Goodrive880 Series Inverter Unit

Software Manual

SHENZHEN INVT ELECTRIC CO., LTD.

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1	First release.	V1.0	April 2024

Preface

Thank you for choosing INVT Goodrive880 series engineering variable-frequency drive (VFD).

For ease of use, read the manual carefully before using the product.

Goodrive880 series engineering VFD provides two topology forms: single-drive and multi-drive. It is a drive product positioned for high-end applications. The product is modularly designed based on the DFX concept and adopts advanced control algorithms, which has the advantages of excellent speed and torque control performance, high reliability, high power density, convenient installation, commissioning, maintenance, and comprehensive protection, and helps to upgrade the localization of process industry and continuous production equipment.

- Excellent speed and torque control performance
- Modular design, as flexible as building blocks, which makes the project integration simple and efficient
- Long-life component selection and fast fault recovery design to ensure efficient process control
- Ergonomic design to make installation and maintenance easier
- Enriched expansion capability to support various protection options
- CCS-compliant

Goodrive880 series engineering VFD can be widely used in:

Metallurgy: Such as high-speed wire rod and hot strip rolling equipment, wide and thick plate equipment, cold rolling equipment, pickling lines, annealing lines, galvanizing line, color coating lines, non-ferrous metal alloy manufacturing equipment, and non-ferrous metal rolling equipment.

Petroleum: All-electric oil drilling rigs, large well repair machines, large oil machinery and equipment electric-drive power transformation, oilfield water injection equipment and other heavy oil equipment.

Paper making: Paper making joint equipment, including flow box, net section, press section, drying section, sizing, hard calendering, coating, super calender, rewinder and other continuous production lines.

Port and other large lifting equipment: Such as shore-side container overhead cranes, tire-type (orbital) container gantry cranes, grab unloaders, grab gantry cranes, large shipbuilding gantry cranes, and large metallurgical casting cranes.

Others: Such as unit test benches, military equipment, oil and gas transmission, and mining transmission equipment.

Goodrive880-51 series is the inverter unit of Goodrive880 series. If not otherwise specified, the inverter unit in this manual refers to the inverter unit of Goodrive800 series, that is, Goodrive880-51 series product. The rated power of a single inverter unit is 3.7kW–720kW, and the max parallel power can be 6500kW. The inverter unit consists of bus capacitor, IGBT, and other components. It is compact in structure and easy to integrate and maintain.

This manual is Goodrive880 Series Inverter Unit Software Manual. Read through this manual carefully before installation to ensure the product is installed and operated in a proper manner to give full play to its excellent performance and powerful functions. If you have any question about the function and performance of the product, please consult our technical support.

If the product is ultimately used for military affairs or weapon manufacture, comply with the export control regulations in the Foreign Trade Law of the People's Republic of China and complete related formalities.

To continuously improve the performance of the product to meet higher application requirements, we reserve the right to continuously improve the product and accordingly the product manual, which may be made without prior notice. We have the final interpretation of the manual content.

Contents

1 Safety precautions

1.1 Safety declaration

Read this manual carefully and follow all safety precautions before moving, installing, operating and servicing the product. Otherwise, equipment damage or physical injury or death may be caused.

We shall not be liable or responsible for any equipment damage or physical injury or death caused due to your or your customers' failure to follow the safety precautions.

1.2 Safety definition

Danger: Severe personal injury or even death can result if related requirements are not followed.

Warning: Personal injury or equipment damage can result if related requirements are not followed.

Note: Actions taken to ensure proper running.

Trained and qualified professionals: People operating the equipment must have received professional electrical and safety training and obtained the certificates, and must be familiar with all steps and requirements of equipment installing, commissioning, running and maintaining and capable to prevent any emergencies.

1.3 Warning symbols

Warnings caution you about conditions that can result in severe injury or death and/or equipment damage and advice on how to prevent dangers. The following table lists the warning symbols in this manual.

Symbol	Name	Description
	Danger	Severe personal injury or even death can result if related requirements are not followed.
	Warning	Personal injury or equipment damage can result if related requirements are not followed.
	Electrostatic discharge	The PCBA may be damaged if related requirements are not followed.
	Hot sides	Do not touch. The inverter unit base may become hot.
25 min	Electric shock	As high voltage still presents in the bus capacitor after power off, wait for at least 25 minutes (depending on the warning symbols on the machine) after power off to prevent electric shock.
Note	Note	Steps to take for ensuring the proper running of the product.

1.4 Safety guidelines

	• Only trained and qualified professionals are allowed to carry out related operations. • Do not perform wiring, inspection or component replacement when power supply is applied. Ensure all the input power supplies have been disconnected before wiring or inspection, and wait for at least the time designated on the Goodrive880 series product or until the DC bus voltage is less than 36V. The minimum waiting time is listed in the following.

Inverter unit model		**Minimum waiting time**
380V	3.7–90kW	5 minutes
	110–200kW	15 minutes
	Higher than 355kW	25 minutes
690V	55–315kW	15 minutes
	Higher than 400kW	25 minutes

- Do not modify the VFD unless authorized; otherwise fire, electric shock or other injury may result.

- The base may become hot when the VFD is running. Do not touch. Otherwise, you may get burnt.

- The electrical parts and components inside the VFD are electrostatic sensitive. Take measurements to prevent electrostatic discharge when performing related operations.

1.4.1 Delivery and installation

- Do not install the inverter unit on inflammables. In addition, prevent the inverter unit from contacting or adhering to inflammables.
- Do not run the inverter unit if it is damaged or incomplete.
- Do not contact the inverter unit with damp objects or body parts. Otherwise, electric shock may result.

Note

- Select appropriate tools for inverter unit delivery and installation to ensure the safe and proper running and avoid physical injury or death. To ensure personal safety, take mechanical protective measures like wearing safety shoes and working uniforms.
- Protect the inverter unit against physical shock or vibration during the delivery and installation.
- Do not carry the product only by its front cover as the cover may fall off.
- The installation site must be away from children and other public places.
- Prevent the screws, cables and other conductive parts from falling into the inverter unit.
- As power unit leakage current caused during running may exceed 3.5mA, ground properly and ensure the grounding resistance is less than 10Ω. The conductivity of PE grounding conductor must meet the following requirements:

Power cable conductor cross-sectional area *S* (mm²)	**Grounding conductor cross-sectional area**
S≤16	S
16<S≤35	16
35<S	S/2

- (+) and (-) are the DC bus input terminals, while U, V, and W are the output terminals. Connect the input power and motor cables properly; otherwise, the inverter unit may be damaged.

1.4.2 Commissioning and running

	• Cut off all power supplies connected to the inverter unit before terminal wiring, and wait for at least the time designated on the inverter unit after disconnecting the power supplies. • High voltage presents inside the inverter unit during running. Do not carry out any operation on the inverter unit during running except for keypad setup. The control terminals of the product form extra-low voltage (ELV) circuits. Therefore, you need to prevent the control terminals from connecting to accessible terminals of other devices. • Before turning on the power supply, check the cable connection status. • Prevent anyone from directly touching the energized part of the cabinet door. Pay special attention to safety when handling shields that are made of metal sheets. • Do not do any withstand voltage testing during unit connection. Disconnect the motor cable before performing any insulation and voltage withstand tests for the motor or motor cable. • Do not open the cabinet door since medium voltage presents inside the rectifier during running.
Note	• Do not switch on or switch off the input power supplies of the inverter unit frequently. • If the inverter unit has been stored for a long time without use, perform checking and carry out pilot run for the inverter unit before using it again. • Close the inverter unit front cover before running; otherwise, electric shock may occur.

1.4.3 Maintenance and component replacement

	• Only trained and qualified professionals are allowed to perform maintenance, inspection, and component replacement for the inverter unit. • Cut off all power supplies connected to the inverter unit before terminal wiring, and wait for at least the time designated on the inverter unit after disconnecting the power supplies. • During maintenance and component replacement, take measures to prevent screws, cables and other conductive matters from falling into the internal of the inverter unit.
Note	• Use proper torque to tighten screws. • During maintenance and component replacement, keep the inverter unit and its parts and components away from combustible materials and ensure they have no combustible materials adhered. • Do not carry out insulation voltage-endurance test on the inverter unit, or measure the control circuits of the inverter unit with a megohmmeter. • During maintenance and component replacement, take proper anti-static measures on the inverter unit and its internal parts.

1.4.4 Disposal

	• The inverter unit contains heavy metals. Dispose of a scrap inverter unit as industrial waste.
	• Dispose of a scrap product separately at an appropriate collection point but not place it in the normal waste stream.

2 Quick startup

2.1 Safety notes

- Equipment can tip over if transported incorrectly or with disallowed means of transport. Serious injury, property damage, or even death may result.
- Only trained and qualified professionals are allowed to carry out the operations mentioned in this chapter. Please carry out operations according to instructions presented in section 1.4.1 Delivery and installation. Ignoring these safety precautions may lead to physical injury or death, or device damage.
- Ensure the rectifier unit power has been disconnected before installation. If the rectifier unit has been powered on, disconnect the rectifier unit power and wait for at least the time specified on the rectifier unit, and ensure the POWER indicator is off. You are recommended to use a multimeter to check and ensure the rectifier unit DC bus voltage is below 36V.
- The equipment installation must be designed and done according to applicable local laws and regulations. We do not assume any liability whatsoever for any equipment installation which breaches local laws or regulations. If recommendations given by us are not followed, the rectifier unit may experience problems that the warranty does not cover.
- Only trained and qualified professionals are allowed to carry out related operations.
- Do not perform wiring, inspection or component replacement when power supply is applied. Ensure all the input power supplies have been disconnected before wiring or inspection, and wait for at least the time designated on the Goodrive880 series product or until the DC bus voltage is less than 36V.

2.2 Unpacking inspection

Check the following after receiving the product.

1. Whether the packing box is damaged or dampened.
2. Whether the model identifier on the exterior surface of the packing box is consistent with the purchased model.
3. Whether the interior surface of the packing box is abnormal, for example, in wet condition, and whether the housing is damaged or cracked.
4. Whether the product nameplate is consistent with the model identifier on the exterior surface of the packing box.
5. Whether the accessories (including the manual, keypad, and expansion card) inside the packing box are complete.

If any problems are found, contact the local INVT dealer or office.

2.3 Checking before use

Check the following before using the product.

1. Mechanical type of the load to be driven by the product to verify whether the product will be

	overloaded during work. Whether the power class of the product needs to be increased.
2.	Whether the actual running current of the motor is less than the rated current of the product.
3.	Whether the voltage of the grid is within the allowable input voltage range of the product.
4.	Whether the product meets the communication requirements.

2.4 Environment checking

Check the following before installing the product.

1.	Whether the actual ambient temperature exceeds 40°C. When the temperature exceeds 40°C, derate by 2% for every increase of 1°C. Do not use the product when the ambient temperature exceeds 50°C.
2.	Whether the actual ambient temperature is lower than -10°C. If the temperature is lower than -10°C, use heating devices.
3.	Whether the altitude of the application site exceeds 1000m. When the altitude exceeds 1000m, derate by 1% for every increase of 100m.
4.	Whether the ambient humidity is higher than 90% or condensation occurs. If yes, take additional protective measures.
5.	Whether there is direct sunlight or biological invasion in the environment where the product is to be used. If yes, take additional protective measures.
6.	Whether there is dust or inflammable and explosive gas in the environment where the product is to be used. If yes, take additional protective measures.

2.5 Checking after installation

Check the following after the product installation is complete.

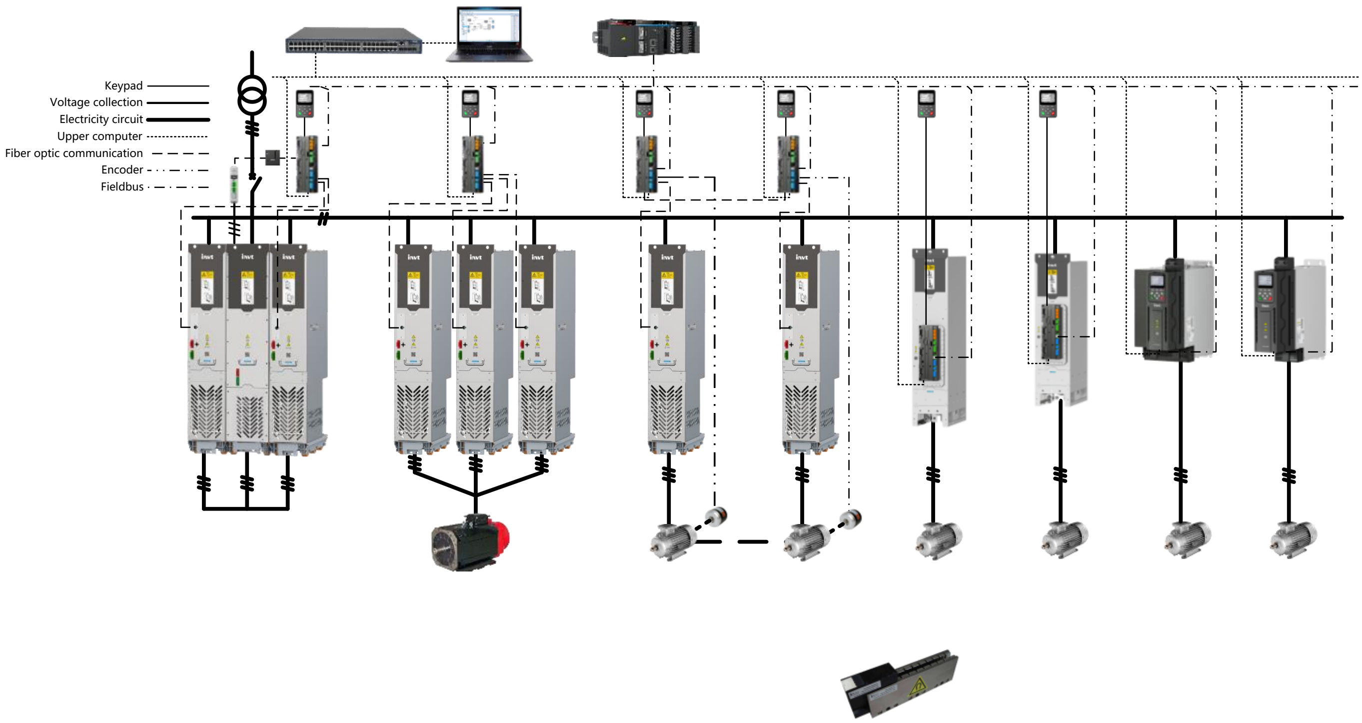
1.	Whether the input power cables and motor cables meet the current-carrying capacity requirements of the actual load.
2.	Whether correct accessories are selected for the product, the accessories are correctly and properly installed, and the installation cables meet the capacity carrying requirements of all components (including the reactor, input filter, output reactor, output filter, DC reactor, braking unit and braking resistor).
3.	Whether the product is installed on non-flammable materials and the heat-radiating accessories (such as the reactor and braking resistor) are away from flammable materials.
4.	Whether all the control cables and power cables are separately routed and whether the routing complies with EMC requirement.
5.	Whether all grounding systems are properly grounded.
6.	Whether all the installation clearances of the product meet the requirements in the manual.
7.	Whether the external wiring terminals are tightened, and whether the torque meets the requirements.
8.	Take protective measures to prevent screws, cables and other conductive parts from falling into the product.

3 System introduction

3.1 System topology

GD880 multi-drive typical topology consists of rectifier (basic rectifier, regenerative rectifier, and active rectifier), inverter and braking units, as shown in Figure 3-1. Module expansion can be implemented through control unit paralleling. The control units are connected to the PLC through the fieldbus, which realizes the centralized management; and the control units can be debugged and monitored on the upper computer through Ethernet communication.

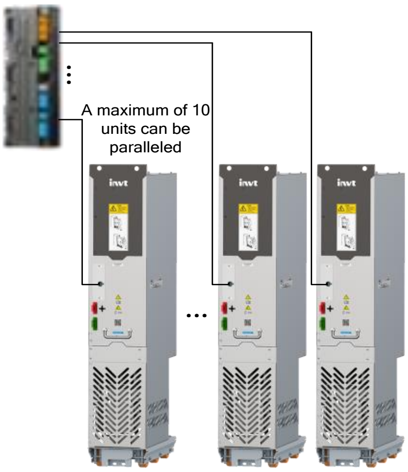
Figure 3-1 GD880 multi-drive typical topology



3.2 Parallel connection for expansion

An inverter control unit (ICU) can be used to control multiple inverter units so as to achieve power expansion, and an ICU supports a maximum of 10 inverter units paralleled. Equipped with output reactors as standard configuration, GD880 series A8i inverter units can be used directly in parallel, while output reactors need to be configured for the units in another size so that they can be used in parallel.

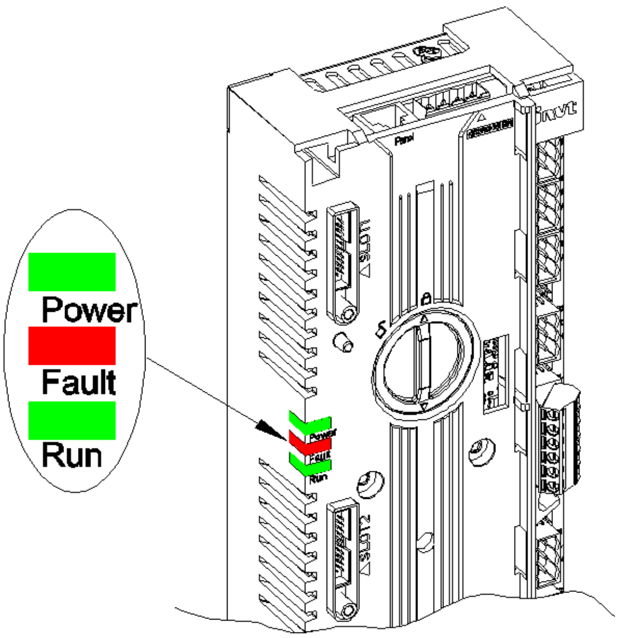
Figure 3-2 Paralleled inverter units



Note: Inverter units of different sizes cannot be used in parallel.

3.3 Inverter control unit (ICU)

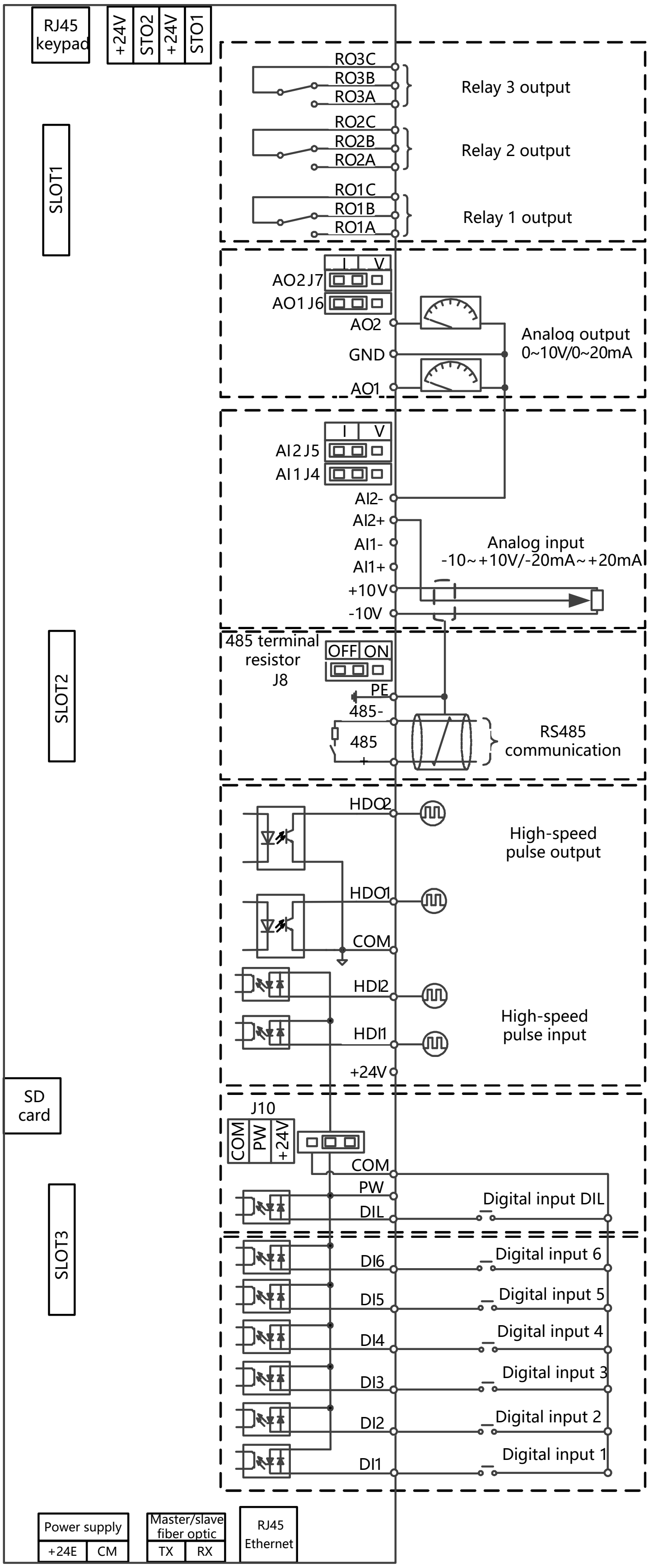
3.3.1 Indicator

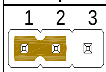
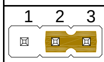
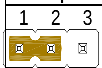
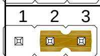


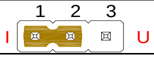
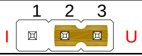
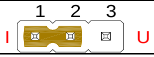
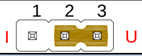
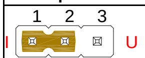
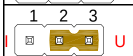
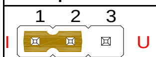
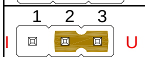
No.	Name	State	Description
1	POWER	ON	The ICU is properly powered.
		OFF	The ICU is not powered or power failure occurs.
2	Fault	ON	The system is faulty.
		OFF	The system is normal.
3	RUN	ON	The power module is running.
		Blinking	The power module is stopped.

