no effect.	ms
P1-32	Rotation state, when the brake output is OFF, the	Run settings	Effective immediately	30	0~3000	When the motor is rotating, the motor speed threshold when the brake (BRK-OFF) is allowed to output OFF. When the brake output (BRK-OFF) is not assigned, this function code has no effect.	rpm

	speed threshold						
P1-33	Rotation state, delay from servo enable OFF to brake output OFF	Run settings	Effective immediately	500	1~1000	When the motor is rotating, the delay time from the servo enable (S-ON) OFF when the brake (BRK-OFF) output is OFF is allowed. When the brake output (BRK-OFF) is not assigned, this function code has no effect.	ms

### 6.3 Gain adjustment

function code	Name	Effective time	Defaults	Range	Definition	Unit
P2-1	1st position loop gain	Effective immediately	400	0~6200	Set the position loop proportional gain to determine the responsiveness of the position control system.	0.1Hz
P2-2	1st speed loop gain	Effective immediately	65	0~35000	Set the speed loop proportional gain to determine the responsiveness of the speed loop.	0.1Hz
P2-3	The first speed loop integral time constant	Effective immediately	1000	100~65535	Set the speed loop integral constant, the smaller the set value, the stronger the integral effect.	0.1ms
P2-4	2nd position loop gain	Effective immediately	35	0~6200	Set the position loop proportional gain to determine the responsiveness of the position control system.	0.1Hz



P2-5	2nd speed loop gain	Effective immediately	65	0~35000	Set the speed loop proportional gain to determine the responsiveness of the speed loop.	0.1Hz
P2-6	2nd speed loop integral time constant	Effective immediately	1000	0~65535	Set the speed loop integral constant, the smaller the set value, the stronger the integral effect.	0.1ms
P2-7	Second gain switching mode	Effective immediately	0	0~3	0: DI terminal; 1: Speed command change rate is too large; 2: Position deviation is large; 3: Reserved	-
P2-9	Speed feedforward gain	Effective immediately	0	0~1000	0.0%~100.0%	0.10%
P2-10	Speed feedforward filter time constant	Effective immediately	50	0~10000	Set the time constant of the primary delay filter related to the speed feedforward input.	0.01ms
P2-11	Torque feedforward gain	Effective immediately	0	0~2000	0.0%~200.0%	0.10%
P2-12	Torque feedforward filter time constant	Effective immediately	50	0~10000	Set the time constant of the primary delay filter related to the torque feedforward input.	0.01ms

## 6.4 Self-tuning parameters

function code	Name	Setting method	Effective time	Defaults	Range	Definition	Unit
P3-1	Load inertia ratio	Run settings	Effective immediately	200	0~10000	Set load inertia ratio, 0.00~100.00 times	0.01
P3-2	Load rigidity level selection	Run settings	Effective immediately	12	0~31	Rigidity grade selection	-
P3-3	Self-adjusting mode selection	Run settings	Effective immediately	0	0~2	<p>0: Rigidity level self-adjustment mode; according to the rigidity level setting, the position loop gain, speed loop gain, speed loop integral time constant, torque filter parameter settings are automatically adjusted.</p> <p>1: Manual setting; users need to manually set the position loop gain, speed loop gain, speed loop integral time constant, torque filter parameter setting</p> <p>2: Online automatic parameter self-tuning mode (not yet realized)</p>	-
P3-4	Online inertia recognition sensitivity	Run settings	Effective immediately	0	0~2	<p>0-Slow change (not implemented yet)</p> <p>1- General changes (not implemented yet)</p> <p>2- Rapid changes (not implemented yet)</p>	-

P3-5	Number of cycles of inertia identification	Stop setting	Effective immediately	2	1~20	Offline load inertia identification process, motor rotation number setting	Circle
P3-6	Maximum speed of inertia identification	Stop setting	Effective immediately	1000	300~2000	Set the allowable maximum motor speed command in offline inertia identification mode. The greater the speed during inertia identification, the more accurate the identification result will be. Usually, you can keep the default value.	rpm
P3-7	Parameter identification of rotation direction	Stop setting	Effective immediately	0	0~2	0: Forward and reverse reciprocating rotation 1: Forward rotation and one-way rotation 2: Reverse one-way rotation	-
P3-8	Parameter identification waiting time	Stop setting	Effective immediately	1000	300~1000 0	During offline inertia recognition, the time interval between two consecutive speed commands	ms

## 6.5 Vibration suppression

Function code	Name	Setting method	Effective time	Defaults	Range	Definition	Unit
P4-1	Pulse command filtering method	Stop setting	Effective immediately	0	0~1	0: First-order low-pass filter 1: Average filtering	-

P4-2	Position command first-order low-pass filter time constant	Stop setting	Effective immediately	0	0~1000	Position command first-order low-pass filter time constant	ms
P4-3	Position command average filter time constant	Stop setting	Effective immediately	0	0~128	Position command average filter time constant	ms
P4-4	Torque filter time constant	Run settings	Effective immediately	50	10~2500	This parameter is automatically set when the [self-adjustment mode selection] is selected as 1, or 2	0.01ms
P4-5	1st notch frequency	Run settings	Effective immediately	300	250~5000	Set the center frequency of the first notch filter. When the set value is 5000, the function of the notch filter is invalid.	Hz
P4-6	1st notch depth	Run settings	Effective immediately	100	0~100	0: all truncated 100: all passed	-
P4-7	1st notch width	Run settings	Effective immediately	4	0~12	0: 0.5 times bandwidth 4: 1 times bandwidth 8: 2 times the bandwidth 12: 4 times bandwidth	-
P4-8	2nd notch filter frequency	Run settings	Effective immediately	500	250~5000	Set the center frequency of the second notch filter. When the set value is 5000, the function of the notch filter is invalid.	Hz
P4-9	2nd notch depth	Run settings	Effective immediately	100	0~100	0: all truncated 100: all passed	-

			y				
P4-10	2nd notch filter width	Run settings	Effective immediately	4	0~12	0: 0.5 times bandwidth 4: 1 times bandwidth 8: 2 times the bandwidth 12: 4 times bandwidth	-

## 6.6 Signal input and output

Function code	Name	Setting method	Effective time	Defaults	Range	Definition	Unit
P5-1	AI_1 input bias	Run settings	Effective immediately	0	-5000~5000	Set AI_1 channel analog offset value	mV
P5-2	AI_1 input filter time constant	Run settings	Effective immediately	200	0~60000	AI_1 channel input first-order low-pass filter time constant	0.01ms
P5-3	AI_1 dead zone	Run settings	Effective immediately	20	0~1000	Set AI_1 channel analog quantity dead zone value	mV
P5-4	AI_1 zero drift	Run settings	Effective immediately	0	-500~500	Automatic calibration of zero drift inside the drive;	mV
P5-5	AI_2 input bias	Run settings	Effective immediately	0	-5000~5000	Set AI_2 channel analog offset value	mV
P5-6	AI_2 input filter time	Run settings	Effective immediately	200	0~60000	AI_2 channel input first-order low-pass filter time constant	0.01ms

	constant		y				
P5-7	AI_2 dead zone	Run settings	Effective immediately	20	0~500	Set AI_1 channel analog quantity dead zone value	mV
P5-8	AI_2 zero drift	Run settings	Effective immediately	0	-500~500	Automatic calibration of zero drift inside the drive;	mV
P5-9	Analog quantity 10V for speed value	Stop setting	Effective immediately	3000	1000~4500	Set the speed value corresponding to the analog 10V	rpm
P5-10	Analog quantity 10V for torque value	Stop setting	Effective immediately	1000	0~3000	Set the torque value corresponding to the analog 10V	0.10%
P5-11	Positioning is completed, positioning close condition setting	Run settings	Effective immediately	0	0~3	<p>Judgment conditions for positioning completion and positioning close to the output signal</p> <p>0: The output is valid when the absolute value of the position deviation is less than the positioning completion threshold/positioning close to the threshold;</p> <p>1: The absolute value of the position deviation is less than the positioning completion threshold/positioning approach threshold, and the output is valid when the input position command is 0;</p>	-

						<p>2: The absolute value of the position deviation is less than the positioning completion threshold/positioning approach threshold, and the output is valid when the input position command filter value is 0;</p> <p>3. The absolute value of the position deviation is less than the positioning completion threshold/positioning approach threshold, the input position command filter value is 0, and the output is valid when the positioning detection window time is continued;</p>	
P5-12	Positioning completion threshold	Run settings	Effective immediately	800	1~65535	Positioning completion threshold	Pul
P5-13	Positioning approach threshold	Run settings	Effective immediately	5000	1~65535	Positioning approach threshold	Pul
P5-14	Position detection window time	Run settings	Effective immediately	10	0~20000	Set the detection window time for positioning completion	ms
P5-15	Positioning signal hold time	Run settings	Effective immediately	100	0~20000	Set the hold time of positioning completion output	ms
P5-16	Rotation detection speed threshold	Run settings	Effective immediately	20	0~1000	Set the motor rotation signal judgment threshold	rpm
P5-17	Speed	Run	Effective	10	0~100	Set speed consistent signal threshold	rpm

	consistent signal threshold	settings	immediately				
P5-18	Speed approaching signal threshold	Run settings	Effective immediately	100	10~6000	Set speed close to signal threshold	rpm
P5-19	Zero speed output signal threshold	Run settings	Effective immediately	10	0~6000	Set zero speed output signal judgment threshold	rpm
P5-20	Torque reaches threshold	Run settings	Effective immediately	100	0~300	<p>The torque reaching threshold must be used together with [Torque reaching hysteresis value]:</p> <p>When the actual torque reaches [Torque Arrival Threshold] + [Torque Arrival Hysteresis Value], the torque reaches DO becomes valid;</p> <p>When the actual torque decreases [Torque arrival threshold value] + [Torque arrival hysteresis value] or less, the torque arrival DO becomes invalid</p>	%
P5-21	Torque reaches the hysteresis value	Run settings	Effective immediately	10	10~20	[Torque arrival hysteresis value] need to be used together with [torque arrival threshold]	%



