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A1 Variable Frequency Driver(CM25) Manual



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11/2021

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1 Fundamental safety instructions

1.1 General safety instructions

⚠ DANGER

Electric shock and danger to life due to other energy sources
Touching live components can result in death or severe injury.

- Only work on electrical devices when you are qualified for this job
- Always observe the country–specific safety rules.

Generally, the following six steps apply when establishing safety:

1. Prepare for disconnection. Notify all those who will be affected by the procedure.
2. Isolate the drive system from the power supply.
–Stop the drive.
–Wait until the discharge time specified on the warning labels has elapsed.
–Check that there is no voltage between any of the power connections, and between any of the power connections and the protective conductor connection.
–Check whether the existing auxiliary supply circuits are de–energized.
–Ensure that the motors cannot move.
3. Identify all other dangerous energy sources, e.g. compressed air, hydraulic systems, or water.
4. Switch the energy sources to a safe state.
5. Take measures to prevent energy sources being switched back on again.
6. Check that the correct drive system is completely locked.

⚠ WARNING

Electric shock due to equipment damage
Improper handling may cause damage to equipment. For damaged devices, hazardous voltages can be present at the enclosure or at exposed components; if touched, this can result in death or severe injury.

- Ensure compliance with the limit values specified in the technical data during transport, storage and operation.
- Do not use any damaged devices.

⚠ WARNING

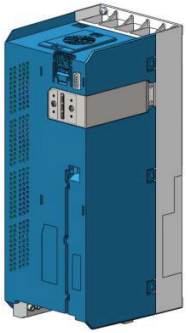
Spread of fire from built–in devices In the event of fire outbreak, the enclosures of built–in devices cannot prevent the escape of fire and smoke. This can result in serious personal injury or property damage.

- Install built–in units in a suitable metal cabinet in such a way that personnel are protected against fire and smoke, or take other appropriate measures to protect personnel.
- Ensure that smoke can only escape via controlled and monitored paths.

2 Description

2.1 Driver structure

Main components of the drive



Power Module
①



Control Module
②

Every A1 series inverter comprises a Control Module（CM） and a Power Module(PM).
·The Control Module monitors and controls the Power Module and the motors connected to Power Module.
·The Power Module is suitable for motors with power range from 0.75kW to 132kW.

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

- Name： e.g.Power ModulePM25
- Technical data： Voltage、Current、Power
- Article No.： e.g.A1–PM25–B3B55–N

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

- Name： e.g.Control ModuleCM25
- Article No.： e.g.A1–CM25–DP–RE

2.2 控制模块

Different models of control module CM25 differ in different field bus and encoder types



Name	Product number	Field bus / Encoder
CM25	A1–CM25–MB–PE	Modbus/Photoelectric
CM25	A1–CM25–DP–PE	Profibus/Photoelectric
CM25	A1–CM25–CN–PE	CANopen/Photoelectric
CM25	A1–CM25–MB–RE	Modbus/Rotation

2.3 Power Module

This section contains important notes of Power Modules.

The power data always refer to rated power or a load cycle according to Low Overload.

The Control Module CM25 can operation with the following Power Modules：

● PM25 IP20 type



Figure 2-1 e.g.Power Modules with protection level IP20

PM25,3AC400V–Standard applied range:

The Power Modules with protection IP20 have 2 models：inverters without integrated filter and inverters with integrated class A filter.PM25 using an external braking resistor to realize dynamic braking function.

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

Frame size	B1	B2	B3	B4	B6
Power range(KW) with IP20	0.75~3.0	4~7.5	11~15	18.5~37	45~132

Note:N means drivers without built–in filter, F means drivers with built–in filter

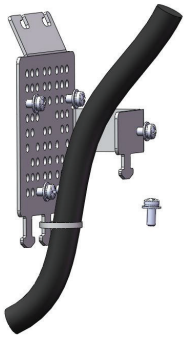
2.4 Components for Power Module

2.4.1 Accessories-Power Module

Shield connection kit can realize the Shield of terminal and strain relief. shield connection kit composed of shield plate, cable tie and screws.

Table 2-1 Product code of shield connection kit

Frame size	Article No.
B1	A1–H06–B1
B2	
B3	A1–H06–B3
B4	A1–H06–B4
B6	A1–H06–B6



2.4.2 Line filter(Accessories can be provided by userself)

The use of power filter can make the driver reach a higher anti RF interference level. Drivers with integrated power filters do not require external filters. Please refer to the model selection sample of A1 variable frequency drive for product model.

2.4.3 Line reactor(Accessories can be provided by userself)

The power reactor can provide over voltage protection, suppress grid harmonics and reduce voltage defects caused by commutation of rectifier circuit. Please refer to the model selection sample of A1 variable frequency drive for product model.

2.4.4 Output reactor(Accessories can be provided by userself)

The output reactor can reduce the voltage load of the motor winding, and can reduce the driver load through 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. Please refer to the model selection sample of A1 variable frequency drive for product model.

2.4.5 Braking resistor(Accessories can be provided by userself)

The braking resistance can make the load with large moment of inertia brake quickly. The power module can control the braking resistance through the integrated braking chopper. Please refer to the model selection sample of A1 variable frequency drive for product model.

2.5 Allowable encoder

The following encoders can be connected to the control module:

Resolver	Used for speed control
HTL Encoder	Used for speed control
TTL Encoder	Used for position and speed control

2.6 Commissioning tools for drives

The following tools are used to debug, diagnose, and control drives and to back up and transfer drive settings

Operation panel		Product number
	OP25 • Plain text display • Provide menu guidance and Application Wizard	A1–OP25

PC tools		
With Boneng Drivesoft, connect to the keyboard interface via USB–RS485 cable to access drive tools.	Website of Boneng Drivesoft:	www.boneng.com
	USB–RS485 cable	It is recommended to use stable and reliable cables with brand.

3 Installing

3.1 Driver installation steps

Prerequisites for installing drives

Please check before installation:

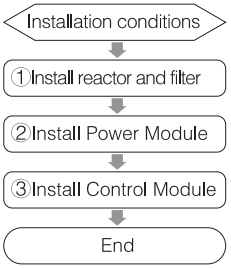
● Are the required drive components complete?

–Power module

–Control module

–Accessories, such as power reactor or braking resistor

● Are the components, tools and parts required for installation complete? The protection grade of the driver is IP20 and needs to be installed in the control cabinet with a certain protection grade.



Step

As shown by the right arrow: ➡

If you have installed, start to debugging

3.2 EMC specifications for drives

3.2.1 Install the shielding plate of the power module

Shielding method using shielding plate:

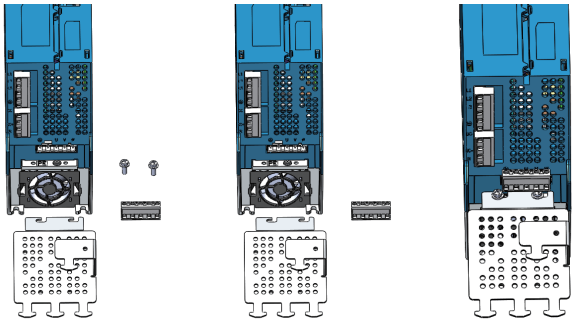
The cable shielding layer must be connected with the shielding plate in a large area through a line card.

Depending on the type of power module, the shielding plate is either included in the scope of supply or provided as an option in the form of shielding connection kit.

Shielding without shielding plate:

Shielding conforming to electromagnetic compatibility regulations can be realized without optional shielding plate. At this time, it must be ensured that the cable shielding layer is connected with the grounding position in a large area.

Installation of shielding plate: PM25 (take B1 as an example and others are similar)



EMC standard wiring example of power module PM25





EMC wiring of power module B1





Detail drawing of shielding plate

Connect the encoder cable and signal cable to the terminal block meet the requirements of electromagnetic compatibility

Please use the shielded cable.

- Mounting the Power Modules shield plates .
- Connect the shield layer of the signal cable / encoder cable to the shield plate of the power module.
- Install the cable clamp on the shield.
- In addition, the shielding layer shall be connected to the shielding bar of the control cabinet.

Meet the requirements of electromagnetic compatibility and connect the encoder to the SUB-D connector

- Please use shielded cable.
- Connect the cable shield to the shield of the power module.
- Install the cable clamp on the shield of the power module.
- If the cable extends out of the control cabinet, the shielding layer shall also be connected to the shielding bar of the control cabinet.

3.3 Installation the reactor, filter and braking resistance

Reactor	The installation position of reactor is 20cm away from the inverter
Filter	The installation position of filter is 20cm away from the inverter
Braking resistance	It is recommended to make an additional electrical cabinet to install the brake resistor

3.4 Install the power modules

Mounting the Power Modules

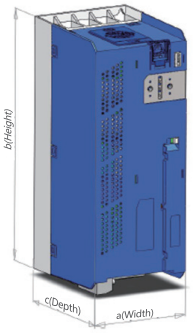
Take note of the following listed specifications when installing the Power Module.

- The Power Modules are designed for installation in a control cabinet
- Only mount the Power Module in a vertical position with the motor connectors at the bottom
- Rules for admissible mounting:

–Maintain the minimum clearances to other components.
–Fastening piece
–Torques for fastening piece

Dimension drawings and drilling dimensions for Power Modules - IP20 devices

Dimension



Drilling dimensions for power module PM25

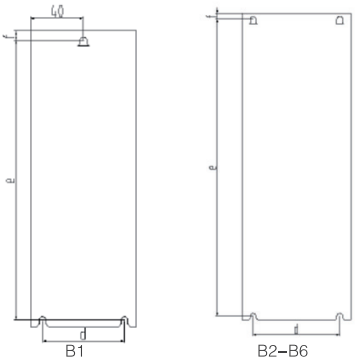


Table 3-1 Dimension drawings and drilling dimensions for PM25(A1 series)

A1 series	Dimension (mm)			Drilling dimensions (mm)		
	a (Width)	b (Height)	c (Depth)	d	e	f
B1	80	230	165	62	218	6
B2	100	292	165	80	281	6
B3	100	355	165	120	343	6
B4	100	472	237	170	430	7
B6	100	757	357	273	727	14

1) Connection kit with shield: B1: +94mm; B2: +94mm; B3: +80mm; B4: +151mm; B5/6: +261mm

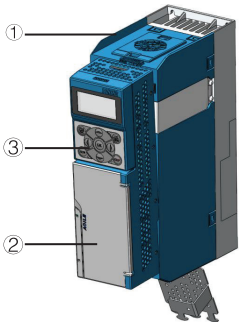
Table 3-2 A1 spacing between installation materials and other equipment

A1 series	Fixing	Torque (Nm)	Cooling air clearances (mm)		
			Top	Bottom	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	300	350	100
B6	M8 Screw	25	300	350	100

1) PM25 mounting without any lateral cooling air clearance. For tolerance reasons, we recommend a lateral clearance of approx 1 mm.
2) Enough space between Control Module and Operator Panel.

Total drive depth

①	Power Module	PM25
②	Control Module	CM25
③	Operator Panel	OP25



Power Module,overall dimension B1...B4

①+②
The converter consists of at least one Power Module and one inserted Control Module:
The total depth of converter
= The depth of Power Module+63mm

①+②+③
Inverter with Operator Panel inserted:
The total depth of converter
= The depth of Power Module+63mm

3.5 Connection of power supply, motor and drive components

3.5.1 Allowable grid system

Requirements on altitude

Above an installation altitude of 4000m, the permissible line supplies are restricted, above 1000m the permissible inverter output current is reduced.

Power requirements

The machine tool manufacturer must ensure that the voltage sag between the input terminal of the transformer and the driver is less than 4% when operating at rated value. The driver is designed for the following power supply systems in accordance with iec60364 – 1 (2005).

TN System

The TN system transmits the protective grounding wire to the installed equipment through a conductor.

Star point in TN system is usually grounded. In addition, there are TN systems with grounded phase lines, such as grounded L1.

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

The drive operate on the TN system

● Driver 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

Example of power module on TN System

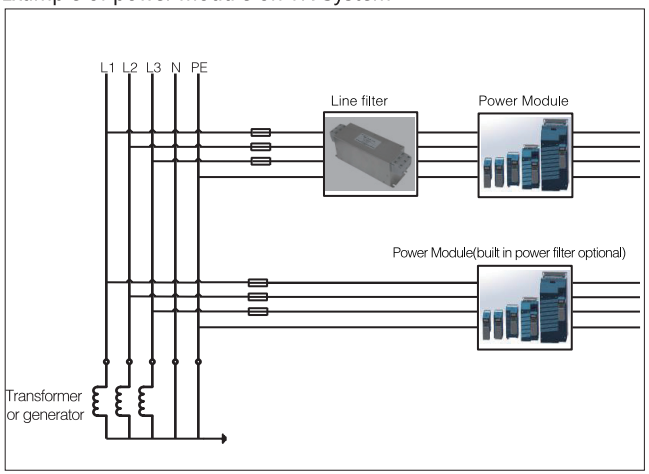


Figure 3-1 TN system with separate transmission of N and PE, grounded star point

TT line system

In a TT line system, the transformer grounding and the installation grounding are independent of one another

There are TT line supplies where the neutral conductor N is either transferred or not.

Inverter connected to a TT system

●Inverters with integrated line filter or an external line filter:

–Operation on TT line systems with grounded neutral point permissible

–Operation on TT line systems without grounded neutral point not permissible.

● Inverter without line filter:

–Operation on all TT line systems permissible.

Power Module diagram on TT system

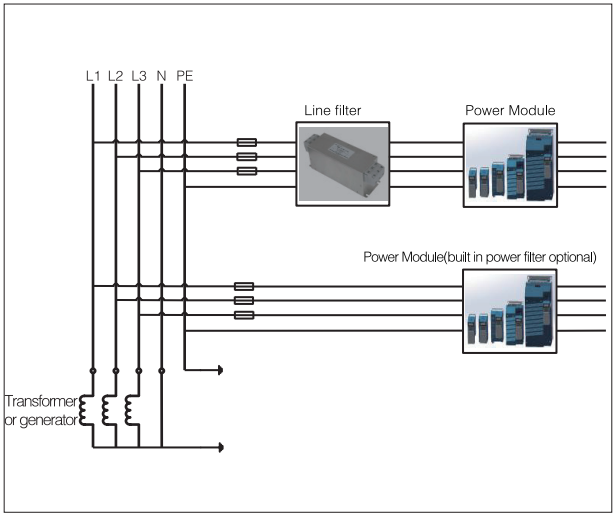


Figure 3-2 TT system with neutral N transmission and grounding star point

IT system

In an IT line system, all of the conductors are insulated with respect to the PE protective conductor – or connected to the PE protective conductor through an impedance.

There are IT systems with and without transfer of the neutral conductor N.

Inverter connected to an IT system

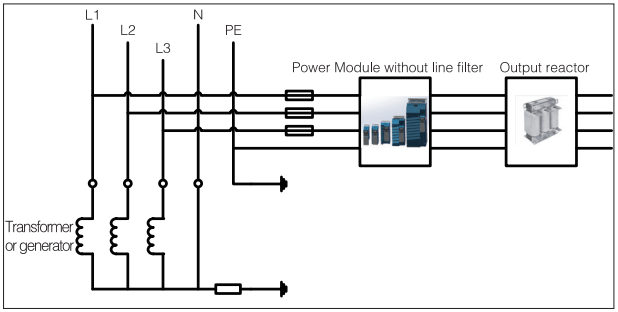
● Inverters with integrated line filter:

–Operation on IT line systems not permissible.

● Inverter without line filter:

–Operation on all IT line systems permissible.

Power Module diagram on IT system



Behavior of the inverter when a ground fault occurs:

If the inverter is to remain operable even when a ground fault occurs at the inverter output,you must install an output reactor.

This prevents an over current trip or damage to the drive.

3.5.2 Protection device

It must be in accordance with the relevant regulations of high leakage current (above 3.5mA), ground the inverter.If local and national regulations require upstream protection through residual protectors, type B leakage circuit breakers shall be used for the inverter.

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

According to IEC61800–5–1, if the leakage current exceeds 3.5ma, special attention shall be paid.

One of the following methods is needed to enhance the grounding:

- The cross–sectional area of the ground wire shall be at least 10mm2 (8 AWG).
- Use two separate grounding wires that meet the size specifications.

3.5.3 connecting drives

Connect the power module to the motor and power supply

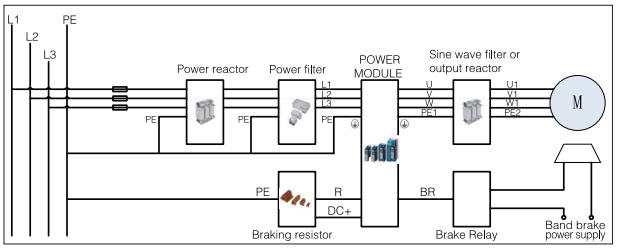


Figure 3-4 3AC Wiring diagram of power module PM25

DANGER

Dangerous voltage on the motor interface can cause life hazard.

Once the inverter is powered on, there may be dangerous voltage on the motor interface of the inverter. If the motor is connected to the inverter and the motor junction box is open,

electric shock hazard due to contact with motor interface.

- Please close the terminal box of the motor before the inverter is powered on.

Connect the power cable to the inverter

Step / connect the inverter to the power supply as follows:

1. If there is an outer cover on the inverter terminal, open the outer 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 inverter.
4. If there is an outer cover on the inverter terminal, close the outer cover.

You have connected the power cable to the inverter.

Connect the motor cable to the asynchronous motor

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

1. Open the junction box of the motor.
2. Connect the motor with star connection or triangle connection.
3. If shielded motor cables are required, the following must be done:

–Strip the sheath of the motor cable around the incoming hole of the junction box to expose the shielding layer.

–Ground the shield through a suitable cable gland on the motor terminal box.

You have successfully connected the motor cable to the asynchronous motor.

Connect the motor cable to the drive

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

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

Please note the EMC cabling regulations.

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

You have connected the motor cable to the drive.

It is forbidden to connect the resistance directly between DC + and DC – of the driver power module, or between P and N.

3.5.4 Connect the braking resistor

Connect the power module to the motor and power supply

WARNING

Improper installation or incorrect installation of braking resistor can lead to fire and life–threatening.

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

The use of unmatched braking resistance can cause open fire and smoke, resulting in casualties or property damage.

- Only the braking resistor matched with the driver is allowed to be used.
- Install the braking resistor as specified.
- Monitor the temperature of the braking resistor.
- It is forbidden to connect the resistance directly between DC + and DC – of the driver power module, or between P and N.

NOTICE

Contact with hot surfaces can cause burns.

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

- Do not touch the brake resistor during operation.

Step / follow the steps below to connect the brake resistor and monitor the temperature of the brake resistor:

1. Connect the brake resistance to the terminals DC + and R2 on the inverter.
2. Connect the braking resistance to the grounding bar of the control cabinet.

The braking resistance is not allowed to be grounded through the PE terminal on the inverter.

3. Please follow the shielding regulations to ensure compliance with electromagnetic compatibility requirements.
4. Connect the thermal relay protection output (temperature monitoring) terminal of the braking resistor to the idle digital input on the driver.
5. When debugging the inverter, define the function of the digital input as an external fault.

3.6 Installing the control module

3.6.1 Insert the control module into the power module

Insert the control module into the power module B1..B6



Removing the Control Module

Inserting the Control Unit

Steps

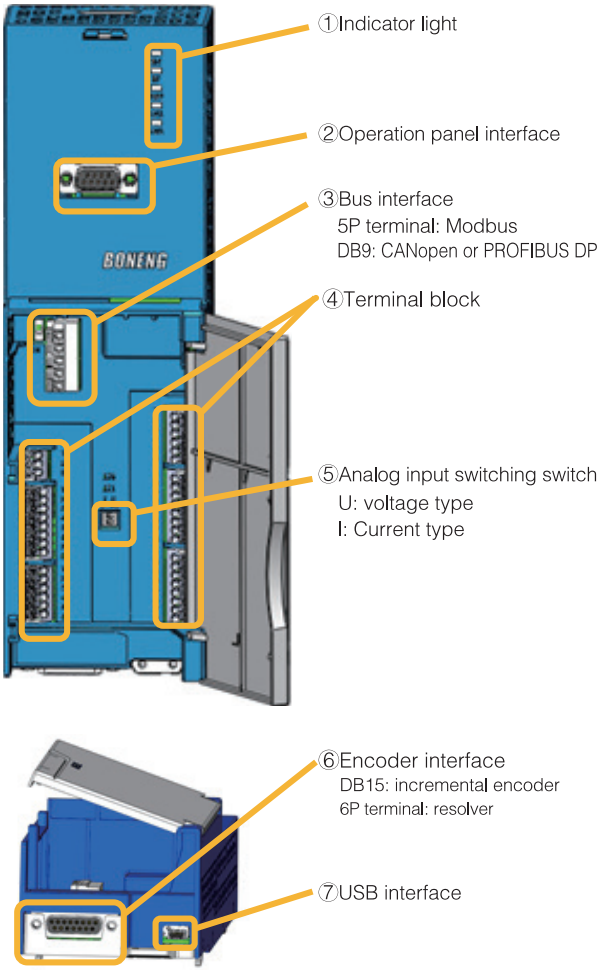
Proceed as follows to plug the Control Unit onto a Power Module:

1. Place the two catches of the Control Module in the matching grooves of the Power Module.
2. Press the Control Unit onto the Power Module until you hear that it latches.

You have now plugged the Control Unit onto the Power Module.

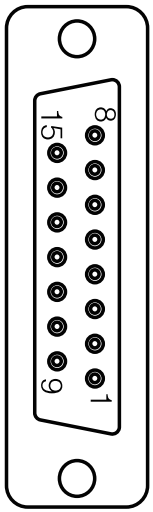
If you want to remove the Control unit. You just need to remove the Control Unit from the Power Module by pressing the release mechanism

3.6.2 Interfaces list



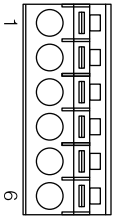
3.6.3 Layout of encoder interface

Incremental encoder terminal X10



Pin	Signal description
1	Initial pole position U–phase signal
2	—
3	—
4	Encoder power supply (5V or 24V)
5	Initial pole position W–phase signal
6	Initial pole position W–phase signal
7	Power ground
8	Power ground
9	Initial pole position V–phase signal
10	Incremental signal Z+
11	Incremental signal Z–
12	Incremental signal B–
13	Incremental signal B+
14	Incremental signal A–
15	Incremental signal A+

X7 resolver terminals



Pin	Signal description
1	Resolver sinusoidal signal +
2	Resolver sinusoidal signal –
3	Resolver cosine signal +
4	Resolver cosine signal –
5	Resolver transformer excitation signal +
6	Resolver transformer excitation signal –

3.6.4 Terminal strip behind the top front protective cover

X1	
1	DO2
2	DO3
3	DO COM

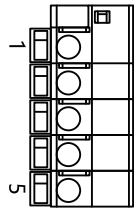
X2	
1	24V IN
2	GND
3	GND
4	AO0
5	AO1
6	GND
7	10V OUT
8	GND

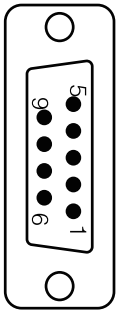
X3	
1	AI0+
2	AI0-
3	AI1+
4	AI1-
5	MOTOR T1
6	GND

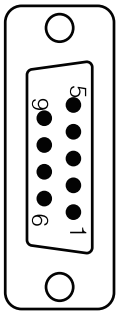
X4	
1	DO0 NC
2	DO0 NO
3	DO0 COM
4	DO1 NC
5	DO1 NO
6	DO1 COM

X5	
1	DI7+
2	DI7-
3	DI8+
4	DI8-
5	DI9+
6	DI9-
7	24V OUT
8	GND OUT

X6	
1	DI0
2	DI1
3	DI2
4	DI3
5	DI4
6	DI5
7	DI6
8	DI COM

X20 – Modbus		
	Pin	Signal description
	1	Shield grounding
	2	RS485 signal B
	3	RS485 signal A
	4	signal ground
	5	—

X20–CANopen Bus		
	Pin	Signal description
	1	Signal ground
	2	—
	3	—
	4	CANopen signal CANL
	5	—
	6	—
	7	—
	8	CANopen signal CANH
	9	Signal ground

X20–PROFIBUS DP Bus		
	Pin	Signal description
	1	—
	2	Power ground
	3	PROFIBUS DP signal P
	4	—
	5	Power ground
	6	Power supply 5V
	7	Power supply 24V
	8	PROFIBUS DP signal N
	9	Power ground

4 Commissioning

4.1 Preparations before commissioning

4.1.1 Collect motor data

Before starting commissioning, it must be possible 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 parameter list corresponding to the driver.

● how to connect the motor?

Pay attention to the wiring of the motor (Star wiring [Y] or delta wiring[Δ])。Record the motor data corresponding to the wiring. For specific parameters, Please refer to the motor parameter identification section of this manual.make drive to restore factory parameter value

4.2 Restore factory value

Some situations may cause debugging exceptions, such as:

● The power supply is interrupted during commissioning, so that the commissioning cannot be completed.

● Unable to continue setting because you do not understand the meaning of a parameter during debugging.

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

Restore these drives to factory settings.

Table 4-1 parameter recovery factory value

parameters	name	description
A04.00	restore factory mode	0: Invalid 1: Restore factory setting of partial parameters 1 (power type of drive and motor information will not be restored) 2: Restore factory setting of partial parameters 2 (motor information will not be restored) 3: Restore factory setting of all parameters 4: Clear fault record(E01 and E07 groups)
A04.01	confirm the recovery	0: cancel 1: yes

Type parameters of drive: set type parameters related to drive power of the PM drive modular

Motor information: the nameplate parameters of motor that be connected to drive

Examples:

Target:

Restore factory setting of partial parameters 1 (power type of drive and motor information will not be restored)

Step:

1. A04.00 = 1;
2. A04.01 = 1;

Waiting 5 seconds and making drive finish to restore the factory setting

4.3 Operation and display of operation panel

Operation and introduction of display panel

The Drive's display panel can set parameters, monitor status of drive start or stop drive , and so on. The outline drawing and function diagram of the drive as follow:

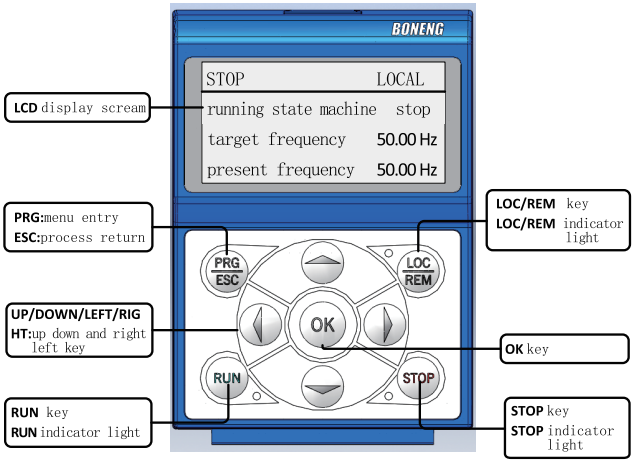


Figure 4-2 Schematic diagram of operation panel

1) Introduction of indicator light

LOC/REM indicator light: The control command is decided by operation panel when the light is powered on, and the control command is decided by remote operation when the light is powered off.

STOP indicator light: The drive be in stop state when the light is powered on

RUN indicator light: The drive be in operate state when the light is powered on.

2) Introduction of the key on operation panel

key	name	function
PRG/ESC	program key/ return key	Pressing this key, it will enter the function menu in main monitoring interface, or it will return to upper interface in other interface.
LOC/REM	local key / remote key	Getting or giving up the control of the operation panel
STOP	stop key	Pressing this key, it will stop the drive in run status, or it will reset the fault in stop status.
RUN	run key	This key can start or stop drive in local mode
▲	Increase key	Increase the data value or function code index
▼	decrease key	Decrease the data value or function code index
▶	right shift key	Pressing this key, you can circularly select the bit that you want to modify towards to right.
◀	left shift key	Pressing this key, you can circularly select the bit that you want to modify towards to left.
OK	Confirm key	Pressing this key, you can enter the next menu or confirm the value that you have been modified.

3) Introducing the content of display scream

LCD displays content by way of four line characters, the first line is the status of drive. The present operation status(stop/operate), status of step control, mode of local or remote control will be displayed when drive is not faulty. The first line displays the current error information at a high priority when drive is faulty. As show in the figure below.

stop	local
running state machine	stop
target frequency	50.00Hz
present frequency	50.00Hz

figure 2 example of LCD display in normal state

Fault: drive over temperature 1	
running state machine	stop
target frequency	50.00Hz
present frequency	50.00Hz

figure 3 example of LCD display in error state

Introduction of checking and modifying the parameters

The operation panel of A1 series drive changes the parameters by type of multilevel menu, and displays content by way of four line charac-ters, it is very visual and convenient.

You can check the parameter groups circularly in turn by pressing up or down key in the parameter setting interface. pressing ok key, you can enter the parameters setting interface.

For example:

The example of the parameter value of B05.00 is changed to SVC control mode from VF control mode as follow, and the possible result will be listed as follow:

1) Modified success 2) Read-only parameter
3) No right to modify 4) Modifying just in stop mode

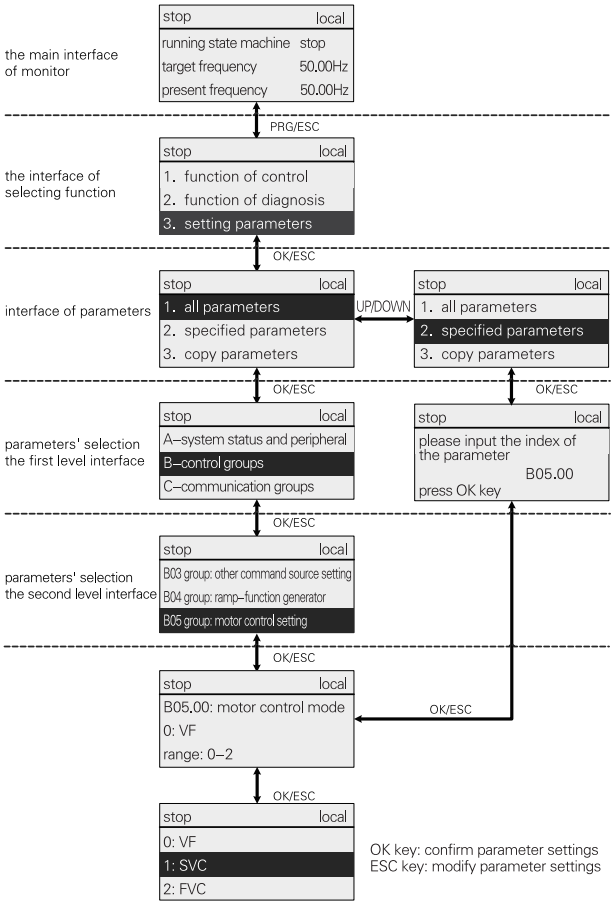


figure 4-3 parameter modification process diagram

5 Extension debugging

5.1 Driver control

5.1.1 Adjust the preset setting of terminal strip

This chapter describes how to modify the functions of various digital and analog inputs and outputs of the driver.

5.1.1.1 Digital input

Function of modifying digital quantity input.

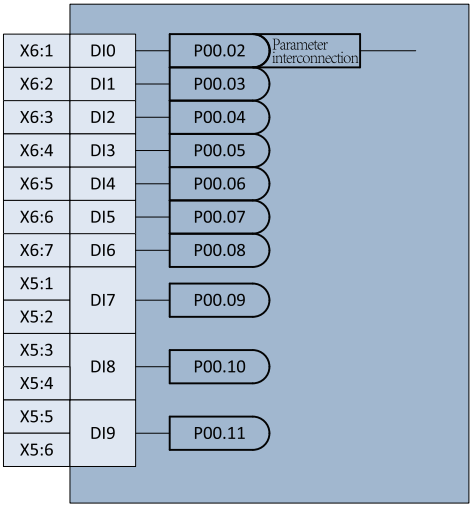


Figure 5-3 Digital input function diagram

Note:To change the function of a digital input, you must interconnect the status parameter of the digital input with a binector input of your choice.

Table 5-1 binary interconnection input parameters of some common drives

BI	Significance	BI	Significance
B00.01	Custom OFF1 source	B03.15	Multi segment given value selection 4
B00.02	Custom OFF2 source	B04.00	RFG ramp time selection 1
B00.13	Fault reset source	B04.01	RFG ramp time selection 2
B01.00	Terminal control command 1 / 2 selection	B04.20	RFG forced 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	Electric potentiometer adds source selection	E00.03	External warning input 2
B03.10	Electric potentiometer reduces source selection	F03.00	PID function valid signal
B03.12	Multi segment given value selection 1	F03.01	PID calculation enable
B03.13	Multi segment given value selection 2	F04.03	Brake switch on
B03.14	Multi segment given value selection 3	F04.09	Force brake switch off

Note: please refer to section 9.7 for detailed interconnection parameters.

Example:Changing the function of a digital input



To acknowledge fault messages of the inverter(E00.00) using digital input DI0, you must interconnect DI0 with the command to acknowledge faults (E00.00: Set E00.00 = 1002.

Note: The coding rules of interconnection parameters are as follows: parameter number +1000; that is, P00.02 is numbered 1002; P13.11 is numbered 2311; P15.89 is numbered 2589; other interconnection parameters are analogized.

5.1.1.2 Digital output

Changing the function of a digital output

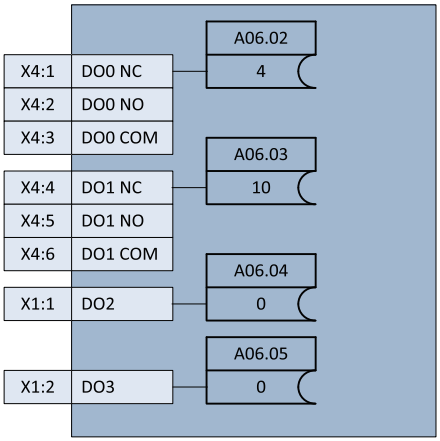


Figure5-4 Changing the function of a digital output

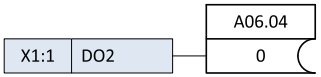
Note:To change the function of a digital output, you must interconnect the digital output with a binector output of your choice.

Table5-2 Function selection table of the inverter digital output

Set values	Meaning	Set value	Meaning
0	Low level	6	Negative speed
1	High level	7	Zero speed operate
2	Ready to start	8	Over speed
3	Allowed to operate	9	Alarm
4	In operation	10	Fault
5	Comparison value arrived	Other: binary interconnection parameters	

Note: For detailed interconnection parameters, please refer to Section 9.7

Changing the function of a digital output – Example



Connect DO2 with the brake open (P01.58) interconnection parameter to represent the current state of the brake relay by digital output DO2. Laser paper A06.04 = 1158.

5.1.1.3 Analog input

Summary

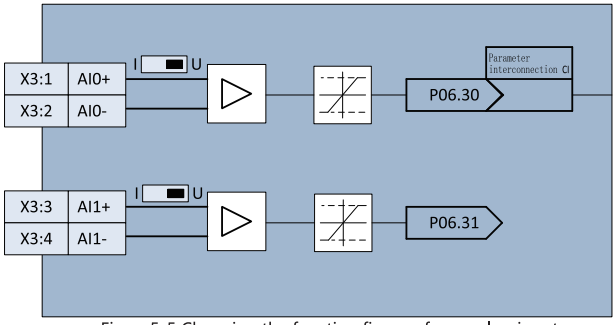


Figure5-5 Changing the function figure of an analog input

Changing the function of an analog input:

1.Define the analog input type using parameter A07.04 and A07.05, and the switch on the inverter.

2.You define the analog input function by interconnecting parameter P06.30 or P06.31 with a connector input CI of your choice.

Note: Connector inputs are marked with "CI" in the parameter list of the List Manual.

Defining the type of an analog input

A07.04	AI0 input type	0:–10~10V 1:0~10V 2:–20~20mA 3:0~20mA 4:4~20mA
A07.05	AI1 input type	0:–10~10V 1:0~10V 2:–20~20mA 3:0~20mA 4:4~20mA

In addition, you must set the switch belonging to the analog input.

You can find the switch on the Control Module behind the lower front door.

- Voltage input: Switch position U (factory setting)
- Current input: Switch position I

Characteristics curve

If you change the analog input type , then the inverter automatically selects the appropriate scaling of the analog input. The linear scaling characteristic is defined using two points. Parameters A07.06 ~ A07.09 correspond to AI0 analog input;Parameters A07.10~ A07.13 correspond to AI1 analog input.

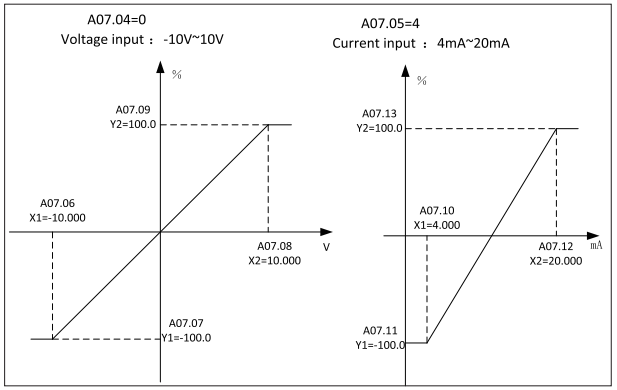


Figure 5-6 Examples for scaling characteristics

Parameter number	Parameter name	Parameter setting range
A07.06	AI0 curve minimum input value	–20.000 ~ 20.000
A07.07	AI0 curve minimum input ratio	–600.0% ~ 600.0%
A07.08	AI0 curve maximum input value	–20.000 ~ 20.000
A07.09	AI0 curve maximum input ratio	–600.0% ~ 600.0%
A07.10	AI1 curve minimum input value	–20.000 ~ 20.000
A07.11	AI1 curve minimum input ratio	–600.0% ~ 600.0%
A07.12	AI1 curve maximum input value	–20.000 ~ 20.000
A07.13	AI1 curve maximum input ratio	–600.0% ~ 600.0%

Set the following parameters and set the analog input as the current input with monitoring:

1. Set A07.24 = 01 to enable the disconnection monitoring function of AI0.
2. Set A07.20 = 4.000 and set the disconnection judgment threshold of AI0 disconnection monitoring.
3. Set A07.06= 6.000 (X1)
4. Set A07.07= –100.0 (Y1)
5. Set A07.08= 12.000 (X2)
6. Set A07.09 = 100.0 (Y2)

5.1.1.4 Analog output

Summary

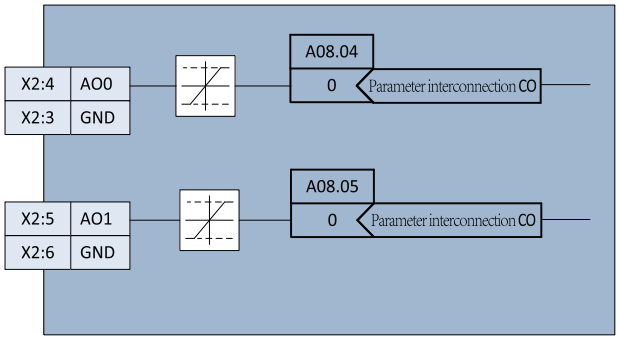


Figure5-7 Changing the function figure of an analog output

Changing the function of an analog output:

1.Define the analog output type usingparameter A08.06 or A08.07.
2.Interconnect parameter A08.04 or A08.05 with a connector output of your choice.

Defining the analog output type

The inverter offers a series of default settings, which you can select using parameter A08.06 or A08.07:

A08.06	AO0 output type	0:0~10V 1:0~20mA 2:4~20mA
A08.07	AO1 output type	0:0~10V 1:0~20mA 2:4~20mA

Characteristic curve

After modifying the type of analog output, the driver will automatically adjust the calibration of analog output. The linear calibration curve is determined by parameters a08.08 ~ a08.11 or a08.12–a08.15.

