BONENG

Type A Drive instructions (CM23)

01/2024

1 Fundamental safety instructions

1.1 General safety instructions

⚠ DANGER

Contacting with charged parts and other energy supplies will cause life danger

Contacting with charged parts can cause serious injury or even death of personnel

● Only professionals are allowed to work on electrical equipment.

● All operations must comply with national safety regulations.

There are usually six security steps:

1.Prepare for power failure and notify team members affected by power failure.

2. Disconnect the power supply of the device

- Close device.
- Please wait until the discharge time specified on the warning board expires.
- Confirm that there is no voltage between the wire or between the wire and the ground wire
- Confirm that the auxiliary voltage circuit is power off
- Confirm that the motor cannot start.

3. Check all other dangerous energy sources, such as compressed air, hydraulic systems and water.

4. Disconnect all dangerous energy supplies, such as closed switch, ground connection, short connection and closed value

5. Make sure that the energy supply will not be connected automatically.

6. Make sure that the correct device is completely locked.

Restore the ready status of the device in reverse order after the job is completed.

⚠ WARNING

Dangerous voltage generated by connecting inappropriate power supply can cause life danger.

Contact with charged parts may cause serious injury or death of personnel.

⚠ WARNING

Contact with the charged parts on the damaged equipment can cause life danger

Improper handling may cause damage to equipment.

For damaged devices, dangerous voltages may be present at the enclosure or at the exposed components which can result in death or serious injury when the enclosure or the components get touched.

● The limits given in technical data shall be followed when transporting, storing and operating equipment.

● Do not use any damaged devices.

⚠ WARNING

Cable shielding without grounding can cause electric shock and thus lead to life danger

When the cable shielding layer is not grounded, the capacitor supercritical coupling may cause fatal contact voltage

● Cable shielding layer and unused power cable core wire (such as lock core wire) have at least one side of shell grounded.

⚠ WARNING

Electric shock may occur when not grounded which can cause life danger.

There will be high pressure on the bare parts of devices with Protection Lever I when lack of secure grounding or connection error which can cause serious injury or death when be touched.

● Grounding the device in compliance with applicable regulations.

⚠ WARNING

Disconnection of plug during operation may cause electric shock, which may lead to life danger.

The arc generated by disconnection of plug during operation may cause serious injury or death.

● If it is not specified that the plug can be disconnected during operation, the connection can only be disconnected when the power is off.

⚠ WARNING

Insufficient space of the shell can cause fire,which can lead to life danger.

Open fire and smoke can cause heavy casualties or property losses.

● Equipment without protective shell should be installed in metal cabinet (or take the same effort to protect) to avoid equipment contacting with open fire.

● Make sure that the smoke can only be discharged through the safety channel.

⚠ WARNING

Accidental movement of the machine when using a mobile radio or mobile phone can cause life danger.

When the mobile radio equipment or mobile phone with transmission power greater than 1W is used within a distance of about 2m from the module, it will lead to the functional failure of the equipment, which will affect the functional safety of the equipment and lead to casualties or property losses.

● Turn off the radio or mobile phone near the device.

⚠ WARNING

Insulation overload can cause fire, which can cause life danger.

In IT network, grounding will make motor insulation increase load. Insulation failure can produce smoke and cause fire, resulting in serious personal injury or death.

● Use monitoring equipment that can report insulation faults.

● Eliminate the fault as soon as possible to avoid motor insulation overload.

⚠ WARNING

Insufficient ventilation will lead to overheating and fire, which will cause life danger.

Insufficient ventilation space will lead to overheating, smoke, fire and personal injury.

This may cause serious injury or death. In addition, the failure rate of equipment/system may increase and the service life may be shortened.

● The specified minimum spacing between components shall be maintained for ventilation.

⚠ WARNING

Lack of warning signs for unclear warning signs can lead to accidents.

Lack of warning signs or unclear warning signs may lead to serious personal injury or death.

● Check the integrity of the warning signs according to the documents.

● Install warning signs for the components, and install warning signs in the native language if necessary

● Replace the unclear warning signs.

⚠ WARNING

Failure to comply with the specified voltage/insulation test can damage the equipment.

Failure to comply with the specified voltage/insulation test can lead to equipment damage.

● Disconnect the equipment before voltage/insulation test of the machine/equipment, as all drives and motors have been tested for high pressure from factory, so there is no need to test again in the machine/equipment.

⚠ WARNING

Invalid safety function can lead to life–threatening.

Invalid or unsuitable safety functions can cause functional failure of the machine, which may lead to serious injury or death.

● Please pay attention to the information in the relevant product documentation before debugging.

● Monitor the whole system and all safety related components to ensure the safety function.

● Make appropriate settings to ensure that the security functions used are matched and activated with drive tasks and automation tasks.

● Perform function test.

● After ensuring the normal operation of the machine's security function, it was put into production.

⚠ WARNING

Machine misoperations caused by incorrect parameter settings or modification of parameter settings may cause life danger.

Wrong parameter setting can lead to incorrect operation of the machine, resulting in serious injury or death.

● Prevent malicious access to parameter settings.

● Take appropriate measures (such as parking or emergency stop) to respond to possible incorrect operation.

1.2 Safety instructions on electromagnetic fields(EMF)

⚠ WARNING

Electromagnetic fields can cause life danger.

Electromagnetic fields(EMF) will be generated when electrical energy technology equipment such as transformer, driver and motor are running.

Therefore, it may cause danger to people near the equipment/system, especially those with pacemakers or medical implants.

● Ensure that there is a certain distance (at least 2m) between relevant personnel and equipment.

1.3 Operating electrostatic sensitive devices(ESD)

Electrostatic Sensitive Devices

It can be damaged by electrostatic field or electrostatic discharge components, integrated circuits, circuit boards or equipments.

⚠ WARNING

Electric field or electrostatic discharge can damage the equipment.

Electric field or electrostatic discharge may damage individual components, integrated circuits, modules or equipment, resulting in functional failure.

● Only use original product packaging or other suitable packaging materials (such as: conductive foam rubber or aluminum foil) to pack, store, transport and ship electronic components, modules and equipment.

● Only when one of the following grounding measures is taken, can contact components, modules and equipment be allowed:

- Wear static - free wrist strap
- Wear anti - static shoes or anti - static grounding strip in the anti - static area with conductive floor

● Electronic components, modules or equipment can only be placed on conductive backing plates (with anti - static backing plates, conductive static - free foam, anti - static packaging bags, anti - static transport containers).

1.4 Industrial safety

Boneng Transmission provides industrial safety functions for its products and solutions to support the safe operation of plants, solutions, machines, equipment and/or networks.

These functions are an important part of the whole industrial safety mechanism. In view of this, Boneng Transmission continues to develop and improve its products and solutions. Boneng Transmission strongly recommends that you regularly learn about product updates and upgrades.

⚠ WARNING

Tampering with software can cause unsafe driving state, which leads to danger.

Tampering with software (such as Virus, Trojans, Worms, Malicious software) can make the device in an unsafe running state, which may lead to death, serious injury and property loss.

● Please use the latest version of the software.

For information and news, please visit the website (www.boneng.com).

● According to the current technology version, the automation components and drive components are integrated into the overall industrial safety mechanism of the equipment or machine.

For more information, please visit the website (www.boneng.com).

● Pay attention to all products used in the overall industrial safety mechanism.

1.5 Legacy risks of drive system (electric drive system)

The control and drive components of the drive system are allowed to be used in industrial and commercial applications within the industrial power grid.

When used in civil power grid, special design or additional measures are required.

This assembly is only allowed to operate in a closed enclosure or control cabinet and must be fitted with protective devices and covers.

Only professional and technical personnel who have been trained, understood and followed all the safety precautions indicated in the component and user manual can work on the component.

When the machine manufacturer carries out the risk assessment of the machine according to the corresponding local directives (such as: European Union machinery directive), it must pay attention to the following residual risks caused by the control components and drive components of the drive system:

1. When debugging, operating, maintaining and repairing the equipment, the driven machine parts run unexpectedly. The possible reasons are as follows:

- Hardware and / or software failures in encoders, controllers, actuators, and connectors
- Response time of controller and transmission equipment
- Operation and / or environmental conditions are not as specified
- Condensation / conductive impurities
- Error in parameter setting, programming, wiring and installation
- Use of radio / mobile phones near controllers
- External influence / damage

2. In case of failure, abnormal temperature, open fire, abnormal light, noise, impurity and gas appear inside and outside the driver, which may be caused by:

- Part failure
- A software failure
- Operation and/or environmental conditions are not as specified
- External influence/damage

The equipment with the protection level of "open type/IP20" must be installed in the metal cabinet (or take the same measures for protection) to avoid the internal and external contact with open fire.

3. Dangerous contact voltage may be caused by:

- Part failure
- Electrostatic charge induction
- Static charge induction
- Operation and / or environmental conditions are not as specified
- Condensation / conductive impurities
- External influence / damage

4.The electric field, magnetic field and electromagnetic field generated during the operation of the equipment may damage the close cardiac pacemaker bracket, medical implant or other metal objects.

5. When the waste components are not operated in accordance with the regulations or disposed in violation of the regulations, the substances damaging the environment will be released and radiation will be produced.

explain:
Measures must be taken to prevent conductive foreign matter from entering the components. If conductive foreign matters are excluded from the installation site, the control cabinet with lower protection level shall be used.

Other information about the legacy risks generated by the components of the drive system can be found in the relevant sections of the user's technical documentation.

2 Description

2.1 Drive structure

Main components of the drive

Power Module
①

Control Module
②

Each A1 series drive is composed of a Control Module (CM) and a Power Module (PM).

- The control module can control and monitor the power module and the motor connected with it.
- The power module is suitable for motors with a power range of 0.75 kW to 37 kW.

The following data can be found on the Power Module nameplate (①)

- Name: for example: Power Module PM25
- Technical data: voltage, current, power
- Product number: for example: A1-PM25-B3B55-N
- Version: for example: ·····

The following data can be found on the Control Module nameplate (②)：

- Name: for example: Control Module CM23
- Product number: for example: A1-CM23-MB-PE
- Version: for example: ·····

2.2 Control Module

The difference between each model of control module CM23 lies in different field bus and encoder types.

Name	Identification of product	Field bus/Encoder
CM23	A1-CM23-MB-PE	Modbus/Photoelectric

2.3 Power Module

This chapter contains important descriptions of Power Modules.

All power data are rated power or low overload (LD) power.

The Control Module CM23 can operate with the following power modules:

● PM25 IP20 type

Table 2-1 Product code of shielding plate connection kit

Boundary dimension	Identification of product
B1	A1-H06-B1
B2	
B3	A1-H06-B3
B4	A1-H06-B4
B5/6	A1-H06-B6

PM25, 3 AC 400 V-Standard application scope:

The power module PM25 with IP20 protection level has two types: without filter or with built-in A-level power filter. PM25 realizes dynamic braking through an external braking resistor.

Product number range: A1-PM25-B3XXX-N (or F)

Boundary dimension	B1	B2	B3	B4	B6
Power range (KW) IP20 type	0.75~3.0	4~7.5	11~15	18.5~37	45~132

Note: N indicates that there is no built-in filter option, and F indicates that there is a built-in filter option.

2.4 Components for Power Modules

2.4.1 Accessories-Power Module

Shielding and strain release of power interface can be realized by shielding connection kit. The shielding connection kit is composed of shielding plate, tie and screw.

Table 2-1 Product code of the shielded connection suite

Boundary dimension	Identification of product
B1	A1-H06-B1
B2	
B3	A1-H06-B3
B4	A1-H06-B4

2.4.2 Incoming filter (users can customize accessories)

The use of power filter can make the drive achieve higher anti-RF interference level. The drive with integrated power filter does not need external filter.

2.4.3 Power reactor (users can customize accessories)

Power reactor can provide over-voltage protection, suppress grid harmonics, and reduce the voltage defects caused by commutation of rectifier circuit.

2.4.4 Output reactor (users can customize accessories)

The output reactor can reduce the voltage load of the motor winding, and the load of the driver can be reduced by the capacitive charge and discharge of the cable. When the motor cable exceeds 50m (shielded cable) or 100m (unshielded cable), an output reactor must be used.

2.4.5 Brake resistor (users can customize accessories)

The braking resistance can make the load with large moment of inertia brake rapidly. The Power Module can control the brake resistance through the integrated brake chopper.

2.5 Allowed encoders

The following encoders can be connected to the Control Module:

Encoder type	Application
24V push-pull encoder	used for speed control
24V open-set pole encoder	used for speed control

2.6 Debugging tools of driver

The following tools are used to debug, diagnose, and control drive, as well as backup and transfer drive settings.

Operation panel		Product number
	OP25 ● plain text display ● provide menu guidance and application wizard	A1-OP25

PC Tool		
With the help of BONENG Drivesoft, usb-RS485 cable is connected to the keyboard interface to access the driver tool.	BONENG Drivesoft Download address	www.boneng.com
	USB-RS485 cable	It is recommended to use stable and reliable brand conversion cable.

3 Install

3.1 Drive installation steps

Prerequisites for installing drive

Please check before installation:

● Are the required drive components complete?

- Power Module
- Control Module
- Accessories, such as power reactor or brake resistor

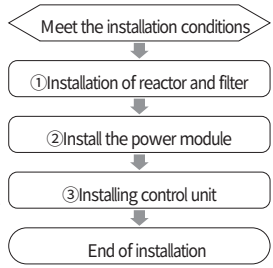
● Install the required components

Are tools and parts complete?

Step

Install the drive as shown by the right arrow:

You have installed all the components and are ready to start.



3.2 EMC specification for drive

3.2.1 Electromagnetic compatibility (EMC) installation regulations of drive

The installation of the drive and motor should be electromagnetic compatible to ensure the normal operation of the drive. Install and operate IP20 drive in a closed control cabinet. IP55 drive are suitable for installation outside the control cabinet.

The design and wiring mode of the control cabinet are briefly described below.

Please refer to the power module installation guide for details.

The EMC installation guide of the drive itself is described below.

3.2.2 Electromagnetic interference (EMI) prevention measures

The drive is designed to be used in industrial environment with high EMI. Only professional installation can ensure the safe, reliable and normal operation of the drive.

Control cabinet design

● All metal parts and components of the control cabinet must keep good electrical connection with the control cabinet frame

- Side panel
- Backplane
- roof
- floor

Large area contact frame or multi-point contact frame with a large number of screws can be selected.

● The grounding bar and EMC shielding bar should also contact the control cabinet frame in a large area to maintain good electrical connection.

● All metal parts installed in the control cabinet, such as drive or power filter, should contact the control cabinet frame in a large area. It is recommended that these devices be mounted on a bare metal mounting plate with good conductivity.

● For painted or oxidized surfaces, an electrical connection can be made between the screw and the surface by one of the following methods:

- A special toothed contact gasket is used to pass through the surface.
- Directly remove the insulating surface at the contact position.

● The following components must be equipped with anti-interference elements:

- Contactor
- Relay
- Magnetic valve
- Motor brake

Connect RC element or rheostat to AC coil and diode or rheostat to DC coil.

Connect the anti-interference element directly to the coil.

Wiring and shielding

● Signal cable and data cable must be separated from all power cables of the drive, including power cable, connecting cable between brake chopper and brake resistor and motor cable. The wiring spacing shall be at least 25cm. If the cable cannot be routed separately, use a metal partition with a good connection to the mounting plate.

● The connecting cable between power supply and power filter must be separated from the following cables:

- Connecting cable between power filter and drive.
- Connecting cable between brake chopper and brake resistor.
- Motor cable.

● Signal cable/data cable and filtered power cable can only be placed perpendicular to unfiltered power cable.

● All connecting cables shall be short as possible.

● signal cable / data cable and equipotential bonding conductor shall be parallel and close to each other all the time.

● Use shielded motor cable.

● The shielded motor cable should be separated from the motor temperature sensor (PTC / KTY) cable.

● signal cable and data cable shall be shielded cable.

● the shielding layer shall be lapped on the grounded metal shell in large area at both ends.

● The shielding layer shall be grounded near the position where the cable enters the control cabinet as far as possible.

● The grounding of power cable shielding layer shall adopt EMC shielding bar.

The signal cable and data cable are grounded by the shielding element on the drive.

● Do not interrupt the cable shield through the intermediate terminal.

3.2.3 Shield board for power module installation

The shielding method of shielding plate is adopted:

The cable shielding layer must be connected with the shielding board in a large area through the line card.

According to the type of power module, the shield board is either included in the scope of supply or provided as an option in the form of shield connection kit.

Shielding mode without shielding plate:

●No optional shielding board is needed to realize the shielding in accordance with EMC regulations. At this time, it must be ensured that the cable shielding layer is connected with the grounding position in a large area.

Installation of shield board: PM25 (take B1 as an example, other similar)

EMC standard wiring example of Power Module PM25

EMC wiring of Power Module B1

Connect the encoder cable and signal cable to the terminal block in the way of electromagnetic compatibility

Please use shielded cable.

●Install the shield board of power module.

● lap the shielding layer of signal cable / encoder cable on the shielding plate of Power Module.

●Install the cable clamp on the shield.

●In addition, the shielding layer shall be lapped on the shielding row of the control cabinet.

3.3 Installation of reactor, filter and braking resistor

Reactor	The installation position of the reactor is more than 20cm away from the drive.
Filter	The installation position of the filter is more than 20cm away from the drive.
Brake resistor	It is recommended to make an additional electrical cabinet for brake resistor installation.

3.4 Installation of Power Module

Installation of Power Module

The correct installation of the Power Module needs to be carried out in the following way.

●Install the Power Module in the control cabinet.

●Install the Power Module vertically with the motor and power terminal facing down.

●Comply with the installation regulations listed below

- Minimum distance from other components
- Fastener
- Torque of fasteners

Size determination

Drilling diagram of Power Module PM25

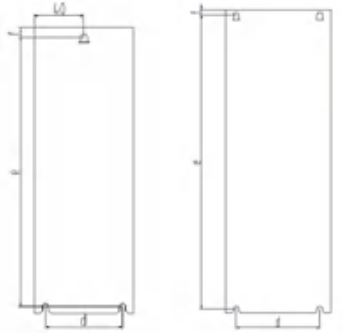


Table 3-1 Overall dimensions and drilling dimensions of A1 series PM25

A1 series	Overall dimensions			drilling dimensions		
	a (width)	b (height)	c (depth)	d	e	f
B1	80	230	165	62	218	6
B2	100	292	165	80	281	6
B3	140	355	165	120	343	6
B4	200	472	237	170	430	7
B5/6	305	757	357	273	727	14

1) Connection Kit with shield plateB1：+94mm；B2：+94mm；B3：+80mm；B4：+151mm；B5/6：+261mm

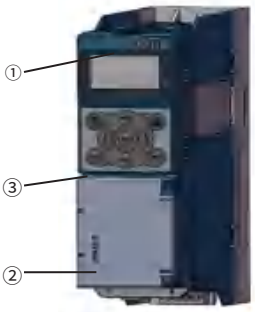
Table 3-2 Spacing between A1 series fasteners and other equipment

A1 series	fastener	tightening torque (Nm)	space between（mm）		
			Upper	Below	Front
B1	M4 screw	2.5	80	100	100
B2	M4 screw	2.5	80	100	100
B3	M5 screw	3.5	80	100	100
B4	M5 screw	6.0	300	350	100
B5/6	M8 screw	25.0	300	350	100

1) In installation and operation, there is no need to keep the side spacing. Considering the error, we suggest that the side spacing should be about 1 mm.

2) Please keep enough space between Control Module and operation panel.

Total drive depth



Power Module, dimensions B1...B4

① Power Module	PM25
② Control Module	CM23
③ Operator Panel	OP25

① + ②

The drive is composed of at least one Power Module and one inserted Control Module.

Total drive depth

=Power Module depth + 53mm (Control Module)

① + ② + ③

Drive with operation panel inserted:

Total depth of drive

=Depth of power module + 53 mm

3.5 Connecting power supply, motor and drive components

3.5.1 Permitted grid system

Altitude requirements:

The installation altitude of the power grid system is limited below 4000m, and it needs to be derated when it exceeds 1000m.

Power requirements:

The machine tool manufacturer must ensure that the voltage sag between the input terminal of the transformer and the drive is less than 4% when operating at rated value.

The drive is designed for the following power supply systems in accordance with IEC60364-1(2005).

TN System

TN system transmits the protective grounding wire to the installed equipment through a wire. The star point in TN system is usually grounded. In addition, there are also TN systems with grounding phase lines, such as L1 with grounding.

TN system can transmit neutral line N and protective earth wire separately or in combination.

The drive runs on TN system

● drive with built-in or external power filter:

- It is allowed to operate on TN system with grounding star point
- It is not allowed to operate on TN system with grounding phase line

● drive without power filter:

- It is allowed to operate on all TN systems ≤ 600V

Example of Power Module on TN System

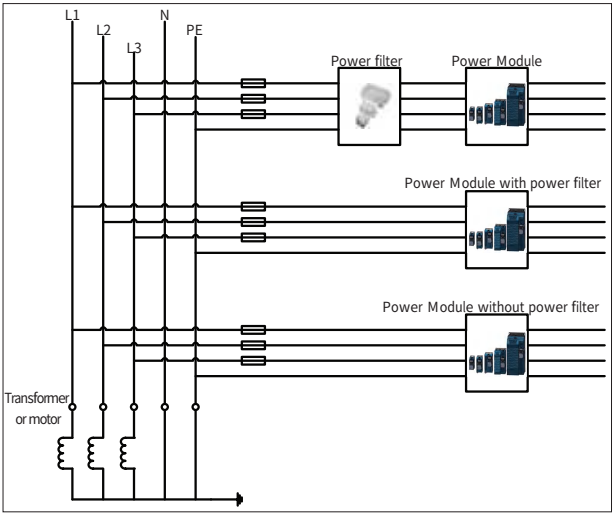


Figure 3-1 TN system with separate transmission of N and PE and grounding star point.

TT system

In TT system, the grounding and installation of transformer are independent.

There are two TT systems with or without neutral N.

Drive running on TT system

● drive with built-in or external power filter:

- It is allowed to operate on TT system with grounding star point.
- It is not allowed to operate on TT system without grounding star.

● drive without power filter:

- Allow to run on all TT systems.

Example of Power Module on TN System

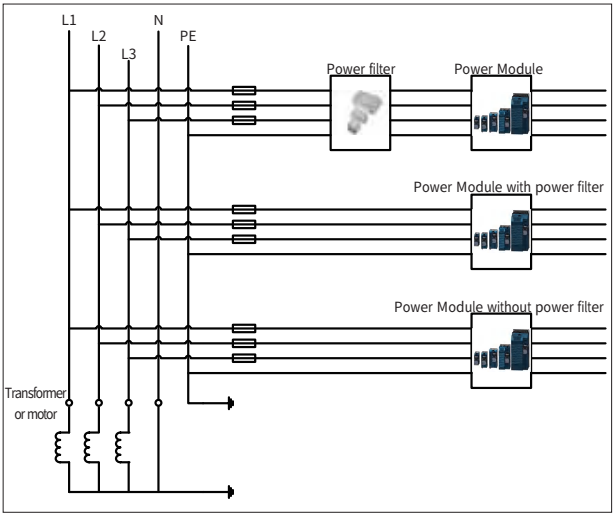


Figure 3-2 TT system with neutral N transmission and grounded star point.

IT system

All wires in IT system are isolated from the protective earth wire or connected to the protective earth wire through an impedance. Two IT systems with or without neutral N transmission.

Drive run on IT systems

● drive with built-in power filter:

- Not allowed to run on IT systems

● drive without power filter:

- Allow to run on all IT systems

Example of Power Module on TN System

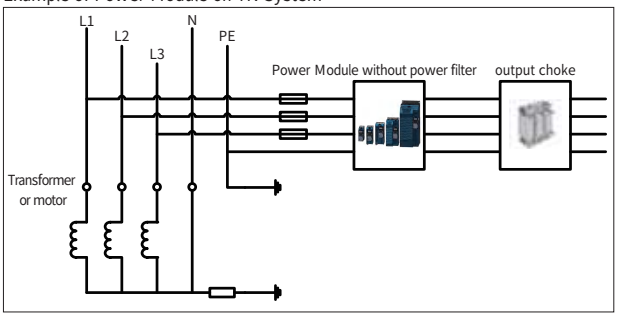


Figure 3-3 IT system with transmission neutral N and impedance of protective earth wire.

Characteristics of the drive when grounded:

In some cases, the drive can still work when the output is grounded.

At this time, an output reactor must be installed to avoid over-current trip of the drive or damage to the motor.

3.5.2 Protection device

The inverter must be grounded according to the relevant provisions of high leakage current (above 3.5 mA). If local and national codes require upstream protection via residual protectors, type B residual current circuit breakers shall be used for drives.

In order to avoid accidental triggering of residual current circuit breaker caused by leakage current, the star point of power supply must be grounded, and the residual current circuit breaker with limiting current of more than 300mA and action time of more than 0.1s shall be selected.

According to the requirements of IEC61800-5-1, special attention should be paid if the leakage current exceeds 3.5mA.

One of the following ways should be adopted to enhance the grounding measures:

●The cross-sectional area of the ground wire shall be at least 10㎟（8 AWG）.

●Use two separate grounding wires that meet the size specifications.

3.5.3 Connecting drive

Connect the power module to the motor and power supply.

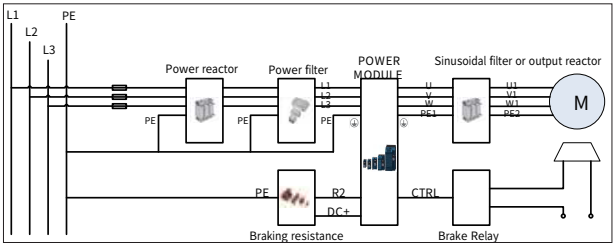


Figure 3-4 Power Module PM25 3AC wiring diagram

DANGER

Dangerous voltage on motor interface can cause life-threatening.

Once the driver is powered on, there may be dangerous voltage on the motor interface of the drive. If the motor is connected to the drive and the motor junction box is open, touching the motor interface can cause an electric shock hazard.

●Please turn off the terminal box of the motor before connecting the drive.

Connect the power cable to the drive

Step / connect the drive and power supply as follows:

1. If there is a cover on the terminal of the drive, open the cover.
2. Connect the power supply to terminals L1, L2 and L3.
3. Connect the protective grounding wire of the power supply to the PE terminal of the drive.
4. If there is a cover on the terminal of the drive, close the cover.

You have connected the power cable to the drive.

Connect the motor cable to the asynchronous motor

Step / connect the motor cable to the asynchronous motor as follows:

1. Open the motor terminal box.
2. Use star connection or triangle connection to connect the motor.
3. If shielded motor cable is needed, the following operations must be carried out:

- Peel off the sheath of the motor cable around the inlet hole of the junction box to expose the shielding layer.
- Ground the shield through a suitable cable gland on the motor junction box.

4. Connect the terminal box of the motor

You have successfully connected the motor cable to the asynchronous motor

You must choose star connection or triangle connection(Y/△) to connect the motor according to your application.

Example: drive and motor running on 400V power supply

Assumption: 230/400V △/Y is marked on the motor nameplate.

Case 1: normally, the motor rises from static state to rated speed

(the speed corresponding to the power frequency).

At this time, the motor must use Y wiring.

In this case, only by using flux weakening, the motor can run beyond the rated speed, that is to say, the available torque of the motor can be reduced above the rated speed.

Before connecting the motor, check whether the wiring of the motor is in accordance with the requirements of your application

Star connection or triangle connection of motor

Schematic diagram of wiring

●Star connection (Y)

●Delta connection (△)

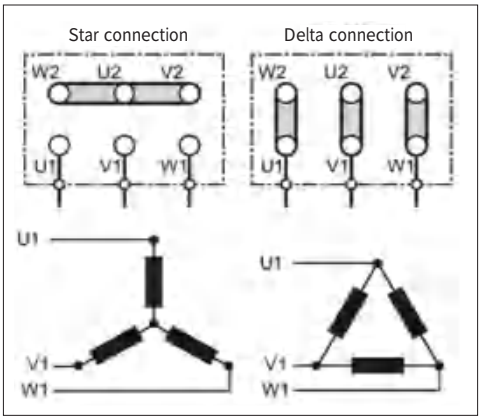


Figure 3-5 star and triangle connection of motor

Connect the motor cable to the drive

Step/connect the motor cable to the drive as follows:

1. If there is a cover on the terminal of the drive, open the cover.
2. Connect the motor to terminals U, V and W.

Please note the EMC Wiring Regulations.

3. Connect the protective grounding wire of the motor to the PE terminal of the drive.
4. If there is a cover on the terminal of the drive, close the cover.

You have connected the motor cable to the drive.

3.5.3 Connecting brake resistor

Connect the Power Module to the motor and power supply.

WARNING

Improper or incorrect installation of the brake resistor can lead to fire and life-threatening.

Open fire and smoke can cause heavy casualties or property losses.

The use of mismatched brake resistor can cause open fire and smoke, resulting in casualties or financial losses.

- Only the brake resistor matched with the drive is allowed to be used.
- Install the brake resistor as required.
- Monitor the temperature of the brake resistor.

Be Careful

Contact with hot surfaces can cause burns.

The temperature of the brake resistor will rise sharply during operation.

- Please do not touch the brake resistor during operation.

Step / connect the brake resistor and monitor the temperature of the brake resistor according to the following steps:

1. Connect the brake resistor to the terminals DC+ and R2 on the drive.
2. Connect the brake resistor directly to the grounding bar of the control cabinet, and the brake resistor is not allowed to be grounded through the PE terminal on the drive.
3. Please follow the shielding regulations to ensure that the electromagnetic compatibility requirements are met.
4. Connect the temperature monitoring terminal of the brake resistor to the idle digital input on the drive.
5. When debugging the drive, the function of the digital input is defined as an external fault.

Now the brake resistor has been successfully connected and the temperature monitoring has been set.

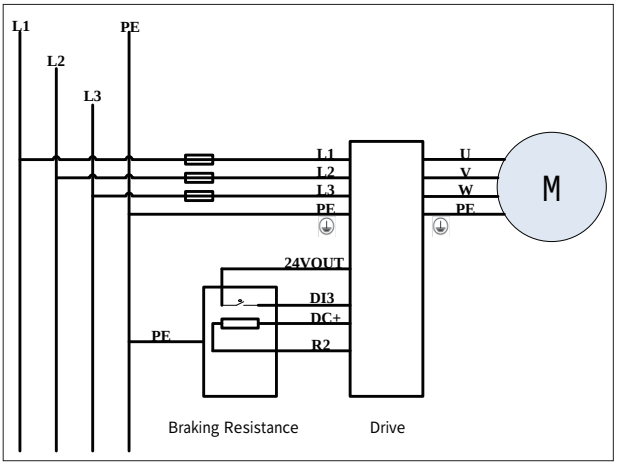


Figure 3-6 Connecting the brake resistor directly to the driver (example: temperature monitoring through DI3)

3.6 Installation of Control Module

⚠ WARNING

The dangerous voltage generated by improper power supply can cause life danger. In case of failure, contacting live parts may cause serious injury or even death.

●All connections and terminals of electronic module are only allowed to use class 2 PELV power supply (Protective Extra Low Voltage).

3.6.1 Insert the Control Module into the Power Module

Insert the Control Module into the Power Module B1.. B4

Remove the Control Module

Load the Control Module

Step

Insert the Control Module into the Power Module as follows:

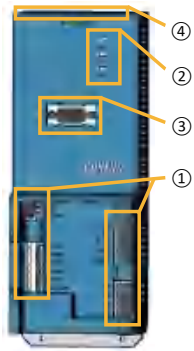
1. Install the convex part on the back of the Control Module in the corresponding groove of the Power Module.
2. Insert the Control Module into the Power Module until the sound of the control unit clamping on the Power Module is heard.

You have inserted the Control Module into the Power Module.

If you want to remove the Control Module, just press and hold the clip on the power unit and remove the Control Module.

3.6.2 Interface list

It is necessary to remove the operation panel (if any) and open the front door cover to operate the interface on the front of the Control Module.



① Terminal block

② Status LED

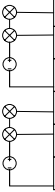
③ Operation panel interface

④ Ethernet terminal

3.6.3 Terminal block behind the top front protective cover

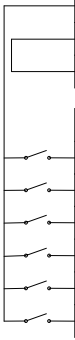
X1	
1	SG+
2	SG-
3	SG GND

Only support the modbus control module, Modbus terminal, maximum support 115200bps



X2	
1	DO 0 NO
2	DO 0 NC
3	DO 0 COM
4	DO 1 NO
5	DO 1 NC
6	DO 1 COM

2-channel digital output (relay) with maximum duration of 2A, supporting 220 VAC and 30 VDC



X3	
1	EC A
2	EC B
3	EC Z
4	EC 24V
5	EC GND
6	24V OUT
7	GND
8	DI COM0

The encoder supports 24 V single ended signal input

EC GND and GND are connected with internal GND, 24V OUT and EC 24v are generated by the machine, and the voltage is 24V±10%

X4	
1	DI 0
2	DI 1
3	DI 2
4	DI 3
5	DI 4
6	DI 5

DI 0-DI 5 is a common digital input of DI COM0, low voltage＜5V，high voltage＞11V，support 24VDC, 36VAC, 48VAC

3.6.4 Top terminal

This terminal is only available in control modules that support PROFINET communication.

X23 and X24

pinout	signal name	signal description
1	TXP	Ethernet sending data+
2	TXN	Ethernet sending data-
3	RXP	Ethernet receiving data+
4	Reserved, unoccupied	—
5	Reserved, unoccupied	—
6	RXN	Ethernet receiving data-
7	Reserved, unoccupied	—
8	Reserved, unoccupied	—

3.7 Installation of encoder

The encoder for speed control

The encoder must be mounted on the motor shaft.

Table 3-3 allowed encoders

Type of encoder	terminal
24V push pull encoder	X3
24V open collector encoder	X3

If the encoder supports 24V input, the 24V power supply provided by terminal X3 can be used directly.

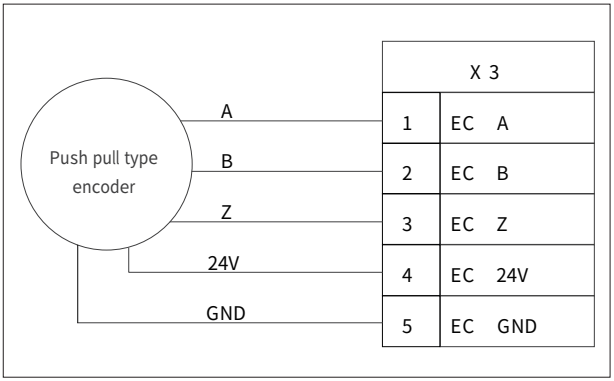


Figure 3-7-1 24V push pull encoder wiring diagram

If the encoder supports 24V input, it can directly use the 24V power supply provided by terminal X3

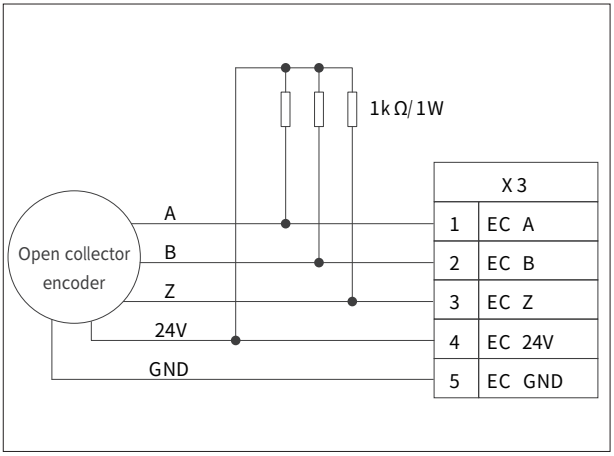


Figure 3-7-2 24V open collector encoder wiring diagram

Note: if different signal is used, it must be noted that only A+, B+, Z+or A-, B-, Z- can be used at the same time.