## 6.7 DI/DO configuration

function code	Name	Setting method	Effective time	Defaults	Range	Definition	Unit
P6-01	High-speed DI port filter time	Stop setting	Power on again	50	0~1000 0	High-speed port DI-7 and DI8 filter time	1us
P6-02	DI_1 channel function selection	Run settings	Power on again	SON	0~16	0 off (not used) 01-SON Servo enable 02-A-CLR Fault and Warning Clear 03-POT forward drive prohibited 04-NOT Reverse drive prohibited 05-ZCLAMP Zero-speed clamp 06-CL Clear deviation counter 07-C-SIGN command reverse 08-E-STOP Emergency stop 09-GEAR-SEL Electronic gear switch 1 10-GAIN-SEL gain switch 11-INH Command pulse prohibited input 12-VSSEL Vibration control switching input 13-INSPD1 Internal speed command selection 1 (not implemented yet) 14-INSPD2 Internal speed command selection 2 (not implemented yet) 15-INSPD3 Internal speed command selection 3 (not implemented yet) 16-J-SEL Inertia ratio switch (not implemented yet)	-
P6-03	DI_1	Run	Power on	0	0~1	DI port input logic validity function selection.	-

	channel logic selection	settings	again			0: Normally open input. Active low (switch closed); 1: Normally closed input. Active high (switch off);	
P6-04	DI_1 input source selection	Run settings	Effective immediatel y	0	0~1	0-hardware DI1 1-VDI1	-
P6-05	DI_2 channel function selection	Run settings	Power on again	A-CLR	0~16	0 off (not used) 01-SON Servo enable 02-A-CLR Fault and Warning Clear 03-POT forward drive prohibited 04-NOT Reverse drive prohibited 05-ZCLAMP Zero-speed clamp 06-CL Clear deviation counter 07-C-SIGN command reverse 08-E-STOP Emergency stop 09-GEAR-SEL Electronic gear switch 1 10-GAIN-SEL gain switch 11-INH Command pulse prohibited input 12-VSSEL Vibration control switching input 13-INSPD1 Internal speed command selection 1 (not implemented yet) 14-INSPD2 Internal speed command selection 2 (not implemented yet) 15-INSPD3 Internal speed command selection 3 (not implemented yet) 16-J-SEL Inertia ratio switch (not implemented yet)	-
P6-06	DI_2 channel	Run settings	Power on again	0	0~1	DI port input logic validity function selection. 0: Normally open input. Active low (switch	-

	logic selection					closed); 1: Normally closed input. Active high (switch off);	
P6-07	DI_2 input source selection	Run settings	Effective immediately	0	0~1	0-hardware DI2 1-VDI2	-
P6-08	DI_3 channel function selection	Run settings	Power on again	POT	0~16	0 off (not used) 01-SON Servo enable 02-A-CLR Fault and Warning Clear 03-POT forward drive prohibited 04-NOT Reverse drive prohibited 05-ZCLAMP Zero-speed clamp 06-CL Clear deviation counter 07-C-SIGN command reverse 08-E-STOP Emergency stop 09-GEAR-SEL Electronic gear switch 1 10-GAIN-SEL gain switch 11-INH Command pulse prohibited input 12-VSSEL Vibration control switching input 13-INSPD1 Internal speed command selection 1 (not implemented yet) 14-INSPD2 Internal speed command selection 2 (not implemented yet) 15-INSPD3 Internal speed command selection 3 (not implemented yet) 16-J-SEL Inertia ratio switch (not implemented yet)	-
P6-09	DI_3 channel logic	Run settings	Power on again	0	0~1	DI port input logic validity function selection. 0: Normally open input. Active low (switch closed);	-

	selection					1: Normally closed input. Active high (switch off);	
P6-10	DI_3 input source selection	Run settings	Effective immediately	0	0~1	0-hardware DI3 1-VDI3	-
P6-11	DI_4 channel function selection	Run settings	Power on again	NOT	0~16	0 off (not used) 01-Servo enable 02-A-CLR Fault and Warning Clear 03-POT forward drive prohibited 04-NOT Reverse drive prohibited 05-ZCLAMP Zero-speed clamp 06-CL Clear deviation counter 07-C-SIGN command reverse 08-E-STOP Emergency stop 09-GEAR-SEL Electronic gear switch 1 10-GAIN-SEL gain switch 11-INH Command pulse prohibited input 12-VSSEL Vibration control switching input 13-INSPD1 Internal speed command selection 1 14-INSPD2 Internal speed command selection 2 15-INSPD3 Internal speed command selection 3 16-J-SEL Inertia ratio switch (not implemented yet)	-
P6-12	DI_4 channel logic selection	Run settings	Power on again	0	0~1	DI port input logic validity function selection. 0: Normally open input. Active low (switch closed); 1: Normally closed input. Active high (switch off);	-
P6-13	DI_4 input source selection	Run settings	Effective immediately	0	0~1	0-hardware DI4 1-VDI4	-

P6-14	DI_5 channel function selection	Run settings	Power on again	C-SIGN	0~16	0 off (not used) 01-Servo enable 02-A-CLR Fault and Warning Clear 03-POT forward drive prohibited 04-NOT Reverse drive prohibited 05-ZCLAMP Zero-speed clamp 06-CL Clear deviation counter 07-C-SIGN command reverse 08-E-STOP Emergency stop 09-GEAR-SEL Electronic gear switch 1 10-GAIN-SEL gain switch 11-INH Command pulse prohibited input 12-VSSEL Vibration control switching input 13-INSPD1 Internal speed command selection 1 (not implemented yet) 14-INSPD2 Internal speed command selection 2 (not implemented yet) 15-INSPD3 Internal speed command selection 3 (not implemented yet) 16-J-SEL Inertia ratio switch (not implemented yet)	-
P6-15	DI_5 channel logic selection	Run settings	Power on again	0	0~1	DI port input logic validity function selection. 0: Normally open input. Active low (switch closed); 1: Normally closed input. Active high (switch off);	-
P6-16	DI_5 input source selection	Run settings	Effective immediately	0	0~1	0-hardware DI5 1-VDI5	-
P6-17	DI_6	Run	Power on	INH	0~16	0 off (not used)	-

	channel function selection	settings	again			01-SON Servo enable 02-A-CLR Fault and Warning Clear 03-POT forward drive prohibited 04-NOT Reverse drive prohibited 05-ZCLAMP Zero-speed clamp 06-CL Clear deviation counter 07-C-SIGN command reverse 08-E-STOP Emergency stop 09-GEAR-SEL Electronic gear switch 1 10-GAIN-SEL gain switch 11-INH Command pulse prohibited input 12-VSSEL Vibration control switching input 13-INSPD1 Internal speed command selection 1 (not implemented yet) 14-INSPD2 Internal speed command selection 2 (not implemented yet) 15-INSPD3 Internal speed command selection 3 (not implemented yet) 16-J-SEL Inertia ratio switch (not implemented yet)	
P6-18	DI_6 channel logic selection	Run settings	Power on again	0	0~1	DI port input logic validity function selection. 0: Normally open input. Active low (switch closed); 1: Normally closed input. Active high (switch off);	-
P6-19	DI_6 input source selection	Run settings	Effective immediately	0	0~1	0-hardware DI6 1-VDI6	-
P6-20	DI_7 channel	Run settings	Power on again	Unused	0~16	0 off (not used) 01-SON Servo enable	-

	function selection					02-A-CLR Fault and Warning Clear 03-POT forward drive prohibited 04-NOT Reverse drive prohibited 05-ZCLAMP Zero-speed clamp 06-CL Clear deviation counter 07-C-SIGN command reverse 08-E-STOP Emergency stop 09-GEAR-SEL Electronic gear switch 1 10-GAIN-SEL gain switch 11-INH Command pulse prohibited input 12-VSSEL Vibration control switching input 13-INSPD1 Internal speed command selection 1 (not implemented yet) 14-INSPD2 Internal speed command selection 2 (not implemented yet) 15-INSPD3 Internal speed command selection 3 (not implemented yet) 16-J-SEL Inertia ratio switch (not implemented yet)	
P6-21	DI_7 channel logic selection	Run settings	Power on again	0	0~1	DI port input logic validity function selection. 0: Normally open input. Active low (switch closed); 1: Normally closed input. Active high (switch off);	-
P6-22	DI_7 input source selection	Run settings	Effective immediately	0	0~1	0-hardware DI7 1-VDI7	-
P6-23	DI_8 channel function	Run settings	Power on again	Unused	0~16	0 off (not used) 01-SON Servo enable 02-A-CLR Fault and Warning Clear	-

	selection					03-POT forward drive prohibited 04-NOT Reverse drive prohibited 05-ZCLAMP Zero-speed clamp 06-CL Clear deviation counter 07-C-SIGN command reverse 08-E-STOP Emergency stop 09-GEAR-SEL Electronic gear switch 1 10-GAIN-SEL gain switch 11-INH Command pulse prohibited input 12-VSSEL Vibration control switching input 13-INSPD1 Internal speed command selection 1 (not implemented yet) 14-INSPD2 Internal speed command selection 2 (not implemented yet) 15-INSPD3 Internal speed command selection 3 (not implemented yet) 16-J-SEL Inertia ratio switch (not implemented yet)	
P6-24	DI_8 channel logic selection	Run settings	Power on again	0	0~1	DI port input logic validity function selection. 0: Normally open input. Active low (switch closed); 1: Normally closed input. Active high (switch off);	-
P6-25	DI_8 input source selection	Run settings	Effective immediately	0	0~1	0-hardware DI8 1-VDI8	-
P6-26	DO_1 channel function selection	Run settings	Power on again	TGON	128~142	128 Close (not used) 129-RDY Servo ready 130-ALM fault signal 131-WARN warning signal	-