3.3.2 Control unit interface

Figure 3-3 Control unit circuit wiring



Terminal	Terminal symbol	Function description	Cable specifications
Input power			
1	24V	24VDC ±10% 2A	Two-core twisted-pair cable is recommended. Cross-sectional area: 0.5–2.5mm^2
2	COM1		
DI input terminal			
1	DI1	Input impedance: 3.3kΩ Voltage input range: 12–30V Supports NPN and PNP bi-direction input, relay contact input Max input frequency: 1kHz	Single-core wire Cross-sectional area: 0.5–2.5mm^2
2	DI2		
3	DI3		
4	DI4		
5	DI5		
6	DI6		
DIL input terminal			
1	DIL	Digital interlock. When its input is high, all other input terminals are forced to be invalid.	Two-core twisted-pair cable is recommended. Cross-sectional area: 0.5–2.5mm^2
2	PW	Provides power supply for DIL, DI1–DI6, HDI, and HDO.	
3	COM	Digital common ground	
Jumper J10: power supply selection			
 1 is short connected to 2 , PW is short connected to internal COM, and DI uses the internal power ground. If external power is required, you need to remove the shorting cap.			
 2 is short connected to 3 , PW is short connected to internal +24V, and DI uses the internal power. If external power is required, you need to remove the shorting cap.			
HDIO terminal			
1	+24V	Input type: PNP, NPN Input frequency range: 0–50kHz Input voltage range: 12–30V Duty ratio: 30%–70%	Two-core twisted-pair cable is recommended. Cross-sectional area: 0.5–2.5mm^2 HDI and COM are in twisted pairs, while HDO and COM are in twisted pairs.
2	HDI1		
3	HDI2		
4	COM	Output type: OC Output frequency range: 0–50kHz Max output load: 20mA/30V Duty ratio: 50%	
5	HDO1		
6	HDO2		
RS485 communication terminals			
1	485+	RS485 bus, standard 5V electrical level Terminal resistor: 120Ω Max baud rate: 115200 Max number of nodes: 32 (without relay)	Two-core twisted-pair cable is recommended. Cross-sectional area: 0.5–2.5mm^2
2	485-		
3	PE		
Jumper J8: terminal resistor selection			
 When 1 and 2 are short-circuited, the terminal resistor is disconnected.			
 When 2 and 3 are short-circuited, the terminal resistor is connected.			
Analog input terminal			
1	-10V	Positive and negative 10V power supply Max output current: 10mA	Cross-sectional area: 0.5–2.5mm^2 When two AIs are used, use two two-core shielded twisted-pair cables. When reference voltage is
2	+10V		
3	AI1+	Current input: -20mA–20mA, Rin: 500Ω Voltage input: -10V–10V, Rin: 30kΩ Differential input range: ±30V Sampling interval: 0.1ms	
4	AI1-		
5	AI2+		
6	AI2-		

Terminal	Terminal symbol	Function description	Cable specifications
		Resolution: 11 bits + sign bit	used, use one four-core shielded twisted-pair cable for one AI.
Jumper J4: Selection between AI1 voltage and current signal inputs			
 When 1 and 2 are short-circuited, AI1 current input is used.			
 When 2 and 3 are short-circuited, AI1 voltage input is used.			
Jumper J5: Selection between AI2 voltage and current signal inputs			
 When 1 and 2 are short-circuited, AI2 current input is used.			
 When 2 and 3 are short-circuited, AI2 voltage input is used.			
Analog output terminal			
1	AO1	AO output range: 0–20mA, Rload ⩽ 500Ω; 0–10V, Rload ⩾ 10kΩ Resolution: 11 bits + sign bit Accuracy: 2% of full scale range	Two-core twisted-pair cable is recommended. Cross-sectional area: 0.5–2.5mm² AO1 and GND, AO2 and GND use twisted-pair cables.
2	GND		
3	AO2		
Jumper J6: Selection between AO1 voltage and current signal outputs			
 When 1 and 2 are short-circuited, AO1 current output is used.			
 When 2 and 3 are short-circuited, AO1 voltage output is used.			
Jumper J7: Selection between AO2 voltage and current signal inputs			
 When 1 and 2 are short-circuited, AO2 current output is used.			
 When 2 and 3 are short-circuited, AO2 voltage output is used.			
Relay 1 output terminal			
1	RO1A	Output type: passive NO and NC contacts Contact parameters: 250Vac/30Vdc, 3A	Single-core wire Cross-sectional area: 0.5–2.5mm²
2	RO1B		
3	RO1C		
Relay 2 output terminal			
1	RO2A	Output type: passive NO and NC contacts Contact parameters: 250Vac/30Vdc, 3A	Single-core wire Cross-sectional area: 0.5–2.5mm²
2	RO2B		
3	RO2C		
Relay 3 output terminal			
1	RO3A	Output type: passive NO and NC contacts Contact parameters: 250Vac/30Vdc, 3A	Single-core wire Cross-sectional area: 0.5–2.5mm²
2	RO3B		
3	RO3C		
Master/slave fiber optic			
1	TX	Transmitting optical fiber communication	Dedicated fiber optic cable
2	RX	Receiving optical fiber communication	
Safe torque off terminal			
1	STO1	Inverter module STO input They have been short connected before delivery by default.	Four-core shielded twisted-pair cable Cross-sectional area: 0.5–2.5mm²
2	+24V		
3	STO2		
4	+24V		
RJ45 keypad			
1	RJ45	Connected to SOP-880-01 keypad	Standard shielded network cable

Terminal	Terminal symbol	Function description	Cable specifications
RJ45 Ethernet			
1	RJ45	Ethernet communication with a PC	Standard shielded network cable

3.3.3 Function module

ICU can be used with other function modules to achieve corresponding functions. The details are as follows.

No.	Name	Model	Function description	Connect with ICU through	W x H x D (mm)
1	Encoder detection module	EC-PG805-05	TTL incremental encoder signal detection	SLOT	73.5×103×23.5
		EC-PG805-24	HTL incremental encoder signal detection	SLOT	73.5×103×23.5
		EC-PG804	Resolver encoders signal detection	SLOT	73.5×103×23.5
2	Input/output module	EC-IO801	Two AIs Two AOs Three DIs 1 relay outputs	SLOT	73.5×103×23.5
3	PROFINET IO module	EC-TX809	PROFINET IO industrial Ethernet	SLOT	73.5×74×23.5
4	PROFIBUS-DP module	EC-TX803	PROFIBUS-DP bus adapter	SLOT	73.5×74×23.5
5	CAN bus module	EC-TX805	CANopen bus adapter	SLOT	73.5×74×23.5
6	Optical fiber expansion module	EC-TX821	One 50M expansion optical fiber	SLOT	73.5×74×23.5
		EC-TX823	Three 50M expansion optical fibers	SLOT	73.5×74×23.5
7	SLOT expansion module	I-ESM-30	SLOT expansion module	Fiber optic	99.5×303×65
8	Voltage detection module	I-VDM-10	AC voltage detection module	Fiber optic	37.4×180×113
		I-VDM-20	DC voltage detection module	Fiber optic	37.4×180×113
9	ntelligent operatior keypad	SOP-880-01	Human-machine interface keypad	RS422	74×121.5×26

Note:

- EC-TX823 can only be inserted in SLOT2 or SLOT3.
- It is recommended to install the EC-PG805 card in SLOT1.
- It is recommended to install the EC-TX803 card in SLOT3.

3.4 Per unit system

In general circuit calculations, the units of current, voltage, power, and impedance are used as A, V, W, and Ω, and this method of representing physical quantities in actual named units is called the system of named units.

In the calculation using the named unit system, the parameters are completely different for the same type of motor due to different capacities, resulting inconvenience. Calculations are often performed using the per unit system in engineering, which simplifies the calculations and makes it easier to analyze changes in physical state. Engineering calculations often use per unit values to mark values, representing the relative values of each physical quantity and parameter. A per unit value is relative to a certain base value. For a same named unit value, when different base values are selected, the per unit values are also different. The conversion relationship between the per unit value and named unit value is as follows:

Per unit value = Named unit value/Base value

In motor control systems, the nominal values of the motor are usually selected as the base values for the per unit system. Take the motor current as an example. If the motor rated current is 100A, the no-load current is 40A, and the motor rated current 100A is used as the base value for calculation, the per unit value of the motor no-load current 40A is 40%.

The per unit value selection in this software system shall comply with the following:

Name	Base value
Motor rotation speed	Uses a motor parameter (P14.34/P15.34/P16.34/P17.34) setting as the base value.
Output current	Uses the motor rated current as the base value.
Output torque	Uses the motor rated torque as the base value. The rated torque is calculated based on the user-entered basic parameters, but not entered directly.
Output power	Uses the motor rated power as the base value.
DC bus voltage	Unit rated voltage (P99.03)* 1.414
Output voltage	Uses the motor rated voltage as the base value.
16-bit parameter	When a 16-bit parameter is used to represent a per unit value, 4096 (hexadecimal 0x1000) represents 100%, indicating the accuracy of up to 0.0244%. A value range of -799.9% – +799.9% (32768/4096) can be represented. They are usually used to indicate the per unit values of current, voltage and torque.

4 Basic operation guidelines

4.1 What this chapter contains

This chapter instructs you how to use the VFD keypad and commission the VFD common functions.

4.2 Keypad introduction

Features:

- The LCD display is more intuitive, eliminating the need to consult manuals and saving time in commissioning.
- It supports parameter upload, storage, and download, and parameter copying reduces project batch commissioning time.
- IP54 high-protection design supports externally installing the keypad on the cabinet door for easy integration.
- Type-C firmware/word library upgrades, quick respond to custom software and multi-language adaptation.

Note:

- ✧ The LCD keypad is equipped with a real-time clock, which can run properly after being installed with batteries even if the power line is disconnected.
- ✧ The clock battery (model CR2032) is user purchased.
- ✧ The LCD keypad has the parameter copying function.
- ✧ If you need install the keypad externally (that is, on another position rather than on the VFD), you can use M3 screws to fix the keypad, or you can use the keypad installation bracket to install the keypad. When installing the keypad externally, use an extension cable with a standard RJ45 crystal head for connection.

4.2.1 Keypad appearance

The VFD has been equipped with a LCD keypad as a standard configuration part. You can use the keypad to control the start and stop, read status data, and set parameters of the VFD.

Figure 4-1 Keypad

4.2.2 Keys

Table 4-1 Key description

Key	Name	Description
	Return key	Press it to return to the previous interface.
	Main interface key	Press it to return directly to the main interface.
	Menu key	The function of function key varies with the menu.
	Up key	The Up key function varies with interfaces, such as shifting up the displayed item, shifting up the selected item, and changing digits.
	Down key	The Down key function varies with interfaces, such as shifting down the displayed item, shifting down the selected item, and changing digits.
	Left key	The Left key function varies with interfaces, such as switch over the monitoring interface, shifting the cursor leftward, exiting the current menu and returning to upper-level menu.
	Right key	The Right key function varies with interfaces, such as switching the monitoring interface, shifting the cursor rightward, and entering the next-level menu.
	LOC/REM key	Press it to switch between the local SOP-880 and the remote.
	Confirmation key	The confirmation key function varies with menus, such as confirming parameter setup, confirming parameter selection, and entering the next-level menu.
	Run key	Press it to run the product when using the keypad for control.
	Stop/Reset key	Press it to stop the product or perform autotuning that is running. In fault alarm state, this key can be used for reset in any control modes.

4.2.3 Status indicator description

Table 4-2 Indicator description

Indicator	Example	Description
Off		Stand by
In green		Running
Blinking in green		Remote control
In red		Faulty
Blinking in red		Pre-alarm

4.2.4 LCD display screen description

The LCD display screen is divided into multiple areas, which display content varying with the interfaces. The following figure shows the content displayed in the main interface for the stopped state.

Figure 4-2 LCD display screen main interface

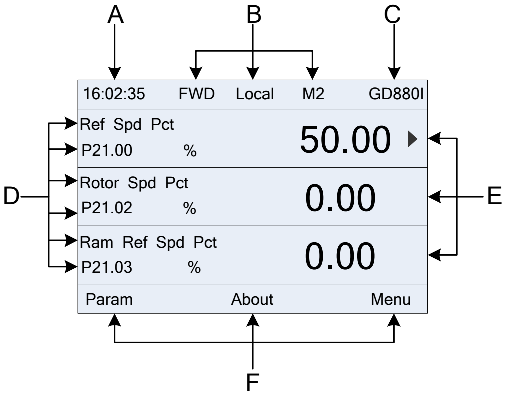
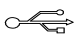
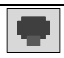
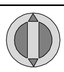


Table 4-3 LCD display screen description

Area	Name	Display
Header A	Real-time display area	Displays the real-time; clock battery is not included; the time needs to be reset when powering on the VFD.
Header B	VFD running state display area	Displays the VFD run status: motor rotating direction: "FWD"—Run forward during operation; "Rev" —Run reversely during operation; "No REV"—Reverse running is disallowed. Displays the VFD command running channel: "Local"—Keypad; "Trml" —Terminal; "Rem"—Communication. VFD actual status display: "M1"—Power-on detection; "M2"—Lockout for startup; "M3"—Ready for startup; "M4"—Pre-charge; "M5"—Ready to run; "M6"—de-magnetization waiting; "M7"—Running; "M8"—Faulty.
Header C	VFD station No. and model display area	Displays VFD station No.: 01–99, applied in multi-drive applications (reserved function). Displays the VFD model: "GD880"—The present VFD is GD880.
Display D	Parameter name and function code monitored by the VFD	Displays the parameter name and corresponding function code monitored by the VFD; three monitoring parameters can be displayed simultaneously. The monitoring parameter list can be edited.
Display E	Parameter value monitored by the VFD	Displays the parameter value monitoring by the VFD, the monitoring value will be refreshed in real time
Footer F	Menu corresponding to the key.	Menu corresponding to the key. The corresponding menu of the key varies with interfaces, and the content displayed in this area also varies.

4.2.5 Other description

Table 4-4 Other description

Appearance	Name	Description
	Type-C interface	Interface to connect to a PC through an adapter.
	RJ45 interface	Interface to connect to a VFD.
	Clock battery cover	Remove this cover when replacing or installing clock battery, and close the cover after battery is installed.

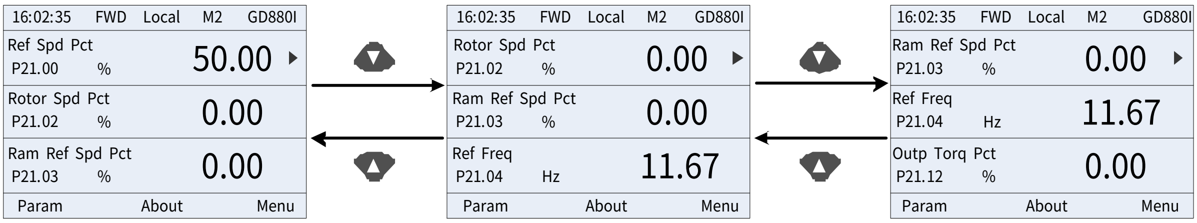
4.3 Keypad display

The VFD keypad can display the stopped-state parameters, running-state parameters, function parameter editing status, and fault alarm status.

4.3.1 Displaying stopped-state parameters

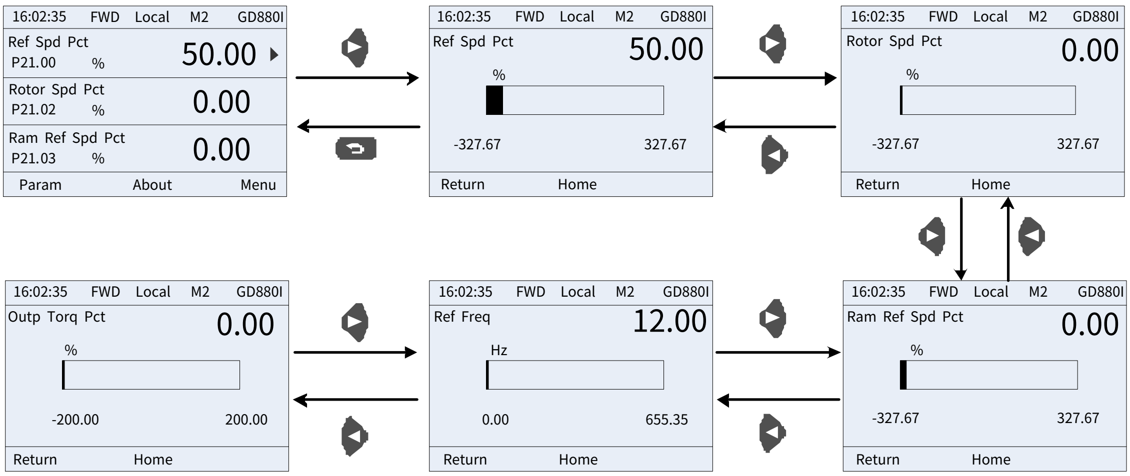
When the VFD is in stopped state, the keypad displays stopped-state parameters, and this interface is the main interface during power-on by default. Under stop state, parameters in various states can be displayed. Press or to shift the displayed parameter up or down.

Figure 4-3 Stopped-state parameter display 1



Press or to switch between different display styles, including list display style and progress bar display style.

Figure 4-4 Stopped-state parameter display 2

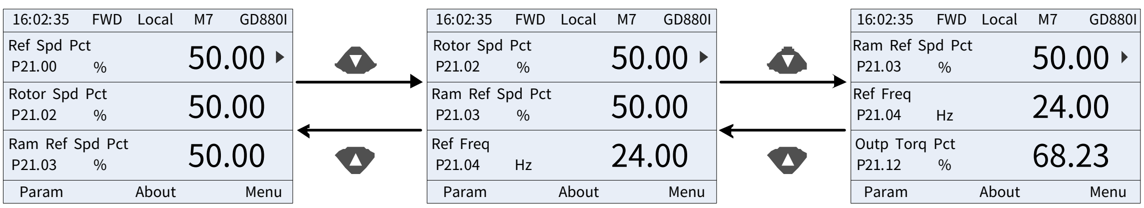


The stop display parameter list is user defined, and each state variable function code can be added to the stop display parameter list as needed. The state variable which has been added to the stop display parameter list can also be deleted or shifted.

4.3.2 Displaying running-state parameters

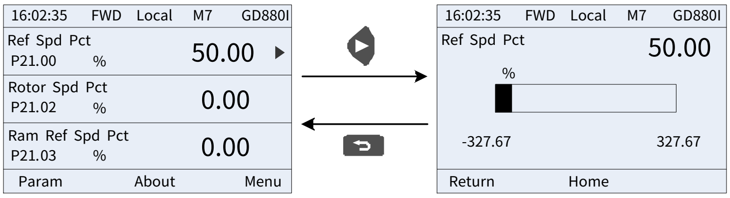
After receiving a valid running command, the VFD will enter the running state, and the keypad displays running state parameter with the keypad Run indicator turning on. Under the running state, multiple types of state parameters can be displayed. Press or to shift up or down.