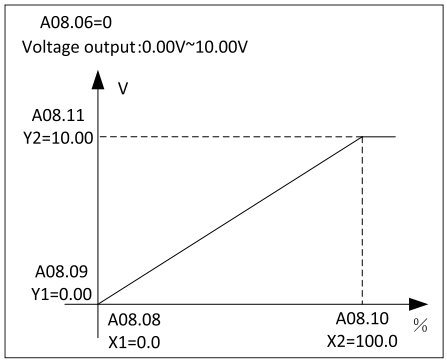


Figure 5-8 Examples for scaling characteristic

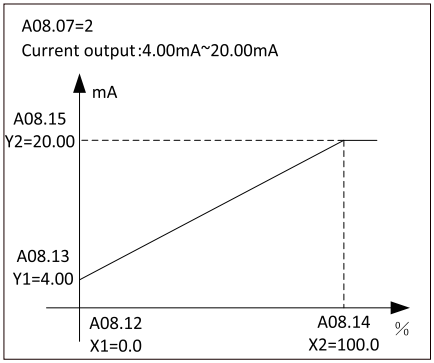


Figure 5-8 Examples for scaling characteristic

Table 5-3 Parameters for the scaling characteristic

Parameter number	Parameter name	Parameter setting range
A08.08	AO0 curve minimum input ratio	–600.0% ~ 600.0%
A08.09	AO0 curve minimum input value	0.00 ~ 20.00
A08.10	AO0 curve maximum input ratio	–600.0% ~ 600.0%
A08.11	AO0 curve maximum input value	0.00 ~ 20.00
A08.12	AO1 curve minimum output ratio	–600.0% ~ 600.0%
A08.13	AO1 curve minimum output value	0.00 ~ 20.00
A08.14	AO1 curve maximum output ratio	–600.0% ~ 600.0%
A08.15	AO1 curve maximum output value	0.00 ~ 20.00

5.1.1.5 High speed pulse input

Summary

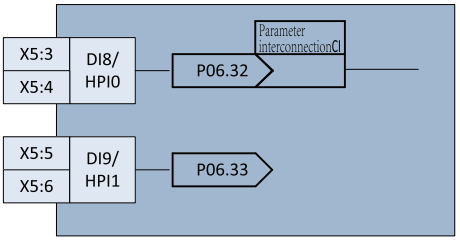


Figure 5-9 Examples for scaling characteristic

Using the function "probe" ("pulse sequence") driver, the digital quantity can be input to terminals D18 and D19.The pulse signal on is converted into analog signal. The driver can detect signals in the range of 10.00khz ~ 500.00khz.

Change the function of high–speed pulse input:

1. Use parameters a09.04 and a09.05 to determine that the current terminal is used as pulse input port.
2. To determine the function of analog output terminal, you only need to connect the analog interconnection input CI you selected with parameter p06.32 or p06.33.

Determine high speed pulse input function selection

Parameter number	parameter name	parameter setting range
A09.04	Function selection of DI8 as HPI0 pulse input	0:invalid 1:valid
A09.05	Function selection of DI9 as HPI1 pulse input	0:invalid 1:valid

Characteristics

After enabling the high–speed pulse input function, the driver will automatically adjust the calibration of the high–speed pulse input. The linear calibration curve is determined by two points. Parameters a09.06 – a09.09 correspond to an hpio analog input; Parameters a09.10–a09.13 correspond to an hpi1 analog input. The following figure takes hpio as an example.

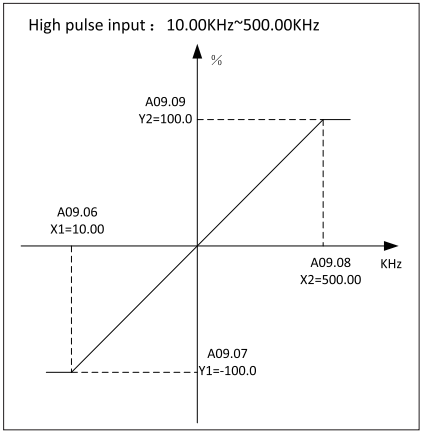


Figure 5-10 Examples for scaling characteristic

5.1.2 Control the driver through digital input (DI)

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

Single line control

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

5.1.3 Two wire control, method 1

In this control method, you can control the start and stop of the motor through one control command (on / off1) and the forward and reverse rotation of the motor through another control command.

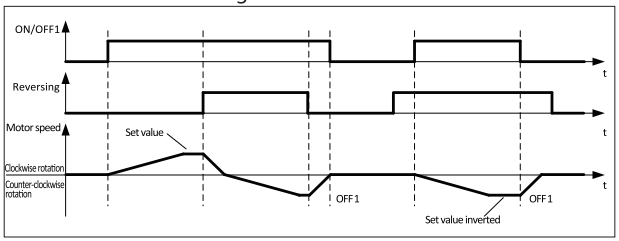


Figure 5-11 Two-wire control: method 1

Related parameter settings

Parameter number	Parameter name	Parameter description
B01.00	Terminal control command 1/2 selectionc	Select terminal start / stop effective module
B01.01	Terminal control command 1 mode	Select the terminal control mode of the electronic start / stop effective module 1. B01.01 = 2 means two–wire control. Method 1
B01.03	Terminal control command 1 input 1	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.04	Terminal control command 1 input 2	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.06	Terminal control command 2 mode	Select the terminal control mode of the electronic start / stop effective module 2. B01.06 = 2 means two–wire control. Method 1
B01.08	Terminal control command 2 input 1	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.
B01.09	Terminal control command 2 input 2	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.

5.1.4 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 on and off the motor and select the reverse rotation of the motor.

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

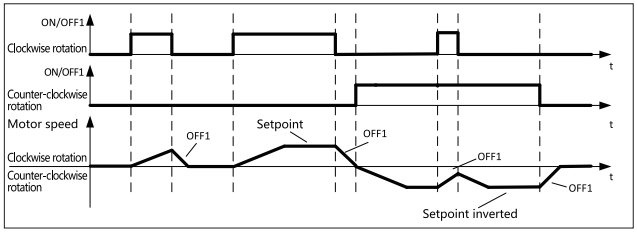


Figure 5-12 Two-wire control: method 2

Related parameter settings

Parameter number	Parameter name	Parameter description
B01.00	Terminal control command 1/2 selectionc	Select terminal start / stop effective module
B01.01	Terminal control command 1 mode	Select the terminal control mode of the electronic start / stop effective module 1. B01.01 = 2 means two–wire control. Method 1.
B01.03	Terminal control command 1 input 1	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.04	Terminal control command 1 input 2	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.06	Terminal control command 2 mode	Select the terminal control mode of the electronic start / stop effective module 2. B01.06 = 2 means two–wire control. Method 1
B01.08	Terminal control command 2 input 1	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.
B01.09	Terminal control command 2 input 2	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.

5.1.5 Two wire control, method 3

In this control method, the first control instruction is used to enable another control instruction. Cancel. When enabled, the motor turns off (OFF1).

The rising edge of the second control command will operate the motor; The operate direction of the motor depends on the wiring phase sequence at the output end of the driver.

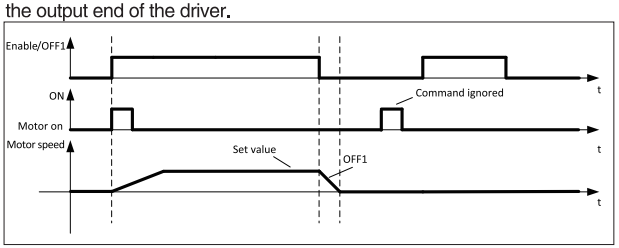


Figure 5-13 Two-wire control: method 3

Related parameter settings

Parameter number	Parameter name	Parameter description
B01.00	Terminal control command 1/2 selectionc	Select terminal start / stop effective module
B01.01	Terminal control command 1 mode	Select the terminal control mode of the electronic start / stop effective module 1. B01.01 = 4 means two–wire control. Method 3
B01.03	Terminal control command 1 input 1	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.04	Terminal control command 1 input 2	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.06	Terminal control command 2 mode	Select the terminal control mode of the electronic start / stop effective module 2. B01.06 = 4 means two–wire control. Method 3
B01.08	Terminal control command 2 input 1	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.
B01.09	Terminal control command 2 input 2	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.

5.1.6 Three wire control, method 1

In this control method, the first control command is used to enable the other two control commands.
After enabling is cancelled, the motor is turned 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.

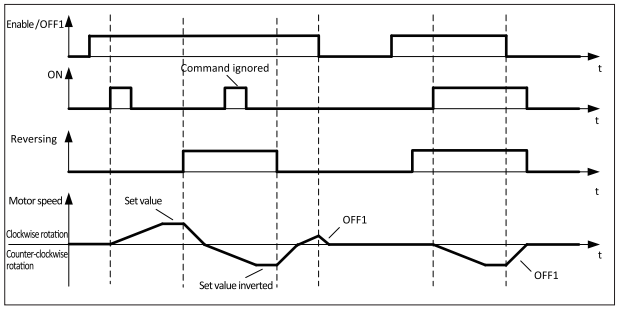


Figure 5-14 Three-wire control: method 1

Related parameter settings

Parameter number	Parameter name	Parameter description
B01.00	Terminal control command 1/2 selection	Select terminal start / stop effective module
B01.01	Terminal control command 1 mode	Select the terminal control mode of the electronic start / stop effective module 1. B01.01 = 5 means three–wire control. Method 1
B01.03	Terminal control command 1 input 1	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.04	Terminal control command 1 input 2	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.05	Terminal control command 1 input 3	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.06	Terminal control command 2 mode	Select the terminal control mode of the electronic start / stop effective module 2. B01.06 = 5 means three–wire control. Method 1
B01.08	Terminal control command 2 input 1	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.
B01.09	Terminal control command 2 input 2	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.
B01.10	Terminal control command 2 input 3	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.

5.1.7 Three wire control, method 2

In this control method, the first control command is used to enable the other two control commands.

After enabling is cancelled, the motor is turned off (OFF1).

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

If the motor is in the last on state, the motor will be turned on.

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

If the motor is in the last on state, the motor will be turned on.

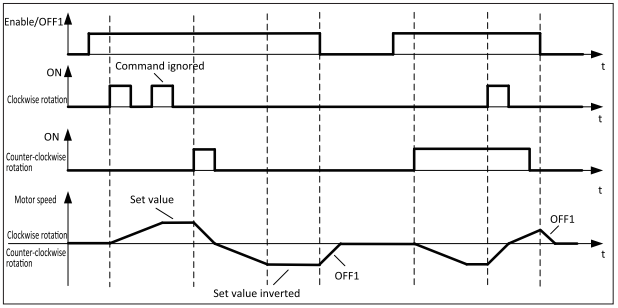


Figure 5-15 Three-wire control: method 2

Related parameter settings

Parameter number	Parameter name	Parameter description
B01.00	Terminal control command 1/2 selection	Select terminal start / stop effective module
B01.01	Terminal control command 1 mode	Select the terminal control mode of the electronic start / stop effective module 1. B01.01 = 6 means three–wire control. Method 2
B01.03	Terminal control command 1 input 1	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.04	Terminal control command 1 input 2	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.05	Terminal control command 1 input 3	Select the terminal source of the terminal start / stop valid module 1. This parameter is a binary interconnection parameter.
B01.06	Terminal control command 2 mode	Select the terminal control mode of the electronic start / stop effective module 2. B01.06 = 6 means three–wire control. Method 2
B01.08	Terminal control command 2 input 1	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.
B01.09	Terminal control command 2 input 2	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.
B01.10	Terminal control command 2 input 3	Select the terminal source of the terminal start / stop valid module 2. This parameter is a binary interconnection parameter.

5.1.8 Motor inching (JOG function)

The "Jog" function is typically used to slowly move a machine part, e.g. a conveyor belt. With the "Jog" function, you switch the motor on and off using a digital input. When the motor is switched on, it accelerates to the jogging setpoint. There are two different setpoints available, e.g. for motor counter-clockwise rotation and clockwise rotation.
The differences of JOG acceleration and deceleration time and ON/OFF1 command depend on setpoints of other parameters.

Jog setting related parameters

Parameter number	Parameter name	Parameter description
B00.00	Start–stop control command source	Select the resource module of control command
B00.07	Custom JOG1 source	Set JOG1 command source of custom control module
B00.08	Custom JOG2 source	Set JOG2 command source of custom control module
B01.11	Source of terminal control module JOG1	Set command source of terminal control module JOG1
B01.12	Source of terminal control module JOG2	Set command source of terminal control module JOG2
B03.00	JOG1 given setpoint	Select the source of JOG1 setpoint
B03.01	JOG2 given setpoint	Select the source of JOG2 setpoint
B03.02	JOG ramp–up time	Set JOG ramp–up time
B03.03	JOG ramp–down time	Set JOG ramp–down time

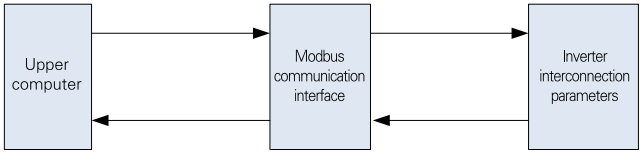
5.1.9 Communication control

At present, the inverter supports Modbus communication and ProfiBus-DP communication.

5.1.9.1 Modbus communication control

See Appendix for specific Modbus communication protocol.

The specific structure of Modbus communication is as follows:



Communication address of Modbus Communication:

Postal address	Name	Definition
0xE720	Modbus communication control command	1: Start up; 2: JOG operation; 3: Free parking; 4: Slow down and stop; 5: Fault reset
0xE721	Modbus Communication set value 1	Modbus communication set value; Setting range: – 600.0% ~ 600.0%
0xE722	Modbus Communication set value 2	Modbus communication set value; Setting range: – 600.0% ~ 600.0%

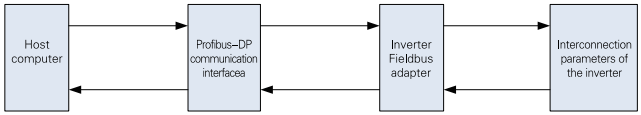
Modbus communication related parameters

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	Parameter setting range (8–E–1) 1: Odd check (8–O–1) 2: No check (8–N–2) 3: 8–N–1
C02.02	Modbus native address	1~255
C02.03	Modbus reply delay	0~20ms
C02.04	Modbus Communication timeout	0: Invalid 0.1s~60.0s
C02.05	Modbus communication base value	0~65535
P02.32	Modbus communication start stop command	0~1
P02.33	modbus communication jog 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 value 1	0~65535
P07.34	Modbus communication set value 2	0~65535
P07.35	Modbus Communication set value 1 per unit	0~65535
P07.36	Modbus Communication set value 2 per unit	0~65535

5.1.9.2 PROFIBUS-DP communication control

See Appendix for details of Profibus-DP communication protocol.

TThe specific structure of Profibus–DP communication is as follows:



5.1.10 Control word and status word

Control word

Bit	Definition	Explain
0	0=OFF1	The motor is braked according to the deceleration time of the ramp function generator. When the static state is reached, the drive turns off the motor.
	0 → 1 = ON	When bit2, bit3 and bit4 are all 1, the drive enters the "operate" state.
1	0=OFF2	Turn off the motor immediately and stop inertia.
	1 = OFF2 not effective	The motor can be switched on (ON command).
2	0 = Quick stop	The quick stop motor is braked according to OFF3 deceleration time until it reaches static state.
	1 = Fast stop invalid	The motor can be switched on (ON command).
3	0 = Operation prohibited	Switch off the motor immediately
	1 = Enable operation	Turn on the motor
4	0 = Block ramp function generator; Driver The driver sets the output of the ramp function generator to 0	Set the output of the ramp function generator to 0
	1 = Do not block the slope	Allow ramp function generator 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 set value	The motor is braked according to the deceleration time of the ramp function generator.
	1 = Enable set volue	The motor increases to the speed setting value according to the acceleration time.
7	0 → 1 = Reset fault	Reset fault. If the on command is still present, the drive advances Enter the "power on blocking" state; The fault still exists and the reset command is invalid.
8	1 = Jog operation command 1	Jog command to turn on the motor
9	1 = Jog operation command 2	
10	0 = Not controlled by PLC	The driver ignores process data from the fieldbus. PROFIBUS –– valid under DP communication.
	1 = Controlled by PLC	Controlled by the fieldbus, the driver will use the process data from the fieldbus.
11	1 = Commutation	Take the set value in the reverse drive.
12	1 = Electric potentiometer increase	Increase the set value stored in the electric potentiometer.
13	1 = Electric potentiometer reduction	Reduce the set value stored in the electric potentiometer.
14	1=Produce external fault	External signal failure, drive shutdown
15		

Status word

Tag number	Definition	Explain
0	1 = Ready for startup	The power is on and the drive is in the pre operate state
1	1 = Operation preparation	The motor has been connected (ON / OFF1 = 1) and there is no fault at present. After receiving the "operate enable" command, the driver will turn on the motor.
2	1 = Operation enabled	The drive is currently allowed to operate
3	1 = Fault	There is a fault in the drive
4	1 = OFF2 not active	Inertia stop function is not active.
5	1 = OFF3 not active	Quick stop is not active.
6	1 = On inhibit valid	It is currently in the power on blocking state. You can exit the current state only when OFF1 = 0 and OFF2, OFF3 and operation permission are all 1
7	1 = Alarm occurs	The motor remains on and no response is required.
8	1 = The speed difference is within tolerance.	The "set / actual" difference is within tolerance
9	1 = Local control request control	Request the automation system to control the drive.
10	1 = Comparison speed reached or exceeded	The speed is greater than or equal to the maximum speed
11	1 = Current limit or torque limit reached	Reach or exceed the comparative value of current or torque.
12	1 = Holding brake open	Signal for opening / closing the motor holding brake.
13	1 = Motor forward rotation	Drive internal actual value > 0.
14	Reserve	
15		

5.2 Set value

5.2.1 Summary

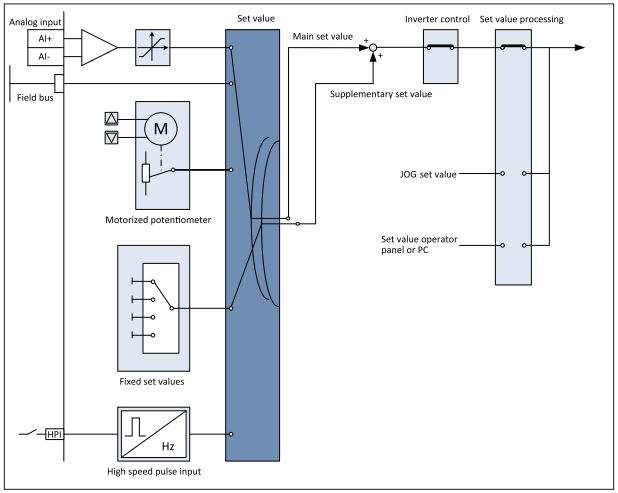


Figure 5-19 Set value processing for the driver

The source of the master set value can be:

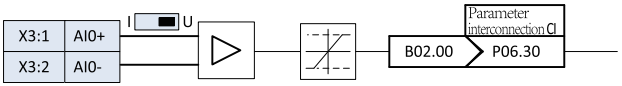
- Analog input of driver
- Field bus interface of driver
- Fixed settings stored in the drive
- High speed pulse input of driver

The above source can also be the source of auxiliary setting value or additional setting value.

5.2.2 Set the analog input to the set value

Interconnected analog input

When you select a standard setting without analog input function, the parameters of the main setting value must be interconnected with an analog input. That is B02.00 select analog quantity interconnection, and then in the expanded parameter list, select P06.30, that is, the conversion result of AI0.



5.2.3 Set the field bus to the set value

Interconnecting the field bus with the main set value

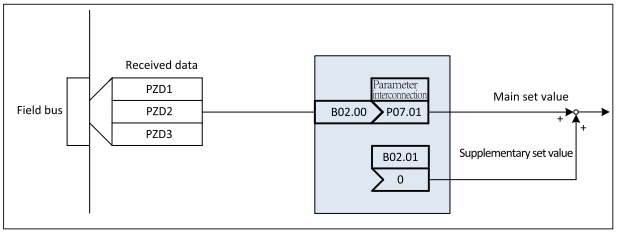


Figure 5-20 Field bus as set value

Most standard telegrams receive the speed set value as a second process data PZD2.

5.2.4 Set the electric potentiometer to the set value

The "Motorized potentiometer" function emulates an electromechanical potentiometer. The output value of the motorized potentiometer can be set with the "higher" and "lower" control signals.

Interconnecting the motorized potentiometer with the set value source.

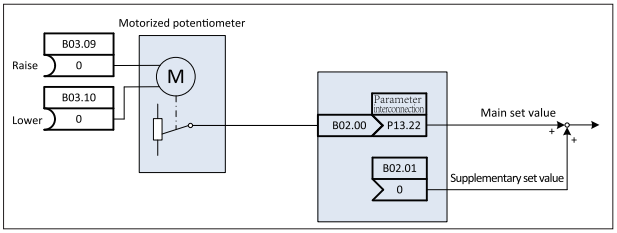


Figure 5-21 Motorized potentiometer as set value

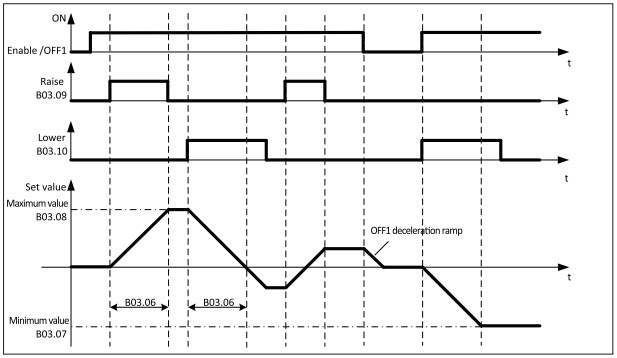


Figure 5-22 Function chart of the motorized potentiometer

5.2.5 Set the multi section speed to the set value

In many applications after switching on the motor, all that is needed is to operate the motor at a constant speed or to switch between different speeds.Example: After it has been switched on,a conveyor belt only operate with two different velocities. Interconnecting the fixed speeds with a main set value.

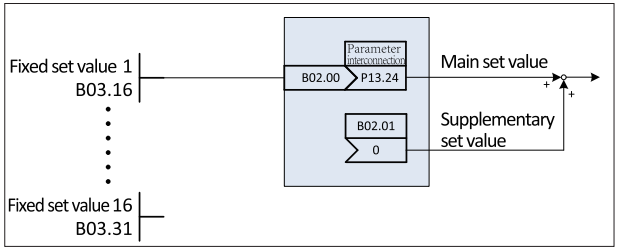


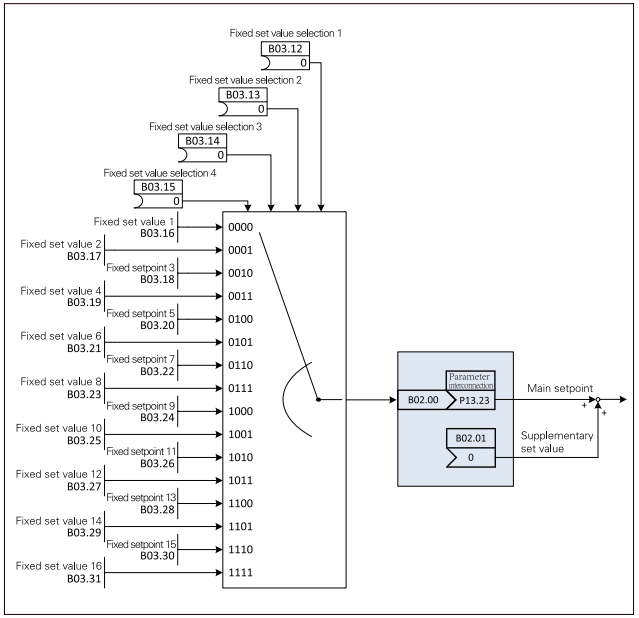
Figure 5-23 Fixed speeds as set value

Table 5-12 Setting the fixed speed as a set value

Parameter	Remark
B02.00=2324（P13.24）	Select main set value of speed resource Interconnecting the main set value with fixed set value 1.

Fixed set value by binary selection

You set 16 different fixed set values. You precisely select one of these 16 fixed set values by a combination of four selection bits.



5.2.6 Set the high-speed pulse input to the set value

Interconnecting the digital input as set value source

Using the "probe" function ("pulse train"), the inverter converts a pulse signal at one of the digital inputs DI8 ⋯ DI9 into an analog signal. The inverter evaluates a signal with a max.
frequency of 500 kHz.

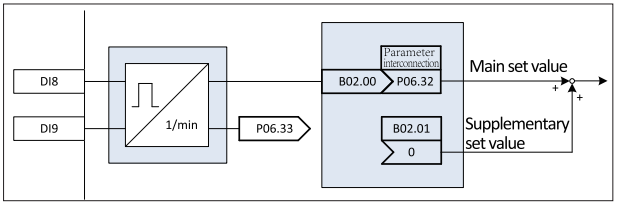


Figure 5-24 Pulse signal of the digital input as set value

It can create an analog value from a pulse train at a digital input of the inverter.

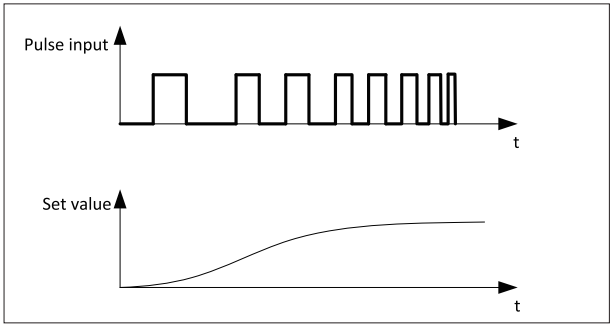


Figure 5-25 Converting the pulse input signal into an analog value

5.3 Set value processing

5.3.1 Set value processing list

●Invert set value to reverse the motor direction of rotation (reversing).
●Inhibit positive or negative direction of rotation, e.g. for conveyor belts, pumps or fans.
●Skip frequency bands to prevent mechanical resonance effects.
The skip frequency band at speed = 0 results in a minimum speed after switching on the motor.
●Limit to a maximum speed to protect the motor and mechanical system.
●Ramp–function generator to accelerate and brake the motor with an optimum torque.

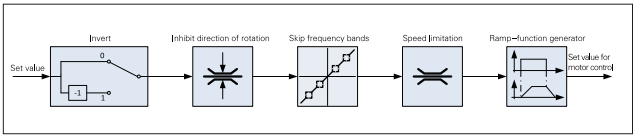
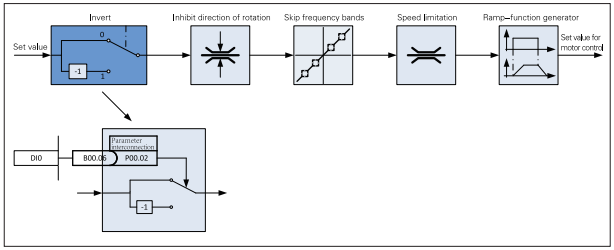


Figure 5-26 Set value processing in the Inverter

5.3.2 Invert set value

The inverter provides an option to invert the set value sign using a bit. As an example, the set value inversion is shown through a digital input.



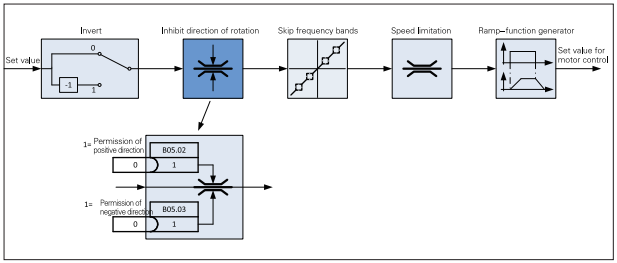
In order to invert the set value through the digital input DI0, connect the parameter B00.06 with a binary signal, e.g. the digital input 0.

Table 5-14 Basic setup of invert the set value

Parameter	Description
Interconnecting B00.06 to P00.02	Invert the set value by DI3 DI3=0,Set value remains unchanged. DI3=1,Inverts the set value.
Interconnecting B00.06 to P02.01	Invert the set value by bit1 of bus adapter A PZD1 P02.01=0,Set value remains unchanged. P02.01=1,Inverts the set value.

5.3.3 Prohibited rotation direction

In the factory setting of the inverter, both motor directions of rotation are enabled.



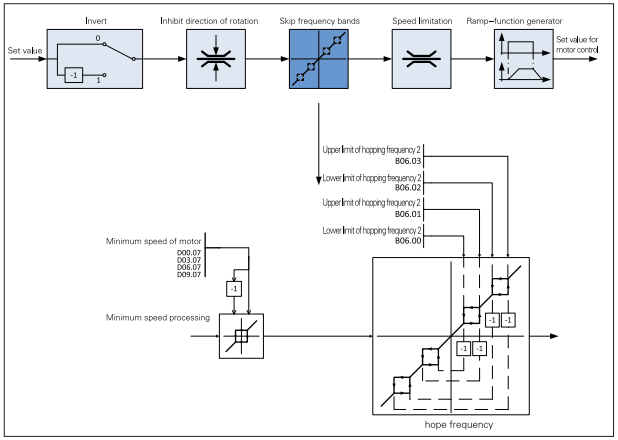
Set the corresponding parameter to a value = 0 to permanently block directions of rotation.

Table 5-15 Examples of settings to inhibit the direction of rotation

Parameter	Remark
B05.02=0	Select permission of positive direction Rotate the motor in the positive direction is inhibited.
B05.03=P00.03	Select permission of negative direction Digital input 1 = 0: Negative direction of rotation is inhibited. Digital input 1 = 1: Negative direction of rotation is enabled.

5.3.4 Suppression band and minimum speed

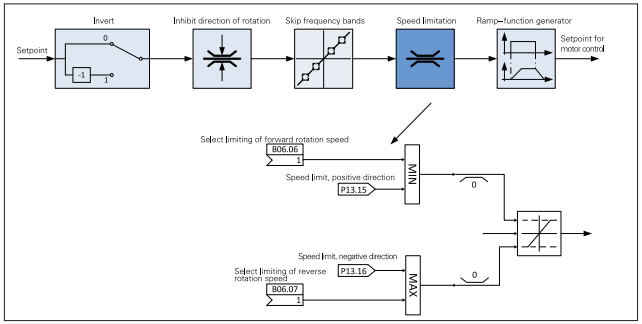
Skip frequency bands
The converter has four skip frequency bands that prevent continuous motor operation within a specific speed range.
Minimum speed
The converter prevents continuous motor operation at speeds < minimum speed. Speeds where the absolute value is less than the minimum speed are only possible during motor operation when accelerating or braking.



NOTICE:
If you are using an analog input as speed set value source, then for a set value = 0 V, noise voltages can be superimposed on the analog input signal. After the on command, the motor accelerates up to the minimum frequency in the direction of the random polarity of the noise voltage. A motor rotating in the wrong direction can cause significant material damage to the machine or system.
● Inhibit the motor direction of rotation that is not permissible.

5.3.5 Maximum speed

The maximum speed limits the speed set value range for both directions of rotation.



The converter generates a message (fault or alarm) when the maximum speed is exceeded. If you must limit the speed depending on the direction of rotation, then you can define speed limits for each direction.

Table 5-16 Parameters for the speed limitation

Parameter	Parameter name
B06.04	Speed limit, positive direction
B06.05	Speed limit, negative direction
B06.06	Select limiting of forward rotation speed
B06.07	Select limiting of reverse rotation speed
D00.06	Maximum speed of motor
D03.06	
D06.06	
D09.06	

5.3.6 Ramp function generator

The ramp function generator in the set value channel is used to limit the rate of change (acceleration) of the speed set value.
Slow acceleration will reduce the acceleration torque of the motor.
In this way, the load of the motor can be reduced and the production equipment can be protected.

- simple ramp function generator
- extended ramp function generator

The extended ramp function generator not only limits the acceleration, but also limits the change of acceleration by rounding the set value. For example, the S curve can realize the smooth start and stop of acceleration and deceleration.

Simple ramp function generator

The simple ramp function generator refers to the time without S–curve (ARC) in the acceleration and deceleration process.

Table5-17 Parameters for setting the basic ramp-function generator

Parameter	Parameter introduction	Parameter name
B04.02	Ramp1 ramp–up time	Accelerating time in seconds from zero speed up to the rated speed
B04.03	Ramp1 ramp–down time	Braking time in seconds from the rated speed down to standstill
B04.04	Ramp2 ramp–up time	Accelerating time in seconds from zero speed up to the rated speed
B04.05	Ramp2 ramp–down time	Braking time in seconds from the rated speed down to standstill
B04.06	Ramp3 ramp–up time	Accelerating time in seconds from zero speed up to the rated speed
B04.07	Ramp3 ramp–down time	Braking time in seconds from the rated speed down to standstill
B04.08	Ramp4 ramp–up time	Accelerating time in seconds from zero speed up to the rated speed
B04.09	Ramp4 ramp–down time	Braking time in seconds from the rated speed down to standstill
B05.33	OFF3 downtime	The quick stop (OFF3) has its own ramp–down time.

Extended ramp-function generator

Initial and final S curves permit smooth, jerk–free acceleration and braking.

- Effective ramp–up time=B04.02+0.5 × (B04.10+B04.11)。
- Effective ramp–down time=B04.03+0.5 × (B04.10+B04.11)。

5.4 Motor control

The driver has three control methods, which can be selected according to the actual needs of different applications

function code	parameter name	Factory default	Set Value 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 frequency command is given, the driver controls the output voltage and controls the motor operation according to the VF characteristic curve. 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 fan and water pump, or one driver with multiple motors, or applications with large difference between driver power and motor power. Vector control mode can be selected in applications with high requirements for speed accuracy.

SVC: that is, open–loop vector control without encoder, which is suitable for common high–performance control occasions. In principle, one driver can only drive –motors, such as machine tools, centrifuges and other loads;

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

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

5.4.1 Motor parameter identification

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

function code	parameter name	Factory default	Set Value range	description
D00.00	Motor type selection	0	0~1	0：Asynchronous motor 1：Permanent magnet synchronous motor
D00.01	Motor rated power	3.7	0.00~655.35kW	Motor nameplate parameters
D00.02	Motor rated voltage	380	0~1500V	
D00.03	Motor rated current	9.00	0.00~655.35A	
D00.04	Motor rated frequency	50.0	0.0~600.00Hz	
D00.05	Motor rated speed	1440	0~65535rpm	
D00.09	Pole pairs of motor	2	0~64	0:Automatic calculation 1~64:Manual setting

When choosing vector control as the motor control mode, accurate motor parameters are required.In order to obtain better motor control

function code	parameter name	Factory default	Set Value range	description
B00.21	Identification request	0	0~3	0：None 1：Simple static identification of asynchronous motor 2：Complete static identification of induction motor 3：Dynamic complete identification of asynchronous motor

The differences among the three parameter identification modes are shown in the table below. Please select according to the actual application

mode	Conditions of use	Identification parameter	description
Simple static identification of asynchronous motor	Motor cannot run	stator resistance	
Complete static identification of induction motor		stator resistance, rotor resistance, Leakage inductance, Mutual inductance,	
Dynamic complete identification of asynchronous motor	Motor can run		Before identification, please make sure that the motor is mechanically separated from the load and there is no danger in operation; 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. Set the basic parameters of group D motor correctly according to the current motor selection
2. Select the parameter identification mode according to the driver control mode, system mechanical status, etc.
3. Press run to start parameter identification. If you want to stop identification in the process, press stop. After identification, the panel will display stop status

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

function code	parameter name	Factory default	Set Value range	description
D01.00	Stator resistance of asynchronous motor	1.667	0.000~65.535ohm	Parameter identification or manual input
D01.01	Rotor resistance of asynchronous motor	1.500	0.000~65.535ohm	
D01.02	Leakage inductance of asynchronous motor	6.540	0.00~655.35mH	
D01.04	No-load current of asynchronous motor	4.00	0.00~655.35A	

5.5.2 V / F control

5.5.2.1 V / F curve

The driver can select the VF characteristic curve according to different load characteristics. The following parameters are only valid when the control mode is VF

function code	parameter name	Factory default	Set Value range	description
B07.00	VF mode selection	0	0~1	0：VF curve 1：VF separation
B07.01	VF curve selection	0	0~3	0：Line VF 1：Multi point VF 2：Square VF 3：The 1.5 power VF

0：Line VF，Suitable for applications where torque does not depend on speed, such as ordinary constant torque load

1：Multi point VF，Suitable for special loads such as dehydrators and centrifuges

2：Square VF，Suitable for occasions where the required torque increases with the speed, such as centrifugal loads such as fans and pumps

3：The 1.5 power VF，Between line VF and square VF curves

VF curve as shown in the figure

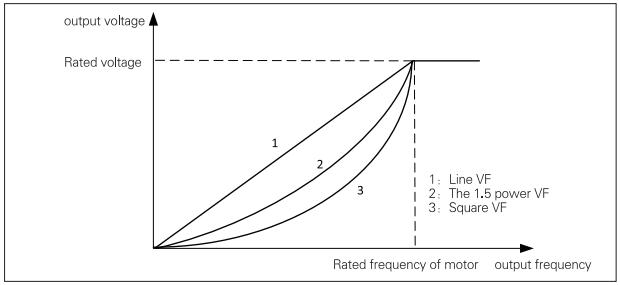


Figure 5-27 VF curve

The multi-point VF curve is defined by parameters B07.02-B07.07, which must be satisfied when setting the curve: 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 run normally. Setting the voltage too high at low frequencies may cause the motor to overheat or even burn, and the driver may report an overcurrent fault.

function code	parameter name	Factory default	Set Value range	description
B07.02	Multipoint VF curve frequency point 1	2	0.0~B07.04	Select the frequency of the multi-point VF
B07.03	Multi-point VF curve voltage point 1	20	0.0~B07.05	Select the voltage of the multi-point VF
B07.04	Multipoint VF curve frequency point 2	20	B07.02~B07.06	Select the frequency of the multi-point VF
B07.05	Multi-point VF curve voltage point 2	152	B07.03~B07.07	Select the voltage of the multi-point VF
B07.06	Multipoint VF curve frequency point 3	40	B07.04~D00.04	Select the frequency of the multi-point VF
B07.07	Multi-point VF curve voltage point 3	304	B07.05~380.0	Select the voltage of the multi-point VF

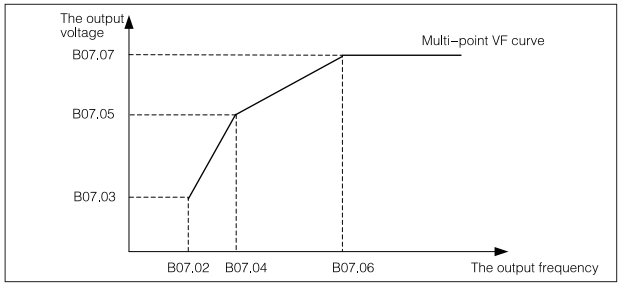


Figure5–28 Multi–point VF curve

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

function code	parameter name	Factory default	Set Value range	description
B07.08	VF separation voltage setting	0	0~10	0:00 1:100.0% 2:AI1 3:AI2 4:HPI1 5:HPI2 6:Multi segment value setting 7:Electric potentiometer 8:Retain 9:Bus adapter A process data 2 10:Bus adapter B process data 2 others:Analog interconnection parameters
B07.09	VF separation voltage change time	10	0.0s~1000.0s	Select the change time of VF separation voltage

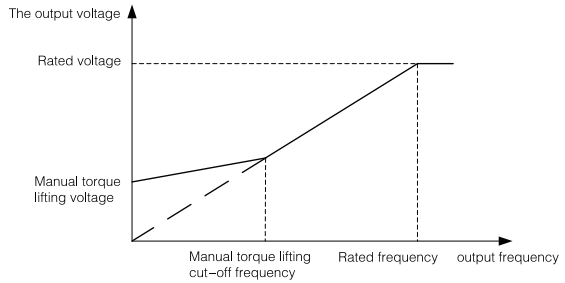
5.4.2.2 Torque lifting

Torque lifting: compensation VF control low–frequency torque characteristics, by increasing the driver output voltage to increase the output torque.