						132-TGON rotation detection 133-ZSP zero speed signal 134-P-COIN positioning completed 135-P-NEAR positioning approach 136-V-COIN consistent speed 137-V-NEAR speed approach 138-T-COIN torque reached 139-T-LIMIT torque limit 140-V-LIMIT speed limited 141-BRK-OFF solenoid valve brake 142-SRV-ST Servo on state output	
P6-27	DO_1 channel logic selection	Run settings	Power on again	0	0~1	Output logic function selection. ★ 1. Set to 0: the output transistor is turned on when the output is valid; The output transistor is cut off when the output is invalid; 2. Set to 1: the output transistor is cut off when the output is valid; The output transistor is turned on when the output is invalid;	-
P6-28	DO_2 channel function selection	Run settings	Power on again	ALM	128~14 2	128 Close (not used) 129-RDY Servo ready 130-ALM fault signal 131-WARN warning signal 132-TGON rotation detection 133-ZSP zero speed signal 134-P-COIN positioning completed 135-P-NEAR positioning approach 136-V-COIN consistent speed	-

						137-V-NEAR speed approach 138-T-COIN torque reached 139-T-LIMIT torque limit 140-V-LIMIT speed limited 141-BRK-OFF solenoid valve brake 142-SRV-ST Servo on state output	
P6-29	DO_2 channel logic selection	Run settings	Power on again	0	0~1	Output logic function selection. ★ 1. Set to 0: the output transistor is turned on when the output is valid; The output transistor is cut off when the output is invalid; 2. Set to 1: the output transistor is cut off when the output is valid; The output transistor is turned on when the output is invalid;	-
P6-30	DO_3 channel function selection	Run settings	Power on again	RDY	128~14 2	128 Close (not used) 129-RDY Servo ready 130-ALM fault signal 131-WARN warning signal 132-TGON rotation detection 133-ZSP zero speed signal 134-P-COIN positioning completed 135-P-NEAR positioning approach 136-V-COIN consistent speed 137-V-NEAR speed approach 138-T-COIN torque reached 139-T-LIMIT torque limit 140-V-LIMIT speed limited 141-BRK-OFF solenoid valve brake	-

						142-SRV-ST Servo on state output	
P6-31	DO_3 channel logic selection	Run settings	Power on again	0	0~1	<p>Output logic function selection. ★</p> <p>1. Set to 0: the output transistor is turned on when the output is valid; The output transistor is cut off when the output is invalid;</p> <p>2. Set to 1: the output transistor is cut off when the output is valid; The output transistor is turned on when the output is invalid;</p>	-
P6-32	DO_4 channel function selection	Run settings	Power on again	P-COIN	128~14 2	<p>128 Close (not used)</p> <p>129-RDY Servo ready</p> <p>130-ALM fault signal</p> <p>131-WARN warning signal</p> <p>132-TGON rotation detection</p> <p>133-ZSP zero speed signal</p> <p>134-P-COIN positioning completed</p> <p>135-P-NEAR positioning approach</p> <p>136-V-COIN consistent speed</p> <p>137-V-NEAR speed approach</p> <p>138-T-COIN torque reached</p> <p>139-T-LIMIT torque limit</p> <p>140-V-LIMIT speed limited</p> <p>141-BRK-OFF solenoid valve brake</p> <p>142-SRV-ST Servo on state output</p>	-
P6-33	DO_4 channel logic selection	Run settings	Power on again	0	0~1	<p>Output logic function selection. ★</p> <p>1. Set to 0: the output transistor is turned on when the output is valid; The output transistor is cut off when</p>	-

						the output is invalid; 2. Set to 1: the output transistor is cut off when the output is valid; The output transistor is turned on when the output is invalid;	
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★: Explanation of output logic selection (take P6-27 for example)

1. When the logic selection of P6-27 is set to 0,

(1) If the function of P6-26 is selected as "fault signal", it means: when DO-1 has a fault signal, the output transistor is turned on; when DO-1 has no fault signal, the output transistor is turned off.

(2) If the function of P6-26 is selected as "positioning complete", it means: when the positioning of DO-1 is completed, the output transistor is turned on; when the positioning of DO-1 is not completed, the output transistor is turned off.

Similarly:

2. When the logic selection of P6-27 is set to 1,

(1) If the function of P6-26 is selected as "fault signal", it means: when DO-1 has a fault signal, the output transistor is cut off; when DO-1 does not have a fault signal, the output transistor is on.

(2) If the function of P6-26 is selected as "positioning complete", it means: when the positioning of DO-1 is completed, the output transistor is turned off; when the positioning of DO-1 is not completed, the output transistor is turned on.

## 6.8 Accessibility

function code	Name	Setting method	Effective time	Defaults	Range	Definition	Unit
P10-1	JOG jog speed	Run settings	Effective immediate	100	0~3000	JOG jog speed	rpm

			y				
P10-2	reset	Stop setting	Effective immediately	0	0~1	Write 1 to restore factory settings	-
P10-3	Fault clearing	Run settings	Effective immediately	0	0~1	<p>0: No operation; 1: For clearable faults, after the cause of the fault is removed, after writing 1 to the function code, the drive will stop the fault display and enter the Rdy (or RUN) state again.</p> <p>【note】! If the servo S-ON is valid, when the fault is removed and the fault is cleared, the servo will directly enter the Run state. When performing fault clearing actions, be sure to stop sending control commands such as pulses to ensure personal safety.</p>	-
P10-4	Motor overload protection time factor	Run settings	Effective immediately	100	50~300	According to the heating condition of the motor, modifying this value can make the overload protection time fluctuate up and down the reference value, 50 corresponds to 50%, that is, the time is reduced by half; 300 corresponds to 300%, that is, the time is extended to 3 times.	%
P10-5	Motor code selection	Run settings	Power on again	6610	0~65535	<p>57475 (E083): WD80M-10025S-E1B (80 flange 4 Nm, 2500rpm)</p> <p>57490 (E092): WD130M-10025S-E1B (130 flange, 4 Nm, 2500rpm)</p> <p>57601 (E101): WD80M-11030S- E1B (80 flange, 3.5 Nm, 3000rpm)</p> <p>57634 (E122): WD130M-15015S-E1B (130 flange, 10 Nm, 1500rpm)</p>	-

						57635 (E113): WD130M-15025S-E1B (130 flange, 6N M, 2500rpm) 57650 (E132): WD110M-18030S-E1B (110 flange, 6 Nm, 3000rpm) 57681 (E151): WD130M-20025S-E1B (130 flange, 7.7 Nm, 2500rpm) 57697 (E161) : WD130M-23015S-E1B (130 flange, 15 Nm, 1500rpm)	
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## 6.9 Communication parameters

function code	Name	Setting method	Effective time	Defaults	Range	Definition	Unit
P12-1	Servo address	Run settings	Effective immediately	1	1~247	Set servo drive modbus communication address	-
P12-2	Baud rate	Run settings	Effective immediately	2	0~5	0-2400bps; 1-4800bps; 2-9600bps; 3-19200bps; 4-38400bps; 5-57600bps	-
P12-3	Serial data format	Run settings	Effective immediately	0	0~3	0: 1 stop bit, no check 1: 1 stop bit, odd parity	-

						2: 1 stop bit, even parity 3: 2 stop bits, no parity	
P12-4	Write modbus communication data to EEPROM	Run settings	Effective immediately	0	0~1	0- Do not write to EEPROM, and do not store when power off; 1- Write to EEPROM, store after power failure.	-

## 6.10 Virtual input terminal

function code	Name	Setting method	Effective time	Defaults	Range	Definition	Unit
P13-1	Virtual VDI_1 input value	Run settings	Effective immediately	0	0~1	VDI1 input level: 0: low level; 1: high level;	-
P13-2	Virtual VDI_2 input value	Run settings	Effective immediately	0	0~1	VDI2 input level: 0: low level; 1: high level;	-
P13-3	Virtual VDI_3 input	Run settings	Effective immediately	0	0~1	VDI3 input level: 0: low level;	-

	value		ely			1: high level;	
P13-4	Virtual VDI_4 input value	Run settings	Effective immediately	0	0~1	VDI4 input level: 0: low level; 1: high level;	-
P13-5	Virtual VDI_5 input value	Run settings	Effective immediately	0	0~1	VDI5 input level: 0: low level; 1: high level;	-
P13-6	Virtual VDI_6 input value	Run settings	Effective immediately	0	0~1	VDI6 input level: 0: low level; 1: high level;	-
P13-7	Virtual VDI_7 input value	Run settings	Effective immediately	0	0~1	VDI7 input level: 0: low level; 1: high level;	-
P13-8	Virtual VDI_8 input value	Run settings	Effective immediately	0	0~1	VDI8 input level: 0: low level; 1: high level;	-