Figure 4-5 Running-state parameter display 1



Press or to switch between different display styles, including list display style and progress bar display style.

Figure 4-6 Running-state parameter display 2

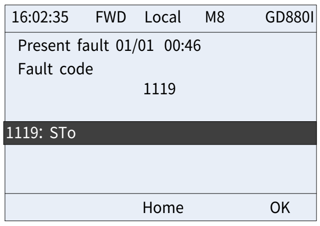


Under running state, multiple kinds of state parameters can be displayed. The running display parameter list is user defined, and each state variable function code can be added to the running display parameter list as needed. The state variable which has been added to the running display parameter list can also be deleted or shifted.

4.3.3 Displaying fault alarms

The VFD enters the fault alarm display state once fault signal is detected, and the keypad displays the fault code and fault information with the keypad red indicator turning on. You can perform fault reset by using the STOP/RST key ( ), control terminals, or communication commands. If the fault persists, the fault code is continuously displayed.

Figure 4-7 Fault alarm display



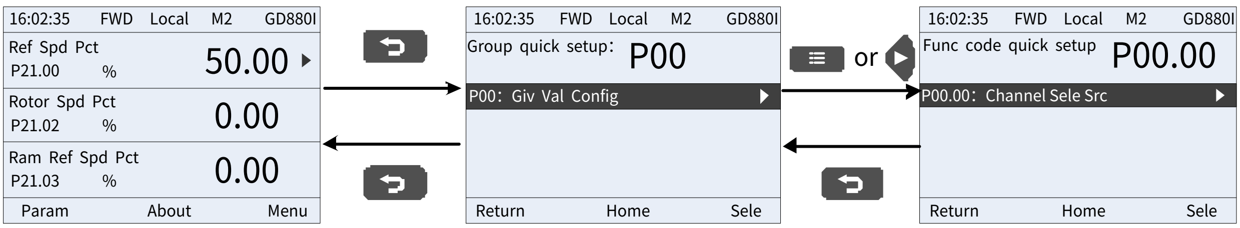
4.4 Operation procedure

Various operations can be performed on the VFD, including entering/exiting menu, parameter selection, list modification and parameter addition.

4.4.1 Entering/Exiting menus

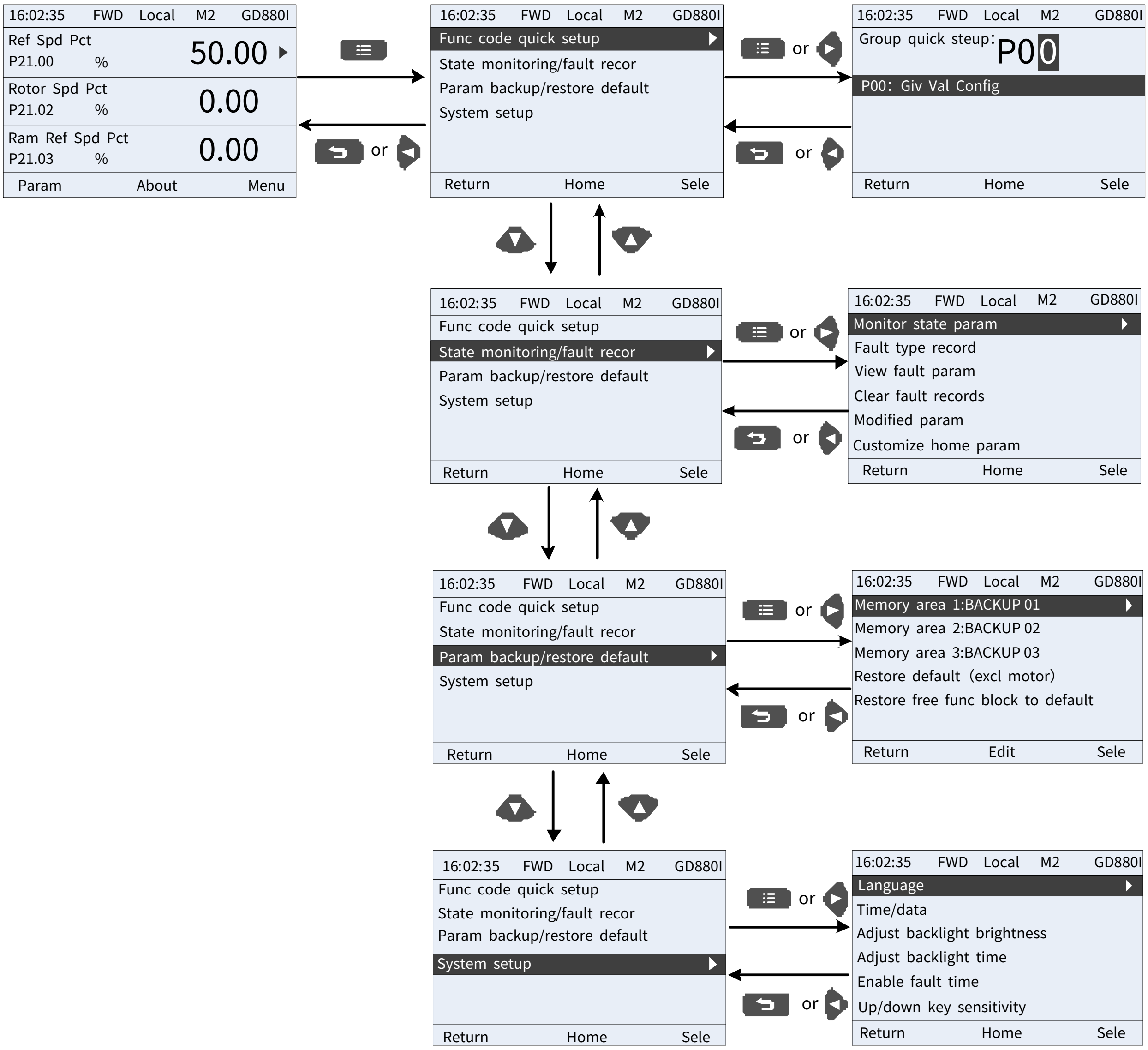
The following figure shows how to enter or exit the parameter menu step by step.

Figure 4-8 Entering/exiting different level menus



The following figure shows how to enter or exit different level menus step by step.

Figure 4-9 Entering/exiting different level menus



The keypad menu setup is shown as follows:

Level 1	Level 2	Level 3
Basic parameters	P00: Giv Val Config	P00.XX
	P01:Start/stop Ctrl	P01.XX
	P02:Ctrl Channel Config	P02.XX
	P03:Vector Ctrl	P03.XX
	P04:V/F Ctrl	P04.XX
	P05:Inp Trml	P05.XX
	P06:Outp Trml	P06.XX
	P07:SYS Info	P07.XX
	P08:Fault Record	P08.XX
	P09:Lim Val Config	P09.XX
	P10:Motor 1 Ctrl Param	P10.XX
	P10:Motor 2 Ctrl Param	P11.XX
	P10:Motor 3 Ctrl Param	P12.XX
	P14:Motor 1 Param	P14.XX

Level 1	Level 2	Level 3
	P14:Motor 2 Param	P15.XX
	P14:Motor 3 Param	P16.XX
	P14:Motor 4 Param	P17.XX
	P18:Prot Config	P18.XX
	P20:CW and SW	P20.XX
	P21: RT Data	P21.XX
	P21: RT Data 1	P22.XX
	P23:SD Card Config	P23.XX
	P24:Param Disp Set	P24.XX
	P30:M/S Ctrl	P30.XX
	P31:Brake Ctrl	P31.XX
	P33:Blackbox Channel Config	P33.XX
	P34:MOP	P34.XX
	P35:Multi-step Spd Ctrl	P35.XX
	P37:BusAdapter A	P37.XX
	P38:BusAdapter B	P38.XX
	P40:Profibus-DP Module	P40.XX
	P41:Profinet-IO Module	P41.XX
	P42:ModbusRTU Module	P42.XX
	P43:CANopen Module	P43.XX
	P44:EtherNet Module-Ethernet Comm Group	P44.XX
	P45:EtherCAT Module	P45.XX
	P46:DeviceNet Module	P46.XX
	P48:Encoder Module 1 Config	P48.XX
	P48:Encoder Module 2 Config	P49.XX
	P51:IO EC 1 Config	P51.XX
	P51:IO EC 2 Config	P52.XX
	P58:Word-to-Bit Func Block Config	P58.XX
	P59:Word-Dword-Conv Func Block Config	P59.XX
	P60:LogicalAnd Func Block Config	P60.XX
	P61:LogicalOr Func Block Config	P61.XX
	P62:Arithmetic Func Block Config 1	P62.XX
	P62:Arithmetic Func Block Config 2	P63.XX
	P65:Ctrl Func Block Config 1	P64.XX
	P65:Ctrl Func Block Config 2	P65.XX
	P66:Swtc Func Block Config	P66.XX
	P67:PID Func Block Config	P67.XX
	P80:BitDataSet 1-Summary of Data of BO Type	P80.XX
	P81:BitDataSet 2-Summary of Data of BO Type	P81.XX
	P82:BitDataSet 3-Summary of Data of BO Type	P82.XX
	P83:BitDataSet 1-Summary of Data of CO Type	P83.XX
	P84:BitDataSet 2-Summary of Data of	P84.XX

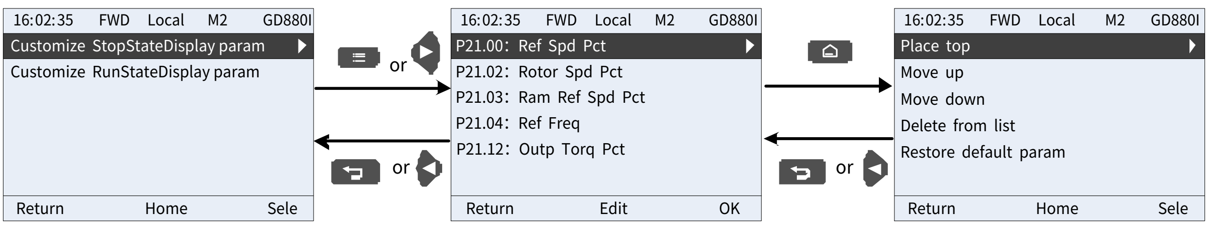
Level 1	Level 2	Level 3
	CO Type	
	P85:Free Pgm Config	P85.XX
	P98:AIAO Calibr Func Group	P98.XX
	P99:Factory Func	P99.XX
State monitoring	Monitor state param	P21.XX
	Fault type record	P08.00:Present Fault Code
		P08.01:Last Fault Code
		P08.02:2nd-last Fault Code
		P08.03:3rd-last Fault Code
		P08.04:4th-last Fault Code
		P08.05:5th-last Fault Code
		P08.06:RT Fault Code 1
		P08.07:RT Fault Code 2
		P08.08:RT Fault Code 3
		P08.09:RT Fault Code 4
		P08.10:RT Fault Code 5
		P08.11:RT Fault Code 6
		P08.12:Present Alarm Code 1
		P08.13:Present Alarm Code 2
		P08.14:Present Alarm Code 3
		P08.15:Present Alarm Code 4
		P08.16:Present Alarm Code 5
		P08.17:Present Alarm Code 6
		P08.18:Run Spd at Present Fault
		P08.19:Ramp Ref Spd at Present Fault
		P08.20:Outp Volt at Present Fault
		P08.21:Outp Cur at Present Fault
		P08.22:Bus Volt at Present Fault
		P08.23:Max Temp at Present Fault
		P08.24:Inp Trml State at Present Fault
		P08.25:Outp Trml State at Present Fault
		P08.26:Run Spd at Last Fault
		P08.27:Ram Ref Freq at Last Fault
		P08.28:Outp Volt at Last Fault
		P08.29:Outp Cur at Last Fault
		P08.30:Bus Volt at Last Fault
		P08.31:Max Temp at Last Fault
		P08.32:Inp Trml State at Last Fault
		P08.33:Outp Trml State at Last Fault
		P08.34:Run Spd at 2nd-last Fault
		P08.35:Ram Ref Freq at 2nd-last Fault
		P08.36:Outp Volt at 2nd-last Fault
		P08.37:Outp Cur at 2nd-last Fault
		P08.38:Bus Volt at 2nd-last Fault
		P08.39:Max Temp at 2nd-last Fault
		P08.40:Inp Trml State at 2nd-last Fault

Level 1	Level 2	Level 3
		P08.41:Outp Trml State at 2nd-last Fault
	Clear fault records	Sure to clear fault records?
	Modified parameter	Searching
	Customize home param	Customize StopStateDisplay param
		Customize RunStateDisplay param
Parameter backup/restore default value	Memory area 1: BACKUP01	Upload param from local to keypad
		Download all param from keypad
		Download non motor param from keypad
		Download motor param from keypad
	Memory area 1: BACKUP02	Upload param from local to keypad
		Download all param from keypad
		Download non motor param from keypad
		Download motor param from keypad
	Memory area 3: BACKUP03	Upload param from local to keypad
		Download all param from keypad
		Download non motor param from keypad
		Download motor param from keypad
	Restore default (excl. motor param)	Sure to restore to default values?
	Restore free func block to default	Sure to restore free func block to default?
System setup	Language selection	Select the language to use
	Time/date	Set time/date
	Adjust backlight brightness	Adjust backlight brightness
	Adjust backlight time	Adjust backlight time
	Keyboard burning selection	Enable fault time
	Enable	Up/down key sensitivity
	Control board burning selection	Select the language to use
	Up/down key sensitivity	Set time/date

4.4.2 Edit list

The monitoring items displayed in the parameter list of stop state can be added as needed (through the menu of the function code in state check group), and the list can also be edited such as "shift up", "shift down" and "delete from the list". Figure 4-10 shows the editing function interface.

Figure 4-10 Editing list 1

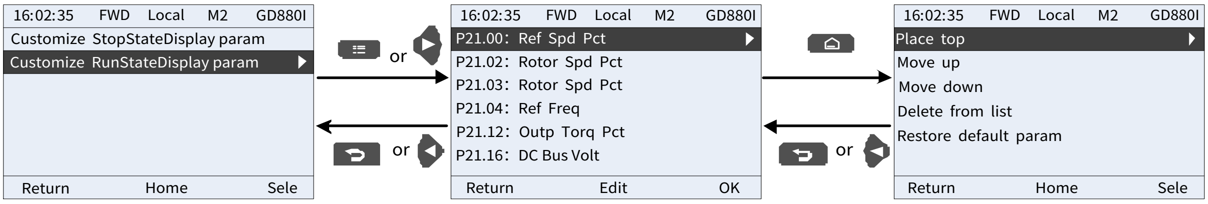


Press the key to enter the edit interface, select the operation needed, and press the key, key or key to confirm the edit operation and return to the previous menu (parameter list). The returned list is the list edited. If the key or key is pressed in the edit interface without selecting the edit operation, it will return to the previous menu (while the parameter list remains unchanged).

Note: For the parameter objects in the list header, the shift-up operation will be invalid, and the same principle can be applied to the parameter objects in the list footer; after deleting a certain parameter, the parameter objects under it will be shifted up automatically.

The monitoring items displayed in the parameter list of running state can be added as needed (through the menu of the function code in state check group), and the list can also be edited such as "shift up", "shift down" and "delete from the list". Figure 4-11 shows the editing function interface.

Figure 4-11 Editing list 2



4.4.3 Adding parameters to the parameter list displayed in stopped/running state

In the third-level menu of "State monitoring", the parameters in the list can be added to the "parameter displayed in stopped state" list or "parameter displayed in running state" list as shown as follows.

Figure 4-12 Adding parameters

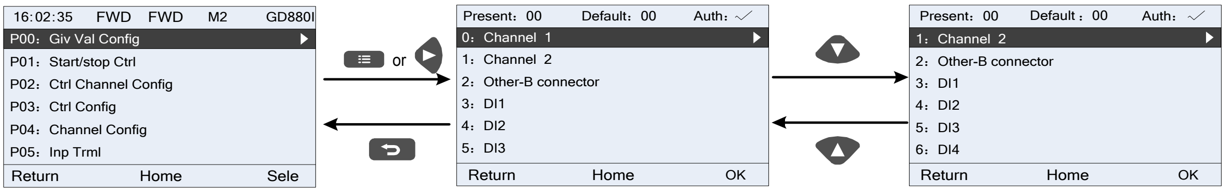
Press the Add key to enter parameter addition interface, select the operation needed, and press the key, key or key to confirm the addition operation. If this parameter is not included in the "parameter displayed in stop state" list or "parameter displayed in running state" list, the parameter added will be at the end of the list; if the parameter is already in the "parameter displayed in stop state" list or "parameter displayed in running state" list, the addition operation will be invalid. If the key or key is pressed without selecting the addition operation in "Addition" interface, it will return to the monitoring parameter list menu.

Up to 16 monitoring parameters can be added to the "parameter displayed in stop state" list; and up to 32 monitoring parameters can be added to the "parameter displayed in running state" list.

4.4.4 Parameter selection edit interface

In the fourth-level menu of parameter setup, press the key, key or key to enter parameter selection edit interface. After entering the edit interface, the present value will be highlighted. Press the key or key to edit the present parameter value, and the corresponding parameter item of the value will be highlighted automatically. After parameter selection is done, press the key or key to save the selected parameter and return to the previous menu. In parameter selection edit interface, press key to maintain the parameter value and return to the previous menu.

Figure 4-13 Parameter selection edit interface



In parameter selection edit interface, the "authority" on the top right indicates whether this parameter is editable or not.

"√" indicates the set value of this parameter can be modified under the present state.

"×" indicates the set value of this parameter cannot be modified under the present state.

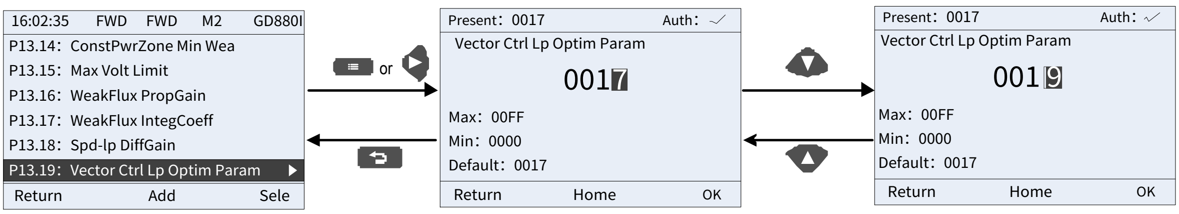
"Present value" indicates the value actually specified.

"Default value" indicates the default value of this parameter.

4.4.5 Parameter setup edit interface

In the fourth-level menu of parameter setup, press key, key or key to enter parameter setup edit interface. After entering edit interface, set the parameter from low bit to high bit, and the bit under setting will be highlighted. Press the key or key to increase or decrease the parameter value (this operation is valid until the parameter value exceeds the max value or min. value); press or to shift the edit bit. After parameters are set, press key or key to save the set parameters and return to the previous parameter. In parameter setup edit interface, press to maintain the original parameter value and return to the previous menu.

Figure 4-14 Parameter setup edit interface



In parameter selection edit interface, the "authority" on the top right indicates whether this parameter is editable or not.

"√" indicates the set value of this parameter can be modified under the present state.

"×" indicates the set value of this parameter cannot be modified under the present state.

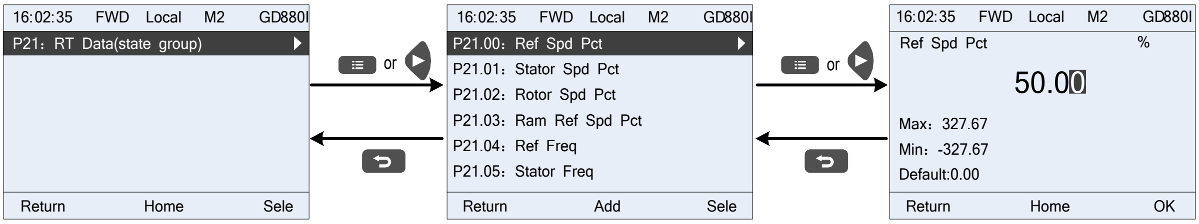
"Current value" indicates the value of current option.

"Default value" indicates the default value of this parameter.

4.4.6 State monitoring interface

In the "State monitoring" menu, press the key, key or key to enter the state monitoring interface. After entering the state monitoring interface, the present parameter value will be displayed in real time, this value is the actually detected value which cannot be modified. In the state monitoring interface, press the key or key to return to the previous menu.