4 Commissioning

4.1 Commissioning Guide

1.Determine the application requirements for frequency converter

●Input cable diameter

●Output cable diameter

●Matching value of braking resistance

2.Power on the inverter for the first time to restore the factory value.

3.Check whether the factory settings of the inverter have met your application requirements.

4.Set the following items during driver debugging:

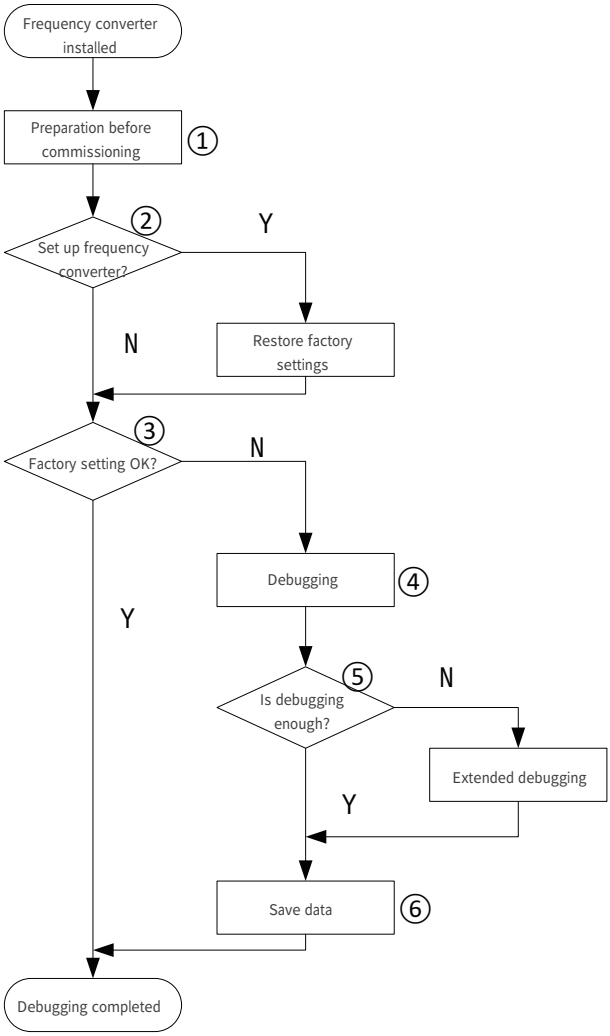
●Motor control mode

●Input and output

●Field bus interface

5.Adjust the inverter parameters according to the demand.

6.Backup all parameters of frequency converter.



4.2 Preparation before commissioning

4.2.1 Collect motor data

Before you start debugging, you must be able to determine the following information

●What kind of motor is connected to the drive?

Please record the product number of the motor and the data on the nameplate, and record the relevant motor parameters in the corresponding parameter list of the driver.

●How to connect the motor?

Pay attention to the motor wiring (Star [y] or delta [△]). Write down the motor data corresponding to the wiring.

4.2.2 Factory settings of drive

Drive model settings

At the factory, the drive has been set according to the rated power of the Power Module.Drive control

The factory setting signal of the drive control comes from the terminal, and the factory setting of the terminal depends on the setting of the Control Module.

X4		Custom function
1	DI 0	Forward running
2	DI 1	Reverse operation
3	DI 2	..... No function
4	DI 3	.....
5	DI 4	.....
6	DI 5	.....

X2		Custom function
1	DO 0 NO	In operation
2	DO 0 NC	
3	DO 0 COM	
4	DO 1 NO	.....
5	DO 1 NC	
6	DO 1 COM	

Turn on and off the motor

In the factory settings of the drive, take the frequency setting value of 5Hz (the rated frequency of the motor is 50Hz) as an example, the drive will make the motor accelerate to the setting value within 5 seconds after being turned on. Similarly, after turning off the motor, the drive will slow down and brake the motor in 5 seconds.

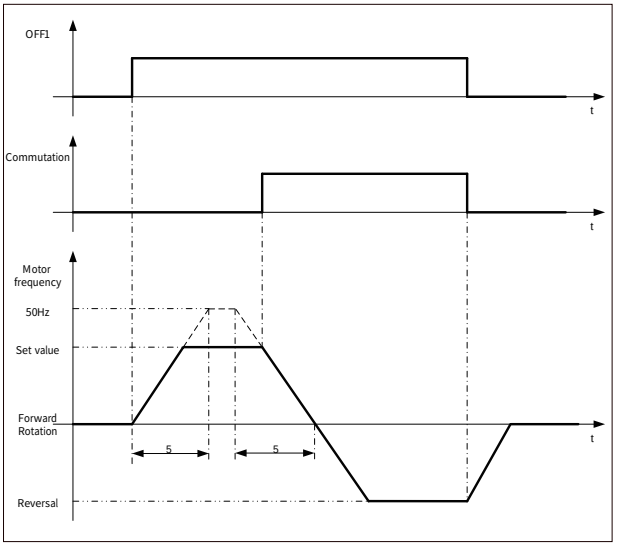


Figure 4-1 Opening, closing and reversing of motor in factory settings.

4.3 Restore factory value

Some situations can cause debugging exceptions, such as:

● power supply is interrupted during the commissioning, which makes the commissioning unable to end.

● In the process of debugging, the setting cannot be continued because the meaning of a parameter is not understood.

●You don't know if the drive has been used once.

In these cases, restore the drive to factory settings.

Table 4 - 1 Parameter recovery factory value

Parameter	Parameter name	Description
A04.00	Parameter reset mode	0: Invalid 1: Model parameters, motor parameters, fault records not reset 2: Motor parameters, fault records not reset 3: Reset all parameters 4: Clear fault records
A04.01	Parameter reset	0: Cancel 1: Confirm

Model parameters: the drive sets the power model parameters of PM drive module.

Motor parameters: motor parameters driven by drive.

Example:

Target requirements:

Restore the parameters other than model parameters and motor parameters to factory values.

Steps:

1.A04.00=1;

2.A04.01=1;

After waiting for 5S, the drive completes the operation of restoring the factory value.

4.4 Operation and display of operation panel

Introduction of operation and display interface

With the operation panel, you can modify the functional parameters of the drive, monitor the working state of the drive and control the operation (start, stop) of the drive which appearance and functional area are shown in the figure below:

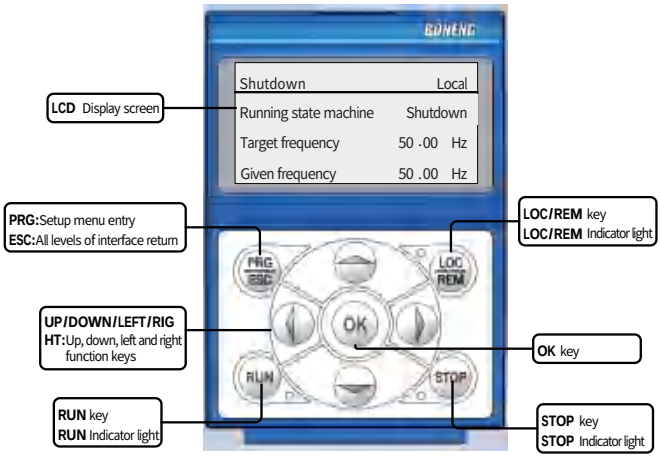


Figure 4-2 Schematic diagram of operation panel

1) Function indicator description

LOC / REM indicator light: the light on indicates the panel operation control status, and the light off indicates the remote operation control status.

Stop indicator light: when the light is on, it indicates that the drive is in shutdown state.

Run indicator light: when the light is on, it indicates that the drive is processing the running state.

2) Operation panel key description

Key	Name	Function
PRG/ESC	PRG/ ESC key	In the main monitoring interface, press this key to enter the function selection interface; For other interfaces, press this key to return to the upper level interface or status
LOC/REM	LOC/REM key	Gets or relinquishes keyboard control
STOP	Stop key	In the running state, pressing this key can be used to stop the operation; Press this key to reset the fault state when the machine is stopped
RUN	Run key	In keyboard operation mode, it is used for operation
▲	Descending key	Increment of data or function code
▼	Descending key	Decrement of data or function code
▶	right shift key	When modifying a parameter, you can cycle right to select the modification bit of the parameter
◀	left shift key	When modifying a parameter, you can cycle to the left to select the modification bit of the parameter
OK	OK key	Enter the menu screen step by step and confirm the setting parameters

3) LCD display interface description

LCD display interface adopts 4 lines of Chinese display mode, in which the first line displays the status line. When there is no fault, display the current operation status (shutdown operation), inching control, local/remote status and other information. When a fault occurs, the first line will display the current fault code first, as shown in the figure below:

Shutdown	Local
Running state machine	Shutdown
Target frequency	50.00 Hz
Given frequency	50.00 Hz

Figure 2 example of LCD display in n ormal state

Fault: converter overtemperature1	
Running state machine	Shutdown
Target frequency	50.00 Hz
Given frequency	50.00 Hz

Figure 3 example of LCD display of fault status

How to view and modify function code

The operation panel of A1 drive adopts multi-level menu structure for parameter setting and other operations. The interface adopts 4 lines of Chinese display, which is very intuitive and easy to operate.

In the state of parameter setting interface, you can view this group of function codes in turn by pressing the up and down buttons.

Press OK to enter the parameter setting interface.

Give an example:

An example of changing function code B05.00 from VF control to SVC control is shown in the figure below.

The result of parameter setting is one of the following:

1) Modified successfully
2) Read only parameter
3) No permission to modify
4) It can only be stopped for modification

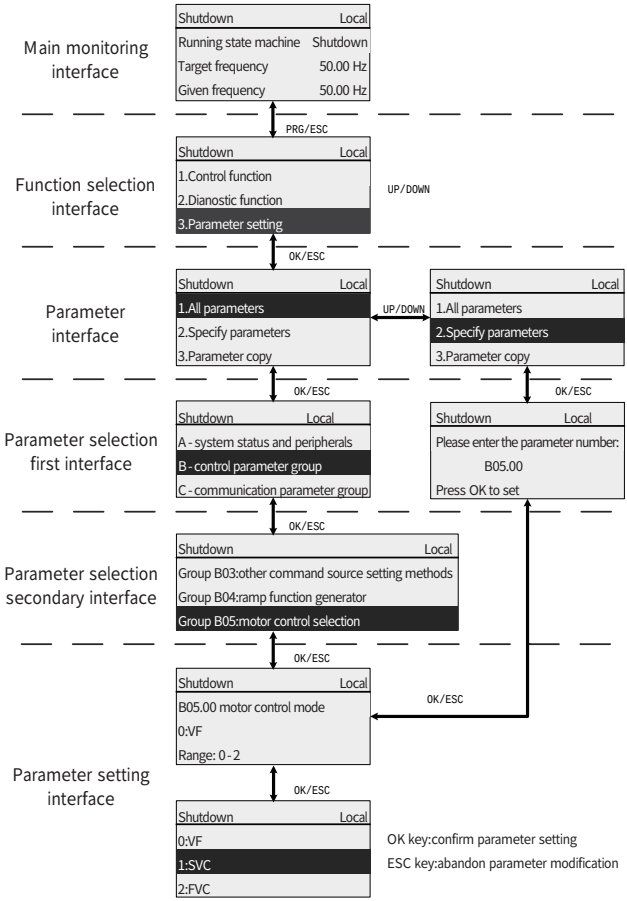


Figure 4 - 3 Schematic diagram of parameter modification process

Main interface monitoring parameter selection

The number of parameters that can be monitored in the main interface is 6, and the range of parameters that can be monitored is A00.00 - A00.40, a total of 41 parameters. The monitoring parameters of the main monitoring interface can be selected by setting the parameter values of A00.41 - A00.46.

For example:

A00.14 (DC bus voltage) needs to be displayed on the second line of the main monitoring interface. Just change the parameter value of A00.42 to 14.

5 Extended debugging

5.1 Drive function list

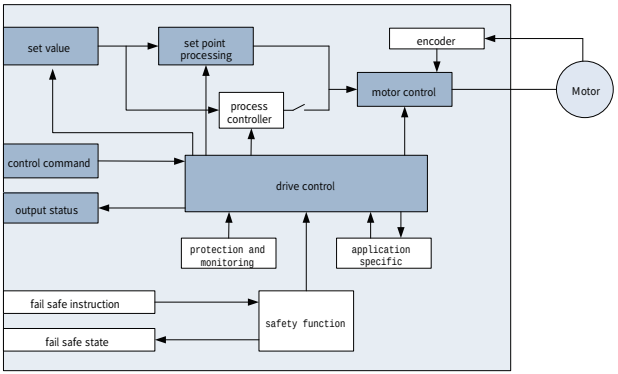


Figure 5 - 1 List of drive functions

Common functions		Special functions	
The functions that need to be used in each application are shown in dark color in the function list above. Please display these functions in white during basic debugging, so that you can run the motor directly without other settings in many applications.		The functions that need to adjust parameters according to the requirements are shown in white in the above function diagram.	
Drive control	Drive control has more authority than all other functions. It defines how to respond to the instructions of the superior monitoring controller.	Protection and monitoring	The protection and monitoring function can avoid damaging the motor, drive and working machinery, such as through temperature monitoring or torque monitoring.
Command output status	The command of the upper controller is sent to the driver through digital input or field - bus. The drive feeds back its status information to the output of control module or field - bus.	Application specific	The application of special functions can control, such as motor holding brake, or enable upper pressure control or temperature control through public controller.
Set value	A set value must be determined, such as: the speed set value	Safety function	The security function is used in the application where the security of the drive function is highly required. The basic function is to safely block the driving torque.
Set point processing	Set value processing is used to avoid sharp change of speed caused by ramp function generator and control the speed below the maximum value.		
Motor control	The motor control is used to make the motor track the speed setting. You can choose between vector control and V / f control.		

5.2 Drive control

5.2.1 Turn on and turn off the motor

After the power supply voltage is turned on, the drive will normally enter the "power on Preparation" state.

In this state, the drive will always wait for the command to turn on the motor

● OFF1 - ON received

After the command, the drive will turn on the motor. The drive enters the "running" state.

● Send OFF1 - OFF

After command, the drive brakes the motor. After the motor stops, the drive will turn off the output. The drive returns to the "power on ready" state.

Drive status and command to turn motor on and off

Except for the OFF1 instruction,

The command to stop the motor is as follows:

● The OFF2 - ON drive stops output immediately without braking the motor first.

● OFF3 - on this instruction means "emergency stop". After the OFF3 - on command is issued, the drive makes the motor brake with OFF3 deceleration time. After the motor stops, the drive will turn off the output. This command is often used in abnormal operation to make the motor brake quickly. The typical application is collision protection.

● Stop operation - the drive stops the motor in the stop mode of OFF1 / OFF2 / OFF3.

● Normal operation - the drive drives the motor.

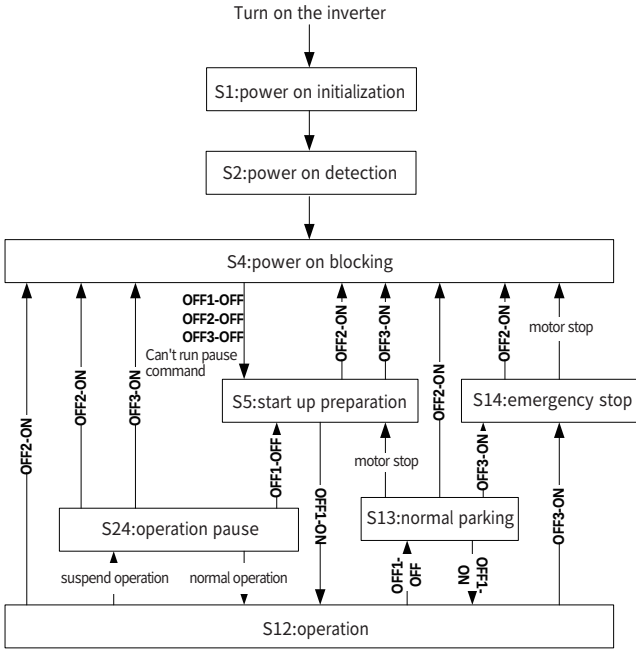


Figure 5 - 2 Internal sequence control of the drive when the motor is turned on and off

Drive status	Instruction
S1	The initialization state of the drive after it is powered on.
S2	The detection status of power devices after drive initialization.
S4	The state in which the drive does not meet the motor operating conditions.
S5	The state of the drive when it meets the operating conditions of the motor.
S12	The output of the drive makes the motor run.
S13	The motor has been shut down by OFF1 command and braked during the ramp down time of ramp function generator.
S14	The motor has been shut down by OFF3 command and decelerated and braked by of 3 deceleration time or according to current limit
S24	The motor operation is suspended.

5.2.2 Adjust the preset of terminal block

This chapter describes how to modify the functions of each digital and analog input / output of the drive.

5.2.2.1 Digital input

Modify the function of digital input

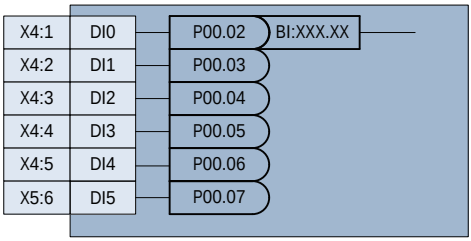


Figure 5-3 Digital input function diagram

Note: the status parameter of DI must be connected with the selected binary interconnection input to modify the function of DI.

Figure 5 - 1 Binary interconnection input parameters of some common drives

BI	Meaning	BI	Meaning
B00.01	Custom OFF1 source	B03.15	Multi segment given value selection 4
B00.02	Custom OFF2 source	B04.00	RFG ramp time selection1
B00.13	Fault reset source	B04.01	RFG ramp time selection2
B01.00	Terminal control command 1/2 selection	B04.20	RFG output enable
B01.03	Terminal control command 1 input 1	E00.00	External fault input 1
B01.04	Terminal control command 1 input 2	E00.01	External fault input 2
B01.05	Terminal control command 1 input 3	E00.02	External warning input 1
B03.09	Source selection of electric potentiometer	E00.03	External warning input 2
B03.10	Electric potentiometer reduces source selection	F04.03	Source of holding brake open command
B03.12	Multi segment given value selection 1	F04.09	Command source of forced holding brake closing
B03.13	Multi segment given value selection 2		
B03.14	Multi segment given value selection 3		

Example:modify the function of digital input

The external fault source selection (E00.00) is connected with DI0 to trigger the external fault through digital input DI0. Set E00.00=1002.

Note:The coding rule of the representative number of interconnection parameters is agreed as parameter number +1000; that is, the number of P00.02 is 1002; The number of P13.11 is 2311,;and the number of P15.89 is 2589; Other interconnection parameters and so on.

5.2.2.2 Digital output

Change the function of digital output

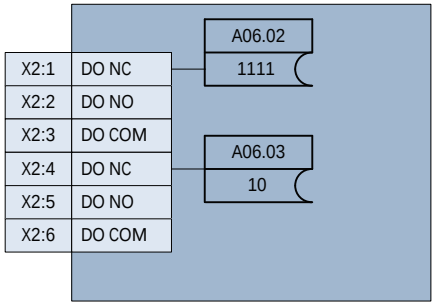


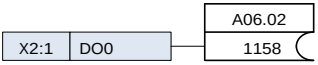
Figure 5 - 4 function diagram of changing digital output

Note:The digital output must be connected with the selected binary interconnection output to change the function of the digital output.

Table 5 - 2 Function selection table of digital output of drive.

Set value	Meaning	Set value	Meaning
0	low level	6	the velocity negative
1	high lever	7	zero speed operation
2	ready for power on	8	over speed
3	operation allowed	9	warning
4	in operation	10	fault
5	comparison value arrived	other:binary interconnection parameters	

Example:modify the function of digital output



The DO0 is connected with the interconnection parameter of holding opening (P01.58) to represent the current state of holding brake relay by digital output DO0;Setting A06.02=1158.

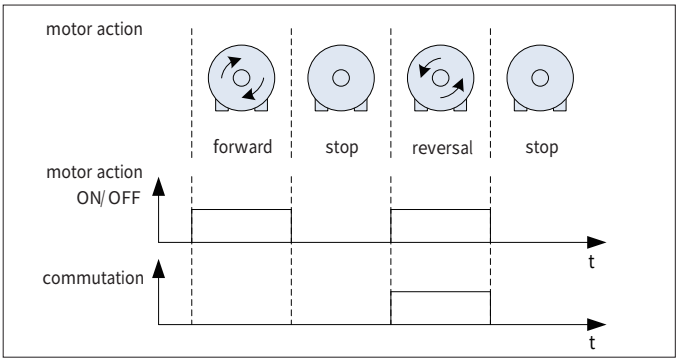
5.2.3 Control drive by digital input (DI)

There are six ways to control the motor by digital input.

Single line control

Single wire control, the input terminal only controls the start and stop of the motor, the rotation direction of the motor is determined by the current driver output terminal wiring phase sequence.

Two wire control, method 1



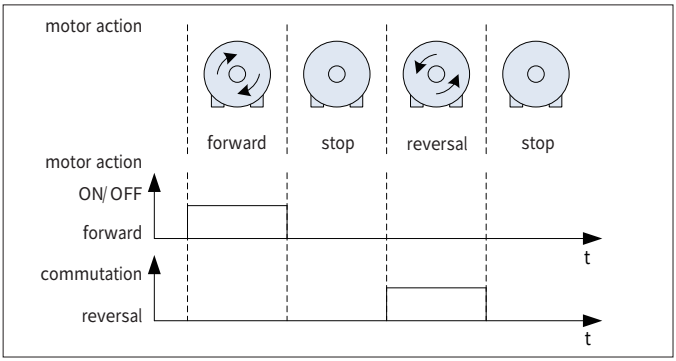
Control command

1. Turn on and off the motor (ON / OFF1).
2. Switch the motor rotation direction (reverse).

Typical applications:

Field control of conveyor application.

Two wire control, method 2



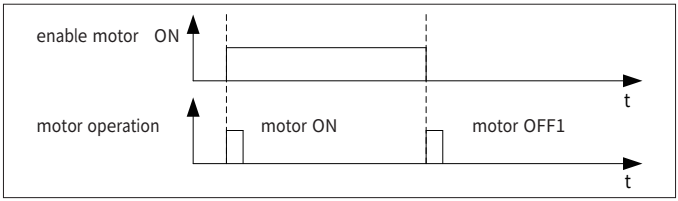
Control command

1. Turn on and off the motor (ON / OFF1) and turn forward.
2. Turn on and off the motor (ON / OFF1) and reverse.

Typical applications

Through the main switch to control the operation of transmission.

Two wire control, method 3

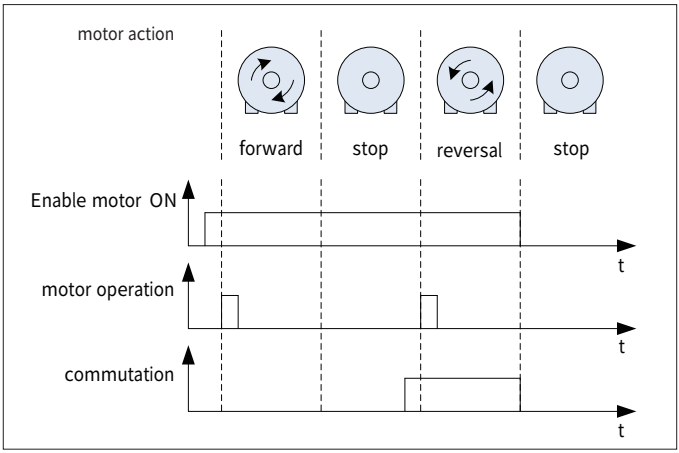


Control command

1.Enable motor and disable motor (OFF).

2.Turn on the motor(ON), and the rotation direction of the motor is determined by the current phase sequence of the output terminal wiring of the drive.

Three wire control, method 1



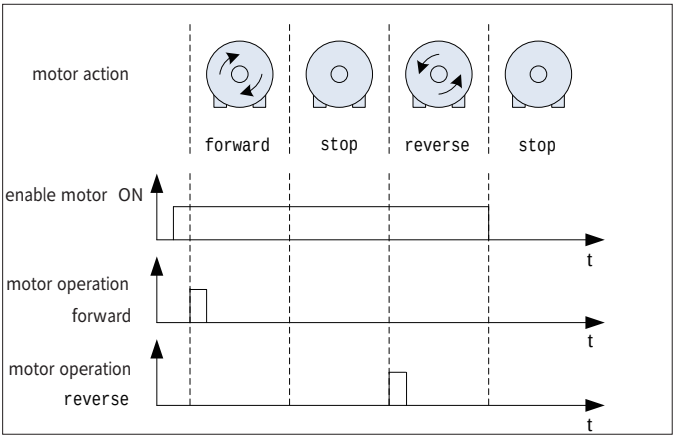
Control command:

1.Enable motor and close motor(OFF1)

2.Turn on the motor.

3.Switch the motor rotation direction(reverse).

Three wire control, method 2



Control command:

1.Enable motor and disable motor(OFF).

2.Motor running forward command (ON), forward.

3.Motor operation reverse command(ON),reverse.

Typical applications

Through the main switch to control the operation of transmission.

5.2.4 Two wire control, method 1

In this control method, you control the start and stop of the motor by one control command (ON/OFF), and control the forward and reverse rotation of the motor by another control command.

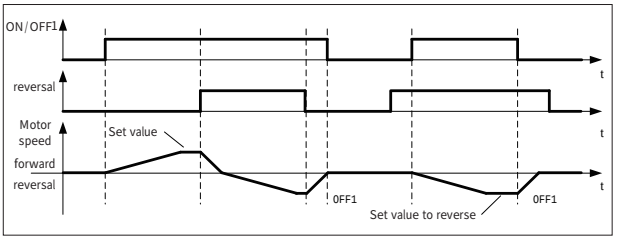


Figure 5-9 Two wire control, method 1

Table 5-4 Terminal function list

ON/OFF1	Reverse	Function
0	0	OFF1:motor stop
0	1	OFF1:motor stop
1	0	ON:the motor rotates forward
1	1	ON:the motor reverses

Related parameter setting

Parameter number	Parameter name	Parameter description
B01.00	Terminal control command 1 / 2 selection	Select a valid module for the terminal.
B01.01	Terminal control command 1 mode	Select the terminal control mode of terminal start stop effective module 1, B01.01 = 2 means two - wire control, method 1.
B01.03	Terminal control command 1 input in1	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.04	Terminal control command 1 input in2	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.06	Terminal control command 2 mode	Select the terminal control mode of terminal start stop effective module 2, B01.06 = 2 means two - wire control, method 1.
B01.08	Terminal control command 2 input in1	Select the input terminal source selection of terminal start stop effective module 2, this parameter is binary interconnection parameter.
B01.09	erminal control command 2 input in2	Select the source of the input terminal of the terminal start stop effective module 2, most of which are binary interconnection parameters

5.2.5 Two wire control, method 2

In this control method, the first control command (ON / OFF1) is used to turn on and off the motor, and select the forward rotation of the motor at the same time.

The second control command is also used to turn the motor on and off while selecting the reverse direction of the motor.

The drive receives new commands only when the motor is stationary.

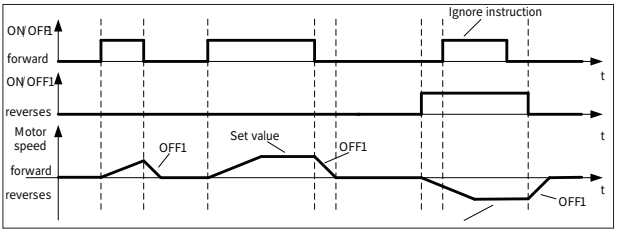


Figure 5 - 10 Two wire control, method 2

Table 5 - 5 function list

ON/OFF1 forward	ON/OFF1 Inversion	Function
0	0	OFF1:motor stop
1	1	ON:motor rotates forward
0	1	ON:the motor reverses
1	1	ON:the motor rotation direction is subject to the first "1" signer.

Related parameter table

Parameter number	Parameter name	Parameter description
B01.00	Terminal control command 1 / 2 selection	Select a valid module for the terminal.
B01.01	Terminal control command 1 mode	Select the terminal control mode of terminal start stop effective module 1, B01.01 = 3 means two - wire control, method 2.
B01.03	Terminal control command 1 input in1	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.04	Terminal control command 1 input in 2	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.06	Terminal control command 2 mode	Select the terminal control mode of terminal start stop effective module 2, B01.06 = 3 means two - wire control, method 2.
B01.08	Terminal control command 2 input in1	Select the input terminal source selection of terminal start stop effective module 2, this parameter is binary interconnection parameter.
B01.09	erminal control command 2 input in 2	Select the source of the input terminal of the terminal start stop effective module 2, most of which are binary interconnection parameters

5.2.6 Two wire control, method 3 wire control, method2

In this control method, the first control command is used to enable another control command. After the enable is canceled, the motor is shut down (OFF 1).

The rising edge of the second control finger moves the motor. The running direction of the motor depends on the line searching phase sequence at the output end of the drive.

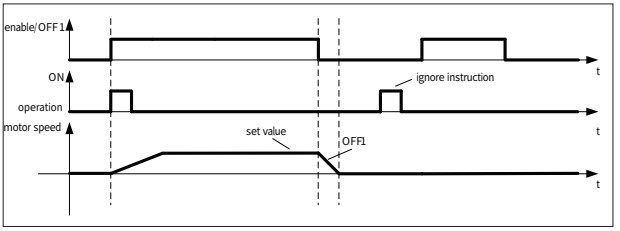


Figure 5 - 11 Two wire control, method 3

Figure 5 - 6 function table

Enable/OFF1	ON/OFF1	Function
0	0	OFF1:motor stop
1	0	OFF1:motor stop
0	1	OFF1:motor stop
1	1	ON:The motor rotation direction is subject to the wring phase sequence of the driver output line.

Related parameter table

Parameter number	Parameter name	Parameter description
B01.00	Terminal control command 1 / 2 selection	Select a valid module for the terminal.
B01.01	Terminal control command 1 mode	Select the terminal control mode of terminal start stop effective module 1, B01.01 = 4 means two - wire control, method 3.
B01.03	Terminal control command 1 input in1	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.04	Terminal control command 1 input in2	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.06	Terminal control command 2 mode	Select the terminal control mode of terminal start stop effective module 2, B01.06 = 4 means two - wire control, method 3.
B01.08	Terminal control command 2 input in1	Select the input terminal source selection of terminal start stop effective module 2, this parameter is binary interconnection parameter.
B01.09	erminal control command 2 input in2	Select the source of the input terminal of the terminal start stop effective module 2, most of which are binary interconnection parameters

5.2.7 Three wire control, method 1

In this control method, the first control instruction is used to enable the other two control instructions. After disable, the motor turns off(OFF1).

The rising edge of the second control command turns on the motor(ON).

The third control command determines the direction of rotation(commutation) of the motor.

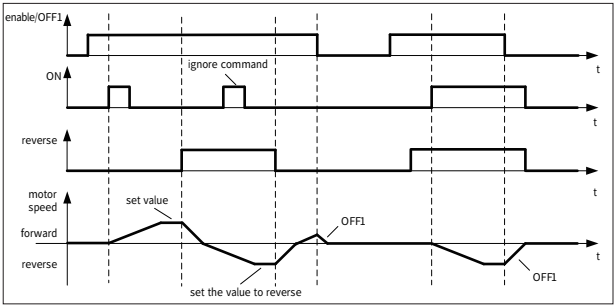


Figure 5-12 Three wire control, method 1

Figure 5-7 function table

enable/OFF1	ON	Reverse Direction	Function
0	0 or 1	0 or 1	OFF1:motor stop
1	0->1	0	ON:motor rotates forward
1	0->1	1	ON:the motor reverses

Relative parameters

parameter number	Parameter name	Parameter description
B01.00	Terminal control command 1 / 2 selection	Select a valid module for the terminal.
B01.01	Terminal control command 1 mode	Select the terminal control mode of terminal start stop effective module 1, B01.01=5 means two-wire control, method 1.
B01.03	Terminal control command 1 input IN1	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.04	Terminal control command 1 input IN2	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.05	Terminal control command 1 input IN3	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.06	Terminal control command 2 mode	Select the terminal control mode of terminal start stop effective module 2, B01.06=5 means two-wire control, method 1.
B01.08	Terminal control command 2 input IN1	Select the input terminal source selection of terminal start stop effective module 2, most of which are binary interconnection parameters.
B01.09	Terminal control command 2 input IN2	Select the input terminal source selection of terminal start stop effective module 2, most of which are binary interconnection parameters.
B01.10	Terminal control command 2 input IN3	Select the input terminal source selection of terminal start stop effective module 2, most of which are binary interconnection parameters.

5.2.8 Three wire control, method 2

In this control method, the first control instruction is used to enable the other two control instructions.

After disable, the motor turns off(OFF1).

The rising edge of the second control command switches the motor to forward.

If the motor is not switched on, the motor is switched on.

The rising edge of the second control command switches the motor to reverse.

If the motor is not switched on, the motor is switched on.

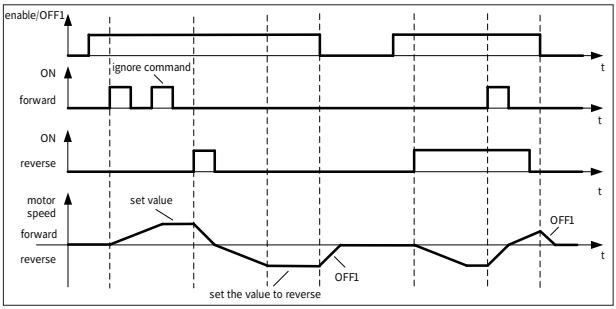


Figure 5-13 Three wire control, method 2

Figure 5-8 Function table

enable/OFF1	ON forward	ON reverse	Function
0	0 or 1	0 or 1	OFF1:motor stop
1	0->1	0	ON:motor rotates forward
1	0	0->1	ON:the motor reverses
1	1	1	OFF1:motor stop

Relative parameters

parameter number	Parameter name	Parameter description
B01.00	Terminal control command 1 / 2 selection	Select a valid module for the terminal.
B01.01	Terminal control command 1 mode	Select the terminal control mode of terminal start stop effective module 1, B01.01=6 means two-wire control, method 2.
B01.03	Terminal control command 1 input IN1	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.04	Terminal control command 1 input IN2	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.05	Terminal control command 1 input IN3	Select the input terminal source selection of terminal start stop effective module 1, this parameter is binary interconnection parameter.
B01.06	Terminal control command 2 mode	Select the terminal control mode of terminal start stop effective module 2, B01.06=6 means two-wire control, method 2.
B01.08	Terminal control command 2 input IN1	Select the input terminal source selection of terminal start stop effective module 2, most of which are binary interconnection parameters.
B01.09	Terminal control command 2 input IN2	Select the input terminal source selection of terminal start stop effective module 2, most of which are binary interconnection parameters.
B01.10	Terminal control command 2 input IN3	Select the input terminal source selection of terminal start stop effective module 2, most of which are binary interconnection parameters.

5.2.9 Motor inching (JOG function)

The "JOG" function is usually used to slowly move a mechanical part, such as a moving conveyor belt.

Through the "JOG" function, the motor can be turned on and off by digital input.

When on, the motor will accelerate to the JOG setting. The drive provides two JOG settings, For example: motor forward setting and reverse setting.

The acceleration and deceleration time of jog is different from that of ON/OFF1 command, which is set by another parameter.