## 6.11 Monitoring parameters

Surveillance number	category	Name	Unit	type of data
U0-01	Universal	Servo Status	-	16 Bit
U0-02	Universal	Servo motor speed	rpm	16 Bit
U0-03	Universal	Input speed command	rpm	16 Bit
U0-04	Universal	Position command corresponding speed	rpm	16 Bit
U0-05	Universal	Pulse deviation	Encoder pulse	16 Bit
U0-06		Reserved	-	16 Bit
U0-07	Universal	Pulse deviation *10000	Encoder pulse	16 Bit
U0-08		Reserved	-	16 Bit
U0-09	Universal	Input command pulse number	Encoder pulse	16 Bit
U0-10		Reserved	-	16 Bit
U0-11	Universal	Input command pulse number *10000	Encoder pulse	16 Bit
U0-12	Universal	Input command pulse frequency	kHz	16 Bit
U0-13	Universal	Encoder cumulative position	Encoder pulse	16 Bit
U0-14		Reserved	-	16 Bit
U0-15	Universal	Encoder cumulative position *10000	Encoder pulse	16 Bit
U0-16	Universal	Real-time load inertia ratio	%	16 Bit
U0-17	Universal	DI input signal status	-	16 Bit
U0-18		Reserved	-	16 Bit
U0-19	Universal	DO output signal status	-	16 Bit
U0-20		Reserved	-	16 Bit
U0-21	Universal	AI1 input voltage value	V	16 Bit

U0-22	Universal	AI2 input voltage value	V	16 Bit
U0-23	Universal	Vibration Frequency	Hz	16 Bit
U0-24	Universal	Vibration amplitude	rpm	16 Bit
U0-25	Universal	Forward torque limit	%	16 Bit
U0-26	Universal	Reverse torque limit value	%	16 Bit
U0-27	Universal	Positive speed limit	rpm	16 Bit
U0-28	Universal	Reverse speed limit value	rpm	16 Bit
U0-29	Universal	Mechanical angle	°	16 Bit
U0-30	Universal	Electrical angle	°	16 Bit
U0-31	Universal	bus voltage	V	16 Bit
U0-32	Universal	Radiator temperature	°C	16 Bit
U0-33	Universal	Instantaneous output power	W	16 Bit
U0-34	Universal	Average output power	W	16 Bit
U0-35	Universal	Total running time hour	h	16 Bit
U0-36		Reserved	-	16 Bit
U0-37	Universal	Total running time min	min	16 Bit
U0-38	Universal	Total running time seconds	s	16 Bit
U0-39	Universal	Load torque percentage	%	16 Bit
U0-40	Universal	Current running time	h	16 Bit
U0-41		Reserved	-	16 Bit
U0-42	Universal	This time running time minutes	min	16 Bit
U0-43	Universal	Current running time seconds	s	16 Bit
U0-44	Universal	Instantaneous braking resistor power	W	16 Bit
U0-45		Reserved	-	16 Bit
U0-46	Universal	Average braking resistor power	W	16 Bit
U0-47		Reserved	-	16 Bit
U0-48	equipment	Power-on times	Times	16 Bit

U0-49		Reserved	-	16 Bit
U0-50	equipment	Motor cumulative number of turns (x1)	Circle	16 Bit
U0-51	equipment	Motor cumulative number of turns (x10e4)	Circle	16 Bit
U0-52	equipment	Motor cumulative number of turns (x10e8)	Circle	16 Bit
U0-53	equipment	Motor model code	-	16 Bit
U1-01	Warning	Current fault code	-	16 Bit
U1-02	Warning	Current warning code	-	16 Bit
U1-03	Warning	U phase current when the fault occurs	A	16 Bit
U1-04	Warning	V-phase current when the fault occurs	A	16 Bit
U1-05	Warning	Bus voltage when the fault occurs	V	16 Bit
U1-06	Warning	IGBT temperature at the time of failure	°C	16 Bit
U1-07	Warning	Torque component at the time of failure	%	16 Bit
U1-08	Warning	Excitation component when the fault occurs	%	16 Bit
U1-09	Warning	Position deviation when the fault occurs	Pul	16 Bit
U1-10	Warning	Speed value when the fault occurs	rpm	16 Bit
U1-11	Warning	Time when the fault occurred	s	16 Bit
U1-12	Warning	Number of failures in this run	-	16 Bit
U1-13	Warning	Number of warnings in this run	-	16 Bit
U1-14	Warning	Total number of historical failures	-	16 Bit
U1-15	Warning	Total number of historical warnings	-	16 Bit

U1-16	Warning	2nd most recent error code	-	16 Bit
U1-17	Warning	3rd most recent error code	-	16 Bit
U1-18	Warning	4th most recent error code	-	16 Bit
U1-19	Warning	5th most recent error code	-	16 Bit
U1-20	Warning	6th most recent error code	-	16 Bit
U1-21	Warning	2nd most recent warning code	-	16 Bit
U1-22	Warning	3rd most recent warning code	-	16 Bit
U1-23	Warning	4th most recent warning code	-	16 Bit
U1-24	Warning	5th most recent warning code	-	16 Bit
U1-25	Warning	6th most recent warning code	-	16 Bit
U2-01	equipment	Product Series	-	16 Bit
U2-02	equipment	model	-	16 Bit
U2-03	equipment	model	-	16 Bit
U2-04	equipment	Version	-	16 Bit
U2-05	equipment	hardware version	-	16 Bit
U2-06	equipment	Date of manufacture year	Year	16 Bit
U2-07	equipment	Delivery date month	Month	16 Bit
U2-08	equipment	Date of manufacture	Day	16 Bit
U2-09	equipment	Device serial number 1	-	16 Bit
U2-10	equipment	Device serial number 2	-	16 Bit
U2-11	equipment	Device serial number 3	-	16 Bit
U2-12	equipment	Device serial number 4	-	16 Bit
U2-13	equipment	Device serial number 5	-	16 Bit
U2-14	equipment	Device serial number 6	-	16 Bit
U2-15	equipment	Device serial number 7	-	16 Bit
U2-16	equipment	Device serial number 8	-	16 Bit

## Chapter 7 malfunction

### 7.1 Fault and warning handling at startup

#### 7.1.1 Position control mode

Boot process	Failure phenomenon	the reason	Confirmation method
Turn on the control power (L1C L2C), Main power supply (L1 L2 L3)	The digital tube is off or the green light is off (bus voltage indicator)	Control terminal is not wired	Re-wiring: L1C/L2C power cords are separately led from the socket.
		Control power supply voltage failure	Measure the AC voltage between (L1C, L2C).
		Servo drive failure	Contact agent or company customer service
	Panel display Er.xx	Refer to 7.2 Fault and alarm handling during operation; find the cause and troubleshoot the fault.	
Servo drive enable signal is valid (S-ON is ON)	Servo motor shaft is in free state	Servo enable signal is invalid	Check whether the servo enable signal is set and the terminal logic is valid.
		Control mode error	Check whether parameter P0-1 is set correctly.
	Panel display Er.xx	Refer to 7.2 Fault and alarm handling during operation; find the cause and troubleshoot the fault.	
Enter position instructions	The motor does not rotate	U0-09 (input command pulse number) is always 0	Position command not entered: Whether DI_3 is set to prohibit forward drive or whether DI_4 is set to prohibit reverse drive; Whether the DI command pulse input function is used.
The motor does not rotate smoothly at low speed	Low speed unstable	Unreasonable gain setting	Adjust the gain
	The motor shaft vibrates left and right	Load inertia ratio is too large	Perform inertia recognition and adjust gain after inertia recognition.

normal operation	Inaccurate positioning	There is a position deviation	The pulse received by U0-09 is inconsistent with the actual one sent by the machine; Whether the equipment is vibrating, adjust it through gain; Whether the coupling at the motor shaft is locked.
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### 7.1.2 Speed control mode

Boot process	Failure phenomenon	the reason	Confirmation method
Turn on the control power (L1C L2C) Main power supply (L1 L2 L3)	The digital tube is off or the green light is off (bus voltage indicator)	Control terminal is not wired	Re-wiring: L1C/L2C power cords are separately led from the socket.
		Control power supply voltage failure	Measure the AC voltage between (L1C, L2C)
		Servo drive failure	Contact agent or company customer service
	Panel display Er.xx	Refer to 7.2 Fault and alarm handling during operation; find the cause and troubleshoot the fault.	
Servo drive enable signal is valid (S-ON is ON)	Servo motor shaft is in free state	Servo enable signal is invalid	Check whether the servo enable signal is set and the terminal logic is valid.
		Control mode error	Check whether parameter P0-1 is set correctly.
	Panel display Er.xx	Refer to 7.2 Fault and alarm handling during operation; find the cause and troubleshoot the fault.	
Input speed command	The motor does not rotate or the speed is different from the set value	U0-03 (input speed command) is 0 Prohibited	The analog interface wiring is wrong, please refer to Chapter 4 Wiring to connect correctly; Speed command not entered: (1) Whether DI_3 is set to prohibit forward drive or

			whether DI_4 is set to prohibit reverse drive; (2) Whether the command pulse input function of DI is used; (3) Check whether the P1-1 speed command source setting is correct; (4) When using the internal speed command, check whether the P1-2 internal speed command is 0.
The motor does not rotate smoothly at low speed	Low speed unstable	Unreasonable gain setting	Adjust the gain
	The motor shaft vibrates left and right	Load inertia ratio is too large	Perform inertia recognition, and adjust gain after inertia recognition.