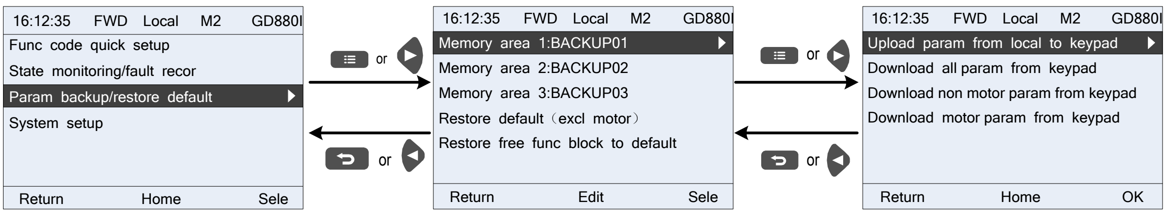
Figure 4-15 State monitoring interface



4.4.7 Parameter backup

In the "Param backup/restore default" menu, press the key, key or key to enter the function parameter backup setting interface and function parameter restoration setup interface to upload/download VFD parameters, or restore VFD parameters to default values. The keypad has three different storage areas for parameter backup, and each storage area can save the parameters of one VFD, namely it can save parameters of three VFDs in total.

Figure 4-16 Parameter backup

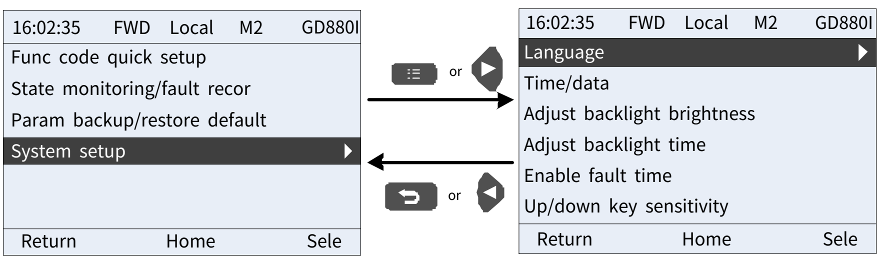


4.4.8 System setting

In the "System setup" menu, press the key, key or key to enter the system setup interface to set the keypad language, time/date, backlight brightness, backlight time and parameter restoring.

Note: No clock battery is equipped by default, and the keypad time/date needs to be reset after keypad re-power on. If time-keeping after power off is needed, you should purchase the clock batteries separately.

Figure 4-17 System configuration



5 Introduction to the Workshop debugging software

5.1 Workshop key features

INVT Workshop is used to configure and monitor the INVT high, medium and low voltage VFDs and the DA series servo products. The VFDs support serial port, Ethernet, CAN, and LIN communication, while the servo products support MSB and Ethernet communication. The software can be run on Windows XP and later, including Windows XP/Win7/Win8/Win10.

The software can be used to:

- Monitor multiple VFDs or one serve device at the same time.
- Set and monitor function parameters; upload and download function parameters in batches; preview and print function parameters.
- View modified function codes, compare default values, and follow up and query for function codes.
- View and follow up status parameters; print and export status parameters.
- View real-time and historical faults; print and export historical faults.
- Display function codes in configuration mode.
- Control device startup, stop, forward running, reverse running, and other operations.
- Jump to the help document for more information about function codes.
- View oscillometric curves, save and replay waveform data, operate waveforms through cursor, and simulate waveform data.
- Switch interface styles and languages.
- Flexibly create function code tables, supporting customized function code tables.

5.2 Main interface

1. Double-click the  icon to open the software to enter the product selection interface.
2. Select "**VFD**" and enter the software main page.

3. If you select "**Do not show again**", the next time you start the software, the engineering wizard interface will not appear automatically.

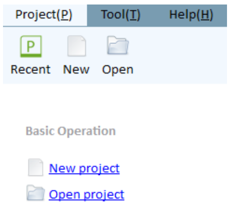
5.3 Creating a project

5.3.1 Local project

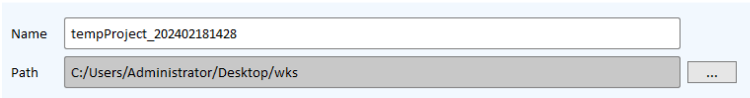
5.3.1.1 Adding a project offline

1. After selecting the VFD, three options will appear: **Recent**, **New**, and **Open**.

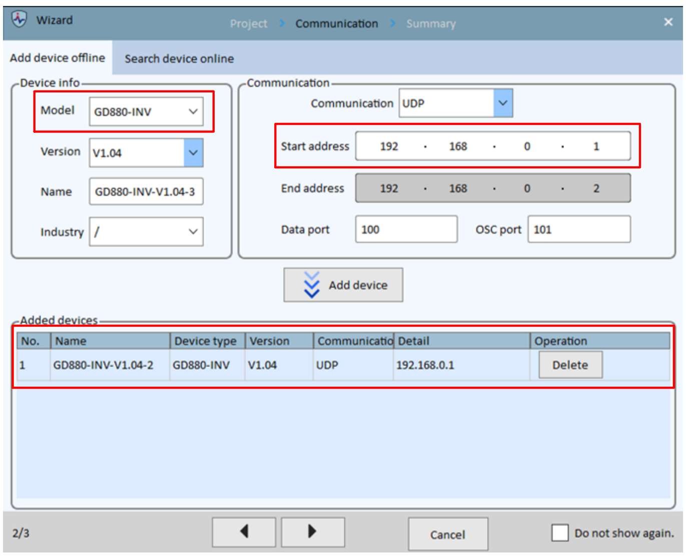
- **Recent**: Most recently opened projects, up to 10 can be saved, and all recent projects can be cleared.
- **New**: A new project is created.
- **Open**: Open the project file for the product in the specified directory, click the **Open** button, and select the project you want to open.



2. Name the newly created project and select the path where the project will be stored (change the default path if the creation fails).

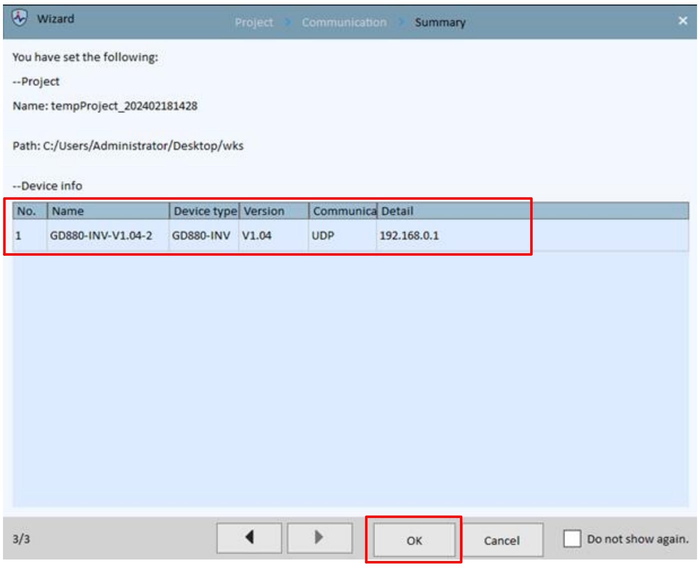


3. Click  at the bottom of the dialog box to set the communication parameters as shown in the following figure.
4. Select the device **GD880-INV**, version, name and communication method (the name is by default composed of device model + version + quantity, which varies with the number of devices added or can be manually modified), as shown in the following figure.
5. Enter the device start address.
6. Click **Add device** to add the device with the start address entered into the list of added devices below. To add multiple devices, modify the start address (the end address changes based on the start address), and click the **Add device** button again.



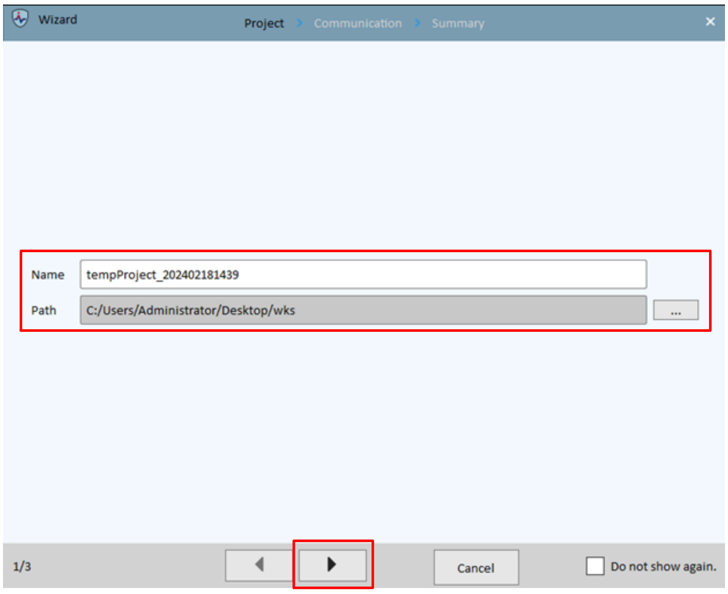
7. Verify the device type, version, communication type, and communication details again.

8. Click **OK**. The new project is completed, as shown in the following figure.

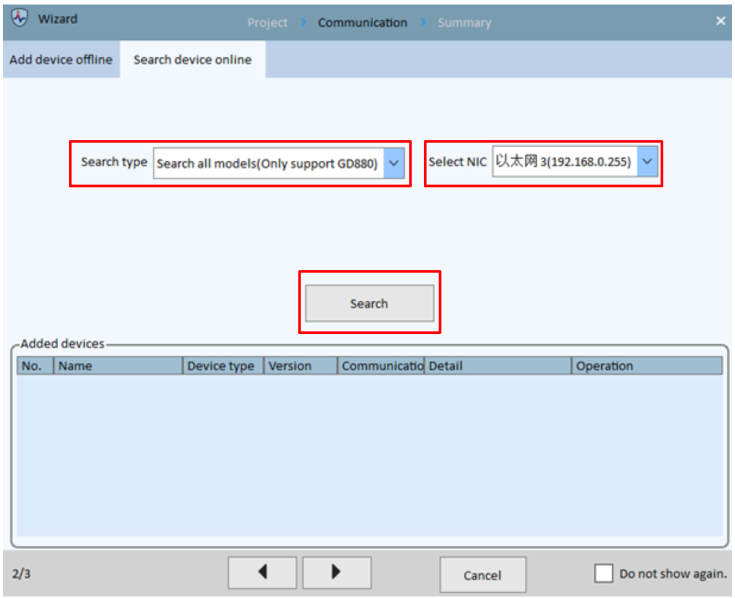


5.3.1.2 Adding a project online

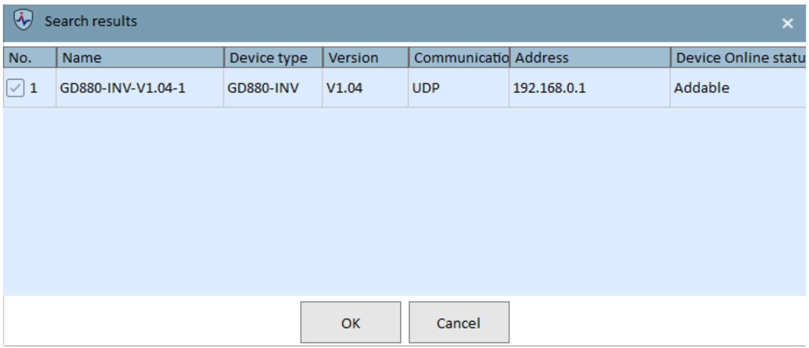
1. Name the newly created project and select the path where the project will be stored (change the default path if the creation fails). Click  at the bottom of the dialog box to set the communication parameters, as shown in the following figure.



2. Select **Search all models** for **Search type**, select the network card correctly, and click **Search**, as shown in the following figure.



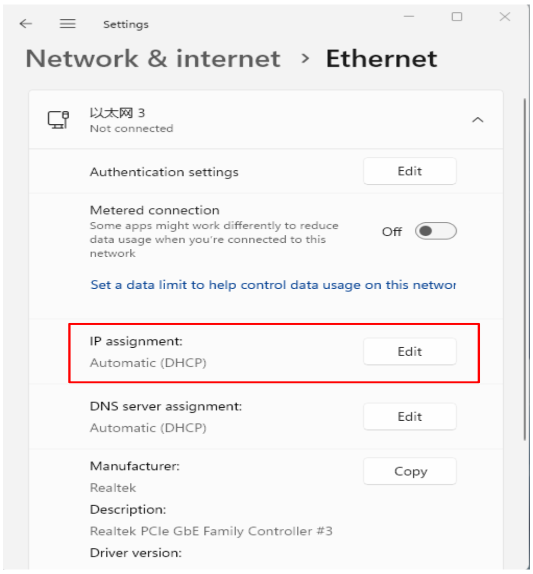
3. In the search result dialog box that appears, add the required device, and click **OK**. The project is created successfully, as shown in the following figure.



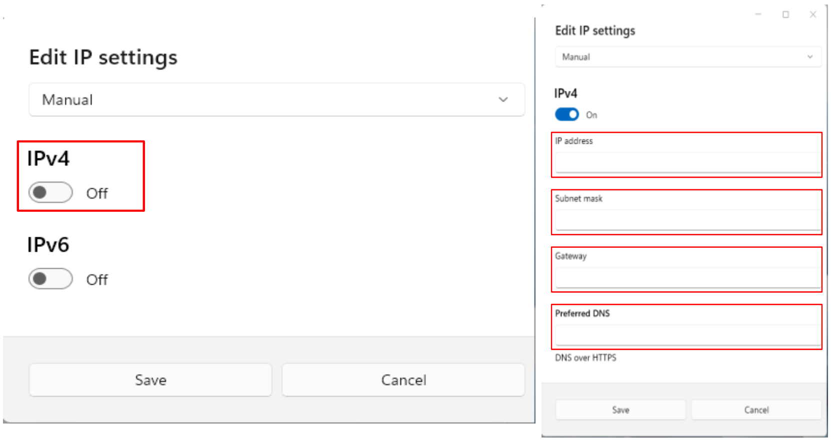
5.4 PC side connection

When Ethernet communication is used, connect one end of a network cable to the PC network port and the other end to the device Ethernet port, and note that the PC IP address needs to be set to be on the same network segment as the device (device IP address: 192.168.0.1).

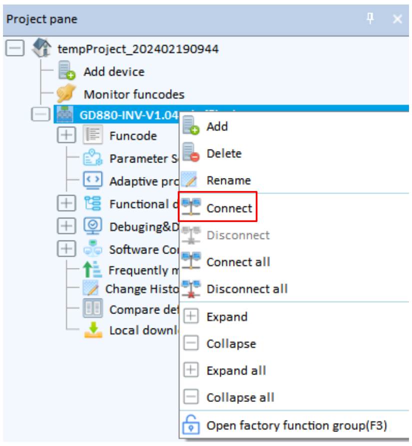
1. For the PC side settings, choose **Network & internet** > **Ethernet**, and click **Edit** for IP assignment.



2. Right-click on the NIC and select **Properties**.
3. Locate Internet Protocol Version 4 and right-click **Properties**.
4. Change only the IP address and subnet mask, and note that the IP address should be different from the device IP address.



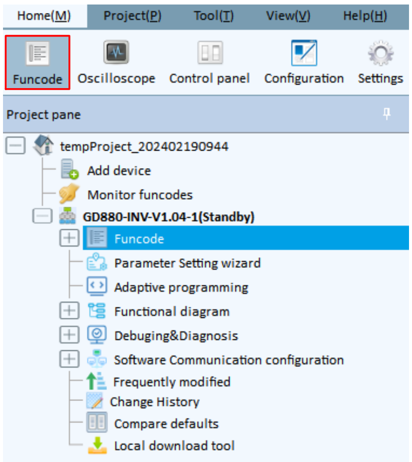
5. Right-click on the product model, and choose **Connect**. The connection is successful when the status of the active machine changes from offline to standby (or failed), as shown in the following figure.



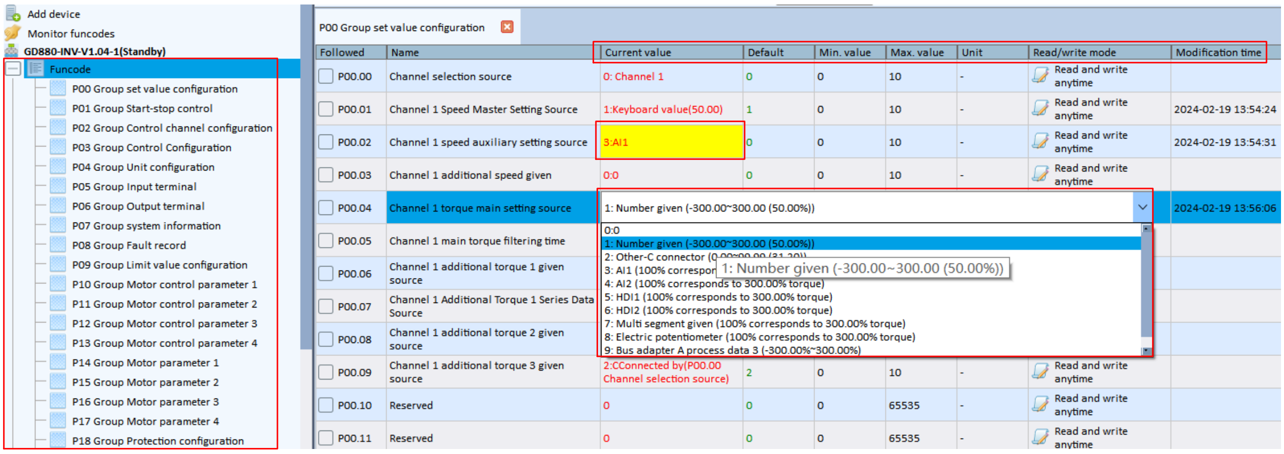
5.5 Basic functions

5.5.1 Viewing and modifying parameters

1. Choose **Home** > **Funcode** to enter the function code interface as shown in the following figure.

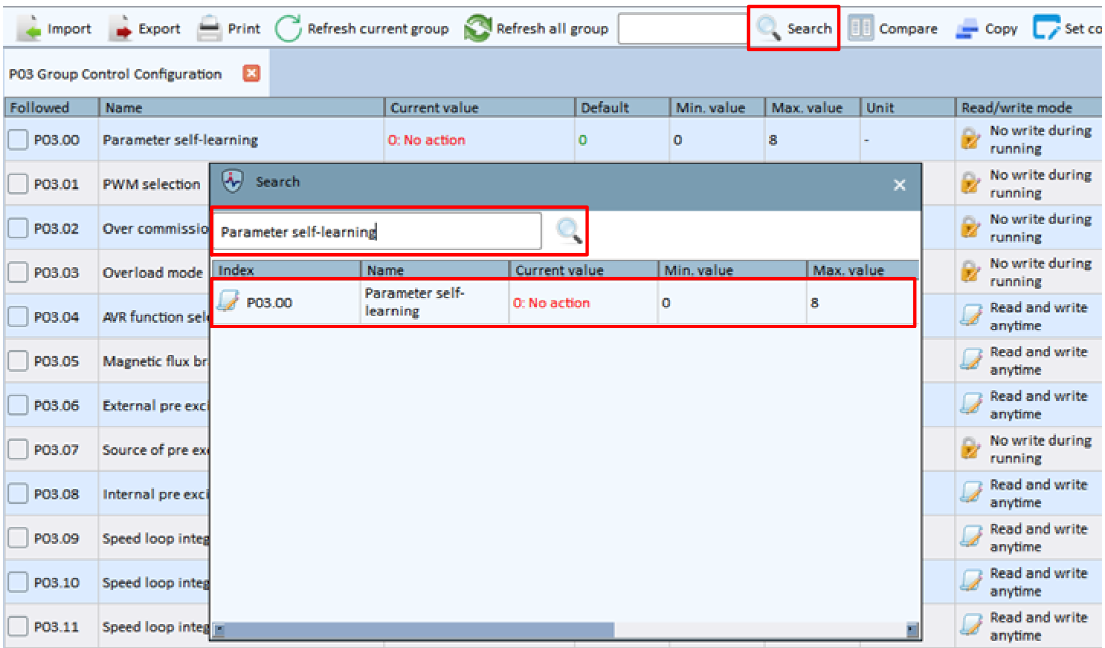


2. Click the function code group in the project tree to display the function code information. The function code groups are displayed on the left. You can switch the function code information by clicking on the function code groups on the left. Only one function code group is displayed at a time. For example, if group P01 is clicked again, group P00 is hidden and group P01 is displayed.
3. The function code information table allows you to view the function code name, current value, default value, min. value, max value, unit, read/write mode, modification time, and comments. You can select the check boxes before function codes to determine which are displayed. All is displayed by default.
4. When the current value does not match the default value, the current value is filled in yellow.
5. Double-click the current value of a function code to edit it, and press **Enter** to take effect. The modification is sent to the device instantly. You can select pressing Enter to take effect or instant taking effect for the function code modification effective method option, as shown in the following figure.