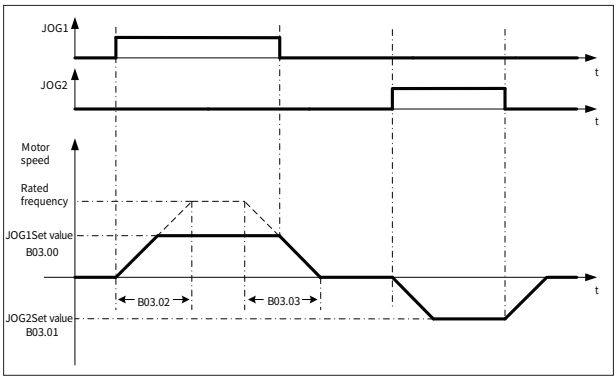


Figure 5 - 14 Working sequence of motor in JOG

Note: before giving the "JOG" control command, the driver should be in the state of power on preparation.

If the motor is running, the "JOG" command will not take effect.

JOG setting related parameters

parameter number	parameter name	parameter description
B00.00	source of start stop control command	select control command source module
B00.07	custom JOG1 source	define the source setting of JOG1 command of control module
B00.08	custom JOG2 source	define the source setting of JOG2 command of control module
B00.11	terminal control module JOG1 source	JOG1 command source setting of terminal control module
B00.12	terminal control module JOG2 source	JOG2 command source setting of terminal control module
B03.00	given setting of JOG1	source selection of JOG1 setting value
B03.01	given setting of JOG2	source selection of JOG2 setting value
B03.02	JOG acceleration time	JOG acceleration time setting
B03.03	JOG deceleration time	JOG deceleration time setting

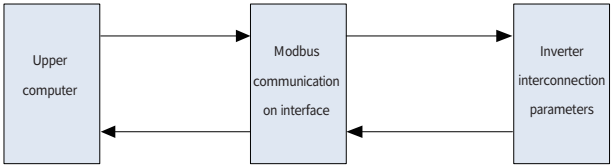
5.2.10 Communication control

Currently, the drive supports Modbus communication and PROFINET communication

5.2.10.1 Modbus communication control

The specific Modbus communication protocol is shown in the appendix.

The specific structure of Modbus communication is as follows:



Modbus communication address:

postal address	name	definition
0xE720	Modbus communica-tioncontrol command	1:start up; 2:inching operation 3:freeparking 4:slow down and stop; 5:fault reset ; 6: Invert Given Speed
0xE721	Modbus communication set point 1	Modbus communication setting value;setting range: -600.0%~600.0%
0xE722	Modbus communication set point 2	Modbus communication setting value;setting range: -600.0%~600.0%

Modbus communication related parameters

Parameter label	Parameter name	Parameter setting range
C02.00	Modbus baud rate	0:1200bps
		1:2400bps
		2:4800bps
		3:9600bps
		4:19200bps
		5:38400bps
		6:57600bps
		7:115200bps
C02.01	Modbus data format	0:even check (8 - E - 1) 1:odd check (8 - O - 1) 2:no check (8 - N - 2) 3:no check (8 - N - 1)
C02.02	Modbus local address	1~255
C02.03	Modbus response delay	0~20ms
C02.04	Modbus communication timeout	0:invalid 0.1s~60.0s
P02.32	Modbus communication start stop command	0~1
P02.33	Modbus communication inching start stop	0~1
P02.34	Modbus communication free stop	0~1
P02.35	Modbus communication fault reset	0~1
P07.32	Modbus control command	0~65535
P07.33	Modbus communication set point 1	0~65535
P07.34	Modbus communication set point 2	0~65535
P07.35	Modbus communication set value 1 standard value	0~65535
P07.36	Modbus communication set value 2 standard value	0~65535

5.2.11 Control word and status word

Control word

Bit number	Definition	Instruction
0	0 = OFF1	The motor brakes according to the deceleration time of the ramp function generator. When the static state is reached, the drive will shut down the motor.
	0 → 1 = ON	When bit2, bit3, bit4 are all 1, the drive will enter the "running" state.
1	0 = OFF2	The motor shut down immediately and the inertia stop.
	1=OFF2 invalid	The motor can be switched on(ON command).
2	0=fast stop(OFF3)	Quick stop: the moor stops according to the deceleration time of OFF3 until it reaches the static state.
	1=fast stop invalid(OFF3)	To turn on the motor(on command).
3	0=disable	Turn off the motor immediately
	1=enable	Turn on the motor
4	0=block ramp function generator;The driver sets the output of the ramp function generator to 0	The drivers sets the output of the ramp function generator to 0
	1=ramp of function generator not blocked	The ramp function generator is allowed to be enabled.
5	0=stop ramp function generator	The output of the ramp function generator remains at the current value.
	1=enable ramp function generator	The output of the ramp function generator tracks the set value.
6	0=blocking setting value	The motor brakes according to the deceleration time of the ramp function generator.
	1=enable setting value	The motor rises to the speed setting value according to the acceleration time.
7	0→1=reset fault	Reset fault. If the ON command still exists, the drive will enter the "power on blocking" state; The fault still exists and the reset command is invalid.
8	1=inching operation command1	The inching command turns on the motor
9	1=inching operation command2	The inching command turns on the motor
10	reserve	reserve
11	1=commutation	Reverse the set value in the drive.
12	1=electric potentiometer increased	Increase the set value stored in the electric potentiometer.
13	1=electric potentiometer reduced	Reduce the set value stored in the electric potentiometer.
14	1=external fault	External signer failure, drive shutdown
15	1=external fault	External signer failure, drive shutdown

Status word

Bit number	Definition	Instruction
0	1=ready for power on	The power is on and the drive is in the state before operation
1	1=operation preparation	The motorr is on (ON/OFF1), there is currently on fault. Received "run enable" command , the driver will turn on the motor.
2	1=run enabled	The drive is currently allowed to run.
3	1=wrong	There is a fault in the drive.
4	1=OFF2 inactive	Inertia stop is not active.
5	1=OFF3 inactive	Quick stop is not active.
6	1=connection forbidden valid	At present, it is in the power on blocking state. Only if OFF1=0 and OFF2, OFF3 and operation permission are all 1, it can exit the current state.
7	1=alarm appears	The motor remains on and there is no need to repond.
8	1=speed difference within tolerance	Set the "actual value" difference within tolerance.
9	1=local control request control	Request the automation system to control the drive.
10	1=reaching or exceeding the comparison speed	The speed is greater than or equal to the maximum speed.
11	1=current limit or torque limit reached	Reaching or exceeding the comparative value of current or torque.
12	1=holding brake open	The signal used to open and close the motor broke.
13	1=the motor turning forward	Drive internal actual value ＞0.
14	reserve	
15	reserve	

5.3 Setting value

5.3.1 Summarize

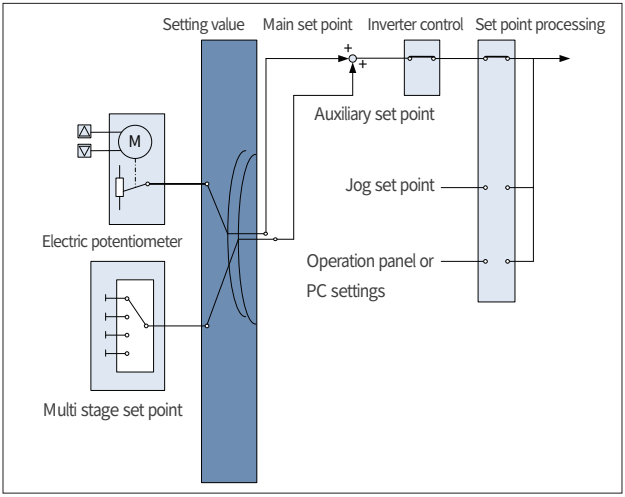


Figure 5-15 Setting value processing of drive

The source of the main setting value can be:
Before you start debugging, you must be able to determine the following information：
● Field bus interface of drive
● Analog electric potentiometer in the drive
● Fixed set value stored in the drive
The above source can also be the source of auxiliary set value or additional set value.

The drive control switches from the master setting to another setting under the following conditions:
Before you start debugging, you must be able to determine the following information:
●When the corresponding interconnected process controller is activated, the output of the process controller will give the motor speed.
●When JOG is activated.
●When controlled by operation panel or PC tool BonengDrivesoft.

5.3.2 Setting electric potentiometer to set value

The "electric potentiometer" function is used to simulate a real potentiometer. The output value of potentiometer can be adjusted by the control signal "up" and "down".

The electric potentiometer is interconnected with the set point source.

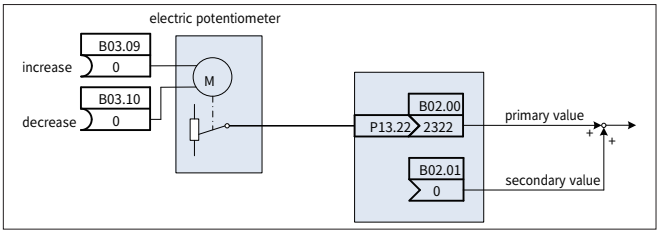


Figure 5-17 setting electric potentiometer to set value

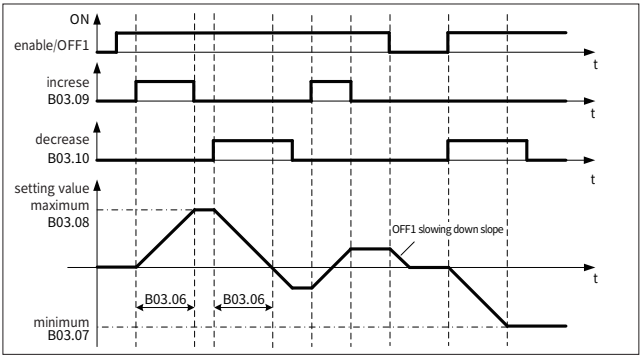


Figure 5-18 Function diagram of electric potentiometer

Table 5-11 Basic setting of electric potentiometer

parameters	Description
B03.04	Function mode selection of electric potentiometer 0: Prohibited 1: Power outage clearing 2: Power failure memory (reserved)
B03.05	Initial value of electric potentiometer
B03.06	Slope time of electric potentiometer
B03.07	Minimum value of electric potentiometer
B03.08	Maximum value of electric potentiometer
B03.09	Source selection of electric potentiometer
B03.10	Selection of descent source of electric potentiometer

5.3.3 Setting the multi-stage speed to the set value

In many applications, the motor only needs to run at a fixed speed after power on, or switch back and forth between different fixed speeds. For example, the conveyor belt only runs at two different speeds after power on.

The fixed speed is interconnected with the main set value

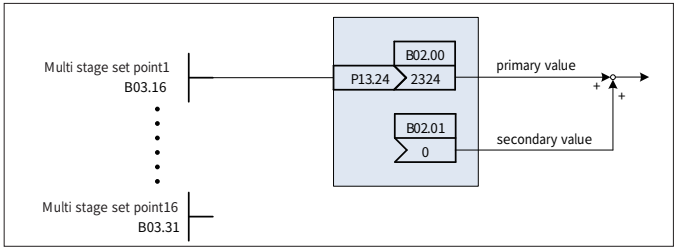


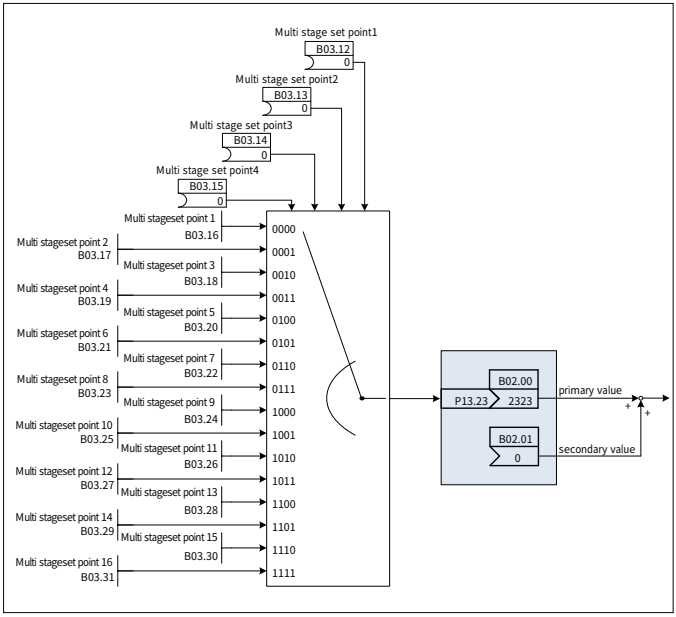
Figure 5-19 Setting electric potentiometer to set value

Table 5-12 Fixed speed setting values

parameter	notes
B02.00=2324（P13.24）	Speed source master set point selection The primary value is interconnected with the multi-stage set point 1

Binary select multi segment set point

Set 16 different fixed settings. Through different combinations of four selection bits, you can accurately select a fixed setting value from 16.



Related parameters for setting multi segment setting values

parameter	description
B03.11	multi segment given only parameter, display the output value of current multi segment setting.
B03.12	multi segment set point selection 1
B03.13	multi segment set point selection 2
B03.14	multi segment set point selection 3
B03.15	multi segment set point selection 4
B03.16	Multi stage set point 1
B03.17	Multi stage set point 2
B03.18	Multi stage set point 3
B03.19	Multi stage set point 4
B03.20	Multi stage set point 5
B03.21	Multi stage set point 6
B03.22	Multi stage set point 7
B03.23	Multi stage set point 8
B03.24	Multi stage set point 9
B03.25	Multi stage set point 10
B03.26	Multi stage set point 11
B03.27	Multi stage set point 12
B03.28	Multi stage set point 13
B03.29	Multi stage set point 14
B03.30	Multi stage set point 15
B03.31	Multi stage set point 16

5.4 Set value processing

5.4.1 Set point processing

●Reverse the setting value to switch the motor rotation direction (reverse).

● positive / negative rotation direction is prohibited, for example, in conveyor belt, electric pump or fan applications.

● Suppression band for suppressing mechanical resonance.

When the speed is 0, the inhibition band will act on the minimum speed after the motor is turned on.

● Set the maximum speed limit to protect the motor and mechanism.

● The ramp function generator is set to control the acceleration and deceleration process of the motor and output the ideal torque.

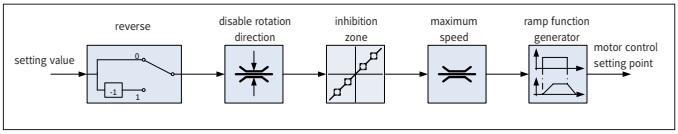


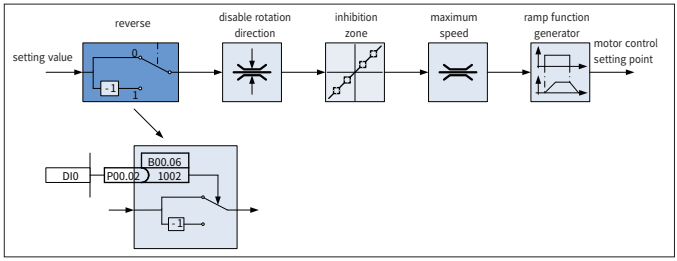
Figure 5 - 20 Set point processing in drive

5.4.2 Reverse setting value

Setting value processing can modify the set value as follows:

The set value symbol can be switched by bit on the drive.

The example shows that the set value is reversed by digital input.



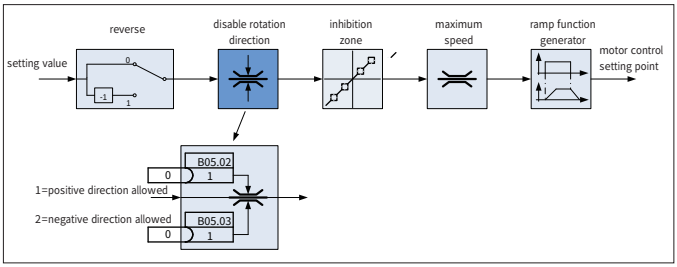
The parameter B00.06 is interconnected with two binary signals (such as digital input 0), The set value is inversed by digital input DI0.

Table 5 - 13 Basic setting of electric potentiometer

Parameter	Description
B00.06 = 1002（P00.02）	reverse the setting value Digital input 0=0: set value remains unchanged. Digital input 0=1: the driver reverses the set value.
B00.06 = 1201（P02.01）	Reverse the set value by Bit1 bit of process data1.

5.4.3 No rotation direction

In the factory settings of the driver, the positive and negative rotation directions of the motor are enabled.



To disable the rotation direction, set the corresponding parameter to 0.

Table 5-14 Examples of setting rotation direction prohibition.

Parameter	Description
B05.02=0	The positive direction allows the selection. Prohibit the motor from rotating in the positive direction.
B05.03=1003（P00.03）	Negative direction allows the selection Digital input 1=0: negative rotation direction is disable. Digital input 1=1: negative rotation direction enabled.

5.4.4 Suppression band and minimum speed

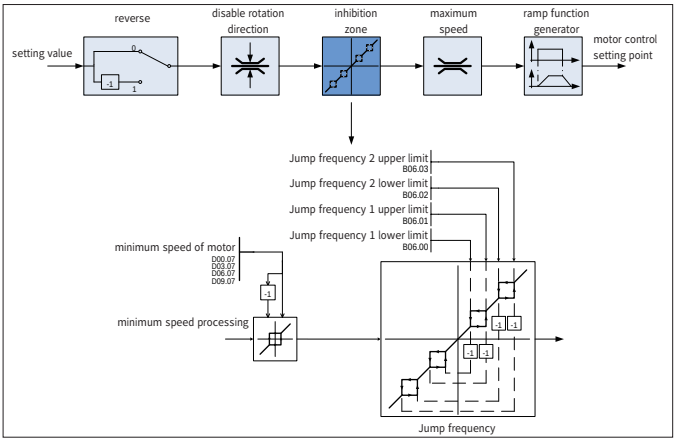
Inhibitory band

The drive has four restraining bands to prevent the motor from running in a certain speed range for a long time.

Minimum speed

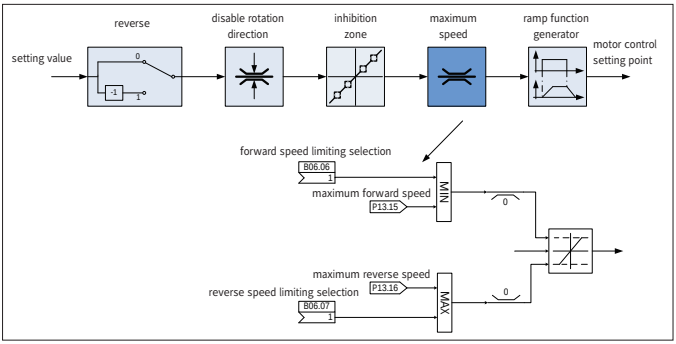
After setting the minimum speed, the drive can prevent the motor from running at a speed lower than the minimum speed for a long time.

Only in the process of motor acceleration or deceleration, the drive allows the motor speed (absolute value) to be lower than the minimum speed for a short time.



5.4.5 Maximum speed

The maximum speed limits the speed settings in both directions of rotation.



Once the value is exceeded, the drive will output alarm or fault information.

When it is necessary to limit the speed according to the direction, the maximum speed in each direction can be determined.

Table 5 - 15 Parameters for limiting speed

parameter	parameter name
B06.04	forward limit speed
B06.05	reverse limit speed
B06.06	forward speed limiting selection
B06.07	reverse speed limiting selection
D00.06	maximum speed of motor
D03.06	maximum speed of motor
D06.06	maximum speed of motor
D09.06	maximum speed of motor

5.4.6 Ramp function generator

The ramp function generator in the set point channel is used to limit the rate of change (acceleration) of the speed set point.

Slow acceleration will reduce the motor acceleration torque.

In this way, the motor load can be reduced and the production equipment can be protected.

●Simple ramp function generator

The simple ramp function generator limits the acceleration, but does not limit the change of acceleration (jerk).

●Extended ramp function generator

The extended ramp function generator not only limits the acceleration, but also limits the change of acceleration (jerk) by rounding the set value. In this way, there is no sudden motor torque.

Simple ramp function generator

Simple ramp function generator means that s curve (ARC) time is not used in acceleration and deceleration process.

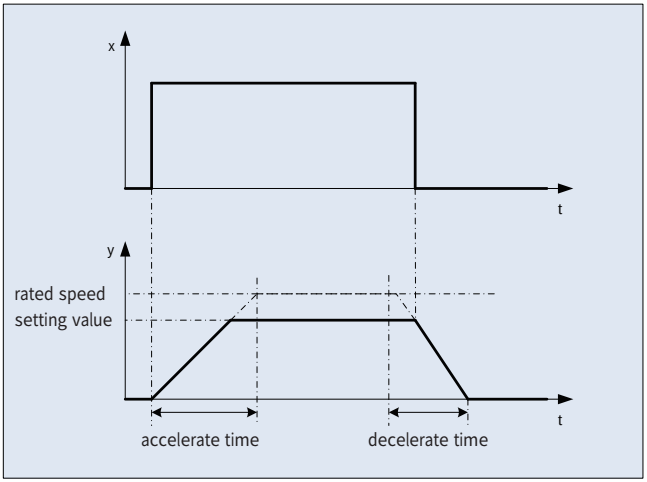
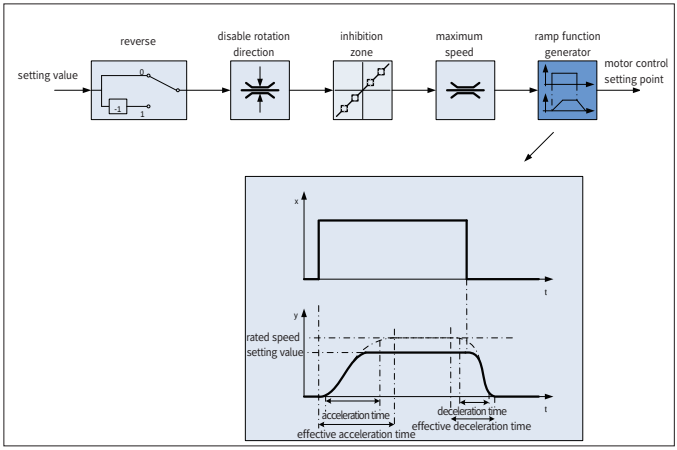


Table 5-16 Parameter setting of simple ramp function generator

Parameter	Parameter instruction	parameter name
B04.02	acceleration time of slope 1	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.03	acceleration time of slope 1	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.04	acceleration time of slope 2	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.05	acceleration time of slope 2	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.06	acceleration time of slope 3	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.07	acceleration time of slope 3	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.08	acceleration time of slope 4	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.09	acceleration time of slope 4	The e-stop function (OFF3) has a separate deceleration time.
B05.33	OFF3 downtime	The e-stop function (OFF3) has a separate deceleration time.

Extended ramp function generator

The acceleration time and deceleration time of extended ramp function generator can be set separately. These two times are only closely related to practical application,which can be hundreds of milliseconds (such as conveyor belt transmission) or a few minutes (such as centrifuge).



Smooth acceleration and deceleration can be achieved by the S-curve at the beginning and S-curve at the end.

●Effective acceleration time=B04.02+0.5x(B04.10+B04.11)

●Effective deceleration time=B04.03+0.5x(B04.10+B04.11)

Table 5-17 Parameter setting of simple ramp function generator

Parameter	Parameter Instruction	Parameter Name
B04.02	acceleration time of slope 1	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.03	deceleration time of slope 1	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.04	acceleration time of slope 2	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.05	deceleration time of slope 2	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.06	acceleration time of slope 3	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.07	deceleration time of slope 3	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.08	acceleration time of slope 4	It refers to the time of motor acceleration from zero to rated speed, unit:s.
B04.09	deceleration time of slope 4	It refers to the time of motor to drop from rated speed to zero, unit:s.
B04.10	start time of S curve 1	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.11	end time of S curve 1	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.12	start time of S curve 1	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.13	end time of S curve 2	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.14	start time of S curve 2	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.15	end time of S curve 3	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.16	start time of S curve 3	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.
B04.17	start time of S curve 4	Extend the S curve time of the start section of the ramp function generator. The modified value is effective for both acceleration and deceleration.

Set the extended ramp function generator as follows:

1. Give a maximum speed setting.
2. Turn on the motor.
3. Check the operation of the motor.

- If the motor accelerates too slowly, shorten the acceleration time.

Too short acceleration time will cause the motor to reach the current limit during acceleration and temporarily unable to track the speed setting. At this time, the drive will exceed the set time.

- If the motor accelerates too fast, extend the acceleration time.
- If the acceleration is too fast, extend the starting arc time.
- We suggest that the end segment arc time be set to the same value as the start segment arc time.

4. Turn off the motor.
5. Check the operation of the motor.

- If the motor decelerates too slowly, shorten the deceleration time.

The minimum effective deceleration time depends on the application.

When the deceleration time is too short, the drive will exceed the motor current limit, and the DC bus voltage in the drive will become too high, depending on the type of power module used.

The actual braking time will exceed the set deceleration time or the drive will fail during braking, depending on the setting of the drive.

- If the motor brakes too fast or the drive fails during braking, the deceleration time should be extended.

6. Repeat steps 1 to 5 until the drive characteristics meet the motor or equipment requirements.

5.5 Motor Control

The drive has the following three speed control modes, which can be selected according to the actual needs of different applications

parameter	parameter name	factory value	setting range	description
B05.00	motor control mode	0	0~2	0：VF 1：SVC (Vector control without encoder) 2：FVC (Vector control with encoder)

VF: After the given frequency command, the drive controls the output voltage according to the VF characteristic curve to control the motor operation. Because there is no speed feedback regulation and the speed control accuracy is not high enough, VF control is suitable for general loads such as fans and water pumps, or one drive with multiple motors, or applications with large difference between drive power and motor power. The vector control mode can be selected in the application of high speed accuracy.

SVC: Open loop vector control without encoder, which is suitable for high performance control occasions. In principle, one drive can only drive one motor, such as machine tool, centrifuge and other loads;

FVC: closed loop vector control with encoder, which is suitable for high - precision speed or torque control. In principle, one drive can only drive one motor, such as elevator, lifting machinery and other loads.

Note: in SVC / FVC mode, if one drive drives multiple motors, the motor parameters must be consistent and rigidly connected.

5.5.1 Parameter identification of motor

No matter which motor control mode is selected, the basic parameters of the motor must be set accurately according to the motor label before running the motor. (take motor 0 as an example,the same below)

function code	parameter name	factory value	setting range	Description
D00.00	motor type selection	0	0~1	0:asynchronous motor 1:permanent magnet synchronous motor
D00.01	rated power of motor	3.7	0.00~655.35kW	motor name plate parameters
D00.02	rated voltage of motor	380	0~1500V	
D00.03	rated current of motor	9.00	0.00~655.35A	
D00.04	rated frequency of motor	50.0	0.0~600.00Hz	
D00.05	rated speed of motor	1440	0~65535rpm	
D00.09	madder pole logarithm	2	0~64	The driver automatically calculates the number of pole pairs of the motor

When choosing the motor control mode as vector control, accurate motor parameters are needed. In order to obtain better motor control performance, parameter identification of controlled motor is needed.

function code	parameter name	factory value	setting range	Description
B00.21	Identify requests	0	0~3	0:None 1:Simple static identification of asynchronous motor. 2:Static integrity identification of induction motor. 3:Dynamic integrity identification of asynchronous motor.

The differences of the three parameter identification modes are shown in the table below, please select according to the actual application situation:

pattern	service conditions	service conditions	Description
Simple static identification of asynchronous motor	motor can not run	stator resistance	
Static complete identification of asynchronous motor	motor can not run	rotor resistance leakage inductance mutual inductance no load current	
Dynamic integrity identification of asynchronous motor	motor can not run		Before identification, please ensure that the motor and the load are mechanically separated, and the operation is not dangerous; If the motor is connected to the load, the identification result may not be accurate enough.

The steps of motor parameter identification are as follows:

1:According to the current motor selection, set the basic parameters of group D motor.

2:The parameter identification mode is selected according to the control mode of the driver and the mechanical state of the system.

3:Press run to start parameter identification,if you want to terminate the identification, press stop. After identification, the panel will display stop status.

After identification, the identification results of the following parameters will be saved automatically. On the premise of knowing the accurate parameters of the motor, the parameters can be input manually without identification.

function code	Parameter name	Factory value	Setting range	Describe
D01.00	Stator resistance of asynchronous motor	1.667	0.000~65.535ohm	Parameters identification or manual input
D01.01	Asynchronous motor rotor resistance	1.500	0.000~65.535ohm	
D01.02	Leakage inductance of asynchronous motor	6.540	0.00~655.35mH	
D01.03	Mutual inductance of asynchronous motor	173.4	0.00~655.35mH	

5.5.2 V/F control

5.5.2.1 V/F curve

The drive can select V/F characteristic curve according to different load characteristics and the following parameters are only valid when the control mode is VF.

Function code	Parameter name	Factory value	Setting range	Describe
B07.00	mode selection of VF	0	0~1	0:VF curve 1:VF separation
B07.01	curve selection of VF	0	0~3	0:Linear of VF 1:Multi-point of VF 2:Square of VF 3:1.5 power of VF

0:Linear VF, suitable for torque independent of speed occasions, such as ordinary constant torque load.

1:Multi-point VF, suitable for special loads such as dehydrator and centrifuge.

2:Square VF, suitable for the occasion where the required torque increase with the increase of speed, such as fan, pump and centrifugal load.

3:VF of degree 1.5 is between VF of straight line and VF of square curve.

The VF curve is shown in the figure.

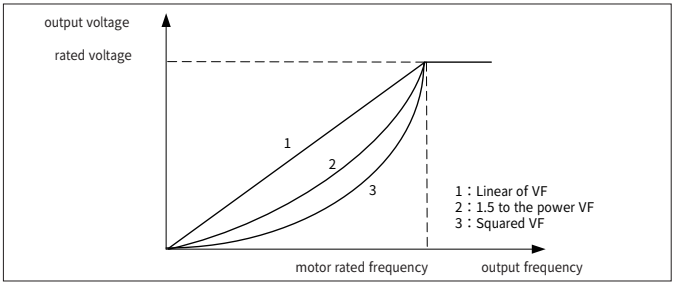


Figure 5-21 VF curve

The point VF curve is defined by parameters B07.02~B07.07. When setting the curve, it must meet the following requirements: frequency point setting B07.02＜B07.04＜B07.06，voltage point setting B07.03＜B07.05＜B07.07. The parameter setting value should be determined according to the load characteristics, otherwise it may not work normally. If the voltage is set too high at low frequency, the motor may overheat or even burn out, and the drive may report over-current fault.

Function code	Parameter name	Factory value	Setting range	Describe
B07.02	Voltage point 1 of multi-point VF curve	2	0.0~B07.04	select voltage point of multi-point VF
B07.03	Voltage point 1 of multi-point VF curve	20	0.0~B07.05	select voltage point of multi-point VF
B07.04	Voltage point 2 of multi-point VF curve	20	0.0~B07.06	select voltage point of multi-point VF
B07.05	Voltage point 2 of multi-point VF curve	152	0.0~B07.07	select voltage point of multi-point VF
B07.06	Voltage point 3 of multi-point VF curve	40	0.0~D00.04	select voltage point of multi-point VF
B07.07	Voltage point 3 of multi-point VF curve	304	380	select voltage point of multi-point VF

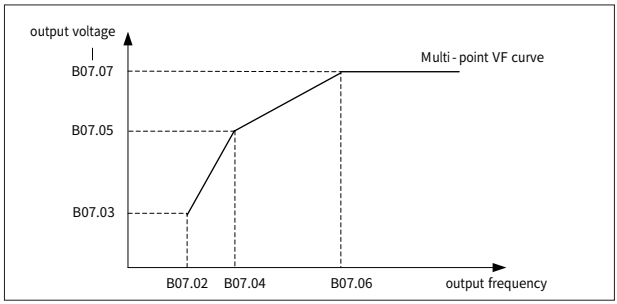


Figure 5-22 Multi-point VF curve

VF voltage separation: the relationship between frequency and output voltage is not calculated in the drive, and the output voltage is set independently by the user. Suitable for induction heating, inverter power supply, torque motor control and other applications.

Function code	Parameter name	Factory value	Setting range	Describe
B07.08	VF separation voltage setting	0	0~10	0:0 1:100.0% 2:reserved 3:reserved 4:reserved 5:reserved 6:multi segment value setting 7:electric potentiometer 8:reserved 9:reserved 10:reserved others:analog interconnection parameters
B07.09	VF separation voltage change time	10	0.0s~1000.0s	VF separation voltage change time

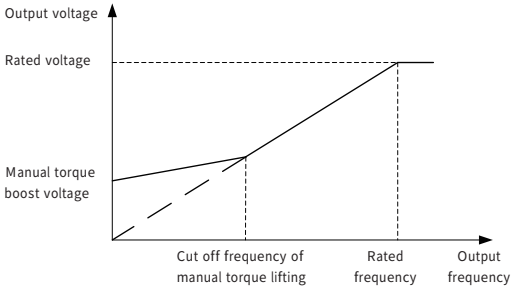
5.5.2.2 Torque increase

Torque boost: compensation VF control low frequency torque characteristics, increase the output voltage of the drive to enhance the output torque.

When the load is large and the starting torque is not enough, the value of torque increase B07.15 can be increased appropriately. When the load is small, the value can be reduced appropriately. This parameter should not be set too large, otherwise it is easy to cause motor overheating or drive over-current fault. It is recommended to gradually increase 1% step value when setting. After setting, run the motor to check the parameter A00.08 (output current), which should not exceed D00.03 (motor rated current).

Function code	Parameter name	Factory value	Setting range	Describe
B07.13	VF torque lifting mode	1	0~1	0: Not enabled 1: Manual
B07.15	VF manual torque boost	1	0%~50%	The lift voltage is a percentage of the rated voltage of the motor
B07.16	Cut off frequency of VF torque increase	50	0.00~50.00	When the frequency setting is greater than this value, the torque increase is invalid

Note: under the condition of multi-point VF, VF separation, parameter identification and speed tracking, the torque increase is invalid.



5.5.2.3 Oscillation suppression

The VF oscillation suppression function is off by default. It needs to be turned on only when there is obvious oscillation in the motor VF operation. The larger the oscillation suppression gain is, the more obvious the suppression effect is. However, if the value is too large, it may cause adverse effects on the normal operation. Therefore, the smaller value should be selected as far as possible within the range of values that can effectively suppress the oscillation.

Function code	Parameter name	Factory value	Describe
B07.20	VF oscillation suppression mode	0	0:invalid 1:valid
B07.21	VF oscillation suppression gain	20	

5.5.3 Vector Control

The performance of vector control is easily affected by the motor parameters and obtaining accurate motor parameters is the key to achieve high performance vector control. In order to obtain good driving performance and operation efficiency, the parameters of the controlled motor must be identified first, which can be manually input on the premise of knowing the accurate motor parameters. Inaccurate motor parameters may cause the motor not to operate properly.

When FVC (B05.00 = 2) is selected as the control mode, the relevant parameters of encoder must be set correctly, otherwise the motor cannot operate normally.

Function code	Parameter name	Factory value	Setting range	Describe
D02.00	Encoder type	0	0~2	0:invalid type 1:common ABZ encoder
D02.01	input AB phase sequence	0	0~1	0:forward 1:reverse
D02.02	speed measurement mode	0	0~2	0:quadruple frequency 1:A pulse 2:B pulse
D02.05	encoder resolution (number of pulses/ speed)	1024	0~65535	The pulse number of ABZ encoder must be set correctly
D02.13	speed feedback PG disconnection detection time	500	0~5000ms	When the drive detects encoder disconnection and the holding time exceeds this value, encoder fault will be reported

After connecting the encoder, set the motor control mode B05.00 = 1, run the motor at medium speed, and check whether the absolute value and symbol of parameter A00.06 (motor speed) and A00.05 (given speed) are consistent. If the absolute value is not equal, please check the encoder connection and related parameter settings; If the symbols are inconsistent, reverse D02.01 (input AB phase sequence). Ensure that the feedback signal of encoder is correct before setting B05.00 = 2 to run the motor.