### 7.1.3 Torque control mode

Boot process	Failure phenomenon	the reason	Confirmation method
Turn on the control power (L1C L2C) Main power supply (L1 L2 L3)	The digital tube is off or the green light is off (bus voltage indicator)	Control terminal is not wired	Re-wiring: L1C/L2C power cord is led separately from the socket
		Control power supply voltage failure	Measure the AC voltage between (L1C, L2C)
		Servo drive failure	Contact agent or company customer service
	Panel display Er.xx	Refer to 7.2 Fault and alarm handling during operation; find the cause and troubleshoot	
Servo drive enable	Servo	Servo enable signal	Check whether the servo

signal is valid (S-ON is ON)	motor shaft is in free state	is invalid	enable signal is set, and the terminal logic is valid
		Control mode error	Check whether the parameter P0-1 is set correctly
	Panel display Er.xx	Refer to 7.2 Fault and alarm handling during operation; find the cause and troubleshoot the fault.	
Input torque command	The motor does not rotate or the speed is different from the set value	U0-03 (input speed command) is 0 Prohibited	The analog interface wiring is wrong, please refer to Chapter 3 Wiring to connect correctly; Speed command not entered: (1) Whether DI_3 is set to prohibit forward drive or whether DI_4 is set to prohibit reverse drive; (2) Whether the command pulse input function of DI is used; (3) Check whether the P1-1 speed command source setting is correct; (4) When using the internal speed command, check whether the P1-2 internal speed command is 0
The motor does not rotate smoothly at low speed	Low speed unstable	Unreasonable gain setting	Adjust the gain
	The motor shaft vibrates left and right	Load inertia ratio is too large	Perform inertia recognition, and adjust gain after inertia recognition

## 7.2 Fault and warning handling during operation

category	Error name	cause of issue	error code	troubleshooting
Class 1	Parameter destruction	EEPROM cannot be read and written	Er.01	The hardware interface cannot read and write parameters, please contact the manufacturer to confirm



				whether the hardware is damaged.
Class 1	Parameter storage error	<p>Abnormalities such as the version, total number, range, etc. stored in internal parameters, and the verification fails;</p> <p>The possible reasons are:</p> <ol style="list-style-type: none"> <li>1. The driver has been upgraded with software;</li> <li>2. An instantaneous power failure occurs during parameter storage;</li> <li>3. Frequent writing of parameters;</li> </ol>	Er.02	<ol style="list-style-type: none"> <li>1. Check whether the program has been updated. If the parameter storage is abnormal due to the updated program, please update the parameters by restoring the factory default parameters and power on again.</li> <li>2. Re-power on and reset the parameters after restoring the factory settings;</li> <li>3. Confirm whether the upper computer writes parameters frequently, and modify the corresponding parameter writing method.</li> </ol>
Class 1	ADC reference source failure	The internal analog reference source of the drive is not accurate	Er.03	Please re-power on to determine whether the fault is eliminated; if there is still an abnormality, please contact the manufacturer.
Class 1	AD current sampling conversion error	Current sampling zero point drift or current sensor error	Er.04	Please re-power on to determine whether the fault is eliminated; if there is still an abnormality, please contact the manufacturer.
Class 1	FPGA communication abnormality	FPGA communication failure	Er.05	Please re-power on to determine whether the fault is eliminated; if there is still an abnormality, please contact the manufacturer.
Class 1	The FPGA program version is wrong	The FPGA program version is wrong	Er.06	Please re-power on to determine whether the fault is eliminated; if there is still an abnormality, please contact the manufacturer.
Class 1	Clock abnormality	The internal clock of the drive is disturbed or abnormal	Er.07	Please re-power on to determine whether the fault is eliminated; if there is still an abnormality, please contact the manufacturer.

Type 2	Overcurrent	<p>The driver detects that the power device has overcurrent, the possible situations are:</p> <ol style="list-style-type: none"> <li>1. Motor power lines U, V, W are short-circuited to ground;</li> <li>2. Short circuit between the motor power lines U, V, W;</li> <li>3. The motor power lines U, V, W have poor contact;</li> <li>4. Internal damage of the motor;</li> <li>5. The encoder cable is aging and loose;</li> <li>6. Excessive fluctuation of control power supply.</li> </ol>	Er.20	<ol style="list-style-type: none"> <li>1. Please check whether the wiring of the motor power line is correct;</li> <li>2. Whether the wiring of the motor power line is loose or short-circuited;</li> <li>3. Replace the motor power line transfer line;</li> <li>4. Replace the motor;</li> <li>5. Replace the encoder adapter cable;</li> <li>6. If the above methods still cannot eliminate the fault, please contact the manufacturer;</li> </ol>
Type 2	Main power supply undervoltage	<p>Drive bus voltage is lower than the limit value:</p> <ol style="list-style-type: none"> <li>(1) 220V driver: normal bus voltage 310V, undervoltage threshold 200V;</li> <li>(2) 380V driver: normal bus voltage 540V, undervoltage threshold 400V;</li> </ol> <p>The possible causes of main power supply undervoltage are:</p> <ol style="list-style-type: none"> <li>(1) The main power supply is not connected;</li> <li>(2) The input voltage is low or the voltage drops;</li> <li>(3) The internal main power relay is damaged;</li> </ol>	Er.21	<ol style="list-style-type: none"> <li>1. Check whether the input voltage of the driver is low, if it is low, please increase the voltage or wait for the power supply to be normal, and then power on again to see if the fault is cleared.</li> <li>2. Check the input power voltage of the drive to see if the voltage drops due to the change of the power load;</li> </ol>

Type 2	Main power supply overvoltage	<p>The driver detects that the bus voltage is too high. The possible reasons are:</p> <ol style="list-style-type: none"> <li>1. Check whether the main power input voltage is normal: (1) 220V driver power supply voltage range: -10%~+10% (198V~242V) (2) 380V driver power supply voltage range: -10%~+10% (342V~418V)</li> <li>2. The resistance of the braking resistor is too large, causing the braking energy to not be absorbed in time;</li> <li>3. The load inertia is large and the motor accelerates and decelerates too fast, and the maximum braking energy exceeds the absorbable value;</li> <li>4. The bus voltage detection deviation is too large</li> </ol>	Er.22	<ol style="list-style-type: none"> <li>1. Check whether the mains input voltage is too high;</li> <li>2. Check whether the resistance of the braking resistor is reasonable;</li> <li>3. Extend the acceleration and deceleration time and choose a braking resistor with a lower resistance;</li> </ol>
Type 2	Braking resistor is not connected	<ol style="list-style-type: none"> <li>1. When using internal braking resistor, the shorting cap between C and D is disconnected;</li> <li>2. When using an external braking resistor, the resistor is not connected;</li> <li>3. The braking resistor status detection circuit is abnormal;</li> </ol>	Er.23	<ol style="list-style-type: none"> <li>1. If using internal braking resistor, please confirm whether the short-circuit jumper between C/D is in normal contact;</li> <li>2. If using an external braking resistor, please make sure that the external braking resistor is reliably connected.</li> <li>3. If you use an external braking resistor, please confirm whether the resistance of the braking resistor is reasonable;</li> <li>4. The above method still cannot eliminate the fault, please contact the manufacturer;</li> </ol>

Type 2	Braking resistor turns on abnormally	The brake resistor bleeder is turned on, but no feedback signal is detected. The possible reasons are: 1. The braking resistor failed to open; 2. Braking resistor feedback detection failure;	Er.24	The circuit of the brake release part may be damaged, please contact the manufacturer
Type 2	The resistance of the braking resistor is too large	The braking resistor is turned on, but the actual bus voltage is still rising. The resistance of the braking resistor may be too large;	Er.25	Please confirm whether the resistance of the braking resistor is reasonable;
Type 2	Motor model error	Motor model error	Er.26	Check whether the function code motor model setting is correct
Type 2	Incremental encoder disconnection	Encoder disconnection	Er.27	1. Check whether the wiring of the motor encoder cable is loose, if it is loose, please tighten it; 2. Replace the encoder cable, and then power on again.
Type 2	Encoder Z pulse lost	No Z pulse signal appears when the motor rotates more than one revolution. The possible reasons are: 1. The motor model is wrong; 2. The motor encoder is disturbed or damaged;	Er.28	1. Check whether the motor model matches the drive model; 2. Replace the motor and power on again;
Type 2	Incremental encoder AB count is not equal to encoder line number*4	The AB count of the incremental encoder is not equal to the number of encoder lines*4. The possible reasons are: 1. The motor model is wrong; 2. Hand interference or damage to the motor encoder;	Er.29	1. Check whether the motor model matches the drive model; replace the motor model that matches the drive;
Type 2	Encoder UVW signal error	Motor encoder UVW signal error	Er.30	Check whether the motor model matches the drive model; replace the motor model that matches the drive;