When the load is large and the starting torque is not enough, the value of b07.15 can be increased properly. When the load is small, the value can be reduced properly. 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 the setting value with 1% as the step value. 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 default	Set Value range	description
B07.13	VF torque lifting modea	1	0~1	0:Disabled 1:Manual
B07.15	VF manual torque lifting	1	0%~50%	The lifting voltage is the percentage of the rated voltage of the motor
B07.16	VF torque lifting cut–off frequency	50	0.00~50.00	When the frequency setting is greater than this value, the torque lifting is invalid

Note: In the state of multi–point VF, VF separation, parameter identification, and speed tracking, torque lifting is invalid.



5.4.2.3 Oscillation suppression

The VF oscillation suppression function is turned off by default, and it needs to be turned on only when there is obvious oscillation in the VF operation of the motor. The larger the oscillation suppression gain, the more obvious the suppression effect. However, if the value is too large, it may adversely affect normal operation. You should choose a smaller value within the range of the value that can effectively suppress the oscillation.

function code	parameter name	Factory default	description
B07.20	VF oscillation suppression mode	0	0: invalid 1: valid
B07.21	VF oscillation suppression gain	20	

5.4.3 Vector control

The performance of vector control is susceptible to motor parameters. Obtaining accurate motor parameters is the key to achieving high–performance vector control. In order to obtain good driving performance and operating efficiency, the parameter of the controlled motor must be identified first, and it can be entered manually when the accurate motor parameters are known. Inaccurate motor parameters may cause the motor to malfunction.

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

function code	parameter name	Factory default	Set Value range	description
D02.00	Encoder type	0	0~2	0: Invalid type 1: ABZ encoder 2: Rotary encoder
D02.01	Input AB phase sequence	0	0~1	0:Forward 1:Reverse
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 driver detects that the encoder is disconnected and the duration exceeds this value, it will report the encoder fault
D02.17	Encoder power selection	0	0~1	0:5V 1:24V

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

5.5 Protect function

5.5.1 Over current protect

The Current of motor is always within the set torque limit in vector control.

The Torque Limit Value can not be set when use V/F control.V/F control mode protects the motor over load from limiting the frequency and voltage of motor(Imax controler).

Imax Controller

The current of motor is limited by the value of torque limit when using vector control,the current of motor is limited by adjusting the output frequency when using VF control.If the current over the set limit value while acceleration ,Imax controller will work,and the output frequency would be deceleration automatically to make the current stay within the set value,thus the actual acceleration time increased.If Imax controller works while deceleration,then rising the output frequency and thus the actual deceleration time increased.The actual procedure as the picture below:

Chart 5-19 Imax Controller parameters

Function code	Parameter name	Default	Description
B07.10	Imax control enable	0	0：invalid 1：valid
B07.11	Imax the gain of control frequency	30	The larger the gain adjustment, the faster the frequency adjustment,the actual acc time shorter.
B07.12	Imax inhibition point	150%	Imax control starting action current point, percentage of reference bus voltage

Note:if the over current trouble is easy to occur even open this function,then the parameter B07.12 should be decreased or increased the B01.11 properly.

5.5.2 Over voltage suppression of DC bus voltage

●Over voltage protection of motor and driver

When the motor decelerates rapidly, the bus voltage rises rapidly,after exceeding the set threshold, VDC_ max controller takes effect. In vector control, the output frequency is adjusted by limiting the maximum output torque; During VF control, directly adjust the output frequency, extend the actual deceleration time, reduce the electric energy fed back to the bus, and maintain the bus voltage at about the set value.

Chart5-20 Vdc_max Controller parameters

Function code	Parameter name	Default Value	Description
B07.28	Vdc_max control switch	0	0：disable 1：enable
B07.29	Vdc_max voltage margin	125%	Vdc_max Control starting action voltage point, percentage of reference bus voltage

Note:
1)If the over voltage trouble is easy to occur even open this function,then the parameter B07.29 should be decrease properly. (Vdc_max voltage margin)
2)The controller is not suitable for the application of the motor to output the regenerated electric energy for a long time,Such as:Crane application or braking of large swinging objects

5.5.3 DC bus under voltage inhibition

The undervoltage inhibition function can make use of the kinetic energy of the load to make the driver continue to work as much as possible, and control the motor to run at a regular frequency reduc–tion.When the bus voltage drops to the setting thread,Vdc_min controller valid,the driver decrease the output frequency automatically,make the motor work in generator mode,the electrical power feed back to the DC bus,thus make the bus voltage stay in the setting value.When the power resumed,the driver resume the operation state before loss power.

Chart 5-21 Vdc_max controller parameter

function code	Name of parameter	default value	description
B07.34	Vdc_min control switch	0	0：disable 1：enable
B07.35	Vdc_min Voltage regulation gain coefficient	85%	Vdc_min Control starting action voltage point, percentage of reference bus voltage

Note:
If the under voltage trouble is easy to occur even open this function,then the parameter B07.35 should be increased properly.

5.6 Application features

5.6.1 Speed tracking

When the motor of the actuator starts, the motor may rotate for some reasons, such as the rotation of the fan due to the wind and the rotation of the motor due to the drive of the large inertia load after the halt. It is easy to cause over–current fault when the actuator starts directly from OHz because the difference between the output frequency and the actual frequency of the motor is too large. 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 instructions, the actuator judges the rotation direction of the motor, injects current (the set value of speed tracking current) into the motor, and searches downward from the set starting frequency. When the starting frequency is the halt frequency, the search speed is the fastest. After the current motor speed is searched, the motor will smoothly transition to the normal operation mode and reach the set frequency after the switching waiting time.

Table 5-22 Parameter settings related to speed tracking

Function code	Parameter name	Factory default	Description
B05.13	Speed tracking mode	0	0: Speed tracking off 1: Search from halt frequency 2: Search from rated frequency 3: Search from maximum frequency
B05.14	Search time of speed tracking	25.0s	Time for frequency reduction from 50Hz to 0Hz
B05.15	Current percentage of speed tracking	50%	Speed search current,Percentage of rated motor current
B05.16	Minimum frequency limit of speed tracking	2Hz	Direct start at less than this frequency, Speed tracking does not work
B05.17	Waiting time for speed tracking switching	250ms	Waiting time for switching speed tracking mode to normal operation mode

Note: Please reduce the search time if it is too long. Please increase the search time appropriately if there is over–current or over–voltage fault during the search process.

5.6.2 Motor holding brake

The motor holding brake holds the motor in position when it is switched off. If the setting is correct, the motor will produce an electrical holding torque before the inverter opens the brake.

The inverter does not close the motor holding brake until the motor is at a standstill.

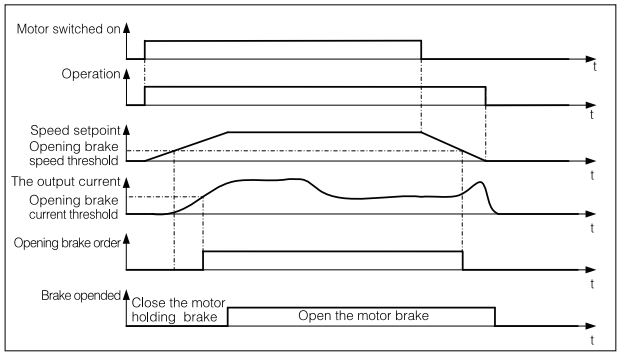


Figure 5-34 Motor holding brake opening sequence diagram

Function after an ON command:

1.With the ON command, the drive send OFF1—ON operate command.

2.The inverter speed set value is greater than opening brake speed threshold and the actual output current is greater than opening brake current threshold, the inverter issues the command to open the brake.

3.The inverter keeps the motor at the speed of brake opening until the "pause time of holding brake opening speed" has ended.

4.The inverter accelerates the motor to the speed set value.

Function after an OFF1 or OFF3 command:

1. The inverter brakes the motor down to a standstill and switches it off using the OFF1 or OFF3 command.

2. When braking, if the inverter speed set value is less than the brake closing speed threshold, the the inverter issues the command to close the brake.

3.The inverter keeps the motor at the speed of brake closing until the pause time of the brake closing speed(F04.16) has ended.

4.The inverter will close the motor.

Function after an OFF2 command

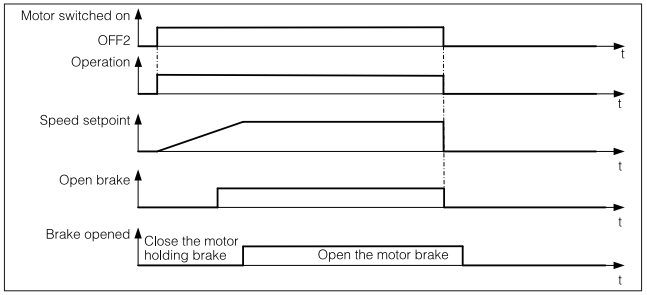


Figure 5-35 Controlling the motor holding brake after OFF2

After an OFF2 command, the inverter issues the signal to immediately close the motor holding brake, irrespective of the motor speed.

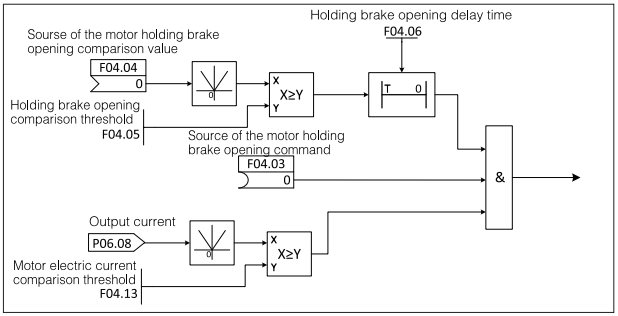


Figure 5-36 Holding brake opening determining function diagram

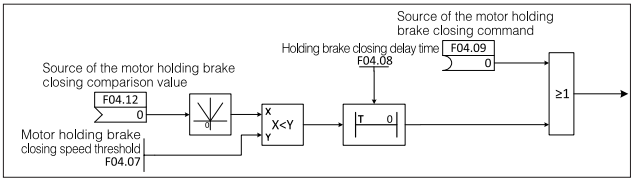


Figure 5-37 Holding brake closing determining function diagram

5.6.3 PID process controller

5.6.3.1 Summary

The technology controller controls process variables, e.g. pressure, temperature, level or flow.

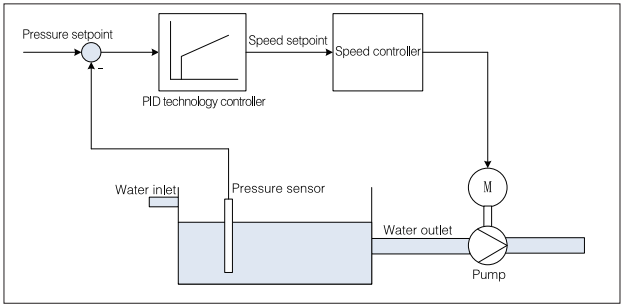
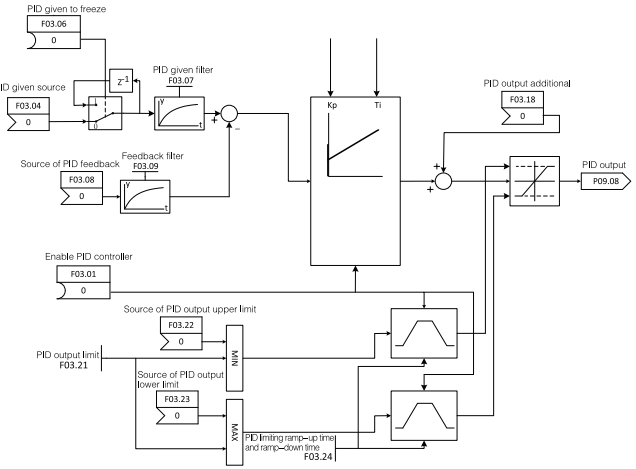


Figure 5-38 Example: Technology controller as a pressure controller

5.6.3.2 Setting the process controller

Simplified representation of the technology controller

The technology controller is implemented as a PID controller (controller with proportional, integral, and derivative action).



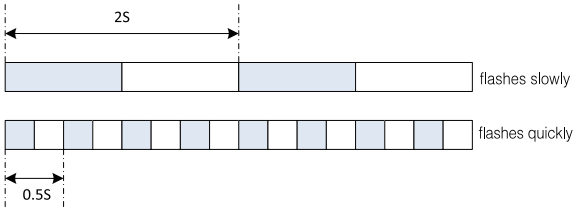
6. Exceptions and system information

6.1 Operation status of LED display

LED RDY(Ready)is always on after the inverter is powered on. When LED RDY turns to red or green,it shows the states of the inverter.

LED states

LED has 2 different flash frequency except ON and OFF:



LED states description	
1	LED is ON
2	LED is OFF
3	LED flashes slowly(2 seconds period)
4	LED flashes quickly(0.5 seconds period)

Table 6-1 inverter LED states

LED		explain
RDY(green and red)	BF(green and red)	
green, ON		inverter is running
green, LED flashes slowly		inverter is ready
green, LED flashes quickly		inverter is blockade
red, ON		error
	red LED flashes slowly	firmware update is active
	red LED flashes quickl	firmware update is over,restart the inverter
	green LED flashes slowly	software is running

6.2 List of faults and warnings

Number	Error name	Error sub-code	Sub-code Explanation	Countermeasures
1	Overcurrent	1	U phase overcurrent	Check the following: 1.If the power cable is broken 2.Power cables for short-circuit fault 3.Increase the acceleration ramp 4. V/f control operation: decrease the torque compensation value 5.motor stops and then start 6. Reduce or remove the load 7.Vector control operation: the parameter identification operates correctly 8.contact the after sale or manufacture for technical support
		2	V phase overcurrent	
		4	W phase overcurrent	
		8	Brake overcurrent	
		9	U phase VCE short-circuit	
		10	V phase VCE short-circuit	
		12	W phase VCE short-circuit	
		15	software overcurrent	
2	Overvoltage	1	DC-link overvoltage during fast detection operation	1. Check the device supply voltage 2. Increase the acceleration ramp time 3.add brake resistor or brake module 4. contact the after sale or manufacture for technical support
		2	DC-link overvoltage during slow detection operation	
3	Undervoltage	1	DC-link undervoltage	1. Check the device supply voltage 2.Check if the line supply transient breakdown 3.contact the after sale or manufacture for technical support
4	Inrush resistor over-temperature	1	Inrush resistor over-temperature	1.check if repeat the power on operation multi-times 2. contact the after sale or manufacture for technical support
5	Inverter overload	1	Inverter overload	1.check the inverter selection is suitable or exchange a larger capacity inverter 2. V/f control operation: decrease the torque compensation value 3. Vector control operation: decrease the torque limitationvalue 4.check if there is an overload situation or motor holding brake is locked. 5. Vector control operation: check the parameter self-learn operates correctly 6.closed-loop control with encoder operation, please confirm the encoder direction and parameter identification are all right. 7. contact the after sale or manufacture for technical support
6	Motor overload	1	Motor overload	1.Confirm the motor load is not too large 2.Vector control operation: the parameter self-learn operates correctly 3..closed-loop control with encoder operation, please confirm the encoder direction and parameter identification are all right. 4.check if there is an overload situation or motor holding brake is locked. 5.Please confirm that the parameter configuration follows the motor type plate correctly 6.Contact the after sale or manufacture for technical support
7	Input line phase lack	1	Line phase lack detection	1. Make sure that the power line cable is connected properly 2.Contact the after sale or manufacture for technical support
8	Output line phase lack	1	Output U phase lack	1.Please check the power line cable is connected properly 2.Make sure the motor runs smoothly and steadily 3.Contact the after sale or manufacture for technical support
		2	Output V phase lack	
		3	Output W phase lack	
		4	FVC control output lack	
		5	3-phase unbalance	
		6	Stator resistor identification lack	
		7	SVC control output lack	

Number	Error name	Error sub-code	Sub-code Explanation	Countermeasures
9	Inverter over-temperature	1	Inverter over-temperature	1.Make sure that if the environment temperature is too high 2.Make sure that if the fan runs properly. 3. Make sure that wind tunnel of the heat sink is not blocked. 4. Contact the after sale or manufacture for technical support
10	PWM wave fault	1	U phase wave fault	1.Shut off the inverter and restart it, if the fault is still exist, please contact the after sale or manufacture for technical support
		2	V phase wave fault	
		4	W phase wave fault	
11	Current zero shift detection fault	1	U phase zero shift is too large	1.PM fault, contact the after sale or manufacture for technical support
		2	V phase zero shift is too large	
12	Ground fault	1	U phase overcurrent ground fault	1. Check the corresponding output phase if there is a short-circuit to ground situation 2..Check if the power cable is broken 3.Contact the after sale or manufacture for technical support
		2	V phase overcurrent ground fault	
		4	W phase overcurrent ground fault	
		5	overcurrent ground fault	
		6	overvoltage ground fault	
13	Motor tuning fault	1	Dynamic motor tuning fault	1.Please confirm that the parameter identification follows the motor type plate correctly 2. Contact the after sale or manufacture for technical support
		2	static motor tuning fault	
14	Encoder fault	1	Closed-loop dynamic tuning with encoder disconnection	1.Please check the encoder line cable is connected properly 2.Please check the encoder line cable is connected stably 3. Please confirm that the parameter configuration of the encoder is correct 4.Check that the encoder power supply is correct 5.Contact the after sale or manufacture for technical support
		2	Closed-loop dynamic tuning with speed measurement not match	
		3	Closed-loop operation with encoder signal line broken	
		9	A phase line broken in ABZ	Check the encoder line connection
		10	B phase line broken in ABZ	
		11	AB phase line broken in ABZ	
		12	Z phase line broken in ABZ	
		13	AZ phase line broken in ABZ	
		14	BZ phase line broken in ABZ	
		15	ALL phase line broken in ABZ	
15	Vector speed loss fault	1	Speed is forced reverse	1.Please confirm that the parameter configuration follows the motor type plate correctly 2.Check the motor parameter self-learn operation is done 3.Please check the parameter setting of the speed loss is correct 4.Contact the after sale or manufacture for technical support
		2	Speed is forced reverse	
16	FPGA data read and write error	1	FPGA data read and write error in initialization process	1.PM fault, shut off the inverter and restart it, if the fault is still exist, please contact the after sale or manufacture for technical support
17	Drive power fault	1	Driver power supply voltage is too low	1. Contact the after sale or manufacture for technical support
18	First-class power fault	1	24V power supply voltage of the first class is too low	1. Contact the after sale or manufacture for technical support
19	CM and PM communication fault	1	CM and PM communication fault	1.Please confirm CM release mechanism is locked. 2. Contact the after sale or manufacture for technical support
		2		
		3		
		4		
20	PM-EEPROM fault	1	PM module EEPROM fault	1.Contact the after sale or manufacture for technical support
21	PM type configuration fault	1	PM type configuration fault	1.Please confirm that the motor type configuration follows the motor type plate correctly 2.Contact the after sale or manufacture for technical support

Number	Error name	Error sub-code	Sub-code Explanation	Countermeasures
22	Wave current limit fault	0	Abnormal fault	1.Confirm the load is suitable 2.Check motor and mechanical condition 3.Confirm the inverter type selection is suitable
		1	U phase current limit fault	
		2	V phase current limit fault	
		3	W phase current limit fault	
23	Rectifier over temperature	1	Rectifier over temperature	1.Make sure that if the environment temperature is too high 2.Make sure that if the fan runs properly. 3. Make sure that wind tunnel of the heat sink is not blocked. 4. Contact the after sale or manufacture for technical support
24	Hardware STO fault	1	Hardware STO fault	1.Please check the STO is enable 2. Please confirm CM release mechanism is locked 3.Contact the after sale or manufacture for technical support
25	Brake over temperature	1	Brake over temperature	1.Check the brake resistor or contact the after sale or manufacture for technical support
33	Inverter pre overload	1	Inverter pre overload alarm	1.Please confirm the pre overload function is enable 2.Contact the after sale or manufacture for technical support
34	Motor pre overload	1	Motor pre overload alarm	1.Please confirm the motor pre overload function is enable 2.Contact the after sale or manufacture for technical support
35	Communication abnormal	1	Background software abnormally disconnection during stating process	1.Please confirm the inverter communication cable connect correctly 2.Contact the after sale or manufacture for technical support
		2	Operation panel software abnormally disconnection during stating process	1.Please confirm the operation panel communication cable connect correctly 2.Contact the after sale or manufacture for technical support
		3	Modbus abnormally disconnection after communication process has been established	1.Please confirm the Modbus communication cable connect correctly 2.Contact the after sale or manufacture for technical support
37	Motor speed over limitation	1	Motor speed over maximum limitation	1.Please confirm the parameter configuration of the speed over limitation is correct 2.Contact the after sale or manufacture for technical support
38	Motor speed deviation is too large	1	Motor actual speed has too large deviation compare to setting speed	1.Please confirm the parameter configuration of the speed deviation is correct 2.Contact the after sale or manufacture for technical support
40	PID feedback missing	1	PID feedback sampling value missing	1.Please confirm the feedback signal 2.Contact the after sale or manufacture for technical support

Number	Name	Error sub-code	Explanation	Remedy
41	External fault	1	External fault 1	1.Check the external input signal
		2	External fault 2	
42	External alarm	1	External alarm 1	
		2	External alarm 2	
43	Pre-drive failure	1	No DC-link voltage is detected after the run order is given	1.Please confirm the line supply voltage is correct 2.Contact the after sale or manufacture for technical support
45	Brake control abnormal	1	Brake open abnormally	1.Please confirm the line supply voltage is correct 2.Contact the after sale or manufacture for technical support
		2	Brake close abnormally	
46	CM voltage abnormal	1	PM 24V voltage is too large	1.Please confirm the external supply voltage is correct 2.Contact the after sale or manufacture for technical support
		2	External 24V voltage is too large	
		3	External 24V or PM 24V voltage is too low	
		4	3.3V voltage is too large	
		5	3.3V voltage is too low	
		6	Brake relay short circuit	
47	Motor over temperature	1	Motor over temperature	1.Reduce the load of motor 2.Check the environment temperature 3.Check the senor layout and connection 4.Contact the after sale or manufacture for technical support
48	Motor over temperature alarm	1	Motor over temperature alarm	
49	AI input line broken	1	AI1 4~20mA input line broken	1.Check the line layout is not disconnected 2.Check the signal voltage 3.Contact the after sale or manufacture for technical support
		2	AI2 4~20mA input line broken	
50	Fan alarm of the capacitor side	1	Fan line broken of the capacitor side	1.Check the fan line of the capacitor side is not disconnected. 2.The fan of the capacitor side is broken, Contact the manufacture for exchanging
51	CM-EEPROM fault	1	CM-EEPROM fault	1.Cut off the inverter and restart. 2.Contact the after sale or manufacture for technical support

7 Technical parameters

7.1 Technical parameters of control module

Allowable length of encoder cable

The allowable length of cable depends on the encoder type and encoder cable

Table 7-1 Maximum cable length

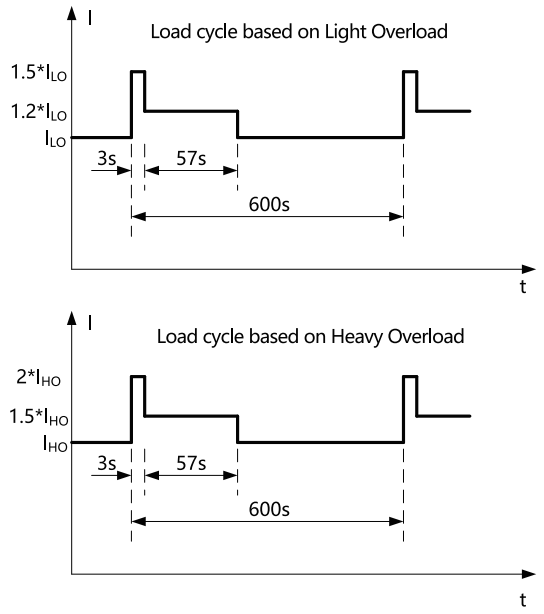
TTL encoder	100m
HTL encoder, with bipolar signal (differential signal)	300m
HTL encoder, with monopole signal	100m

The maximum speed that can be detected by the resolver

Resolver		The maximum speed that can be detected by the resolver	
Number of poles	Number of pole pairs	Pulse frequency = 4KHz = 4KHz	Pulse frequency = 2KHz
2-pole type	1	60000 rpm	30000 rpm
4-pole type	2	30000 rpm	15000 rpm
6-pole type	3	20000 rpm	10000 rpm
8-pole type	4	15000 rpm	7500

7.2 Technical data of the Power Module

Typical inverter load cycles



7.2.1 General technical data of the PM25

Property	Technical data
Line voltage	3AC 380V ~ 480V ± 10%
Output voltage	3AC 0V ~ Output voltag (max)
Input frequency	50Hz ~ 60Hz ± 3Hz
Output frequency	0Hz ~ 600Hz，depending on the control mode
Line impedance	Uk≥1%. For Uk < 1%, we recommend a line reactor, or a Power Module with the next higher power rating.
Inrush current	< LO base load input current
Pulse frequency	● 4 kHz (factory setting)
	● 2kHz ~ 8kHz，Adjustable
rated Short-circuit current	● ≤ 65kA rms
	● Short-circuit current with fuses
Electromagnetic compatibility	Inverters with integrated filter are suitable for operation in the second environment, Category C2.
According to IEC/EN 61800-3	
Braking methods	DC braking, compound braking, dynamic braking with integrated braking chopper
Degree of protection	IP20,Install built-in a control cabinet
According to EN60529	
ambient temperature	● For operation according to Low Overload without current Derating:-10 ℃ ~ +40 ℃
	● For operation according to High Overload without current Derating:-10 ℃ ~ +50 ℃
	● For operation according to Low/High Overload with current Derating:-10 ℃ ~ +50 ℃
storage temperature	-40℃ ~ +70℃
According to 60721-3-3	
Cooling air	Clean and dry air
Relative humidity	<95%，No condensation allowed
Pollution	Suitable for environments with degree of pollution 2
According to EN61800-5-1	
Installation altitude	● Up to 1000 m above sea level without limitations
	● At installation altitudes between 1000 m and 4000m the permissible inverter output current is reduced

7.2.2 Power technical data of PM25

Line voltage 380V...480V 3AC

Line voltage 380 ... 480 V 3AC			
Technical data		A1–PM25–B3A75	A1–PM25–B3B15
rated output power	LO base load output power(KW)	–	1.5
	HO base load output power(KW)	0.75	1.1
rated input current	With Line reactor (A)	2.3	4.3
	Without Line reactor(A)	2.6	4.9
rated output current	LO base load output current(A)	–	4.1
	HO base load output current(A)	2.2	3.1
rated pulse frequency (kHz)		4	4
efficiency η		> 0.95	> 0.95
power lost(kW)		0.1	0.1
Noise emission db (A)		< 40	< 40
Maximum permissible lengths of braking resistor connecting cables (m)		15	15
The connection of input cable	L1、L2、L3	Screw–type terminal	Screw–type terminal
	Conductor cross–section(mm^2)	1…2.5	1…2.5
The connection of motor cable	U、V、W	Screw–type terminal	Screw–type terminal
	Conductor cross–section(mm^2)	1…2.5	1…2.5
Cable at the inverter DC link connection(Cable between the inverter and braking resistor)	DC+、DC–、R	Screw–type terminal	Screw–type terminal
	Conductor cross–section(mm^2)	1…2.5	1…2.5
The connection of PE		M4 screws on enclosure	M4 screws on enclosure
Maximum permissible lengths of motor connecting cables	Shielded cable (m)	50	50
	Unshielded cable (m)	100	100
Degree of protection		IP20	IP20
dimension size	Width (W) mm	80	80
	Height (H) mm	230	230
	Depth (D) mm	165	165
Frame size		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–type terminal	Screw–type terminal	Screw–type terminal	Screw–type terminal	Screw–type terminal
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
Screw–type terminal	Screw–type terminal	Screw–type terminal	Screw–type terminal	Screw–type terminal
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
Screw–type terminal	Screw–type terminal	Screw–type terminal	Screw–type terminal	Screw–type terminal
1…2.5	1…2.5	2.5…6	2.5…6	2.5…6
M4 screws on enclosure	M4 screws on enclosure	M5 screws on enclosure	M5 screws on enclosure	M5 screws on enclosure
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

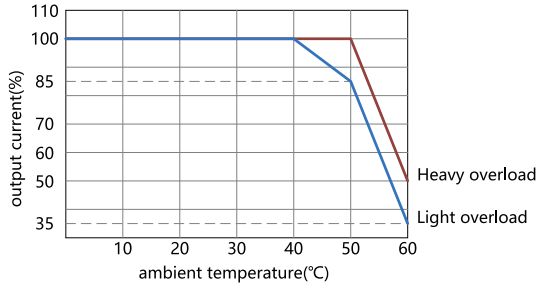
Line voltage 380…480V 3AC			
Technical data		A1–PM25–B3C11	A1–PM25–B3C15
rated output power	LO base load output power (kW)	11	15
	HO base load output power (kW)	7.5	11
rated input current	With Line reactor (A)	26	33
	Without Line reactor (A)	32	39
rated output current	LO base load output current (A)	26	32
	HO base load output current (A)	18	26
rated pulse frequency (kHz)		4	4
efficiency η		> 0.95	> 0.95
Noise emission db (A)		< 50	< 50
Maximum permissible lengths of braking resistor connecting cables (m)		15	15
The connection of input cable	L1、L2、L3	Screw–type terminal	Screw–type terminal
	Conductor cross–section (mm^2)	4…10	4…10
The connection of motor cable	U、V、W	Screw–type terminal	Screw–type terminal
	Conductor cross–section (mm^2)	4…10	4…10
Cable at the inverter DC link connection(Cable between the inverter and braking resistor)	DC+、DC–、R	Screw–type terminal	Screw–type terminal
	Conductor cross–section (mm^2)	4…10	4…10
The connection of PE		M5 screws on enclosure	M5 screws on enclosure
Maximum permissible lengths of motor connecting cables	Shielded cable (m)	50	50
	Unshielded cable (m)	100	100
Degree of protection		IP20	IP20
dimension size	Width (W) mm	140	140
	Height (H) mm	355	355
	Depth (D) mm	165	165
Frame size		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–type terminal	Screw–type terminal	Screw–type terminal	Screw–type terminal
6…25	6…25	6…25	6…25
Screw–type terminal	Screw–type terminal	Screw–type terminal	Screw–type terminal
6…25	6…25	6…25	6…25
Screw–type terminal	Screw–type terminal	Screw–type terminal	Screw–type terminal
6…25	6…25	6…25	6…25
M4 screws on enclosure	M4 screws on enclosure	M5 screws on enclosure	M5 screws on enclosure
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

Line voltage 380V...480V 3AC							
Technical data		A1-PM25-B3C45	A1-PM25-B3C55	A1-PM25-B3C75	A1-PM25-B3C90	A1-PM25-B3D11	A1-PM25-B3D13
rated output power	LO base load output power (kW)	45	55	75	90	110	132
	HO base load output power (kW)	37	45	55	75	90	110
rated input current	With Line reactor (A)	86	104	140	172	198	242
	Without Line reactor (A)	78	94	117	154	189	218
rated output current	LO base load output current (A)	90	110	145	178	205	250
	HO base load output current (A)	75	90	110	145	178	205
rated pulse frequency(kHz)		4	4	4	4	2	2
efficiency η		> 0.95	> 0.95	> 0.95	> 0.95	> 0.95	> 0.95
Power lost (kw)		1.3	1.67	1.93	2.48	2.3	3.02
The cooling airflow m^3/s		0.083	0.083	0.153	0.153	0.153	0.153
Noise emission db (A)		< 75	< 75	< 75	< 75	< 75	< 75
24V DC output power supply (designed for Control Module)		1	1	1	1	1	1
Maximum permissible lengths of braking resistor connecting cables(m)		15	15	15	15	15	15
The connection of input cable	L1、L2、L3	Cable lug	Cable lug	Cable lug	Cable lug	Cable lug	Cable lug
	Conductor cross-section (mm^2)	35…2x120	35…2x120	35…2x120	35…2x120	35…2x120	35…2x120
The connection of motor cable	U、V、W	Cable lug	Cable lug	Cable lug	Cable lug	Cable lug	Cable lug
	Conductor cross-section (mm^2)	35…2x120	35…2x120	35…2x120	35…2x120	35…2x120	35…2x120
Cable at the inverter DC link connection (Cable between the inverter and braking resistor)	DC+、DC-、R	Screw-type terminal	Screw-type terminal	Screw-type terminal	Screw-type terminal	Screw-type terminal	Screw-type terminal
	Conductor cross-section (mm^2)	25…70	25…70	25…70	25…70	25…70	25…70
The connection of PE		Cable lug	Cable lug	Cable lug	Cable lug	Cable lug	Cable lug
Maximum permissible lengths of motor connecting cables	Shielded cable (m)	50	50	50	50	50	50
	Unshielded cable (m)	100	100	100	100	100	100
Degree of protection		IP20	IP20	IP20	IP20	IP20	IP20
dimension size	Width (W) mm	305	305	305	305	305	305
	Height (H) mm	750	750	750	750	750	750
	Depth (D) mm	357	357	357	357	357	357
Frame size		B6	B6	B6	B6	B6	B6
Approximate weight (kg)		65	65	65	65	65	65

7.3 Technical data of power module

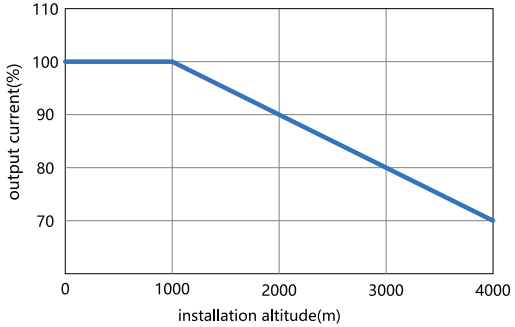
Current reduction as a function of the ambient temperature



The allowable cable length depends on the encoder type and encoder cable.

Current reduction as a function of the installation altitude

At installation altitudes above 1000 m the permissible inverter output current is reduced.