5.6 Protection Function

5.6.1 Over current protection

In vector control, the motor current is always kept within the set torque limit.

If V/F control is used, the torque limit cannot be set. V/F control prevents motor overload by limiting output frequency and motor voltage (Imax controller).

IMAX controller

In vector control, the motor current is limited by torque limiting. In VF control, the drive limits the current by adjusting the output frequency. If the current exceeds the set threshold in the process of motor acceleration, the Imax controller will take effect and automatically reduce the output frequency to maintain the current around the set value, thus prolonging the actual acceleration time. If the motor takes effect during deceleration, the output frequency will be increased and the actual deceleration time will be prolonged. The process is shown in the figure below:

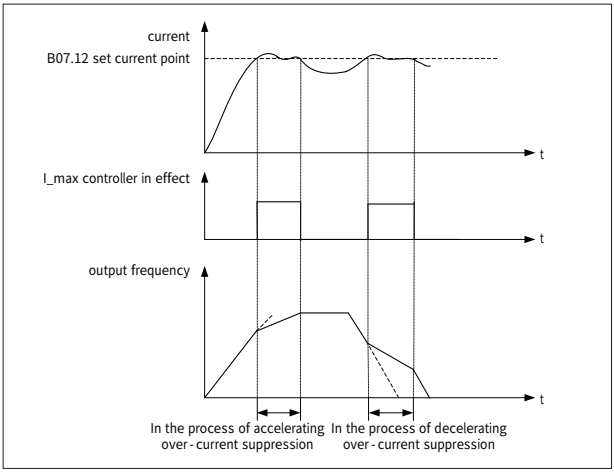


Figure 5 - 23 schematic diagram of over current suppression process

Setting

If the motor is easy to vibrate when it reaches the current limit or trip due to over - current, the factory setting of Imax controller must be modified.

Table 5 - 18 parameters of Imax controller

Function code	Parameter name	Factory value	Describe
B07.10	Imax control enable	0	0:invalid 1:valid
B07.11	Frequency modulation gain controlled by Imax	30	The larger the FM gain, the faster the frequency regulation, and the shorter the actual acceleration and deceleration time.
B07.12	Inhibition point of Imax	150	Imax control starting action current point, percentage of rated current of drive.

Note: if the function is still easy to trigger over - current fault, B07,12 (I_max suppression point) can be appropriately reduced or B07.11 (I_max control frequency modulation gain) can be increased.

5.6.2 DC bus voltage over-voltage suppression

●How does the motor cause over-voltage?

When an asynchronous motor is driven by a connected load, the motor works as a generator motor, and the generator motor convert mechanical energy into electrical energy. The power returns to the drive. If the drive cannot transfer power to the brake resistor, the DC bus voltage VDC in the driver will increase.

Too high DC bus voltage will damage not only the drive, but also the motor. Before it reaches the dangerous level, the driver will shut down the connected motor and send out the fault message "DC overvoltage".

●Over voltage protection of motor and drive

As long as the application allows, Vdc_max controller will avoid the DC bus voltage is too high. The max controller will extend the stopping time of the motor, so that the motor can only feed back a small amount of electric energy to the drive, which can be completely consumed in the form of drive loss.

When the motor is in the power generation state, the electric energy is fed back to the DC bus side, and the bus voltage rises. If the drive is not connected with the brake resistor, the bus voltage rises to the over-voltage point, which will trigger the over-voltage fault. The over-voltage suppression function can avoid the bus voltage too high as far as possible.

When the motor decelerates rapidly, the bus voltage rises rapidly. When the bus voltage exceeds the set threshold, Vdc_max controller is in effect. In vector control, the output frequency is adjusted by limiting the maximum output torque; In VF control, the output frequency is directly adjusted to extend the actual deceleration time, reduce the electric energy fed back to the bus, and maintain the bus voltage at the set value. The process is shown in the figure below:

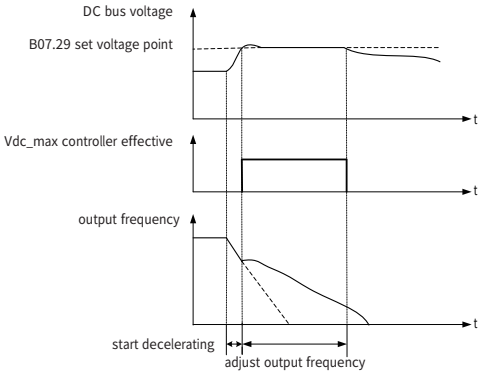


Table 5-19 parameters of VDC_max controller

Function code	Parameter name	Factory value	Describe
B07.28	Vdc_max control switch	0	0:forbid 1:enable
B07.29	Vdc_max voltage margin	125%	The percentage of reference bus voltage and the starting point of operation controlled by VDC_max.

Note:

1) If it is still easy to trigger over-voltage fault by turning on this function, B07.29 can be reduced appropriately (Vdc_max voltage margin).

2) The Vdc_max controller is not suitable for the application of motor long time output regenerative power. For example:crane application or large swing object braking.

5.6.3 DC bus voltage under-voltage suppression

When the drive operates with a large inertia load, if the bus voltage drops suddenly or the power supply loses power, the under voltage fault will be triggered after the bus voltage drops to the under voltage point, which will cause the motor to stop freely. Due to the large inertia of the load, the motor may still be running at high speed after the voltage returns to normal, and it is easy to cause over-current fault when starting immediately.

Under voltage suppression function can make use of the kinetic energy of the load to make the drive continue to work as far as possible, and control the motor to reduce the frequency regularly. When the bus voltage is reduced to the set threshold, the DC voltage will decrease. When the Vdc_min controller takes effect, the drive automatically reduces the output frequency to make the motor in the power generation state, and the electric energy is fed back to the DC bus side to maintain the bus voltage around the set value. After the power supply is normal, the drive will return to the running state before power down. The process is shown in the figure below:

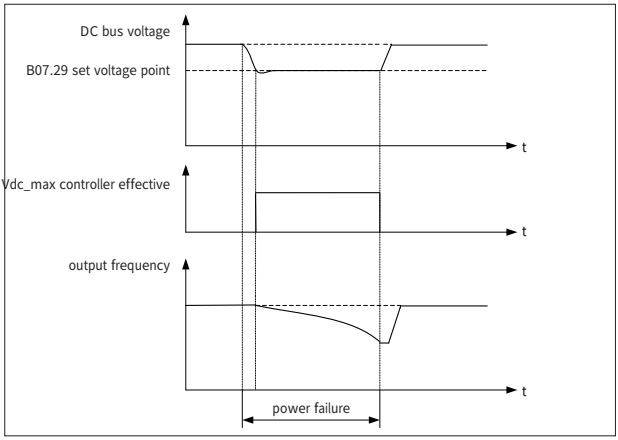


Table 5-24 schematic diagram of under voltage suppression process

Table 5-20 Vdc_max controller parameters

Function code	Parameter name	Factory value	Describe
B07.34	Vdc_max control switch	0	0:forbid 1:enable
B07.35	Vdc_min voltage regulation gain coefficient	85%	The percentage of reference bus voltage and the starting point of operation controlled by VDC_min.

Note:

If it is still easy to trigger under-voltage fault by opening this function, increase B07.35 appropriately. (Vdc_min voltage regulation gain coefficient)

5.7 Application features

5.7.1 DC braking

DC braking: the driver outputs DC to stop the motor braking, which is shorter than the normal deceleration shutdown time. DC braking converts the braking energy of motor into heat energy, which can avoid the motor feeding back the braking energy to the drive. The drive does not have to deal with the regenerative power. It is suitable for applications that do not feed back energy to the power grid, such as centrifuges, sawing machines, grinding machines, conveyor belts, etc.

DC braking is divided into the following two situations:

1. DC braking during shutdown

When the motor inertia is large, it will rotate due to inertia during deceleration and shutdown. When the DC braking time (B05.11) is greater than 0 during shutdown, the DC braking function will be turned on and the motor will start to decelerate. After shutdown, when the motor speed is lower than the starting speed of DC braking (B05.12), the drive will start DC braking. According to the time set in B05.11, the set DC braking current (B05.09) will be output and the motor braking decelerates to 0. The process of DC braking is shown in figure 5-31.

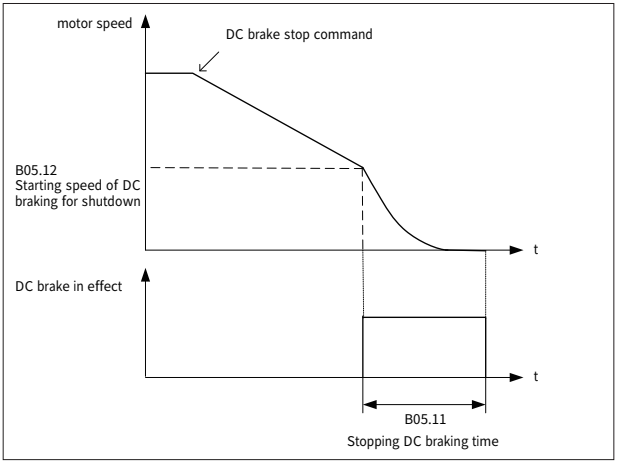


Figure 5-25 schematic diagram of DC braking process during shutdown

2. DC braking when starting

If the motor is in free rotation due to external force or inertia when it wants to start, direct start (B05.04 = 0) may cause over-voltage or over-current fault of the drive. At this time, DC braking start (B05.04 = 3) or speed tracking start (B05.04 = 2) can be selected. Set the starting DC braking time (B05.10), the motor will first brake and decelerate to 0, and then restart to run to the specified frequency. The process of starting DC braking is shown in figure 5-32.

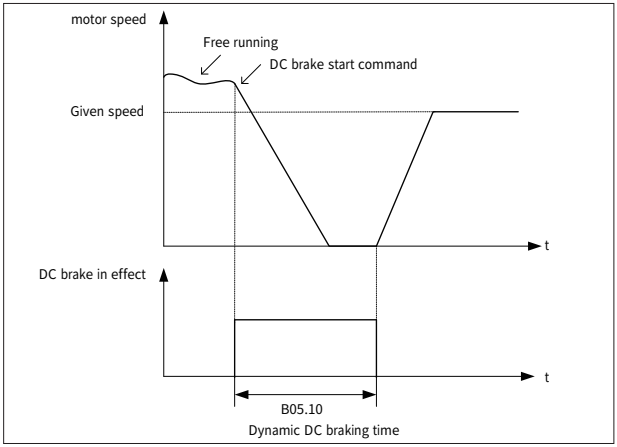


Figure 5-26 schematic diagram of DC braking process when starting

Function code	Parameter name	Factory value	Setting range	Describe
B05.04	motor starting mode	0	0~3	0: start directly 1: pre-excitation start 2: speed tracking start 3: DC brake start
B05.09	DC braking current	0	0.0%~100.0%	braking current setting during DC braking 100% corresponding to motor rated current
B05.10	DC braking time at startup	0	0.00s~100.00s	setting of DC braking time at startup 0 means starting without DC braking
B05.11	DC braking time during shutdown	0	0.00s~100.00s	setting of DC braking time during shutdown 0 is no DC braking process during shutdown
B05.12	starting speed of DC braking for shutdown	0	0~3000rpm	starting speed of DC braking for shutdown

Notes:

● The DC braking function is only available on the asynchronous motor.

● DC braking can be switched during operation.

● The DC braking will make the motor heated violently, the braking characteristics are not clear, there is no constant braking torque, there is no braking torque in the static state, the braking energy is converted into heat consumption, and it can not be used when the power grid is powered down.

● If the motor is braked by DC braking for a long time or often, the motor will overheat and may be damaged. Please check the motor temperature when using. If the motor temperature is too high, give the motor a longer cooling time or choose other braking methods.

5.7.2 Speed tracking

When the drive drives the motor to start, the motor may be in the rotating state for some reasons, such as the fan rotation under the action of wind, and the large inertia load drives the motor to rotate after shutdown. If the drive starts directly from 0Hz, it is easy to cause over-current fault due to the large difference between the output frequency and the actual frequency of the motor. The speed tracking function can detect the actual speed of the motor and run from the current speed to avoid over-current during starting.

After receiving the operation command, the driver judges the rotation direction of the motor, injects current into the motor (the set value of speed tracking current), and searches down from the set starting frequency. When the starting frequency is the stop frequency, the search speed is the fastest. After searching the current motor speed, after the switching waiting time, the motor will smoothly transition to the normal operation mode and reach the set frequency.

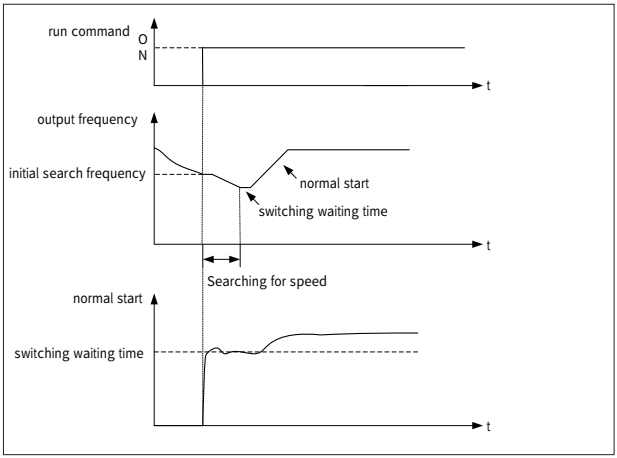


Figure 5-27 schematic diagram of speed tracking process

Table 5-21 parameter setting of speed tracking

Function code	Parameter name	Factory value	Describe
B05.13	speed tracking mode	0	0:speed tracking off 1:start search from outage frequency 2:search from rated frequency 3:search from maximum frequency
B05.14	speed tracking speed search time	25.0s	Time for frequency reduction from 50Hz to 0Hz
B05.15	speed tracking current percentage	50%	speed search current percentage of motor rated current
B05.16	speed tracking minimum frequency limit	2Hz	start directly below this frequency speed tracking does not work
B05.17	waiting time of speed tracking switching	250ms	waiting time for speed tracking mode to switch to normal operation mode.

Note: if the search time is too long, please reduce the search time appropriately. If there is over current or over voltage fault in the search process, please increase the search time appropriately.

5.7.3 motor holding brake

The motor brake holds the closed motor in this position. When the setting is correct, the motor will generate electric brake torque before the driver opens the brake.

The drive will only close the holding brake when the motor is stationary.

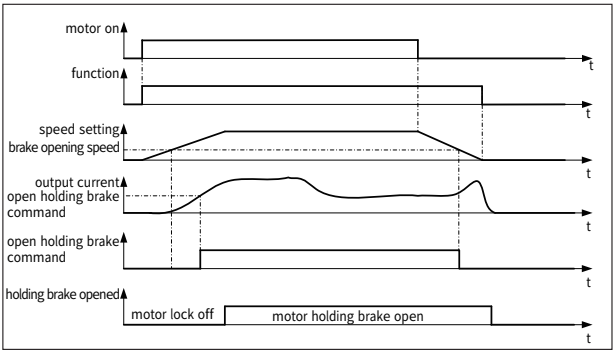


Figure 5-28 motor holding brake opening sequence diagram

Function after ON command:

1.After receiving the ON command, the drive sends the OFF1-ON running command.

2.If the set value of the drive speed is greater than the threshold value of the brake opening speed and the current output current is greater than the threshold value of the brake opening current, the drive sends out the command to open the brake.

3.The motor keeps the speed of holding brake open until the end of holding brake open speed pause time (F04.15).

4.The drive accelerates the motor to the set speed.

Functions after OFF1 or OFF3 command:

1.After receiving OFF1 or OFF3 command, the drive will brake the motor until it stops.

2.When braking, when the set value of the drive speed is less than the threshold value of the brake closing speed, the drive sends out the command to close the brake.

3.The motor keeps the speed when the holding brake is closed until the end of the holding brake closing speed pause time (F04.16).

4. The drive turns off the motor.

Function after OFF2 instruction

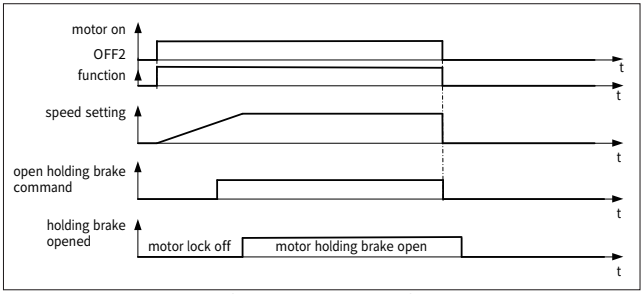


Figure 5-29 control mode of motor holding brake after sending OFF2 command

After the command OFF2 is issued, no matter what the motor speed is, the command of closing holding brake will be given directly.

Commissioning of motor holding brake

Be careful

Life threatening if load falls

When the "motor holding brake" function is set incorrectly, it may cause life danger due to load falling in applications such as cranes, cranes or elevators.

●The following measures are taken to ensure the load safety before commissioning the "motor holding brake"

- Lower the load to the ground
- Blockade of dangerous areas

Step

Debug the "band brake control" function as follows:

1. Set F04.00 = 1 or 2

"Holding brake control" is enabled.

F04.00 = 1 band brake control is effective, do not detect whether the band brake relay is closed.

F04.00 = 2 band brake control is effective, and the system detects whether the band brake relay is closed at the same time

2. Set F04.03 (source of holding brake opening command)

To select the command of holding brake opening, F04.03 = 1102 (P01.02 running flag) is usually set.

3. Set F04.04 (source of holding brake opening comparison value)

Select the judgment parameter of holding brake opening, usually set F04.04 = 2311 (P13.11 CM given speed).

4. Set F04.05 (holding brake open comparison threshold)

The comparison threshold of holding brake opening should be set according to the actual application requirements.

5. Set F04.06 (The delay time of brake opening).

6.Set F04.13 (holding brake open motor current comparison threshold).

This parameter is used to ensure that the motor can guarantee a certain output torque when the holding brake is opened; Factory setting F04.13 = 50%, can basically meet most of the field applications.

7. Set F04.07 (brake closing speed threshold).

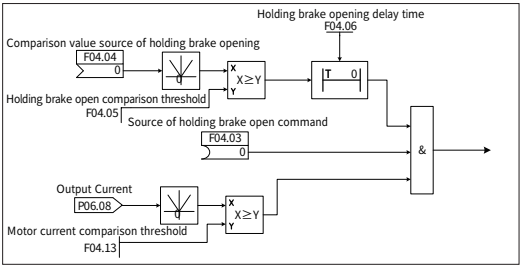
It is used to set the speed judgment threshold when the band brake is closed, according to the actual application requirements.

8. Set F04.08 (The delay time of brake closing).

9. Set F04.12 (source of holding brake closing comparison value).

Select the judgment parameter of holding brake closing, usually set F04.12 = 2311 (p13.11 CM given speed).

The above steps 1-6 are the setting process of holding brake opening, and steps 7~9 are the setting process of holding brake closing.



Function diagram of holding brake opening judgment

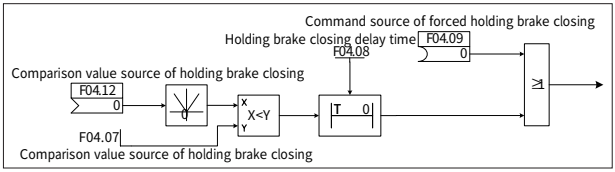


Figure 5-31 band brake closing judgment function diagram

Table 5-22 band brake control setting parameters:

Parameters	Parameter name	Description
F04.00	Function selection of band brake	Band brake enable setting
F04.03	Source of holding brake open command	Holding brake open command selection
F04.04	Comparison value source of holding brake opening	Selection of judgment value for holding brake opening
F04.05	Holding brake open comparison threshold	Comparison threshold of holding brake opening
F04.06	Holding brake opening delay time	Delay time of holding brake opening command
F04.07	Brake closing speed threshold	Comparison threshold of holding brake closing
F04.08	Holding brake closing delay time	Delay time of holding brake closing command
F04.09	Command source of forced holding brake closing	Setting the command source of forced holding brake closing
F04.10	Feedback point source of holding brake opening	Feedback value source of holding brake opening
F04.12	Comparison value source of holding brake closing	Selection of judgment value for holding brake closing
F04.13	Holding brake open motor current comparison threshold	Judgment threshold of output current for holding brake opening
F04.16	Holding brake opening speed pause time	Set RFG pause time for holding brake opening
F04.17	Holding brake closing speed pause time	Setting the RFG pause time of holding brake closing

5.7.4 Automatic restart

Automatic restart includes two functions:

●Automatic reset fault information of drive

●After fault reset, the drive will restart the motor automatically

Set fault auto reset

The realization of automatic fault reset function is determined by the following aspects:

Fault reset time: automatic fault reset processing within a certain period of time. The start time depends on the first fault time after the automatic reset fault is enabled.

Fault reset interval: the minimum interval between two fault reset commands.

Fault reset times: the maximum number of times a fault reset command is generated within the fault reset time. After this number of times, no fault reset command will be generated unless the fault reset time is over.

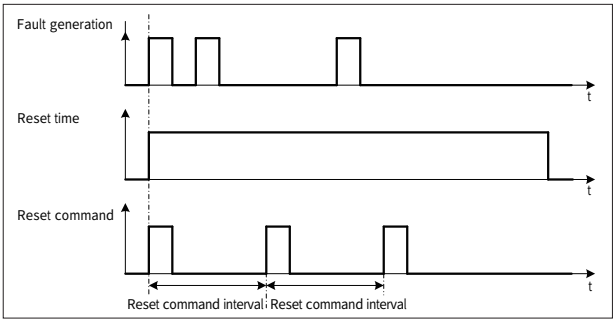


Figure 5-32 fault automatic reset command sequence diagram

Note: parameter E00.14、E00.15 and E00.16 can be used to set the non reset faults after the automatic reset function is enabled.

Table 5-23 parameters related to automatic fault reset

parameter	parameter name
E00.10	Automatic fault reset function
E00.11	Fault reset times reset time
E00.12	Fault reset interval time
E00.13	Fault reset times
E00.14	Non resettable exception code 1
E00.15	Non resettable exception code 2
E00.16	Non resettable exception code 3

Set auto restart

Automatic restart takes effect after the fault is reset automatically. If the motor may rotate for a long time after the fault occurs, you must also enable the "speed tracking" function, see 5-26.

Table 5-24 setting parameters of automatic restart

Parameter	Parameter name	Description
E00.23	reset and restart function	E00.23 the enable auto restart function
E00.24	exception source to allow restart	E00.24 0:specify exception code to allow restart 1:the specified exception code does not allow restart
E00.25	specified exception code 1	E00.25 set up special handing faults
E00.26	specified exception code 2	E00.26 set up special handing faults
E00.27	specified exception code 3	E00.27 set up special handing faults
E00.28	specified exception code 4	E00.28 set up special handing faults
E00.29	specified exception code 5	E00.29 set up special handing faults

5.7.5 Free function block

5.7.5.1 General

Using free function block, configurable signal interconnection can be established in the drive.

The drive mainly provides the following free function blocks:

- Logic operation module: AND, OR, XOR, NOT
- Arithmetic module: ADD (adder), SUB (subtracter), MUL (multiplier), DIV (divider), AVA (absolute value), NCM (comparator)
- Time relay RLY
- Limiter LVM
- Low pass filter PF
- Bit to word module
- Word transposition module

The number of free function blocks in the drive is limited. Each function block can only be used once. The drive has three adders.

Example: if three adders have been configured, no more adders can be added.

5.7.5.2 Free function block list

Logic and module

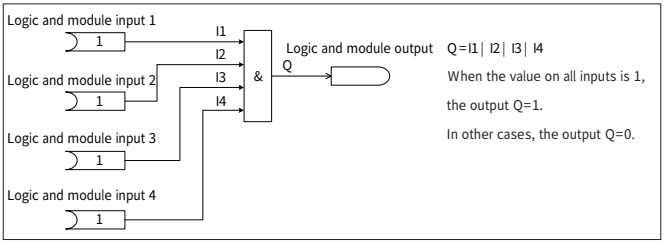


Figure 5-25 Logic and module setting parameters

	AND A	AND B	AND C	AND D
I1	F00.00	F00.05	F00.10	F00.15
I2	F00.01	F00.06	F00.11	F00.16
I3	F00.02	F00.07	F00.12	F00.17
I4	F00.03	F00.08	F00.13	F00.18
Q	P03.00	P03.01	P03.02	P03.03

Logic or module

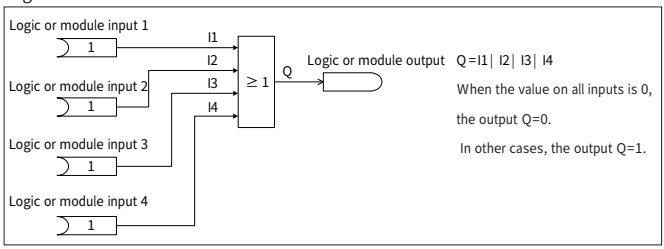


Table 5-26 Logic or module setting parameters

	OR A	OR B	OR C	OR D
I1	F00.36	F00.41	F00.46	F00.51
I2	F00.37	F00.42	F00.47	F00.52
I3	F00.38	F00.43	F00.48	F00.53
I4	F00.39	F00.44	F00.49	F00.54
Q	P03.12	P03.13	P03.14	P03.15

Logic non module

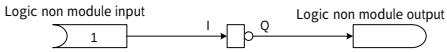


Table 5-27 Logic non module setting parameters

	NOT A	NOT B	NOT C	NOT D	NOT E	NOT F	NOT G	NOT H
I	F00.20	F00.22	F00.24	F00.26	F00.28	F00.30	F00.32	F00.34
Q	P03.04	P03.05	P03.06	P03.07	P03.08	P03.09	P03.10	P03.11

Logical XOR module

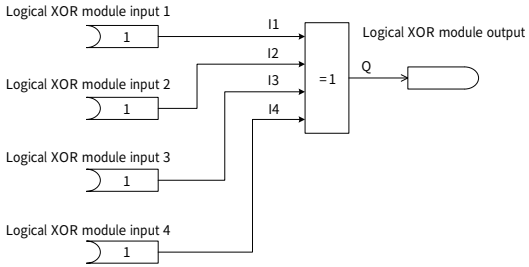


Table 5-28 truth table

I0	I1	I2	I3	Q
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

Table 5-29 Logical XOR module setting parameters

	XOR A	XOR B	XOR C	XOR D
I1	F00.56	F00.61	F00.66	F00.71
I2	F00.57	F00.62	F00.67	F00.72
I3	F00.58	F00.63	F00.68	F00.73
I4	F00.59	F00.64	F00.69	F00.74
Q	P03.16	P03.17	P03.18	P03.19

Arithmetic module - adder

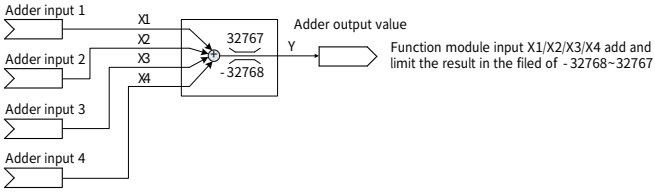


Table 5-30 Adder setting parameters

	ADD A	ADD B	ADD C
X1	F01.00	F01.05	F01.10
X2	F01.01	F01.06	F01.11
X3	F01.02	F01.07	F01.12
X4	F01.03	F01.08	F01.13
Y	P08.00	P08.01	P08.02

Arithmetic module - subtractor

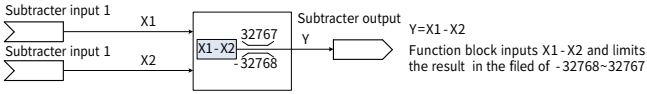


Table 5-31 Subtractor setting parameters

	SUB A	SUB B
X1	F01.15	F01.18
X2	F01.16	F01.19
Y	P08.04	P08.05

Arithmetic module multiplier

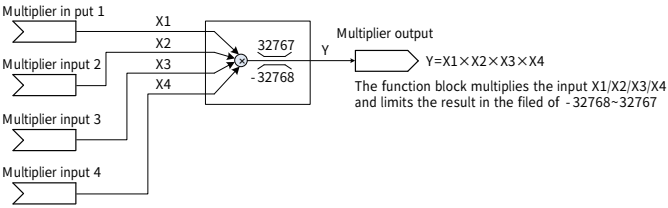
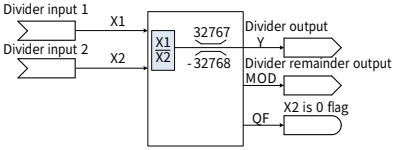


Table 5-32 multiplier setting parameters

	MUL A	MUL B
X1	F01.21	F01.26
X2	F01.22	F01.27
X3	F01.23	F01.28
X4	F01.24	F01.29
Y	P08.08	P08.09

Arithmetic operation module - divider



Y=X1/X2
The function block draws the input X1/X2 and makes the result in the filed of -32768~32767

Table 5-33 divider setting parameters

	DIV A	DIV B
X1	F01.31	F01.34
X2	F01.32	F01.35
Y	P08.13	P08.16
MOD	P08.14	P08.17
QF	P03.30	P03.31

Arithmetic module comparator

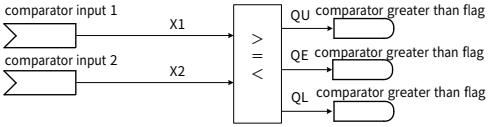


Table 5-34 function list

input comparison	QU	QE	QL
X1＞X2	1	0	0
X1＝X2	0	1	0
X1＜X2	0	0	1

Table 5-35 comparator setting parameters

	NCM A	NCM B
X1	F01.41	F01.44
X2	F01.42	F01.45
QU	P03.24	P03.27
QE	P03.25	P03.28
QL	P03.26	P03.29

Arithmetic operation module - absolute value calculator

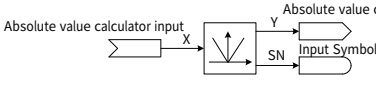


Table 5-36 absolute value calculator setting parameters

	AVA A	AVA B
X	F01.37	F01.39
Y	P08.24	P08.25
SN	P03.32	P03.33

Time relay

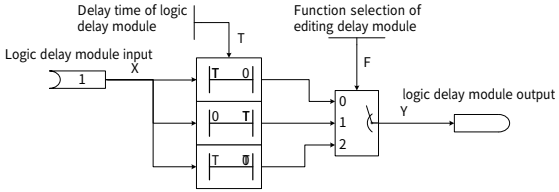
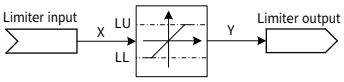


Table 5-37 setting parameters of time relay

	RLY A	RLY B	RLY C	RLY D
X	F00.76	F00.79	F00.82	F00.85
F	F00.77	F00.80	F00.83	F00.86
T	F00.78	F00.81	F00.84	F00.87
Y	P03.20	P03.21	P03.22	P03.23

Limiter module



Y = LU, X ≥ LU
Y = X, LL < X < LU
Y = LL, X ≤ LL
the function block limits the output Y to LU~LL

Table 5-38 limiter module setting parameters

	LIM A	LIM B
X	F01.47	F01.51
LU	F01.48	F01.52
LL	F01.49	F01.53
Y	P08.28	P08.29

low pass filter

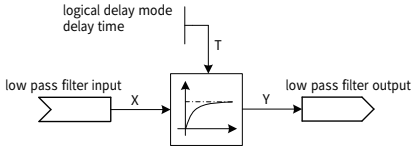


Table 5-39 setting parameters of low pass filter module

	LPF A	LPF B
X	F01.55	F01.58
T	F01.56	F01.59
Y	P08.32	P08.33

5.7.6 Smooth lifting function

When lifting a heavy object, if the speed of the heavy object is too fast at the moment when it is off the ground, the tower arm will shake up and down, affecting the safety and stability of the tower crane. This situation can be improved by using the stable lifting function. After the stable lifting function is turned on, when the load increase (for the moment when the heavy object is off the ground) quickly reduce the rotating speed to tension the rope for lifting the heavy object, and lift the heavy at a low speed. When the heavy object is stable off the ground, it will automatically accelerate the rise.

This function is only applicable to closed-loop vector and open-loop vector control mode.

The parameters which need to be set are as follows:

Function mode	Parameter name	Factory default	Description
F08.50	Enable smooth lifting function	0	0:Invalid 1:Effective
F08.51	Loose rope torque	25.0%	Percentage of load torque of slack rope torque in rated torque.
F08.52	Loose rope detection time	0.80	Time of rope loosening determined by detection.
F08.53	Added value of loading torque	10.0	The increase of load torque under loading compared with slack rope torque.
F08.54	Load detection time	0.10	Time to detect and judge the loading status
F08.55	Load torque fluctuation value	10.0%	Fluctuation range of fully loaded output torque as a percentage of rated torque.
F08.56	Load stabilization time	1.00	Holding time of output torque within the fluctuation range of F08.55 after full loading.
F08.57	Fast deceleration speed	0.50	Fast deceleration time under loading.
F08.58	Rope tightening maintain speed	10.0%	Percentage of low speed value in loaded state in fixed frequency.

Attention:

The lifting direction shall be consistent with the forward rotation direction given by the speed.

5.7.7 Ant speed function

When the speed function source is selected as 1, the given speed is correspondingly switched from multi-stage setting value 1~8 to multi-stage setting value 9~16. The multi-stage setting value 9~16 can be set as the required low speed, and the speed switching is carried out by using parameter F0860.

Ant speed function parameters:

Parameter	Description
F08.60	Speed function source selection
B03.16	Multi segment set point 1
B03.17	Multi segment set point 2
B03.18	Multi segment set point 3
B03.19	Multi segment set point 4
B03.20	Multi segment set point 5
B03.21	Multi segment set point 6
B03.22	Multi segment set point 7
B03.23	Multi segment set point 8
B03.24	Multi segment set point 9
B03.25	Multi segment set point 10
B03.26	Multi segment set point 11
B03.27	Multi segment set point 12
B03.28	Multi segment set point 13
B03.29	Multi segment set point 14
B03.30	Multi segment set point 15
B03.31	Multi segment set point 16

5.7.8 Smooth rotation function

When the tower crane rotates, in order to make the rotation stable and reduce shaking, the stable rotation function can be turned on. The parameters which need to be set are as follows:

Function mode	Parameter name	Factory value	Description
F08.61	Smooth swing function enable	0	0:invalid 1:valid
F08.62	Swing arm length	32~100m	
F08.63	Acceleration gain	0~100	
F08.64	Deceleration gain	0~100	

6. Exception and system information

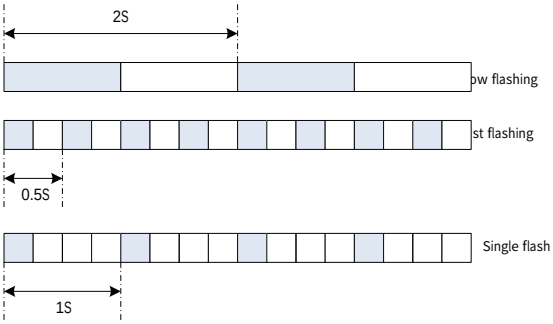
6.1 LED display of operating status

After turning on the power, the LED RDY (Ready) will remain on. Once the LED RDY turns red or green, it displays the status of the driver.

LED lights are divided into RDY (Ready) lights and COM (Communication) lights. RDY lights are used to display the status and upgrade status of the driver, while COM lights are used to display whether communication is present.