Type 2	Power line broken	The motor power line is loose or broken	Er.31	<ol style="list-style-type: none"> <li>1. Check whether the motor power line wiring is loose, if it is loose, please tighten it;</li> <li>2. Better the motor power line transfer cable, and then power on again.</li> </ol>
Type 2	Maximum motor speed exceeded	<p>Exceeding the maximum speed threshold of function code P1-10. Possible reasons are:</p> <ol style="list-style-type: none"> <li>1. The U/V/W phase sequence of the motor power line is wrong;</li> <li>2. The motor model is wrong;</li> <li>3. Wrong wiring of motor power line;</li> <li>4. The wiring of the motor encoder is wrong;</li> </ol>	Er.32	<ol style="list-style-type: none"> <li>1. Please check whether the motor power line is correctly wired;</li> <li>2. Confirm whether the motor model is correct;</li> <li>3. Use the correct power line and encoder line transfer wiring;</li> </ol>
Type 2	Power module over temperature	<p>The temperature of the power module exceeds the normal value. The possible reasons are:</p> <ol style="list-style-type: none"> <li>1. The cooling fan fails, causing abnormal heat dissipation;</li> <li>2. The ambient temperature is too high;</li> <li>3. The installation of the drive is unreasonable, and the interval is too small to cause abnormal heat dissipation;</li> </ol>	Er.33	<ol style="list-style-type: none"> <li>1. Confirm whether the cooling fan is operating normally. If it is not normal, please replace the drive;</li> <li>2. Improve the ambient temperature;</li> <li>3. Install the installation standard of the servo drive;</li> </ol>
Type 2	Motor overload protection	<p>The drive detects that the motor is running overloaded. The possible reasons are:</p> <ol style="list-style-type: none"> <li>1. The load is too large, and the motor works in a state that exceeds the rated torque for a long time;</li> <li>2. The load inertia is relatively large while frequent acceleration and deceleration are</li> </ol>	Er.34	<ol style="list-style-type: none"> <li>1. Check whether the load of the motor is too large. If the load is too large, replace the motor and driver with a larger power.</li> <li>2. Increase the acceleration and deceleration time;</li> <li>3. Use the host computer software to observe the actual torque and observe whether there is obvious overshoot of the speed. Adjust the</li> </ol>

		<p>performed;</p> <p>3. The speed loop and position loop gain parameter settings are unreasonable;</p> <p>4. The motor is blocked;</p> <p>5. Servo drive failure;</p>		<p>appropriate loop gain parameters;</p> <p>4. Check the mechanical connection and troubleshoot;</p> <p>5. Replace the servo drive;</p>
Type 2	Electronic gear ratio exceeds limit	<p>In the electronic gear ratio setting, the numerator/denominator ratio is less than 0.01, or greater than 100;</p>	Er.35	<p>Check whether the setting value of the electronic gear numerator and denominator of the function codes P0-16~P0-19 is satisfied: the numerator/denominator is within the range of [0.01~100], and then power on again after modification.</p>
Type 2	Position deviation is too large	<p>The deviation of the current position pulse exceeds the setting value of [P0-26] position deviation limit. The possible reasons for this failure are:</p> <p>1. The motor U/V/W wire is not connected or disconnected;</p> <p>2. The phase sequence of the U/V/W wires of the motor is connected incorrectly;</p> <p>3. The motor load is too large, or the motor is blocked;</p> <p>4. The driver gain setting is unreasonable;</p> <p>5. The position command equivalent speed changes too fast;</p>	Er.36	<p>1. Check whether the wiring of the motor power line U/V/W is normal;</p> <p>2. Check the load condition of the motor. If the load is too large, please replace the driver and motor with higher power; if it is blocked, please check the machine;</p> <p>3. Set the gain parameters according to the method in the "Adjustment" chapter in the user manual;</p> <p>4. When the position command equivalent speed changes too much, the ramp time can be appropriately increased to reduce the speed change rate;</p>

Type 2	Abnormal torque saturation	<p>The torque reaches the maximum torque limit and exceeds the setting time of [P1-19] function code. The possible reasons are:</p> <ol style="list-style-type: none"> <li>1. The load is too large, and the drive is outputting with the maximum torque, but still cannot reach the target speed within the predetermined time;</li> <li>2. Whether the maximum forward torque limit and the maximum reverse torque limit are set too small;</li> <li>3. The motor is blocked;</li> <li>4. [P1-19] The torque limit time set is too short;</li> </ol>	Er.37	<ol style="list-style-type: none"> <li>1. Confirm whether the load is too large;</li> <li>2. According to the actual application, modify the forward torque limit and the maximum reverse torque limit to appropriate values;</li> <li>3. Check whether the machine is blocked;</li> <li>4. Confirm whether the setting of function code [P1-19] is reasonable;</li> </ol>
Type 2	Reserved		Er.38	
Type 2	Emergency shutdown	The drive received an emergency stop order	Er.39	<ol style="list-style-type: none"> <li>1. Check whether it is a man-made emergency shutdown protection, if so, wait for other system faults to be removed and then power on again;</li> <li>2. If it is triggered by mistake, please check whether the wiring and function configuration of the DI terminal are normal.</li> </ol>
Class 3	ADC conversion is not complete	ADC conversion is not complete	Er.60	Please re-power on to determine whether the fault is eliminated; if there is still an abnormality, please contact the manufacturer.
Class 3	Internal software failure	Torque loop error	Er.61	Please re-power on to determine whether the fault is eliminated; if there is still an abnormality, please contact the manufacturer.
Class 3	Internal software failure	Speed loop error	Er.62	Please re-power on to determine whether the fault is eliminated; if there is still an

				abnormality, please contact the manufacturer.
Class 3	Internal software failure	Illegal instruction	Er.63	Please re-power on to determine whether the fault is eliminated; if there is still an abnormality, please contact the manufacturer.
Class 3	Internal software failure	Internal RAM parameter destruction	Er.64	Please re-power on to determine whether the fault is eliminated; if there is still an abnormality, please contact the manufacturer.
Class 3	Internal software failure	Internal function code parameter destruction	Er.65	Please re-power on to determine whether the fault is eliminated; if there is still an abnormality, please contact the manufacturer.
Class 4	Speeding alarm	The speed exceeds the alarm limit value	A-81	Check whether the setting value of function code P1-14 is too small, and then check whether the speed setting is too high.
Class 4	overload	Motor overload warning	A-82	Check whether the load of the motor is too large. If the load is too large, replace the motor and driver with a larger power.
Class 4	Braking resistor is overheated or overloaded	1. When the braking resistor is selected as the internal braking resistor, it means over temperature; 2. When external braking resistor is selected, it means overload.	A-83	1. Please confirm whether the load inertia is too large; 2. Please confirm whether it starts and stops frequently, and whether the speed is too high; 3. Please check whether the actual resistance value is greater than the set value.
Class 4	Parameter modification that needs to be powered on again	Modified the parameters that need to be re-powered on	A-84	Re-power on or clear the alarm to make the alarm disappear.



Class 4	Receive position pulse when servo is OFF	Servo received pulse command in non-SON state or non-position mode	A-85	Please check the control signal timing of the upper device, the servo is stopped or pulse is still being sent in non-position mode.
Class 4	Input pulse frequency is too high	The equivalent speed of the input frequency of the command pulse is too large	A-86	Check whether the setting of the pulse input frequency and the command pulse number of one revolution of the motor (P0-15) or the electronic gear ratio (P0-16~P0-19) is reasonable.
Class 4	Reserved	Reserved	A-87	Reserved
Class 4	Instantaneous power failure of the main circuit	The main circuit input voltage is momentarily too low	A-88	Check whether the mains input has voltage, and then power on again or clear the alarm; if the mains is normal and the alarm still exists, please contact the manufacturer.
Class 4	Duplicate DI port configuration	Different DI ports are set to the same function	A-89	Check the function code "DIDO configuration" to check the DI channel function selection: DI_1 channel function selection (P6-02) ~ DI_8 channel function selection (P6-23), and check whether the 8 DI channel function selections are repeated. If you set the unwanted channels to be closed, power off and then power on again.
Class 4	Duplicate DO port configuration	Different DO ports are set to the same function	A-90	Check the function code "DIDO configuration" to check the DO channel function selection: DO_1 channel function selection (P6-26) ~ DO_4 channel function selection (P6-32), check whether the 4 DO channel function selections are

				duplicated. If you set the unwanted channels to be closed, power off and then power on again.
Class 4	Parameter modification is too frequent	The frequency of communication to modify function code parameters is too frequent	A-91	Confirm whether the host computer writes parameters frequently, and modify the corresponding parameter writing method
Class 4	Reserved		A-92	
Class 4	Reserved		A-93	

## Chapter 8 Modbus register address

### 8.1 Basic settings

function code	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
P0-1	0x0001	1	Control Mode	-	16 Bit
P0-4	0x0004	4	Rotate direction	-	16 Bit
P0-5	0x0005	5	Servo OFF stop mode	-	16 Bit
P0-9	0x0009	9	Braking resistance setting	-	16 Bit
P0-10	0x000A	10	Resistance of external braking resistor	$\Omega$	16 Bit
P0-11	0x000B	11	External braking resistor power	W	16 Bit
P0-12	0x000C	12	Position pulse type selection	-	16 Bit
P0-13	0x000D	13	Maximum position pulse frequency	kHz	16 Bit
P0-14	0x000E	14	Position pulse anti-interference level	-	16 Bit
P0-16	0x0010	16	Number of command pulses for one motor rotation	Pulse unit	16 Bit
P0-17	0x0011	17	Electronic gear 1 molecule	-	16 Bit
P0-18	0x0012	18	Electronic gear 1 denominator	-	16 Bit
P0-19	0x0013	19	Electronic gear 2 molecules	-	16 Bit
P0-20	0x0014	20	Electronic gear 2 denominator	-	16 Bit
P0-21	0x0015	21	Pulse frequency division output direction	-	16 Bit
P0-22	0x0016	22	The number of output pulses per revolution of the motor	Pulse unit	16 Bit
P0-23	0x0017	23	Z pulse output OZ polarity	-	16 Bit
P0-25	0x0019	25	Position deviation limit	Pulse unit	16 Bit
P0-26	0x001A	26	Pulse output frequency division numerator	-	16 Bit