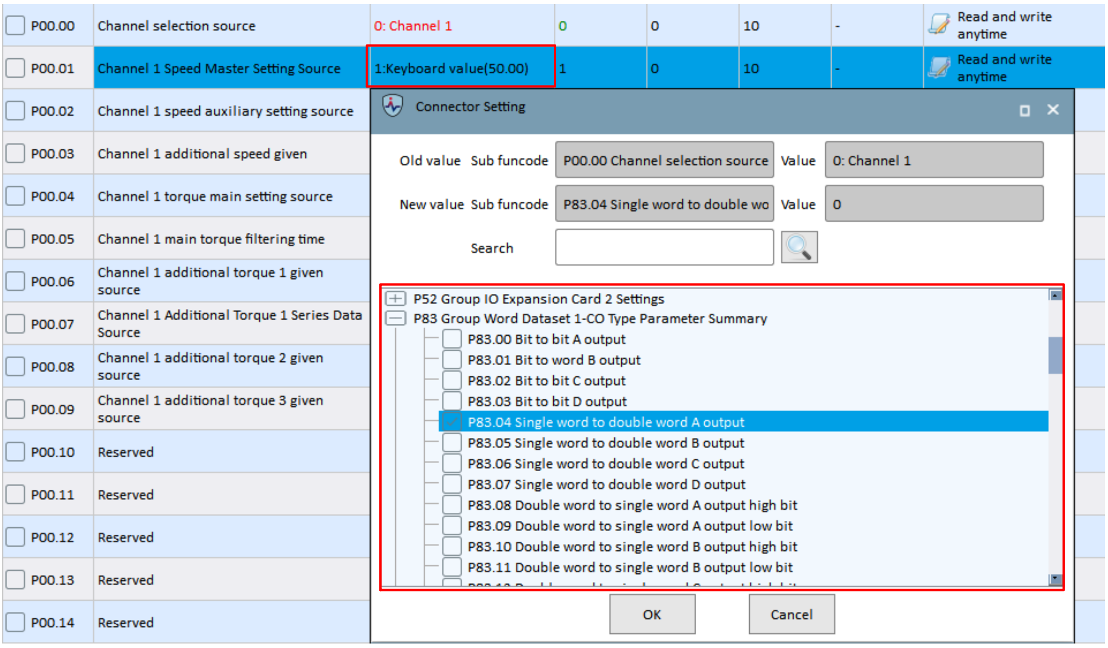
5.5.2 Searching for parameters

1. Click the **Search** button to pop up the function code search interface, which supports fuzzy query.
2. Enter the function name or index, select a value from the drop-down list box, select one or none, and click **Search**. Results can be displayed on a table.
3. Click on a line to jump to the function code line of the function code interface without closing the search interface.



5.5.3 Interconnecting parameters

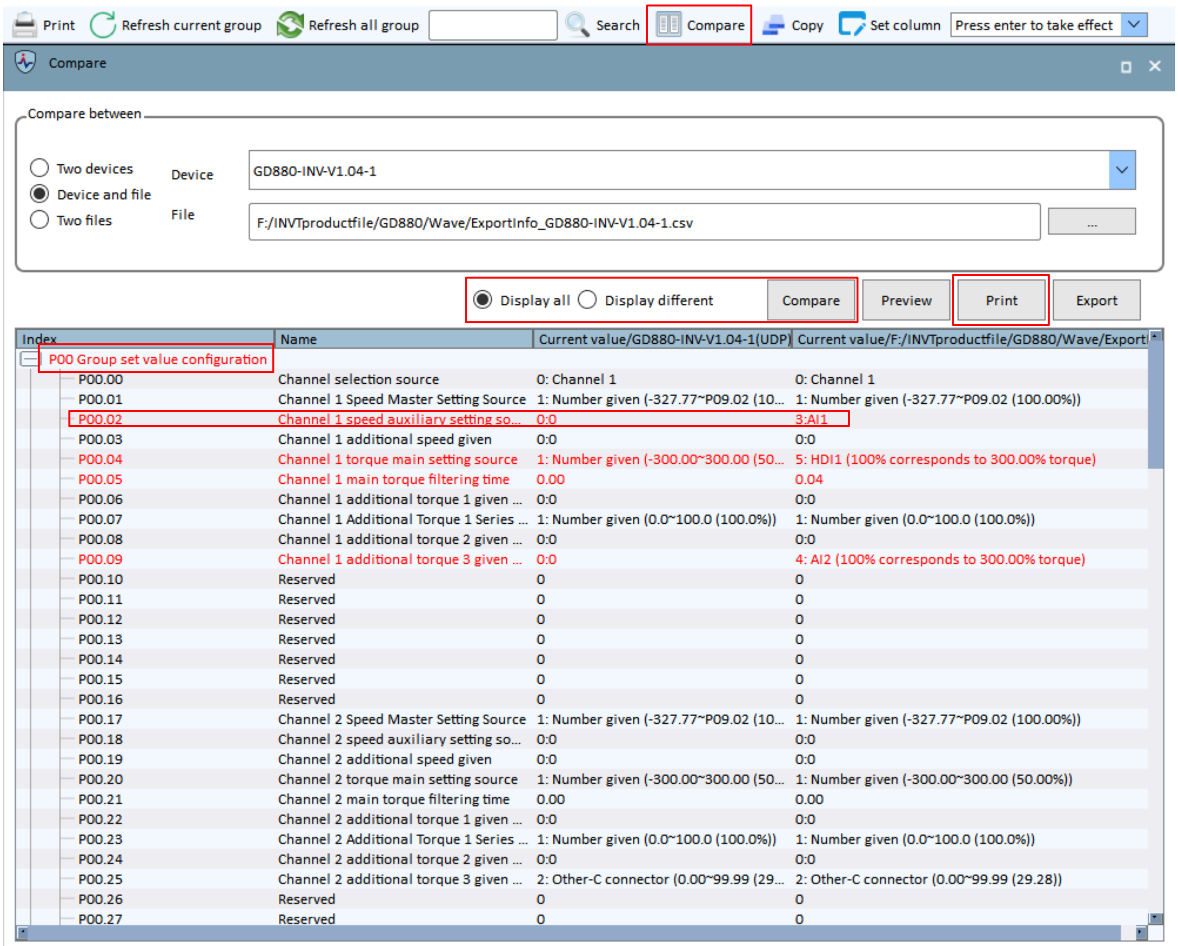
1. You can link the parameter source or display of one function code to another function code through Other-B or Other-C.
2. Select the function code source.



5.5.4 Comparing parameters

1. You can compare the function codes of two devices, function codes in two files, or function codes of a device and in a file. You can compare all values and different values, Different values are highlighted in red. In addition to exporting comparison values (to **.csv** files), you can print, preview, and print the comparison values.
2. **Display All** shows all function codes after comparison, both the same values and different values; **Display different** shows the function codes with different values, and the motor will compare the function codes with different values.

3. A parent node highlighted indicates there are different values.
4. A child node highlighted indicates that the function code is different, as shown in the following figure.



5. Printing comparison function codes allows you to print all values or different values. The following is a print preview interface example for all values. The format is the same as that of the current comparison function code interface.

GD880-INV-V1.04-1(UDP) VS F:/INVTproductfile/GD880/Wave/ExportInfo_GD880-INV-V1.04-1.csv()

2024-02-19,14:45:10

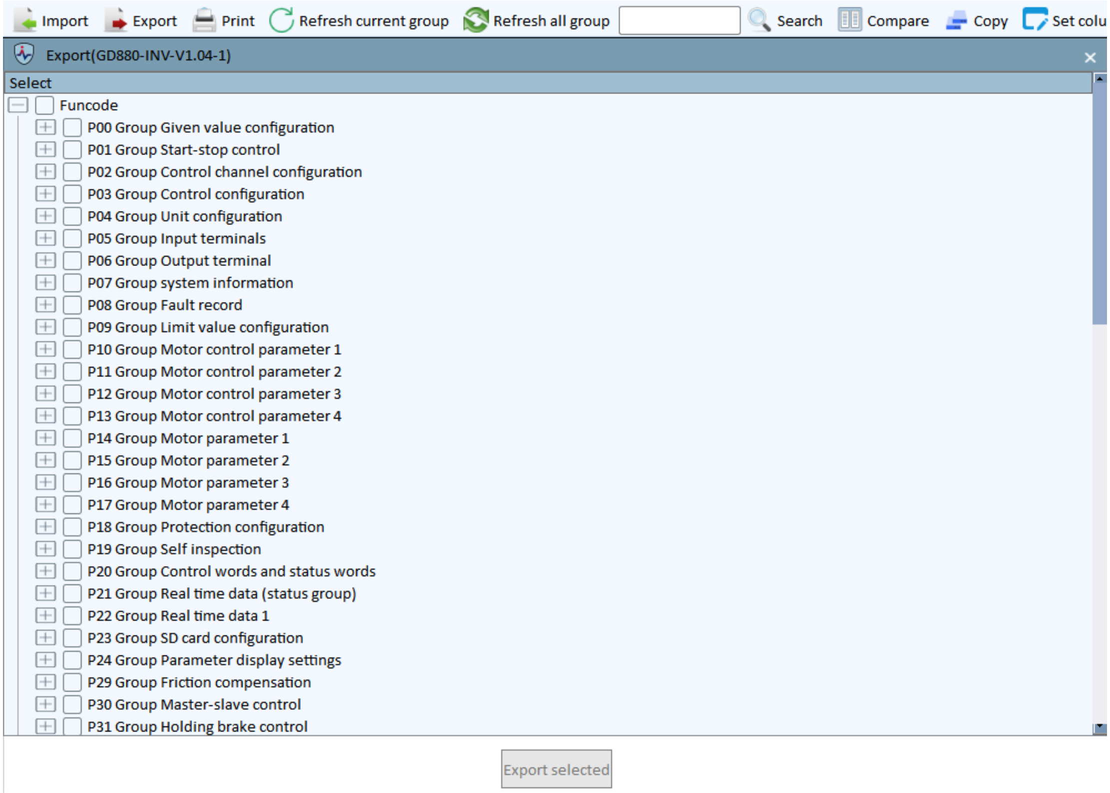
-Compare-

Index	Name	Current value/GD880-INV-V1.04-1(UDP)	Current value/F:/INVTproductfile/GD880/Wave/ExportInfo_GD880-INV-V1.04-1.csv()
P00.00	Channel selection source	0: Channel 1	0: Channel 1
P00.01	Channel 1 Speed Master Setting Source	1: Number given (-327.77~P09.02 (100.00%))	1: Number given (-327.77~P09.02 (100.00%))
P00.02	Channel 1 speed auxiliary setting source	0:0	3:AI1
P00.03	Channel 1 additional speed given	0:0	0:0
P00.04	Channel 1 torque main setting source	1: Number given (-300.00~300.00 (50.00%))	5: HDI1 (100% corresponds to 300.00% torque)
P00.05	Channel 1 main torque filtering time	0.00	0.04
P00.06	Channel 1 additional torque 1 given source	0:0	0:0
P00.07	Channel 1 Additional Torque 1 Series Data Source	1: Number given (0.0~100.0 (100.0%))	1: Number given (0.0~100.0 (100.0%))
P00.08	Channel 1 additional torque 2 given source	0:0	0:0
P00.09	Channel 1 additional torque 3 given source	0:0	4: AI2 (100% corresponds to 300.00% torque)
P00.10	Reserved	0	0
P00.11	Reserved	0	0
P00.12	Reserved	0	0

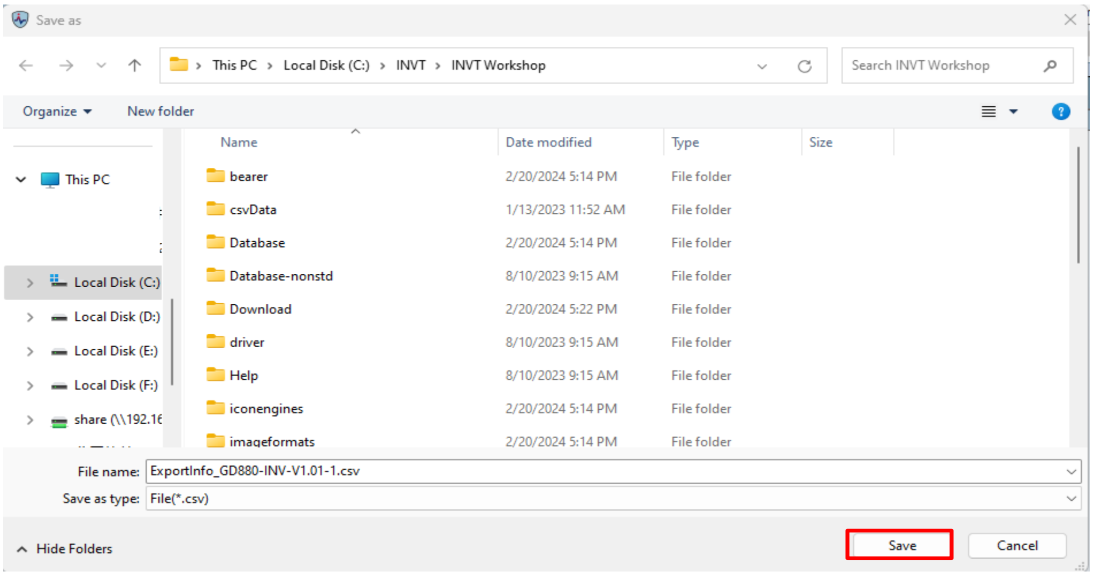
1

5.5.5 Backing up and downloading parameters

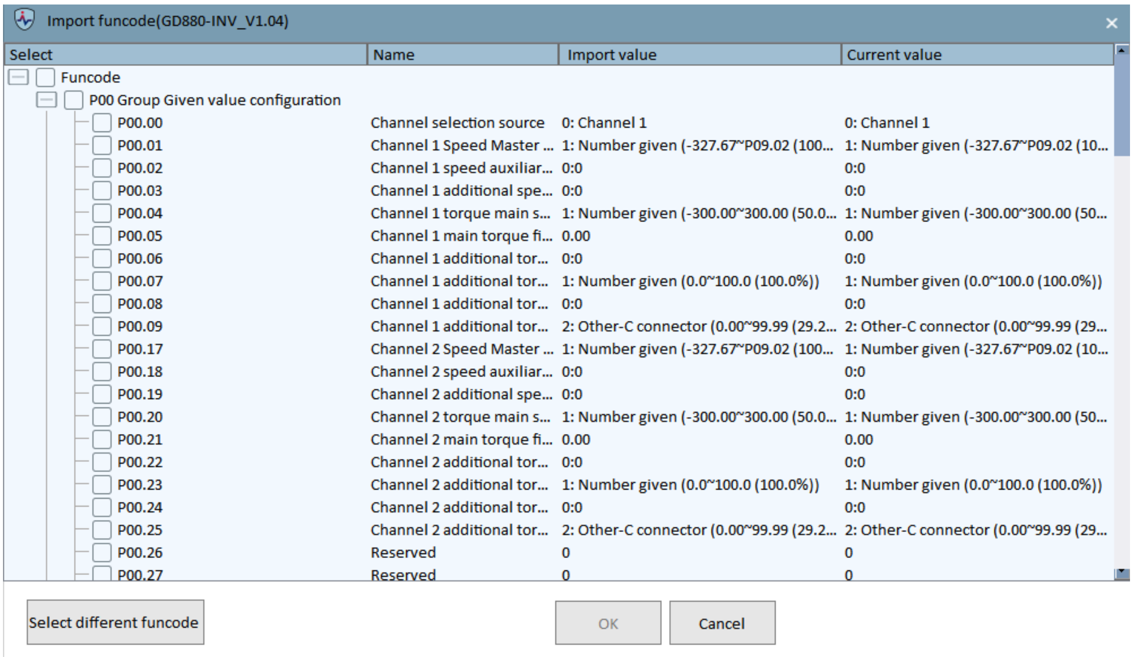
1. You can export function codes for easy copying of values to other devices by using the **Export** tool in the function code toolbar.
2. You can select the function codes you want to export as required, as shown in the following figure.



3. Click **Export Selected**, select the storage directory, and click **Save**, as shown in the following figure. The selected items are saved in a **.csv** file.

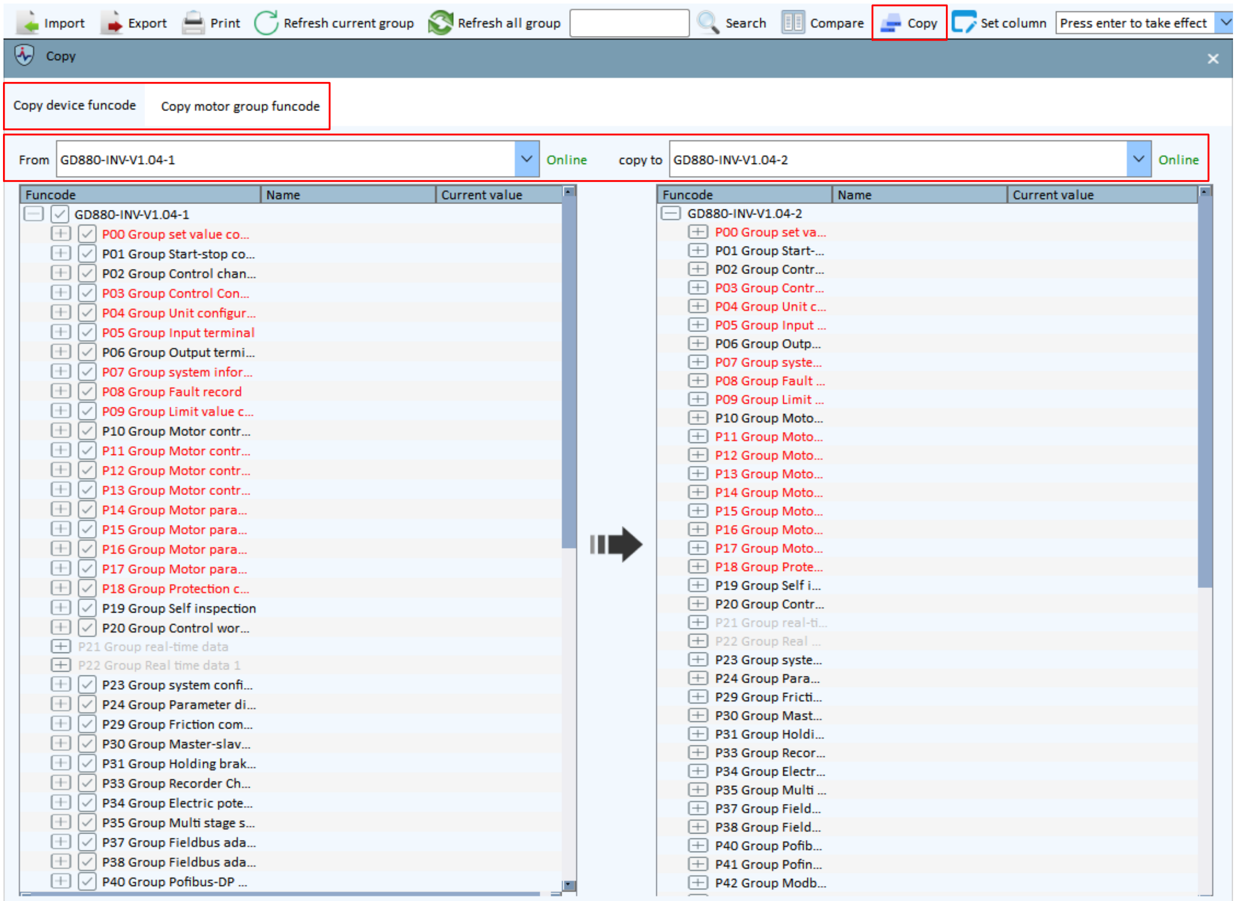


4. The exported function code database file can be imported into any device of the same model, overwriting the current values. The values that are different from the current values are marked in red. Please wait while the device is written after clicking **OK**.