Signal status of LED

In addition to "on" and "off", the LED also has three different flashing frequencies:



LED lighting status description	
1	Bright
2	Extinguish
3	Slow flashing (2S cycle)
4	Fast flashing (0.5S cycle)
5	Single flash (1s cycle)

Table 6-1 LED signal status of driver

LED				illustrate
RDY（Green）	RDY（Red）	COM（Green）	COM（Red）	
bright	extinguish			Drive operation
Slow flashing	extinguish			Preparation for startup
Fast flashing	extinguish			Power on blocking status
extinguish	bright			fault
bright	bright			Fault shutdown
bright	Slow flashing			CM/PM Upgrade
Fast flashing	Fast flashing			Upgrade Successful
extinguish	Slow flashing			Upgrade failed
		Slow flashing	extinguish	Modbus communication connection
		extinguish	extinguish	Modbus communication disconnection
		bright	extinguish	PROFINET process data communication
		extinguish	Fast flashing	PROFINET burning mode
		Red green alternating fast flashing		PROFINET DCP request
		Single flash	extinguish	PROFINET AR establishment
		extinguish	Single flash	PROFINET communication error

6.2 Fault and warning list

rious number	fault name	fault sub code	inclusive sub-code	solutions
1	over current	1	U phase over current	1.Eliminate the damage of power line
				2.Check the wiring for short circuit
				3.Increase the acceleration and deceleration time
				4.Reducing VF torque increment under VF control
		2	V phase over current	5.Please make sure the motor stops stably before starting
		4	W phase hardware over current	6.reduce or cancel the load
		8	Brake pipe hardware over current	7.Under vector control, please confirm whether the correct parameter identification operation has been carried out.
		15	software over current	8.Contact after-sales or manufacture for technical support
2	over voltage	1	Bus voltage over voltage in fast detection	1.Please check whether the input power is in a reasonable range
				2.Please increase the acceleration and deceleration time
				3.Add brake resistor or brake unit
		2	Bus voltage in slow speed detection	4 Contact after-sales or manufacture for technical support
3	under voltage	1	bus under voltage	1.Please check whether the input power is in a reasonable range
				2.Please confirm whether the power grid is cut off instantaneously
				3.Contact after-sales or manufacturer for technical support
4	buffer resistance overheating	1	buffer resistance overheated	1.Please confirm whether the drive is repeatedly powered on.
				2.Contact after-sales or manufacturer for technical support
5	drive overload	1	drive overload	1.Please confirm whether the drive selection is appropriate, or replace a larger capacity drive
				2.Reduce VF torque increase under VF control
				3.Reduce the torque under vector control
				4.Please confirm whether the load is too heavy or the brake is locked
				5.Please confirm the correct parameter self learning operation in vector control
				6.In the application with encoder, please confirm whether the encoder direction and parameter setting are correct
				7.Contact after-sales or manufacturer for technical support
6	motor overload	1	motor overload	1.Please conform whether the motor load is too large
				2.In vector control, please confirm whether motor parameter self-learning has been carried out
				3.For the application with encoder, please confirm whether the encoder direction and parameter setting are correct
				4.Please confirm whether the load is too heavy or the brake is locked
				5.Please confirm whether the motor nameplate parameters are set correctly
				6.Contact after-sales or manufacture for technical support
7	input phase loss	1	input open phase detection	1.Please check if the power input cable is in good contact
				2.Contact after-sales or manufacturer for technical support
8	output phase miss	1	U phase output phase missing	1.Please check whether the corresponding output cable is correctly connected and in good contact
		2	V phase output phase missing	2.Please confirm whether the motor runs smoothly
		3	W phase output phase missing	3.Contact after-sales or manufacturer for technical support
		4	phase loss of FVC control output	
		5	stator resistance identification of output open phase	
		6	three phase output is seriously unbalanced	

rious number	fault name	fault sub code	inclusive sub-code	solutions
9	drive overheating	1	drive overheating	1.Please confirm whether the ambient temperature is too high 2.Please check the radiator fan for normal operation 3.Please check whether the radiator air is blocked 4.Contact after-sales or manufacture tho technical support
10	PWM wave generation anomaly	1	U-phase wave generation anomaly	1.Power on the power again. If it persists, contact after-sales or home for technical support
		2	V-phase wave generation anomaly	
		4	W-phase wave generation anomaly	
11	Current zero drift detection error	1	The zero drift of U-phase is too large	1.If PM is abnormal, contact after-sales or manufacturer for technical support
		2	The zero drift of V-phase is too large	
12	Short circuit to ground fault detection	1	U-phase over current during short circuit to ground	1.Please check whether the corresponding output phase is short circuited to ground
		2	V-phase over current during short circuit to ground	2.Check whether the motor cable is damaged
		4	W-phase over current during short circuit to ground	3.Contact after-sales or manufacturer for technical support
		5	The short circuit current to ground exceeds threshold	
		6	Over voltage in case of short circuit to ground	
13	Faillure of promise transfer	1	abnormal dynamic tuning	1.Please confirm whether the motor nameplate parameter setting is correct
		2	static tuning failure	2.Contact after-sales or manufacturer for technical support
14	encoder failed	1	Encoder not connected during closed loop dynamic tuning	1.Please check whether the encoder connection is correct 2.Please confirm whether the encoder wiring is reliable 3.Please check whether the relevant parameters of encoder are set correctly
		2	The speed measurement of the encoder does not match in the dynamic closed loop tuning	4. Please check whether the encoder power supply is selected correctly
		3	Encoder disconnection during closed loop operation	5. Contact after-sales or manufacturer for technical support
15	vector stall alarm	1	The velocity is reversed by external force	1.Please confirm whether the motor nameplate parameters setting is correct 2.Please confirm whether the motor parameter self-learning operation has been done 3.Please check whether the stall related parameters settings are reasonable
		2	Excessive speed deviation	4.Contact after-sales or manufacturer for technical support
16	FPGA data read / write error	1	FPGA read/write error in initialization	1.PM is abnormal, power off and restart. If it continues to exist, contact after-sales ir manufacturer for technical support
17	drive power failure	1	Low voltage of driving power supply	1.Contact after-sales or manufacturer for technical support
18	primary power failure	1	Level 24V power supply voltage is low	1.Contact after-sales or manufacturer for technical support
19	CM no answer fault	1	CM no response	1.Please confirm whether the lock catch of CM is locked
		2		2.Contact after-sales or manufacturer for technical support
		3		
		4		
20	PM-EEPROM fault	1	Abnormal EEPROM of PM unit	1.Contact after-sales or manufacturer for technical support
21	PM model setting error	1	PM model setting error	1.Please confirm whether the drive model is consistent with the label 2.Contact after-sales or manufacturer for technical support
33	Drive OVER-PRE loading	1	Drive overload warning	1.Please confirm whether the drive OVER-PRE loading function is enabled 2.Contact after-sales or manufacturer for technical support

erious number	fault name	fault sub code	inclusive sub-code	solutions
34	Motor OVER-PRE loading	1	Motor overload warning	Please confirm whether the drive OVER-PRE loading function is enabled Contact after-sales or manufacturer for technical support
35	abnormal communication	1	Abnormal disconnection during background startup	1. Check whether the communication cable between the background and the drive is connected abnormally 2.Contact after-sales or manufacturer for technical support
		2	Abnormal disconnection of operation panel during startup	1. Check whether the communication cable between the operation panel and the drive is connected abnormally Contact after-sales or manufacturer for technical support
		3	Abnormal disconnection of communication after modbusconnection	1. Check whether the communication cable between the operation panel and the drive is connected abnormally Contact after-sales or manufacturer for technical support
37	motor speed overrun	1	Motor speed exceedsthe maximum speed limit	1. Please check whether the parameter setting related to motor over-speed is reasonable 2.Contact after-sales or manufacturer for technical support
38	motor speed deviation is too large	1	The deviation between the motor speed and the given speed is too large	1. Please check whether the parameter setting related to motor over-speed is reasonable 2.Contact after-sales or manufacturer for technical support
41	external fault	1	generate external fault 1	1 check the external input signal
		2	generate external warning 2	
42	external warning	1	generate external warning 1	
		2	generate external warning 2	
43	PRE-DRIVE failure	1	No bus voltage is detectedwhen operation command is generated	1. Check whether the external power supply voltage is abnormal 2.Contact after-sales or manufacturer for technical support
44	CM chip recognition abnormality	2	Chip recognition error	Contact after-sales or manufacturer for technical support
			Clock configuration failed	
45	band brake control abnormal	1	Abnormal opening of band brake	1. Check whether the external relay is abnormal
		2	Abnormal closing of band brake	2.Contact after-sales or manufacturer for technical support
46	Abnormal voltage of control board	1	Excessive voltage of PM24V power supply	1.Chrck whether the external power supply voltage is abnormal
		2	Excessive voltage of external PM24V power supply	2.Contact after-sales or manufacturer for technical support
		3	Low voltage of PM24V or external 24V power supply	
		4	3.3V voltage too high	
		5	3.3V voltage too low	
47	Motor over temperature warning	1	Motor over temperature warning	1.Reduce the motor load. 2.Check the ambient temperature. 3.Check the wiring and connection of the sensor.
48	Motor over temperature warning	1	Motor over temperature warning	4.Contact after-sales or manufacturer for technical support
50	Capacitor side fan warning	1	Capacitor side fan disconnection	1.Check whether the connection of fan at capacitor side is interrupted 2.The fan on the capacitor side is damaged. Contact the manufacturer for replacement
51	CM-EEPROM fault	1	Abnormal EEPROM of CM unit	1.Contact after-sales or manufacturer for technical support

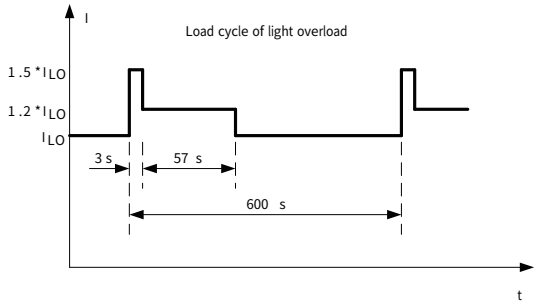
7 Technical data

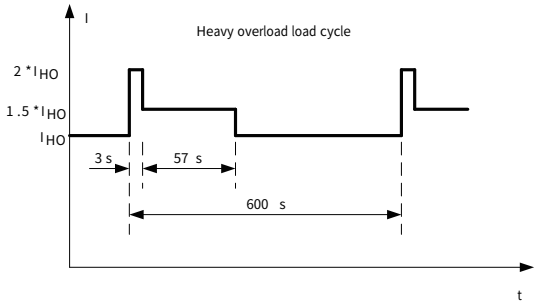
7.1 Technical data of control module

function	technical fata	
bus interface	A1-CM23-MB-PE	●support Modbus RTU communication ● baud rate: 115200bps maximum
working power supply	power module power supply	24V/0.6A
output power supply	+24V output	● voltage range: DC 18V · · · 26.8V ● maximum current: 200mA
	encoder power supply	● voltage range: DC 18V · · · 26.8V ● maximum current: 200mA
digital input	six（DI0 ~ DI5）	● common terminal DICOMO ● electrical isolation ● support Source and Sink mode ● voltage: DC24V AC36V AC48V ● signal voltage "1": ＞11V ● signal voltage "0": ＜5V ● 24V typical current: 4mA ● response time: 6ms (including software filtering)
digital output	2 relays (DO0~DO1)	●voltage: DC 24V、AC 220V ●continuous current: 2A ●switching current: 2A ●contact type: 1 normally open 1 normally closed
encoder signal input	incremental ABZ encoder	●support 24V single ended signal ●input frequency: maximum 200kHz ●cable length: 24V open collector type 50m 24V push-pull type 100m
indicator light	two two color indicator lights	●RDY indicator: red and green ●BF indicator: red and green
	1 single color indicator light	●SAFE indicator: yellow
keyboard interface	support for OP25	●it can be installed directly or externally
working temperature	-10°C··· +50°C	
storage temperature	-40°C··· +70°C	
relative air humidity	<95%	condensation is not allowed
pollution	comply IEC 61800-5-1	applicable to environment with pollution level 2
electromagnetic compatibility	comply IEC 61800-3	

7.2 Technical data of Power Module

Typical load cycles for drive





7.2.1 General technical data of PM25

Characteristic	Data
supply voltage	3AC 380V ~ 480V ±10%
output voltage	3AC 0V ~ output voltage (the maximum)
input frequency	50Hz ~ 60Hz ±3Hz
output frequency	0Hz ~ 600Hz，depending on the contral mode
source impedance	Uk ≥ 1%, it is recommended to use power reactor or higher power under the condition of lower value
starting current	＜ light load basic load input current
pulse frequency	●4kHz factory setting
	●2kHz~8kHz adjustable
rated short circuit current	● ≤ 65kA rms
	● The drive with built-in filter is suitable for class C2 environment
electromagnetic compatibility	The drive with built-in filter is suitable for class C2 environment
according with IEC/EN 61800-3	
braking method	braking、compound braking and resistance braking with integrated brake chopper
protection level	IP20 witch needs to be installed in the control cabinet
according with EN60529	
ambient temperature	●Basic load power of light load without capacity reduction：-10℃~+40℃
	●Basic load power of heavy load without capacity reduction：-10℃~+50℃
	●Basic load power of light or heavy load with capacity reduction：-10℃~+50℃
storage temperature	-40℃ ~ +70℃
according with 60721-3-3	
cooling air medium	clean、dry air
relative air humidity	＜95%, condensation is nor allowed
pollution	applicable to environment with pollution level 2
according with EN61800-5-1	
installation altitude	●without capacity reduction: below 1000m
	●with capacity reduction: 1000m~4000m

7.2.2 PM25 power technical data

Incoming line voltage 380 · · · 480V 3AC

Incoming line voltage 380 · · · 480V 3AC			
technical parameter		A1-PM25-B3A75	A1-PM25-B3B15
rated output power	based on (LD) kW	-	1.5
	based on (HD) kW	0.75	1.1
rated input current	reactor A with incoming line	2.3	4.3
	reactor A without incoming line	2.6	4.9
rated output current	based on (LD) A	-	4.1
	based on (HD) A	2.2	3.1
rated carrier frequency kHz		4	4
efficiency η		＞0.95	＞0.95
power loss kW		0.1	0.1
noise level dB(A)		＜40	＜40
maximum length of brake resistance connecting cable m		15	15
incoming power connection	L1、L2、L3	screw terminal	screw terminal
	cross sectional area of cable mm^2	1…2.5	1…2.5
motor connection	U、V、W	screw terminal	screw terminal
	cross sectional area of cable mm^2	1…2.5	1…2.5
DC bus connection (connection ofbrake resistor)	DC+、DC-、R	screw terminal	screw terminal
	cross sectional area of cable mm^2	1…2.5	1…2.5
PE connection		M4 screw on housing	M4 screw on housing
maximum motor cable length	shielded cable m	50	50
	unshielded cable m	100	100
degree of protection		IP20	IP20
installation dimension	width（W）mm	80	80
	height（H）mm	230	230
	depth（D）mm	165	165
overall dimension		B1	B1
approximate weight kg		2	2

A1-PM25-B3B22	A1-PM25-B3B30	A1-PM25-B3B40	A1-PM25-B3B55	A1-PM25-B3B75
2.2	3	4	5.5	7.5
1.5	2.2	3	4	5.5
6.1	8	10.4	15.3	18.7
7.6	10.2	13.4	17.2	21.9
5.9	7.7	10.2	13.2	18
4.1	5.9	7.7	10.2	13.2
4	4	4	4	4
＞0.95	＞0.95	＞0.95	＞0.95	＞0.95
0.11	0.14	0.16	0.18	0.24
＜40	＜40	＜50	＜50	＜50
15	15	15	15	15
screw terminal	screw terminal	screw terminal	screw terminal	screw terminal
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
screw terminal	screw terminal	screw terminal	screw terminal	screw terminal
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
screw terminal	screw terminal	screw terminal	screw terminal	screw terminal
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
M4 screw on housing	M4 screw on housing	M4 screw on housing	M4 screw on housing	M4 screw on housing
50	50	50	50	50
100	100	100	100	100
IP20	IP20	IP20	IP20	IP20
80	80	100	100	100
230	230	270	270	270
165	165	165	165	165
B1	B1	B2	B2	B2
2	2	4	4	4

Incoming line voltage 380 · · · 480V 3AC			
technical parameter		A1-PM25-B3C11	A1-PM25-B3C15
rated output power	based on (LD) kW	11	15
	based on (HD) kW	7.5	11
rated input current	reactor A with incoming line	26	33
	reactor A without incoming line	32	39
rated output current	based on (LD) A	26	32
	based on (HD) A	18	26
rated carrier frequency kHz		4	4
efficiency η		＞0.95	＞0.95
noise level dB(A)		＜50	＜50
maximum length of brake resistance connecting cable m		15	15
incoming power connection	L1、L2、L3	screw terminal	screw terminal
	cross sectional area of cable mm^2	4…10	4…10
motor connection	U、V、W	screw terminal	screw terminal
	cross sectional area of cable mm^2	4…10	4…10
DC bus connection (connection ofbrake resistor)	DC+、DC-、R	screw terminal	screw terminal
	cross sectional area of cable mm^2	4…10	4…10
PE connection		M4 screw on housing	M4 screw on housing
maximum motor cable length	shielded cable m	50	50
	unshielded cable m	100	100
degree of protection		IP20	IP20
installation dimension	width（W）mm	140	140
	height（H）mm	355	355
	depth（D）mm	165	165
overall dimension		B3	B3
approximate weight kg		7	7

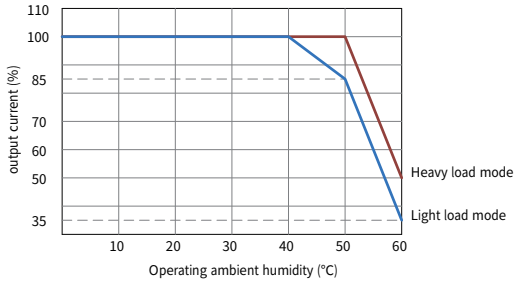
A1-PM25-B3C18	A1-PM25-B3C22	A1-PM25-B3C30	A1-PM25-B3C37
18.5	22	30	37
15	18.5	22	30
39	46	63	78
46	53	73	88
38	45	60	75
32	38	45	69
4	4	4	4
＞0.95	＞0.95	＞0.95	＞0.95
＜50	＜50	＜50	＜50
15	15	15	15
screw terminal	screw terminal	screw terminal	screw terminal
6…25	6…25	6…25	6…25
screw terminal	screw terminal	screw terminal	screw terminal
6…25	6…25	6…25	6…25
screw terminal	screw terminal	screw terminal	screw terminal
6…25	6…25	6…25	6…25
M4 screw on housing	M4 screw on housing	M5 screw on housing	M5 screw on housing
50	50	50	50
100	100	100	100
IP20	IP20	IP20	IP20
200	200	200	200
472	472	472	472
237	237	237	237
B4	B4	B4	B4
16	16	16	16

PM 25 power module incoming line voltage 380 · · · 480V 3AC			
technical parameter		A1-PM25-B3C45	A1-PM25-B3C55
rated output power	based on (LD) kW	45	55
	based on (HD) kW	37	45
reted input current	reactor a with incoming line	86	104
	reactor a without incoming line	78	94
rated output current	based on (LD) A	90	110
	based on (HD) A	75	90
rated carried frequency kHz		4	4
efficiency η		＞0.95	＞0.95
power loss kW		1.3	1.67
cooling air volume requirement Mm^3/s		0.083	0.083
noise level dB(A)		＜75	＜75
24V DC output power supply (for control unit)		1	1
maximum length of brake resistance connection cable m		15	15
incoming power connection	L1、L2、L3	cable termination	cable termination
	cross sectional area of cable mm^2	35…2x120	35…2x120
motor connection	U、V、W	cable termination	cable termination
	cross sectional area of cable mm^2	35…2x120	35…2x120
DC bus connection (connection of brake resistor)	DC+、DC-、R	screw terminal	screw terminal
	cross sectional area of cable mm^2	25…70	25…70
PE connection		cable termination	cable termination
maximum motor cable length	shielded cable m	50	50
	shielded cable m	100	100
degree of protection		IP20	IP20
overall dimension	width (W) mm	305	305
	heigh (H) mm	750	750
	depth (D) mm	357	357
overall dimension		B6	B6
approximate weight/kg		65	65

A1-PM25-B3C75	A1-PM25-B3C90	A1-PM25-B3D11	A1-PM25-B3D13
75	90	110	132
55	75	90	110
140	172	198	242
117	154	189	218
145	178	205	250
110	145	178	205
4	4	2	2
＞0.95	＞0.95	＞0.95	＞0.95
1.93	2.48	2.3	3.02
0.153	0.153	0.153	0.153
＜75	＜75	＜75	＜75
1	1	1	1
15	15	15	15
cable termination	cable termination	cable termination	cable termination
35…2x120	35…2x120	35…2x120	35…2x120
cable termination	cable termination	cable termination	cable termination
35…2x120	35…2x120	35…2x120	35…2x120
screw terminal	screw terminal	screw terminal	screw terminal
25…70	25…70	25…70	25…70
cable termination	cable termination	cable termination	cable termination
50	50	50	50
100	100	100	100
IP20	IP20	IP20	IP20
305	305	305	305
750	750	750	750
357	357	357	357
B6	B6	B6	B6
65	65	65	65

7.3 Restrictions under special environmental conditions

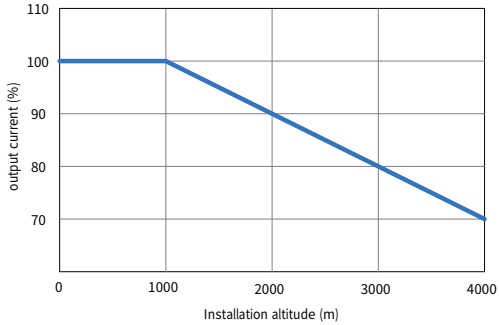
Functional relationship between operating ambient temperature and current reduction.



The control module and operation panel can limit the maximum allowable working environment temperature of the power module.

Functional relationship between installation altitude and current derating

Because the cooling performance of the air is low when thealtitude exceeds 1000m, the output current of the drive must be reduced.



The installation altitude is a function of the allowable power supply.

●The installation altitude is below 2000 meters.

- Connect to each grid system allowed for the drive.

●The installation altitude is 2000m to 4000m.

- It can only be connected to TN system with grounding star point.
- It is not allowed to connect TN system with grounding outer conductor.
- The TN system can be provided with a grounding star point through an isolation transformer.
- Do not reduce the phase to phase voltage.

8 Parameter list
8.1 A–system status and peripherals

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
A00:Status monitoring and setting						
A00.00	Current state machine	S0:Uninitialized S1:Initialization S2:Power on detection S3:Fault S4:Power on blocking S5:Startup preparation S6:Pre drive S7:Preparation for operation S8:Demagnetization waiting S9:Pre operation detection S10:Pre excitation S11:Speed search S12:Operation S13:Off1 shutdown S14:Off3 shutdown S15:Start DC braking S16:Self inspection preparation S17:Self inspection S18:Identification preparation S19:Identification S20:Restore factory value S21:Parameter Download S22:Inching operation S23:Inching	0	0	65535	0x2000
A00.01	Target Frequency	-300.00~300.00Hz	0.00	-300.00	300.00	0x2001
A00.02	Given Frequency	-300.00~300.00Hz	0.00	-300.00	300.00	0x2002
A00.03	Motor Frequency	-300.00~300.00Hz	0.00	-300.00	300.00	0x2003
A00.04	Target speed	-18000~18000rpm	0	-18000	18000	0x2004
A00.05	Given speed	-18000~18000rpm	0	-18000	18000	0x2005
A00.06	Motor speed	-18000~18000rpm	0	-18000	18000	0x2006
A00.07	Output voltage	0~1000V	0	0	1000	0x2007
A00.08	Output current	0~655.35A	0.00	0.00	655.35	0x2008
A00.09	Output power	0~655.67kw	0.00	-327.68	327.67	0x2009
A00.10	Given torque	-300.0~300.0%	0.0	-300.0	300.0	0x200a
A00.11	Output torque	-300.0~300.0%	0.0	-300.0	300.0	0x200b
A00.14	DC bus voltage	0~1000.0V	0.0	0.0	1000.0	0x200e
A00.15	Radiator temperature	-40~150°	0	-40	150	0x200f
A00.16	DI status	0~65535	0x00	0x00	0xFFFF	0x2010
A00.17	DO status	0~65535	0x00	0x00	0xFFFF	0x2011
A00.18	Rectifier bridge temperature	-40~150°	0	-40	150	0x2012
A00.19	Synchronization frequency	-327.68~327.67Hz	0.00	-327.68	327.67	0x2013
A00.20	Encoder frequency	-327.68~327.67Hz	0.00	-327.68	327.67	0x2014
A00.22	Brake tube temperature	-40~150℃	0	-40	150	0x2016

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
A00:Status monitoring and setting						
A00.41	Power on display selection 1	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed 6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque 11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature 16:Di status 17:Do status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	1	0	40	0x2029
A00.42	Power on display selection 2	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed 6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque 11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature 16:Di status 17:Do status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	3	0	40	0x202a

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
A00:Status monitoring and setting						
A00.43	Power on display selection 3	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed 6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque 11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature 16:Di status 17:Do status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	8	0	40	0x202b
A00.44	Power on display selection 4	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed 6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque 11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature 16:Di status 17:Do status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	11	0	40	0x202c

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
A00:Status monitoring and setting						
A00.45	Power on display selection 5	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed 6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque 11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature 16:Di status 17:Do status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	14	0	40	0x202d
A00.46	Power on display selection 6	0:Current state machine 1:Target frequency 2:Given frequency 3:Motor frequency 4:Target speed 5:Given speed 6:Motor speed 7:Output voltage 8:Output current 9:Output power 10:Given torque 11:Output torque 12:System reservation 13:System reservation 14:DC bus voltage 15:Radiator temperature 16:Di status 17:Do status 18:Rectifier bridge temperature 19:Synchronous frequency 20:Encoder frequency	15	0	40	0x202e

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
A02:Drive Information and Set						
A02.00	CM-ARM Software Version number	0.00~655.35	0.00	0.00	655.35	0x2200
A02.01	CM-FPGA Version Number	0.00~655.35	0.00	0.00	655.35	0x2201
A02.02	PM-DSP Software Version number	0.00~655.35	0.00	0.00	655.35	0x2202
A02.03	PM-FPGA Version Number	0.00~655.35	0.00	0.00	655.35	0x2203
A02.04	Rated power of PM power unit	0.00~655.35	0.00	0.00	655.35	0x2204
A02.05	Rated voltage of PM power unit	0~65535	0	0	65535	0x2205
A02.06	Rated current of PM power unit	0.00~655.35	0.00	0.00	655.35	0x2206
A02.07	Function code version number	0.00~655.35	0.00	0.00	655.35	0x2207
A02.08	CM version release time	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2208
A02.11	Platform version number	0.00~655.35	0.00	0.00	655.35	0x220b
A03:PM power Protect and Set						
A03.08	Carrier frequency setting	0:1KHz 1:2KHz 2:4KHz 3:6KHz 4:8KHz	2	0	4	0x2308
A03.09	Load mode selection	0:Light load 1:Overload	0	0	1	0x2309
A03.13	DPWM switching frequency	0.0Hz～600.0Hz	8.00	1.00	60.00	0x230d
A03.16	Dead time compensation enable	0:Forbid 1:Dead-time COMP method1 2:Dead-time COMP method2	1	0	2	0x2310
A03.17	Wave-by-wave CUR limit enable	0:Forbidden 1:Enable	1	0	1	0x2311
A03.18	Wave-by-wave CUR limit ratio	0~100	100	0	100	0x2312
A03.19	Input phase loss detection	0:Forbidden 1:Allow	0	0	1	0x2313
A03.20	Braking resistance action point	600.0~800.OV	700.0	600.0	800.0	0x2314
A03.21	Software under-voltage point	85.0%～150.0%	100	60	150	0x2315
A04:System and Environment Set						
A04.00	Parameter reset mode	0:Invalid 1:Model PARAM,motor PARAM and fault records are not reset 2:Motor PARAM and fault records are not reset 3:Reset All Parameters 4:Clear fault record	0	0	4	0x2400

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
A04:System and Environment Set						
A04.01	Parameter reset	0:Cancel 1:Confirm	0	0	1	0x2401
A04.02	Parameter access level	0:Standard parameter 1:Extended parameters 2:Expert parameters 3:Manufacturer parameters	0	0	3	0x2402
A04.03	Manufacturer password	0~65535	0	0	65535	0x2403
A04.05	Motor selection source 0	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:binary interconnection parameters	0	0	10	0x2405
A04.06	Motor selection source 1	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:binary interconnection parameters	0	0	10	0x2406
A04.10	Disable control of panel	0:Prohibition invalid 1:Prohibition valid	0	0	1	0x240a
A04.11	User latch password	0~65535	0	0	65535	0x240b
A04.12	Industry mode selection	0:Industry mode is not enabled 1:Closed loop lifting mode of tower crane 2:Open loop lifting mode of tower crane 3:Tower crane rotation mode 4:Tower crane luffing mode 5:Driving closed-loop lifting mode 6:Open loop lifting mode of traveling crane 7:Driving horizontal walking mode	0	0	7	0x240c
A04.13	CFM of industry mode SEL	0:Invalid 1:Confirm	0	0	1	0x240d

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
A05:Digital Input						
A05.00	DI physical state value	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2500
A05.02	DI state value after treatment	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2502
A05.04	DI forced selection	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2504
A05.06	DI mandatory data	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2506
A05.08	DI0 opening delay	0.00~655.35S	0.00	0.00	655.35	0x2508
A05.09	DI0 off delay	0.00~655.35S	0.00	0.00	655.35	0x2509
A05.10	DI1 opening delay	0.00~655.35S	0.00	0.00	655.35	0x250a
A05.11	DI1 off delay	0.00~655.35S	0.00	0.00	655.35	0x250b
A05.12	DI2 opening delay	0.00~655.35S	0.00	0.00	655.35	0x250c
A05.13	DI2 off delay	0.00~655.35S	0.00	0.00	655.35	0x250d
A05.14	DI3 opening delay	0.00~655.35S	0.00	0.00	655.35	0x250e
A05.15	DI3 off delay	0.00~655.35S	0.00	0.00	655.35	0x250f
A05.16	DI4 opening delay	0.00~655.35S	0.00	0.00	655.35	0x2510
A05.17	DI4 off delay	0.00~655.35S	0.00	0.00	655.35	0x2511
A05.18	DI5 opening delay	0.00~655.35S	0.00	0.00	655.35	0x2512
A05.19	DI5 off delay	0.00~655.35S	0.00	0.00	655.35	0x2513
A06:Digital Output						
A06.00	DO signal source state value	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2600
A06.01	State VAL after DO processing	0x0~0xFFFF	0x00	0x00	0xFFFF	0x2601
A06.02	Output FUNC SEL of DO0	0:Low level 1:High level 2:Ready for operation 3:Operation permission 4:In operation 5:Comparison value reached 6:Speed reversal 7:Zero speed operation 8:Overspeed 9:Warning 10:Malfunction Others:Binary interconnection of parameters	1111	0	10	0x2602
A06.03	Output FUNC SEL of DO1	0:Low level 1:High level 2:Ready for operation 3:Operation permission 4:In operation 5:Comparison value reached 6:Speed reversal 7:Zero speed operation 8:Overspeed 9:Warning 10:Malfunction Others:Binary interconnection of parameters	10	0	10	0x2603
A06.09	DO0 opening delay	0.00~655.35S	0.00	0.00	655.35	0x2609
A06.10	DO0 off delay	0.00~655.35S	0.00	0.00	655.35	0x260a
A06.11	DO1 opening delay	0.00~655.35S	0.00	0.00	655.35	0x260b
A06.12	DO1 off delay	0.00~655.35S	0.00	0.00	655.35	0x260c

8.2 B– control parameter group

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B00:System Ctrl and Set						
B00.00	Start-stop Ctrl command source	0:Terminal control module 1:Custom control module	0	0	1	0x3000
B00.01	Customize OFF1 source	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3001
B00.02	Customize OFF2 source1	0:Valid 1:Invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x3002
B00.03	Customize OFF3 source1	0:Valid 1:Invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x3003
B00.04	Custom run allowed source	0:Run not allowed 1:Run allowed 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection of parameters	1	0	10	0x3004

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B00:System Ctrl and Set						
B00.05	Custom fault reset source1	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3005
B00.06	Custom speed command negate SRC	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3006
B00.07	Custom JOG1 source	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3007
B00.08	Custom JOG2 source	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3008

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B00:System Ctrl and Set						
B00.09	OFF2 source2	0:Valid 1:Invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x3009
B00.11	OFF3 source2	0:Valid 1:Invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x300b
B00.13	Fault reset source2	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x300d
B00.15	RFG inhibit source	0:RFG prohibition is valid 1:RFG prohibition is invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection of parameters	1	0	10	0x300f

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B00:System Ctrl and Set						
B00.16	RFG pause source	0:RFG suspension is valid 1:RFG suspension is invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection of parameters	1	0	10	0x3010
B00.17	RFG sets the position to 0 SRC	0:RFG given set to 0 is valid 1:RFG given set to 0 is invalid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection of parameters	1	0	10	0x3011
B00.21	Identification request	0:None 1:Simple static identification of asynchronous machine 2:Static integrity identification of asynchronous machine 3:Dynamic integrity identification of asynchronous machine 4:Reserved 5:Reserved 6:Reserved 7:Reserved 8:Reserved 9:Reserved 10:Reserved 11:Synchronous machine without encoder 12:Synchronous machine with encoder identification	0	0	12	0x3015
B00.23	OFF1 shutdown mode	0:Free shutdown 1:Deceleration shutdown	1	0	1	0x3017
B00.24	OFF3 downtime	0.0~1000.0S	10.0	0.0	1000.0	0x3018

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B01:Terminal Control Module						
B01.01	Terminal control command 1 mode	0:Invalid 1:IN1 start 2:IN1 start, IN2 direction 3:IN1 forward start, IN2 reverse start 4:IN1P start, IN2 stop 5:IN1P start, IN2 stop, IN3 direction 6:IN1P forward start, IN2P reverse start, IN3 stop	3	0	6	0x3101
B01.03	Terminal Ctrl command 1 input 1	0:Invalid 1:Reserve 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	2	0	10	0x3103
B01.04	Terminal Ctrl command 1 input 2	0:Invalid 1:Reserve 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	3	0	10	0x3104
B01.05	Terminal Ctrl command 1 input 3	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3105
B01.11	Terminal Ctrl module JOG1 SRC	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x310b

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B01:Terminal Control Module						
B01.12	Terminal Ctrl module JOG2 SRC	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x310c
B02:Command Source Settings						
B02.00	Speed Ctrl main setting SEL	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Bus adapter A-PZD2 10:Reserved Others:Analog interconnection parameters	1	0	10	0x3200
B02.01	Speed Ctrl AUX setting SEL	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Bus adapter A-PZD2 10:Reserved Others:Analog interconnection parameters	0	0	10	0x3201
B02.02	Additional speed setting	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Bus adapter A-PZD2 10:Reserved Others:Analog interconnection parameters	0	0	10	0x3202

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B02:Command Source Settings						
B02.03	Torque Ctrl torque setting SEL	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x3203
B02.04	Torque Ctrl ramp time	0~10.00S	0.00	0.00	10.00	0x3204
B02.05	Torque Ctrl filtering time	0~10.00S	0.00	0.00	10.00	0x3205
B02.06	Torque Ctrl forward speed limit	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	2101	0	10	0x3206
B02.07	Torque Ctrl reverse speed limit	0:00 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	2105	0	10	0x3207
B02.08	Torque Ctrl the speed ramp time	0~10.00S	0.00	0.00	10.00	0x3208
B02.09	Additional torque setting 1 SEL	0:0 1:Digital setting Other:Analog interconnection parameters	0	0	1	0x3209
B02.10	Additional torque setting 1 SEL	-400.0~400.0%	0.0	-200.0	200.0	0x320a