P0-27	0x001B	27	Pulse output frequency division denominator	-	16 Bit
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## 8.2 Control parameters

function code	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
P1-1	0x0101	257	Speed command source	-	16 Bit
P1-2	0x0102	258	Internal speed command 0	rpm	16 Bit
P1-3	0x0103	259	Accelerated Time	ms	16 Bit
P1-4	0x0104	260	deceleration time	ms	16 Bit
P1-7	0x0107	263	Torque command source	-	16 Bit
P1-8	0x0108	264	Torque command keyboard setting value	0.1%	16 Bit
P1-9	0x0109	265	Source of speed limit in torque mode	-	16 Bit
P1-10	0x010A	266	Maximum speed threshold	rpm	16 Bit
P1-11	0x010B	267	Warning speed threshold	rpm	16 Bit
P1-12	0x010C	268	Forward speed threshold	rpm	16 Bit
P1-13	0x010D	269	Reversal speed threshold	rpm	16 Bit
P1-14	0x010E	270	Torque limit source	-	16 Bit
P1-15	0x010F	271	Forward torque limit	0.1%	16 Bit
P1-16	0x0110	272	Reverse torque limit	0.1%	16 Bit
P1-19	0x0113	275	Torque saturation timeout	ms	16 Bit
P1-21	0x0115	277	Zero-speed clamp function selection	-	16 Bit
P1-22	0x0116	278	Zero speed clamp speed threshold	rpm	16 Bit
P1-23	0x0117	279	Internal speed command 1	rpm	16 Bit

P1-24	0x0118	280	Internal speed command 2	rpm	16 Bit
P1-25	0x0119	281	Internal speed command 3	rpm	16 Bit
P1-26	0x011A	282	Internal speed command 4	rpm	16 Bit
P1-27	0x011B	283	Internal speed command 5	rpm	16 Bit
P1-28	0x011C	284	Internal speed command 6	rpm	16 Bit
P1-29	0x011D	285	Internal speed command 7	rpm	16 Bit
P1-30	0x011E	286	Delay from brake output ON to command reception	ms	16 Bit
P1-31	0x011F	287	Static state, the brake output is OFF to the motor is not powered on	ms	16 Bit
P1-32	0x0120	288	Rotation state, when the brake output is OFF, the speed threshold	rpm	16 Bit
P1-33	0x0121	289	Rotation state, delay from servo enable OFF to brake output OFF	ms	16 Bit

### 8.3 Gain adjustment

function code	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
P2-1	0x0201	513	1st position loop gain	0.1Hz	16 Bit
P2-2	0x0202	514	1st speed loop gain	0.1Hz	16 Bit
P2-3	0x0203	515	The first speed loop integral time constant	0.1ms	16 Bit
P2-4	0x0204	516	2nd position loop gain	0.1Hz	16 Bit
P2-5	0x0205	517	2nd speed loop gain	0.1Hz	16 Bit

P2-6	0x0206	518	2nd speed loop integral time constant	0.1ms	16 Bit
P2-7	0x0207	519	Second gain switching mode	-	16 Bit
P2-9	0x0209	521	Speed feedforward gain	0.1%	16 Bit
P2-10	0x020A	522	Speed feedforward filter time constant	0.01ms	16 Bit
P2-11	0x020B	523	Torque feedforward gain	0.1%	16 Bit
P2-12	0x020C	524	Torque feedforward filter time constant	0.01ms	16 Bit

#### 8.4 Self-tuning parameters

function code	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
P3-1	0x0301	769	Load inertia ratio	0.01	16 Bit
P3-2	0x0302	770	Load rigidity level selection	-	16 Bit
P3-3	0x0303	771	Self-adjusting mode selection	-	16 Bit
P3-4	0x0304	772	Online inertia recognition sensitivity	-	16 Bit
P3-5	0x0305	773	Number of cycles of inertia identification	Circle	16 Bit
P3-6	0x0306	774	Maximum speed of inertia identification	rpm	16 Bit
P3-7	0x0307	775	Parameter identification of rotation direction	-	16 Bit
P3-8	0x0308	776	Parameter identification waiting time	ms	16 Bit

#### 8.5 Vibration suppression

function code	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
P4-1	0x0401	1025	Pulse command filtering method	-	16 Bit
P4-2	0x0402	1026	Position command first-order low-pass filter time constant	ms	16 Bit
P4-3	0x0403	1027	Position command average filter time constant	ms	16 Bit

P4-4	0x0404	1028	Torque filter time constant	0.01ms	16 Bit
P4-5	0x0405	1029	1st notch frequency	Hz	16 Bit
P4-6	0x0406	1030	1st notch depth	-	16 Bit
P4-7	0x0407	1031	1st notch width	-	16 Bit
P4-8	0x0408	1032	2nd notch filter frequency	Hz	16 Bit
P4-9	0x0409	1033	2nd notch depth	-	16 Bit
P4-10	0x040A	1034	2nd notch filter width	-	16 Bit

## 8.6 Signal input and output

function code	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
P5-1	0x0501	1281	AI_1 input bias	mV	16 Bit
P5-2	0x0502	1282	AI_1 input filter time constant	0.01ms	16 Bit
P5-3	0x0503	1283	AI_1 dead zone	mV	16 Bit
P5-4	0x0504	1284	AI_1 zero drift	mV	16 Bit
P5-5	0x0505	1285	AI_2 input bias	mV	16 Bit
P5-6	0x0506	1286	AI_2 input filter time constant	0.01ms	16 Bit
P5-7	0x0507	1287	AI_2 dead zone	mV	16 Bit
P5-8	0x0508	1288	AI_2 zero drift	mV	16 Bit
P5-9	0x0509	1289	Analog quantity 10V for speed value	rpm	16 Bit
P5-10	0x050A	1290	Analog quantity 10V for torque value	0.1%	16 Bit
P5-11	0x050B	1291	Positioning is completed, positioning close condition setting	-	16 Bit
P5-12	0x050C	1292	Positioning completion threshold	Pulse unit	16 Bit
P5-13	0x050D	1293	Positioning approach threshold	Pulse unit	16 Bit

P5-14	0x050E	1294	Position detection window time	ms	16 Bit
P5-15	0x050F	1295	Positioning signal hold time	ms	16 Bit
P5-16	0x0510	1296	Rotation detection speed threshold	rpm	16 Bit
P5-17	0x0511	1297	Speed consistent signal threshold	rpm	16 Bit
P5-18	0x0512	1298	Speed approaching signal threshold	rpm	16 Bit
P5-19	0x0513	1299	Zero speed output signal threshold	rpm	16 Bit
P5-20	0x0514	1300	Torque reaches threshold	%	16 Bit
P5-21	0x0515	1301	Torque reaches the hysteresis value	%	16 Bit

## 8.7 DI/DO configuration

function code	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
P6-01	0x0601	1537	High-speed DI port filter time	1us	16 Bit
P6-02	0x0602	1538	DI_1 channel function selection	-	16 Bit
P6-03	0x0603	1539	DI_1 channel logic selection	-	16 Bit
P6-04	0x0604	1540	DI_1 input source selection	-	16 Bit
P6-05	0x0605	1541	DI_2 channel function selection	-	16 Bit
P6-06	0x0606	1542	DI_2 channel logic selection	-	16 Bit
P6-07	0x0607	1543	DI_2 input source selection	-	16 Bit
P6-08	0x0608	1544	DI_3 channel function selection	-	16 Bit
P6-09	0x0609	1545	DI_3 channel logic selection	-	16 Bit
P6-10	0x060A	1546	DI_3 input source selection	-	16 Bit
P6-11	0x060B	1547	DI_4 channel function selection	-	16 Bit
P6-12	0x060C	1548	DI_4 channel logic selection	-	16 Bit
P6-13	0x060D	1549	DI_4 input source selection	-	16 Bit
P6-14	0x060E	1550	DI_5 channel function selection	-	16 Bit



P6-15	0x060F	1551	DI_5 channel logic selection	-	16 Bit
P6-16	0x0610	1552	DI_5 input source selection	-	16 Bit
P6-17	0x0611	1553	DI_6 channel function selection	-	16 Bit
P6-18	0x0612	1554	DI_6 channel logic selection	-	16 Bit
P6-19	0x0613	1555	DI_6 input source selection	-	16 Bit
P6-20	0x0614	1556	DI_7 channel function selection	-	16 Bit
P6-21	0x0615	1557	DI_7 channel logic selection	-	16 Bit
P6-22	0x0616	1558	DI_7 input source selection	-	16 Bit
P6-23	0x0617	1559	DI_8 channel function selection	-	16 Bit
P6-24	0x0618	1560	DI_8 channel logic selection	-	16 Bit
P6-25	0x0619	1561	DI_8 input source selection	-	16 Bit
P6-26	0x061A	1562	DO_1 channel function selection	-	16 Bit
P6-27	0x061B	1563	DO_1 channel logic selection	-	16 Bit
P6-28	0x061C	1564	DO_2 channel function selection	-	16 Bit
P6-29	0x061D	1565	DO_2 channel logic selection	-	16 Bit
P6-30	0x061E	1566	DO_3 channel function selection	-	16 Bit
P6-31	0x061F	1567	DO_3 channel logic selection	-	16 Bit
P6-32	0x0620	1568	DO_4 channel function selection	-	16 Bit
P6-33	0x0621	1569	DO_4 channel logic selection	-	16 Bit