Permissible line supplies dependent on the installation altitude

● The installation altitude is below 2000m

–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 group status and peripherals of system

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
A00 group：status monitoring and setting						
A00.00	Current state machine	0~65535	0	0	65535	0x2000
A00.01	Target Frequency	–327.68~327.67Hz	0	–327.7	327.67	0x2001
A00.02	Current Frequency	–327.68~327.67Hz	0	–327.7	327.67	0x2002
A00.03	Output Frequency	–327.68~327.67Hz	0	–327.7	327.67	0x2003
A00.04	Target speed	–32768~32767rpm	0	–32768	32767	0x2004
A00.05	Current speed	–32768~32767rpm	0	–32768	32767	0x2005
A00.06	Motor speed	–32768~32767rpm	0	–32768	32767	0x2006
A00.07	Output voltage	0~1000V	0	0	1000	0x2007
A00.08	Output current	0~655.35A	0	0	655.35	0x2008
A00.09	Output power	0~655.35kw	0	0	655.35	0x2009
A00.10	Setting torque	–300.0~300.0%	0	–300	300	0x200A
A00.11	Output torque	–300.0~300.0%	0	–300	300	0x200B
A00.14	DC link voltage	0~1000.0V	0	0	1000	0x200E
A00.15	Radiator temperature	–40~150℃	0	–40	150	0x200F
A00.16	DI status	0~65535	0	0	65535	0x2010
A00.17	DO status	0~65535	0	0	65535	0x2011
A00.41	Boot display selection 1	0 ~ 40 Equivalent parameters' index of A0.00–A0.40 Easy to differentiate the state parameters in monitoring screen	0	0	40	0x2029
A00.42	Boot display selection 2	same as above	1	0	40	0x202A
A00.43	Boot display selection 3	same as above	2	0	40	0x202B
A00.44	Boot display selection 4	same as above	3	0	40	0x202C
A00.45	Boot display selection 5	same as above	4	0	40	0x202D
A00.46	Boot display selection 6	same as above	5	0	40	0x202E

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
A01 group：Faults and warnings						0x2100
A01.00	Current fault code 1	0~65535	0	0	65535	0x2100
A01.01	Current fault code 1 Subcode	0~65535	0	0	65535	0x2101
A01.02	Current fault code 2	0~65535	0	0	65535	0x2102
A01.03	Current fault code 2 Subcode	0~65535	0	0	65535	0x2103
A01.04	Current fault code 3	0~65535	0	0	65535	0x2104
A01.05	Current fault code 3 Subcode	0~65535	0	0	65535	0x2105
A01.06	Current fault code 4	0~65535	0	0	65535	0x2106
A01.07	Current fault code 4 Subcode	0~65535	0	0	65535	0x2107
A01.08	Current fault code 5	0~65535	0	0	65535	0x2108
A01.09	Current fault code 5 Subcode	0~65535	0	0	65535	0x2109
A01.10	Current fault code 6	0~65535	0	0	65535	0x210A
A01.11	Current fault code 6 Subcode	0~65535	0	0	65535	0x210B
A01.12	Current warning code 1	0~65535	0	0	65535	0x210C
A01.13	Current warning code 1 Subcode	0~65535	0	0	65535	0x210D
A01.14	Current warning code 2	0~65535	0	0	65535	0x210E
A01.15	Current warning code 2 Subcode	0~65535	0	0	65535	0x210F
A01.16	Current warning code 3	0~65535	0	0	65535	0x2110
A01.17	Current warning code 3 Subcode	0~65535	0	0	65535	0x2111
A01.18	Current warning code 4	0~65535	0	0	65535	0x2112
A01.19	Current warning code 4 Subcode	0~65535	0	0	65535	0x2113
A01.20	Current warning code 5	0~65535	0	0	65535	0x2114
A01.21	Current warning code 5 Subcode	0~65535	0	0	65535	0x2115
A01.22	Current warning code 6	0~65535	0	0	65535	0x2116
A01.23	Current warning code 6 Subcode	0~65535	0	0	65535	0x2117

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
A02 group：Inverter information and setting						
A02.00	CM-ARM Software Version	0.00~655.35	0	0	655.35	0x2200
A02.01	CM-FPGA Version Number	0.00~655.35	0	0	655.35	0x2201
A02.02	PM-DSP Software Version	0.00~655.35	0	0	655.35	0x2202
A02.03	PM-FPGA Version Number	0.00~655.35	0	0	655.35	0x2203
A02.04	PM rated power of power unit	0.00~655.35	0	0	655.35	0x2204
A02.05	PM rated voltage of power unit	0~65535	0	0	65535	0x2205
A02.06	PM rated CUR of power unit	0.00~655.35	0	0	655.35	0x2206
A02.07	FUNC code version number	0.00~655.35	0	0	655.35	0x2207
A02.08	CM release time	0x0000~0xFFFF	0x0000	0x0000	0xFFFF	0x2208
A03 group：Protecting and setting the power module						
A03.00	Set type of PM power unit	0~336	0	0	336	0x2300
A03.08	Set carrier Frequency	0.8~16.0kHz	4	0.8	16	0x2308
A03.09	Load mode selection	0:Light load 1:Overload	1	0	1	0x2309
A03.13	Switching frequency of DPWM	0.0Hz ~ 600.0Hz	8	0	60	0x230D
A03.16	Dead-time compensate selection	0:No 1:Dead-time COMP method1 2:Dead-time COMP method2	0	0	2	0x2310
A03.19	Loss detection of input phase	0:No 1:Yes	0	0	1	0x2313
A03.20	Brake resistance action point	600.0~800.0V	700	600	800	0x2314
A03.21	Software under-voltage point	85.0% ~ 150.0%	100	85	150	0x2315

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
A04 group：System application and environment setting						
A04.00	parameter reset mode	0:Ineffective 1:Partial PARM restore factory1(Model PARM、motor PARM not restore) 2:Partial PARM restore factory2 (Motor PARM not restore) 3:Restore all PARMs to factory 4:Clear record PARMs	0	0	4	0x2400
A04.01	parameter reset	0:No 1:Yes	0	0	1	0x2401
A04.02	parameter access level	0:Common PARM 1:Extended PARM 2:Expert PARM 3:Manufacturer PARM	0	0	3	0x2402
A04.03	Manufacturer password	0~65535	0	0	65535	0x2403
A04.04	User password	0~65535	0	0	65535	0x2404
A04.05	Source0 of motor selection Motor SEL	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:RESV Others: Binary interconnection of parameters	0	0	10	0x2405
A04.06	Source1 of motor selection Motor SEL	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:RESV Others:Binary interconnection of parameters	0	0	10	0x2406
A04.10	Disable control of panel	00: Disable invalid 1: Disable valid	0	0	1	0x240A
A04.11	User latch password	0~65535	0	0	65535	0x240B

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
A05 group：Digital input						
A05.00	DI physical state value	0x0~0xFFFF	0x0	0x0	0xFFFF	0x2500
A05.02	DI processed state value	0x0~0xFFFF	0x0	0x0	0xFFFF	0x2502
A05.04	DI forced function selection	0x0~0xFFFF	0x0	0x0	0xFFFF	0x2504
A05.06	DI forced selective value	0x0~0xFFFF	0x0	0x0	0xFFFF	0x2506
A05.08	DI0 turn–on delay	0.0~6553.5s	0	0	6553.5	0x2508
A05.09	DI0 turn–off delay	0.0~6553.5s	0	0	6553.5	0x2509
A05.10	DI1 turn–on delay	0.0~6553.5s	0	0	6553.5	0x250A
A05.11	DI1 turn–off delay	0.0~6553.5s	0	0	6553.5	0x250B
A05.12	DI2 turn–on delay	0.0~6553.5s	0	0	6553.5	0x250C
A05.13	DI2 turn–off delay	0.0~6553.5s	0	0	6553.5	0x250D
A05.14	DI3 turn–on delay	0.0~6553.5s	0	0	6553.5	0x250E
A05.15	DI3 turn–off delay	0.0~6553.5s	0	0	6553.5	0x250F
A05.16	DI4 turn–on delay	0.0~6553.5s	0	0	6553.5	0x2510
A05.17	DI4 turn–off delay	0.0~6553.5s	0	0	6553.5	0x2511
A05.18	DI5 turn–on delay	0.0~6553.5s	0	0	6553.5	0x2512
A05.19	DI5 turn–off delay	0.0~6553.5s	0	0	6553.5	0x2513
A05.20	DI6 turn–on delay	0.0~6553.5s	0	0	6553.5	0x2514
A05.21	DI6 turn–off delay	0.0~6553.5s	0	0	6553.5	0x2515
A05.22	DI7 turn–on delay	0.0~6553.5s	0	0	6553.5	0x2516
A05.23	DI7 turn–off delay	0.0~6553.5s	0	0	6553.5	0x2517
A05.24	DI8 turn–on delay	0.0~6553.5s	0	0	6553.5	0x2518
A05.25	DI8 turn–off delay	0.0~6553.5s	0	0	6553.5	0x2519
A05.26	DI9 turn–on delay	0.0~6553.5s	0	0	6553.5	0x251A
A05.27	DI9 turn–off delay	0.0~6553.5s	0	0	6553.5	0x251B
A06 group：Digital output						
A06.00	State value of DO signal source	0x0~0xFFFF	0x0	0x0	0xFFFF	0x2600
A06.01	State value of processed DO	0x0~0xFFFF	0x0	0x0	0xFFFF	0x2601
A06.02	Output selection of DO0 function	0:Low level 1:High level 2:Running ready 3:Run permission 4:Running 5:Comparison arrived 6:Negative speed 7:Zero speed operation 8:Overspeed 9:Warning 10:Fault Others:Binary interconnection of parameters	4	0	10	0x2602
A06.03	Output selection of DO1 function	same as A06.02	10	0	10	0x2603
A06.04	Output selection of DO2 function	same as A06.02	0	0	10	0x2604
A06.05	Output selection of DO3 function	same as A06.02	0	0	10	0x2605
A06.09	DO0 turn–on delay	0.0~6553.5s	0	0	6553.5	0x2609
A06.10	DO0 turn–off delay	0.0~6553.5s	0	0	6553.5	0x260A
A06.11	DO1 turn–on delay	0.0~6553.5s	0	0	6553.5	0x260B
A06.12	DO1 turn–off delay	0.0~6553.5s	0	0	6553.5	0x260C
A06.13	DO2 turn–on delay	0.0~6553.5s	0	0	6553.5	0x260D
A06.14	DO2 turn–off delay	0.0~6553.5s	0	0	6553.5	0x260E
A06.15	DO3 turn–on delay	0.0~6553.5s	0	0	6553.5	0x260F
A06.16	DO3 turn–off delay	0.0~6553.5s	0	0	6553.5	0x2610

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
A07 group：Analog input						
A07.00	AI0 input value	–20.000 ~ 20.000	0	–20	20	0x2700
A07.01	AI0 input ratio	–600.0% ~ 600.0%	0	–600	600	0x2701
A07.02	AI1 input value	–20.000 ~ 20.000	0	–20	20	0x2702
A07.03	AI1 input ratio	–600.0% ~ 600.0%	0	–600	600	0x2703
A07.04	AI0 type	0:–10~10V 1:0~10V 2:–20~20mA 3:0~20mA 4:4~20mA	0	0	4	0x2704
A07.05	AI1 type	0:–10~10V 1:0~10V 2:–20~20mA 3:0~20mA 4:4~20mA	0	0	4	0x2705
A07.06	AI0 min input value of curve	–20.000 ~ 20.000	–10	–20	20	0x2706
A07.07	AI0 min input ratio of curve	–600.0% ~ 600.0%	–100	–600	600	0x2707
A07.08	AI0 max input value of curve	–20.000 ~ 20.000	10	–20	20	0x2708
A07.09	AI0 max input ratio of curve	–600.0% ~ 600.0%	100	–600	600	0x2709
A07.10	AI1 min input value of curve	–20.000 ~ 20.000	–10	–20	20	0x270A
A07.11	AI1 min input ratio of curve	–600.0% ~ 600.0%	–100	–600	600	0x270B
A07.12	AI1 max input value of curve	–20.000 ~ 20.000	10	–20	20	0x270C
A07.13	AI1 max input ratio of curve	–600.0% ~ 600.0%	100	–600	600	0x270D
A07.14	Selecting lower limit of AI	Bit0:Selecting lower limit of AI1 0:Min input ratio 1:0.0% Bit1:Selecting lower limit of AI2 0:Min input ratio 1:0.0%	0	0	11	0x270E
A07.15	AI0 filtering time	0~10000ms	10	0	10000	0x270F
A07.16	AI1 filtering time	0~10000ms	10	0	10000	0x2710
A07.17	AI0 denoising threshold	0.0% ~ 20.0%	0	0	20	0x2711
A07.18	AI1 denoising threshold	0.0% ~ 20.0%	0	0	20	0x2712
A07.19	AI zero–crossing threshold	0.0%~1.0%	0.5	0	1	0x2713
A07.20	AI0 breakage detection threshold	0~4.000mA	0	0	4	0x2714
A07.21	AI1 breakage detection threshold	0~4.000mA	0	0	4	0x2715
A07.22	AI0 breakage detection delay	0~1.00s	0	0	1	0x2716
A07.23	AI1 breakage detection delay	0~1.00s	0	0	1	0x2717
A07.24	AI breakage detection enable	Bit0:Enable detection of AI1 wire break 0:Disbale 1:Enable Bit1:Enable detection of AI2 wire break 0:Disable 1:Enable	0	0	11	0x2718

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
A08 group：Analog output						
A08.00	AO0 output value	0.00 ~ 20.00	0	0	20	0x2800
A08.01	AO0 output ratio	–600.0% ~ 600.0%	0	–600	600	0x2801
A08.02	AO1 output value	0.00 ~ 20.00	0	0	20	0x2802
A08.03	AO1 output ratio	–600.0% ~ 600.0%	0	–600	600	0x2803
A08.04	AO0 signal source	0:00 1:Motor speed 2:Synchronous frequency 3:Output current 4:Output torque 5:DC link voltage 6:Output power 7:RFG input 8:RFG slope output 9:Speed reference 10:Reserve Others:Binary interconnection of parameters	0	0	10	0x2804
A08.05	AO1 signal source	same as A08.04	0	0	10	0x2805
A08.06	AO0 type	0:0~10V 1:0~20mA 2:4~20mA	0	0	2	0x2806
A08.07	AO1 type	0:0~10V 1:0~20mA 2:4~20mA	0	0	2	0x2807
A08.08	AO0 min output ratio of curve	–600.0% ~ 600.0%	0	–600	600	0x2808
A08.09	AO0 min output value of curve	0.00 ~ 20.00	0	0	20	0x2809
A08.10	AO0 max output ratio of curve	–600.0% ~ 600.0%	100	–600	600	0x280A
A08.11	AO0 max output value of curve	0.00 ~ 20.00	10	0	20	0x280B
A08.12	AO1 min output ratio of curve	–600.0% ~ 600.0%	0	–600	600	0x280C
A08.13	AO1 min output value of curve	0.00 ~ 20.00	0	0	20	0x280D
A08.14	AO1 max output ratio of curve	–600.0% ~ 600.0%	100	–600	600	0x280E
A08.15	AO1 max output ratio of curve	0.00 ~ 20.00	10	0	20	0x280F

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
A09 group：High speed pulse input						
A09.00	HPI0 input value for pulse input	10.00~500.00kHz	10	10	500	0x2900
A09.01	HPI0 input ratio for pulse input	–600.0% ~ 600.0%	0	–600	600	0x2901
A09.02	HPI1 input value for pulse input	10.00~500.00kHz	10	10	500	0x2902
A09.03	HPI1 input ratio for pulse input	–600.0% ~ 600.0%	0	–600	600	0x2903
A09.04	FUNC SEL of DI8 as HPI0 pulse input	0: No 1: Enable	0	0	1	0x2904
A09.05	FUNC SEL of DI9 as HPI1 pulse input	0: No 1: Enable	0	0	1	0x2905
A09.06	HPI0 min input FREQ of pulse input curve	10.00~500.00kHz	10	10	500	0x2906
A09.07	HPI0 min input ratio of pulse input curve	–600.0% ~ 600.0%	0	–600	600	0x2907
A09.08	HPI0 max input FREQ of pulse input curve	10.00~500.00kHz	500	10	500	0x2908
A09.09	HPI0 max input ratio of pulse input curve	–600.0% ~ 600.0%	100	–600	600	0x2909
A09.10	HPI1 min input FREQ of pulse input curve	10.00~500.00kHz	10	10	500	0x290A
A09.11	HPI1 min input ratio of pulse input curve	–600.0% ~ 600.0%	0	–600	600	0x290B
A09.12	HPI1 max input FREQ of pulse input curve	10.00~500.00kHz	500	10	500	0x290C
A09.13	HPI1 min input ratio of pulse input curve	–600.0% ~ 600.0%	100	–600	600	0x290D
A09.14	HPI0 pulse input lower than min input SETs	0:min input ratio 1:0.0%	0	0	1	0x290E
A09.15	HPI1 pulse input lower than min input SETs	0:min input ratio 1:0.0%	0	0	1	0x290F
A09.16	HPI0 pulse input filtering time	0~10000ms	10	0	10000	0x2910
A09.17	HPI1 pulse input filtering time	0~10000ms	10	0	10000	0x2911
A09.18	Pulse input SET zero–crossing threshold	0.0%~1.0%	0.5	0	1	0x2912

8.2 B: Control Parameters

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B00 group: System control command settings						
B00.00	Source of start–stop control command	0:Terminal control module 1:Custom control module	0	0	1	0x3000
B00.01	Custom OFF1 source	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3001
B00.02	Custom OFF2 source1	0:effective 1:Ineffective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	1	0	10	0x3002
B00.03	Custom OFF3 source1	0:effective 1:Ineffective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve 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:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	1	0	10	0x3004
B00.05	Custom fault reset source1	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3005
B00.06	Custom speed command reverse source	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3006

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B00 group: System control command settings						
B00.07	Costom JOG1 source	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3007
B00.08	Costom JOG2 source	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3008
B00.09	OFF2 source2	0:effective 1:Ineffective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	1	0	10	0x3009
B00.10	OFF2 source 3	0:effective 1:Ineffective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	1	0	10	0x300A
B00.11	OFF3 source 2	0:effective 1:Ineffective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	1	0	10	0x300B
B00.12	OFF3 source 3	0:effective 1:Ineffective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	1	0	10	0x300C

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B00 group: System control command settings						
B00.13	Fault reset source 2	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x300D
B00.14	Fault reset source 3	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x300E
B00.15	Prohibition source of Ramp function generator(RFG)	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x300F
B00.16	Suspension source of Ramp function generator(RFG)	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3010
B00.17	Given 0 source of Ramp function generato(RFG)	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3011
B00.21	Identification request	0:None 1:Simple identification for Asynchronous motor 2:Static identification for Asynchronous motor 3:Rotating identification for Asynchronous motor	0	0	3	0x3015

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B01 group：Terminal control module						
B01.00	Terminal control command 1/2 selection	0:Terminal control command1 1:Terminal control command2 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3100
B01.01	Terminal control command 1 mode	0:Ineffective 1:IN1start up 2:IN1start up，IN2direction 3:IN1forward start, IN2reverse start 4:IN1Pstart up，IN2stop 5:IN1Pstart up，IN2stop，IN3direction 6:IN1Pforward start，IN2Preverse start，IN3stop	3	0	6	0x3101
B01.03	Terminal control command 1 input IN1	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	2	0	10	0x3103
B01.04	Terminal control command 1 input IN2	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	3	0	10	0x3104
B01.05	Terminal control command 1 input IN3	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3105
B01.06	Terminal control command 2 mode	0:Ineffective 1:IN1start up 2:IN1start up，IN2direction 3:IN1forward start, IN2reverse start 4:IN1Pstart up，IN2stop 5:IN1Pstart up，IN2stop，IN3direction IN1Pforward start，IN2Preverse start，IN3stop	3	0	6	0x3106

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B01 group：Terminal control module						
B01.08	Terminal control command 2 input IN1	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	2	0	10	0x3108
B01.09	Terminal control command 2 input IN2	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	3	0	10	0x3109
B01.10	Terminal control command 2 input IN3	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x310A
B01.11	Terminal control module JOG1 source	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x310B
B01.12	Terminal control module JOG2 source	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x310C

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B02 group：Command source settings						
B02.00	Speed control main setting selection	0:0 1:Multi–stage setting 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 Others:Binary interconnection parameters	1	0	10	0x3200
B02.01	Speed control secondary setting selection	0:0 1:Multi–stage setting 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 Others:Binary interconnection parameters	0	0	10	0x3201
B02.02	Additional speed given	0:0 1:Multi–stage setting 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 Others:Binary interconnection parameters	0	0	10	0x3202

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B03 group：Other command source settings						
B03.00	JOG1 given settings	0:0 1:Multi–stage setting 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 Others:Binary interconnection parameters	0	0	10	0x3300
B03.01	JOG2 given settings	0:0 1:Multi–stage setting 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 Others:Binary interconnection parameters	0	0	10	0x3301
B03.02	JOG acceleration time	0.0~1000.0	0	0	1000	0x3302
B03.03	JOG deceleration time	0.0~1000.0	0	0	1000	0x3303
B03.04	Electric potentiometer function	0:No 1:Power–off clear 2:Power–off memory	1	0	2	0x3304
B03.05	Electric potentiometer initial value	–600.0~600.0%	0	–600	600	0x3305
B03.06	Electric potentiometer ramp time	0.0~1000.0s	10	0	1000	0x3306
B03.07	Electric potentiometer minimum value	–600.0~600.0%	0	–600	600	0x3307
B03.08	Electric potentiometer Maximum value	–600.0~600.0%	100	–600	600	0x3308
B03.09	Electric potentiometer increased source selection	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3309
B03.10	Electric potentiometer descent source selection	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x330A
B03.11	Multisegment given value	–600.0~600.0%	0	–600	600	0x330B
B03.12	Multisegment given value choice 1	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x330C

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B03 group：Other command source settings						
B03.13	Multisegment given value choice 2	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x330D
B03.14	Multisegment given value choice 3	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x330E
B03.15	Multisegment given value choice4	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x330F
B03.16	Multisegment given value 1	–600.0~600.0%	10	–600	600	0x3310
B03.17	Multisegment given value 2	–600.0~600.0%	20	–600	600	0x3311
B03.18	Multisegment given value 3	–600.0~600.0%	30	–600	600	0x3312
B03.19	Multisegment given value 4	–600.0~600.0%	–10	–600	600	0x3313
B03.20	Multisegment given value 5	–600.0~600.0%	–20	–600	600	0x3314
B03.21	Multisegment given value 6	–600.0~600.0%	–30	–600	600	0x3315
B03.22	Multisegment given value 7	–600.0~600.0%	0	–600	600	0x3316
B03.23	Multisegment given value 8	–600.0~600.0%	0	–600	600	0x3317
B03.24	Multisegment given value 9	–600.0~600.0%	0	–600	600	0x3318
B03.25	Multisegment given value 10	–600.0~600.0%	0	–600	600	0x3319
B03.26	Multisegment given value 11	–600.0~600.0%	0	–600	600	0x331A
B03.27	Multisegment given value 12	–600.0~600.0%	0	–600	600	0x331B
B03.28	Multisegment given value 13	–600.0~600.0%	0	–600	600	0x331C
B03.29	Multisegment given value 14	–600.0~600.0%	0	–600	600	0x331D
B03.30	Multisegment given value 15	–600.0~600.0%	0	–600	600	0x331E
B03.31	Multisegment given value 16	–600.0~600.0%	0	–600	600	0x331F

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B04 group：Ramp function generator						
B04.00	RFG Ramp time selection 1	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3400
B04.01	RFG Ramp time selection 2	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3401
B04.02	Ramp 1 acceleration time	0.0~1000.0s	20	0	1000	0x3402
B04.03	Ramp 1 deceleration time	0.0~1000.0s	20	0	1000	0x3403
B04.04	Ramp 2 acceleration time	0.0~1000.0s	20	0	1000	0x3404
B04.05	Ramp 2 deceleration time	0.0~1000.0s	20	0	1000	0x3405
B04.06	Ramp 3 acceleration time	0.0~1000.0s	20	0	1000	0x3406
B04.07	Ramp 3 deceleration time	0.0~1000.0s	20	0	1000	0x3407
B04.08	Ramp 4 acceleration time	0.0~1000.0s	20	0	1000	0x3408
B04.09	Ramp 4 deceleration time	0.0~1000.0s	20	0	1000	0x3409
B04.10	S curve 1 starting time	0.00~20.00s	0	0	20	0x340A
B04.11	S curve 1 end time	0.00~20.00s	0	0	20	0x340B
B04.12	S curve 2 starting time	0.00~20.00s	0	0	20	0x340C
B04.13	S curve 2 end time	0.00~20.00s	0	0	20	0x340D
B04.14	S curve 3 starting time	0.00~20.00s	0	0	20	0x340E
B04.15	S curve 3 end time	0.00~20.00s	0	0	20	0x340F
B04.16	S curve 4 starting time	0.00~20.00s	0	0	20	0x3410
B04.17	S curve 4 end time	0.00~20.00s	0	0	20	0x3411
B04.20	RFG forced output enable	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x3414
B04.21	RFG forced set point	0:0 Others: Analog interconnection parameters	0	0	0	0x3415
B04.26	RFG Ramp time selection 3	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x341A
B04.28	Ramp 5 acceleration time	0.0~1000.0	Type decision	0	10000	0x341C
B04.29	Ramp 5 deceleration time	0.0~1000.0	Type decision	0	10000	0x341D
B04.30	Ramp 6 acceleration time	0.0~1000.0	Type decision	0	10000	0x341E
B04.31	Ramp 6 deceleration time	0.0~1000.0	Type decision	0	10000	0x341F
B04.32	Ramp 7 acceleration time	0.0~1000.0	Type decision	0	10000	0x3420
B04.33	Ramp 7 deceleration time	0.0~1000.0	Type decision	0	10000	0x3421
B04.34	Ramp 8 acceleration time	0.0~1000.0	Type decision	0	10000	0x3422
B04.35	Ramp 8 deceleration time	0.0~1000.0	Type decision	0	10000	0x3423

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B05 group：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:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	1	0	10	0x3502
B05.03	Negative speed allowed	0:Ineffective 1:Effective 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	1	0	10	0x3503
B05.04	Motor starting mode	0:Direct start 1:Pre-excitation start 2:Speed tracking start 3:DC brake start	0	0	3	0x3504
B05.06	Pre-excitation time setting	0.00s~100.00s	0	0	100	0x3506
B05.08	Digital setting of pre-excitation current	10.0% ~ 400.0% 10.0% ~ 400.0%(100.0% relative to motor rated current)	100	10	400	0x3508
B05.09	DC braking current	0.0% ~ 100.0% 0.0% ~ 100.0%(100.0% corresponding motor rated current)	0	0	100	0x3509
B05.10	DC braking time at start-up	0.00s~100.00s	0	0	100	0x350A
B05.11	DC braking time at stop	0.00s~100.00s	0	0	100	0x350B
B05.12	DC braking starting speed at stop	0 ~ 3000rpm	0	0	3000	0x350C
B05.13	Speed tracking mode	0:Speed tracking off 1:Search from shutdown frequency 2:Search from rated frequency 3:Search from maximum frequency	0	0	3	0x350D
B05.14	Speed tracking search time	0.0~120.0s	25	0	120	0x350E
B05.15	Speed tracking current percentage	0~100%	50	0	100	0x350F
B05.16	Speed tracking minimum frequency limitation	0.00~50.00Hz	2	0	50	0x3510
B05.17	Speed tracking switching waiting time	0~60000ms	250	0	60000	0x3511
B05.29	Zero speed judgement value	0 ~ 3000rpm	30	0	3000	0x351D
B05.30	Zero speed shutdown delay time	0.00s~100.00s	0	0	100	0x351E
B05.31	Demagnetization time	0.00s~100.00s	0	0	100	0x351F
B05.32	OFF1 stop mode	0:Free shutdown 1:Deceleration shutdown	1	0	1	0x3520
B05.33	OFF3 downtime	0.0s~1000.0s	10	0	1000	0x3521
B05.34	OFF3 stop mode	0:Deceleration shutdown 1:Maximum capacity shutdown(RESV)	0	0	1	0x3522
B05.35	Operation allowed stop mode	0:Mode OFF1 shutdown 1:Mode OFF2 shutdown 2:Mode OFF3 shutdown	0	0	2	0x3523
function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B06 group：Motor control limit and protection						
B06.00	Lower limit of jump frequency 1	0.0%~600.0% (100.0% relative to motor rated frequency)	0	0	B06.01	0x3600
B06.01	Upper limit of jump frequency 1	0.0%~600.0% (100.0% relative to motor rated frequency)	0	B06.00	B06.02	0x3601
B06.02	Lower limit of jump frequency 2	0.0%~600.0% (100.0% relative to motor rated frequency)	0	B06.01	B06.03	0x3602
B06.03	Upper limit of jump frequency 2	0.0%~600.0% (100.0% relative to motor rated frequency)	0	B06.02	600	0x3603
B06.04	Forward limit speed	0.0%~600.0%	100	0	600	0x3604
B06.05	Reverse limit speed	-600.0%~0.0%	-100	-600	0	0x3605

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B06 group：Motor control limit and protection						
B06.06	Forward speed limit selection	0:0 1:600.0% 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value SET Motorized potentiometer 8:RESV 9:Bus adapterA-PZD2 10:Bus adapterB-PZD2 Others:Connector PARM	1	0	10	0x3606
B06.07	Negative speed limit selection	0:0 1:-600.0% 2:AI0 3:AI1 4:HPI0 5:HP1 6:Multi-segment value SET 7:Motorized potentiometer 8:RESV 9:Bus adapterA-PZD2 10:Bus adapterB-PZD2 Others:Connector PARM	1	0	10	0x3607
B06.12	Vector control torque limitation	0.0%~200.0%	180	0	200	0x360C
B06.13	Torque limitation before opening brake	0.0%~200.0%	180	0	200	0x360D
B06.25	Selection of motor overload software protection	0:No 1:Yes	0	0	1	0x3619
B06.26	Motor overload software protection gain	20~1000%	100	20	1000	0x361A
B06.27	Motor overload warning coefficient	50% ~ 100%	80	50	100	0x361B
B06.28	Overspeed detection value	0.0% ~ 50.0% (100.0% relative to motor rated speed)	20	0	50	0x361C
B06.29	Overspeed detection time	0.0S:Non-detection 0.1s ~ 60.0s	5	0	60	0x361D
B06.30	Excessive speed deviation detection value	0.0 ~ 100.0% (100.0% relative to motor rated speed)	20	0	100	0x361E
B06.31	Excessive speed deviation detection time	0.0:Non-detection 0.1s ~ 600.0s	0	0	600	0x361F
B06.32	Comparison value reachese detection value	0.0 ~ 600.0% (100.0% relative to motor rated speed)	100	0	600	0x3620
B06.33	Comparison value reachese detection hysteresis value	0.0% ~ B06.32 (100.0% relative to motor rated speed)	3	0	B06.32	0x3621
B06.34	Comparison value reachese detection time	0.0:Non-detection 0.1s ~ 600.0s	3	0	600	0x3622
B06.37	Outpue phase loss detection	0:No 1:Yes	1	0	1	0x3625
B06.39	Motor temperature detection method	0:Prohibit detection 1:KTY84 2:PT100 3:NT100(RESV)	2	0	3	0x3627
B06.40	Motor over temperature protection value	0~300℃	130	0	300	0x3628
B06.42	Inverter overload protection	0:on 1:off	0	0	1	0x362A
B06.43	Encoder fault protection	0:on 1:off	0	0	1	0x362B
B06.44	Inverter overheating protection	0:on 1:off	0	0	1	0x362C
B06.45	Rectifier overheating protection	0:on 1:off	0	0	1	0x362D
B06.46	Brake overheating protection	0:on 1:off	0	0	1	0x362E
B06.47	Bus undervoltage protection	0:on 1:off	0	0	1	0x362F
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 coefficient	0~100%	20	0	100	0x363D
B06.62	SVC control mode	0: Control mode 1 1:Control mode 2 2:Control mode 3	0	2	0	0x363E
B06.63	FVC control mode	0: Control mode 1 1:Control mode 2 2:Control mode 3	0	2	0	0x363F
B06.64	Slip compensation coefficient of vector control	50~200%	100	50	200	0x3640

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B07 group：VF control						
B07.00	VF mode selection	0:VF curve 1:VF separate	0	0	1	0x3700
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	frequency point 1 of multipoint VF curve	0.0 ~ B07.04	2	0	B07.04	0x3702
B07.03	Voltage point 1 of multipoint VF curve	0.0 ~ B07.05	20	0	B07.05	0x3703
B07.04	frequency point 2 of multipoint VF curve	B07.02 ~ B07.06	20	B07.02	B07.06	0x3704
B07.05	Voltage point 2 of multipoint VF curve	B07.03 ~ B07.07	152	B07.03	B07.07	0x3705
B07.06	frequency point 3 of multipoint VF curve	B07.04~D00.04	40	B07.04	D00.04	0x3706
B07.07	Voltage point 3 of multipoint VF curve	B07.05 ~ 380.0	304	B07.05	380	0x3707
B07.08	VF separation voltage given	0:0 1:100.0% 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value SET 7:Motorized potentiometer 8:RESV 9:Bus adapterA-PZD2 10:Bus adapterB-PZD2 Others:Connector PARM	0	0	10	0x3708
B07.09	VF separation voltage change time	0.0s ~ 1000.0s	10	0	1000	0x3709
B07.10	Imax control enable	0:Ineffective 1:Effective	1	0	1	0x370A
B07.11	Imax control gain	0 ~ 100%	30	0	100	0x370B
B07.12	Imax inhibition point	0 ~ 200%	150	0	200	0x370C
B07.13	VF torque lifting mode	0:Not enabled 1:Manual 2:AUTO	1	0	2	0x370D
B07.15	VF manual acceleration torque lifting	0% ~ 250%	1	0	50	0x370F
B07.16	VF torque lifting cut-off frequency	0.00~50.00Hz	50	0	50	0x3710
B07.17	VF slip compensation coefficient	0.0% ~ 300.0%	0	0	300	0x3711
B07.20	VF oscillation suppression mode	0:Ineffective 1:Effective	1	0	1	0x3714
B07.21	VF oscillation suppression gain	0 ~ 500%	0	0	500	0x3715
B07.24	VF overexcitation gain	0 ~ 200.0%	0	0	200	0x3718
B07.28	Vdc_max control switch	0:No 1:Yes	0	0	1	0x371C
B07.29	Vdc_max voltage regulation gain coefficient	20.0~300.0V	125	100	150	0x371D
B07.34	Vdc_min control switch	0:No 1:Yes	0	0	1	0x3722
B07.35	Vdc_min voltage regulation gain coefficient	65~100%	85	65	100	0x3723
function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B08 group：Speed regulator						
B08.00	Motor vector control setting speed filter time	0~10000ms	0	0	10000	0x3800
B08.01	Motor vector control feedback speed filter time	0~10000ms	0	0	10000	0x3801
B08.02	Speed loop low speed Kp	0.00~20.00	1	0	20	0x3802
B08.03	Speed loop low speed Ti	1~65535ms	500	1	65535	0x3803
B08.04	Speed loop high speed Kp	0.00~20.00	1	0	20	0x3804
B08.05	Speed loop high speed Ti	1~65535ms	500	1	65535	0x3805
B08.11	Speed loop switching low frequency	0.00~50.00Hz	5	0	B08.12	0x380B
B08.12	Speed loop switching high frequency	0.00~50.00Hz	10	B08.11	400	0x380C
B08.13	Speed loop switching high frequency correction factor	0.0~400.0%	100	0	400	0x380D
B08.25	Encoder feedback speed filtering time	0~1000ms	0	0	1000	0x3819
B08.26	Estimated speed loop filtering time	0~1000ms	35	0	1000	0x381A
function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B09 group：Current regulator						
B09.04	Proportional coefficient of current loop	1%~1000%	100	1	1000	0x3904
B09.05	Intergral coefficient of current loop	1%~1000%	100	1	1000	0x3905
function code	name	value scope	default value	Lower limit	Upper limit	Communication address
B10 group：Control parameters of synchronous motor						
B10.00	Pole position identification of synchronous motor	0:Method 0 1:Method 1 2:Method 2 3:Method 3 4:Method 4	1	0	4	0x3a00
B10.01	Pole position identification current of synchronous motor	0~200	50	0	200	0x3a01
B10.02	Calculation methods of magnetic pole position of synchronous motor	0:Method 0 1:Method 1	0	0	1	0x3a02
B10.03	Forced initial position enable	0:OFF 1:Method 1 2:Method 2	0	0	2	0x3a03
B10.04	Z signal correction enable	0:OFF 1:ON	1	0	1	0x3a04

8.3 C- Communication parameter group

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
C00 group：Fieldbus adapter A						
C00.00	Bus adapter supporting bus type	0:None 1:Modbus 2:CanOpen 3:ProfibusDP 4:ProfiNet(Reserve) 5:EtherCat(Reserve) 6:EtherNet(Reserve) 7:DeviceNet(Reserve)	0	0	7	0x4000
C00.01	Handling method after communication failure	0:Keep data 1:Data clear(Reserve)	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
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 communication basic value	0~65535	0	0	65535	0x4012
C00.19	PZD output 2 communication basic value	0~65535	0	0	65535	0x4013
C00.20	PZD output 3 communication basic value	0~65535	0	0	65535	0x4014
C00.21	PZD output 4 communication basic value	0~65535	0	0	65535	0x4015
C00.22	PZD output 5 communication basic value	0~65535	0	0	65535	0x4016
C00.23	PZD output 6 communication basic value	0~65535	0	0	65535	0x4017
C00.24	PZD output 7 communication basic value	0~65535	0	0	65535	0x4018
C00.25	PZD output 8 communication basic value	0~65535	0	0	65535	0x4019
C00.26	PZD output 9 communication basic value	0~65535	0	0	65535	0x401A
C00.27	PZD output 10 communication basic value	0~65535	0	0	65535	0x401B
C00.28	PZD output 11 communication basic value	0~65535	0	0	65535	0x401C

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
C00 group：Fieldbus adapter A						
C00.29	PZD output 12 communication basic value	0~65535	0	0	65535	0x401D
C00,30	PZD output 13 communication basic value	0~65535	0	0	65535	0x401E
C00.31	PZD output 14 communication basic value	0~65535	0	0	65535	0x401F
C00,32	PZD output 15 communication basic value	0~65535	0	0	65535	0x4020
C00,33	PZD output 16 communication basic value	0~65535	0	0	65535	0x4021
C00.34	PZD input 1 communication basic value	0~65535	0	0	65535	0x4022
C00.35	PZD input 2 communication basic value	0~65535	0	0	65535	0x4023
C00.36	PZD input 3 communication basic value	0~65535	0	0	65535	0x4024
C00.37	PZD input 4 communication basic value	0~65535	0	0	65535	0x4025
C00,38	PZD input 5 communication basic value	0~65535	0	0	65535	0x4026
C00.39	PZD input 6 communication basic value	0~65535	0	0	65535	0x4027
C00,40	PZD input 7 communication basic value	0~65535	0	0	65535	0x4028
C00,41	PZD input 8 communication basic value	0~65535	0	0	65535	0x4029
C00.42	PZD input 9 communication basic value	0~65535	0	0	65535	0x402A
C00,43	PZD input 10 communication basic value	0~65535	0	0	65535	0x402B
C00,44	PZD input 11 communication basic value	0~65535	0	0	65535	0x402C
C00,45	PZD input 12 communication basic value	0~65535	0	0	65535	0x402D
C00,46	PZD input 13 communication basic value	0~65535	0	0	65535	0x402E
C00,47	PZD input 14 communication basic value	0~65535	0	0	65535	0x402F
C00.48	PZD input 15 communication basic value	0~65535	0	0	65535	0x4030
C00.49	PZD input 16 communication basic value	0~65535	0	0	65535	0x4031
C00.50	PZD output 1 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4032
C00.51	PZD output 2 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4033
C00,52	PZD output 3 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4034
C00.53	PZD output 4 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4035
C00.54	PZD output 5 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4036
C00,55	PZD output 6 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4037
C00.56	PZD output 7 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4038
C00.57	PZD output 8 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4039
C00,58	PZD output 9 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x403A
C00.59	PZD output 10 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x403B
C00,60	PZD output 11 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x403C
C00,61	PZD output 12 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x403D
C00.62	PZD output 13 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x403E
C00,63	PZD output 14 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x403F
C00.64	PZD output 15 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4040
C00.65	PZD output 16 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4041
C00,66	PZD input 1 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4042
C00.67	PZD input 2 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4043
C00.68	PZD input 3 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4044
C00,69	PZD input 4 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4045
C00.70	PZD input 5 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4046
C00.71	PZD input 6 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4047
C00,72	PZD input 7 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4048
C00.73	PZD input 8 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4049
C00.74	PZD input 9 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x404A
C00,75	PZD input 10 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x404B
C00.76	PZD input 11 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x404C
C00.77	PZD input 12 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x404D
C00.78	PZD input 13 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x404E
C00.79	PZD input 14 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x404F
C00,80	PZD input 15 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4050
C00.81	PZD input 16 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4051

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
C01group：Fieldbus adapter B						
C01.00	Bus adapter supporting bus type	0:None 1:Modbus 2:CanOpen 3:ProfibusDP 4:ProfiNet(Reserve) 5:EtherCat(Reserve) 6:EtherNet(Reserve) 7:DeviceNet(Reserve)	0	0	7	0x4100
C01.01	Handling method after communication failure	0:Keep data 1:Data clear(Reserve)	0	0	1	0x4101
C01.02	PZD output 1	0:0 Others:Analog interconnection parameters	0	0	0	0x4102
C01.03	PZD output 2	0:0 Others:Analog interconnection parameters	0	0	0	0x4103
C01.04	PZD output 3	0:0 Others:Analog interconnection parameters	0	0	0	0x4104
C01.05	PZD output 4	0:0 Others:Analog interconnection parameters	0	0	0	0x4105
C01.06	PZD output 5	0:0 Others:Analog interconnection parameters	0	0	0	0x4106
C01.07	PZD output 6	0:0 Others:Analog interconnection parameters	0	0	0	0x4107
C01.08	PZD output 7	0:0 Others:Analog interconnection parameters	0	0	0	0x4108
C01.09	PZD output 8	0:0 Others:Analog interconnection parameters	0	0	0	0x4109
C01.10	PZD output 9	0:0 Others:Analog interconnection parameters	0	0	0	0x410A
C01.11	PZD output 10	0:0 Others:Analog interconnection parameters	0	0	0	0x410B
C01.12	PZD output 11	0:0 Others:Analog interconnection parameters	0	0	0	0x410C
C01.13	PZD output 12	0:0 Others:Analog interconnection parameters	0	0	0	0x410D
C01.14	PZD output 13	0:0 Others:Analog interconnection parameters	0	0	0	0x410E
C01.15	PZD output 14	0:0 Others:Analog interconnection parameters	0	0	0	0x410F
C01.16	PZD output 15	0:0 Others:Analog interconnection parameters	0	0	0	0x4110
C01.17	PZD output 16	0:0 Others:Analog interconnection parameters	0	0	0	0x4111
C01.18	PZD output 1 communication basic value	0~65535	0	0	65535	0x4112
C01.19	PZD output 2 communication basic value	0~65535	0	0	65535	0x4113
C01.20	PZD output 3 communication basic value	0~65535	0	0	65535	0x4114
C01.21	PZD output 4 communication basic value	0~65535	0	0	65535	0x4115
C01.22	PZD output 5 communication basic value	0~65535	0	0	65535	0x4116
C01.23	PZD output 6 communication basic value	0~65535	0	0	65535	0x4117
C01.24	PZD output 7 communication basic value	0~65535	0	0	65535	0x4118
C01.25	PZD output 8 communication basic value	0~65535	0	0	65535	0x4119
C01.26	PZD output 9 communication basic value	0~65535	0	0	65535	0x411A
C01.27	PZD output 10 communication basic value	0~65535	0	0	65535	0x411B
C01.28	PZD output 11 communication basic value	0~65535	0	0	65535	0x411C