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B03:Others of Command SRC Set						
B03.00	JOG1 given settings	0:0 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	1	0	10	0x3300
B03.01	JOG2 given settings	0:0 1:Multi segment setpoint 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x3301
B03.02	JOG acceleration time	0.0~1000.0S	10.0	0.0	1000.0	0x3302
B03.03	JOG deceleration time	0.0~1000.0S	10.0	0.0	1000.0	0x3303
B03.04	Electric potentiometer function	0:Forbidden 1:Power down clearing 2:Power down memory (RESV)	1	0	2	0x3304
B03.05	Electric POT initial value	-600.0~600.0%	0.0	-600.0	600.0	0x3305
B03.06	Electric POT ramp time	0.0~1000.0S	10.0	0.0	1000.0	0x3306
B03.07	Minimum value of electric POT	-600.0~600.0%	0.0	-600.0	600.0	0x3307
B03.08	Maximum value of electric POT	-600.0~600.0%	100.0	-600.0	600.0	0x3308
B03.09	Electric POT adds source SEL	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x3309

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B03:Others of Command SRC Set						
B03.10	SEL of drop SRC of ELEC POT	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x330a
B03.11	Multisegment given value	-600.0~600.0%	0.0	-600.0	600.0	0x330b
B03.12	Multisegment given value SEL 1	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x330c
B03.13	Multisegment given value SEL 2	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x330d
B03.14	Multisegment given value SEL 3	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x330e

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B03:Others of Command SRC Set						
B03.15	Multisegment given value SEL 4	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x330f
B03.16	Multisegment set point 1	-600.0~600.0%	10.0	-600.0	600.0	0x3310
B03.17	Multisegment set point 2	-600.0~600.0%	20.0	-600.0	600.0	0x3311
B03.18	Multisegment set point 3	-600.0~600.0%	30.0	-600.0	600.0	0x3312
B03.19	Multisegment set point 4	-600.0~600.0%	-10.0	-600.0	600.0	0x3313
B03.20	Multisegment set point 5	-600.0~600.0%	-20.0	-600.0	600.0	0x3314
B03.21	Multisegment set point 6	-600.0~600.0%	-30.0	-600.0	600.0	0x3315
B03.22	Multisegment set point 7	-600.0~600.0%	0.0	-600.0	600.0	0x3316
B03.23	Multisegment set point 8	-600.0~600.0%	0.0	-600.0	600.0	0x3317
B03.24	Multisegment set point 9	-600.0~600.0%	0.0	-600.0	600.0	0x3318
B03.25	Multisegment set point 10	-600.0~600.0%	0.0	-600.0	600.0	0x3319
B03.26	Multisegment set point 11	-600.0~600.0%	0.0	-600.0	600.0	0x331a
B03.27	Multisegment set point 12	-600.0~600.0%	0.0	-600.0	600.0	0x331b
B03.28	Multisegment set point 13	-600.0~600.0%	0.0	-600.0	600.0	0x331c
B03.29	Multisegment set point 14	-600.0~600.0%	0.0	-600.0	600.0	0x331d
B03.30	Multisegment set point 15	-600.0~600.0%	0.0	-600.0	600.0	0x331e
B03.31	Multisegment set point 16	-600.0~600.0%	0.0	-600.0	600.0	0x331f
B04:Ramp Function Generator						
B04.00	RFG ramp time selection 1	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3400

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B04:Ramp Function Generator						
B04.01	RFG ramp time selection 2	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3401
B04.02	Acceleration time of Slope 1	0.0~1000.0S	5.0	0.0	1000.0	0x3402
B04.03	Deceleration time of Slope 1	0.0~1000.0S	5.0	0.0	1000.0	0x3403
B04.04	Acceleration time of Slope 2	0.0~1000.0S	5.0	0.0	1000.0	0x3404
B04.05	Deceleration time of Slope 2	0.0~1000.0S	5.0	0.0	1000.0	0x3405
B04.06	Acceleration time of Slope 3	0.0~1000.0S	5.0	0.0	1000.0	0x3406
B04.07	Deceleration time of Slope 3	0.0~1000.0S	5.0	0.0	1000.0	0x3407
B04.08	Acceleration time of Slope 4	0.0~1000.0S	5.0	0.0	1000.0	0x3408
B04.09	Deceleration time of Slope 4	0.0~1000.0S	5.0	0.0	1000.0	0x3409
B04.10	Start time of S cerve 1	0.00~20.00S	0.00	0.00	20.00	0x340a
B04.11	End time of S cerve 1	0.00~20.00S	0.00	0.00	20.00	0x340b
B04.12	Start time of S cerve 2	0.00~20.00S	0.00	0.00	20.00	0x340c
B04.13	End time of S cerve 2	0.00~20.00S	0.00	0.00	20.00	0x340d
B04.14	Start time of S cerve 3	0.00~20.00S	0.00	0.00	20.00	0x340e
B04.15	End time of S cerve 3	0.00~20.00S	0.00	0.00	20.00	0x340f
B04.16	Start time of S cerve 4	0.00~20.00S	0.00	0.00	20.00	0x3410
B04.17	End time of S cerve 4	0.00~20.00S	0.00	0.00	20.00	0x3411
B04.20	RFG forced output enable	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x3414
B04.21	RFG forced setpoint	0:0 Others:Analog interconnection parameters	0	0	0	0x3415
B04.22	RFG start delay time	0.0~1000.0S	0.0	0.0	1000.0	0x3416

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B04:Ramp Function Generator						
B04.26	RFG ramp time selection 3	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x341a
B04.28	Acceleration time of slope 5	0.0~1000.0S	5.0	0.0	1000.0	0x341c
B04.29	Deceleration time of slope 5	0.0~1000.0S	5.0	0.0	1000.0	0x341d
B04.30	Acceleration time of slope 6	0.0~1000.0S	5.0	0.0	1000.0	0x341e
B04.31	Deceleration time of slope 6	0.0~1000.0S	5.0	0.0	1000.0	0x341f
B04.32	Acceleration time of slope 7	0.0~1000.0S	5.0	0.0	1000.0	0x3420
B04.33	Deceleration time of slope 7	0.0~1000.0S	5.0	0.0	1000.0	0x3421
B04.34	Acceleration time of slope 8	0.0~1000.0S	5.0	0.0	1000.0	0x3422
B04.35	Deceleration time of slope 8	0.0~1000.0S	5.0	0.0	1000.0	0x3423
B04.40	Source of acceleration time	0:0 Others:Analog interconnection parameters	0	0	0	0x3428
B04.41	Source of deceleration time	0:0 Others:Analog interconnection parameters	0	0	0	0x3429
B05:Motor Control Selection						
B05.00	Motor control mode	0:VF 1:SVC 2:FVC	0	0	2	0x3500
B05.01	System control mode	0:Speed control 1:Torque control	0	0	1	0x3501
B05.02	Positive speed allowed	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x3502

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B05:Motor Control Selection						
B05.03	Negative speed allowed	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1	0	10	0x3503
B05.04	Motor starting mode	0:Start directly 1:Pre excitation start 2:Speed tracking start 3:DC brake start	0	0	3	0x3504
B05.06	Pre excitation time setting	0.00~100.00S	0.00	0.00	100.00	0x3506
B05.09	DC braking current	0.0%～100.0% 100.0% corresponding motor rated CUR	50.0	0.0	100.0	0x3509
B05.10	DC braking time at start-up	0.00s~100.00s	0.00	0.00	100.00	0x350a
B05.11	DC braking time during shutdown	0.00s~100.00s	0.00	0.00	100.00	0x350b
B05.12	DC braking INIT speed at stop	0～3000rpm	0	0	3000	0x350c
B05.13	Speed tracking mode	0:Search from shutdown frequency 1:Search from rated frequency 2:Search from maximum frequency	0	0	3	0x350d
B05.14	Speed tracking search time	0.0~120.0S	25.0	0.0	120.0	0x350e
B05.15	Speed tracking CUR percentage	0~100%	50	0	100	0x350f
B05.16	Speed tracking MIN-FRQ limit	0.00~50.00Hz	2.00	0.00	50.00	0x3510
B05.17	Speed tracking switching time	0~60000ms	250	0	60000	0x3511
B05.29	Zero speed judgement value	0～10.00rpm	0.00	0.00	10.00	0x351d
B05.30	Zero speed shutdown delay time	0.00~100.00S	0.00	0.00	100.00	0x351e
B05.32	OFF1 shutdown mode	0:Free shutdown 1:Deceleration shutdown	1	0	1	0x3520
B05.33	OFF3 downtime	0.0~1000.0S	10.0	0.0	1000.0	0x3521

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B06:Motor Limit and Protection						
B06.04	Forward limit speed	0.0%~300.0%	100.0	0.0	300.0	0x3604
B06.05	Reverse limit speed	-300.0%~0.0%	-100.0	-300.0	0.0	0x3605
B06.06	SEL of forward speed limit	0:0 1:300.0% 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	1	0	10	0x3606
B06.07	SEL of reverse speed limit	0:0 1:-300.0% 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	1	0	10	0x3607
B06.08	Torque upper limit setting	0.0%~400.0%	200.0	0.0	200.0	0x3608
B06.09	Torque lower limit setting	-400.0%~0.0%	-200.0	-200.0	0.0	0x3609
B06.10	Selection of torque upper limit	0:0 1:200.0% 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	1	0	10	0x360a

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B06:Motor Limit and Protection						
B06.11	Selection of torque lower limit	0:0 1:-200.0% 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi segment value setting 7:Electric potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	1	0	10	0x360b
B06.12	Vector control torque limit	0.0%~200.0%	180.0	0.0	200.0	0x360c
B06.13	Torque limit before brake open	0.0%~200.0%	180.0	0.0	200.0	0x360d
B06.14	Dead time of FWD and REV speed	0.0~3000.0s	0.0	0.0	3000.0	0x360e
B06.15	Output torque limited threshold	0.0%~100.0%	5.0	0.0	100.0	0x360f
B06.16	Vector Ctrl torque limit source	0: Vector control torque limiting set value (B06.12) Others:Analog interconnection parameters	0	0	0	0x3610
B06.25	Motor overload PROT FUNC	0:Forbidden 1:Allow	0	0	1	0x3619
B06.26	Motor overload PROT FUNC gain	20~1000%	100	20	1000	0x361a
B06.27	Motor overload warning factor	50%～100%	80	50	100	0x361b
B06.28	Overspeed detection value	0.0%～50.0% 100.0% relative to motor rated speed	20.0	0.0	50.0	0x361c
B06.29	Overspeed detection time	0.0:Non-detection 0.1S～60.0S	5.0	0.0	60.0	0x361d
B06.32	CV reaches detection value	0.0%～600.0% 100.0% relative to motor rated speed	100.0	0.0	600.0	0x3620
B06.33	CV reaches detection lag value	0.0%～B06.32 100.0% relative to motor rated speed	3.0	0.0	B06.32	0x3621
B06.34	CV reaches the detection time	0.0:Non-detection 0.1s～600.0s	3.0	0.0	600.0	0x3622
B06.37	Outpue phase loss detection	0:Forbidden 1:Allow	1	0	1	0x3625
B06.48	Fan variable TEMP FUNC enable	0:Close 1:Enable	0	0	1	0x3630
B06.59	Stall detection time 1	0~5000ms	500	0	5000	0x363b
B06.60	Stall detection time 2	0~5000ms	500	0	5000	0x363c
B06.61	Vector stall detection COEF 2	0~100%	20	0	100	0x363d

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B06:Motor Limit and Protection						
B06.62	IM SVC control mode	0:Control Mode 1 1:Control Mode 2 2:Control Mode 3	0	0	2	0x363e
B06.63	PMSM SVC control mode	0:Control Mode 1 1:Control Mode 2 2:Control Mode 3	0	0	2	0x363f
B06.64	Vector Ctrl slip COMP COEF	50~200%	100	50	200	0x3640
B07:VF Control						
B07.01	VF curve selection	0:Line VF 1:Multipoint VF 2:Square V/F 3:1.5 power V/F	0	0	3	0x3701
B07.02	Multipoint VF curve:FRQ point 1	0.0～B07.04	2.00	0.00	B07.04	0x3702
B07.03	Multipoint VF curve:Volt point1	0.0～B07.05	20	0	B07.05	0x3703
B07.04	Multipoint VF curve:FRQ point 2	B07.02～B07.06	20.00	B07.02	B07.06	0x3704
B07.05	Multipoint VF curve:Volt point2	B07.03～B07.07	152	B07.03	B07.07	0x3705
B07.06	Multipoint VF curve:FRQ point 3	B07.04~D00.04	40.00	B07.04	D00.04	0x3706
B07.07	Multipoint VF curve:Volt point3	B07.05～380.0	304	B07.05	D00.02	0x3707
B07.10	Imax control enablation	0:Invalid 1:Valid	1	0	1	0x370a
B07.11	Imax controlling FM gain	0～100	30	0	100	0x370b
B07.12	Imax inhibition point	0～200	150	0	200	0x370c
B07.15	VF manual torque boost	0%～50%	1.0	0.0	50.0	0x370f
B07.16	VF torque lifting cut-off FRQ	0.00~50.00	50.00	0.00	100.00	0x3710
B07.17	VF slip compensation COEF	0.0%～300.0%	0.0	0.0	300.0	0x3711
B07.20	VF oscillation suppression mode	0:Invalid 1:Valid	1	0	1	0x3714
B07.21	VF oscillation suppression gain	0～500%	10	0	500	0x3715
B07.24	VF over-excitation gain	0～200.0	0.0	0.0	200.0	0x3718
B07.28	Vdc_max control switch	0:Forbidden 1:Enable	0	0	1	0x371c
B07.29	Vdc_ Max voltage margin	20.0~300.0V	125	115	150	0x371d
B07.34	Vdc_min control switch	0:Forbidden 1:Enable	0	0	1	0x3722
B07.35	Vdc_min of Volt gain COEF	65~100	85	65	100	0x3723

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
B08:Speed Regulator						
B08.02	Speed loop low speed Kp	0.00~20.00	10.0	0.0	100.0	0x3802
B08.03	Speed loop low speed Ti	1~65535ms	1.00	0.10	10.00	0x3803
B08.04	Speed loop high speed Kp	0.00~20.00	10.0	0.0	100.0	0x3804
B08.05	Speed loop high speed Ti	1~65535ms	2.00	0.10	10.00	0x3805
B08.11	Speed loop switch:low FRQ	0.00~50.00Hz	5.00	0.00	B08.12	0x380b
B08.12	Speed loop switch:high FRQ	0.00~50.00Hz	10.00	B08.11	40.00	0x380c
B08.25	Encoder FDBK speed filter time	0~1000ms	5	0	1000	0x3819
B08.26	EST speed loop filter time	0~65535	35	0	1000	0x381a
B09:Current Regulator						
B09.04	Proportional COEF of current	1%~1000%	100	1	1000	0x3904
B09.05	Intergral COEF of current	1%~1000%	100	1	1000	0x3905
B10:PMSM Ctrl Parameters						
B10.01	PMSM:pole position ID current	0~200	50	0	200	0x3a01
B10.03	Force initial POS test enable	0:Forbidden 1:Enable 1 2:Enable 2	0	0	2	0x3a03
B10.13	IF current amplitude	0~65535	60	0	65535	0x3a0d
B11:Motor Model and Others						
B11.51	Monitoring channel 1	0~65535	207	0	65535	0x3b33
B11.52	Monitoring channel 2	0~65535	209	0	65535	0x3b34
B11.53	Monitoring channel 3	0~65535	210	0	65535	0x3b35
B11.54	Monitoring channel 4	0~65535	211	0	65535	0x3b36
B11.56	Maximum electric frequency	0~65535	1200	0	65535	0x3b38
B11.57	Maximum generation frequency	0~65535	800	0	65535	0x3b39
B11.75	Heavy load speed limit enable	0~65535	0	0	65535	0x3b4b
B11.78	Reserved	0~65535	0	0	65535	0x3b4e
B11.93	Interactive data monitor SEL 0	0~511	0	0	511	0x3b5d
B11.94	Interactive data monitor SEL 1	0~511	0	0	511	0x3b5e
B11.95	Interactive data monitor SEL 2	0~511	0	0	511	0x3b5f
B11.96	Interactive data monitor SEL 3	0~511	0	0	511	0x3b60

8.3 C–communication parameters group

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
C00:Fieldbus Adapter A						
C00.00	Bus type for bus adapter	0:No 1:Modbus 2:PROFINET	0	0	2	0x4000
C00.01	Data handling after COMM fault	0:Keep data 1:Data clear(RESV)	0	0	1	0x4001
C00.02	PZD output 1	0:0 Others:Analog interconnection parameters	0	0	0	0x4002
C00.03	PZD output 2	0:0 Others:Analog interconnection parameters	0	0	0	0x4003
C00.04	PZD output 3	0:0 Others:Analog interconnection parameters	0	0	0	0x4004
C00.05	PZD output 4	0:0 Others:Analog interconnection parameters	0	0	0	0x4005
C00.06	PZD output 5	0:0 Others:Analog interconnection parameters	0	0	0	0x4006
C00.07	PZD output 6	0:0 Others:Analog interconnection parameters	0	0	0	0x4007
C00.08	PZD output 7	0:0 Others:Analog interconnection parameters	0	0	0	0x4008
C00.09	PZD output 8	0:0 Others:Analog interconnection parameters	0	0	0	0x4009
C00.10	PZD output 9	0:0 Others:Analog interconnection parameters	0	0	0	0x400a
C00.11	PZD output 10	0:0 Others:Analog interconnection parameters	0	0	0	0x400b
C00.12	PZD output 11	0:0 Others:Analog interconnection parameters	0	0	0	0x400c
C00.13	PZD output 12	0:0 Others:Analog interconnection parameters	0	0	0	0x400d
C00.14	PZD output 13	0:0 Others:Analog interconnection parameters	0	0	0	0x400e
C00.15	PZD output 14	0:0 Others:Analog interconnection parameters	0	0	0	0x400f

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
C00:Fieldbus Adapter A						
C00.16	PZD output 15	0:0 Others:Analog interconnection parameters	0	0	0	0x4010
C00.17	PZD output 16	0:0 Others:Analog interconnection parameters	0	0	0	0x4011
C00.18	PZD output 1 COMM base value	0~65535	0	0	65535	0x4012
C00.19	PZD output 2 COMM base value	0~65535	0	0	65535	0x4013
C00.20	PZD output 3 COMM base value	0~65535	0	0	65535	0x4014
C00.21	PZD output 4 COMM base value	0~65535	0	0	65535	0x4015
C00.22	PZD output 5 COMM base value	0~65535	0	0	65535	0x4016
C00.23	PZD output 6 COMM base value	0~65535	0	0	65535	0x4017
C00.24	PZD output 7 COMM base value	0~65535	0	0	65535	0x4018
C00.25	PZD output 8 COMM base value	0~65535	0	0	65535	0x4019
C00.26	PZD output 9 COMM base value	0~65535	0	0	65535	0x401a
C00.27	PZD output 10 COMM base value	0~65535	0	0	65535	0x401b
C00.28	PZD output 11 COMM base value	0~65535	0	0	65535	0x401c
C00.29	PZD output 12 COMM base value	0~65535	0	0	65535	0x401d
C00.30	PZD output 13 COMM base value	0~65535	0	0	65535	0x401e
C00.31	PZD output 14 COMM base value	0~65535	0	0	65535	0x401f
C00.32	PZD output 15 COMM base value	0~65535	0	0	65535	0x4020
C00.33	PZD output 16 COMM base value	0~65535	0	0	65535	0x4021
C00.34	PZD input 1 COMM base value	0~65535	0	0	65535	0x4022
C00.35	PZD input 2 COMM base value	0~65535	0	0	65535	0x4023

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
C00:Fieldbus Adapter A						
C00.36	PZD input 3 COMM base value	0~65535	0	0	65535	0x4024
C00.37	PZD input 4 COMM base value	0~65535	0	0	65535	0x4025
C00.38	PZD input 5 COMM base value	0~65535	0	0	65535	0x4026
C00.39	PZD input 6 COMM base value	0~65535	0	0	65535	0x4027
C00.40	PZD input 7 COMM base value	0~65535	0	0	65535	0x4028
C00.41	PZD input 8 COMM base value	0~65535	0	0	65535	0x4029
C00.42	PZD input 9 COMM base value	0~65535	0	0	65535	0x402a
C00.43	PZD input 10 COMM base value	0~65535	0	0	65535	0x402b
C00.44	PZD input 11 COMM base value	0~65535	0	0	65535	0x402c
C00.45	PZD input 12 COMM base value	0~65535	0	0	65535	0x402d
C00.46	PZD input 13 COMM base value	0~65535	0	0	65535	0x402e
C00.47	PZD input 14 COMM base value	0~65535	0	0	65535	0x402f
C00.48	PZD input 15 COMM base value	0~65535	0	0	65535	0x4030
C00.49	PZD input 16 COMM base value	0~65535	0	0	65535	0x4031
C00.50	PZD output 1 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4032
C00.51	PZD output 2 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4033
C00.52	PZD output 3 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4034
C00.53	PZD output 4 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4035
C00.54	PZD output 5 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4036
C00.55	PZD output 6 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4037
C00.56	PZD output 7 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4038
C00.57	PZD output 8 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4039
C00.58	PZD output 9 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403a

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
C00:Fieldbus Adapter A						
C00.59	PZD output 10 data presentation presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403b
C00.60	PZD output 11 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403c
C00.61	PZD output 12 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403d
C00.62	PZD output 13 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403e
C00.63	PZD output 14 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x403f
C00.64	PZD output 15 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4040
C00.65	PZD output 16 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4041
C00.66	PZD input 1 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4042
C00.67	PZD input 2 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4043
C00.68	PZD input 3 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4044
C00.69	PZD input 4 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4045
C00.70	PZD input 5 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4046
C00.71	PZD input 6 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4047
C00.72	PZD input 7 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4048
C00.73	PZD input 8 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4049
C00.74	PZD input 9 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404a
C00.75	PZD input 10 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404b
C00.76	PZD input 11 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404c
C00.77	PZD input 12 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404d
C00.78	PZD input 13 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404e
C00.79	PZD input 14 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x404f
C00.80	PZD input 15 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4050
C00.81	PZD input 16 data presentation	0~0xFFFF	0x00	0x00	0xFFFF	0x4051

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
C02:Modbus COMM SET						
C02.00	Modbus baud rate	0:1200bps 1:2400bps 2:4800bps 3:9600bps 4:19200bps 5:38400bps 6:57600bps 7:115200bps	7	0	7	0x4200
C02.01	Modbus data format	0:Even check(8-E-1) 1:Odd check(8-O-1) 2:No check(8-N-2) 3:No check(8-N-1)	3	0	3	0x4201
C02.02	Modbus local address	1~255	1	1	255	0x4202
C02.03	Modbus response delay	0~20ms	0	0	20	0x4203
C02.04	Modbus communication timeout	0:Invalid,0.1s~60.0s	0.0	0.0	60.0	0x4204
C02.05	Modbus communication base value	0~65535	1000	0	65535	0x4205
C02.06	Modbus COMM setpoint unit SEL	0:Percentage 1:Frequency	0	0	1	0x4206
C03:PROFINET COMM SET						
C03.00	Telegram type	0:The telegram is invalid 1:Standard telegram 1, PZD-2/2 2:Siemens telegram 352,PZD-6/6 3:Boneng Free telegram,PZD-4/4 4:Boneng Free telegram,PZD-8/8 5:Boneng Free telegram,PZD-12/12 6:Boneng Free telegram,PZD-16/16	0	0	6	0x4300
C03.01	Communication status	0:Communication not established 1:AR establishment 2:Process data communication 3:Burning 4:AR establishment error 5:Recovering communication parameters	0	0	5	0x4301

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
C03:PROFINET COMM SET						
C03.03	Diagnostic information is valid	0:Invalid 1:Valid	1	0	1	0x4303
C03.04	Software version number	0~65535	0	0	65535	0x4304
C03.05	Communication error code	0~65535	0	0	100	0x4305
C03.06	Communication Cycle	0~512	0	0	512	0x4306
C03.07	SendClock	0~512	0	0	512	0x4307
C03.08	RedRatio	0~512	0	0	512	0x4308
C03.10	Special function selection	0:Invalid 1:Burning mode 2:The communication parameters are restored to the factory	0	0	2	0x430a
C03.13	1 and 352 telegram mode	0:Standard mode 1:Free mode	0	0	1	0x430d
C03.17	Actual IP address 1	0~255	0	0	255	0x4311
C03.18	Actual IP address 2	0~255	0	0	255	0x4312
C03.19	Actual IP address 3	0~255	0	0	255	0x4313
C03.20	Actual IP address 4	0~255	0	0	255	0x4314
C03.21	Actual subnet mask 1	0~255	0	0	255	0x4315
C03.22	Actual subnet mask 2	0~255	0	0	255	0x4316
C03.23	Actual subnet mask 3	0~255	0	0	255	0x4317
C03.24	Actual subnet mask 4	0~255	0	0	255	0x4318
C03.25	Actual gateway address 1	0~255	0	0	255	0x4319
C03.26	Actual gateway address 2	0~255	0	0	255	0x431a
C03.27	Actual gateway address 3	0~255	0	0	255	0x431b
C03.28	Actual gateway address 4	0~255	0	0	255	0x431c
C03.29	Actual MAC address 1	0~65535	0x00	0x00	0xFFFF	0x431d
C03.30	Actual MAC address 2	0~65535	0x00	0x00	0xFFFF	0x431e
C03.31	Actual MAC address 3	0~65535	0x00	0x00	0xFFFF	0x431f
C03.36	1 and 352 speed base value	0~65535	16384	0	65535	0x4324

8.4 D–motor parameters group

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
D00:Motor 0 Basic PARAMs						
D00.00	Motor type seletion	0:Induction motor 1:Permanent magnet synchronous motor	0	0	1	0x5000
D00.01	Motor rated power	0.00~655.35kW	0.55	0.00	655.35	0x5001
D00.02	Motor rated voltage	0~1500V	380	0	1500	0x5002
D00.03	Motor rated current	0.00~655.35A	1.60	0.00	655.35	0x5003
D00.04	Motor rated frequency	0.0~600.00Hz	50.00	0.00	600.00	0x5004
D00.05	Motor rated speed	0~65535rpm	1330	0	65535	0x5005
D00.06	Maximum motor speed	0.0%~600.0% Rated speed	100.0	0.0	300.0	0x5006
D00.07	Minimum motor speed	0.0%~600.0% Rated speed	0.0	0.0	300.0	0x5007
D00.09	Motor polar logarithm	0:Automatic calculation 1 ~ 64:manual setting	2	1	64	0x5009
D00.16	Motor control mode	0:VF 1:SVC 2:FVC	0	0	2	0x5010
D01:Motor 0 Identified PARAMs						
D01.00	IM stator resistance	0.000~65.535ohm	14.477	0.000	65.535	0x5100
D01.01	IM rotor resistance	0.000~65.535ohm	8.469	0.000	65.535	0x5101
D01.02	IM leakage inductance	0.000~655.35mH	51.30	0.00	655.35	0x5102
D01.03	IM mutual inductance	0.00~6553.5mH	545.3	0.0	6553.5	0x5103
D01.04	IM no-load CUR	0.0~655.35A	1.28	0.00	655.35	0x5104
D01.10	PMSM stator resistance	0.000~65.535ohm	1.667	0.000	65.535	0x510a
D01.11	PMSM D-axis inductance	0.00~655.35mH	20.00	0.00	655.35	0x510b
D01.12	PMSM Q-axis inductance	0.00~655.35mH	20.00	0.00	655.35	0x510c
D01.13	PMSM back EMF coefficient	0.0~6553.5V	300	0	65535	0x510d
D02:Motor 0 Encoder PARAMs						
D02.00	Encoder type	0:Invalid type 1:Normal ABZ encoder	1	0	1	0x5200
D02.01	Input AB phase sequence	0:Forward 1:Reverse	0	0	1	0x5201
D02.05	Encoder RES(pulses/revolutions)	0~65535	1024	0	65535	0x5205
D02.13	Speed FDBK PG break test time	0~5000ms	500	0	5000	0x520d

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
D03:Motor 1 Basic PARAMs						
D03.00	SEL of motor types	0:Induction motor 1:Permanent magnet synchronous motor	0	0	1	0x5300
D03.01	Motor rated power	0.00~655.35kW	0.55	0.00	655.35	0x5301
D03.02	Motor rated voltage	0~1500V	380	0	1500	0x5302
D03.03	Motor rated CUR	0.0~6553.5A	1.60	0.00	655.35	0x5303
D03.04	Motor rated FREQ	0.0~600.00Hz	50.00	0.00	600.00	0x5304
D03.05	Motor rated speed	0~65535rpm	1330	0	65535	0x5305
D03.06	Motor max speed	0.0%~600.0% Rated speed	100.0	0.0	300.0	0x5306
D03.07	Motor min speed	0.0%~600.0% Rated speed	0.0	0.0	300.0	0x5307
D03.09	Motor pole pair	0:AUTO calculation 1~64:Manual SET	2	1	64	0x5309
D03.16	Motor control mode	0:VF 1:SVC 2:FVC	0	0	2	0x5310
D04:Motor 1 Identified PARAMs						
D04.00	IM stator resistance	0.000~65.535ohm	14.477	0.000	65.535	0x5400
D04.01	IM rotor resistance	0.000~65.535ohm	8.469	0.000	65.535	0x5401
D04.02	IM leakage inductance	0.000~655.35mH	51.30	0.00	655.35	0x5402
D04.03	IM mutual inductance	0.00~6553.5mH	545.3	0.0	6553.5	0x5403
D04.04	IM no-load CUR	0.0~655.35A	1.28	0.00	655.35	0x5404
D04.10	PMSM stator resistance	0.000~65.535ohm	1.667	0.000	65.535	0x540a
D04.11	PMSM D-axis inductance	0.00~655.35mH	20.00	0.00	655.35	0x540b
D04.12	PMSM Q-axis inductance	0.00~655.35mH	20.00	0.00	655.35	0x540c
D04.13	PMSM back EMF coefficient	0.0~6553.5V	300	0	65535	0x540d
D05:Motor 1 Encoder PARAMs						
D05.00	Encoder type	0:Invalid type 1:Normal ABZ encoder	1	0	1	0x5500
D05.01	Input AB phase sequence	0:Forward 1:Reverse	0	0	1	0x5501
D05.05	Encoder RES(pulses/revolutions)	0~65535	1024	0	65535	0x5505
D05.13	Speed FDBK PG break test time	0~5000ms	500	0	5000	0x550d

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
D06:Basic Parameters of Motor 2						
D06.00	Motor type seletion	0:Induction motor 1:Permanent magnet synchronous motor	0	0	1	0x5600
D06.01	Motor rated power	0.00~655.35kW	0.55	0.00	655.35	0x5601
D06.02	Motor rated voltage	0~1500V	380	0	1500	0x5602
D06.03	Motor rated current	0.0~6553.5A	1.60	0.00	655.35	0x5603
D06.04	Motor rated frequency	0.0~600.00Hz	50.00	0.00	600.00	0x5604
D06.05	Motor rated speed	0~65535rpm	1330	0	65535	0x5605
D06.06	Motor maximum speed	0.0%~600.0% Rated speed	100.0	0.0	300.0	0x5606
D06.07	Motor minimum speed	0.0%~600.0% Rated speed	0.0	0.0	300.0	0x5607
D06.09	Motor polar logarithm	0:AUTO calculation 1~64:Manual SET	2	1	64	0x5609
D06.16	Motor control mode	0:VF 1:SVC 2:FVC	0	0	2	0x5610
D07:Motor 2 Identified PARAMs						
D07.00	IM stator resistance	0.000~65.535ohm	14.477	0.000	65.535	0x5700
D07.01	IM rotor resistance	0.000~65.535ohm	8.469	0.000	65.535	0x5701
D07.02	IM leakage inductance	0.000~655.35mH	51.30	0.00	655.35	0x5702
D07.03	IM mutual inductance	0.00~6553.5mH	545.3	0.0	6553.5	0x5703
D07.04	IM no-load current	0.0~655.35A	1.28	0.00	655.35	0x5704
D07.10	PMSM stator resistance	0.000~65.535ohm	1.667	0.000	65.535	0x570a
D07.11	PMSM D-axis inductance	0.00~655.35mH	20.00	0.00	655.35	0x570b
D07.12	PMSM Q-axis inductance	0.00~655.35mH	20.00	0.00	655.35	0x570c
D07.13	PMSM back EMF coefficient	0.0~6553.5V	300	0	65535	0x570d
D08:Motor 2 Encoder Parameters						
D08.00	Encoder type	0:Invalid type 1:Normal ABZ encoder	1	0	1	0x5800
D08.01	Input AB phase sequence	0:Forward 1:Reverse	0	0	1	0x5801
D08.05	Encoder RES(pulses/revolutions)	0~65535	1024	0	65535	0x5805
D08.13	Speed FDBK PG break test time	0~5000ms	500	0	5000	0x580d

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
D09:Basic Parameters of Motor 3						
D09.00	Motor type seletion	0:Induction motor 1:Permanent magnet synchronous motor	0	0	1	0x5900
D09.01	Motor rated power	0.00~655.35kW	0.55	0.00	655.35	0x5901
D09.02	Motor rated voltage	0~1500V	380	0	1500	0x5902
D09.03	Motor rated current	0.0~655.35A	1.60	0.00	655.35	0x5903
D09.04	Motor rated frequency	0.0~600.00Hz	50.00	0.00	600.00	0x5904
D09.05	Motor rated speed	0~65535rpm	1330	0	65535	0x5905
D09.06	Motor maximum speed	0.0%~600.0% Rated speed	100.0	0.0	300.0	0x5906
D09.07	Motor minimum speed	0.0%~600.0% Rated speed	0.0	0.0	300.0	0x5907
D09.09	Motor polar logarithm	0:AUTO calculation 1~64:Manual SET	2	1	64	0x5909
D09.16	Motor control mode	0:VF 1:SVC 2:FVC	0	0	2	0x5910
D10:Motor 3 Identified PARAMs						
D10.00	IM stator resistance	0.000~65.535ohm	14.477	0.000	65.535	0x5a00
D10.01	IM rotor resistance	0.000~65.535ohm	8.469	0.000	65.535	0x5a01
D10.02	IM leakage inductance	0.000~655.35mH	51.30	0.00	655.35	0x5a02
D10.03	IM mutual inductance	0.00~6553.5mH	545.3	0.0	6553.5	0x5a03
D10.04	IM no-load CUR	0.0~655.35A	1.28	0.00	655.35	0x5a04
D10.10	PMSM stator resistance	0.000~65.535ohm	1.667	0.000	65.535	0x5a0a
D10.11	PMSM D-axis inductance	0.00~655.35mH	20.00	0.00	655.35	0x5a0b
D10.12	PMSM Q-axis inductance	0.00~655.35mH	20.00	0.00	655.35	0x5a0c
D10.13	PMSM back EMF coefficient	0.0~6553.5V	300	0	65535	0x5a0d
D11:Motor 3 Encoder Parameters						
D11.00	Encoder type	0:Invalid type 1:Ordinary ABZ encoder	1	0	1	0x5b00
D11.01	Input AB phase sequence	0:Forward 1:Reverse	0	0	1	0x5b01
D11.05	Encoder RES(pulses/revolutions)	0~65535	1024	0	65535	0x5b05
D11.13	Speed FDBK PG break test time	0~5000ms	500	0	5000	0x5b0d

8.5 E–Failsafe and recording

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E00:Fault Handling						
E00.00	External fault 1 source	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x6000
E00.01	External fault 2 source	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x6001
E00.02	External warning 1 source	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x6002
E00.03	External warning 1 source	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Other:Binary interconnection parameters	0	0	10	0x6003
E00.10	Automatic fault reset function	0:Invalid 1:Valid	0	0	1	0x600a
E00.11	Fault reset times reset time	0.0~3600.0s	180.0	0.0	3600.0	0x600b
E00.12	Fault reset interval	0.0~600.0s	30.0	0.0	600.0	0x600c
E00.13	Fault reset times	0~5	5	0	5	0x600d