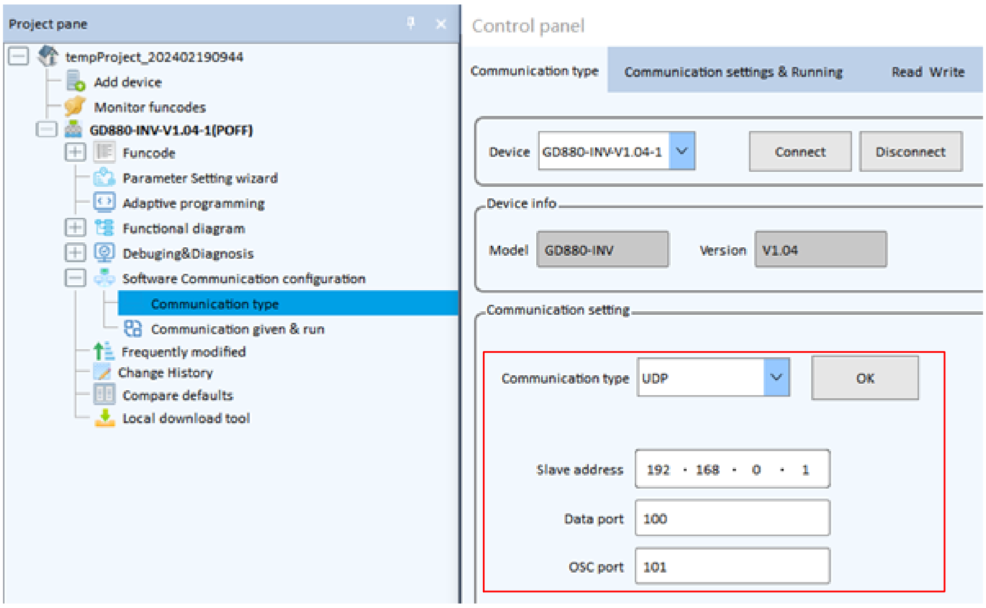
5.5.6 Copying function codes

1. Copying function codes enables you to write the function code values on one device directly to another device.
2. The following conditions must be met: at least two devices are connected, the target device is the same model as the source device, and are currently online.
3. You can choose to copy device function codes or motor parameters.

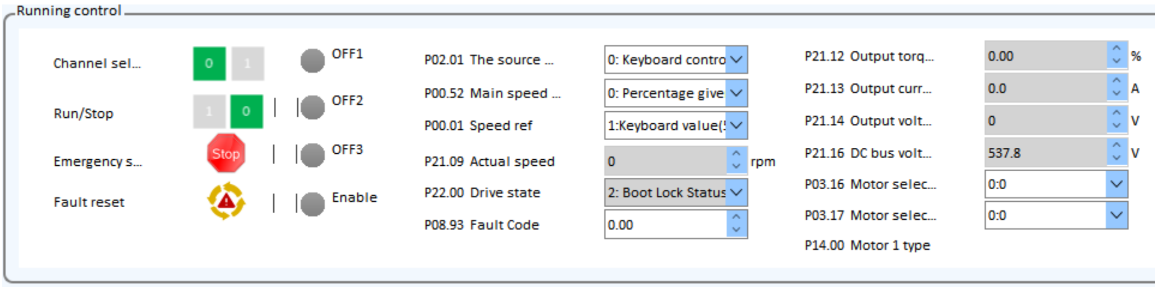


5.5.7 Control panel

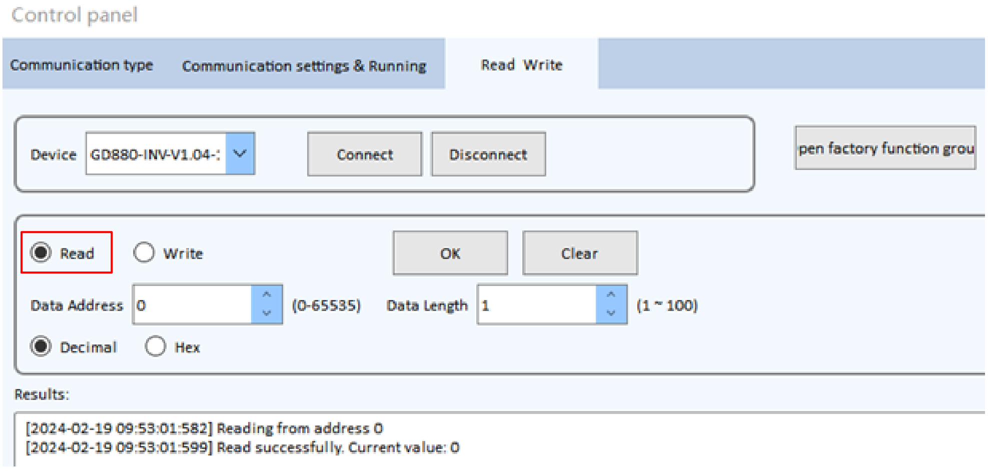
1. Choose **Home** > **Control Panel** to enter the control panel interface, in which you can change the communication type, data port, and oscilloscope port, as shown in the following figure.



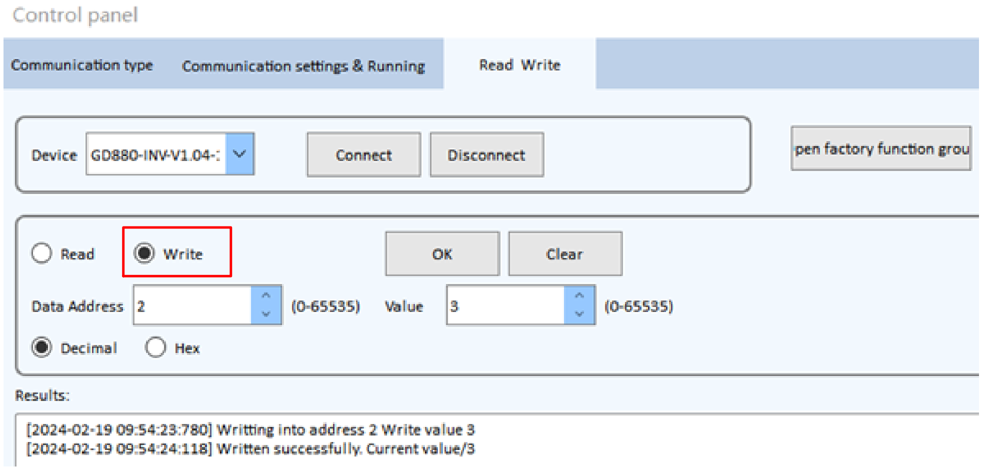
2. The function of communication parameter setting in communication giving and operation is to select a device, select communication parameters, enter the parameter values, and click **Set** to send the values to the device.
3. Running control implements forward running, reverse running, deceleration to stop, quick stop, coasting to stop, fault reset, forward jogging, and reverse jogging for the selected device after the device is connected, as shown in the following figure.



4. The read/write testing supports the operation on any device, supports the connection to or disconnection from the device, and supports clearing result records, but requiring a factory password.
5. Read: Enter the start address of the data (as recorded in the configuration table), the read data length (range 1–20), and then return the data to the result display interface. If the sending fails, a message is displayed, such as the device is offline, as shown in the following figure.

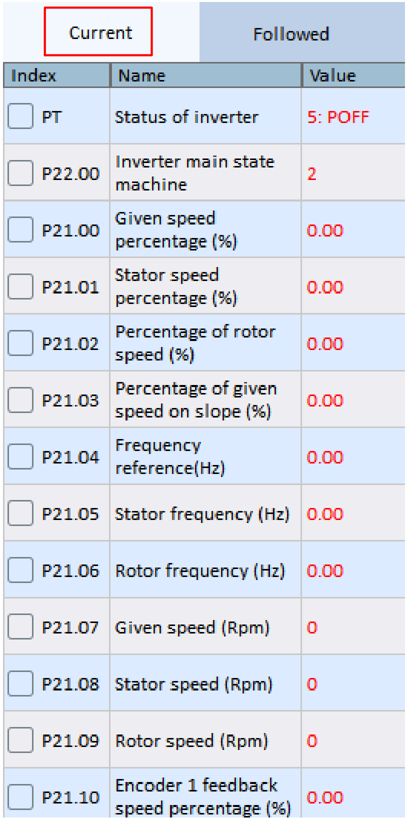


6. Write: Enter the start address of the data (as recorded in the data table), the data length can only be 1, and enter the data value. After confirmation, the data can be returned to the result display interface. If the sending fails, a message is displayed, such as the device is offline, as shown in the following figure.

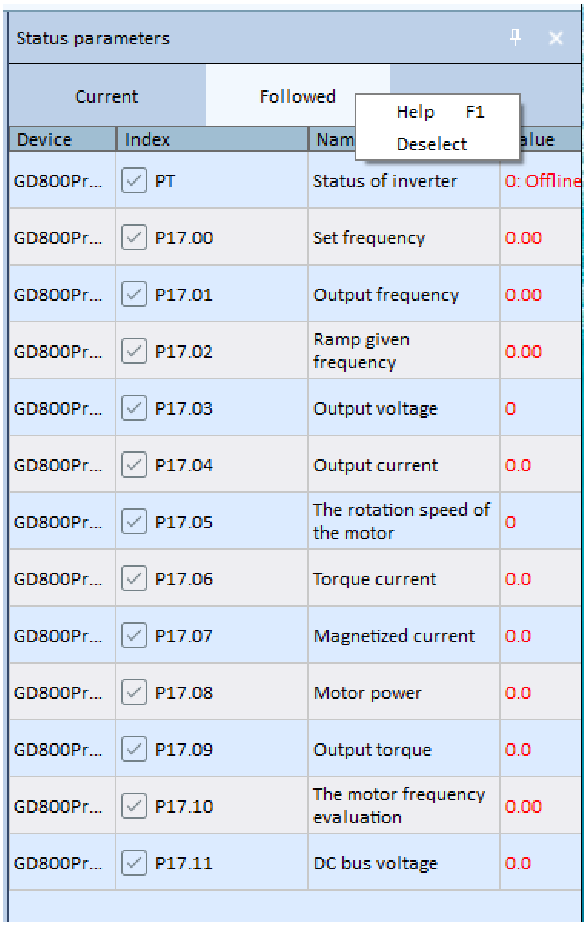


5.5.8 Status parameters

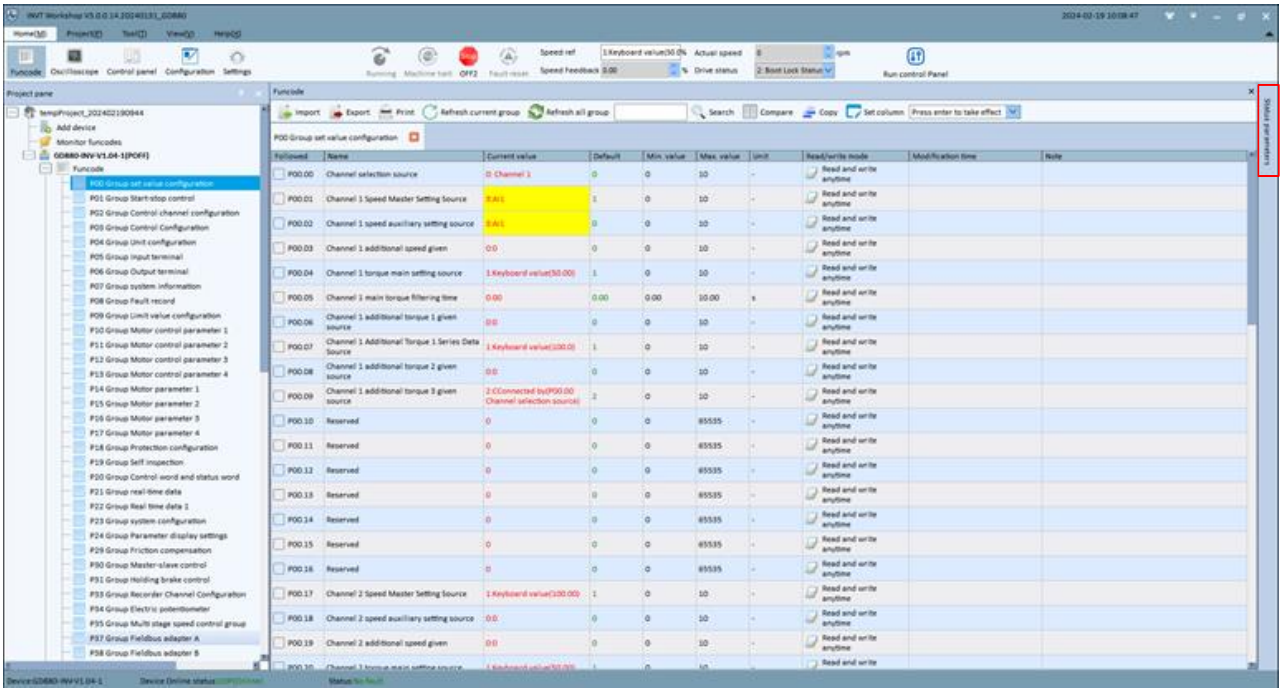
1. Status parameters are also function codes, but can only be read and cannot be modified, and the interface periodically refreshes the status parameters. When selected, the status parameters become followed status parameters; when deselected, the status parameters are removed from the followed status parameters. If you save the followed parameters when you close the project or software, the system loads the followed parameters the next time you start the software. The followed status parameter interface is shown in the following figure.



2. In the **Status parameters** interface, right-click to deselect all status parameters, as shown in the following figure.



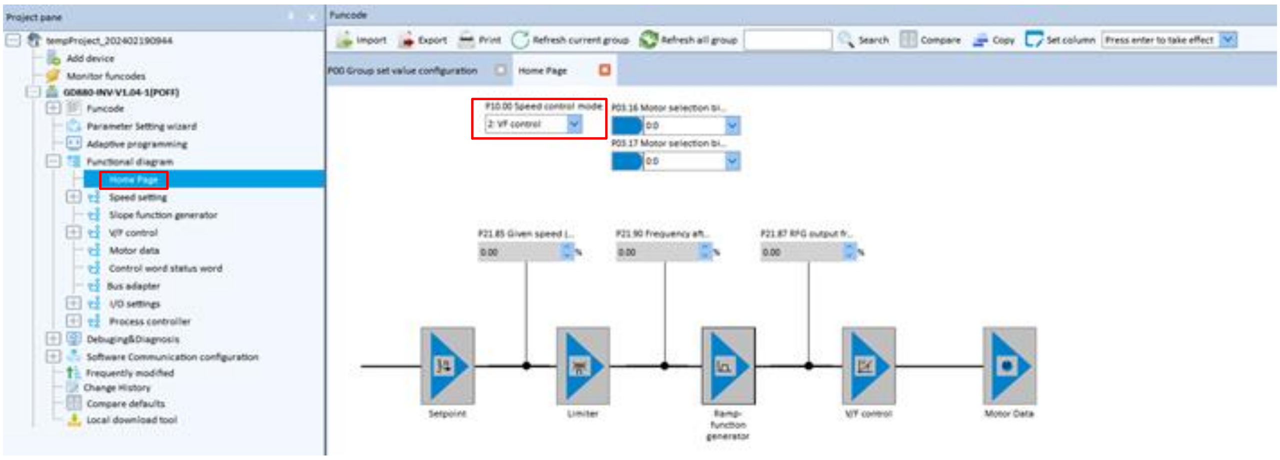
3. The status window can be hidden or closed. When hidden, the status window is displayed vertically; when closed, the status window will not be displayed, but the status parameters can be redisplayed after choosing **View** > **Status parameters**.



5.6 Function charts

5.6.1 Home

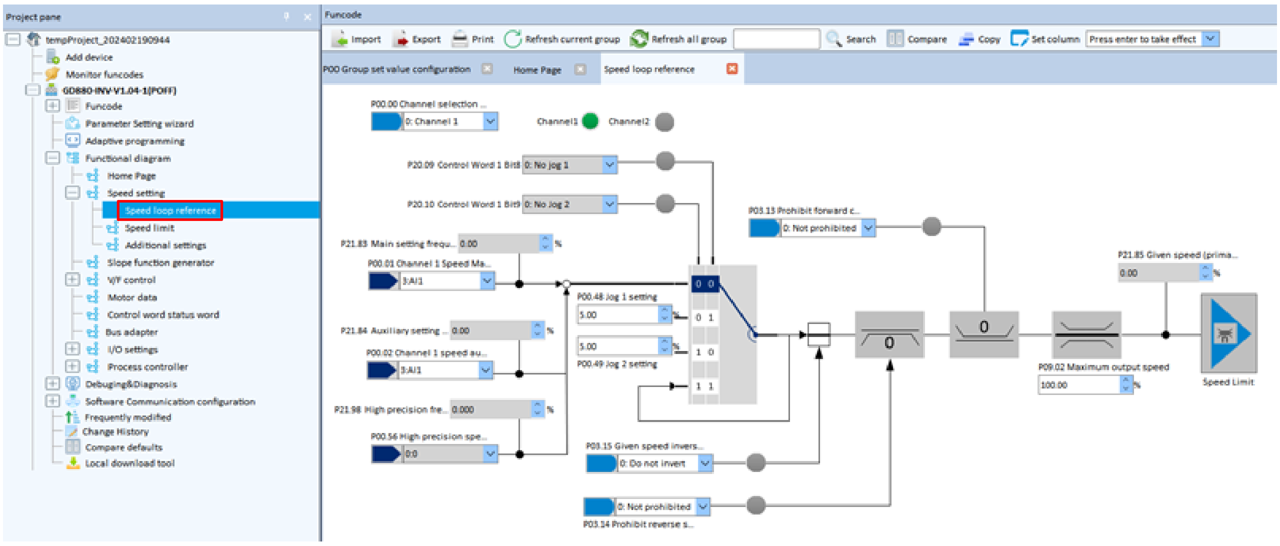
1. Function charts to display the main control parameters in a graphical way so that these parameters can be directly modified through these interfaces on the Workshop function charts.
2. You can switch the control modes (only V/F control mode described in this function chart), as shown in the following figure.



5.6.2 Speed setting

Speed reference

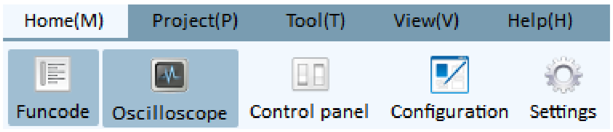
Choose **Speed setting** > **Speed loop reference**. The speed reference function chart is displayed, as shown in the following figure.



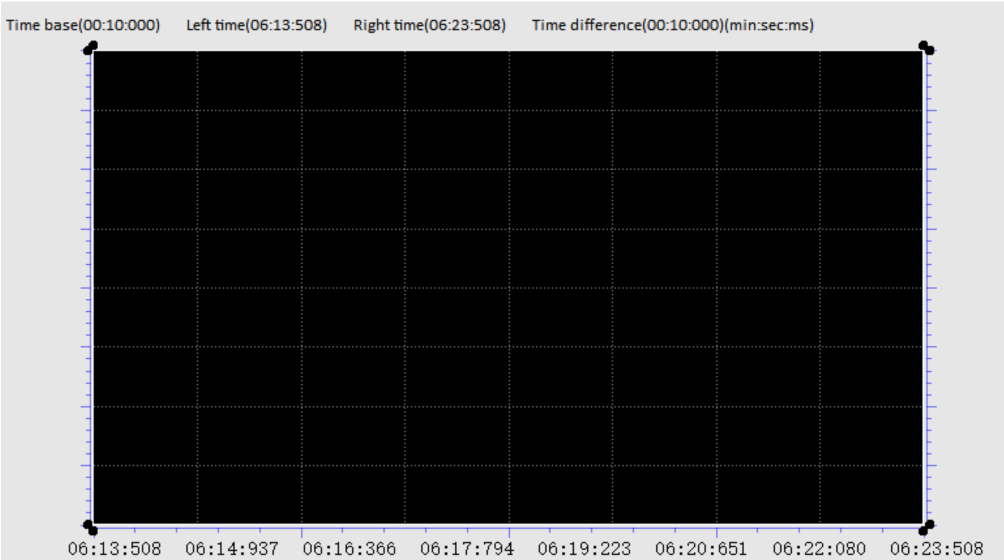
5.7 Waveform recording and analysis

5.7.1 Oscilloscope

1. Choose **Home** > **Oscilloscope** to enter the oscilloscope interface. The interface consists of a plot area, a toolbar, and channel information.



2. Plot area: Displays waveforms as shown in the following figure.



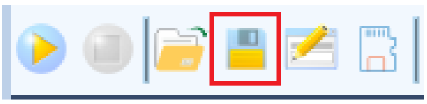
3. Toolbar: Adjusts waveforms for easy viewing, as well as the ability to save and import waveforms, allowing you to select the waveforms to be observed in the channel information.