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
C01 group: Fieldbus adapter						
C01.29	PZD output 12 communication basic value	0~65535	0	0	65535	0x411D
C01.30	PZD output 13 communication basic value	0~65535	0	0	65535	0x411E
C01.31	PZD output 14 communication basic value	0~65535	0	0	65535	0x411F
C01.32	PZD output 15 communication basic value	0~65535	0	0	65535	0x4120
C01.33	PZD output 16 communication basic value	0~65535	0	0	65535	0x4121
C01.34	PZD input 1 communication basic value	0~65535	0	0	65535	0x4122
C01.35	PZD input 2 communication basic value	0~65535	0	0	65535	0x4123
C01.36	PZD input 3 communication basic value	0~65535	0	0	65535	0x4124
C01.37	PZD input 4 communication basic value	0~65535	0	0	65535	0x4125
C01.38	PZD input 5 communication basic value	0~65535	0	0	65535	0x4126
C01.39	PZD input 6 communication basic value	0~65535	0	0	65535	0x4127
C01.40	PZD input 7 communication basic value	0~65535	0	0	65535	0x4128
C01.41	PZD input 8 communication basic value	0~65535	0	0	65535	0x4129
C01.42	PZD input 9 communication basic value	0~65535	0	0	65535	0x412A
C01.43	PZD input 10 communication basic value	0~65535	0	0	65535	0x412B
C01.44	PZD input 11 communication basic value	0~65535	0	0	65535	0x412C
C01.45	PZD input 12 communication basic value	0~65535	0	0	65535	0x412D
C01.46	PZD input 13 communication basic value	0~65535	0	0	65535	0x412E
C01.47	PZD input 14 communication basic value	0~65535	0	0	65535	0x412F
C01.48	PZD input 15 communication basic value	0~65535	0	0	65535	0x4130
C01.49	PZD input 16 communication basic value	0~65535	0	0	65535	0x4131
C01.50	PZD output 1 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4132
C01.51	PZD output 2 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4133
C01.52	PZD output 3 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4134
C01.53	PZD output 4 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4135
C01.54	PZD output 5 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4136
C01.55	PZD output 6 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4137
C01.56	PZD output 7 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4138
C01.57	PZD output 8 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4139
C01.58	PZD output 9 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x413A
C01.59	PZD output 10 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x413B
C01.60	PZD output 11 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x413C
C01.61	PZD output 12 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x413D
C01.62	PZD output 13 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x413E
C01.63	PZD output 14 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x413F
C01.64	PZD output 15 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4140
C01.65	PZD output 16 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4141
C01.66	PZD input 1 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4142
C01.67	PZD input 2 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4143
C01.68	PZD input 3 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4144
C01.69	PZD input 4 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4145
C01.70	PZD input 5 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4146
C01.71	PZD input 6 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4147
C01.72	PZD input 7 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4148
C01.73	PZD input 8 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4149
C01.74	PZD input 9 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x414A
C01.75	PZD input 10 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x414B
C01.76	PZD input 11 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x414C
C01.77	PZD input 12 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x414D
C01.78	PZD input 13 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x414E
C01.79	PZD input 14 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x414F
C01.80	PZD input 15 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4150
C01.81	PZD input 16 data presentation	0~0xFFFF	0x0	0x0	0xFFFF	0x4151

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
C02 group：Modbus Communication settings						
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) 3:8-N-1	2	0	3	0x4201
C02.02	Modbus local address	1~247	1	1	255	0x4202
C02.03	Modbus response delay	0~20ms	0	0	20	0x4203
C02.04	Modbus communication timeout	0:Ineffective，0.1s~60.0s	2	0	60	0x4204
C03group：CANopen Communication settings						
C03.00	CANopen slave station number	1~127	1	1	127	0x4300
C03.01	CANopen slave baud rate(kbps)	0:20kbps 1:50kbps 2:100kbps 3:125kbps 4:250kbps 5:500kbps 6:1Mbps	5	0	6	0x4301
C04 group：ProfibusDP Communication settings						
C04.01	DP slave station number	2~255	2	2	255	0x4401
C04.02	GSD file type	0:Boneng GSD 1:Siemens GSD1 2:Siemens GSD2 3:Siemens GSD3 4:Siemens GSD4	0	0	4	0x4402

8.4 D-Motor parameter group

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
D00 group：motor 0 basic parameters						
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	3.7	0	655.35	0x5001
D00.02	Motor rated voltage	0~1500V	380	0	1500	0x5002
D00.03	Motor rated current	0.00~655.35A	9	0	655.35	0x5003
D00,04	Motor rated frequency	0.0~600.00Hz	50	0	600	0x5004
D00,05	Motor rated speed	0~65535rpm	1440	0	65535	0x5005
D00,06	Motor maximum speed	0.0%~600.0% rated speed	100	0	600	0x5006
D00,07	Motor minimum speed	0.0%~600.0% rated speed	0	0	600	0x5007
D00.08	Motor maximum current	0.0%~600.0%rated current	100	0	600	0x5008
D00.09	Number of pole pairs	0:AUTO calculation 1~64:Manual set	2	0	64	0x5009
D00.16	Motor control method	0: VF 1:SVC 2:FVC	0	0	2	0x5010
D01 group：motor 0 identification parameters						
D01.00	Asynchronous motor stator resistance	0.000~65.535ohm	1.667	0	65.535	0x5100
D01.01	Asynchronous motor rotor resistance	0.000~65.535ohm	1.5	0	65.535	0x5101
D01.02	Asynchronous motor leakage inductance	0.000~65.535mH	6.54	0	65.535	0x5102
D01.03	Asynchronous motor mutual inductance	0.00~655.35mH	173.4	0	6553.5	0x5103
D01.04	Asynchronous motor no-load current	0.0~655.35A	4	0	655.35	0x5104
D02 group：motor 0 encoder parameters						
D02.00	Encoder type	0:Invalid type 1:Normal ABZ encoder 2:Rotary encoder	1	0	2	0x5200
D02.01	Input AB phase sequence	0:Forward 1:Reverse	0	0	1	0x5201
D02.02	Speed measuring method	0:quadruple-frequency 1:A pulse 2:B pulse	0	0	2	0x5202
D02.03	Input interface type	0:Single ended 1:Difference	0	0	1	0x5203
D02.05	Encoder resolution (pulse count/Revolutions)	0 ~ 65535	1024	0	65535	0x5205
D02.11	Pole pairs of resolver	1 ~ 65535	1	1	65535	0x520B
D02.13	Speed feedback PG disconnection detect time	0~5000ms	500	0	5000	0x520D
D02.17	Encoder power selection	0:5V 1:24V	0	0	2	0x5211
D03 group：motor 1 basic parameters						
D03.00	Motor type seletion	0:Induction motor 1:Permanent magnet synchronous motor	0	0	1	0x5300
D03.01	Motor rated power	0.00~655.35kW	3.7	0	655.35	0x5301
D03,02	Motor rated voltage	0~1500V	380	0	1500	0x5302
D03,03	Motor rated current	0.0~6553.5A	9	0	655.35	0x5303
D03.04	Motor rated frequency	0.0~600.00Hz	50	0	600	0x5304
D03.05	Motor rated speed	0~65535rpm	1440	0	65535	0x5305
D03.06	Motor maximum speed	0.0%~600.0%rated speed	100	0	600	0x5306
D03.07	Motor minimum speed	0.0%~600.0%rated speed	0	0	600	0x5307
D03.08	Motor maximum current	0.0%~600.0%rated current	100	0	600	0x5308
D03.09	Number of pole pairs	0:AUTO calculation 1~64:Manual set	2	0	64	0x5309
D03,16	Motor control method	0: VF 1:SVC 2:FVC	0	0	2	0x5310
D04 group：motor 1 identification parameters						
D04.00	Asynchronous motor stator resistance	0.000~6.5535ohm	1.667	0	65.535	0x5400
D04.01	Asynchronous motor rotor resistance	0.000~6.553ohm	1.5	0	6.553	0x5401
D04.02	Asynchronous motor leakage inductance	0.000~65.535mH	6.54	0	65.535	0x5402
D04.03	Asynchronous motor mutual inductance	0.00~655.35mH	173.4	0	655.35	0x5403
D04.04	Asynchronous motor no-load current	0.0~6553.5A	4	0	6553.5	0x5404

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
D05 group：motor 1 encoder parameters						
D05.00	Encoder type	0:Invalid type 1:Normal ABZ encoder 2:Rotary encoder	1	0	2	0x5500
D05,01	Input AB phase sequence	0:Forward 1:Reverse	0	0	1	0x5501
D05,02	Speed measuring method	0:quadruple-frequency 1:A pulse 2:B pulse	0	0	2	0x5502
D05.03	Input interface type	0:Single ended 1:Difference	0	0	1	0x5503
D05,11	Pole pairs of resolver	1 ~ 65535	2	1	65535	0x550B
D05.13	Speed feedback PG disconnection detect time	0~5000ms	500	0	5000	0x550D
D05.17	Encoder power selection	0:5V 1:24V	0	0	2	0x5511
D06 group：motor 2 basic parameters						
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	3.7	0	655.35	0x5601
D06,02	Motor rated voltage	0~1500V	380	0	1500	0x5602
D06,03	Motor rated current	0.0~6553.5A	9	0	655.35	0x5603
D06,04	Motor rated frequency	0.0~600.00Hz	50	0	600	0x5604
D06,05	Motor rated speed	0~65535rpm	1440	0	65535	0x5605
D06,06	Motor maximum speed	0.0%~600.0%rated speed	100	0	600	0x5606
D06,07	Motor minimum speed	0.0%~600.0%rated speed	0	0	600	0x5607
D06,08	Motor maximum current	0.0%~600.0%rated current	100	0	600	0x5608
D06.09	Number of pole pairs	0:AUTO calculation 1~64:Manual set	2	0	64	0x5609
D06.16	Motor control method	0:VF 1:SVC 2:FVC	0	0	2	0x5610
D07 group：motor 2 identification parameters						
D07,00	Asynchronous motor stator resistance	0.000~6.5535ohm	1.667	0	65.535	0x5700
D07,01	Asynchronous motor rotor resistance	0.000~6.553ohm	1.5	0	6.553	0x5701
D07,02	Asynchronous motor leakage inductance	0.000~65.535mH	6.54	0	65.535	0x5702
D07,03	Asynchronous motor mutual inductance	0.00~655.35mH	173.4	0	655.35	0x5703
D07,04	Asynchronous motor no-load current	0.0~6553.5A	4	0	6553.5	0x5704
D08 group：motor 2 encoder parameters						
D08,00	Encoder type	0:Invalid type 1:Normal ABZ encoder 2:Rotary encoder	1	0	2	0x5800
D08,01	Input AB phase sequence	0:Forward 1:Reverse	0	0	1	0x5801
D08,02	Speed measuring method	0:quadruple-frequency 1:A pulse 2:B pulse	0	0	2	0x5802
D08,03	Input interface type	0:Single ended 1:Difference	0	0	1	0x5803
D08,11	Pole pairs of resolver	1 ~ 65535	2	1	65535	0x580B
D08,13	Speed feedback PG disconnection detect time	0~5000ms	500	0	5000	0x580D
D08,17	Encoder power selection	0:5V 1:24V	0	0	2	0x5811
D09 group：motor 3 basic parameters						
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	3.7	0	655.35	0x5901
D09,02	Motor rated voltage	0~1500V	380	0	1500	0x5902
D09,03	Motor rated current	0.0~655.35A	9	0	655.35	0x5903
D09,04	Motor rated frequency	0.0~600.00Hz	50	0	600	0x5904
D09,05	Motor rated speed	0~65535rpm	1440	0	65535	0x5905
D09,06	Motor maximum speed	0.0%~600.0%rated speed	100	0	600	0x5906
D09,07	Motor minimum speed	0.0%~600.0%rated speed	0	0	600	0x5907
D09,08	Motor maximum current	0.0%~600.0%rated current	100	0	600	0x5908
D09,09	Number of pole pairs	0:AUTO calculation 1~64:Manual set	2	0	64	0x5909
D09,16	Motor control method	0: VF 1: SVC 2: FVC	0	0	2	0x5910
D10 group：motor 3 identification parameters						
D10,00	Asynchronous motor stator resistance	0.000~6.5535ohm	1.667	0	65.535	0x5A00
D10,01	Asynchronous motor rotor resistance	0.000~6.553ohm	1.5	0	6.553	0x5A01
D10,02	Asynchronous motor leakage inductance	0.000~65.535mH	6.54	0	65.535	0x5A02
D10,03	Asynchronous motor mutual inductance	0.00~655.35mH	173.4	0	655.35	0x5A03
D10.04	Asynchronous motor no-load current	0.0~6553.5A	4	0	6553.5	0x5A04
D11 group：motor 3 encoder parameters						
D11.00	Encoder type	0:Invalid type 1:Normal ABZ encoder 2:Rotary encoder	1	0	2	0x5B00
D11,01	Input AB phase sequence	0:Forward 1:Reverse	0	0	1	0x5B01
D11.02	Speed measuring method	0:quadruple-frequency 1:A pulse 2:B pulse	0	0	2	0x5B02
D11.03	Input interface type	0:Single ended 1:Difference	0	0	1	0x5B03
D11.11	Pole pairs of resolver	1 ~ 65535	2	1	65535	0x5B0B
D11.13	Speed feedback PG disconnection detect time	0~5000ms	500	0	5000	0x5B0D
D11.17	Encoder power selection	0:5V 1:24V	0	0	2	0x5B11

8.5 E-Fault protection and recording

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
E00 grouop：fault handling						
E00.00	External fault 1 source	0:Ineffective 1:Reserve 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x6000
E00.01	External fault 2 source	0:Ineffective 1:Reserve 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x6001
E00.02	External warning 1 source	0:Ineffective 1:Reserve 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x6002
E00.03	External warning 2 source	0:Ineffective 1:Reserve 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve Others:Binary interconnection parameters	0	0	10	0x6003
E00.10	Automatic fault reset function	0:Ineffective 1:Effective	0	0	1	0x600A
E00.11	reset time of failure reset number	0.0~3600.0s	180	0	3600	0x600B
E00.12	Failure reset interval	0.0~600.0s	30	0	600	0x600C
E00.13	Fault reset times	0~5	5	0	5	0x600D
E00.14	Non-resetable exception code 1	0~65535	0	0	65535	0x600E
E00.15	Non-resetable exception code 2	0~65535	0	0	65535	0x600F
E00.16	Non-resetable exception code 3	0~65535	0	0	65535	0x6010
E00.23	Restart after automatic reset	0:Ineffective 1:Effective	0	0	1	0x6017
E00.24	Source of exception allowed to restart	0:Specified exception code allows restart 1:Specified exception code does not allow restart	1	0	1	0x6018
E00.25	Specified exception code 1	0~65535	0	0	65535	0x6019
E00.26	Specified exception code 2	0~65535	0	0	65535	0x601A
E00.27	Specified exception code 3	0~65535	0	0	65535	0x601B
E00.28	Specified exception code 4	0~65535	0	0	65535	0x601C
E00.29	Specified exception code 5	0~65535	0	0	65535	0x601D

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
E00 grouop：fault handling						
E00.36	Exception level modification exception code1	0~65535	0	0	65535	0x6024
E00.37	Exception level of exception code1	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:warning 4:No exception handling	0	0	4	0x6025
E00.38	Exception level modification exception code 2	0~65535	0	0	65535	0x6026
E00.39	Exception level of exception code 2	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:warning 4:No exception handling	0	0	4	0x6027
E00.40	Exception level modification exception code 3	0~65535	0	0	65535	0x6028
E00.41	Exception level of exception code 3	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:warning 4:No exception handling	0	0	4	0x6029
E00.42	Exception level modification exception code 4	0~65535	0	0	65535	0x602A
E00.43	Exception level of exception code 4	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:warning 4:No exception handling	0	0	4	0x602B
E00.44	Exception level modification exception code 5	0~65535	0	0	65535	0x602C
E00.45	Exception level of exception code 5	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:warning 4:No exception handling	0	0	4	0x602D
E00.46	Exception level modification exception code 6	0~65535	0	0	65535	0x602E
E00.47	Exception level of exception code 6	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:warning 4:No exception handling	0	0	4	0x602F
E00.48	Exception level modification exception code 7	0~65535	0	0	65535	0x6030
E00.49	Exception level of exception code 7	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:warning 4:No exception handling	0	0	4	0x6031
E00.50	Exception level modification exception code 8	0~65535	0	0	65535	0x6032
E00.51	Exception level of exception code 8	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:warning 4:No exception handling	0	0	4	0x6033
E00.52	Exception level modification exception code 9	0~65535	0	0	65535	0x6034
E00.53	Exception level of exception code 9	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:warning 4:No exception handling	0	0	4	0x6035
E00.54	Exception level modification exception code 10	0~65535	0	0	65535	0x6036
E00.55	Exception level of exception code 10	0:Free stop 1:Emergency stop 2:Stop mode shutdown 3:warning 4:No exception handling	0	0	4	0x6037

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
E01 group：Latest fault and fault data records						
E01.00	Fault code 1	0~65535	0	0	65535	0x6100
E01.01	Fault code 1 subcode	1~16	1	1	16	0x6101
E01.02	Fault code 2	0~65535	0	0	65535	0x6102
E01.03	Fault code 2 subcode	1~16	1	1	16	0x6103
E01.04	Fault code 3	0~65535	0	0	65535	0x6104
E01.05	Fault code 3 subcode	1~16	1	1	16	0x6105
E01.06	Fault code 4	0~65535	0	0	65535	0x6106
E01.07	Fault code 4 subcode	1~16	1	1	16	0x6107
E01.08	Fault code 5	0~65535	0	0	65535	0x6108
E01.09	Fault code 5 subcode	1~16	1	1	16	0x6109
E01.10	Fault code 6	0~65535	0	0	65535	0x610A
E01.11	Fault code 6 subcode	1~16	1	1	16	0x610B
E01.12	Fault speed	–300.00~300.00Hz	0	–300	30	0x610C
E01.13	Fault current	0.0~6553.5A	0	0	6553.5	0x610D
E01.14	Fault DC–link voltage	0.0~800.0V	0	0	800	0x610E
E01.15	Fault output torque	–300.0%~300.0%	0	–300	300	0x610F
E01.16	Fault control word 1	0~65535	0	0	65535	0x6110
E01.17	Fault control word 2	0~65535	0	0	65535	0x6111
E01.18	Fault state word 1	0~65535	0	0	65535	0x6112
E01.19	Fault state word 2	0~65535	0	0	65535	0x6113
E01.20	Fault state machine	0~29	0	0	29	0x6114
E01.21	Fault temperature	0~300°	0	0	300	0x6115
E01.22	Fault output voltage	0~6553.5V	0	0	65535	0x6116
E01.23	Fault PM state word	0~65535	0	0	65535	0x6117
E02 group：Previous fault and fault data records						
E02.00	Fault code 1	0~65535	0	0	65535	0x6200
E02.01	Fault code 1 subcode	1~16	1	1	16	0x6201
E02.02	Fault code 2	0~65535	0	0	65535	0x6202
E02.03	Fault code 2 subcode	1~16	1	1	16	0x6203
E02.04	Fault code 3	0~65535	0	0	65535	0x6204
E02.05	Fault code 3 subcode	1~16	1	1	16	0x6205
E02.06	Fault code 4	0~65535	0	0	65535	0x6206
E02.07	Fault code 4 subcode	1~16	1	1	16	0x6207
E02.08	Fault code 5	0~65535	0	0	65535	0x6208
E02.09	Fault code 5 subcode	1~16	1	1	16	0x6209
E02.10	Fault code 6	0~65535	0	0	65535	0x620A
E02.11	Fault code 6 subcode	1~16	1	1	16	0x620B
E02.12	Fault speed	–300,00~300,00Hz	0	–300	30	0x620C
E02.13	Fault current	0.0~6553.5A	0	0	6553.5	0x620D
E02.14	Fault DC–link voltage	0.0~800.0V	0	0	800	0x620E
E02.15	Fault output torque	–300.0~300.0%	0	–300	300	0x620F
E02.16	Fault control word1	0~65535	0	0	65535	0x6210
E02.17	Fault control word2	0~65535	0	0	65535	0x6211
E02.18	Fault state word1	0~65535	0	0	65535	0x6212
E02.19	Fault state word2	0~65535	0	0	65535	0x6213
E02.20	Fault state machine	0~29	0	0	29	0x6214
E02.21	Fault temperature	–0~300°	0	–40	300	0x6215
E02.22	Fault output voltage	0~65535V	0	0	65535	0x6216
E02.23	Fault PM status word	0~65535	0	0	65535	0x6217
E03 group：Previous two faults and fault data records						
E03.00	Fault code 1	0~65535	0	0	65535	0x6300
E03.01	Fault code 1 subcode	1~16	1	1	16	0x6301
E03.02	Fault code 2	0~65535	0	0	65535	0x6302
E03.03	Fault code 2 subcode	1~16	1	1	16	0x6303
E03.04	Fault code 3	0~65535	0	0	65535	0x6304
E03.05	Fault code 3 subcode	1~16	1	1	16	0x6305
E03.06	Fault code 4	0~65535	0	0	65535	0x6306
E03.07	Fault code 4 subcode	1~16	1	1	16	0x6307
E03.08	Fault code 5	0~65535	0	0	65535	0x6308
E03.09	Fault code 5 subcode	1~16	1	1	16	0x6309
E03.10	Fault code 6	0~65535	0	0	65535	0x630A
E03.11	Fault code 6 subcode	1~16	1	1	16	0x630B
E03.12	Fault speed	–300.00~300.00Hz	0	–300	30	0x630C
E03.13	Fault current	0.0~6553.5A	0	0	6553.5	0x630D
E03.14	Fault DC–link voltage	0.0~800.0V	0	0	800	0x630E
E03.15	Fault output torque	–300.0~300.0%	0	–300	300	0x630F
E03.16	Fault control word1	0~65535	0	0	65535	0x6310
E03.17	Fault control word2	0~65535	0	0	65535	0x6311
E03.18	Fault status word1	0~65535	0	0	65535	0x6312
E03.19	Fault status word2	0~65535	0	0	65535	0x6313
E03.20	Fault status machine	0~29	0	0	29	0x6314
E03.21	Fault temperature	0~300°	0	0	300	0x6315
E03.22	Fault output voltage	0~65535V	0	0	65535	0x6316
E03.23	Fault PM state word	0~65535	0	0	65535	0x6317

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
E04 group：Previous three faults and fault data records						
E04.00	Fault code 1	0~65535	0	0	65535	0x6400
E04.01	Fault code 1 subcode	1~16	1	1	16	0x6401
E04.02	Fault code 2	0~65535	0	0	65535	0x6402
E04.03	Fault code 2 subcode	1~16	1	1	16	0x6403
E04.04	Fault code 3	0~65535	0	0	65535	0x6404
E04.05	Fault code 3 subcode	1~16	1	1	16	0x6405
E04.06	Fault code 4	0~65535	0	0	65535	0x6406
E04.07	Fault code 4 subcode	1~16	1	1	16	0x6407
E04.08	Fault code 5	0~65535	0	0	65535	0x6408
E04.09	Fault code 5 subcode	1~16	1	1	16	0x6409
E04.10	Fault code 6	0~65535	0	0	65535	0x640A
E04.11	Fault code 6 subcode	1~16	1	1	16	0x640B
E04.12	Fault speed	–300.00~300.00Hz	0	–300	30	0x640C
E04.13	Fault current	0,0~6553,5A	0	0	6553,5	0x640D
E04.14	Fault DC–link voltage	0.0~800.0V	0	0	800	0x640E
E04.15	Fault output torque	–300.0~300.0%	0	–300	300	0x640F
E04.16	Fault control word1	0~65535	0	0	65535	0x6410
E04.17	Fault control word2	0~65535	0	0	65535	0x6411
E04.18	Fault state word1	0~65535	0	0	65535	0x6412
E04.19	Fault state word2	0~65535	0	0	65535	0x6413
E04.20	Fault state machine	0~29	0	0	29	0x6414
E04.21	Fault temperature	0~300°	0	0	300	0x6415
E04.22	Fault output voltage	0~65535V	0	0	65535	0x6416
E04.23	Fault PM state word	0~65535	0	0	65535	0x6417
E05 group：Previous four faults and fault data records						
E05.00	Fault code 1	0~65535	0	0	65535	0x6500
E05.01	Fault code 1 subcode	1~16	1	1	16	0x6501
E05.02	Fault code 2	0~65535	0	0	65535	0x6502
E05.03	Fault code 2 subcode	1~16	1	1	16	0x6503
E05.04	Fault code 3	0~65535	0	0	65535	0x6504
E05.05	Fault code 3 subcode	1~16	1	1	16	0x6505
E05.06	Fault code 4	0~65535	0	0	65535	0x6506
E05.07	Fault code 4 subcode	1~16	1	1	16	0x6507
E05.08	Fault code 5	0~65535	0	0	65535	0x6508
E05.09	Fault code 5 subcode	1~16	1	1	16	0x6509
E05.10	Fault code 6	0~65535	0	0	65535	0x650A
E05.11	Fault code 5 subcode	1~16	1	1	16	0x650B
E05.12	Fault speed	–300.00~300.00Hz	0	–300	30	0x650C
E05.13	Fault current	0.0~6553.5A	0	0	6553.5	0x650D
E05.14	Fault DC–link voltage	0.0~800.0V	0	0	800	0x650E
E05.15	Fault output torque	–300.0~300.0%	0	–300	300	0x650F
E05.16	Fault control word1	0~65535	0	0	65535	0x6510
E05.17	Fault control word2	0~65535	0	0	65535	0x6511
E05.18	Fault state word1	0~65535	0	0	65535	0x6512
E05.19	Fault state word2	0~65535	0	0	65535	0x6513
E05.20	Fault state machine	0~29	0	0	29	0x6514
E05.21	Fault temperature	0~300°	0	0	300	0x6515
E05.22	Fault output voltage	0~65535V	0	0	65535	0x6516
E05.23	Fault PM state word	0~65535	0	0	65535	0x6517
E06 group：Previous five faults and fault data records						
E06.00	Fault code 1	0~65535	0	0	65535	0x6600
E06.01	Fault code 1 subcode	1~16	1	1	16	0x6601
E06.02	Fault code 2	0~65535	0	0	65535	0x6602
E06.03	Fault code 2 subcode	1~16	1	1	16	0x6603
E06.04	Fault code 3	0~65535	0	0	65535	0x6604
E06.05	Fault code 3 subcode	1~16	1	1	16	0x6605
E06.06	Fault code 4	0~65535	0	0	65535	0x6606
E06.07	Fault code 4 subcode	1~16	1	1	16	0x6607
E06.08	Fault code 5	0~65535	0	0	65535	0x6608
E06.09	Fault code 5 subcode	1~16	1	1	16	0x6609
E06.10	Fault code 6	0~65535	0	0	65535	0x660A
E06.11	Fault code 6 subcode	1~16	1	1	16	0x660B
E06.12	Fault speed	–300.00~300.00Hz	0	–300	30	0x660C
E06.13	Fault current	0,0~6553,5A	0	0	6553,5	0x660D
E06.14	Fault DC–link voltage	0,0~800,0V	0	0	800	0x660E
E06.15	Fault output torque	–300.0~300.0%	0	–300	300	0x660F
E06.16	Fault control word1	0~65535	0	0	65535	0x6610
E06.17	Fault control word2	0~65535	0	0	65535	0x6611
E06.18	Fault state word1	0~65535	0	0	65535	0x6612
E06.19	Fault state word2	0~65535	0	0	65535	0x6613
E06.20	Fault state machine	0~29	0	0	29	0x6614
E06.21	Fault temperature	0~300°	0	0	300	0x6615
E06.22	Fault output voltage	0~65535V	0	0	65535	0x6616
E06.23	Fault PM state word	0~65535	0	0	65535	0x6617
E07 group：Lastest warning excerption code record						
E07.00	Fault code 1	0~65535	0	0	65535	0x6700
E07.01	Fault code 1 subcode	1~16	1	1	16	0x6701
E07.02	Fault code 2	0~65535	0	0	65535	0x6702
E07.03	Fault code 2 subcode	1~16	1	1	16	0x6703
E07.04	Fault code 3	0~65535	0	0	65535	0x6704
E07.05	Fault code 3 subcode	1~16	1	1	16	0x6705
E07.06	Fault code 4	0~65535	0	0	65535	0x6706
E07.07	Fault code 4 subcode	1~16	1	1	16	0x6707
E07.08	Fault code 5	0~65535	0	0	65535	0x6708
E07.09	Fault code 5 subcode	1~16	1	1	16	0x6709
E07.10	Fault code 6	0~65535	0	0	65535	0x670A
E07.11	Fault code 6 subcode	1~16	1	1	16	0x670B

8.6 F-Free function block and process parameter group

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F00 group：Logic operation module						
F00.00	Logic "AND" maodule A Input 1	1:Invalid other:Binary interconnection parameters	1	1	1	0x7000
F00.01	Logic "AND" maodule A Input 2	1:Invalid other:Binary interconnection parameters	1	1	1	0x7001
F00.02	Logic "AND" maodule A Input 3	1:Invalid other:Binary interconnection parameters	1	1	1	0x7002
F00.03	Logic "AND" maodule A Input 4	1:Invalid other:Binary interconnection parameters	1	1	1	0x7003
F00.04	Logic "AND" module A sample processing time	1~20	2	1	20	0x7004
F00.05	Logic "AND" module B Input 1	1:Invalid other:Binary interconnection parameters	1	1	1	0x7005
F00.06	Logic "AND" module B Input 2	1:Invalid other:Binary interconnection parameters	1	1	1	0x7006
F00.07	Logic "AND" module B Input 3	1:Invalid other:Binary interconnection parameters	1	1	1	0x7007
F00.08	Logic "AND" module B Input 4	1:Invalid other:Binary interconnection parameters	1	1	1	0x7008
F00.09	Logic "AND" module B sample processing time	1~20	2	1	20	0x7009
F00.10	Logic "AND" module C Input 1	1:Invalid other:Binary interconnection parameters	1	1	1	0x700A
F00.11	Logic "AND" module C Input 2	1:Invalid other:Binary interconnection parameters	1	1	1	0x700B
F00.12	Logic "AND" module C Input 3	1:Invalid other:Binary interconnection parameters	1	1	1	0x700C
F00.13	Logic "AND" module C Input 4	1:Invalid other:Binary interconnection parameters	1	1	1	0x700D
F00.14	Logic "AND" module C sample processing time	1~20	2	1	20	0x700E
F00.15	Logic "AND" module D Input 1	1:Invalid other:Binary interconnection parameters	1	1	1	0x700F
F00.16	Logic "AND" module D Input 2	1:Invalid other:Binary interconnection parameters	1	1	1	0x7010
F00.17	Logic "AND" module D Input 3	1:Invalid other:Binary interconnection parameters	1	1	1	0x7011
F00.18	Logic "AND" module D Input 4	1:Invalid other:Binary interconnection parameters	1	1	1	0x7012
F00,19	Logic "AND" module D sample processing time	1~20	2	1	20	0x7013
F00.20	Logic "NOT" module A Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x7014
F00,21	Logic "NOT" module A sample processing time	1~20	2	1	20	0x7015
F00.22	Logic "NOT" module B Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x7016
F00.23	Logic "NOT" module B sample processing time	1~20	2	1	20	0x7017
F00.24	Logic "NOT" module C Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x7018
F00.25	Logic "NOT" module B sample processing time	1~20	2	1	20	0x7019
F00.26	Logic "NOT" module D Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x701A
F00,27	Logic "NOT" module D sample processing time	1~20	2	1	20	0x701B
F00,28	Logic "NOT" module E Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x701C
F00,29	Logic "NOT" module E sample processing time	1~20	2	1	20	0x701D
F00,30	Logic "NOT" module F Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x701E
F00,31	Logic "NOT" module F sample processing time	1~20	2	1	20	0x701F
F00.32	Logic "NOT" module G Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x7020
F00,33	Logic "NOT" module G sample processing time	1~20	2	1	20	0x7021
F00.34	Logic "NOT" module H Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x7022
F00,35	Logic "NOT" module H sample processing time	1~20	2	1	20	0x7023
F00.36	Logic "OR" module A Input 1	0:Invalid other:Binary interconnection parameters	0	0	0	0x7024
F00,37	Logic "OR" module A Input 2	0:Invalid other:Binary interconnection parameters	0	0	0	0x7025
F00,38	Logic "OR" module A Input 3	0:Invalid other:Binary interconnection parameters	0	0	0	0x7026
F00.39	Logic "OR" module A Input 4	0:Invalid other:Binary interconnection parameters	0	0	0	0x7027
F00.40	Logic "OR" module A sample processing time	1~20	2	1	20	0x7028
F00.41	Logic "OR" module B Input 1	0:Invalid other:Binary interconnection parameters	0	0	0	0x7029
F00,42	Logic "OR" module B Input 2	0:Invalid other:Binary interconnection parameters	0	0	0	0x702A
F00,43	Logic "OR" module B Input 3	0:Invalid other:Binary interconnection parameters	0	0	0	0x702B
F00,44	Logic "OR" module B Input 4	0:Invalid other:Binary interconnection parameters	0	0	0	0x702C
F00,45	Logic "OR" module B sample processing time	1~20	2	1	20	0x702D
F00,46	Logic "OR" module C Input 1	0:Invalid other:Binary interconnection parameters	0	0	0	0x702E

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F00 group：Logic operation module						
F00.47	Logic "OR" module C Input 2	0:Invalid other:Binary interconnection parameters	0	0	0	0x702F
F00,48	Logic "OR" module C Input 3	0:Invalid other:Binary interconnection parameters	0	0	0	0x7030
F00,49	Logic "OR" module C Input 4	0:Invalid other:Binary interconnection parameters	0	0	0	0x7031
F00.50	Logic "OR" module C sample processing time	1~20	2	1	20	0x7032
F00.51	Logic "OR" module D Input 1	0:Invalid other:Binary interconnection parameters	0	0	0	0x7033
F00,52	Logic "OR" module D Input 2	0:Invalid other:Binary interconnection parameters	0	0	0	0x7034
F00.53	Logic "OR" module D Input 3	0:Invalid other:Binary interconnection parameters	0	0	0	0x7035
F00.54	Logic "OR" module D Input 4	0:Invalid other:Binary interconnection parameters	0	0	0	0x7036
F00.55	Logic "OR" module D sample processing time	1~20	2	1	20	0x7037
F00.56	Logic "XOR" module A Input 1	0:Invalid other:Binary interconnection parameters	0	0	0	0x7038
F00.57	Logic "XOR" module A Input 2	0:Invalid other:Binary interconnection parameters	0	0	0	0x7039
F00.58	Logic "XOR" module A Input 3	0:Invalid other:Binary interconnection parameters	0	0	0	0x703A
F00.59	Logic "XOR" module A Input 4	0:Invalid other:Binary interconnection parameters	0	0	0	0x703B
F00,60	Logic "OR" module A sample processing time	1~20	2	1	20	0x703C
F00.61	Logic "XOR" module B Input 1	0:Invalid other:Binary interconnection parameters	0	0	0	0x703D
F00.62	Logic "XOR" module B Input 2	0:Invalid other:Binary interconnection parameters	0	0	0	0x703E
F00.63	Logic "XOR" module B Input 3	0:Invalid other:Binary interconnection parameters	0	0	0	0x703F
F00.64	Logic "XOR" module B Input 4	0:Invalid other:Binary interconnection parameters	0	0	0	0x7040
F00.65	Logic "OR" module B sample processing time	1~20	2	1	20	0x7041
F00,66	Logic "XOR" module C Input 1	0:Invalid other:Binary interconnection parameters	0	0	0	0x7042
F00.67	Logic "XOR" module C Input 2	0:Invalid other:Binary interconnection parameters	0	0	0	0x7043
F00.68	Logic "XOR" module C Input 3	0:Invalid other:Binary interconnection parameters	0	0	0	0x7044
F00,69	Logic "XOR" module C Input 4	0:Invalid other:Binary interconnection parameters	0	0	0	0x7045
F00.70	Logic "OR" module C sample processing time	1~20	2	1	20	0x7046
F00.71	Logic "XOR" module D Input 1	0:Invalid other:Binary interconnection parameters	0	0	0	0x7047
F00.72	Logic "XOR" module D Input 2	0:Invalid other:Binary interconnection parameters	0	0	0	0x7048
F00,73	Logic "XOR" module D Input 3	0:Invalid other:Binary interconnection parameters	0	0	0	0x7049
F00.74	Logic "XOR" module D Input 4	0:Invalid other:Binary interconnection parameters	0	0	0	0x704A
F00.75	Logic "OR" module D sample processing time	1~20	2	1	20	0x704B
F00,76	Logic Delay Module A Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x704C
F00,77	Logic Delay Module A function select	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x704D
F00,78	Logic Delay Module A delay time(N*2ms)	0~10000ms	0	0	10000	0x704E
F00,79	Logic Delay Module B Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x704F
F00.80	Logic Delay Module B function select	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x7050
F00.81	Logic Delay Module B delay time(N*2ms)	0~10000ms	0	0	10000	0x7051
F00.82	Logic Delay Module C Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x7052
F00.83	Logic Delay Module C function select	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x7053
F00.84	Logic Delay Module C delay time(N*2ms)	0~10000ms	0	0	10000	0x7054
F00,85	Logic Delay Module D Input	0:Invalid other:Binary interconnection parameters	0	0	0	0x7055
F00.86	Logic Delay Module D function select	0:ON delay 1:OFF delay 2:Double-side delay	0	0	2	0x7056
F00.87	Logic Delay Module D delay time(N*2ms)	0~10000ms	0	0	10000	0x7057
F00.88	Command source of free pulse A	0:Invalid other:Binary interconnection parameters	0	0	0	0x7058
F00.89	High duration of free pulse A	0~10000	0	0	10000	0x7059
F00.90	Command source of free pulse B	0:Invalid other:Binary interconnection parameters	0	0	0	0x705A
F00.91	High duration of free pulse B	0~10000	0	0	10000	0x705B

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F01 group：Arthmetic Operation Module						
F01.00	Addition module A Input 1	0:0 other:Analog interconnection parameters	0	0	0	0x7100
F01.01	Addition module A Input 2	0:0 other:Analog interconnection parameters	0	0	0	0x7101
F01.02	Addition module A Input 3	0:0 other:Analog interconnection parameters	0	0	0	0x7102
F01.03	Addition module A Input 4	0:0 other:Analog interconnection parameters	0	0	0	0x7103
F01.04	Addition module A sample processing time	1~20	2	1	20	0x7104
F01.05	Addition module B Input 1	0:0 other:Analog interconnection parameters	0	0	0	0x7105
F01.06	Addition module B Input 2	0:00 other:Analog interconnection parameters	0	0	0	0x7106
F01.07	Addition module B Input 3	0:00 other:Analog interconnection parameters	0	0	0	0x7107
F01.08	Addition module B Input 4	0:0 other:Analog interconnection parameters	0	0	0	0x7108
F01.09	Addition module B sample processing time	1~20	2	1	20	0x7109
F01.10	Addition module C Input 1	0:0 other:Analog interconnection parameters	0	0	0	0x710A
F01.11	Addition module C Input 2	0:0 other:Analog interconnection parameters	0	0	0	0x710B
F01.12	Addition module C Input 3	0:00 other:Analog interconnection parameters	0	0	0	0x710C
F01.13	Addition module C Input 4	0:0 other:Analog interconnection parameters	0	0	0	0x710D
F01.14	Addition module C sample processing time	1~20	2	1	20	0x710E
F01.15	Subtraction module A input 1	0:0 other:Analog interconnection parameters	0	0	0	0x710F
F01.16	Subtraction module A input 2	0:0 other:Analog interconnection parameters	0	0	0	0x7110
F01.17	Subtraction module A sample processing time	1~20	2	1	20	0x7111
F01.18	Subtraction module B input 1	0:0 other:Analog interconnection parameters	0	0	0	0x7112
F01.19	Subtraction module B input 2	0:0 other:Analog interconnection parameters	0	0	0	0x7113
F01.20	Subtraction module B sample processing time	1~20	2	1	20	0x7114
F01.21	Multiplication module A Input 1	1:1 other:Analog interconnection parameters	1	1	1	0x7115
F01.22	Multiplication module A Input 2	1:1 other:Analog interconnection parameters	1	1	1	0x7116
F01.23	Multiplication module A Input 3	1:1 other:Analog interconnection parameters	1	1	1	0x7117
F01.24	Multiplication module A Input 4	1:1 other:Analog interconnection parameters	1	1	1	0x7118
F01.25	Multiplication module A sample processing time	1~20	2	1	20	0x7119
F01.26	Multiplication module B Input 1	1:1 other:Analog interconnection parameters	1	1	1	0x711A
F01.27	Multiplication module B Input 2	1:1 other:Analog interconnection parameters	1	1	1	0x711B
F01.28	Multiplication module B Input 3	1:1 other:Analog interconnection parameters	1	1	1	0x711C