## 8.8 Accessibility

function code	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
P10-1	0x0A01	2561	JOG jog speed	rpm	16 Bit
P10-2	0x0A02	2562	reset	-	16 Bit
P10-3	0x0A03	2563	Fault clearing	-	16 Bit
P10-4	0x0A04	2564	Motor overload protection time factor	%	16 Bit
P10-5	0x0A05	2565	Motor model selection	-	16 Bit

## 8.9 Communication parameters

function code	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
P12-1	0x0C01	3073	Servo address	-	16 Bit
P12-2	0x0C02	3074	Baud rate	-	16 Bit
P12-3	0x0C03	3075	Serial data format	-	16 Bit
P12-4	0x0C04	3076	Write modbus communication data to EEPROM	-	16 Bit

## 8.10 Virtual input terminal

function code	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
P13-1	0x0D01	3329	Virtual VDI_1 input value	-	16 Bit
P13-2	0x0D02	3330	Virtual VDI_2 input value	-	16 Bit
P13-3	0x0D03	3331	Virtual VDI_3 input value	-	16 Bit
P13-4	0x0D04	3332	Virtual VDI_4 input value	-	16 Bit
P13-5	0x0D05	3333	Virtual VDI_5 input value	-	16 Bit
P13-6	0x0D06	3334	Virtual VDI_6 input value	-	16 Bit

P13-7	0x0D07	3335	Virtual VDI_7 input value	-	16 Bit
P13-8	0x0D08	3336	Virtual VDI_8 input value	-	16 Bit

### 8.11 Monitoring parameters

Surveillance number	Modbus address		Name	Unit	Data width
	Hexadecimal	Decimal			
U0-01	0x1E01	7681	Servo Status	-	16 Bit
U0-02	0x1E02	7682	Servo motor speed	rpm	16 Bit
U0-03	0x1E03	7683	Input speed command	rpm	16 Bit
U0-04	0x1E04	7684	Position command corresponding speed	rpm	16 Bit
U0-05	0x1E05	7685	Pulse deviation	Encoder pulse	16 Bit
U0-06	0x1E06	7686	Reserved	-	16 Bit
U0-07	0x1E07	7687	Pulse deviation *10000	Encoder pulse	16 Bit
U0-08	0x1E08	7688	Reserved	-	16 Bit
U0-09	0x1E09	7689	Input command pulse number	Encoder pulse	16 Bit
U0-10	0x1E0A	7690	Reserved	-	16 Bit
U0-11	0x1E0B	7691	Input command pulse number *10000	Encoder pulse	16 Bit
U0-12	0x1E0C	7692	Input command pulse frequency	kHz	16 Bit
U0-13	0x1E0D	7693	Encoder cumulative position	Encoder pulse	16 Bit
U0-14	0x1E0E	7694	Reserved	-	16 Bit
U0-15	0x1E0F	7695	Encoder cumulative position *10000	Encoder pulse	16 Bit
U0-16	0x1E10	7696	Real-time load inertia ratio	%	16 Bit
U0-17	0x1E11	7697	DI input signal status	-	16 Bit
U0-18	0x1E12	7698	Reserved	-	16 Bit

U0-19	0x1E13	7699	DO output signal status	-	16 Bit
U0-20	0x1E14	7700	Reserved	-	16 Bit
U0-21	0x1E15	7701	AI1 input voltage value	V	16 Bit
U0-22	0x1E16	7702	AI2 input voltage value	V	16 Bit
U0-23	0x1E17	7703	Vibration Frequency	Hz	16 Bit
U0-24	0x1E18	7704	Vibration amplitude	rpm	16 Bit
U0-25	0x1E19	7705	Forward torque limit	%	16 Bit
U0-26	0x1E1A	7706	Reverse torque limit value	%	16 Bit
U0-27	0x1E1B	7707	Positive speed limit	rpm	16 Bit
U0-28	0x1E1C	7708	Reverse speed limit value	rpm	16 Bit
U0-29	0x1E1D	7709	Mechanical angle	°	16 Bit
U0-30	0x1E1E	7710	Electrical angle	°	16 Bit
U0-31	0x1E1F	7711	bus voltage	V	16 Bit
U0-32	0x1E20	7712	Radiator temperature	°C	16 Bit
U0-33	0x1E21	7713	Instantaneous output power	W	16 Bit
U0-34	0x1E22	7714	Average output power	W	16 Bit
U0-35	0x1E23	7715	Total running time hour	h	16 Bit
U0-36	0x1E24	7716	Reserved	-	16 Bit
U0-37	0x1E25	7717	Total running time min	min	16 Bit
U0-38	0x1E26	7718	Total running time seconds	s	16 Bit
U0-39	0x1E27	7719	Load torque percentage	%	16 Bit
U0-40	0x1E28	7720	Current running time	h	16 Bit
U0-41	0x1E29	7721	Reserved	-	16 Bit
U0-42	0x1E2A	7722	This time running time	min	16 Bit

			minutes		
U0-43	0x1E2B	7723	Current running time seconds	s	16 Bit
U0-44	0x1E2C	7724	Instantaneous braking resistor power	W	16 Bit
U0-45	0x1E2D	7725	Reserved	-	16 Bit
U0-46	0x1E2E	7726	Average braking resistor power	W	16 Bit
U0-47	0x1E2F	7727	Reserved	-	16 Bit
U0-48	0x1E30	7728	Power-on times	Times	16 Bit
U0-49	0x1E31	7729	Reserved	-	16 Bit
U0-50	0x1E32	7730	Motor cumulative number of turns (x1)	Circle	16 Bit
U0-51	0x1E33	7731	Motor cumulative number of turns (x10e4)	Circle	16 Bit
U0-52	0x1E34	7732	Motor cumulative number of turns (x10e8)	Circle	16 Bit
U0-53	0x1E35	7733	Motor model code	-	16 Bit
U1-01	0x1F01	7937	Current fault code	-	16 Bit
U1-02	0x1F02	7938	Current warning code	-	16 Bit
U1-03	0x1F03	7939	U phase current when the fault occurs	A	16 Bit
U1-04	0x1F04	7940	V-phase current when the fault occurs	A	16 Bit
U1-05	0x1F05	7941	Bus voltage when the fault occurs	V	16 Bit
U1-06	0x1F06	7942	IGBT temperature at the time of failure	°C	16 Bit
U1-07	0x1F07	7943	Torque component at the time of failure	%	16 Bit
U1-08	0x1F08	7944	Excitation component when the fault occurs	%	16 Bit
U1-09	0x1F09	7945	Position deviation when the fault occurs	Pulse unit	16 Bit
U1-10	0x1F0A	7946	Speed value when the fault occurs	rpm	16 Bit

U1-11	0x1F0B	7947	Time when the fault occurred	s	16 Bit
U1-12	0x1F0C	7948	Number of failures in this run	-	16 Bit
U1-13	0x1F0D	7949	Number of warnings in this run	-	16 Bit
U1-14	0x1F0E	7950	Total number of historical failures	-	16 Bit
U1-15	0x1F0F	7951	Total number of historical warnings	-	16 Bit
U1-16	0x1F10	7952	The second most recent failure code	-	16 Bit
U1-17	0x1F11	7953	The 3rd most recent failure code	-	16 Bit
U1-18	0x1F12	7954	The 4th most recent failure code	-	16 Bit
U1-19	0x1F13	7955	The latest 5th fault code	-	16 Bit
U1-20	0x1F14	7956	The latest 6th failure code	-	16 Bit
U1-21	0x1F15	7957	The 2nd most recent warning code	-	16 Bit
U1-22	0x1F16	7958	3rd most recent warning code	-	16 Bit
U1-23	0x1F17	7959	4th most recent warning code	-	16 Bit
U1-24	0x1F18	7960	The 5th most recent warning code	-	16 Bit
U1-25	0x1F19	7961	The 6th most recent warning code	-	16 Bit
U2-01	0x2001	8193	Product Series	-	16 Bit
U2-02	0x2002	8194	model	-	16 Bit
U2-03	0x2003	8195	model	-	16 Bit
U2-04	0x2004	8196	Version	-	16 Bit
U2-05	0x2005	8197	hardware version	-	16 Bit
U2-06	0x2006	8198	Date of manufacture year	Year	16 Bit
U2-07	0x2007	8199	Delivery date month	Month	16 Bit

U2-08	0x2008	8200	Date of manufacture	Day	16 Bit
U2-09	0x2009	8201	Device serial number 1	-	16 Bit
U2-10	0x200A	8202	Device serial number 2	-	16 Bit
U2-11	0x200B	8203	Device serial number 3	-	16 Bit
U2-12	0x200C	8204	Device serial number 4	-	16 Bit
U2-13	0x200D	8205	Device serial number 5	-	16 Bit
U2-14	0x200E	8206	Device serial number 6	-	16 Bit
U2-15	0x200F	8207	Device serial number 7	-	16 Bit
U2-16	0x2010	8208	Device serial number 8	-	16 Bit