4. Channel information: Displays the specific waveform numeric values (which you can select for observation) and the channel properties can be modified, as shown in the following figure.

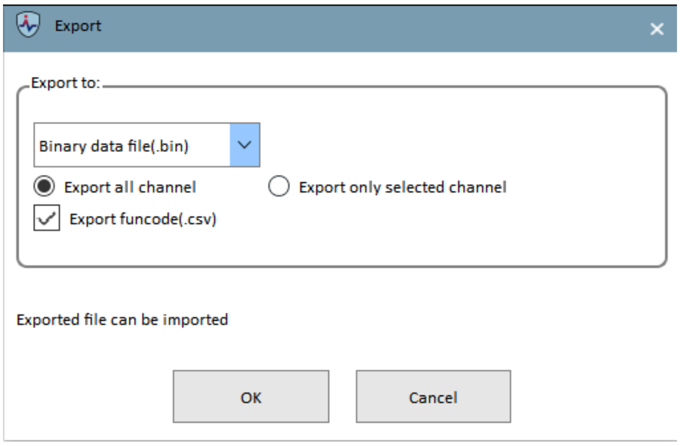
Select	Color	Name	Channel	Device On	Current va	Left value	Right valu	Difference	Upper	Lower	Height	Min. valu	Max. valu	Unit	Symbol	Base 10/1	Trigger
✓		GD880-INV-V1....	Actual Speed o...	POFF	null	null	null	null	300.00	-300.00	600.00	0.00	0.00	%	Y	10	Not triggered
✓		GD880-INV-V1....	Ramp given Sp...	POFF	null	null	null	null	300.00	-300.00	600.00	0.00	0.00	%	Y	10	Not triggered
✓		GD880-INV-V1....	Torque	POFF	null	null	null	null	300.00	-300.00	600.00	0.00	0.00	%	Y	10	Not triggered
✓		GD880-INV-V1....	Output voltage	POFF	null	null	null	null	20000	-200	20200	0	0	V	N	10	Not triggered
✓		GD880-INV-V1....	busbar voltage	POFF	null	null	null	null	2000.0	-20.0	2020.0	0.0	0.0	V	N	10	Not triggered

5.7.2 Waveform storage

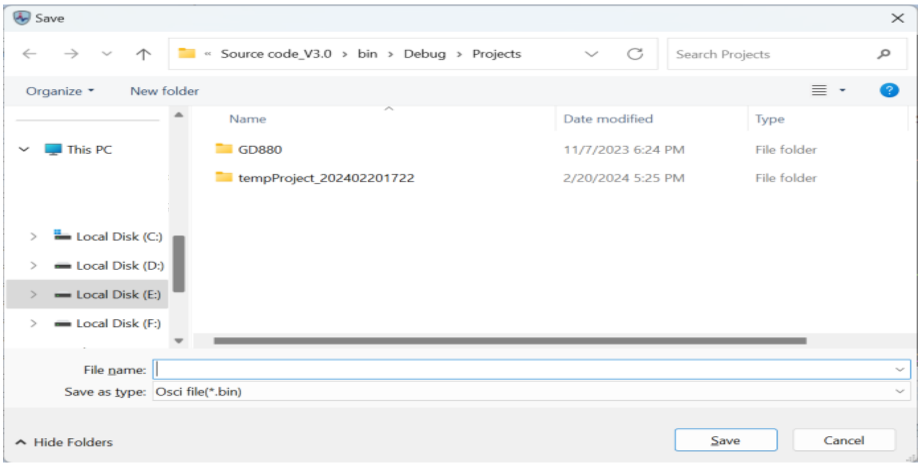
1. To save the present wave data locally, use the **Save** button, as shown in the following figure.



2. The following window is displayed. If you also select **Export funcodes(.csv)** at the same time, all present function code values are automatically exported as a database file (CSV file). When saving waveforms, you can select the format of file to export and channel waveforms (all channel waveforms are exported by default), as shown in the following figure.

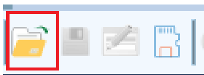


3. Click **OK**. A window is displayed to ask you to enter the save name and location, as shown in the following figure.

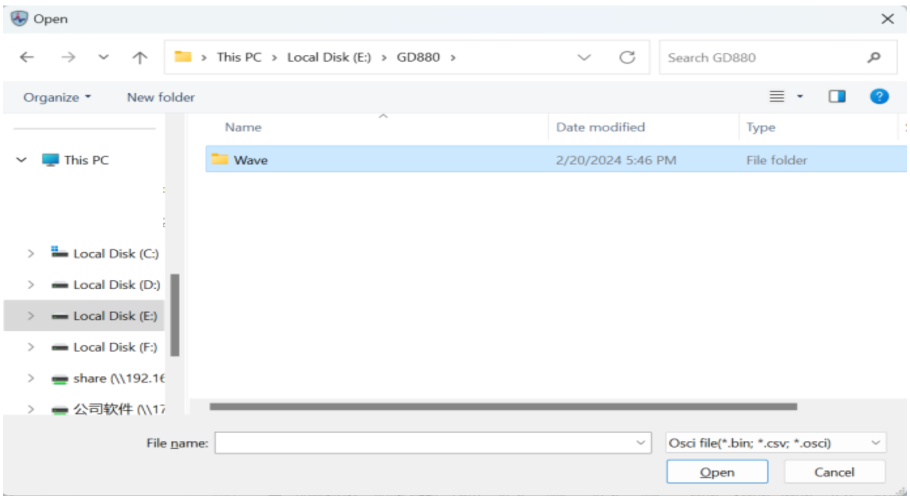


5.7.3 Waveform reading

1. Locate the button for loading historical waveforms from the toolbar, as shown in the following figure.



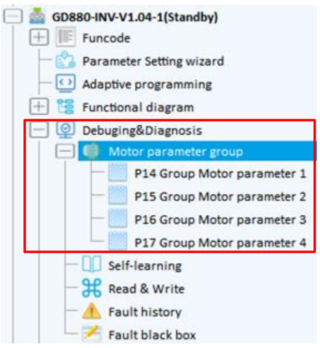
2. In the window that is displayed, select the waveform to be read, and click **Open** to import, as shown in the following figure.



5.8 Commissioning wizard

5.8.1 Motor parameter group

1. You can choose **Debuging&Diagnosis** > **Motor parameter group** to directly jump to parameter groups (P14 – P17) for motor 1 to motor 4, as shown in the following figure.

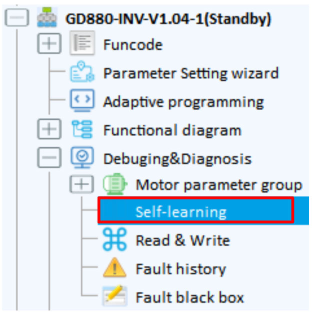


2. Modify the corresponding motor parameters as required.

5.8.2 Autotuning

Autotuning function

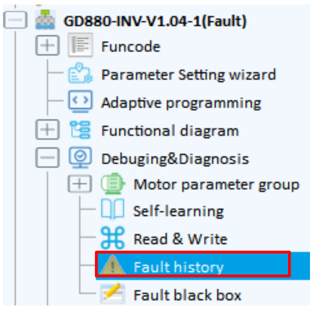
A. Locate **Self-learning** under **Debuging&Diagnosis**, as shown in the following figure.



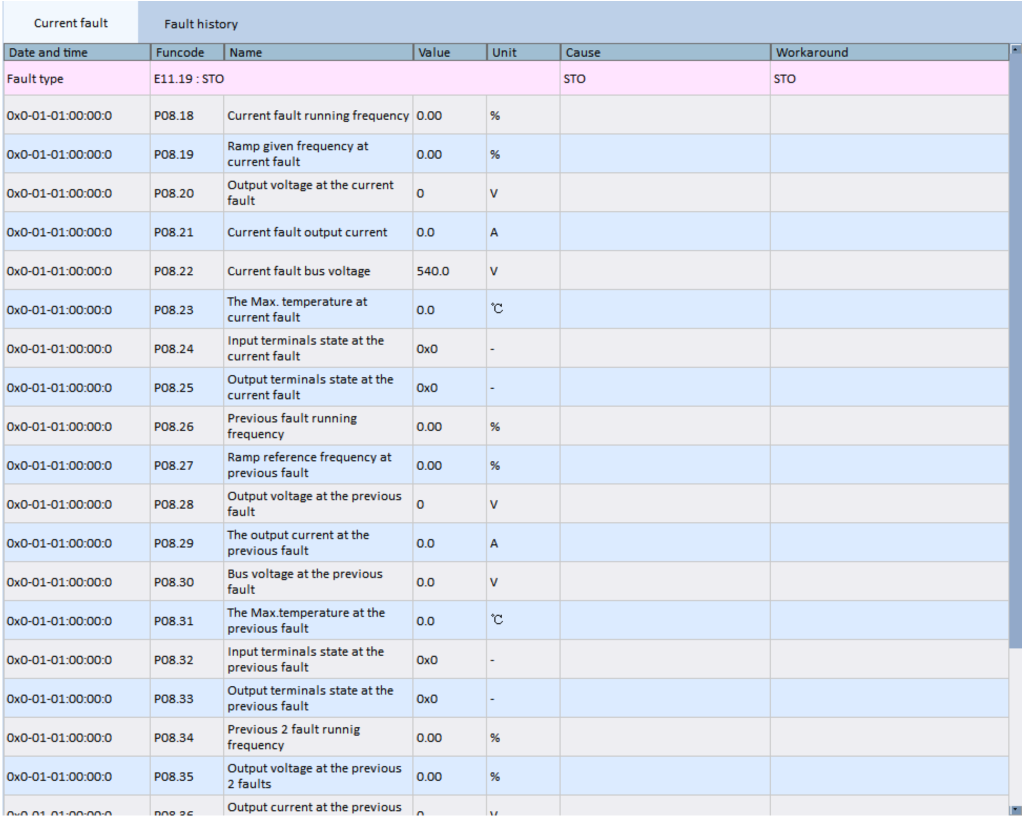
B. In the function window that is displayed, you only need to set the corresponding controlparameters and motor parameters as required.

5.8.3 Fault records

1. When a device fails, choose **Debuging&Diagnosis** > **Fault history** to view device fault information, as shown in the following figure.



2. A window is displayed, in which you can view the parameters related to the present and historical faults, as shown in the following figure.



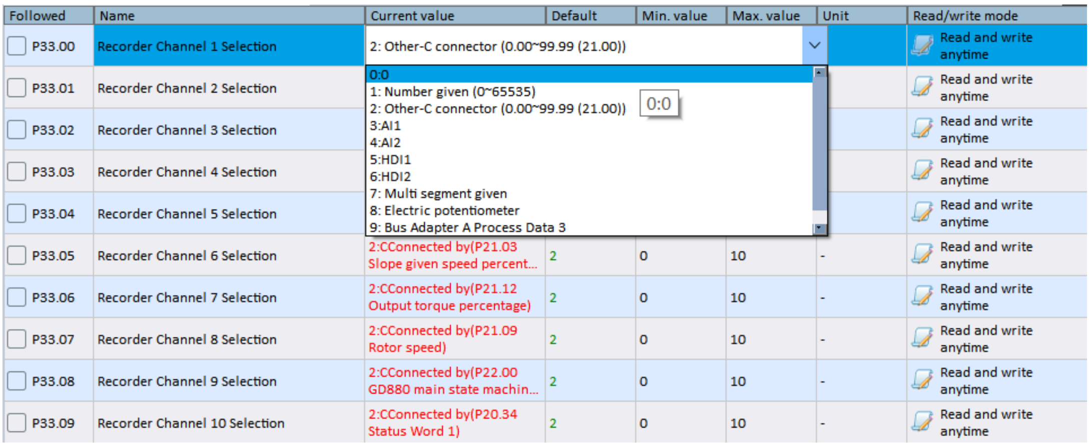
Current fault | Fault history

Date and time	Funcode	Name	Value	Unit	Cause	Workaround
Fault type	E11.19 : STO				STO	STO
0x0-01-01:00:00:0	P08.18	Current fault running frequency	0.00	%		
0x0-01-01:00:00:0	P08.19	Ramp given frequency at current fault	0.00	%		
0x0-01-01:00:00:0	P08.20	Output voltage at the current fault	0	V		
0x0-01-01:00:00:0	P08.21	Current fault output current	0.0	A		
0x0-01-01:00:00:0	P08.22	Current fault bus voltage	540.0	V		
0x0-01-01:00:00:0	P08.23	The Max. temperature at current fault	0.0	℃		
0x0-01-01:00:00:0	P08.24	Input terminals state at the current fault	0x0	-		
0x0-01-01:00:00:0	P08.25	Output terminals state at the current fault	0x0	-		
0x0-01-01:00:00:0	P08.26	Previous fault running frequency	0.00	%		
0x0-01-01:00:00:0	P08.27	Ramp reference frequency at previous fault	0.00	%		
0x0-01-01:00:00:0	P08.28	Output voltage at the previous fault	0	V		
0x0-01-01:00:00:0	P08.29	The output current at the previous fault	0.0	A		
0x0-01-01:00:00:0	P08.30	Bus voltage at the previous fault	0.0	V		
0x0-01-01:00:00:0	P08.31	The Max.temperature at the previous fault	0.0	℃		
0x0-01-01:00:00:0	P08.32	Input terminals state at the previous fault	0x0	-		
0x0-01-01:00:00:0	P08.33	Output terminals state at the previous fault	0x0	-		
0x0-01-01:00:00:0	P08.34	Previous 2 fault runnig frequency	0.00	%		
0x0-01-01:00:00:0	P08.35	Output voltage at the previous 2 faults	0.00	%		
		Output current at the previous				

5.8.4 Fault blackbox

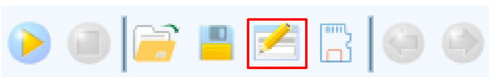
1. Upper computer online fault black box

A. Set group P33 Blackbox channel configuration according to the requirements. Select the channel you want to read at the time of the fault data, as shown in the following figure.

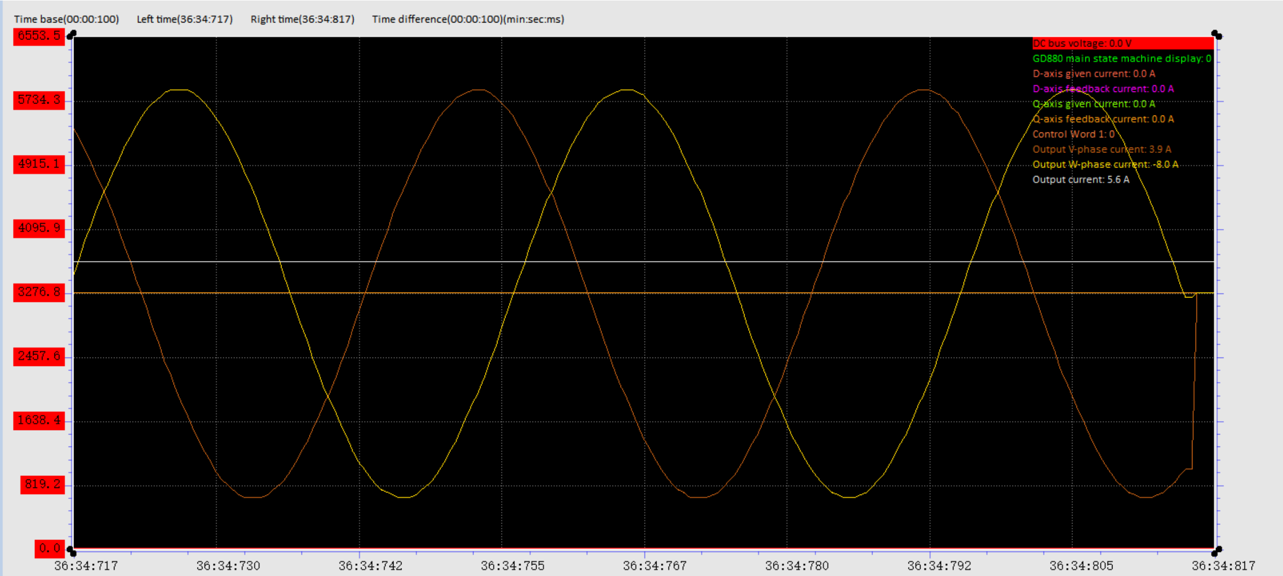


Followed	Name	Current value	Default	Min. value	Max. value	Unit	Read/write mode
P33.00	Recorder Channel 1 Selection	2: Other-C connector (0.00~99.99 (21.00))					Read and write anytime
P33.01	Recorder Channel 2 Selection						Read and write anytime
P33.02	Recorder Channel 3 Selection						Read and write anytime
P33.03	Recorder Channel 4 Selection						Read and write anytime
P33.04	Recorder Channel 5 Selection						Read and write anytime
P33.05	Recorder Channel 6 Selection	2:CConnected by(P21.03 Slope given speed percent...	2	0	10	-	Read and write anytime
P33.06	Recorder Channel 7 Selection	2:CConnected by(P21.12 Output torque percentage)	2	0	10	-	Read and write anytime
P33.07	Recorder Channel 8 Selection	2:CConnected by(P21.09 Rotor speed)	2	0	10	-	Read and write anytime
P33.08	Recorder Channel 9 Selection	2:CConnected by(P22.00 GD880 main state machin...	2	0	10	-	Read and write anytime
P33.09	Recorder Channel 10 Selection	2:CConnected by(P20.34 Status Word 1)	2	0	10	-	Read and write anytime

B. When a fault occurs, use the fault waveform reading button in the motor oscilloscope toolbar, as shown in the following figure.



C. The fault waveforms are displayed in the oscilloscope plot area and the fault waveform data matches group P33.



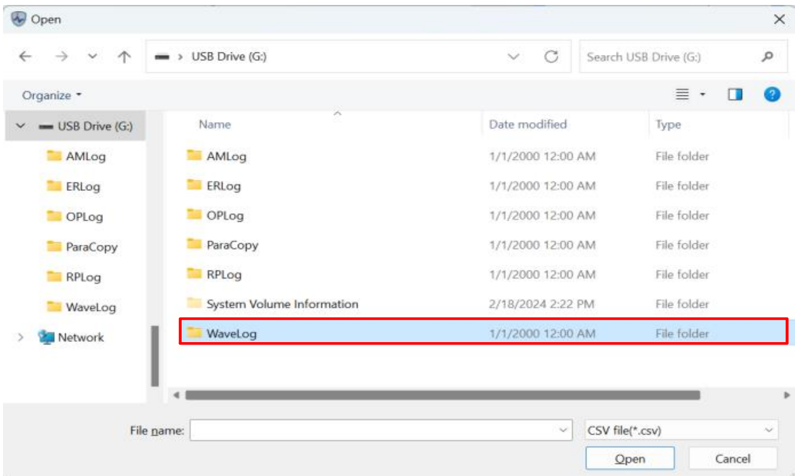
2. SD card fault blackbox

A. Similar to upper computer fault blackbox, set group P33 Blackbox channel configuration according to the requirements, and select the channel you want to read at the time of the fault data.

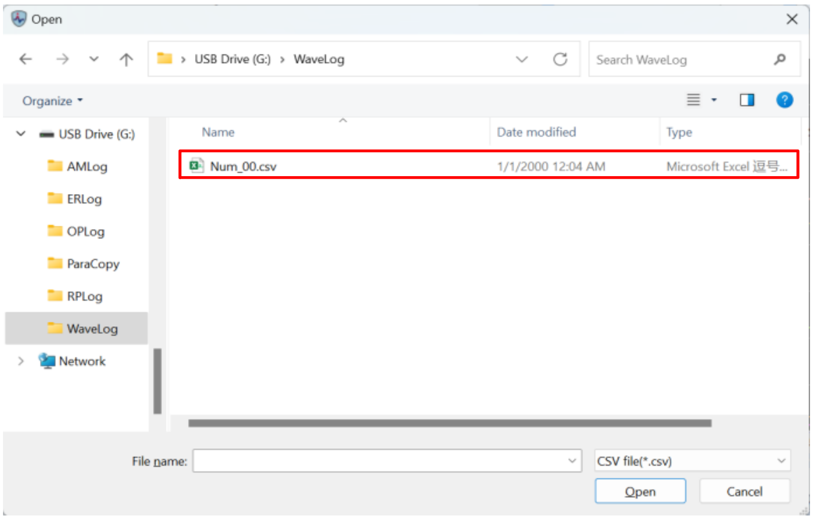
B. Remember that the SD card needs to be inserted into the master controller. The SD card will automatically record the fault waveform data in the event of a fault.