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F01 group：Arthmetic Operation Module						
F01.29	Multiplication module B Input 4	1:1 other:Analog interconnection parameters	1	1	1	0x711D
F01.30	Multiplication module B sample processing time	1~20	2	1	20	0x711E
F01.31	Division module A dividor input	1:1 other:Analog interconnection parameters	1	1	1	0x711F
F01.32	Division module A dividend input	1:1 other:Analog interconnection parameters	1	1	1	0x7120
F01.33	Division module A sample processing time	1~20	2	1	20	0x7121
F01.34	Division module B dividor input	1:1 other:Analog interconnection parameters	1	1	1	0x7122
F01.35	Division module B dividend input	1:1 other:Analog interconnection parameters	1	1	1	0x7123
F01.36	Division module B sample processing time	1~20	2	1	20	0x7124
F01.37	Absolute value module A Input	0:0 other:Analog interconnection parameters	0	0	0	0x7125
F01.38	Absolute value module A sample processing time	1~20	2	1	20	0x7126
F01.39	Absolute value module B Input	0:0 other:Analog interconnection parameters	0	0	0	0x7127
F01.40	Absolute value module B sample processing time	1~20	2	1	20	0x7128
F01.41	Comparison module A Input 1	0:0 other:Analog interconnection parameters	0	0	0	0x7129
F01.42	Comparison module A Input 2	0:0 other:Analog interconnection parameters	0	0	0	0x712A
F01.43	Comparison module A sample processing time	1~20	2	1	20	0x712B
F01.44	Comparison module B Input 1	0:0 other:Analog interconnection parameters	0	0	0	0x712C
F01.45	Comparison module B Input 2	0:0 other:Analog interconnection parameters	0	0	0	0x712D
F01.46	Comparison module B sample processing time	1~20	2	1	20	0x712E
F01.47	Limit module A Input	0:0 other:Analog interconnection parameters	0	0	0	0x712F
F01.48	Limit module A upper limit selection	0:0 other:Analog interconnection parameters	0	0	0	0x7130
F01.49	Limit module A lower limit selection	0:0 other:Analog interconnection parameters	0	0	0	0x7131
F01.50	Limit module A sample processing time	1~20	2	1	20	0x7132
F01.51	Limit module B Input	0:0 other:Analog interconnection parameters	0	0	0	0x7133
F01.52	Limit module B upper limit selection	0:0 other:Analog interconnection parameters	0	0	0	0x7134
F01.53	Limit module B lower limit setect	0:0 other:Analog interconnection parameters	0	0	0	0x7135
F01.54	Limit module B sample processing time	1~20	2	1	20	0x7136
F01.55	First-order low-pass filter module A Input	0:0 other:Analog interconnection parameters	0	0	0	0x7137
F01.56	Filter time of First-order low-pass filter module A (N*2ms)	0~20000ms	0	0	20000	0x7138
F01.57	First-order low-pass filter module A sample processing time	1~20	2	1	20	0x7139
F01.58	First-order low-pass filter module B Input	0:0 other:Analog interconnection parameters	0	0	0	0x713A
F01.59	Filter time of First-order low-pass filter module B (N*2ms)	0~20000ms	0	0	20000	0x713B
F01.60	First-order low-pass filter module B sample processing time	1~20	2	1	20	0x713C

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F01 group：Arthmetic Operation Module						
F01.61	command source 1 of Data selector A	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binary interconnection parameter	0	0	10	0x713D
F01.62	command source 2 of Data selector A	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binary interconnection parameter	0	0	10	0x713E
F01.63	data source 1 of Data selector A	0:0 1:Multi–segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 other:Analog interconnection parameters	0	0	10	0x713F
F01.64	data source 2 of Data selector A	0:0 1:Multi–segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 other:Analog interconnection parameters	0	0	10	0x7140
F01.65	data source 3 of Data selector A	0:0 1:Multi–segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 other:Analog interconnection parameters	0	0	10	0x7141

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F01 group：Arthmetic Operation Module						
F01.66	data source 4 of Data selector A	0:0 1:Multi–segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 other:Analog interconnection parameters	0	0	10	0x7142
F01.67	command source 1 of Data selector B	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binary interconnection parameter	0	0	10	0x7143
F01.68	command source 2 of Data selector B	0:0 1:1 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binary interconnection parameter	0	0	10	0x7144
F01.69	data source 1 of Data selector B	0:0 1:Multi–segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 other:Analog interconnection parameters	0	0	10	0x7145
F01.70	data source 2 of Data selector B	0:0 1:Multi–segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 other:Analog interconnection parameters	0	0	10	0x7146

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F01 group：Arthmetic Operation Module						
F01.71	data source 3 of Data selector B	0:0 1:Multi-segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A-PZD2 10:Bus adapter B-PZD2 other:Analog interconnection parameters	0	0	10	0x7147
F01.72	data source 4 of Data selector B	0:0 1:Multi-segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A-PZD2 10:Bus adapter B-PZD2 other:Analog interconnection parameters	0	0	10	0x7148
F01.73	Comparator module C input 1	0:0 other:Analog interconnection parameters	0	0	0	0x7149
F01.74	Comparator module C input 2	0:0 other:Analog interconnection parameters	0	0	0	0x714A
F01.76	Comparator module D input 1	0:0 other:Analog interconnection parameters	0	0	0	0x714B
F01.77	Comparator module D input 2	0:0 other:Analog interconnection parameters	0	0	0	0x714C

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F02 group：Word bit conversion module						
F02.00	Word to bit function A Input select	0:0 other:Analog interconnection parameters	0	0	0	0x7200
F02.01	Word to bit function A sample processing time	1~20	2	1	20	0x7201
F02.02	Word to bit function B Input select	0:0 other:Analog interconnection parameters	0	0	0	0x7202
F02.03	Word to bit function B sample processing time	1~20	2	1	20	0x7203
F02.04	Word to bit function C Input select	0:0 other:Analog interconnection parameters	0	0	0	0x7204
F02.05	Word to bit function C sample processing time	1~20	2	1	20	0x7205
F02.06	Word to bit function D Input select	0:0 other:Analog interconnection parameters	0	0	0	0x7206
F02.07	Word to bit function D sample processing time	1~20	2	1	20	0x7207
F02.08	Bit to word function A-Bit00 select	0:0 other:Analog interconnection parameters	0	0	0	0x7208
F02.09	Bit to word function A-Bit01 select	0:0 other:Analog interconnection parameters	0	0	0	0x7209
F02.10	Bit to word function A-Bit02 select	0:0 other:Analog interconnection parameters	0	0	0	0x720A
F02.11	Bit to word function A-Bit03 select	0:0 other:Analog interconnection parameters	0	0	0	0x720B
F02.12	Bit to word function A-Bit04 select	0:0 other:Analog interconnection parameters	0	0	0	0x720C
F02.13	Bit to word function A-Bit05 select	0:0 other:Analog interconnection parameters	0	0	0	0x720D
F02.14	Bit to word function A-Bit06 select	0:0 other:Analog interconnection parameters	0	0	0	0x720E
F02.15	Bit to word function A-Bit07 select	0:0 other:Analog interconnection parameters	0	0	0	0x720F
F02.16	Bit to word function A-Bit08 select	0:0 other:Analog interconnection parameters	0	0	0	0x7210
F02.17	Bit to word function A-Bit09 select	0:0 other:Analog interconnection parameters	0	0	0	0x7211
F02.18	Bit to word function A-Bit10 select	0:0 other:Analog interconnection parameters	0	0	0	0x7212
F02.19	Bit to word function A-Bit11 select	0:0 other:Analog interconnection parameters	0	0	0	0x7213
F02.20	Bit to word function A-Bit12 select	0:0 other:Analog interconnection parameters	0	0	0	0x7214
F02.21	Bit to word function A-Bit13 select	0:0 other:Analog interconnection parameters	0	0	0	0x7215
F02.22	Bit to word function A-Bit14 select	0:0 other:Analog interconnection parameters	0	0	0	0x7216
F02.23	Bit to word function A-Bit15 select	0:0 other:Analog interconnection parameters	0	0	0	0x7217
F02.24	Bit to word function A sample processing time	1~20	2	1	20	0x7218
F02.25	Bit to word function B-Bit00 select	0:0 other:Analog interconnection parameters	0	0	0	0x7219
F02.26	Bit to word function B-Bit01 select	0:0 other:Analog interconnection parameters	0	0	0	0x721A
F02.27	Bit to word function B-Bit02 select	0:0 other:Analog interconnection parameters	0	0	0	0x721B
F02.28	Bit to word function B-Bit03 select	0:0 other:Analog interconnection parameters	0	0	0	0x721C
F02.29	Bit to word function B-Bit04 select	0:0 other:Analog interconnection parameters	0	0	0	0x721D
F02.30	Bit to word function B-Bit05 select	0:0 other:Analog interconnection parameters	0	0	0	0x721E
F02.31	Bit to word function B-Bit06 select	0:0 other:Analog interconnection parameters	0	0	0	0x721F
F02.32	Bit to word function B-Bit07 select	0:0 other:Analog interconnection parameters	0	0	0	0x7220
F02.33	Bit to word function B-Bit08 select	0:0 other:Analog interconnection parameters	0	0	0	0x7221
F02.34	Bit to word function B-Bit09 select	0:0 other:Analog interconnection parameters	0	0	0	0x7222
F02.35	Bit to word function B-Bit10 select	0:0 other:Analog interconnection parameters	0	0	0	0x7223
F02.36	Bit to word function B-Bit11 select	0:0 other:Analog interconnection parameters	0	0	0	0x7224
F02.37	Bit to word function B-Bit12 select	0:0 other:Analog interconnection parameters	0	0	0	0x7225
F02.38	Bit to word function B-Bit13 select	0:0 other:Analog interconnection parameters	0	0	0	0x7226

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F02 group：Word bit conversion module						
F02.39	Bit to word function B–Bit14 select	0:0 other:Binary interconnection parameters	0	0	0	0x7227
F02.40	Bit to word function B–Bit15 select	0:0 other:Binary interconnection parameters	0	0	0	0x7228
F02.41	Bit to word function B sample processing time	1~20	2	1	20	0x7229
F02.42	Bit to word function C–Bit00 select	0:0 other:Binary interconnection parameters	0	0	0	0x722A
F02.43	Bit to word function C–Bit01 select	0:0 other:Binary interconnection parameters	0	0	0	0x722B
F02.44	Bit to word function C–Bit02 select	0:0 other:Binary interconnection parameters	0	0	0	0x722C
F02.45	Bit to word function C–Bit03 select	0:0 other:Binary interconnection parameters	0	0	0	0x722D
F02.46	Bit to word function C–Bit04 select	0:0 other:Binary interconnection parameters	0	0	0	0x722E
F02.47	Bit to word function C–Bit05 select	0:0 other:Binary interconnection parameters	0	0	0	0x722F
F02.48	Bit to word function C–Bit06 select	0:0 other:Binary interconnection parameters	0	0	0	0x7230
F02.49	Bit to word function C–Bit07 select	0:0 other:Binary interconnection parameters	0	0	0	0x7231
F02.50	Bit to word function C–Bit08 select	0:0 other:Binary interconnection parameters	0	0	0	0x7232
F02.51	Bit to word function C–Bit09 select	0:0 other:Binary interconnection parameters	0	0	0	0x7233
F02.52	Bit to word function C–Bit10 select	0:0 other:Binary interconnection parameters	0	0	0	0x7234
F02.53	Bit to word function C–Bit11 select	0:0 other:Binary interconnection parameters	0	0	0	0x7235
F02.54	Bit to word function C–Bit12 select	0:0 other:Binary interconnection parameters	0	0	0	0x7236
F02.55	Bit to word function C–Bit13 select	0:0 other:Binary interconnection parameters	0	0	0	0x7237
F02.56	Bit to word function C–Bit14 select	0:0 other:Binary interconnection parameters	0	0	0	0x7238
F02.57	Bit to word function C–Bit15 select	0:0 other:Binary interconnection parameters	0	0	0	0x7239
F02.58	Bit to word function C sample processing time	1~20	2	1	20	0x723A
F02.59	Bit to word function D–Bit00 select	0:0 other:Binary interconnection parameters	0	0	0	0x723B
F02.60	Bit to word function D–Bit01 select	0:0 other:Binary interconnection parameters	0	0	0	0x723C
F02.61	Bit to word function D–Bit02 select	0:0 other:Binary interconnection parameters	0	0	0	0x723D
F02.62	Bit to word function D–Bit03 select	0:0 other:Binary interconnection parameters	0	0	0	0x723E
F02.63	Bit to word function D–Bit04 select	0:0 other:Binary interconnection parameters	0	0	0	0x723F
F02.64	Bit to word function D–Bit05 select	0:0 other:Binary interconnection parameters	0	0	0	0x7240
F02.65	Bit to word function D–Bit06 select	0:0 other:Binary interconnection parameters	0	0	0	0x7241
F02.66	Bit to word function D–Bit07 select	0:0 other:Binary interconnection parameters	0	0	0	0x7242
F02.67	Bit to word function D–Bit08 select	0:0 other:Binary interconnection parameters	0	0	0	0x7243
F02.68	Bit to word function D–Bit09 select	0:0 other:Binary interconnection parameters	0	0	0	0x7244
F02.69	Bit to word function D–Bit10 select	0:0 other:Binary interconnection parameters	0	0	0	0x7245
F02.70	Bit to word function D–Bit11 select	0:0 other:Binary interconnection parameters	0	0	0	0x7246
F02.71	Bit to word function D–Bit12 select	0:0 other:Binary interconnection parameters	0	0	0	0x7247
F02.72	Bit to word function D–Bit13 select	0:0 other:Binary interconnection parameters	0	0	0	0x7248
F02.73	Bit to word function D–Bit14 select	0:0 other:Binary interconnection parameters	0	0	0	0x7249
F02.74	Bit to word function D–Bit15 select	0:0 other:Binary interconnection parameters	0	0	0	0x724A
F02.75	Bit to word function D sample processing time	1~20	2	1	20	0x724B

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F03 group：Process PID module						
F03.00	Effective signal of PID function	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binary interconnection parameters	0	0	10	0x7300
F03.01	Enable signal of PID function	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binary interconnection parameters	0	0	10	0x7301
F03.02	Direction of PID	0:Positive 1:Negative	0	0	1	0x7302
F03.03	PID sampling calculate	1~20	2	1	20	0x7303
F03.04	PID given source	0:F03.05 1:Multi–segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A–PZD2 10:Bus adapter B–PZD2 other:Analog interconnection parameters	0	0	10	0x7304
F03.05	PID value given	–600.0~600.0%	0	–600	600	0x7305
F03.06	PID given freeze enable	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binary interconnection parameters				0x7306
F03.07	PID given filter time	0~60000ms	0	0	60000	0x7307
F03.08	PID feedback source	0:0 1:Multi–segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A process data2 10:Bus adapter B process data 2 other:Analog interconnection parameters	0	0	10	0x7308
F03.09	PID feedback filter time	0~60000ms	0	0	60000	0x7309
F03.10	PID deviation additional given	0:0 1:Multi–segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi–segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A process data2 10:Bus adapter B process data 2 other:Analog interconnection parameters	0	0	10	0x730A

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F03 group：Process PID module						
F03.11	Proportional gain KP	0.00~125.00	1	0	125	0x730B
F03.12	Proportional gain coefficient	0:100.0% 1:Multi-segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A process data2 10:Bus adapter B process data 2 other:Analog interconnection parameters	0	0	10	0x730C
F03.13	Integral time Ti	0~60000ms	2000	0	60000	0x730D
F03.14	Integral time coefficient	0:100.0% 1:Multi-segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A process data2 10:Bus adapter B process data 2 other:Analog interconnection parameters	0	0	10	0x730E
F03.15	Derivative time Td1	0~60000ms	0	0	60000	0x730F
F03.16	Derivative time coefficient	0:100.0% 1:Multi-segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A process data2 10:Bus adapter B process data 2 other:Analog interconnection parameters	0	0	10	0x7310
F03.17	Initial value of PID output integral	0:100.0% 1:Multi-segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A process data2 10:Bus adapter B process data 2 other:Analog interconnection parameters	0	0	10	0x7311
F03.18	Additional given of PID output	0:100.0% 1:Multi-segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A process data2 10:Bus adapter B process data 2 other:Analog interconnection parameters	0	0	10	0x7312
F03.19	PID integral component forced enable	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binary interconnection parameter	0	0	10	0x7313

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
3 group：Process PID module						
F03.20	PID integral component forced value	0:0 1:Multi-segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A process data2 10:Bus adapter B process data 2 other:Analog interconnection parameters	0	0	10	0x7314
F03.21	PID output limit	0.0~600.0	100	0	600	0x7315
F03.22	PID output upper limit source	0:100% 1:Multi-segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value given 7:Electric potentiometer 8:Reserve 9:Bus adapter A process data2 10:Bus adapter B process data 2 other:Analog interconnection parameters	0	0	10	0x7316
F03.23	PID output lower limit source	0:0 1:Multi-segment setting value 1 2:AI0 3:AI1 4:HPI0 5:HPI1 6:Multi-segment value given 7:Motorized potentiometer 8:Reserve 9:Bus adapter A process data2 10:Bus adapter B process data 2 other:Analog interconnection parameters	0	0	10	0x7317
F03.24	PID output limit up/down time	0.00~100.00s	0	0	100	0x7318
F03.25	PID deviation dead zone enable	0:Forbid 1:Enable	0	0	1	0x7319
F03.26	PID deviation dead zone range	0.0~100.0%	0	0	100	0x731A
F03.27	PID feedback loss detection value	0.0~100.0%	0	0	100	0x731B
F03.28	PID feedback loss detection value	0.0~60.0s	0	0	60	0x731C

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
F04 group：Holding brake control						
F04.00	Holding brake function selection	0:No holding brake 1:Holding brake without detection information 2:Holding brake with detection information	0	0	2	0x7400
F04.01	Brake opening working time	0.00~10.00s	0	0	10	0x7401
F04.02	Brake closing working time	0.00~10.00s	0	0	10	0x7402
F04.03	Brake open command source	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binector parameters	0	0	10	0x7403
F04.04	Brake open comparison source	0:0 other:connertor parameters	0	0	0	0x7404
F04.05	Brake open comparison threshold	0.0~200.0%	0	0	200	0x7405
F04.06	Brake opening delay time	0.00~10.00s	0	0	10	0x7406
F04.07	Brake closing speed threshold	1.0~200.0%	1	1	200	0x7407
F04.08	Brake closing delay time	0.00~10.00s	0	0	10	0x7408
F04.09	Forced brake closing command source	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binector parameters	0	0	10	0x7409
F04.10	Source of brake feedback point	0:Invalid 1:Valid 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:Reserve other:Binector parameters	0	0	10	0x740A
F04.12	Source of brake closing comparison value	0:0 other:connertor parameters	0	0	0	0x740C
F04.13	Brake opening motor current comparison threshold	0.0~200.0%	50	0	200	0x740D
F04.14	Brake relay drive power selection	0:5V 1:12V 2:24V	0	0	2	0x740E
F04.15	Brake opening speed pause time	0.00~10.00s	0	0	10	0x740F
F04.16	Brake closing speed pause time	0.00~10.00s	0	0	10	0x7410

功能码	名称	设定范围	出厂值	下限值	上限值	通信地址
F08组:起升控制模块						
F08.00	防摇摆功能使能	0:禁止 1:允许 2:DI0 3:DI1 4:DI2 5:DI3 6:DI4 7:DI5 8:DI6 9:DI7 10:预留 其它:二进制互联参数	0	0	10	0x7800
F08.01	自动防摇摆功能使能	0:禁止自动防摇摆功能 1:允许自动防摇摆功能	0	0	1	0x7801
F08.02	自动防摇摆最大摆长	0.10~100.00	100	0.1	100	0x7802
F08.03	自动防摇摆最小摆长	0.10~100.00	0.1	0.1	100	0x7803
F08.04	允许防摇摆最小转速	0.0~100.0	0	0	100	0x7804
F08.06	防摇摆斜坡时间	0.0~1000.0	3	0	1000	0x7806
F08.07	防摇调整速度差值	0.0~100.0	20	0	100	0x7807
F08.08	目标频率变化滤波时间	0.00~10.00	0	0	10	0x7808
F08.17	提升摆长来源选择	0:设定值有效(F08.18) 1:AI0 2:AI1 3:预留 4:预留 5:保留 6:保留 7:保留 8:保留 9:保留 10:保留 其它:模拟量互联参数	0	0	10	0x7811
F08.18	摆长设定值	1.00~90.00	9	1	90	0x7812
F08.19	摆长偏移值	0.00~10.00	0	0	10	0x7813
F08.20	提升最大摆长	1.00~100.00	100	1	100	0x7814
F08.21	实际摆长	1.00~100.00	1	1	100	0x7815
F08.22	摇摆周期	0.0~20.0	0	0	20	0x7816
F08.25	摆长计数复位使能	0:禁止 1:允许	0	0	1	0x7819
F08.26	摆长比例系数	0.01~600.00	0.3	0.01	600	0x781a
F08.27	提升编码器计数高	0~65535	0	0	65535	0x781b
F08.28	提升编码器计数低	0~65535	0	0	65535	0x781c
F08.29	提升反馈脉冲反向	0:禁止 1:允许	0	0	1	0x781d

8.7 P-Interconnection parameter group

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
P00 group：Binary interconnection parameter（hardware status）						
P00.00	Logic 0	0	0	0	0	0xE000
P00.01	Logic 1	1	1	1	1	0xE001
P00.02	Multifunctional digital input DI0	0~1	0	0	1	0xE002
P00.03	Multifunctional digital input DI1	0~1	0	0	1	0xE003
P00.04	Multifunctional digital input DI2	0~1	0	0	1	0xE004
P00.05	Multifunctional digital input DI3	0~1	0	0	1	0xE005
P00.06	Multifunctional digital input DI4	0~1	0	0	1	0xE006
P00.07	Multifunctional digital input DI5	0~1	0	0	1	0xE007
P00.08	Multifunctional digital input DI6	0~1	0	0	1	0xE008
P00.09	Multifunctional digital input DI7	0~1	0	0	1	0xE009
P00.10	Multifunctional digital input DI8	0~1	0	0	1	0xE00A
P00.11	Multifunctional digital input DI9	0~1	0	0	1	0xE00B
P00.23	Multifunctional digital input DI0 reverse	0~1	0	0	1	0xE017
P00.24	Multifunctional digital input DI1 reverse	0~1	0	0	1	0xE018
P00.25	Multifunctional digital input DI2 reverse	0~1	0	0	1	0xE019
P00.26	Multifunctional digital input DI3 reverse	0~1	0	0	1	0xE01A
P00.27	Multifunctional digital input DI4 reverse	0~1	0	0	1	0xE01B
P00.28	Multifunctional digital input DI5 reverse	0~1	0	0	1	0xE01C
P00.29	Multifunctional digital input DI6 reverse	0~1	0	0	1	0xE01D
P00.30	Multifunctional digital input DI7 reverse	0~1	0	0	1	0xE01E
P00.31	Multifunctional digital input DI8 reverse	0~1	0	0	1	0xE01F
P00.32	Multifunctional digital input DI9 reverse	0~1	0	0	1	0xE020
P00.50	Multifunctional digital output DO0	0~1	0	0	1	0xE032
P00.51	Multifunctional digital output DO1	0~1	0	0	1	0xE033
P00.52	Multifunctional digital output DO2	0~1	0	0	1	0xE034
P00.53	Multifunctional digital output DO3	0~1	0	0	1	0xE035
P00.57	Multifunctional digital output DO0 reverse	0~1	0	0	1	0xE039
P00.58	Multifunctional digital output DO1 reverse	0~1	0	0	1	0xE03A
P00.59	Multifunctional digital output DO2 reverse	0~1	0	0	1	0xE03B
P00.60	Multifunctional digital output DO3 reverse	0~1	0	0	1	0xE03C

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
P01 group：Binary interconnection parameter（system control words and state）						
P01.00	Startup ready	0~1	0	0	1	0xE100
P01.01	Running ready	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	Startup block	0~1	0	0	1	0xE106
P01.07	Alarm activation	0~1	0	0	1	0xE107
P01.08	Set speed reached	0~1	0	0	1	0xE108
P01.09	Comparison value reached	0~1	0	0	1	0xE109
P01.10	Torque/current limiting reached	0~1	0	0	1	0xE10A
P01.11	Holding brake opening	0~1	0	0	1	0xE10B
P01.12	Positive speed	0~1	0	0	1	0xE10C
P01.13	IGBT operating	0~1	0	0	1	0xE10D
P01.14	Jog operation in effect	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
P01.17	Speed tracking start	0~1	0	0	1	0xE111
P01.18	Effective torque control	0~1	0	0	1	0xE112
P01.19	Softening function enable	0~1	0	0	1	0xE113
P01.20	Not ready to start	0~1	0	0	1	0xE114
P01.21	Not ready to run	0~1	0	0	1	0xE115
P01.22	Not running	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	Startup unblocked	0~1	0	0	1	0xE11A
P01.27	No warning	0~1	0	0	1	0xE11B
P01.28	Set speed not reached	0~1	0	0	1	0xE11C
P01.29	Comparison value not reached	0~1	0	0	1	0xE11D
P01.30	Torque/current limiting not reached	0~1	0	0	1	0xE11E
P01.31	Holding brake closing	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	Jog operation in effect	0~1	0	0	1	0xE122
P01.35	Pre-excitation completed	0~1	0	0	1	0xE123
P01.36	DC braking ends	0~1	0	0	1	0xE124
P01.41	RFG output forbid	0~1	0	0	1	0xE129
P01.42	RFG pause	0~1	0	0	1	0xE12A
P01.43	RFG input forbid	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
P01.58	Holding brake is open	0~1	0	0	1	0xE13A
P01.59	Holding brake is 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 status	0~1	0	0	1	0xE13E
P01.63	Zero speed given operation	0~1	0	0	1	0xE13F
P01.64	DC bus charged flag	0~1	0	0	1	0xE140
P01.65	Motor speed is zero	0~1	0	0	1	0xE141
P01.66	PID function is valid	0~1	0	0	1	0xE142
P01.67	PID operation enable	0~1	0	0	1	0xE143
P01.68	PID action direction	0~1	0	0	1	0xE144
P01.69	PID given freeze enable	0~1	0	0	1	0xE145
P01.70	PID integral component forced enable	0~1	0	0	1	0xE146
P01.71	PID deviation deadband enable	0~1	0	0	1	0xE147
P01.72	PID saturation state	0~1	0	0	1	0xE148
P01.73	Motor over temperature protection flag	0~1	0	0	1	0xE149
P01.74	Motor over temperature warning flag	0~1	0	0	1	0xE14A
P01.75	Motor select bit0	0~1	0	0	1	0xE14B
P01.76	Motor select 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 value given select 1	0~1	0	0	1	0xE14F
P01.80	Multi-segment value given select 2	0~1	0	0	1	0xE150
P01.81	Multi-segment value given select 3	0~1	0	0	1	0xE151
P01.82	Multi-segment value given select 4	0~1	0	0	1	0xE152
P01.83	Process PID feedback disconnection flag	0~1	0	0	1	0xE153
P01.84	Brake control feedback flag	0~1	0	0	1	0xE154
P01.85	RFG running flag	0~1	0	0	1	0xE155

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
P02 group：Binary interconnection parameters（FBA and fault flag）						
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
P02.16	Bus adapter B,PZD1,0	0~1	0	0	1	0xE210
P02.17	Bus adapter B,PZD1,1	0~1	0	0	1	0xE211
P02.18	Bus adapter B,PZD1,2	0~1	0	0	1	0xE212
P02.19	Bus adapter B,PZD1,3	0~1	0	0	1	0xE213
P02.20	Bus adapter B,PZD1,4	0~1	0	0	1	0xE214
P02.21	Bus adapter B,PZD1,5	0~1	0	0	1	0xE215
P02.22	Bus adapter B,PZD1,6	0~1	0	0	1	0xE216
P02.23	Bus adapter B,PZD1,7	0~1	0	0	1	0xE217
P02.24	Bus adapter B,PZD1,8	0~1	0	0	1	0xE218
P02.25	Bus adapter B,PZD1,9	0~1	0	0	1	0xE219
P02.26	Bus adapter B,PZD1,10	0~1	0	0	1	0xE21A
P02.27	Bus adapter B,PZD1,11	0~1	0	0	1	0xE21B
P02.28	Bus adapter B,PZD1,12	0~1	0	0	1	0xE21C
P02.29	Bus adapter B,PZD1,13	0~1	0	0	1	0xE21D
P02.30	Bus adapter B,PZD1,14	0~1	0	0	1	0xE21E
P02.31	Bus adapter B,PZD1,15	0~1	0	0	1	0xE21F
P02.32	Modbus communication run/stop command	0~1	0	0	1	0xE220
P02.33	Modbus communication JOG run/stop	0~1	0	0	1	0xE221
P02.34	Modbus communication free stop	0~1	0	0	1	0xE222
P02.35	Modbus communication fault reset	0~1	0	0	1	0xE223

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
P03 group：Binary interconnection parameters（Free function module1）						
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 is larger then 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 smaller than flag	0~1	0	0	1	0xE31A
P03.27	Comparison module B is larger then flag	0~1	0	0	1	0xE31B
P03.28	Comparison module B equals flag	0~1	0	0	1	0xE31C
P03.29	Comparison module B smaller than flag	0~1	0	0	1	0xE31D
P03.30	Division module A dividend equals 0	0~1	0	0	1	0xE31E
P03.31	Division module B dividend equals 1	0~1	0	0	1	0xE31F
P03.32	Absolute value module A Input symbol	0~1	0	0	1	0xE320
P03.33	Absolute value module B Input symbol	0~1	0	0	1	0xE321

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
P04 group：Binary interconnection parameters (Free function module 2)						
P04.00	Word to bit function A output bit0	0~1	0	0	1	0xE400
P04.01	Word to bit function A output bit1	0~1	0	0	1	0xE401
P04.02	Word to bit function A output bit2	0~1	0	0	1	0xE402
P04.03	Word to bit function A output bit3	0~1	0	0	1	0xE403
P04.04	Word to bit function A output bit4	0~1	0	0	1	0xE404
P04.05	Word to bit function A output bit5	0~1	0	0	1	0xE405
P04.06	Word to bit function A output bit6	0~1	0	0	1	0xE406
P04.07	Word to bit function A output bit7	0~1	0	0	1	0xE407
P04.08	Word to bit function A output bit8	0~1	0	0	1	0xE408
P04.09	Word to bit function A output bit9	0~1	0	0	1	0xE409
P04.10	Word to bit function A output bit10	0~1	0	0	1	0xE40A
P04.11	Word to bit function A output bit11	0~1	0	0	1	0xE40B
P04.12	Word to bit function A output bit12	0~1	0	0	1	0xE40C
P04.13	Word to bit function A output bit13	0~1	0	0	1	0xE40D
P04.14	Word to bit function A output bit14	0~1	0	0	1	0xE40E
P04.15	Word to bit function A output bit15	0~1	0	0	1	0xE40F
P04.16	Word to bit function B output bit0	0~1	0	0	1	0xE410
P04.17	Word to bit function B output bit1	0~1	0	0	1	0xE411
P04.18	Word to bit function B output bit2	0~1	0	0	1	0xE412
P04.19	Word to bit function B output bit3	0~1	0	0	1	0xE413
P04.20	Word to bit function B output bit4	0~1	0	0	1	0xE414
P04.21	Word to bit function B output bit5	0~1	0	0	1	0xE415
P04.22	Word to bit function B output bit6	0~1	0	0	1	0xE416
P04.23	Word to bit function B output bit7	0~1	0	0	1	0xE417
P04.24	Word to bit function B output bit8	0~1	0	0	1	0xE418
P04.25	Word to bit function B output bit9	0~1	0	0	1	0xE419
P04.26	Word to bit function B output bit10	0~1	0	0	1	0xE41A
P04.27	Word to bit function B output bit11	0~1	0	0	1	0xE41B
P04.28	Word to bit function B output bit12	0~1	0	0	1	0xE41C
P04.29	Word to bit function B output bit13	0~1	0	0	1	0xE41D
P04.30	Word to bit function B output bit14	0~1	0	0	1	0xE41E
P04.31	Word to bit function B output bit15	0~1	0	0	1	0xE41F
P04.32	Word to bit function C output bit0	0~1	0	0	1	0xE420
P04.33	Word to bit function C output bit1	0~1	0	0	1	0xE421
P04.34	Word to bit function C output bit2	0~1	0	0	1	0xE422
P04.35	Word to bit function C output bit3	0~1	0	0	1	0xE423
P04.36	Word to bit function C output bit4	0~1	0	0	1	0xE424
P04.37	Word to bit function C output bit5	0~1	0	0	1	0xE425
P04.38	Word to bit function C output bit6	0~1	0	0	1	0xE426
P04.39	Word to bit function C output bit7	0~1	0	0	1	0xE427
P04.40	Word to bit function C output bit8	0~1	0	0	1	0xE428
P04.41	Word to bit function C output bit9	0~1	0	0	1	0xE429
P04.42	Word to bit function C output bit10	0~1	0	0	1	0xE42A
P04.43	Word to bit function C output bit11	0~1	0	0	1	0xE42B
P04.44	Word to bit function C output bit12	0~1	0	0	1	0xE42C
P04.45	Word to bit function C output bit13	0~1	0	0	1	0xE42D
P04.46	Word to bit function C output bit14	0~1	0	0	1	0xE42E
P04.47	Word to bit function C output bit15	0~1	0	0	1	0xE42F
P04.48	Word to bit function D output bit0	0~1	0	0	1	0xE430
P04.49	Word to bit function D output bit1	0~1	0	0	1	0xE431
P04.50	Word to bit function D output bit2	0~1	0	0	1	0xE432
P04.51	Word to bit function D output bit3	0~1	0	0	1	0xE433
P04.52	Word to bit function D output bit4	0~1	0	0	1	0xE434
P04.53	Word to bit function D output bit5	0~1	0	0	1	0xE435
P04.54	Word to bit function D output bit6	0~1	0	0	1	0xE436
P04.55	Word to bit function D output bit7	0~1	0	0	1	0xE437
P04.56	Word to bit function D output bit8	0~1	0	0	1	0xE438
P04.57	Word to bit function D output bit9	0~1	0	0	1	0xE439
P04.58	Word to bit function D output bit10	0~1	0	0	1	0xE43A
P04.59	Word to bit function D output bit11	0~1	0	0	1	0xE43B
P04.60	Word to bit function D output bit12	0~1	0	0	1	0xE43C
P04.61	Word to bit function D output bit13	0~1	0	0	1	0xE43D
P04.62	Word to bit function D output bit14	0~1	0	0	1	0xE43E
P04.63	Word to bit function D output bit15	0~1	0	0	1	0xE43F

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
P06 group：Analog interconnection parameters (running state and peripheral)						
P06.00	Current state machine	0~65535	0	0	65535	0xE600
P06.01	Target frequency	0~65535	0	0	65535	0xE601
P06.02	Given frequency	0~65535	0	0	65535	0xE602
P06.03	Output frequency	0~65535	0	0	65535	0xE603
P06.04	Target speed	0~65535	0	0	65535	0xE604
P06.05	Given speed	0~65535	0	0	65535	0xE605
P06.06	Motor speed	0~65535	0	0	65535	0xE606
P06.07	Output voltage	0~65535	0	0	65535	0xE607
P06.08	Output current	0~65535	0	0	65535	0xE608
P06.09	Output power	0~65535	0	0	65535	0xE609
P06.10	Given torque	0~65535	0	0	65535	0xE60A
P06.11	Output torque	0~65535	0	0	65535	0xE60B
P06.12	Torque current	0~65535	0	0	65535	0xE60C
P06.13	Excitation current	0~65535	0	0	65535	0xE60D
P06.14	DC-link voltage	0~65535	0	0	65535	0xE60E
P06.15	Raduiator temperature	0~65535	0	0	65535	0xE60F
P06.16	Encoder feedback frequency	0~65535	0	0	65535	0xE610
P06.19	Panel given value	0~65535	0	0	65535	0xE613
P06.20	PC given value	0~65535	0	0	65535	0xE614
P06.30	Conversion result of analog input AI0	0~65535	0	0	65535	0xE61E
P06.31	Conversion result of analog input AI1	0~65535	0	0	65535	0xE61F
P06.32	Conversion result of pulse input HPI0	0~65535	0	0	65535	0xE620
P06.33	Conversion result of pulse input HPI1	0~65535	0	0	65535	0xE621
P06.34	Output value of control board AO0	0~65535	0	0	65535	0xE622
P06.35	Output value of control board AO1	0~65535	0	0	65535	0xE623
P07 group：Analog interconnection parameters (communication)						
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
P07.16	Bus adapter B.PZD1	0~65535	0	0	65535	0xE710
P07.17	Bus adapter B.PZD2	0~65535	0	0	65535	0xE711
P07.18	Bus adapter B.PZD3	0~65535	0	0	65535	0xE712
P07.19	Bus adapter B.PZD4	0~65535	0	0	65535	0xE713
P07.20	Bus adapter B.PZD5	0~65535	0	0	65535	0xE714
P07.21	Bus adapter B.PZD6	0~65535	0	0	65535	0xE715
P07.22	Bus adapter B.PZD7	0~65535	0	0	65535	0xE716
P07.23	Bus adapter B.PZD8	0~65535	0	0	65535	0xE717
P07.24	Bus adapter B.PZD9	0~65535	0	0	65535	0xE718
P07.25	Bus adapter B.PZD10	0~65535	0	0	65535	0xE719
P07.26	Bus adapter B.PZD11	0~65535	0	0	65535	0xE71A
P07.27	Bus adapter B.PZD12	0~65535	0	0	65535	0xE71B
P07.28	Bus adapter B.PZD13	0~65535	0	0	65535	0xE71C
P07.29	Bus adapter B.PZD14	0~65535	0	0	65535	0xE71D
P07.30	Bus adapter B.PZD15	0~65535	0	0	65535	0xE71E
P07.31	Bus adapter B.PZD16	0~65535	0	0	65535	0xE71F
P07.32	Modbus control command	0	0	0	0	0xE720
P07.33	Modbus communication setting value 1	0	0	0	0	0xE721
P07.34	Modbus communication setting value 2	0	0	0	0	0xE722
P07.35	Modbus communication setting value 1 P.U	0	0	0	0	0xE723
P07.36	Modbus communication setting value 2 P.U	0	0	0	0	0xE724