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E00:Fault Handling						
E00.14	Non-resettable EXC code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x600e
E00.15	Non-resettable EXC code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x600f

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E00:Fault Handling						
E00.23	Restart FUNC after AUTO reset	0:Invalid 1:Valid	0	0	1	0x6017
E00.24	Abnormal SRC of restart allowed	0:Specified exception code allows restart 1:Specified exception code does not allow restart	0	0	1	0x6018
E00.25	Specified EXC code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6019
E00.26	Specified EXC code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x601a

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E00:Fault Handling						
E00.36	EXC level MOD EXC code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6024
E00.37	EXC level of EXC code 1	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:Warning 4:No exception handling	0	0	4	0x6025
E00.38	EXC level MOD EXC code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6026
E00.39	EXC level of EXC code 2	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:Warning 4:No exception handling	0	0	4	0x6027

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E01:Latest Faults and Records						
E01.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6100
E01.01	Fault code 1 subcode	1~16	0	0	16	0x6101
E01.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6102

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E01:Latest Faults and Records						
E01.03	Fault code 2 subcode	1~16	0	0	16	0x6103
E01.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x610c
E01.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x610d
E01.14	Fault bus voltage	0.0~800.0V	0.0	0.0	800.0	0x610e
E01.15	Fault output torque	-300.0%~300.0%	0.0	-300.0	300.0	0x610f
E01.18	Fault running time - hour	0~65535	0	0	65535	0x6112
E01.19	Fault running time - second	0~65535	0	0	65535	0x6113
E01.20	Fault power-on CRT - hour	0~65535	0	0	29	0x6114
E01.21	Fault power-on CRT - second	0~65535	0	0	300	0x6115
E01.22	Fault output voltage	0~65535V	0	0	65535	0x6116
E02:Previous Faults and Records						
E02.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6200
E02.01	Fault code 1 subcode	1~16	0	0	16	0x6201

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E02:Previous Faults and Records						
E02.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6202
E02.03	Fault code 2 subcode	1~16	0	0	16	0x6203
E02.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x620c
E02.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x620d
E02.14	Fault bus voltage	0.0~800.0V	0.0	0.0	800.0	0x620e
E02.15	Fault output torque	-300.0%~300.0%	0.0	-300.0	300.0	0x620f
E02.18	Fault running time - hour	0~65535	0	0	65535	0x6212
E02.19	Fault running time - second	0~65535	0	0	65535	0x6213
E02.20	Fault power-on CRT - hour	0~65535	0	0	29	0x6214
E02.21	Fault power-on CRT - second	0~65535	0	0	300	0x6215
E02.22	Fault output voltage	0~65535V	0	0	65535	0x6216

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E03:Pre-2 Faults and Records						
E03.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6300
E03.01	Fault code 1 subcode	1~16	0	0	16	0x6301
E03.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6302

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E03:Pre-2 Faults and Records						
E03.03	Fault code 2 subcode	1~16	0	0	16	0x6303
E03.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x630c
E03.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x630d
E03.14	Fault DC-link voltage	0.0~800.0V	0.0	0.0	800.0	0x630e
E03.15	Fault bus torque	-300.0%~300.0%	0.0	-300.0	300.0	0x630f
E03.18	Fault running time - hour	0~65535	0	0	65535	0x6312
E03.19	Fault running time - second	0~65535	0	0	65535	0x6313
E03.20	Fault power-on CRT - hour	0~65535	0	0	29	0x6314
E03.21	Fault power-on CRT - second	0~65535	0	0	300	0x6315
E03.22	Fault output voltage	0~65535V	0	0	65535	0x6316
E04:Pre-3 Faults and Records						
E04.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6400
E04.01	Fault code 1 subcode	1~16	0	0	16	0x6401

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E04:Pre-3 Faults and Records						
E04.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6402
E04.03	Fault code 2 subcode	1~16	0	0	16	0x6403
E04.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x640c
E04.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x640d
E04.14	Fault DC-link voltage	0.0~800.0V	0.0	0.0	800.0	0x640e
E04.15	Fault output torque	-300.0%~300.0%	0.0	-300.0	300.0	0x640f
E04.18	Fault running time - hour	0~65535	0	0	65535	0x6412
E04.19	Fault running time - second	0~65535	0	0	65535	0x6413
E04.20	Fault power-on CRT - hour	0~65535	0	0	29	0x6414
E04.21	Fault power-on CRT - second	0~65535	0	0	300	0x6415
E04.22	Fault output voltage	0~65535V	0	0	65535	0x6416

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E05:Pre-4 Faults and Records						
E05.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6500
E05.01	Fault code 1 subcode	1~16	0	0	16	0x6501
E05.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6502

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E05:Pre-4 Faults and Records						
E05.03	Fault code 2 subcode	1~16	0	0	16	0x6503
E05.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x650c
E05.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x650d
E05.14	Fault bus voltage	0.0~800.0V	0.0	0.0	800.0	0x650e
E05.15	Fault output torque	-300.0%~300.0%	0.0	-300.0	300.0	0x650f
E05.18	Fault running time - hour	0~65535	0	0	65535	0x6512
E05.19	Fault running time - second	0~65535	0	0	65535	0x6513
E05.20	Fault power-on CRT - hour	0~65535	0	0	29	0x6514
E05.21	Fault power-on CRT - second	0~65535	0	0	300	0x6515
E05.22	Fault output voltage	0~65535V	0	0	65535	0x6516
E06:Pre-5 Faults and Records						
E06.00	Fault code 1	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6600
E06.01	Fault code 1 subcode	1~16	0	0	16	0x6601

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E06:Pre-5 Faults and Records						
E06.02	Fault code 2	0:No fault 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6602
E06.03	Fault code 2 subcode	1~16	0	0	16	0x6603
E06.12	Fault speed	-300.00~300.00Hz	0.00	-300.00	300.00	0x660c
E06.13	Fault current	0.0~655.35A	0.00	0.00	655.35	0x660d
E06.14	Fault bus voltage	0.0~800.0V	0.0	0.0	800.0	0x660e
E06.15	Fault output torque	-300.0%~300.0%	0.0	-300.0	300.0	0x660f
E06.18	Fault running time - hour	0~65535	0	0	65535	0x6612
E06.19	Fault running time - second	0~65535	0	0	65535	0x6613
E06.20	Fault power-on CRT - hour	0~65535	0	0	29	0x6614
E06.21	Fault power-on CRT - second	0~65535	0	0	300	0x6615
E06.22	Fault output voltage	0~65535V	0	0	65535	0x6616

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
E07:Lastest Warning Code Record						
E07.00	Warning code 1	0:No warning 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6700
E07.01	Warning code 1 subcode	1~16	0	0	16	0x6701
E07.02	Warning code 2	0:No warning 1:OverCUR 2:DC overVolt 3:DC underVolt 4:Buffer RES overheat 5:Overload 6:Motor overload 7:Input phase loss 8:Output phase loss 9:Over-TEMP 10:ABN PWM wave EXC 11:CUR zero drift error 12:Short circuit to ground fault 13:Motor tuning fault 14:Encoder ABN 15:Vector stall alarm 16:FPGA read/write error 17:Drive power fault 18:Primary power fault 19:ABN COMM between CM and PM 20:PM-EEPROM fault 21:PM model-set error 22:Wave by wave	0	0	65535	0x6702
E07.03	Warning code 2 subcode	1~16	0	0	16	0x6703

8.6 F–Customized func and process

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F00:Logic Operation Module						
F00.00	Logic "AND" module A Input 1	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7000
F00.01	Logic "AND" module A Input 2	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7001
F00.02	Logic "AND" module A Input 3	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7002
F00.03	Logic "AND" module A Input 4	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7003
F00.05	Logic "AND" module B Input 1	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7005
F00.06	Logic "AND" module B Input 2	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7006
F00.07	Logic "AND" module B Input 3	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7007
F00.08	Logic "AND" module B Input 4	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7008
F00.10	Logic "AND" module C Input 1	1:Invalid Others:Binary interconnection parameters	0	0	0	0x700a
F00.11	Logic "AND" module C Input 2	1:Invalid Others:Binary interconnection parameters	0	0	0	0x700b
F00.12	Logic "AND" module C Input 3	1:Invalid Others:Binary interconnection parameters	0	0	0	0x700c
F00.13	Logic "AND" module C Input 4	1:Invalid Others:Binary interconnection parameters	0	0	0	0x700d
F00.15	Logic "AND" module D Input 1	1:Invalid Others:Binary interconnection parameters	0	0	0	0x700f
F00.16	Logic "AND" module D Input 2	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7010
F00.17	Logic "AND" module D Input 3	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7011
F00.18	Logic "AND" module D Input 4	1:Invalid Others:Binary interconnection parameters	0	0	0	0x7012

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F00:Logic Operation Module						
F00.20	Logic "NOT" module A Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7014
F00.22	Logic "NOT" module B Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7016
F00.24	Logic "NOT" module C Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7018
F00.26	Logic "NOT" module D Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x701a
F00.28	Logic "NOT" module E Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x701c
F00.30	Logic "NOT" module F Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x701e
F00.32	Logic "NOT" module G Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7020
F00.34	Logic "NOT" module H Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7022
F00.36	Logic "OR" module A Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7024
F00.37	Logic "OR" module A Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7025
F00.38	Logic "OR" module A Input 3	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7026
F00.39	Logic "OR" module A Input 4	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7027
F00.41	Logic "OR" module B Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7029
F00.42	Logic "OR" module B Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702a
F00.43	Logic "OR" module B Input 3	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702b
F00.44	Logic "OR" module B Input 4	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702c

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F00:Logic Operation Module						
F00.46	Logic "OR" module C Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702e
F00.47	Logic "OR" module C Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702f
F00.48	Logic "OR" module C Input 3	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7030
F00.49	Logic "OR" module C Input 4	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7031
F00.51	Logic "OR" module D Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7033
F00.52	Logic "OR" module D Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7034
F00.53	Logic "OR" module D Input 3	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7035
F00.54	Logic "OR" module D Input 4	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7036
F00.56	Logic "XOR" module A Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7038
F00.57	Logic "XOR" module A Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7039
F00.58	Logic "XOR" module A Input 3	0:Invalid Others:Binary interconnection parameters	0	0	0	0x703a
F00.59	Logic "XOR" module A Input 4	0:Invalid Others:Binary interconnection parameters	0	0	0	0x703b
F00.61	Logic "XOR" module B Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x703d
F00.62	Logic "XOR" module B Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x703e
F00.63	Logic "XOR" module B Input 3	0:Invalid Others:Binary interconnection parameters	0	0	0	0x703f
F00.64	Logic "XOR" module B Input 4	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7040
F00.66	Logic "XOR" module C Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7042

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F00:Logic Operation Module						
F00.67	Logic "XOR" module C Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7043
F00.68	Logic "XOR" module C Input 3	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7044
F00.69	Logic "XOR" module C Input 4	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7045
F00.71	Logic "XOR" module D Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7047
F00.72	Logic "XOR" module D Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7048
F00.73	Logic "XOR" module D Input 3	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7049
F00.74	Logic "XOR" module D Input 4	0:Invalid Others:Binary interconnection parameters	0	0	0	0x704a
F00.76	LDM A Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x704c
F00.77	LDM A FUNC selection	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x704d
F00.78	LDM A delay time	0~10000ms	0	0	10000	0x704e
F00.79	LDM B Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x704f
F00.80	LDM B FUNC selection	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x7050
F00.81	LDM B delay time	0~10000ms	0	0	10000	0x7051
F00.82	LDM C Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7052
F00.83	LDM C FUNC selection	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x7053
F00.84	LDM C delay time	0~10000ms	0	0	10000	0x7054
F00.85	LDM D Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7055
F00.86	LDM D FUNC selection	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x7056
F00.87	LDM D delay time	0~10000ms	0	0	10000	0x7057

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F01:Arthmetic Operation Module						
F01.00	ADD module A Input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x7100
F01.01	ADD module A Input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x7101
F01.02	ADD module A Input 3	0:0 Others:Analog interconnection parameters	0	0	0	0x7102
F01.03	ADD module A Input 4	0:0 Others:Analog interconnection parameters	0	0	0	0x7103
F01.05	ADD module B Input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x7105
F01.06	ADD module B Input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x7106
F01.07	ADD module B Input 3	0:0 Others:Analog interconnection parameters	0	0	0	0x7107
F01.08	ADD module B Input 4	0:0 Others:Analog interconnection parameters	0	0	0	0x7108
F01.10	ADD module C Input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x710a
F01.11	ADD module C Input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x710b
F01.12	ADD module C Input 3	0:0 Others:Analog interconnection parameters	0	0	0	0x710c
F01.13	ADD module C Input 4	0:0 Others:Analog interconnection parameters	0	0	0	0x710d
F01.15	SUB module A input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x710f
F01.16	SUB module A input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x7110
F01.18	SUB module B input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x7112
F01.19	SUB module B input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x7113

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F01:Arthmetic Operation Module						
F01.21	MUL module A Input 1	1:1 Others:Analog interconnection parameters	0	0	0	0x7115
F01.22	MUL module A Input 2	1:1 Others:Analog interconnection parameters	0	0	0	0x7116
F01.23	MUL module A Input 3	1:1 Others:Analog interconnection parameters	0	0	0	0x7117
F01.24	MUL module A Input 4	1:1 Others:Analog interconnection parameters	0	0	0	0x7118
F01.26	MUL module B Input 1	1:1 Others:Analog interconnection parameters	0	0	0	0x711a
F01.27	MUL module B Input 2	1:1 Others:Analog interconnection parameters	0	0	0	0x711b
F01.28	MUL module B Input 3	1:1 Others:Analog interconnection parameters	0	0	0	0x711c
F01.29	MUL module B Input 4	1:1 Others:Analog interconnection parameters	0	0	0	0x711d
F01.31	DIV module A divdor input	1:1 Others:Analog interconnection parameters	0	0	0	0x711f
F01.32	DIV module A dividend input	1:1 Others:Analog interconnection parameters	0	0	0	0x7120
F01.34	DIV module B divdor input	1:1 Others:Analog interconnection parameters	0	0	0	0x7122
F01.35	DIV module B dividend input	1:1 Others:Analog interconnection parameters	0	0	0	0x7123
F01.37	AVA module A Input	0:0 Others:Analog interconnection parameters	0	0	0	0x7125
F01.39	AVA module B Input	0:0 Others:Analog interconnection parameters	0	0	0	0x7127
F01.41	NCM module A Input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x7129
F01.42	NCM module A Input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x712a

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F01:Arthmetic Operation Module						
F01.44	NCM module B Input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x712c
F01.45	NCM module B Input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x712d
F01.47	LIM module A Input	0:0 Others:Analog interconnection parameters	0	0	0	0x712f
F01.48	LIM module A upper limit setect	0:0 Others:Analog interconnection parameters	0	0	0	0x7130
F01.49	LIM module A lower limit setect	0:0 Others:Analog interconnection parameters	0	0	0	0x7131
F01.51	LIM module B Input	0:0 Others:Analog interconnection parameters	0	0	0	0x7133
F01.52	LIM module B upper limit SEL	0:0 Others:Analog interconnection parameters	0	0	0	0x7134
F01.53	LIM module B lower limit SEL	0:0 Others:Analog interconnection parameters	0	0	0	0x7135
F01.55	FOLPF module A Input	0:0 Others:Analog interconnection parameters	0	0	0	0x7137
F01.56	FOLPF module A FLT	0~20000ms	0	0	20000	0x7138
F01.58	FOLPF module B Input	0:0 Others:Analog interconnection parameters	0	0	0	0x713a
F01.59	FOLPF module B FLT	0~20000ms	0	0	20000	0x713b
F01.61	Data selector A command SRC 1	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x713d

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F01:Arthmetic Operation Module						
F01.62	Data selector A command SRC 2	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x713e
F01.63	Data selector A data source 1	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x713f
F01.64	Data selector A data source 2	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7140
F01.65	Data selector A data source 3	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7141

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F01:Arthmetic Operation Module						
F01.66	Data selector A data source 4	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7142
F01.67	Data selector B command SRC 1	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x7143
F01.68	Data selector B command SRC 2	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x7144
F01.69	Data selector B data source 1	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7145

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F01:Arthmetic Operation Module						
F01.70	Data selector B data source 2	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7146
F01.71	Data selector B data source 3	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7147
F01.72	Data selector B data source 4	0:0 1:Multi-segment setting value 1 2:Reserved 3:Reserved 4:Reserved 5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8:Reserved 9:Reserved 10:Reserved Others:Analog interconnection parameters	0	0	10	0x7148
F01.73	Compare module C input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x7149
F01.74	Compare module C input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x714a
F01.76	Compare module D input 1	0:0 Others:Analog interconnection parameters	0	0	0	0x714c
F01.77	Compare module D input 2	0:0 Others:Analog interconnection parameters	0	0	0	0x714d

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F02:Word Bit Conversion Module						
F02.00	WTB FUNC A Input selection	0:0 Others:Analog interconnection parameters	0	0	0	0x7200
F02.02	WTB FUNC B Input selection	0:0 Others:Analog interconnection parameters	0	0	0	0x7202
F02.08	BTW FUNC A-Bit00 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7208
F02.09	BTW FUNC A-Bit01 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7209
F02.10	BTW FUNC A-Bit02 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720a
F02.11	BTW FUNC A-Bit03 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720b
F02.12	BTW FUNC A-Bit04 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720c
F02.13	BTW FUNC A-Bit05 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720d
F02.14	BTW FUNC A-Bit06 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720e
F02.15	BTW FUNC A-Bit07 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x720f
F02.16	BTW FUNC A-Bit08 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7210
F02.17	BTW FUNC A-Bit09 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7211
F02.18	BTW FUNC A-Bit10 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7212
F02.19	BTW FUNC A-Bit11 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7213
F02.20	BTW FUNC A-Bit12 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7214
F02.21	BTW FUNC A-Bit13 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7215

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F02:Word Bit Conversion Module						
F02.22	BTW FUNC A-Bit14 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7216
F02.23	BTW FUNC A-Bit15 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7217
F02.25	BTW FUNC B-Bit00 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7219
F02.26	BTW FUNC B-Bit01 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721a
F02.27	BTW FUNC B-Bit02 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721b
F02.28	BTW FUNC B-Bit03 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721c
F02.29	BTW FUNC B-Bit04 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721d
F02.30	BTW FUNC B-Bit05 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721e
F02.31	BTW FUNC B-Bit06 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721f
F02.32	BTW FUNC B-Bit07 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7220
F02.33	BTW FUNC B-Bit08 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7221
F02.34	BTW FUNC B-Bit09 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7222
F02.35	BTW FUNC B-Bit10 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7223
F02.36	BTW FUNC B-Bit11 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7224
F02.37	BTW FUNC B-Bit12 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7225
F02.38	BTW FUNC B-Bit13 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7226

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F02:Word Bit Conversion Module						
F02.22	BTW FUNC A-Bit14 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7216
F02.23	BTW FUNC A-Bit15 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7217
F02.25	BTW FUNC B-Bit00 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7219
F02.26	BTW FUNC B-Bit01 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721a
F02.27	BTW FUNC B-Bit02 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721b
F02.28	BTW FUNC B-Bit03 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721c
F02.29	BTW FUNC B-Bit04 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721d
F02.30	BTW FUNC B-Bit05 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721e
F02.31	BTW FUNC B-Bit06 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x721f
F02.32	BTW FUNC B-Bit07 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7220
F02.33	BTW FUNC B-Bit08 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7221
F02.34	BTW FUNC B-Bit09 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7222
F02.35	BTW FUNC B-Bit10 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7223
F02.36	BTW FUNC B-Bit11 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7224
F02.37	BTW FUNC B-Bit12 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7225
F02.38	BTW FUNC B-Bit13 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7226
F02.39	BTW FUNC B-Bit14 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7227

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F02:Word Bit Conversion Module						
F02.40	BTW FUNC B-Bit15 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7228
F02.42	BTW FUNC C-Bit00 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x722a
F02.43	BTW FUNC C-Bit01 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x722b
F02.44	BTW FUNC C-Bit02 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x722c
F02.45	BTW FUNC C-Bit03 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x722d
F02.46	BTW FUNC C-Bit04 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x722e
F02.47	BTW FUNC C-Bit05 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x722f
F02.48	BTW FUNC C-Bit06 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7230
F02.49	BTW FUNC C-Bit07 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7231
F02.50	BTW FUNC C-Bit08 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7232
F02.51	BTW FUNC C-Bit09 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7233
F02.52	BTW FUNC C-Bit10 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7234
F02.53	BTW FUNC C-Bit11 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7235
F02.54	BTW FUNC C-Bit12 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7236
F02.55	BTW FUNC C-Bit13 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7237
F02.56	BTW FUNC C-Bit14 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7238
F02.57	BTW FUNC C-Bit15 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7239

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F02:Word Bit Conversion Module						
F02.59	BTW FUNC D-Bit00 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x723b
F02.60	BTW FUNC D-Bit01 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x723c
F02.61	BTW FUNC D-Bit02 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x723d
F02.62	BTW FUNC D-Bit03 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x723e
F02.63	BTW FUNC D-Bit04 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x723f
F02.64	BTW FUNC D-Bit05 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7240
F02.65	BTW FUNC D-Bit06 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7241
F02.66	BTW FUNC D-Bit07 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7242
F02.67	BTW FUNC D-Bit08 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7243
F02.68	BTW FUNC D-Bit09 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7244
F02.69	BTW FUNC D-Bit10 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7245
F02.70	BTW FUNC D-Bit11 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7246
F02.71	BTW FUNC D-Bit12 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7247
F02.72	BTW FUNC D-Bit13 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7248
F02.73	BTW FUNC D-Bit14 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x7249
F02.74	BTW FUNC D-Bit15 selection	0:0 Others:Binary interconnection parameters	0	0	0	0x724a

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F04:Holding Brake Control						
F04.00	Holding brake FUNC select	0:No holding brake 1:Band brake without detection information 2:Band brake detection information	0	0	2	0x7400
F04.03	Brake open command source	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:Reserved 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	1102	0	10	0x7403
F04.04	Brake open comparison source	0:0 Others:Analog interconnection parameters	2311	0	0	0x7404
F04.05	Brake open comparison THR	0.0~200.0%	4.0	0.0	200.0	0x7405
F04.06	Brake opening delay time	0.00~10.00s	0.00	0.00	10.00	0x7406
F04.07	Brake closing speed THR	1.0~200.0%	4.0	1.0	200.0	0x7407
F04.08	Brake closing delay time	0.00~10.00s	0.50	0.00	10.00	0x7408
F04.10	Brake open feedback point SRC	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x740a
F04.12	Brake close comparison source	0:0 Others:Analog interconnection parameters	2311	0	0	0x740c
F04.13	Brake open CURR comparison THR	0.0~200.0%	50.0	1.0	200.0	0x740d
F04.16	Brake open mechanical act time	0.00~10.00S	0.50	0.00	10.00	0x7410
F04.17	Brake close mechanical act time	0.00~10.00S	0.50	0.00	10.00	0x7411
F04.18	Restart brake control	0:No brake action 1:Brake action	1	0	1	0x7412
F04.19	Restart waiting time	0.00~10.00s	0.50	0.00	10.00	0x7413

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F08:Lifting Control Module						
F08.50	Enable the smooth lifting FUNC	0:Invalid 1:Valid	0	0	1	0x7832
F08.51	Slack torque	0.0~100.0	25.0	0.0	100.0	0x7833
F08.52	Slack detection time	0.00~100.00	0.80	0.00	100.00	0x7834
F08.53	Added value of loading torque	0.0~100.0	10.0	0.0	100.0	0x7835
F08.54	Load detection time	0~10.00	0.10	0.00	10.00	0x7836
F08.55	Load torque fluctuation THR	0.0~100.0	10.0	0.0	100.0	0x7837
F08.56	Load stabilization time	0.00~100.00	0.50	0.00	100.00	0x7838
F08.57	Fast deceleration time	0.00~100.00	0.50	0.00	100.00	0x7839
F08.58	Tight rope to maintain speed	0.0~100.0	10.0	0.0	100.0	0x783a
F08.59	Loading torque change rate	0.0~100.0	2.0	0.0	100.0	0x783b
F08.60	Source SEL of ant speed FUNC	0:Invalid 1:Reserved 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:Reserved 9:Reserved 10:Reserved Others:Binary interconnection parameters	0	0	10	0x783c
F08.61	Smooth swing FUNC enable	0:Invalid 1:Valid	0	0	1	0x783d
F08.62	Swing arm length	32.0~100.0m	60.0	32.0	100.0	0x783e
F08.63	Acceleration gain	0.0~100.0	45.0	0.0	100.0	0x783f
F08.64	Deceleration gain	0.0~100.0	45.0	0.0	100.0	0x7840

8.7 P–Interconnection parameter

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
F00:Logic Operation Module						
F00.20	Logic "NOT" module A Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7014
F00.22	Logic "NOT" module B Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7016
F00.24	Logic "NOT" module C Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7018
F00.26	Logic "NOT" module D Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x701a
F00.28	Logic "NOT" module E Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x701c
F00.30	Logic "NOT" module F Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x701e
F00.32	Logic "NOT" module G Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7020
F00.34	Logic "NOT" module H Input	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7022
F00.36	Logic "OR" module A Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7024
F00.37	Logic "OR" module A Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7025
F00.38	Logic "OR" module A Input 3	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7026
F00.39	Logic "OR" module A Input 4	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7027
F00.41	Logic "OR" module B Input 1	0:Invalid Others:Binary interconnection parameters	0	0	0	0x7029
F00.42	Logic "OR" module B Input 2	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702a
F00.43	Logic "OR" module B Input 3	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702b
F00.44	Logic "OR" module B Input 4	0:Invalid Others:Binary interconnection parameters	0	0	0	0x702c

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P00:Hardware Status(Binary connect)						
P00.00	Logic 0	0	0	0	0	0xe000
P00.01	Logic 1	1	1	1	1	0xe001
P00.02	Multifunctional DI0	0~1	0	0	1	0xe002
P00.03	Multifunctional DI1	0~1	0	0	1	0xe003
P00.04	Multifunctional DI2	0~1	0	0	1	0xe004
P00.05	Multifunctional DI3	0~1	0	0	1	0xe005
P00.06	Multifunctional DI4	0~1	0	0	1	0xe006
P00.07	Multifunctional DI5	0~1	0	0	1	0xe007
P00.23	Digital input DI0 inversion	0~1	0	0	1	0xe017
P00.24	Digital input DI1 inversion	0~1	0	0	1	0xe018
P00.25	Digital input DI2 inversion	0~1	0	0	1	0xe019
P00.26	Digital input DI3 inversion	0~1	0	0	1	0xe01a
P00.27	Digital input DI4 inversion	0~1	0	0	1	0xe01b
P00.28	Digital input DI5 inversion	0~1	0	0	1	0xe01c
P00.50	Multi-FUNC digital output DO0	0~1	0	0	1	0xe032
P00.51	Multi-FUNC digital output DO1	0~1	0	0	1	0xe033
P00.57	Digital output DO0 inversion	0~1	0	0	1	0xe039
P00.58	Digital output DO1 inversion	0~1	0	0	1	0xe03a
P01:System Ctrl Words and State(Binary connect)						
P01.00	Ready for startup	0~1	0	0	1	0xe100
P01.01	Ready for run	0~1	0	0	1	0xe101
P01.02	Run	0~1	0	0	1	0xe102
P01.03	Fault activation	0~1	0	0	1	0xe103
P01.04	OFF2 invalid	0~1	0	0	1	0xe104
P01.05	OFF3 invalid	0~1	0	0	1	0xe105
P01.06	Boot block	0~1	0	0	1	0xe106
P01.07	Alarm activate	0~1	0	0	1	0xe107
P01.08	Speed output bias too large	0~1	0	0	1	0xe108
P01.09	Comparison value reached	0~1	0	0	1	0xe109
P01.10	Torque/current reach limit	0~1	0	0	1	0xe10a
P01.11	Holding brake open	0~1	0	0	1	0xe10b
P01.12	Positive speed	0~1	0	0	1	0xe10c
P01.13	IGBT operation	0~1	0	0	1	0xe10d
P01.14	Jog operation valid	0~1	0	0	1	0xe10e
P01.15	Pre-excitation start	0~1	0	0	1	0xe10f
P01.16	Open DC brake	0~1	0	0	1	0xe110
P01.18	Torque control in effect	0~1	0	0	1	0xe112
P01.20	Boot is not ready	0~1	0	0	1	0xe114
P01.21	Running is not ready	0~1	0	0	1	0xe115

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P01:System Ctrl Words and State(Binary connect)						
P01.22	Not run	0~1	0	0	1	0xe116
P01.23	No fault	0~1	0	0	1	0xe117
P01.24	OFF2 in effect	0~1	0	0	1	0xe118
P01.25	OFF3 in effect	0~1	0	0	1	0xe119
P01.26	Boot is not blocked	0~1	0	0	1	0xe11a
P01.27	No alarm/Light fault	0~1	0	0	1	0xe11b
P01.28	The speed output bias is normal	0~1	0	0	1	0xe11c
P01.29	Comparison value not reach	0~1	0	0	1	0xe11d
P01.30	Torque/current not reach limit	0~1	0	0	1	0xe11e
P01.31	Holding brake close	0~1	0	0	1	0xe11f
P01.32	Negative speed	0~1	0	0	1	0xe120
P01.33	IGBT blockade	0~1	0	0	1	0xe121
P01.34	Inching not in effect	0~1	0	0	1	0xe122
P01.35	Preexcitation complete	0~1	0	0	1	0xe123
P01.36	DC brake end	0~1	0	0	1	0xe124
P01.41	RFG output inhibit	0~1	0	0	1	0xe129
P01.42	RFG pause	0~1	0	0	1	0xe12a
P01.43	RFG input inhibit	0~1	0	0	1	0xe12b
P01.44	RFG acceleration	0~1	0	0	1	0xe12c
P01.45	RFG deceleration	0~1	0	0	1	0xe12d
P01.46	RFG constant speed	0~1	0	0	1	0xe12e
P01.48	Vdc_min activation	0~1	0	0	1	0xe130
P01.57	Motor overspeed	0~1	0	0	1	0xe139
P01.58	Holding brake opened	0~1	0	0	1	0xe13a
P01.59	Holding brake closed	0~1	0	0	1	0xe13b
P01.60	Holding brake can not be opened	0~1	0	0	1	0xe13c
P01.61	Holding brake can not be closed	0~1	0	0	1	0xe13d
P01.62	Motor pre-overload state	0~1	0	0	1	0xe13e
P01.63	Zero speed given operation	0~1	0	0	1	0xe13f
P01.64	DC bus live mark	0~1	0	0	1	0xe140
P01.65	Motor speed is zero	0~1	0	0	1	0xe141
P01.73	Motor over TEMP protection mark	0~1	0	0	1	0xe149
P01.74	Motor over TEMP warning sign	0~1	0	0	1	0xe14a
P01.75	Motor selection bit0	0~1	0	0	1	0xe14b

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P01:System Ctrl Words and State(Binary connect)						
P01.76	Motor selection bit1	0~1	0	0	1	0xe14c
P01.77	RFG select bit0	0~1	0	0	1	0xe14d
P01.78	RFG select bit1	0~1	0	0	1	0xe14e
P01.79	Multi segment given value SEL 1	0~1	0	0	1	0xe14f
P01.80	Multi segment given value SEL 2	0~1	0	0	1	0xe150
P01.81	Multi segment given value SEL 3	0~1	0	0	1	0xe151
P01.82	Multi segment given value SEL 4	0~1	0	0	1	0xe152
P01.85	RFG operation flag	0~1	0	0	0	0xe155
P02:FBA and Fault Flag(Binary connect)						
P02.00	Bus adapter A.PZD1.0	0~1	0	0	1	0xe200
P02.01	Bus adapter A.PZD1.1	0~1	0	0	1	0xe201
P02.02	Bus adapter A.PZD1.2	0~1	0	0	1	0xe202
P02.03	Bus adapter A.PZD1.3	0~1	0	0	1	0xe203
P02.04	Bus adapter A.PZD1.4	0~1	0	0	1	0xe204
P02.05	Bus adapter A.PZD1.5	0~1	0	0	1	0xe205
P02.06	Bus adapter A.PZD1.6	0~1	0	0	1	0xe206
P02.07	Bus adapter A.PZD1.7	0~1	0	0	1	0xe207
P02.08	Bus adapter A.PZD1.8	0~1	0	0	1	0xe208
P02.09	Bus adapter A.PZD1.9	0~1	0	0	1	0xe209
P02.10	Bus adapter A.PZD1.10	0~1	0	0	1	0xe20a
P02.11	Bus adapter A.PZD1.11	0~1	0	0	1	0xe20b
P02.12	Bus adapter A.PZD1.12	0~1	0	0	1	0xe20c
P02.13	Bus adapter A.PZD1.13	0~1	0	0	1	0xe20d
P02.14	Bus adapter A.PZD1.14	0~1	0	0	1	0xe20e
P02.15	Bus adapter A.PZD1.15	0~1	0	0	1	0xe20f
P02.32	Modbus COMM start-stop command	0~1	0	0	1	0xe220
P02.33	Modbus COMM inching start stop	0~1	0	0	1	0xe221
P02.34	Modbus COMM free parking	0~1	0	0	1	0xe222
P02.35	Modbus COMM fault reset	0~1	0	0	1	0xe223
P02.36	Modbus COMM given speed reverse	0~1	0	0	1	0xe224

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P03:Logic arithmetic module(Binary connect)						
P03.00	Logic "AND" module A output	0~1	0	0	1	0xe300
P03.01	Logic "AND" module B output	0~1	0	0	1	0xe301
P03.02	Logic "AND" module C output	0~1	0	0	1	0xe302
P03.03	Logic "AND" module D output	0~1	0	0	1	0xe303
P03.04	Logic "NOT" module A output	0~1	0	0	1	0xe304
P03.05	Logic "NOT" module B output	0~1	0	0	1	0xe305
P03.06	Logic "NOT" module C output	0~1	0	0	1	0xe306
P03.07	Logic "NOT" module D output	0~1	0	0	1	0xe307
P03.08	Logic "NOT" module E output	0~1	0	0	1	0xe308
P03.09	Logic "NOT" module F output	0~1	0	0	1	0xe309
P03.10	Logic "NOT" module G output	0~1	0	0	1	0xe30a
P03.11	Logic "NOT" module H output	0~1	0	0	1	0xe30b
P03.12	Logic "OR" module A output	0~1	0	0	1	0xe30c
P03.13	Logic "OR" module B output	0~1	0	0	1	0xe30d
P03.14	Logic "OR" module C output	0~1	0	0	1	0xe30e
P03.15	Logic "OR" module D output	0~1	0	0	1	0xe30f
P03.16	Logic "XOR" module A output	0~1	0	0	1	0xe310
P03.17	Logic "XOR" module B output	0~1	0	0	1	0xe311
P03.18	Logic "XOR" module C output	0~1	0	0	1	0xe312
P03.19	Logic "XOR" module D output	0~1	0	0	1	0xe313
P03.20	Logic delay module A output	0~1	0	0	1	0xe314
P03.21	Logic delay module B output	0~1	0	0	1	0xe315
P03.22	Logic delay module C output	0~1	0	0	1	0xe316
P03.23	Logic delay module D output	0~1	0	0	1	0xe317
P03.24	Comparison module A larger flag	0~1	0	0	1	0xe318
P03.25	Comparison module A equals flag	0~1	0	0	1	0xe319
P03.26	Comparison module A less flag	0~1	0	0	1	0xe31a
P03.27	Comparison module B larger flag	0~1	0	0	1	0xe31b
P03.28	Comparison module B equals flag	0~1	0	0	1	0xe31c