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
P08 group：Analog interconnection parameters (Free function module)						
P08.00	Addition module A output	0~65535	0	0	65535	0xE800
P08.01	Addition module B output	0~65535	0	0	65535	0xE801
P08.02	Addition module C output	0~65535	0	0	65535	0xE802
P08.04	Subtraction module A output	0~65535	0	0	65535	0xE804
P08.05	Subtraction module B output	0~65535	0	0	65535	0xE805
P08.08	Multiplication module A output	0~65535	0	0	65535	0xE808
P08.09	Multiplication module B output	0~65535	0	0	65535	0xE809
P08.13	Division module A quotient	0~65535	0	0	65535	0xE80D
P08.14	Division module A remainder	0~65535	0	0	65535	0xE80E
P08.16	Division module B quotient	0~65535	0	0	65535	0xE810
P08.17	Division module B remainder	0~65535	0	0	65535	0xE811
P08.24	Absolute value module A output	0~65535	0	0	65535	0xE818
P08.25	Absolute value module B output	0~65535	0	0	65535	0xE819
P08.28	Limit moudle A output	0~65535	0	0	65535	0xE81C
P08.29	Limit moudle B output	0~65535	0	0	65535	0xE81D
P08.32	First order low pass filter module A output	0~65535	0	0	65535	0xE820
P08.33	First order low pass filter module B output	0~65535	0	0	65535	0xE821
P08.36	Bit to word function A output	0~65535	0	0	65535	0xE824
P08.37	Bit to word function A output	0~65535	0	0	65535	0xE825
P08.38	Bit to word function A output	0~65535	0	0	65535	0xE826
P08.39	Bit to word function A output	0~65535	0	0	65535	0xE827
P09 group：Analog interconnection parameters (Process application)						
P09.00	Process PID output (After limiting)	0~65535	0	0	65535	0xE900
P09.01	Process PID output (before limiting)	0~65535	0	0	65535	0xE901
P09.02	Process PID proportional output	0~65535	0	0	65535	0xE902
P09.03	Process PID integral output	0~65535	0	0	65535	0xE903
P09.04	Process PID differential output	0~65535	0	0	65535	0xE904
P09.05	Process PID given value	0~65535	0	0	65535	0xE905
P09.06	Process PID feedback value	0~65535	0	0	65535	0xE906
P09.07	Process PID deviation value	0~65535	0	0	65535	0xE907
P09.08	Process PID deviation value before added	0~65535	0	0	65535	0xE908
P09.20	Simply PLC output	0~65535	0	0	65535	0xE914
P09.25	Pendulum length	-32768~32767	0	-32768	32767	0xE919

function code	name	value scope	default value	Lower limit	Upper limit	Communication address
P11 group：Analog interconnection parameters (System internal variables of CM)						
P11.00	Fixed value 0%	0~65535	0	0	65535	0xEB00
P11.01	Fixed value 100%	0~65535	0	0	65535	0xEB01
P11.02	Fixed value 200%	0~65535	0	0	65535	0xEB02
P11.03	Fixed value 400%	0~65535	0	0	65535	0xEB03
P11.04	Fixed value 600%	0~65535	0	0	65535	0xEB04
P11.05	Fixed value -100%	0~65535	0	0	65535	0xEB05
P11.06	Fixed value -200%	0~65535	0	0	65535	0xEB06
P11.07	Fixed value -400%	0~65535	0	0	65535	0xEB07
P11.08	Fixed value -600%	0~65535	0	0	65535	0xEB08
P11.18	FPGA receive error counter	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	0	65535	0xEB14
P11.21	Previous state machine	0~65535	0	0	65535	0xEB15
P11.22	First two state machine	0~65535	0	0	65535	0xEB16
P11.23	First three state machine	0~65535	0	0	65535	0xEB17
P11.24	First four state machine	0~65535	0	0	65535	0xEB18
P11.25	First five state machine	0~65535	0	0	65535	0xEB19
P11.26	First six state machine	0~65535	0	0	65535	0xEB1A
P11.27	First seven state machine	0~65535	0	0	65535	0xEB1B
P11.28	First eight state machine	0~65535	0	0	65535	0xEB1C
P11.29	First nine state machine	0~65535	0	0	65535	0xEB1D
P11.30	Motor tuning status	0~65535	0	0	65535	0xEB1E
P12 group：Analog interconnection parameters (system control and state)						
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 run/stop control word	0~65535	0	0	65535	0xEC09
P12.10	OP start and stop control word	0~65535	0	0	65535	0xEC0A
P12.11	PC start and stop control word	0~65535	0	0	65535	0xEC0B
P12.12	Customized run/stop control word	0~65535	0	0	65535	0xEC0C
P12.13	Panel given value	0~65535	0	0	65535	0xEC0D
P12.14	PC given value	0~65535	0	0	65535	0xEC0E
P12.16	DI state	0~65535	0	0	65535	0xEC10
P12.17	DO state	0~65535	0	0	65535	0xEC11
P12.20	Voltage of analog input AI0	0~65535	0	0	65535	0xEC14
P12.21	Voltage of analog input AI1	0~65535	0	0	65535	0xEC15
P12.22	HPI0 frequency for pulse input	0~65535	0	0	65535	0xEC16
P12.23	HPI1 frequency for pulse input	0~65535	0	0	65535	0xEC17
P12.24	Voltage of control board AO0	0~65535	0	0	65535	0xEC18
P12.25	Voltage of control board AO1	0~65535	0	0	65535	0xEC19
P12.26	DB15 temperature	0~65535	0	0	65535	0xEC1A
P12.27	Encoder voltage	0~65535	0	0	65535	0xEC1B
P12.28	Holding brake Ibr	0~65535	0	0	65535	0xEC1C
P12.29	Holding brake Vbr	0~65535	0	0	65535	0xEC1D
P12.30	Motor temperature	0~65535	0	0	65535	0xEC1E
P12.31	PM24V voltage	0~65535	0	0	65535	0xEC1F
P12.32	External 24v voltage	0~65535	0	0	65535	0xEC20
P12.33	Vcc3P3 voltage	0~65535	0	0	65535	0xEC21
P13 group：Analog interconnection parameters (system setting and feedback)						
P13.00	Motor actual speed	0~65535	0	0	65535	0xED00
P13.01	Motor final setting speed	0~65535	0	0	65535	0xED01
P13.02	Main speed given	0~65535	0	0	65535	0xED02
P13.03	Auxiliary speed given	0~65535	0	0	65535	0xED03
P13.04	Speed given before forward / reverse limit	0~65535	0	0	65535	0xED04
P13.05	Speed given before limiting	0~65535	0	0	65535	0xED05
P13.06	Speed given after limiting	0~65535	0	0	65535	0xED06
P13.07	Speed given after minimum speed limit	0~65535	0	0	65535	0xED07
P13.08	RFG input speed given	0~65535	0	0	65535	0xED08
P13.09	RFG output speed given	0~65535	0	0	65535	0xED09
P13.10	Additional speed given	0~65535	0	0	65535	0xED0A
P13.11	CM given speed	0~65535	0	0	65535	0xED0B
P13.15	Positive maximum speed	0~65535	0	0	65535	0xED0F
P13.16	Reverse maximum speed	0~65535	0	0	65535	0xED10
P13.17	Encoder feedback speed	0~65535	0	0	65535	0xED11
P13.22	Electric potentiometer output	0~65535	0	0	65535	0xED16
P13.23	Multi segment given selection output	0~65535	0	0	65535	0xED17
P13.24	Multi segment given value 1	0~65535	0	0	65535	0xED18
P13.25	Multi segment given value 2	0~65535	0	0	65535	0xED19
P13.26	Multi segment given value 3	0~65535	0	0	65535	0xED1A
P13.27	Multi segment given value 4	0~65535	0	0	65535	0xED1B
P13.28	Multi segment given value 5	0~65535	0	0	65535	0xED1C
P13.29	Multi segment given value 6	0~65535	0	0	65535	0xED1D
P13.30	Multi segment given value 7	0~65535	0	0	65535	0xED1E
P13.31	Multi segment given value 8	0~65535	0	0	65535	0xED1F
P13.32	Multi segment given value 9	0~65535	0	0	65535	0xED20
P13.33	Multi segment given value 10	0~65535	0	0	65535	0xED21
P13.34	Multi segment given value 11	0~65535	0	0	65535	0xED22
P13.35	Multi segment given value 12	0~65535	0	0	65535	0xED23
P13.36	Multi segment given value 13	0~65535	0	0	65535	0xED24
P13.37	Multi segment given value 14	0~65535	0	0	65535	0xED25
P13.38	Multi segment given value 15	0~65535	0	0	65535	0xED26
P13.39	Multi segment given value 16	0~65535	0	0	65535	0xED27

9 Maintenance

9.1 Replacing the drive assembly

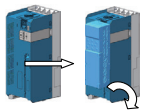
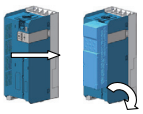
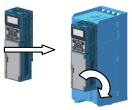
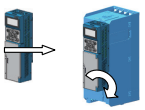
9.1.1 Replacement of drive components

Allows components to be placed

After a continuous malfunction,The power module or control module of the drive must be replaced.

The power and control modules of the drive can be replaced separately.

The drive can be replaced in the following situations:

Replace power module		Replace control module	
Spare parts：	Spare parts	Spare parts	Spare parts
•Same model	•Same model	•Same model	•Same model
•Same power	•Same dimensions	• The firmware version is the same	• Higher firmware version
	•More power		E.g. by firmware version V4.3 replace V4.2
x kW x kW 	y kW > x kW 	Firmware A Firmware A 	Firmware A > Firmware B 
	Power module and motor must be matched,In other words： Motor and power module power ratio must be greater than 1/8	The drive must be reset to factory settings after replacing the control module	

⚠ Warning

Improper drive operation can cause injury.

Replacing a different type of drive may cause abnormal operation

If the drive replacement does not meet the requirements in the table above,The drive must be retried after replacement.

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

Attention

Damage to the motor by changing the connecting cable of the motor

Swap two phases of motor cables cause the motor to reverse rotation.

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

·Connect the three phases of the motor cable in the correct order.

·Check the motor rotation direction 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 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 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 not enabled

⚠ Danger

Dangerous voltages at the driver terminals can be life-threatening

Please wait at least 5 minutes after disconnecting the power supply,

Until the capacitor in the driver discharges to a safe voltage level.

Verify the voltage on the driver 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.

Attention

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

A Modbus RTU communication protocol

A1 driver uses standard RS485 communication interface and Modbus communication protocol to support serial communication between driver and host computer or PLC. The communication protocol of A1 driver includes three layers: physical layer, data link layer and application layer. The physical layer and data link layer adopt the Modbus protocol based on RS485, and the application layer includes various operation methods such as controlling the operation, stop, parameter reading and writing of A1 driver.

Modbus protocol is master–slave protocol. There are two types of communication between master and slave: Master request and slave response; The master broadcasts and the slave does not respond. At any time, only one device on the bus is transmitting. The host polls the slave, and the slave cannot send messages without obtaining the command from the host. The host can send commands repeatedly when the communication is incorrect. If no response is received within a given time, it is considered that the polled slave is lost. If the slave cannot execute a message, an exception message is sent to the host. There is no direct communication between slaves. The data of one slave must be read out through the software of the host, and then sent to another slave. The range of slave address: 0 to 247, and the message with address 0 is broadcast message.

RTU data frame

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

Start bit	Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Check bit	Stop bit

10 bit character frame

Start bit	Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Check bit	Stop bit

11 bit character frame

Using RTU mode, message sending should start with a pause interval of at least 3.5 characters. It is the easiest to realize multiple character times at the network baud rate (as shown in t1–t2–t3–t4 in the figure below). The first domain of the transmission is the device address. The transfer characters that can be used are hexadecimal... 0... F. Network equipment continuously detects the network bus, including the pause interval. When the first domain (address domain) is received, each device decodes 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 entire message frame must be input 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 within less than 3.5 characters, the receiving device will consider it a continuation of the previous message. This will cause an error because the value in the last CRC field cannot be correct.

Free at least 3.5 characters	Slave address	Function code	Data	Check	Free at least 3.5 characters

RTU frame format:

Frame header START	3.5 character time
Slave address ADR	Communication address: 1 ~ 247
Command code CMD	03: read slave parameters；06：write slave parameters
Data content DATA(N-1)	Information content: Function code parameter address, function code parameter number, function code parameter value.
Data content DATA (N-2)	
……	
Data content DATA 0	
CRC CHK Low post	Detection value: CRC value
CRC CHK High post	
END	3.5 character time

A1 driver supports the Modbus protocol in RTU (Remote Terminal Unit) mode. The Modbus function codes supported by the driver are as follows:
Command code and communication data description:

CMD	Meaning	Broadcast	Maximum number of registers
03H	Read multiple registers	NO	30
06H	Write a single register	YES	1
10H	Write multiple registers	YES	27

Command-code:03H

The command code 03H (0000 0011) reads N words (Word, 16bit data), and can read up to 16 words continuously. For example: the driver with the slave address of 0x55 reads the target speed of the motor, the given speed, the current motor speed, the modbus logic start address is 0x2004, and reads three consecutive words,the structure of the frame is described as follows:

Host sends:

START	T1-T2-T3-T4
Slave address	0x55
Modbus function code	0x03
High address	0x20
Low address	0x04
Read high byte	0x00
Read low byte	0x03
CRC low order	0x42
CRC high order	0x1E

The slave responds normally:

START	T1-T2-T3-T4
Slave address	0x55
Modbus function code	0x03
Returns the number of data bytes	0x06
First data high	0x05
First data low	0xDC
Second data high	0x00
Second data low	0x00
…	
Nth data high bit	0x00
Nth data low bit	0x00
CRC low order	0x30
CRC high order	0x3E

The driver responds to the target speed of the motor 0x05DC (1500rpm), given the speed 0x0000, 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 order	0xE2
CRC high order	0x17

Command code: 06H

Command code 06H (0000 0110), write a word (Word)

For example: if the slave address is 0x55, set the target speed of the drive to 100%, that is, modbus logical address 0xE721 is written as 0x03E8, then the structure of the frame is described as follows:

RTU host command information

START	T1–T2–T3–T4
Lave address	0x55
Modbus function code	0x06
High address	0xE7
Low address	0x21
Data high	0x03
Data low	0xE8
CRC low order	0xE2
CRC high order	0x1E

Slave responds normally

START	T1–T2–T3–T4
Lave address	0x55
Modbus function code	0x06
High address	0xE7
Low address	0x21
Data high	0x03
Data low	0xE8
CRC low order	0xE2
CRC high order	0x1E

Slave abnormal response

START	T1–T2–T3–T4
Slave address	0x55
Modbus function code	0x86
Error code	0x03
CRC low order	0x43
CRC high order	0xB1

Command code: 10H

Command code: 10H (0001 0000), write N words (Word)

For example: the drive with the slave address of 0x55 writes 3 data to the address of 0x3500. 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
High address	0x35
Low address	0x00
High byte number written	0x00
Low byte number written	0x03
Total number of bytes written	0x06
First data high	0x00
First data low	0x01
……	……
Nth data high bit	
Nth data low bit	
CRC low order	0x4A
CRC high order	0x12

Slave responds normally

START	T1–T2–T3–T4
Slave address	0x55
Modbus function code	0x90
High address	0x35
Low address	0x00
Data high	0x00
Data low	0x03
CRC low order	0x4A
CRC high order	0x12

Slave abnormal response:

START	T1–T2–T3–T4
Slave address	0x55
Modbus function code	0x90
Error code	0x03
CRC low order	0x43
CRC high order	0xB1

Exception code

Code	Name	Meaning
1	Illegal Function Code	Received unsupported function code
2	Illegal address	The requested register address is illegal, or the combination of the 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 illegally requested data	The number of requested data is greater than the maximum number
5	Read-only	Read-only
6	Can only be stopped to modify	Can only be stopped to modify

Communication frame error check

Using the RTU frame format, the frame includes the frame error detection domain calculated based on the CRC method. The CRC domain detects the contents of the whole frame. The CRC field is a two byte, 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 a transmis-sion error. CRC is stored in 0xFFFF 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 the start bit, stop bit and parity bit are invalid. In the process of CRC generation, each 8-bit character is different from the contents of the register (XOR), the result moves to the least significant bit, and the most significant bit is filled with 0. The LSB is extracted and detected. If the LSB is 1, the register is different from the preset value or if the LSB is 0, it will not be detected.

The whole process should be repeated 8 times. After the last bit (bit 8) is completed, the next 8-bit byte is different or different from the current value of the register. The value in the final register is the CRC value after all bytes in the frame are executed. For example, "11001110" needs to be transmitted, and the data contains five "1". 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 at the check bit position of the frame, and the receiving device also needs to perform parity check. If the parity of the received data is found to be inconsistent with the preset, It is considered that there is a communication error. This CRC calculation method adopts the interna-tional standard CRC verification rule. When editing the CRC algorithm, users can refer to the CRC algorithm of relevant standards and 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 provide a simple function for CRC calculation for user reference (programming in C language):

```
unsigned int crc_cal_value(unsigned char *data_value,unsigned char 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 the drive: (read-only)

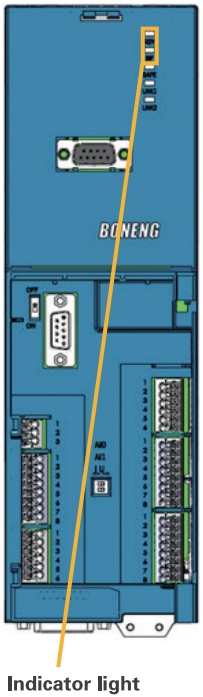
Command word address	Command function
0xE720	0001：Run
	0002：Jog operation
	0003：Free parking
	0004：Slow down
	0005：Fault reset
0xE721	Modbus communication setpoint 1
0xE722	Modbus communication setpoint 2

Note: The range of communication setting value is -30000 ~ 30000

Appendix
B CANopen operating instructions
1 Product introduction
1.1 Product functions and characteristics

(1) Comply with the standards of CIA 301 (Application Layer and Communication Profile).
(2) Support for Node Guard protocol.
(3) Support for Heartbeat protocol.
(4) Support for SDO accelerated transmission mechanism.
(5) Support for 4 TPDOs and 4 RPDOs.

2 Installation information
2.1 Description of indicator light



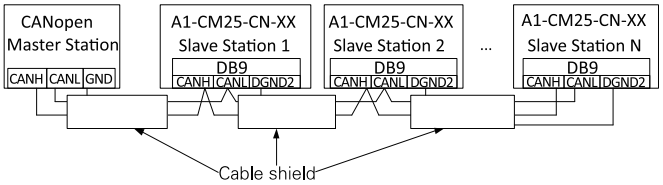
Indicator light

CANopen communication status	Indicator light	
	RDY	BF
Drive operation status		Green light, always on
Drive pre operation status		Green light, flash
CANopen communication failure	Red light, always on	

Note: for the flashing cycle of the indicator light, please refer to the cm25 operation manual.

2.2 Wiring with CANopen master station
2.2.1 Connection diagram

The wiring diagram of A1-CM25-CN-XX module to CANopen master station is as follows:



The general CANopen bus connection method is shown in the figure. The master station is located at one end of the bus and the terminal resistance (120Ω) is turned on. Then connect the rear stations in turn, turn OFF the terminal resistance of the middle station and turn ON the terminal resistance of the rear station.

At the same time, in order to avoid the influence of other tension on the communication cable and ensure the stability of communication, please fix the cable close to the equipment before CANopen communication.

2.2.2 Communication rate and communication distance at each rate

Baud rate (bit/s)	Maximum length of bus (m)
50k	1000
125k	300
250k	150
500k	100
1M	40

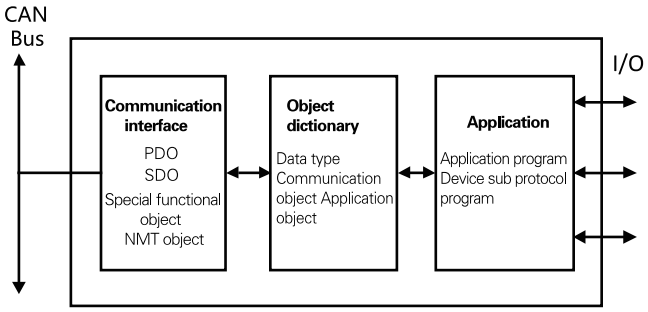
2.2.3 Communication rate and communication distance at each rate

Maximum number of nodes / Communication cable resistance	16	32	64
33Ω/km	575m	530m	460m
70Ω/km	270m	250m	215m
88Ω/km	215m	200m	170m
93Ω/km	205m	185m	160m
157Ω/km	120m	110m	95m

3 CANopen protocol description

3.1 ntroduction to CANopen Protocol

CANopen's equipment model is as follows:



3.1.1 Object dictionary

Object dictionary is the most important feature of CANopen. It standardizes the description of devices. Each object in the object dictionary is addressed by a 16 bit index and an 8–bit sub index. For a single object dictionary item, the sub index is always 0.

A master node or configuration tool can access the values of the object dictionary of the slave node.

Object Dictionary Structure:

Index (HEX)	Object
0000	Not used
0001–001F	Static data type (standard data type, such as boolean, integer16)
0020–003F	The structure defined by a complex data type item is composed of standard data types, such as PDOCommpar and SDOParameter
0040–005F	Complex data types specified by the manufacturer
0060–007F	Static data type specified in the equipment sub agreement
0080–009F	Complex data types specified in the equipment sub agreement
00A0–0FFF	Retain
1000–1FFF	Communication sub protocol area (such as device type, error register, number of supported PDOS, etc.)
2000–5FFF	The manufacturer's specific sub protocol area corresponds to the function code of Bonan driver one by one
6000–9FFF	Standard device sub protocol area (such as DSP 402, etc.)
A000–FFFF	Retain

3.1.2 Common communication objects of CANopen protocol

Network management object NMT

The network management objects include Boot–up message, Heartbeat protocol and NMT message. Based on the master–slave communication mode, NMT is used to manage and monitor each node in the network. It mainly realizes three functions: node state control, error control and node startup.

Service data object (SDO)

By using indexes and sub indexes, SDO enables clients to access items in the device object dictionary. SDO is implemented through CMS objects in the multi domain of CAL, which allows the transmission of data of any length (when the data exceeds 4 bytes, it will be divided into several messages).

A protocol is a confirmation service type that generates a response for each message. SDO request and response messages always contain 8 bytes.

Process data object (PDO)

A PDO is used to transmit real–time data from one creator to one or multiple receivers. The length of transmitted data ranges from one to eight bytes. Each CANopen device has eight default PDO channels, that is, four TPDO channels and four RPDO channels. PDOs support synchronous transmission and asynchronous transmission. Which transmission mode is used is determined by PDO communication parameters.

3.1.3 Format description of CANopen message

NMT module control message

Only NMT–Master node can transmit NMT Module Control message.
All slave devices must support NMT module control services.
NMT Module Control messages do not require a reply.

The format of NMT message is as follows:

COB-ID	byte 0	byte 1
0x000	CS	Node-ID

When node id = 0, all NMT slaves are addressed (broadcast). CS is the command word, and the following values can be taken:

CS	NMT service
0x01	start remote node
0x02	stop remote node
0x80	enter pre-operational state
0x81	reset node
0x82	reset communication

Nodeguarding message

The NMT master node can check the current state of each node through node protection. This service is particularly important when these nodes have no data service.

The standard protocol object 0x100c does not set the guard time, and 0x100d sets the guard time score factor. Both of them jointly determine the time period of node protection.

The NMT master node sends remote frames as shown in the following table:

COB-ID	RTR
0x700+Node-ID	1

The response message returned by NMT from the node is shown in the following table:

COB-ID	RTR	data0
0x700+Node-ID	0	State

Nodeguarding returns status bit7

Data bit	Explain
bit7	"0" – "1" – "0" – "1" must appear alternately every time.
bit6–bit0	0x04: Stopped 0x05: Operate 0x7F: Pre operation

For example:

The master station requests the status of node 5 and sends a remote frame, RTR = 1, COB–ID = 705

If the slave station of node 5 is running, respond: RTR=0, COB–ID= 705, Data0 = 0x05

The master station then requests the status of node 5 and sends a remote frame, RTR = 1, COB–ID= 705

If the slave station of node 5 is running, the response is: RTR = 0,COB–ID= 705, Data0 = 0x85

Heartbeat message

The heartbeat is from the slave to the master periodically to actively send their status to indicate that the communication is normal. To enable the heartbeat, you need to configure the heartbeat time in the object dictionary to the required time. The bit 7 of status word is 0 and the bit 6–bit 0 has the same meaning as the NodeGuarding.

COB–ID	RTR	data0
0x700+Node–ID	0	State

3.2 Description of cm25 CANopen protocol of Agile Series driver

3.2.1 CANopen communication object COB-ID

CANopen provides a variety of communication objects. Each communication object has different characteristics. Please refer to CANopen standard protocol for details. Using a predefined COB–ID, The specific rules are as follows:

(1) NMT object: 0x000

(2) SYNC object:: 0x080

(3) SDO object

RPDO:0x600+Node–ID

TPDO:0x580+Node–ID

(4)PDO object

RPDO1:0x200+Node–ID

RPDO2:0x300+Node–ID

RPDO3:0x400+Node–ID

RPDO4:0x500+Node–ID

TDPO1:0x180+Node–ID

TPDO2:0x280+Node–ID

TPDO3:0x380+Node–ID

TPDO4:0x480+Node–ID

(5)Emergency:0x80+Node–ID

3.2.2 Emergency message and Frequency converter fault network description

Emergency message data

Emergency error code	Error register	Vendor specified error code
0~1	2	3~7

Emergency error code: please refer to relevant chapters of ds301.

Fault code

Fault code	Fault name	Fault code	Fault name
0	Not fault	33	Frequency converter pre overload
1	Overcurrent	34	Motor pre overload
2	DC overvoltage	35	Abnormal communication
3	DC undervoltage	36	Abnormal parameter setting
4	Buffer resistance overheating	37	Motor speed over run
5	Frequency converter overload	38	Large motor speed deviation
6	Motor overload	39	STO execution exception
7	Input phase loss	40	PID feedback missing
8	Output phase loss	41	External fault
9	Overtemperature of frequency converter	42	External warning
10	Abnormal PWM wave generation	43	Pre drive failed
11	Current zero drift error	44	Encoder hardware exception
12	Short circuit to ground fault	45	Abnormal holding brake control
13	Motor tuning fault	46	Abnormal control board voltage
14	Encoder abnormality	47	Abnormal motor temperature
15	Vector stall alarm	48	Motor temperature warning
16	FPGA read / write error	49	AI disconnection fault limit
17	Drive power failure	50	Capacitor side fan fault
18	Primary power failure	51	Cm-eeprom fault
19	Abnormal communication between CM and PM	52	Reserved
20	Pm-eeprom fault	53	Reserved
21	PM model intelligence error	54	Reserved
22	Wave by wave current limiting fault	55	Reserved
23	Rectifier bridge overheating	56	Reserved
24	STO fault	57	Reserved

3.2.3 Driver parameter operation

The frequency converter function code group is mapped to the main index number 0x2020–0x20ff of the object dictionary, and the sub index of the number mapping object dictionary in the function code group is the function code number plus 1. For example, the main index number of the data object mapped by the function code A00.41 is 0x2020 and the sub index number is 0x2A.

The main indexes of the data dictionary corresponding to the function code group are as follows:

Function code group	Primary index
A00 – A09	0x2020 – 0x2029
B00 – B11	0x2030 – 0x203B
C00 – C08	0x2040 – 0x2048
D00 – D11	0x2050 – 0x205B
E00 – E07	0x2060 – 0x2067
F00 – F08	0x2070 – 0x2078
G00 – G05	0x2080 – 0x2085
P00 – P15	0x20E0 – 0x20EF

The sub index of the data dictionary corresponding to the number in the function code group = offset address in the group + 1.

3.2.4 SDO read / write operation

1. Write the function code of the drive

CAN	CANopen data	Explain
11 bit ID	0x600+Node–ID	Node ID drive station address
RTR	0	Remote frame flag
DATA 0	Command code	0x2B; Write command
DATA 1	Index low byte	Primary index corresponding to function code group
DATA 2	Index high byte	
DATA 3	Subindex	Offset within function code group + 1
DATA 4	Data–low	Modified data value
DATA 5	Data–high	
DATA 6	Reserved	Reserved "0"
DATA 7	Reserved	Reserved "0"

Slave SDO response

CAN	CANopen data	Description
11 bit ID	0x580+Node–ID	Node ID drive station address
RTR	0	Remote frame flag
DATA 0	Command code	Correct 0x60; Failed 0x80
DATA 1	Index low byte	Primary index corresponding to function code group
DATA 2	Index high byte	
DATA 3	Subindex	Offset within function code group + 1
DATA 4	Data 1	Correct:0 Error: SDO operation failed error code
DATA 5	Data 2	
DATA 6	Data 3	
DATA7	Data 4	

For example, the station address is 0x01 and the write function code a00.41 is 0x03

COB–ID	RTR	Data(hex)
0x601	0	2B 20 20 2A 03 00 00 00

Normal response

COB–ID	RTR	Data(hex)
0x581	0	60 20 20 2A 00 00 00 00

Error response

COB–ID	RTR	Data(hex)
0x581	0	80 20 20 2A error code

2. Read the function code of the driver

The drive uses CANopen service data object (SDO) to read and write to the drive,The format of data sent by the master station is as follows:

CAN	CANopen data	Explain
11 bit ID	0x600+Node–ID	Node ID drive station address
RTR	0	Remote frame flag
DATA0	Command code	0x40; Read command
DATA1	Index low byte	Primary index corresponding to function code group
DATA2	Index high byte	
DATA3	Subindex	Offset within function code group + 1
DATA4	Data 1	Reserved "0"
DATA5	Data 2	Reserved "0"
DATA6	Data 3	Reserved "0"
DATA7	Data 4	Reserved "0"

SDO response for read operation

CAN	CANopen data	Explain
11 bit ID	0x580+Node–ID	Node ID drive station address
RTR	0	Remote frame flag
DATA 0	Command code	Error 0x48; error 0x80
DATA 1	Index low byte	Primary index corresponding to function code group
DATA 2	Index high byte	
DATA 3	Subindex	Offset within function code group + 1
DATA 4	Data 1	Correct: return the data value. Data 1 is the low byte and data 2 is the high byte Error: SDO operation failed error code
DATA 5	Data 2	
DATA 6	Data 3	
DATA 7	Data 4	

SDO exception code

SDO abort code	Description
0x05040000	SDO access time out
0x06010000	Object does not support access
0x06010001	An attempt was made to read and write only parameters
0x06010002	An attempt was made to write a read–only parameter
0x06020000	The object dictionary does not exist
0x06070010	Data type mismatch, service parameter length mismatch
0x06090011	Sub index does not exist
0x06090030	Write access out of parameter range [1]
0x08000022	The current device state cannot be transferred or saved [2]

Note 1: the function code address or data is out of range
Note 2: the operation process cannot be modified or the permission is insufficient

3.2.5 PDO read / write operation

1. Rpdo drive operation

This protocol supports four RPDO, namely RPDO1, RPDO2, RPDO3 and RPDO4. The mapping relationship of each rpdo is shown in the table below.

For more details, please refer to the EDS document of Bonan agile.

RPDO	Mapping object	Explain
RPDO1	Receive PZD 1	Map to bus data adapter receive PZD1
	Receive PZD 2	Map to bus data adapter receive PZD2
	Receive PZD 3	Map to bus data adapter receive PZD3
	Receive PZD 4	Map to bus data adapter receive PZD4
RPDO2	Receive PZD 5	Map to bus data adapter receive PZD5
	Receive PZD 6	Map to bus data adapter receive PZD6
	Receive PZD 7	Map to bus data adapter receive PZD7
	Receive PZD 8	Map to bus data adapter receive PZD8
RPDO3	Receive PZD 9	Map to bus data adapter receive PZD9
	Receive PZD 10	Map to bus data adapter receive PZD10
	Receive PZD 11	Map to bus data adapter receive PZD11
	Receive PZD 12	Map to bus data adapter receive PZD12
RPDO4	Receive PZD 13	Map to bus data adapter receive PZD13
	Receive PZD 14	Map to bus data adapter receive PZD14
	Receive PZD 15	Map to bus data adapter receive PZD15
	Receive PZD 16	Map to bus data adapter receive PZD16

Generally, Receive PZD1 is used as the control word and Receive PZD 2 is used as the command word, which can also be defined by the user.

2. TPDO driver operation

Four TPDO are supported, namely TPDO1, TPDO2, TPDO3 and TPDO4.

The mapping relationship is shown in the table below

TPDO	Mapping object	Description
TPDO1	Transmit PZD 1	Mapping to bus data adapter sends PZD1
	Transmit PZD 2	Mapping to bus data adapter sends PZD2
	Transmit PZD 3	Mapping to bus data adapter sends PZD3
	Transmit PZD 4	Mapping to bus data adapter sends PZD4
TPDO2	Transmit PZD 5	Mapping to bus data adapter sends PZD5
	Transmit PZD 6	Mapping to bus data adapter sends PZD6
	Transmit PZD 7	Mapping to bus data adapter sends PZD7
	Transmit PZD 8	Mapping to bus data adapter sends PZD8
TPDO3	Transmit PZD 9	Mapping to bus data adapter sends PZD9
	Transmit PZD 10	Mapping to bus data adapter sends PZD10
	Transmit PZD 11	Mapping to bus data adapter sends PZD11
	Transmit PZD 12	Mapping to bus data adapter sends PZD12
TPDO4	Transmit PZD 13	Mapping to bus data adapter sends PZD13
	Transmit PZD 14	Mapping to bus data adapter sends PZD14
	Transmit PZD 15	Mapping to bus data adapter sends PZD15
	Transmit PZD 16	Mapping to bus data adapter sends PZD16

Generally, Transmit PZD1 is used as the status word and Transmit PZD 2 is used as the command feedback, which can also be defined by the user.

3.2.6 EDS documents

EDS file is a spreadsheet. It is a node specific ASCII format file that needs to be used when configuring can network. This file contains the general information of nodes and their object dictionaries in CANopen network.

EDS files of CANopen protocol of BONENG agile series drive cm25 can be downloaded on the official website or contact the manufacturer.

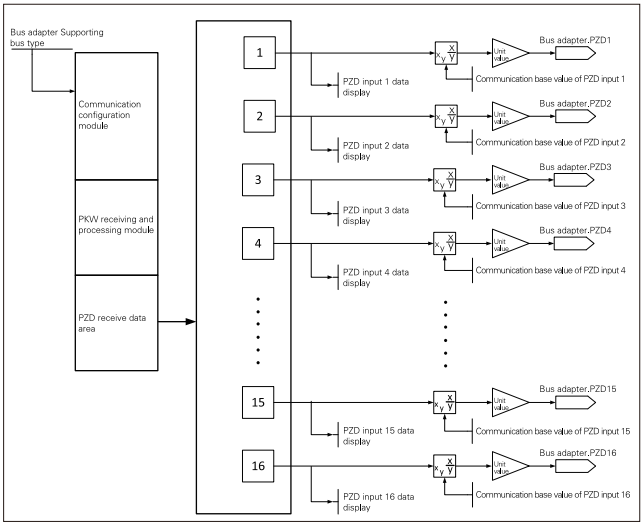
3.2.7 Introduction to interconnection parameters of bus adapter

Agile Series drives use bus adapters to send and receive fieldbus data. The process data received by the master station is first saved in P07.00–P07.31. In the next step, the user needs to analyze the received data.

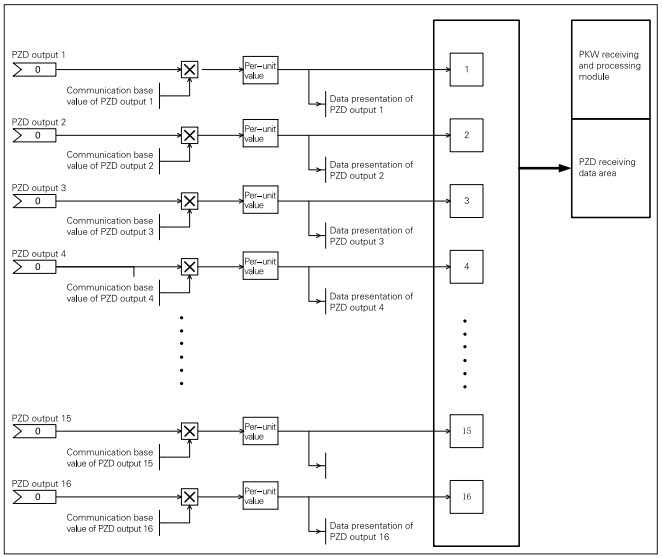
For the data sent from the driver, the source of the data needs to be selected, and then the scale and scale conversion are sent to the master station.

The function diagram of sending and receiving interconnection words is as follows:

Interconnection of transmitted words



Interconnection of receive words



4 Application examples of CANopen

Heda DVP15MC11 – 6 is used as the master station, and BONENG A1–CM25–CN–PE is used as the slave station. Set C03.00 slave address to 1 and baud rate to 500kps

4.1 Driver related parameter settings

Driver parameter settings are as follows:

CANopen bus correlation number

Function code number	Function code name	Modify value	Explain
C00.00	Bus adapter supporting bus type	2：CANopen	
C03.00	CANopen slave station number	1	Software settings
C03.01	CANopen slave baud rate	5:500K	

Start stop control

Function Code	Function code name	Modify value	Explain
B00.00	Start stop control source	Custom control module	
B00.01	Custom off1 source	P02.01: bus adapter	Select start stop source

Speed source

Function Code	Function code name	Modify value	Explain
B02.00	Speed control main setting selection	9:Bus adapter A–PZD2	Select speed source

State feedback

Function Code	Function Code Name	Set value	Explain
C00.02	PZD output 1	P12.07:State word	For the bit definition of the status word, please refer to the agile driver manual

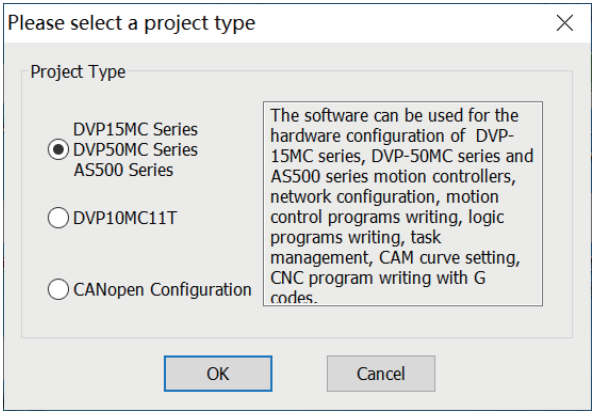
Speed feedback

Function Code	Function Code Name	Set value	Description
C00.03	PZD output 2	P13.00: actual motor speed	Actual speed of feedback motor

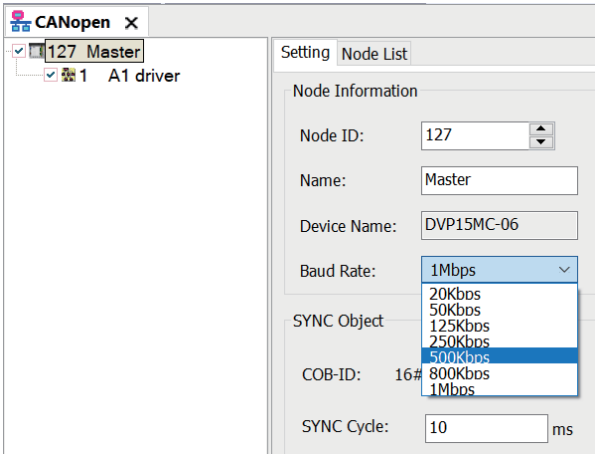
4.2 CANopen master station setting

1. Open CANopenBuilder

2. New project

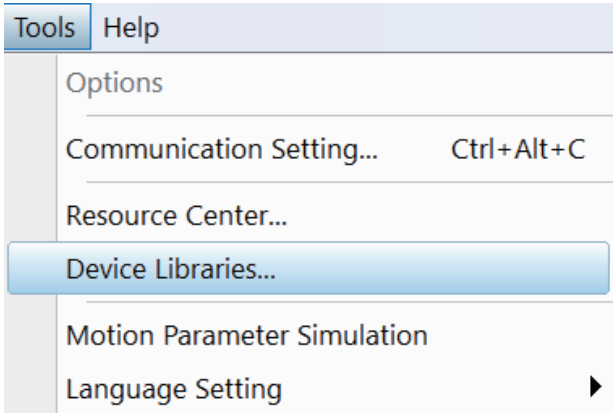


3. Configure master station parameters

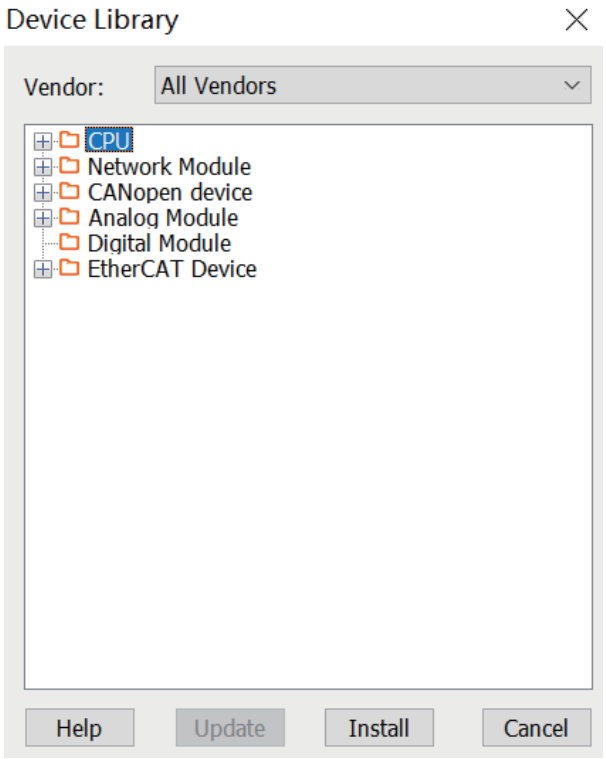


4. Add EDS

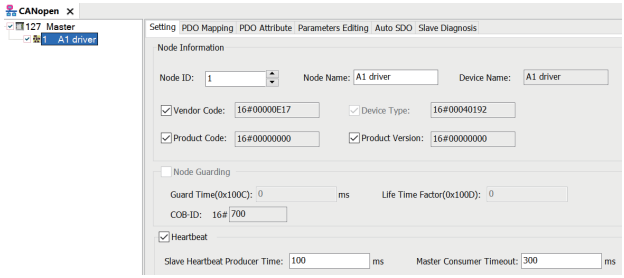
• **Select equipment library**



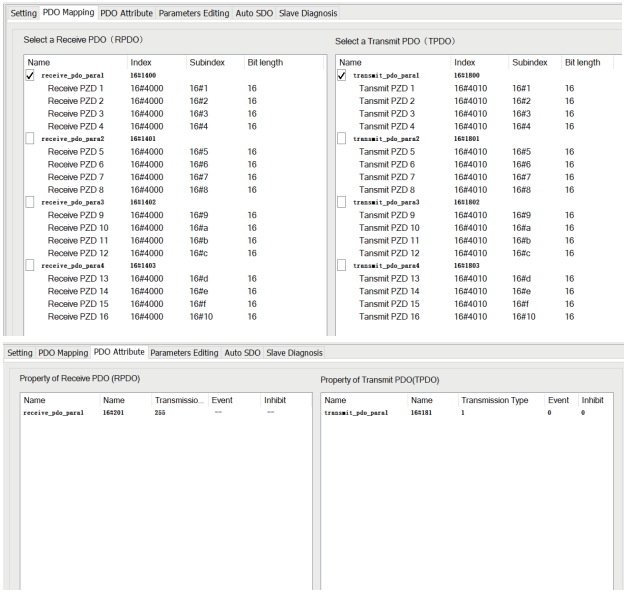
• **Then install the equipment library**



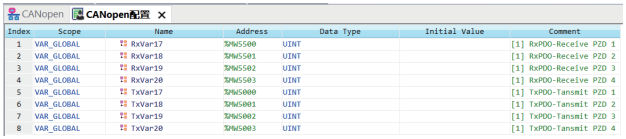
5. Set the parameters related to slave station



6. Set slave PDO properties



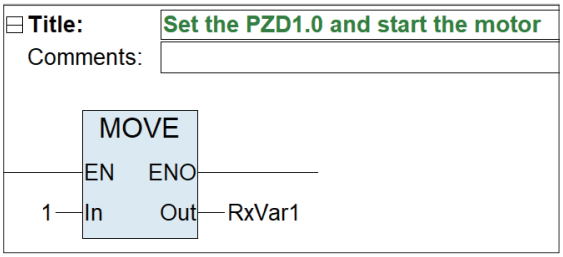
7. PDO address corresponding to the drive



4.3 Master station compiling ladder diagram

1. Give start stop command

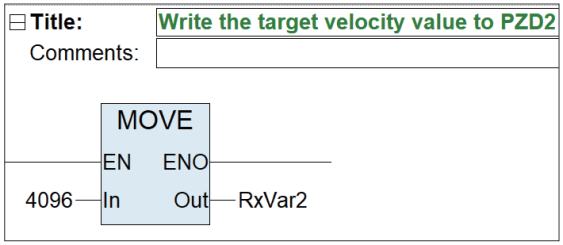
Pzd1.0 is operated by 0 – > 1 motor, pzd1.0 = 0, and the motor stops running



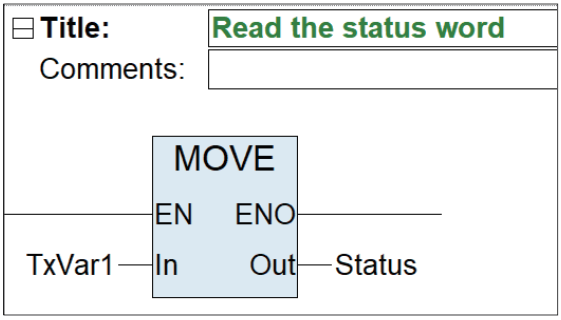
2. Master station sending frequency setting

Pzd2 = 4096, indicating 100% of the given rated frequency,

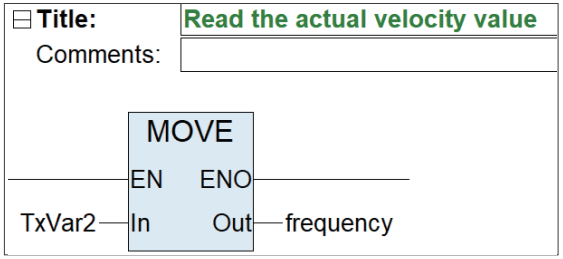
Pzd2 = 2048, representing 50% of the given rated frequency.



3. Read slave feedback status word



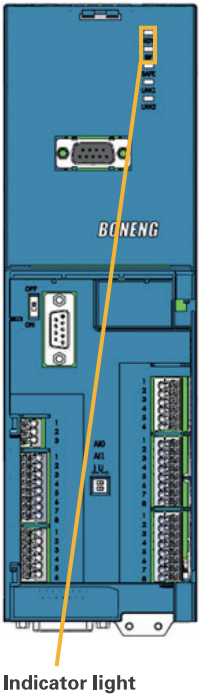
4. Read slave feedback frequency



Appendix
C PROFIBUS-DP operating instructions
1 product introduction
1.1 product functions and characteristics

(1) Support PZD control data exchange.
(2) PKW access to drive parameters is supported.
(3) The communication rate can be detected automatically, and the maximum communication rate can reach 12mbps

2 Installation information
2.1 Description of indicator light

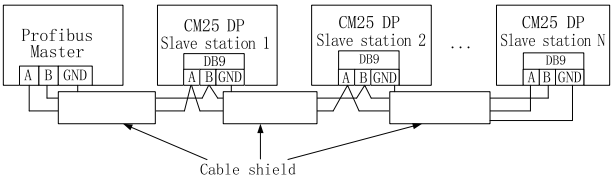


Indicator light		Explain
RDY	BF	
	Green light, always on	Data exchange between frequency converter and master station has been activated;
	Green light, flash	Data exchange between frequency converter and master station is not activated;
Red light, always on		Report PROFIBUS DP Communication failure, master station dropping;

2.1 Wiring with PROFIBUS DP master station

2.1.1 Connection diagram

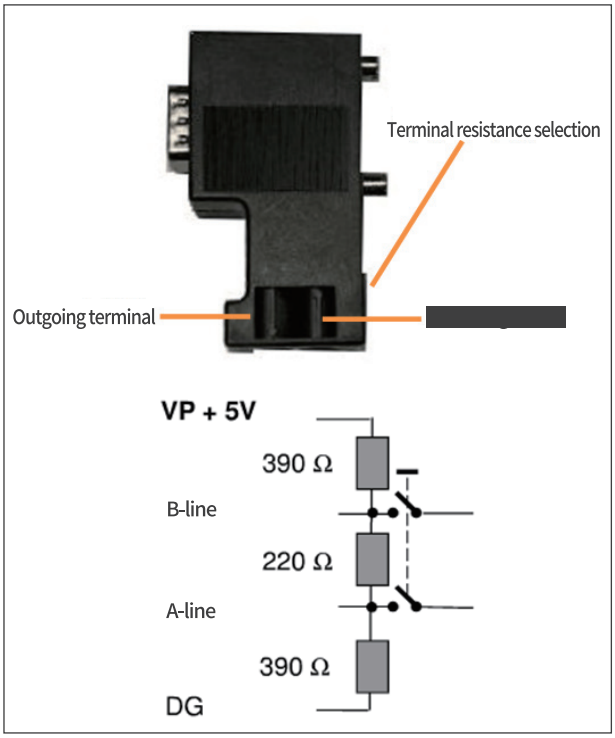
The wiring diagram of CM25 DP module to PROFIBUS DP master station is as follows:



The general PROFIBUS DP bus connection method is shown in the figure above. The master station is located at one end of the bus and the terminal resistance is turned ON.

Then connect the rear stations in turn, turn OFF the terminal resistance of the middle station and turn ON the terminal resistance of the rear station.

The equipment with the terminal resistance ON cannot be powered off, as shown in the figure below. In addition to the terminal resistance of 220Ω, there are two 390Ω bias resistors on the PROFIBUS DP plug, and the power supply must be connected to the bias resistor.



PROFIBUS DP plug and internal circuit diagram

If the terminal equipment needs frequent power-off maintenance, or the terminal equipment has only wiring terminals but no 9 pin D socket, it is necessary to use the active terminal module as the terminal of PROFIBUS DP bus.

2.1.2 Cable technical specifications

Cable parameters	Type A	Type B
Impedance	135Ω~165Ω (f=3~20MHz)	100Ω~130Ω (f>1000KHz)
Capacitance	<30pF/m	<60pF/m
Resistance	<110Ω/km	Not specified
Conductor cross-sectional area	≥0.34mm²	≥0.22mm²

2.1.3 Communication speed and communication distance at each rate

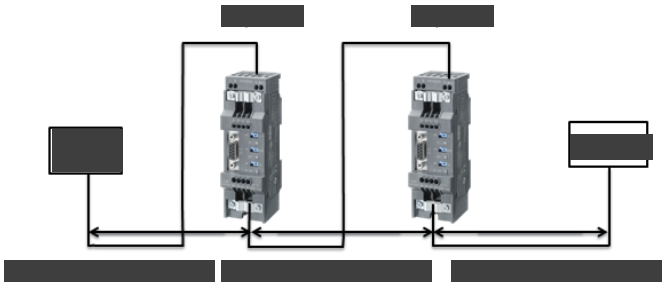
Transmission rate	Maximum length of cable type A (m)	Maximum length of cable type B (m)
9.6	1200	1200
19.2	1200	1200
45.45	900	900
93.75	600	600
9.6187.5	600	600
500	200	200
1500	100	70
3000	100	Not supported
6000	100	
12000	100	

2.1.3.1 Use method of terminal resistance of RS485 repeater

The maximum length of PROFIBUS DP communication cable depends on the baud rate of communication. If the body cable exceeds the maximum length of communication, RS485 repeater needs to be used to extend the communication distance.

There are terminals on the repeater, and the Profibus DP cable can be directly connected to the terminals. In addition, the repeater is also equipped with terminal resistance. Its usage is the same as that of cable plug.

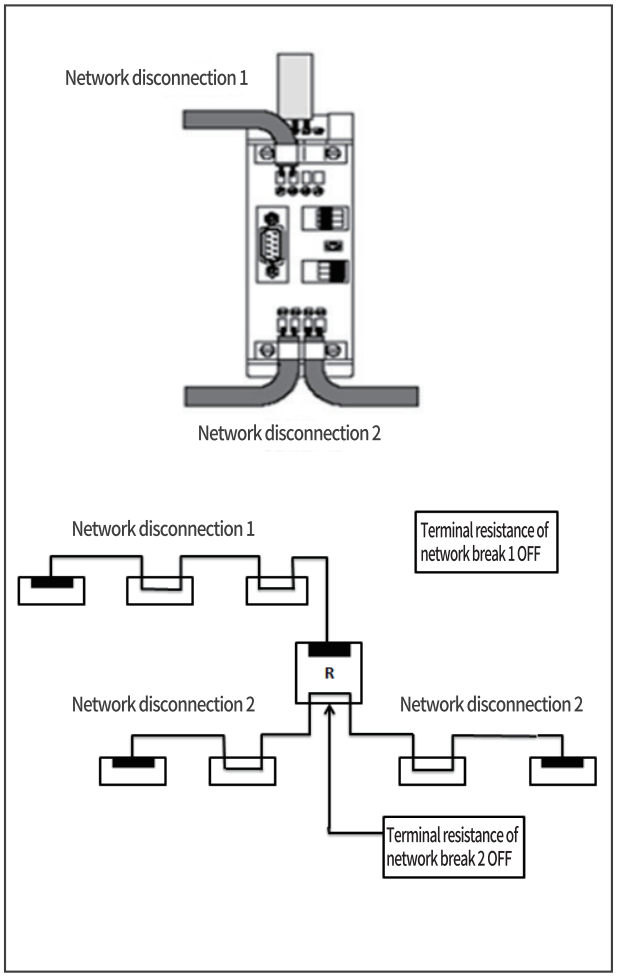
Network expansion using RS485 repeater



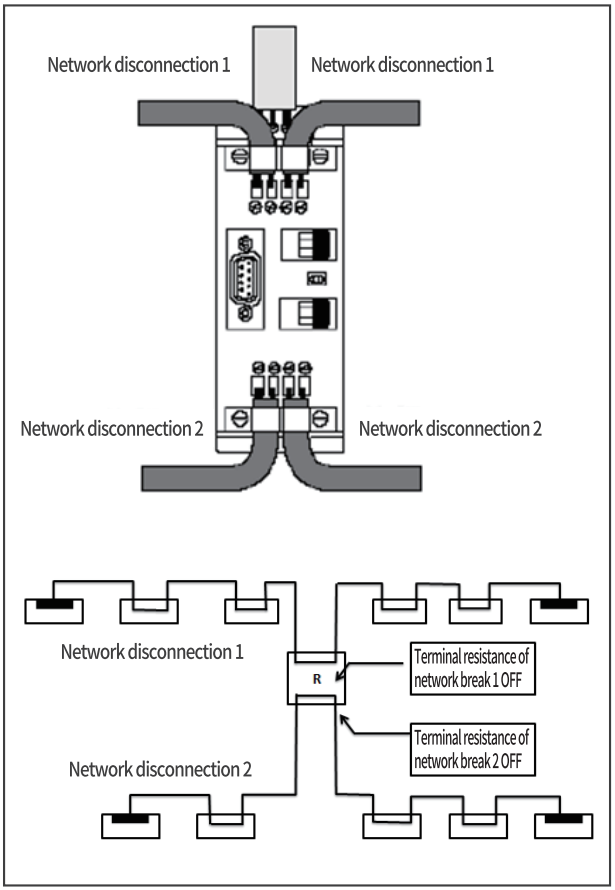
Since RS485 repeaters have signal amplification and regeneration functions, up to 9 RS485 repeaters can be installed on one PROFIBUS bus. A Profibus network segment can have up to 31 stations. If there are more than 32 stations on a Profibus network segment, it also needs to be isolated by RS485 repeaters. For example, if there are 80 stations on a PROFIBUS bus, two RS485 repeaters are required to divide the network into three segments. RS485 repeater is an active network element, which also occupies a station. RS485 repeater can also play the role of electrical isolation between network segments.

PROFIBUS electrical network is not only a bus network, but also can use RS485 repeater to realize "tree" and "Star" bus structure. The two commonly used topology structures of RS485 repeater are shown in the figure:

Common topology of RS485 repeater 1



Common topology of RS485 repeater 2



2.1.3.2 Application method of plug terminal resistance on OLM

If the communication distance of field equipment is far, or the field electromagnetic interference is serious, OLM can be used to convert the electrical signal into optical signal, and optical cable can be used to transmit the signal. There is RS485 electrical interface on OLM, and PROFIBUS DP plug is required to connect cables.

And the connection method of OLM electrical interface is the same whether it is connected to master station or slave station.

2.1.3.3 Application method of plug terminal resistance on DP / DP coupler

Two DP master stations can use DP / DP coupler to transmit data. There are two RS485 interfaces on DP / DP coupler, and the connection method is the same as OLM.

3 PROFIBUS DP communication configuration description

The Profibus DP of Agile Series driver needs to set relevant function codes to establish communication with the master station.

3.1 Driver bus adapter selection

If you use the Profibus DP bus of the agile series driver, you need to select the function code C00.00 as 3: PROFIBUS DP

Function code parameters	Name	Setting range	Set value	Explain
C00.00	Bus adapter Supporting bus type	0:none 1: Modbus 2:CANopen 3 :PROFIBUS–DP 4 :PROFINET 5 :EtherCAT 6 :EtherNet 7 :DeviceNet	3	Bus type: PROFIBUS–DP

3.2 Baud rate setting

The Profibus DP bus of Agile Series driver does not need to set baud rate and adopts adaptive baud rate. The baud rates supported are as follows:

Number	Baud rate (bps)
1	9.6K
2	19.2K
3	45.45K
4	93.75K
5	187.5K
6	500K
7	1.5M
8	3M
9	6M
10	12M

3.3 PROFIBUS DP slave address configuration

The master–slave control function of PROFIBUS DP needs to set the address of PROFIBUS DP communication slave station. The slave address can be set through the driver function code C04.01.

Function code parameters	Name	Setting range	Set value	Explain
C04.01	Local address	1~125	2	DP support slave station NO 1~125

3.4 Communication timeout setting

Function code parameters	Name	Setting range	Factory value	introduction
C04.05	DP communication timeout	0.0s: Do not detect timeout 0.1s–60.0s	0.0s	Setting 0 does not detect Main station off station

3.5 PROFIBUS DP communication protocol description

Agile Series drives support periodic process data exchange and drive parameter access based on PROFIBUS DP.

3.5.1 Periodic process data exchange

Through PROFIBUS DP communication, the master station can periodically send process data such as control word and master set speed to the driver, and periodically obtain process data of status word and actual speed from the driver.

The communication uses periodic communication PZD channel (process data area), and different types of messages define different amounts of process data (PZD).

3.5.2 Driver parameter access

Agile Series drives support the modification of function code parameters through the periodic communication PKW channel (parameter data area) of the master station. Only one parameter can be read or written at a time. The length of the PKW channel is fixed at 4 bytes.

3.5.3 Data transmission format

PPO type is used as data transmission format in PHOFIdrive protocol. Agile Series drives support eight types of PPO1–PPO8.

The data block contained in PPO type data format is divided into two areas, namely PKW area (parameter area) and PZD area (process data area).

The PPO type data format supported by A1 variable frequency drive is shown in the figure below:

Protocol type	PKW	PZD
PPO1	4 WORD	2 WORD
PPO2	4 WORD	6 WORD
PPO3	0 WORD	2 WORD
PPO4	0 WORD	6 WORD
PPO5	4 WORD	10 WORD
PPO6	0 WORD	10 WORD
PPO7	4 WORD	12 WORD
PPO8	0 WORD	12 WORD

3.5.4 Data description of PZD area

PZD area data realizes real–time driver data change and reading and periodic data interaction by the master station. It mainly includes the following contents:

(1) Real time setting of driver control command and target frequency
(2) Read the current status and operating frequency of the driver in real time
(3) Real time interaction of functional parameters and monitoring parameter data between driver and PROFIBUS DP master station. PZD process data mainly completes the periodic data interaction between the master station and the driver.

3.5.4.1 Master station sends PZD area

For example, it can be agreed that pzd1 sent by the master station to the frequency converter is the command given, and pzd2 is the frequency given.

Drive command	Driver target frequency	Drive parameters change in real time
PZD1	PZD2	PZD3~PZD12

Control word bit	Meaning	Parameter setting
15	User defined	P02.15, for interconnection
14	User defined	P02.14, for interconnection
13	User defined	P02.13, for interconnection
12	User defined	P02.12, for interconnection
11	User defined	P02.11, for interconnection
10	Controlled by PLC (not changeable)	1 Valid, this bit cannot be customized
9	User defined	P02.09, for interconnection
8	User defined	P02.08, for interconnection
7	User defined	P02.07, for interconnection
6	User defined	P02.06, for interconnection
5	User defined	P02.05, for interconnection
4	User defined	P02.04, for interconnection
3	Operate inhibit (changeable)	P02.03 for interconnection Connect b00.04 to p02.03 and control this bit to allow operation
2	OFF3 shutdown (changeable)	P02.02 for interconnection Connect b00.03 to p02.02 and control this bit to realize OFF3 shutdown
1	OFF2 shutdown (changeable)	P02.01 for interconnection Connect b00.02 to p02.01 and control this bit to realize OFF2 shutdown
0	ON/OFF1 shutdown (changeable)	P02.00 for interconnection Connect b00.01 to p02.00 and control this bit to start and stop OFF1

Note: the meaning of PZD data can be customized.
For example, b00.01 interconnects p02.0 – p02.15 to realize any bit of PZD to control the start and stop of motor

3.5.4.2 Driver slave station response PZD data area

For example, the user can agree that PZD1 sent by the frequency converter to the master station is the state of the driver, and PZD2 is the operating frequency of the driver

Drive state	Drive target frequency	Drive parameters change in real time
PZD1	PZD2	PZD3~PZD12

The driver selects the data source from c00.02–c00.17 and generates the PZD data area sent by the driver after proportional and unit conversion. The content of the slave station responding to PZD can be customized by the user. For example,Pzd1 can be defined as follows:

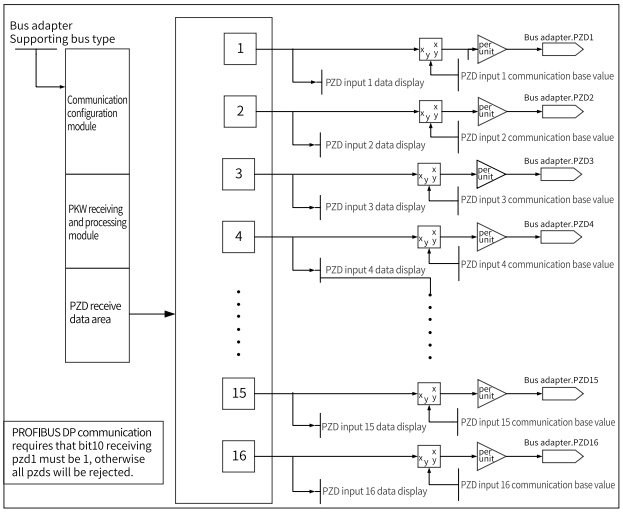
Status bit	meaning
15	User defined
14	User defined
13	User defined
12	User defined
11	User defined
10	User defined
9	User defined
8	User defined
7	User defined
6	User defined
5	User defined
4	User defined
3	User defined For example: define the bit as 0: Operating frequency not reached 1: operating frequency not reached
2	User defined For example: define the bit as 0: no fault 1: fault
1	User defined For example: define the bit as 0: forward operation 1: reverse operation
0	User defined For example: define the bit as 0: drive shutdown 1: drive operation

3.5.4.3 Interconnection of transmitted words

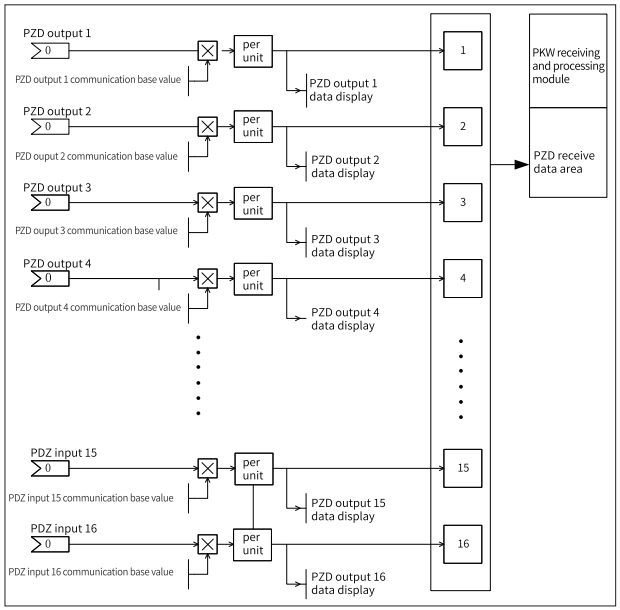
Agile Series drives use bus adapters to send and receive fieldbus data. The process data received by the master station is first saved in P07.00–P07.31. In the next step, the user needs to analyze the received data.

For the data sent from the driver, the source of the data needs to be selected, and then the scale and scale conversion are sent to the master station. The function diagram of sending and receiving interconnection words is as follows:

3.5.4.3.1 Interconnection of transmitted words



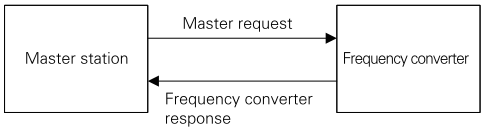
3.5.4.3.2 Interconnection of receive words



3.5.5 Data description of PKW area

For the PKW channel (parameter data area) of periodic communication, the master station of PKW channel can read and write the function code parameters of the driver. Only one parameter can be read or written at a time. The length of PKW channel is fixed to 4 words.

PKW communication working mode: the master station sends a request, the driver processes the request after receiving the master station's request, and replies the processing result to the master station.



The request and response data of PKW communication contains 4 words and is divided into three groups of data areas, namely PKE, ind and PWE. The length of PKE data byte is 2 bytes, IND is 2 bytes and PWE is 4 bytes. The data format is as follows:

Master station sends data PKW							
Operation command	Function code mailing address [1]		Retain			Write function code: parameter value Read function code: None	
PKE	PKE	IND	IND	PWE	PWE	PWE	PWE
Drive response data PKW							
Operation command	Function code mailing address		Retain			Success: return value Failure: error message	
PKE	PKE	IND	IND	PWE	PWE	PWE	PWE

Note 1: Please refer to the manual for the correspondence address of the function code

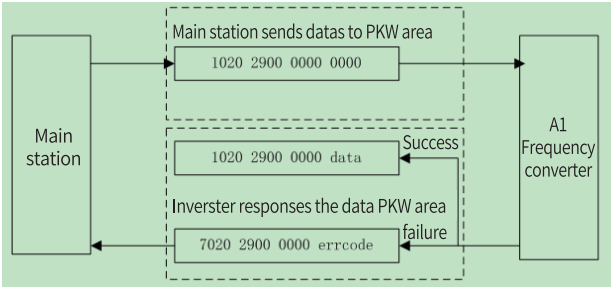
Data description

Format description of PKW data sent by master station		Driver response PKW data format description	
PKE	High 4 bits: operation command 0x0: no request 0x1: read function code parameter data 0x2: change function code parameter data, Do not save eeprom! 0xE: change function code parameter data, Save EEPROM Lower 4 bits: reserved Low 8 bits: high bit of function code Parameter address	PKE	High 4 bits: response code 0x0: no request 0x1: function code parameters operate correctly 0x7: cannot execute Lower 4 bits: reserved Lower 8 bits: function code parameters Address high bit
IND	Upper 8 digits: function code parameters Address low order Lower 8 bits: reserved	IND	Upper 8 digits: function code parameters Address low order Lower 8 bits: reserved
PWE	High 16 bits: reserved Low 16: not used when reading requests; Indicates the parameter value when writing a request	PWE	When the request is successful: parameter value When PWE request failed: error code(see table below)

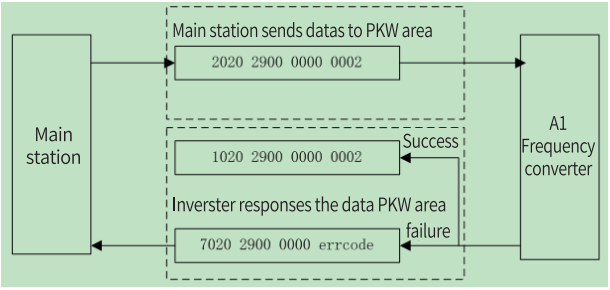
Note: do not change EEPROM value frequently, otherwise EEPROM may be damaged.

Read function code example

Read function code example
Main station reads function code A00.41 parameter of drive



Main station changes function code A00.41 parameter of drive



Error code

Code	Name	Meaning
01	illogical data	illogical data
02	read–only parameters	read–only parameters
03	No permission to modify	No permission to modify
04	Modify instop model	Modify instop model
05	illegal address	illegal address
06	illegal operational code	illegal operational code

4 Instruction about GSD file

Please log in to the official website or connect factory to obtain GSD file.

5 Panel display instructions and troubleshooting

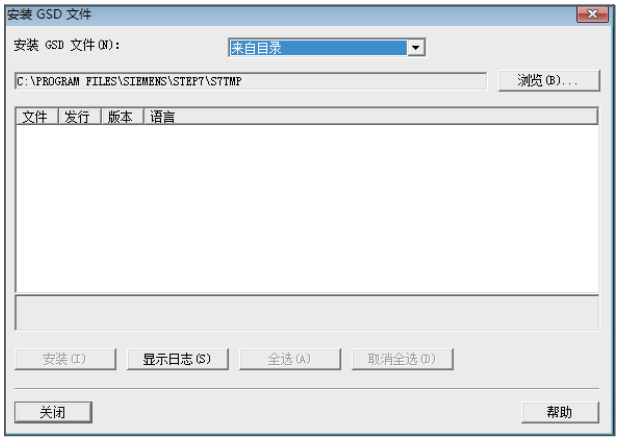
Fault description	Solution
After the inverter is powered on, the BF green light flashes slowly, and communication cannot be established	Check whether the inverter parameters are set correctly. Please refer to "PROFIBUS DP Communication Configuration Instructions" to configure the inverter parameters. Check whether the master station configuration is correct. Check whether the cable is connected properly. Check the DIP switches of the DP connector, except that the DIP switches on the DP connectors at both ends of the network are ON, the DIP switches on the other DP connectors must be OFF.
RDY red light is always on, and the keyboard panel reports PROFIBUS–DP communication failure	Check that the cable is connected properly. Whether the communication timeout setting is reasonable,Increase the C04.05 value.
RDY green light is always on, BF green light is always on,But the motor can't operate normally	The main station and inverter have entered the stage of data conversion,but the data that control the converter is not correct,please refert to the "PROFIBUS–DP communication protocol description"

6 Application example

Complete data interaction between Siements PLC CPU315–2DP with Agile series drive through PROFIBUS DP

6.1 Install GSD file

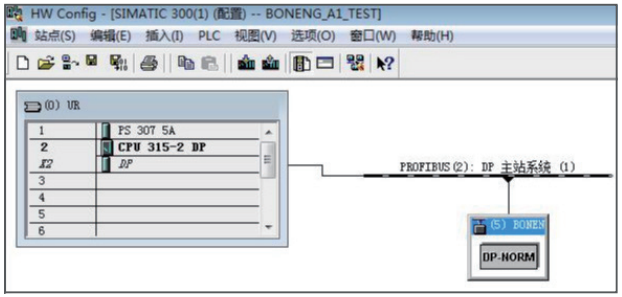




6.2 Networking

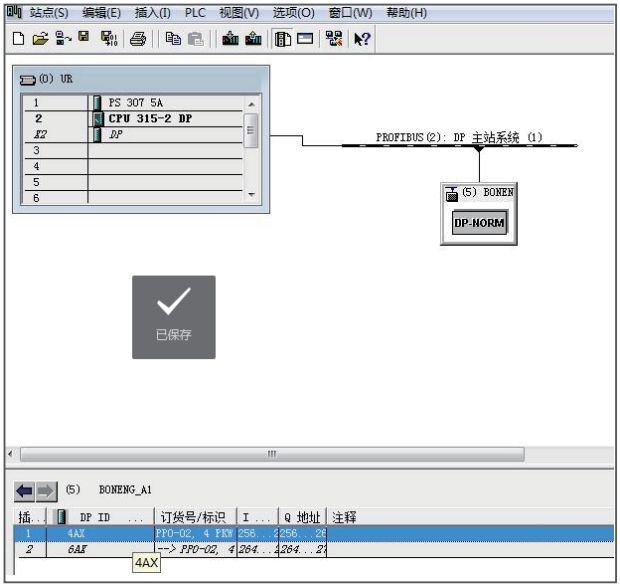
6.2.1 The PROFIBUS network composited of PLC and drive

Click right–>additional Field Device–>Drivers–>BONENG/PROFIBUS DP–>BONENG_AGILE

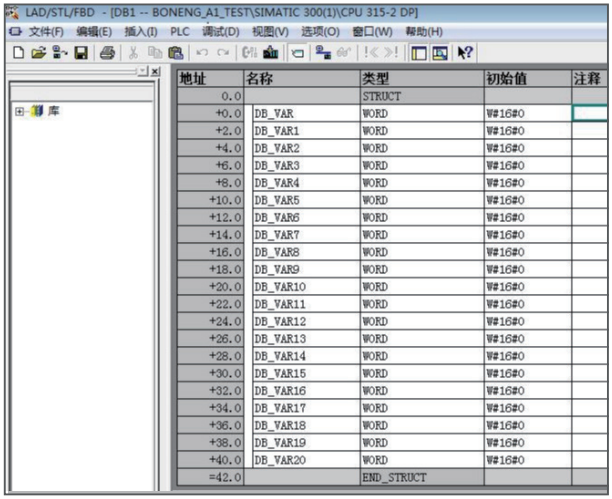


6.2.2 Select type of protocol

Select PPO2,which include 4 WORD PKW and 6 WORD PZD



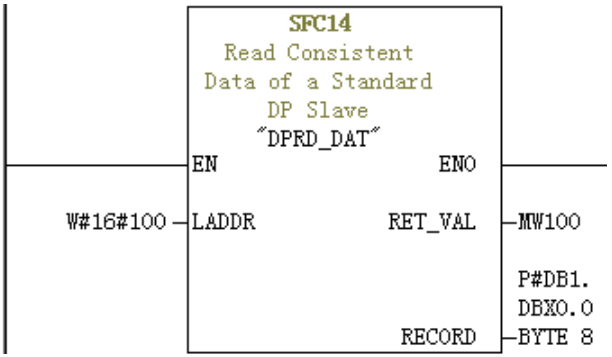
6.3 Add variable sheet DB1

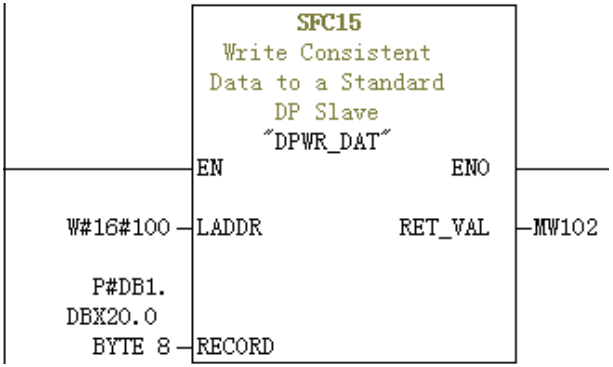


地址	名称	类型	初始值	注释
0.0		STRUCT		
+0.0	DB_VAR	WORD	W#16#0	
+2.0	DB_VAR1	WORD	W#16#0	
+4.0	DB_VAR2	WORD	W#16#0	
+6.0	DB_VAR3	WORD	W#16#0	
+8.0	DB_VAR4	WORD	W#16#0	
+10.0	DB_VAR5	WORD	W#16#0	
+12.0	DB_VAR6	WORD	W#16#0	
+14.0	DB_VAR7	WORD	W#16#0	
+16.0	DB_VAR8	WORD	W#16#0	
+18.0	DB_VAR9	WORD	W#16#0	
+20.0	DB_VAR10	WORD	W#16#0	
+22.0	DB_VAR11	WORD	W#16#0	
+24.0	DB_VAR12	WORD	W#16#0	
+26.0	DB_VAR13	WORD	W#16#0	
+28.0	DB_VAR14	WORD	W#16#0	
+30.0	DB_VAR15	WORD	W#16#0	
+32.0	DB_VAR16	WORD	W#16#0	
+34.0	DB_VAR17	WORD	W#16#0	
+36.0	DB_VAR18	WORD	W#16#0	
+38.0	DB_VAR19	WORD	W#16#0	
+40.0	DB_VAR20	WORD	W#16#0	
+42.0		END_STRUCT		

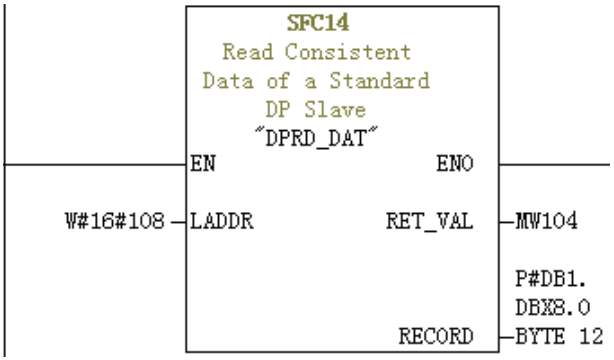
6.4 Ladder Diagram Program

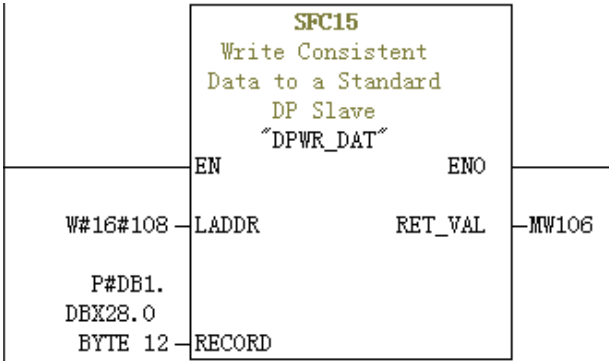
6.4.1 Read and write PKW area





6.4.2 Read and write PZD area





6.5 Control start-stop and speed

Setting parameter of drive,selecting the start–stop of drive to be set from the main–link PZD1.0,and the speed is set from PZD2.

B00.01	Source of motor control start–stop command	Customize control model
B00.01	Source of motor customize OFF1 command	P02.00:Bus adapter
B02.00	Main setting or selecting command of control speed	9: Bus adapter

Modify the value of monitor sheet to visit the data of PZD. Through modify DB1.DBW 20~DB1.DBW 26 can modify the value of function code, the result displayed by DB1.DBW 0~DB1.DBW 6 .

Through modify DB1.DBW 28~DB1.DBW 38 can control drive,the DB1.DBW 8~DB1.DBW 18 displays the state and speed of drive.

The specific format refers to the description chapter of the PROFIBUS communication protocol.

	Address	Symbol	Display format	State value	Modify value
1	// PKW Read inverter function code				
2	DB1.DBW 0		HEX	W#16#1020	
3	DB1.DBW 2		HEX	W#16#2900	
4	DB1.DBW 4		HEX	W#16#0000	
5	DB1.DBW 6		HEX	W#16#0003	
6	// PZD Feedback				
7	DB1.DBW 8		HEX	W#16#0003	
8	DB1.DBW 10		HEX	W#16#0000	
9	DB1.DBW 12		HEX	W#16#0000	
10	DB1.DBW 14		HEX	W#16#0000	
11	DB1.DBW 16		HEX	W#16#0000	
12	DB1.DBW 18		HEX	W#16#0000	
13	// PWK Write inverter function code				
14	DB1.DBW 20		HEX	W#16#1020	W#16#1020
15	DB1.DBW 22		HEX	W#16#2900	W#16#2900
16	DB1.DBW 24		HEX	W#16#0000	W#16#0000
17	DB1.DBW 26		HEX	W#16#0000	W#16#0000
18	// Given				
19	DB1.DBW 28		HEX	W#16#0401	W#16#0401
20	DB1.DBW 30		HEX	W#16#0100	W#16#0100
21	DB1.DBW 32		HEX	W#16#0000	
22	DB1.DBW 34		HEX	W#16#0000	
23	DB1.DBW 36		HEX	W#16#0000	
24	DB1.DBW 38		HEX	W#16#0000	
25					

After–sale service

When customs find quality problems with various drive products, they should not disassemble the machine first. They should explain the following situations and contact the after–sales services department of our company, explain the phenomenon and confirm the problem, and then adopt a better method to deal with it.

Model and specification: _____

Date of production: _____

Serial number: _____

Time used: _____

Applications or host name: _____

Host manufacturer: _____

Quality problem description: _____

_____

_____

_____

_____

User unit: _____

Address: _____

Telephone: _____ Fax: _____

Post code: _____ Contacts: _____

After sales service telephone of BONENG: _____

Fax: _____

NOTE: _____

_____

_____

_____

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