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P03:Logic arithmetic module(Binary connect)						
P03.29	Comparison module B less flag	0~1	0	0	1	0xe31d
P03.30	Division A dividend equals 0	0~1	0	0	1	0xe31e
P03.31	Division B dividend equals 0	0~1	0	0	1	0xe31f
P03.32	Symbol of ABS module A input	0~1	0	0	1	0xe320
P03.33	Symbol of ABS module B input	0~1	0	0	1	0xe321
P03.34	Overflow flag:absolute value A	0~1	0	0	1	0xe322
P03.35	Overflow flag:absolute value B	0~1	0	0	1	0xe323
P03.36	Overflow flag:addition A	0~1	0	0	1	0xe324
P03.37	Overflow flag:addition B	0~1	0	0	1	0xe325
P03.38	Overflow flag:addition C	0~1	0	0	1	0xe326
P03.39	Overflow flag:substraction A	0~1	0	0	1	0xe327
P03.40	Overflow flag:substraction B	0~1	0	0	1	0xe328
P03.41	Overflow flag:multiplicatio n A	0~1	0	0	1	0xe329
P03.42	Overflow flag:multiplicatio n B	0~1	0	0	1	0xe32a
P03.43	Overflow flag:divide module A	0~1	0	0	1	0xe32b
P03.44	Overflow flag:divide module B	0~1	0	0	0	0xe32c
P03.47	Comparison module C larger flag	0~1	0	0	0	0xe32f
P03.48	Comparison module C equals flag	0~1	0	0	0	0xe330
P03.49	Comparison module C less flag	0~1	0	0	0	0xe331
P03.50	Comparison module D larger flag	0~1	0	0	1	0xe332
P03.51	Comparison module D equals flag	0~1	0	0	1	0xe333
P03.52	Comparison module D less flag	0~1	0	0	1	0xe334

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P04:Word Bit Conversion Module(Binary connect)						
P04.00	WTB function 1 output bit0	0~1	0	0	1	0xe400
P04.01	WTB function 1 output bit1	0~1	0	0	1	0xe401
P04.02	WTB function 1 output bit2	0~1	0	0	1	0xe402
P04.03	WTB function 1 output bit3	0~1	0	0	1	0xe403
P04.04	WTB function 1 output bit4	0~1	0	0	1	0xe404
P04.05	WTB function 1 output bit5	0~1	0	0	1	0xe405
P04.06	WTB function 1 output bit6	0~1	0	0	1	0xe406
P04.07	WTB function 1 output bit7	0~1	0	0	1	0xe407
P04.08	WTB function 1 output bit8	0~1	0	0	1	0xe408
P04.09	WTB function 1 output bit9	0~1	0	0	1	0xe409
P04.10	WTB function 1 output bit10	0~1	0	0	1	0xe40a
P04.11	WTB function 1 output bit11	0~1	0	0	1	0xe40b
P04.12	WTB function 1 output bit12	0~1	0	0	1	0xe40c
P04.13	WTB function 1 output bit13	0~1	0	0	1	0xe40d
P04.14	WTB function 1 output bit14	0~1	0	0	1	0xe40e
P04.15	WTB function 1 output bit15	0~1	0	0	1	0xe40f
P04.16	WTB function 2 output bit0	0~1	0	0	1	0xe410
P04.17	WTB function 2 output bit1	0~1	0	0	1	0xe411
P04.18	WTB function 2 output bit2	0~1	0	0	1	0xe412
P04.19	WTB function 2 output bit3	0~1	0	0	1	0xe413
P04.20	WTB function 2 output bit4	0~1	0	0	1	0xe414
P04.21	WTB function 2 output bit5	0~1	0	0	1	0xe415
P04.22	WTB function 2 output bit6	0~1	0	0	1	0xe416
P04.23	WTB function 2 output bit7	0~1	0	0	1	0xe417
P04.24	WTB function 2 output bit8	0~1	0	0	1	0xe418
P04.25	WTB function 2 output bit9	0~1	0	0	1	0xe419
P04.26	WTB function 2 output bit10	0~1	0	0	1	0xe41a
P04.27	WTB function 2 output bit11	0~1	0	0	1	0xe41b
P04.28	WTB function 2 output bit12	0~1	0	0	1	0xe41c
P04.29	WTB function 2 output bit13	0~1	0	0	1	0xe41d
P04.30	WTB function 2 output bit14	0~1	0	0	1	0xe41e
P04.31	WTB function 2 output bit15	0~1	0	0	1	0xe41f

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P06:State and Peripheral(Analog connect)						
P06.00	Current state machine	0~65535	0	-32768	32767	0xe600
P06.01	Target frequency	0~65535	0	-32768	32767	0xe601
P06.02	Given frequency	0~65535	0	-32768	32767	0xe602
P06.03	Output frequency	0~65535	0	-32768	32767	0xe603
P06.04	Target speed	0~65535	0	-32768	32767	0xe604
P06.05	Given speed	0~65535	0	-32768	32767	0xe605
P06.06	Motor speed	0~65535	0	-32768	32767	0xe606
P06.07	Output voltage	0~65535	0	-32768	32767	0xe607
P06.08	Output current	0~65535	0	-32768	32767	0xe608
P06.09	Output power	0~65535	0	-32768	32767	0xe609
P06.10	Given torque	0~65535	0	-32768	32767	0xe60a
P06.11	Output torque	0~65535	0	-32768	32767	0xe60b
P06.14	DC-link voltage	0~65535	0	-32768	32767	0xe60e
P06.15	Raduiator temperature	0~65535	0	-32768	32767	0xe60f
P06.16	Encoder feedback frequency	0~65535	0	-32768	32767	0xe610
P06.17	VF separation voltage give	0~65535	0	-32768	32767	0xe611
P06.19	Panel given value	0~65535	0	32768	32767	0xe613
P06.20	PC given value	0~65535	0	-32768	32767	0xe614
P06.36	Physical state of the DI input	0~0xFFFF	0	-32768	32767	0xe624
P07:Communication(Analog connect)						
P07.00	Bus adapter A.PZD1	0~65535	0	0	65535	0xe700
P07.01	Bus adapter A.PZD2	0~65535	0	0	65535	0xe701
P07.02	Bus adapter A.PZD3	0~65535	0	0	65535	0xe702
P07.03	Bus adapter A.PZD4	0~65535	0	0	65535	0xe703
P07.04	Bus adapter A.PZD5	0~65535	0	0	65535	0xe704
P07.05	Bus adapter A.PZD6	0~65535	0	0	65535	0xe705
P07.06	Bus adapter A.PZD7	0~65535	0	0	65535	0xe706
P07.07	Bus adapter A.PZD8	0~65535	0	0	65535	0xe707
P07.08	Bus adapter A.PZD9	0~65535	0	0	65535	0xe708
P07.09	Bus adapter A.PZD10	0~65535	0	0	65535	0xe709
P07.10	Bus adapter A.PZD11	0~65535	0	0	65535	0xe70a
P07.11	Bus adapter A.PZD12	0~65535	0	0	65535	0xe70b
P07.12	Bus adapter A.PZD13	0~65535	0	0	65535	0xe70c
P07.13	Bus adapter A.PZD14	0~65535	0	0	65535	0xe70d
P07.14	Bus adapter A.PZD15	0~65535	0	0	65535	0xe70e
P07.15	Bus adapter A.PZD16	0~65535	0	0	65535	0xe70f
P07.32	Modbus control command	0	0	0	65535	0xe720
P07.33	Modbus COMM setting value 1	0	0	-32768	32767	0xe721
P07.34	Modbus COMM setting value 1	0	0	-32768	32767	0xe722
P07.35	Modbus COMM setting value 1 P.U	0	0	-32768	32767	0xe723
P07.36	Modbus COMM setting value 1 P.U	0	0	-32768	32767	0xe724

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P08:Word Bit Conversion Module(Analog connect)						
P08.00	ADD module A output	0~65535	0	-32768	32767	0xe800
P08.01	ADD module B output	0~65535	0	-32768	32767	0xe801
P08.02	ADD module C output	0~65535	0	-32768	32767	0xe802
P08.04	SUB module A output	0~65535	0	-32768	32767	0xe804
P08.05	SUB module B output	0~65535	0	-32768	32767	0xe805
P08.08	MUL module A output	0~65535	0	-32768	32767	0xe808
P08.09	MUL module B output	0~65535	0	-32768	32767	0xe809
P08.12	DIV module A output	0~65535	0	-32768	32767	0xe80c
P08.14	DIV module A remainder	0~65535	0	-32768	32767	0xe80e
P08.15	DIV module B output	0~65535	0	-32768	32767	0xe80f
P08.17	DIV module B remainder	0~65535	0	-32768	32767	0xe811
P08.24	AVA module A output	0~65535	0	-32768	32767	0xe818
P08.25	AVA module B output	0~65535	0	-32768	32767	0xe819
P08.28	LIM moudle A output	0~65535	0	-32768	32767	0xe81c
P08.29	LIM moudle B output	0~65535	0	-32768	32767	0xe81d
P08.32	FOLPF module A output	0~65535	0	-32768	32767	0xe820
P08.33	FOLPF module B output	0~65535	0	-32768	32767	0xe821
P08.36	BTW function A output	0~65535	0	-32768	32767	0xe824
P08.37	BTW function A output	0~65535	0	-32768	32767	0xe825
P08.38	BTW function A output	0~65535	0	-32768	32767	0xe826
P08.39	BTW function A output	0~65535	0	-32768	32767	0xe827
P08.41	Data selector A output	0~65535	0	-32768	32767	0xe829
P08.42	Data selector B output	0~65535	0	-32768	32767	0xe82a
P10:PM Internal Variables(Analog connect)						
P10.00	Given current of Axis M	0~65535	0	-32768	32767	0xea00
P10.01	Feedback current of Axis M	0~65535	0	-32768	32767	0xea01
P10.02	Given current of Axis T	0~65535	0	-32768	32767	0xea02
P10.03	Feedback current of Axis T	0~65535	0	-32768	32767	0xea03
P10.04	Given frequency	0~65535	0	-32768	32767	0xea04
P10.05	Feedback frequency	0~65535	0	-32768	32767	0xea05
P10.06	Synchronous frequency	0~65535	0	-32768	32767	0xea06
P10.07	Encoder frequency	0~65535	0	-32768	32767	0xea07
P10.10	Given voltage of Axis M	0~65535	0	-32768	32767	0xea0a

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P10:PM Internal Variables(Analog connect)						
P10.11	Given voltage of Axis T	0~65535	0	-32768	32767	0xea0b
P10.19	CRC check count	0~65535	0	-32768	32767	0xea13
P10.26	Monitoring channel 1	0~65535	0	-32768	32767	0xea1a
P10.27	Monitoring channel 2	0~65535	0	-32768	32767	0xea1b
P10.28	Monitoring channel 3	0~65535	0	-32768	32767	0xea1c
P10.29	Monitoring channel 4	0~65535	0	-32768	32767	0xea1d
P10.32	State machine	0~65535	0	-32768	32767	0xea20
P10.33	U phase current	0~65535	0	-32768	32767	0xea21
P10.34	V phase current	0~65535	0	-32768	32767	0xea22
P11:CM Internal Variables(Analog connect)						
P11.00	Fixed value 0%	0~65535	0	-32768	32767	0xeb00
P11.01	Fixed value 100%	0~65535	0	-32768	32767	0xeb01
P11.02	Fixed value 200%	0~65535	0	-32768	32767	0xeb02
P11.03	Fixed value 400%	0~65535	0	-32768	32767	0xeb03
P11.04	Fixed value 600%	0~65535	0	-32768	32767	0xeb04
P11.05	Fixed value -100%	0~65535	0	-32768	32767	0xeb05
P11.06	Fixed value -200%	0~65535	0	-32768	32767	0xeb06
P11.07	Fixed value -400%	0~65535	0	-32768	32767	0xeb07
P11.08	Fixed value -600%	0~65535	0	-32768	32767	0xeb08
P11.09	CM interactive data monitor 0	0~65535	0	0	65535	0xeb09
P11.10	CM interactive data monitor 1	0~65535	0	0	65535	0xeb0a
P11.11	CM interactive data monitor 2	0~65535	0	0	65535	0xeb0b
P11.12	CM interactive data monitor 3	0~65535	0	0	65535	0xeb0c
P11.13	CM and PM handshake monitor	0~65535	0	0	65535	0xeb0d
P11.14	Status monitor:steady raise	0~65535	0	0	65535	0xeb0e
P11.18	FPGA receive error countor	0~65535	0	0	65535	0xeb12
P11.19	FPGA send non-response counter	0~65535	0	0	65535	0xeb13
P11.20	Current state machine	0~65535	0	-32768	32767	0xeb14
P11.21	State machine:the first 1 times	0~65535	0	-32768	32767	0xeb15
P11.22	State machine:the first 2 times	0~65535	0	-32768	32767	0xeb16
P11.23	State machine:the first 3 times	0~65535	0	-32768	32767	0xeb17
P11.24	State machine:the first 4 times	0~65535	0	-32768	32767	0xeb18

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P11:CM Internal Variables(Analog connect)						
P11.25	State machine:the first 5 times	0~65535	0	-32768	32767	0xeb19
P11.26	State machine:the first 6 times	0~65535	0	-32768	32767	0xeb1a
P11.27	State machine:the first 7 times	0~65535	0	-32768	32767	0xeb1b
P11.28	State machine:the first 8 times	0~65535	0	-32768	32767	0xeb1c
P11.29	State machine:the first 9 times	0~65535	0	-32768	32767	0xeb1d
P11.32	Power-on time - hour	0~65535	0	0	0	0xeb20
P11.33	Power-on time - second	0~65535	0	0	0	0xeb21
P11.34	Running time - hour	0~65535	0	0	0	0xeb22
P11.35	Running time - second	0~65535	0	0	0	0xeb23
P11.36	Power-on CRT - hour	0~65535	0	0	0	0xeb24
P11.37	Power-on CRT - second	0~65535	0	0	0	0xeb25
P11.38	Abnormal start monitoring value	0~65535	0	0	65535	0xeb26
P11.48	CM storage model	0~65535	0	0	0	0xeb30
P11.49	System running mode	0~65535	0	0	65535	0xeb31
P11.50	CM monitor 0(OSC free memory)	0~65535	0	0	65535	0xeb32
P11.51	CM monitor 1(OSC overflow)	0~65535	0	0	65535	0xeb33
P11.52	CM monitor 2(sine wave)	0~65535	0	0	65535	0xeb34
P11.53	CM monitor 3(triangle wave)	0~65535	0	0	65535	0xeb35
P11.54	CM monitor 4(stright line)	0~65535	0	0	65535	0xeb36
P11.55	CM monitor 5(KB error counter)	0~65535	0	0	65535	0xeb37
P11.56	CM monitor 6(MB error counter)	0~65535	0	0	65535	0xeb38
P11.57	CM monitor 7(EPM wrong adress)	0~65535	0	0	65535	0xeb39
P11.58	CM monitor 8(EPM wrong value)	0~65535	0	0	65535	0xeb3a
P11.60	CM program execution time	0~65535	0	0	65535	0xeb3c
P11.61	CM program execution cycle	0~65535	0	0	65535	0xeb3d
P11.62	CM program max time	0~65535	0	0	65535	0xeb3e
P11.63	CM program max time	0~65535	0	0	65535	0xeb3f

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P12:System Control and State(Analog connect)						
P12.00	Current state machine	0~65535	0	0	65535	0xec00
P12.01	Current motor	0~65535	0	0	65535	0xec01
P12.02	Current RFG	0~65535	0	0	65535	0xec02
P12.03	Current fault	0~65535	0	0	65535	0xec03
P12.04	Current warning	0~65535	0	0	65535	0xec04
P12.05	Control word 1	0~65535	0	0	65535	0xec05
P12.06	Control word 2	0~65535	0	0	65535	0xec06
P12.07	State word 1	0~65535	0	0	65535	0xec07
P12.08	State word 2	0~65535	0	0	65535	0xec08
P12.09	Terminal start-stop Ctrl word	0~65535	0	0	65535	0xec09
P12.10	OP start-stop control word	0~65535	0	0	65535	0xec0a
P12.11	PC start-stop control word	0~65535	0	0	65535	0xec0b
P12.12	Custom start-stop control word	0~65535	0	0	65535	0xec0c
P12.13	Panel given value	0~65535	0	-32768	32767	0xec0d
P12.14	PC given value	0~65535	0	-32768	32767	0xec0e
P12.16	DI state	0~65535	0	0	65535	0xec10
P12.17	DO state	0~65535	0	0	65535	0xec11
P12.31	PM 24V voltage	0~65535	0	0	65535	0xec1f
P13:System Setting and Feedback(Analog connect)						
P13.00	Motor actual speed	0~65535	0	-32768	32767	0xed00
P13.02	Main speed given	0~65535	0	-32768	32767	0xed02
P13.03	Auxiliary speed given	0~65535	0	-32768	32767	0xed03
P13.04	SET speed before FWD/REV limit	0~65535	0	-32768	32767	0xed04
P13.05	Speed given before limiting	0~65535	0	-32768	32767	0xed05
P13.06	Speed given after limiting	0~65535	0	-32768	32767	0xed06
P13.07	Speed given after minimum limit	0~65535	0	-32768	32767	0xed07
P13.08	RFG input speed given	0~65535	0	-32768	32767	0xed08
P13.09	RFG output speed given	0~65535	0	-32768	32767	0xed09
P13.10	Additional speed given	0~65535	0	-32768	32767	0xed0a
P13.11	function final given speed	0~65535	0	-32768	32767	0xed0b
P13.12	RFG module input value	0~65535	0	-32768	32767	0xed0c
P13.15	Positive maximum speed	0~65535	0	-32768	32767	0xed0f
P13.16	Reverse maximum speed	0~65535	0	-32768	32767	0xed10
P13.17	Encoder feedback speed	0~65535	0	-32768	32767	0xed11
P13.22	Motorized potentiometer output	0~65535	0	-32768	32767	0xed16

Function code	Name	Range	Factory value	Lower limi	Upper limit	Postal address
P13:System Setting and Feedback(Analog connect)						
P13.23	Multi segment given SEL output	0~65535	0	-32768	32767	0xed17
P13.24	Multi segment setting value 1	0~65535	0	-32768	32767	0xed18
P13.25	Multi segment setting value 2	0~65535	0	-32768	32767	0xed19
P13.26	Multi segment setting value 3	0~65535	0	-32768	32767	0xed1a
P13.27	Multi segment setting value 4	0~65535	0	-32768	32767	0xed1b
P13.28	Multi segment setting value 5	0~65535	0	-32768	32767	0xed1c
P13.29	Multi segment setting value 6	0~65535	0	-32768	32767	0xed1d
P13.30	Multi segment setting value 7	0~65535	0	-32768	32767	0xed1e
P13.31	Multi segment setting value 8	0~65535	0	-32768	32767	0xed1f
P13.32	Multi segment setting value 9	0~65535	0	-32768	32767	0xed20
P13.33	Multi segment setting value 10	0~65535	0	-32768	32767	0xed21
P13.34	Multi segment setting value 11	0~65535	0	-32768	32767	0xed22
P13.35	Multi segment setting value 12	0~65535	0	-32768	32767	0xed23
P13.36	Multi segment setting value 13	0~65535	0	-32768	32767	0xed24
P13.37	Multi segment setting value 14	0~65535	0	-32768	32767	0xed25
P13.38	Multi segment setting value 15	0~65535	0	-32768	32767	0xed26
P13.39	Multi segment setting value 16	0~65535	0	-32768	32767	0xed27
P13.40	RFG acceleration	0~65535	0	-32768	32767	0xed28
P13.41	Torque setting value	0~65535	0	-32768	32767	0xed29
P13.42	Additional torque:setting value	0~65535	0	-32768	32767	0xed2a
P13.43	Torque Ctrl speed:upper limit	0~65535	0	-32768	32767	0xed2b
P13.44	Torque Ctrl speed:lower limit	0~65535	0	-32768	32767	0xed2c

9 Maintenance

9.1 Replacing the drive pack

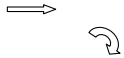
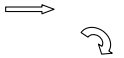
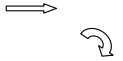
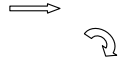
9.1.1 Replacement of drive components

Components allowed to be replaced

After a continuous functional failure, the power module or control module of the drive must be replaced.

The power module and control module of the driver can be replaced separately.

The drive can be replaced when:

<table>
<tr><td colspan="2">replace the power module</td><td colspan="2">replace the control module</td></tr>
<tr><td>spare parts：
•same model
•same power</td><td>spare parts：
•same model
•same overall dimension
•more power</td><td>spare parts：
•same model
•same firmware version</td><td>spare parts：
•same model
•firmware version higher
(for example, replacing V4.2 with firmware version v4.3)</td></tr>
<tr><td>x kW x kW
  </td><td>y kW > x kW
  </td><td>Firmware A Firmware A
  </td><td>Firmware A Firmware A
  </td></tr>
<tr><td></td><td>The power module and motor module must be matched.
That is: the rated power of motor and power module must be greater than 1/8</td><td colspan="2">After replacing the control module, the drive must be restored to the factory setting.</td></tr>
</table>

Warning

Abnormal operation of the drive may cause personal injury.

Replacing different types of drives may cause abnormal operation.

If the drive replacement does not meet the requirements of the above table,you must retry the new drive after the replacement.

9.1.2 Replace the power module when the safety function has been enabled

Be careful

Replacing the connecting cables of the motor can cause damage to the motor.

Changing the two phases of the motor cable will cause the motor to rotate in the opposite direction.

Reverse rotation of the motor can cause damage to the machine or equipment.

Connect the three phases of the motor cables in the correct order.

Check the rotation direction of the motor after replacing the power module.

Step

➡ Replace the power module as follows:

1. Disconnect the main power supply of the power module.
   If the control module uses an external 24V power supply, the power supply may not be turned off.
2. Pull out the connecting cable on the power module.
3. Remove the CM module from the power module.
4. Replace the power module.
5. Insert the CM module into the new power module.
6. Connect the connecting cable on the new power module.
7. Reconnect the main power supply, and connect the 24V power supply of the control module if necessary.

■ You have successfully replaced the power module.

9.1.3 Replace the power module whose safety function is no enabled

DANGER

Dangerous voltage on the drive terminals can cause life–threatening.

Please wait at least 5 minutes after power off,
Until the capacitor in the drive discharges to a safe voltage level.
•Verify the voltage at the drive interface again before unplugging the connecting cable.

Step

Replace the power module as follows:
1. Disconnect the main power supply of the power module.
If the control module adopts external 24V power supply, the power supply may not be turned off.
2. Pull out the connecting cable on the power module.
3. Remove the control module from the power module.
4. Replace with a new power module.
5. Insert the control module into the new power module.
6. Connect the connecting cable on the new power module.

Be careful
Replacing the connecting cables of the motor can cause damage to the motor

Changing the two phases of the motor cable will cause the motor to rotate in the opposite direction.
•Connect the three phases of the motor cables in the correct order.
•Check the rotation direction of the motor after replacing the power module.

7. Reconnect the main power supply, and connect the 24V power supply of the control module if necessary.
You have successfully replaced the power module.

Appendix

Appendix a Modbus–RTU communication protocol

A1 drive uses standard RS485 communication interface and MODBUS communication protocol to support serial communication between drive and host computer or PLC. The communication protocol of A1 drive includes three layers: physical layer, data link layer and application layer. Modbus protocol based on RS485 is adopted in physical layer and data link layer, and various operation methods such as controlling A1 drive to run, stop, read and write parameters are included in application layer.

Modbus protocol is a master - slave protocol. There are two kinds of communication between master and slave: master requests and slave answers; Host broadcast, slave does not respond. Only one device on the bus is sending at any time. The host polls the slave, and the slave cannot send messages without obtaining the command from the host. If the host does not receive a response within a given time, it is considered that the polling slave is lost. If the slave cannot execute a message, an exception message is sent to the host. There is no direct communication between the slave computers, so the data of one slave computer must be read out through the software of the host computer, and then sent to another slave computer. Slave address range: 0 to 247, address 0 message is broadcast message.

RTU data frame

Data format and sending order of each byte: 1 start bit + 7/8 data bits (low bit first) + 1 parity bit or no parity bit + 1 or 2 stop bits.

start bit	Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	parity bit	stop bits

10bit Character frame

start bit	Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	parity bit	stop bits

11bit Character frame

In RTU mode, message sending should start with a pause interval of at least 3.5 characters. In the network baud rate, multiple character times are the easiest to achieve (as shown in T1-T2-T3-T4 in the figure below). The first domain of transmission is the device address. The transmission characters that can be used are hexadecimal 0... 9, A... F. Network devices constantly detect the network bus, including the pause interval. When the first domain (address domain) receives it, each device decodes it to determine whether it is sent to its own. After the last transmitted character, a pause of at least 3.5 characters marks the end of the message. A new message can start after this pause.

The whole message frame must be transmitted as a continuous stream. If there is a pause time of more than 1.5 characters before the frame is completed, the receiving device will refresh the incomplete message and assume that the next byte is the address field of a new message. Similarly, if a new message starts with the previous message in less than 3.5 characters, the receiving device will consider it as a continuation of the previous message. This will result in one error, because the value in the last CRC field cannot be correct.

start idle time of at least 3 characters	slave address	function code	data	check	start idle time of at least 3 characters

RTU frame format:

Frame header start	3.5 character time
Slave address ADR	mailing address: 1~247
Command code CMD	03: reader slave parameters;06; write slave parameters
Data (N-1)	Data content: function code parameter address, function code parameter number, function code parameter value,etc.
Data (N-2)	
……	
Data content	
CRC CHK low	Detection value: CRC value
CRC CHK high	
END	3.5 character time

A1 drive supports the MODBUS protocol of RTU mode.

The MODBUS function codes supported by the drive are as follows:

Command code and communication data description:

CMD	Meaning	Radio broadcast	Maximum number registers
03H	Read multiple registers	No	30
06H	Write single register	Yes	1
10H	Write multiple register	Yes	27

Command code:03H

Command code 03H(00000011), read N words(Word, 16bit data), can read up to 16 words.

For example: if the drive with slave address of 0x55 reads motor target speed, given speed, current motor speed, MODBUS logic starting address of 0x2004 and reads three consecutive words, the frame structure is described as follows:

Host send:

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x03
address high bit	0x20
address low bit	0x04
read byte high	0x00
read byte low	0x03
CRC low	0x42
CRC high	0x1E

Slave normal response:

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x03
number of data bytes returned	0x06
High bit of the first data	0x05
Low bit of the first data	0xDC
High bit of the second data	0x00
The second data low	0x00
…	
Nth data high	0x00
Nth data low	0x00
CRC low	0x30
CRC high	0x3E

The drive responds to the motor target speed 0x05DC (1500rpm), the given speed 0x0000, and the current motor speed 0x0000

Slave abnormal response:

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x03
error code	0x02
CRC low	0xE2
CRC high	0x17

Command code:06H

Command code 06H(00000110), write a word(Word)

For example, if the salve address is 0x55 and the target speed of the driver is set to 100%, that is, MODBUS logical address 0xE721 is written to 0x03E8, the frame structure is described as follow:

RTU host command information

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x06
address high bit	0xE7
address low bit	0x21
Data high	0x03
Data low	0xE8
CRC low	0xE2
CRC high	0x1E

Slave normal response

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x06
address high bit	0xE7
address low bit	0x21
Data high	0x03
Data low	0xE8
CRC low	0xE2
CRC high	0x1E

Slave abnormal response:

START	T1-T2-T3-T4
slave address	0x55
Modbus function code	0x86
error code	0x03
CRC low	0x43
CRC high	0xB1

Command code: 10th

Command code 10H(00010000), write N words(Word)

For example:if the slave address is Ox55, write 3 pieces of data to the address of Ox3500. The structure of the frame is described as follows:

RTU host command information

START	T1-T2-T3-T4
Slave address	0x55
Modbus function code	0x10
Address high	0x35
Address low	0x00
Bytes written high	0x00
Bytes written low	0x03
Total number of bytes written	0x06
First data high	0x00
First data low	0x01
……	……
Nth data high	
Nth data low	
CRC low	0x4A
CRC high	0x12

Slave normal response

START	T1-T2-T3-T4
Slave address	0x55
Modbus function code	0x90
Address high	0x35
Address low	0x00
data high	0x00
data low	0x03
CRC low	0x4A
CRC high	0x12

Slave abnormal response

START	T1-T2-T3-T4
Slave address	0x55
Modbus function code	0x90
error code	0x03
CRC low	0x43
CRC high	0xB1

Abnormal code

Code	name	meaning
1	illegal function code	an unsupported function code was received
2	illegal address	the request register address is illegal, or the combination of register address and the number of requested data is illegal
3	illegal data value	the received data field contains at least one illegal data value
4	number of illegal request data	the number of requested data is greater than the maximum number
5	read - only	read - only
6	it can only be stopped for modification	it can only be stopped for modification

Communication frame error check

Using RTU frame format, the frame includes the frame error detection domain based on CRC method. CRC domain detects the content of the whole frame. The CRC field is two bytes, containing a 1 - bit binary value. It is calculated by the transmission device and added to the frame. The receiving device recalculates the CRC of the received frame and compares it with the value in the received CRC field. If the two CRC values are not equal, it indicates that there is an error in the transmission. CRC is stored in 0xFFF first and then invoked a process to process more than 6 consecutive bytes in the frame and the values in the current register. Only 8bit data in each character is valid for CRC, and start bit, stop bit and parity bit are invalid. In the process of CRC generation, each 8 - bit character is different from or (XOR) in the register content, and the result moves to the least significant bit direction, and the most significant bit is filled with 0. LSB is extracted to detect. If LSB is 1, the register is different from the preset value or if LSB is 0, it is not detected. The whole process is repeated eight times.

After the last bit (the 8th bit) is completed, the next 8 - bit byte is different from or different from the current value of the register. The value in the final register is the CRC value after all the bytes in the frame are executed. For example, to transmit "11001110", the data contains five "1s". If even check is used, the even check bit is "1". If odd check is used, the odd check bit is "0". When transmitting data, the parity check bit is calculated and placed in the position of the check bit of the frame, and the receiving device also performs parity check. If the parity of the received data is inconsistent with the preset value, the receiving device will also perform parity check, I think there's something wrong with the communication. This calculation method of CRC adopts the international standard CRC check rule. When editing CRC algorithm, users can refer to the relevant standard CRC algorithm to write a CRC calculation program that really meets the requirements.

Standard : CRC - 16/MODBUS
Polynomial : x16+x15+x2+1(0x8501)
CRC initial value : 0xFFFF

Now a simple function of CRC calculation is provided for user's reference (program in C language)

```
unsigned int crc_cal_value(unsigned char *data_value,unsignedchar data_length)
{
int i;
unsigned int crc_value=0xffff;
      while(data_length- -)
{
crc_value^=*data_value++;
for(i=0;i<8;i++)
{
if(crc_value&0x0001)
crc_value=(crc_value>>1)^0xa001;
else
                  {
crc_value=crc_value>>1;
                  }
          }
          }
          returncrc_value;
}
```

Modbus communication parameter address

control command input to drive:(write only)

command word address	command function
0xE720	0001:running
	0002:inching operation
	0003:free parking
	0004:deceleration shutdown
	0005:fault reset
	0006: Invert given speed
0xE721	Modbus communication set point1
0xE722	Modbus communication set point2

Note: the value range of communication setting value is - 600.0%~600.0%

The parameter address table of function parameters is as follows:

Drive parameter number	Modbus communication address
Group A	
A00.00 – A00.99	0x2000
A01.00 – A01.99	0x2100
A02.00 – A02.99	0x2200
A03.00 – A03.99	0x2300
A04.00 – A04.99	0x2400
A05.00 – A05.99	0x2500
A06.00 – A06.99	0x2600
A07.00 – A07.99	0x2700
A08.00 – A08.99	0x2800
A09.00 – A09.99	0x2900
Group B	
B00.00 - B00.99	0x3000
B01.00 - B01.99	0x3100
B02.00 - B02.99	0X3200
B03.00 - B03.99	0X3300
B04.00 - B04.99	0X3400
B05.00 - B05.99	0X3500
B06.00 - B06.99	0X3600
B07.00 - B07.99	0X3700
B08.00 - B08.99	0X3800
B09.00 - B09.99	0X3900
B10.00 – B10.99	0X3A00
B11.00 – B11.99	0X3B00
Group C	
C00.00 – C00.99	0X4000
C01.00 – C01.99	0X4100
C02.00 – C02.99	0X4200
C03.00 – C03.99	0X4300
C04.00 – C04.99	0X4400
C05.00 – C05.99	0X4500
C06.00 – C06.99	0X4600
C07.00 – C07.99	0X4700
C08.00 – C08.99	0X4800
Group D	
D00.00 – D00.99	0X5000
D01.00 – D01.99	0X5100
D02.00 – D02.99	0X5200
D03.00 – D03.99	0X5300
D04.00 – D04.99	0X5400
D05.00 – D05.99	0X5500
D06.00 – D06.99	0X5600
D07.00 – D07.99	0X5700
D08.00 – D08.99	0X5800
D09.00 – D09.99	0X5900
D10.00 – D10.99	0X5A00
D11.00 – D11.99	0X5B00

Drive parameter number	Modbus communication address
Group E	
E00.00 – E00.99	0X6000
E01.00 – E01.99	0X6100
E02.00 – E02.99	0X6200
E03.00 – E03.99	0X6300
E04.00 – E04.99	0X6400
E05.00 – E05.99	0X6500
E06.00 – E06.99	0X6600
E07.00 – E07.99	0X6700
Group F	
F00.00 – F00.99	0X7000
F01.00 – F01.99	0X7100
F02.00 – F02.99	0X7200
F03.00 – F03.99	0X7300
F04.00 – F04.99	0X7400
F05.00 – F05.99	0X7500
F06.00 – F06.99	0X7600
F07.00 – F07.99	0X7700
Group P	
P00.00 – P00.99	0XE000
P01.00 – P01.99	0XE100
P02.00 – P02.99	0XE200
P03.00 – P03.99	0XE300
P04.00 – P04.99	0XE400
P05.00 – P05.99	0XE500
P06.00 – P06.99	0XE600
P07.00 – P07.99	0XE700
P08.00 – P08.99	0XE800
P09.00 – P09.99	0XE900
P10.00 – P10.99	0XEA00
P11.00 – P11.99	0XEB00
P12.00 – P12.99	0XEC00
P13.00 – P13.99	0XED00
P14.00 – P14.99	0XEE00
P15.00 – P15.99	0XEF00

After–sale service

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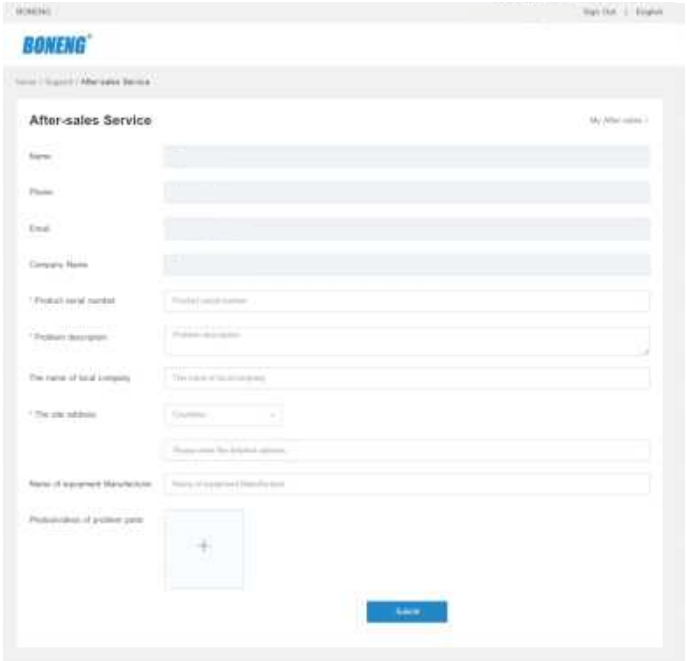

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