C. Click the SD card oscilloscope button on the oscilloscope toolbar, as shown in the following figure.

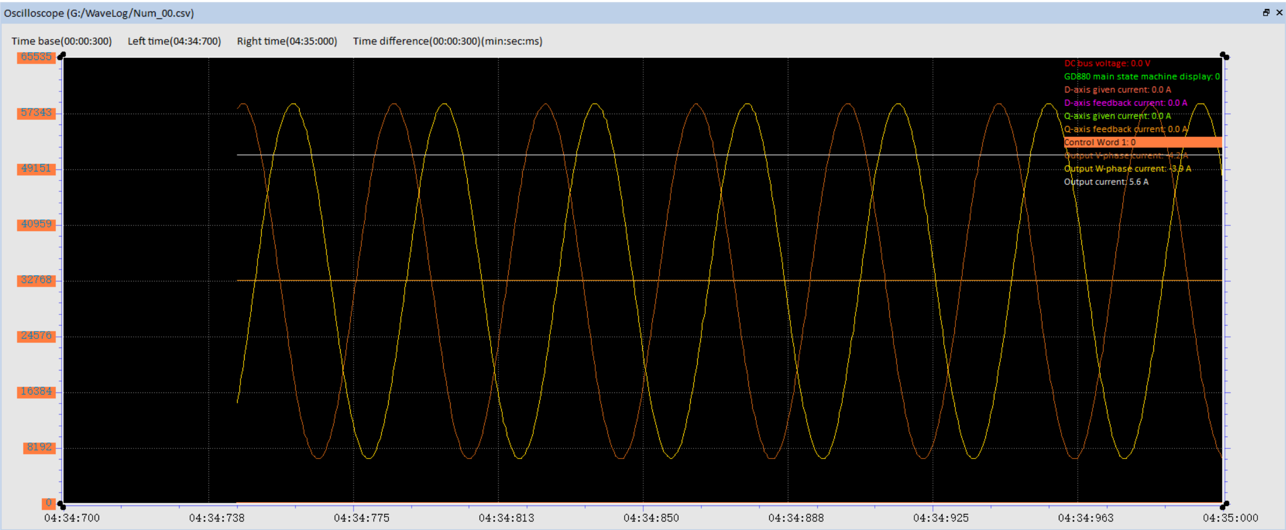
D. In the window that is displayed, select the **WaveLog** folder where the fault waveform data is stored, as shown in the following figure.



E. Open the waveform data you want to view based on the recorded time. Select **Num_02.csv** if you want to open the most recent fault waveform, as shown in the following figure.

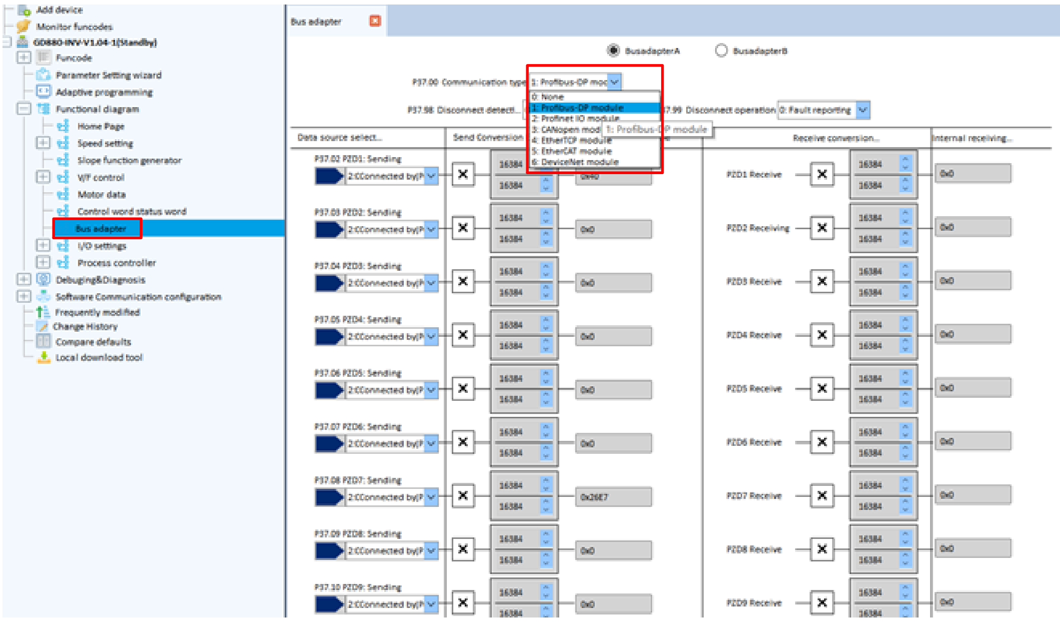


F. The open waveform is the SD card fault waveform saved at the fault time, and the waveform data matches group P33, as shown in the following figure.



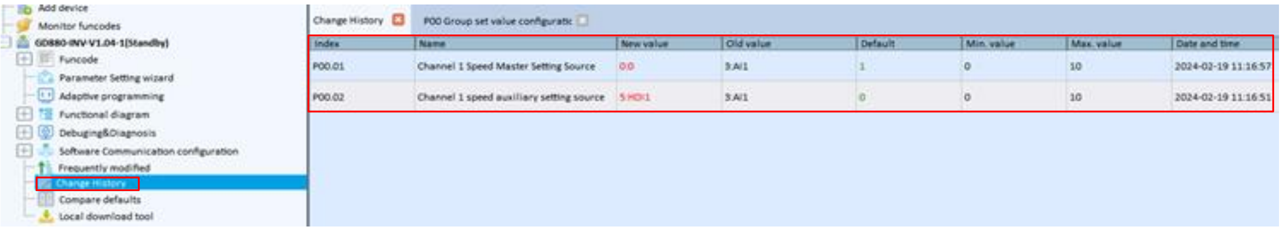
5.9 Device communication configuration

1. Different bus configurators can be selected.
2. Different communication card modules can be selected, as shown in the following figure.



5.10 Change history

You can view the function parameter values that have been modified by the upper computer Workshop in the modification records.



6 Function description

6.1 What this section describes

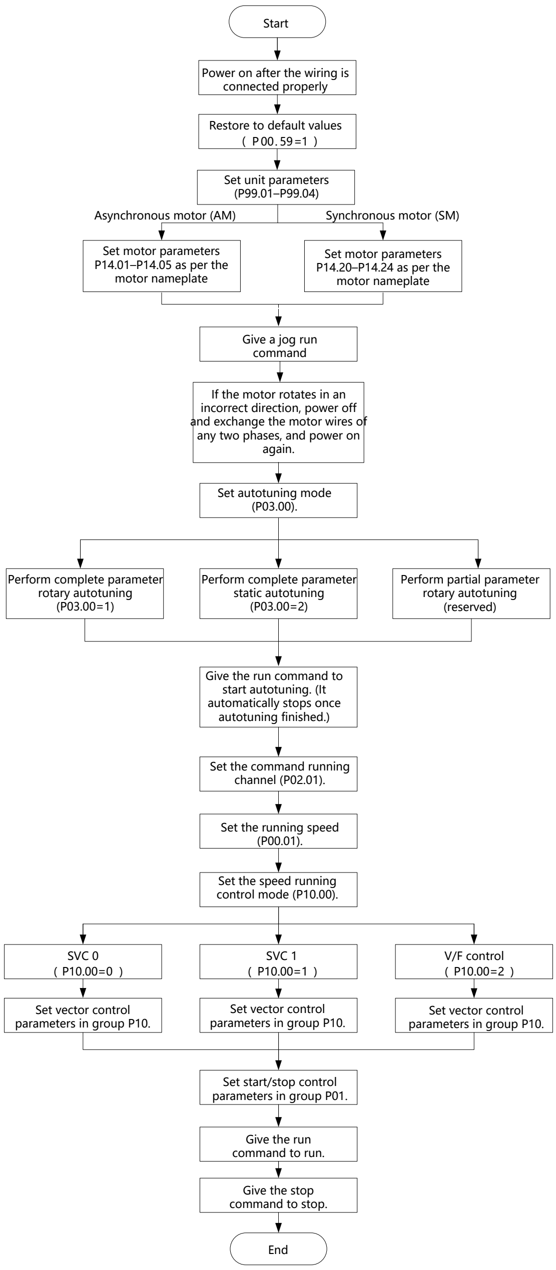
This section describes the internal function modules of the inverter unit.

⚠	● Ensure that all terminals have been securely connected. ● Ensure that the motor power matches the inverter unit.

6.2 Common commissioning procedure of the inverter unit

Figure 6-1 shows the common procedure. (The following uses motor 1 for example.)

Figure 6-1 Common commissioning procedure of the inverter unit



Note: If a fault occurred, find out the fault cause and remove the fault according to fault tracking.

Related function parameters

Function code	Name	Description	Setting range	Default
P00.00	Channel selection source	0: Channel 1 1: Channel 2 2: Other-B connector (0.00–99.99, 0.00) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P00.01	Channel 1 speed main setting source	0: 0 1: Digital (-327.67–P09.02, 100.00%) 2: Other-C connector (0.00–99.99, 0.00) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1
P00.59	Function parameter restore	0: No operation 1: Restore to default values(motor parameters, free function blocks P58–P85, group P08 for fault records, and group P23 for system time cannot be restored) 2: Clear fault records(group P08 for fault records) 3: Clear electric meter records 4: Restore to default values for free function blocks(P58–P85) 5: Clear EEPROM function code area	0–5	0
P02.01	Channel 1 start/stop CW source	0: Keypad 1: Digital 2: Other-C connector (0.00–99.99, 0.00) 3: Terminal start/stop module (IN1, IN2, IN3) 4: Bus adapter A 5: Bus adapter B 6: PC (addresses 0x4200, 0x4201) 7: Modbus (addresses 0x4200, 0x4201) 8: Customized	0–8	0
P10.00	Speed control mode	0: SVC mode 0 1: SVC mode 1	0–3	2

Function code	Name	Description	Setting range	Default
		2: V/F control 3: Closed-loop vector control mode		
P03.00	Parameter autotuning	0: No operation 1: Rotary autotuning 2: Complete static autotuning 3: Partial static autotuning 4: Encoder autotuning 5: AM static autotuning 6: Rotation inertia identifying 7: Friction torque identifying 8: Deadzone identifying	0–8	0
P14.00	Type of motor 1	0: Asynchronous motor (AM) 1: Permanent magnet synchronous motor 2: Synchronous reluctance motor (reserved)	0–2	0
P14.01	Rated power of AM 1	0.1–6000.0kW	0.1–6000.0	Model depended
P14.02	Rated frequency of AM 1	0.01–655.35Hz	0.01–655.35	50.00Hz
P14.03	Rated speed of AM 1	1–36000rpm	1–36000	Model depended
P14.04	Rated voltage of AM 1	0–20000V	0–20000	Model depended
P14.05	Rated current of AM 1	0.1–6000.0A	0.1–6000.0	Model depended
P14.20	Rated power of SM 1	4.0–5000.0kW	4.0–5000.0	Model depended
P14.21	Rated frequency of SM 1	0.01–655.35Hz	0.01–655.35	50.00Hz
P14.22	Number of pole pairs of SM 1	1–50	1–50	2
P14.23	Rated voltage of SM 1	0–20000V	0–20000	Model depended
P14.24	Rated current of SM 1	0.1–1000.0A	0.1–1000.0	Model depended

6.3 Control channel

Motor start or stop control is mainly determined by the run command or run allowing command, which can be set by the start or stop control word (CW).

6.3.1 OFF1 run command

The system enters the state of ready to turn on when OFF1=0, OFF2 and OFF3 commands are invalid (1 indicates invalid) and there are no faults. When the OFF1 command changes from 0 to 1 to send a run command, the system enters the pre-charge state. When detecting the DC bus voltage is normal, the system enters the run ready state and waits for the run allowing command.

After the run allowing command is effective, the system performs pre-run detection. If no problem is detected, the system selects a start mode depending on the value of P01.00 (Start run mode).

If OFF1=0, a stop command is sent, and the system exits the running state and enters the OFF1 stop state.

6.3.2 Run allowing command

A run allowing command controls only IGBT triggering, and it can be determined after the OFF1 command to switch on to run has been executed. If the run allowing command is invalid, the IGBT is never triggered and remains in the run ready state although the OFF1 command to switch on to run is sent. The system waits for the run allowing signal to become effective before triggering the IGBT to control the motor to run.

Normally, the run allowing command remains high level so that the run and stop can be controlled directly with the OFF1 command.

Channel selection	CW source	OFF1	Run allowing
P00.00=0	P02.01=0: Keypad	Local control	1
	P02.01=1: Digital	P20.01	P20.04
	P02.01=3: Terminal	Terminal start/stop	1
	P02.01=4 or 5: Bus adapter	P20.01	P20.04
	P02.01=6: PC	PC control panel	PC control panel
	P02.01=7: Modbus	Modbus control	1
	P02.01=8: Customized	P20.71_bit0	P20.71_bit3
P00.00=1	P02.19=0: Keypad	Local control	1
	P02.19=1: Digital	P20.01	P20.04
	P02.19=3: Terminal	Terminal start/stop	1
	P02.01=4 or 5: Bus adapter	P20.01	P20.04
	P02.19=6: PC	PC control panel	PC control panel
	P02.19=7: Modbus	Modbus control	1
	P02.19=8: Customized	P20.71_bit0	P20.71_bit3

6.3.3 Emergency stop command

6.3.3.1 Emergency stop

OFF2 emergency stop: to unconditionally block the IGBT output when receiving the command. The emergency stop command is effective at low level, and the emergency stop action is taken when the corresponding effective parameter value is 0. The OFF2 command has several sources, and the parameters that are currently effective depend on the control channel settings, as shown in the following table.

Channel selection	CW source	OFF2					
		P02.07	P02.08	P02.25	P02.26	P20.02	STO
P00.00=0	P02.02=0: Keypad	√	√	X	X	√	√
	P02.01=1: Digital	√	√	X	X	√	√
	P02.01=3: Terminal	√	√	X	X	√	√
	P02.01=4 or 5: Bus adapter	√	√	X	X	√	√
	P02.01=6: PC	√	√	X	X	√	√
	P02.01=7: Modbus	√	√	X	X	√	√
	P02.01=8: Customized	√	√	X	X	√	√
P00.00=1	P02.19=0: Keypad	X	X	√	√	√	√
	P02.19=1: Digital	X	X	√	√	√	√
	P02.19=3: Terminal	X	X	√	√	√	√

Channel selection	CW source	OFF2					
		P02.07	P02.08	P02.25	P02.26	P20.02	STO
	P02.01=4 or 5: Bus adapter	X	X	√	√	√	√
	P02.19=6: PC	X	X	√	√	√	√
	P02.19=7: Modbus	X	X	√	√	√	√
	P02.19=8: Customized	X	X	√	√	√	√

Note:

- In the table, "√" indicates that the command source is effective.
- In the table, "X" indicates that the command source is ineffective.

6.3.3.2 Quick stop

OFF3 quick stop: After receiving the command, the system decelerates to zero according to the OFF3 stop time specified by P01.20, and then blocks the IGBT output. The quick stop command is effective at low level, and the quick stop action is taken when the corresponding effective parameter value is 0. The OFF3 command has several sources, and the parameters that are currently effective depend on the control channel settings, as shown in the following table.

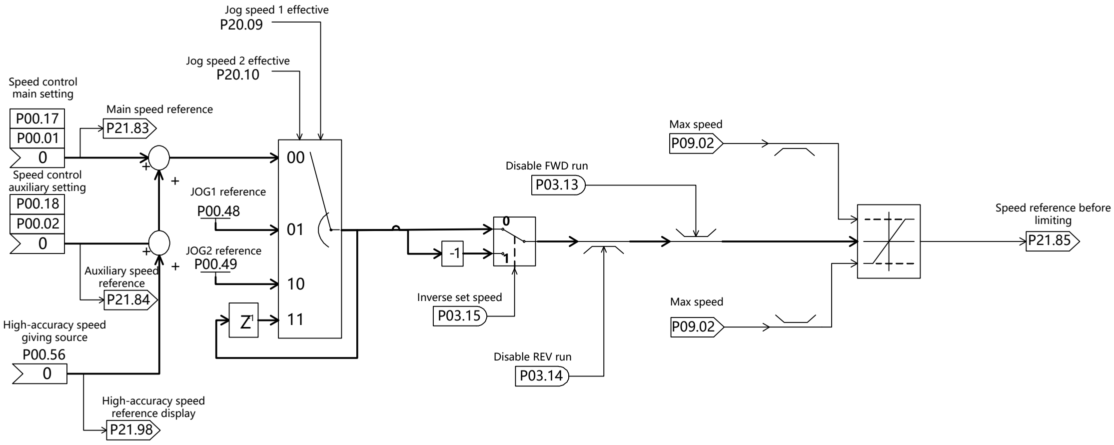
Channel selection	CW source	OFF3				
		P02.09	P02.10	P02.27	P02.28	P20.03
P00.00=0	P02.02=0: Keypad	√	√	X	X	X
	P02.01=1: Digital	√	√	X	X	√
	P02.01=3: Terminal	√	√	X	X	√
	P02.01=4 or 5: Bus adapter	√	√	X	X	√
	P02.01=6: PC	√	√	X	X	√
	P02.01=7: Modbus	√	√	X	X	X
	P02.01=8: Customized	√	√	X	X	X
P00.00=1	P02.19=0: Keypad	X	X	√	√	X
	P02.19=1: Digital	X	X	√	√	√
	P02.19=3: Terminal	X	X	√	√	√
	P02.01=4 or 5: Bus adapter	X	X	√	√	√
	P02.19=6: PC	X	X	√	√	√
	P02.19=7: Modbus	X	X	√	√	X
	P02.19=8: Customized	X	X	√	√	X

Note:

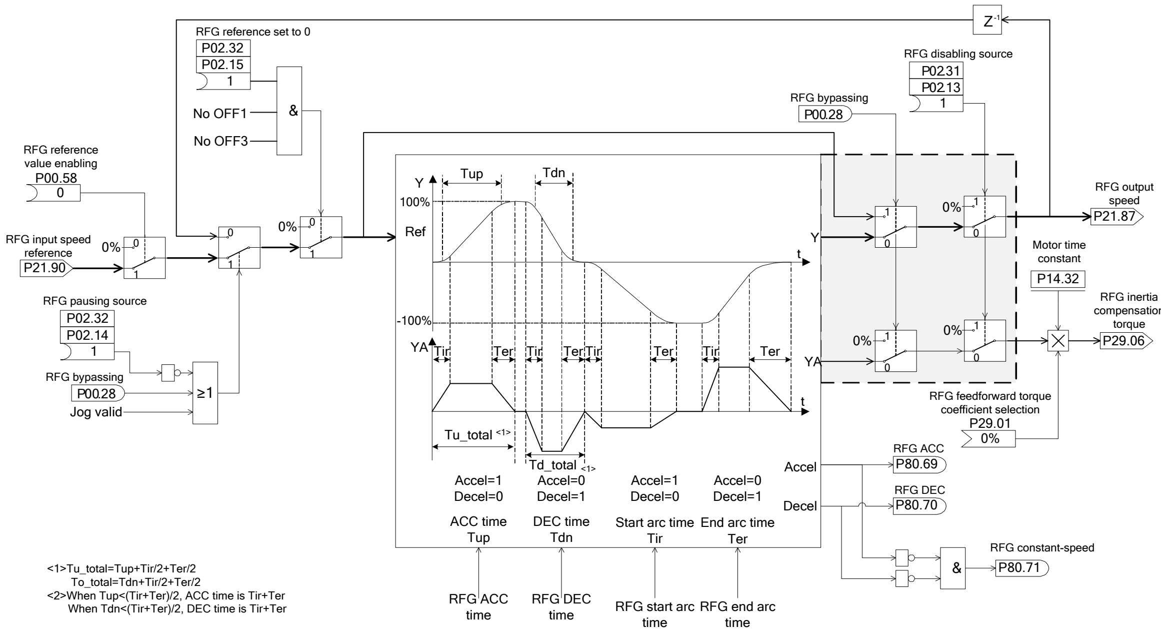
- In the table, "√" indicates that the command source is effective.
- In the table, "X" indicates that the command source is ineffective.

6.4 Given value channel

6.4.1 Speed reference



The primary reference and auxiliary reference are superimposed as input to the ramp function generator, which generates the actual set speed after the acceleration or deceleration speed time.

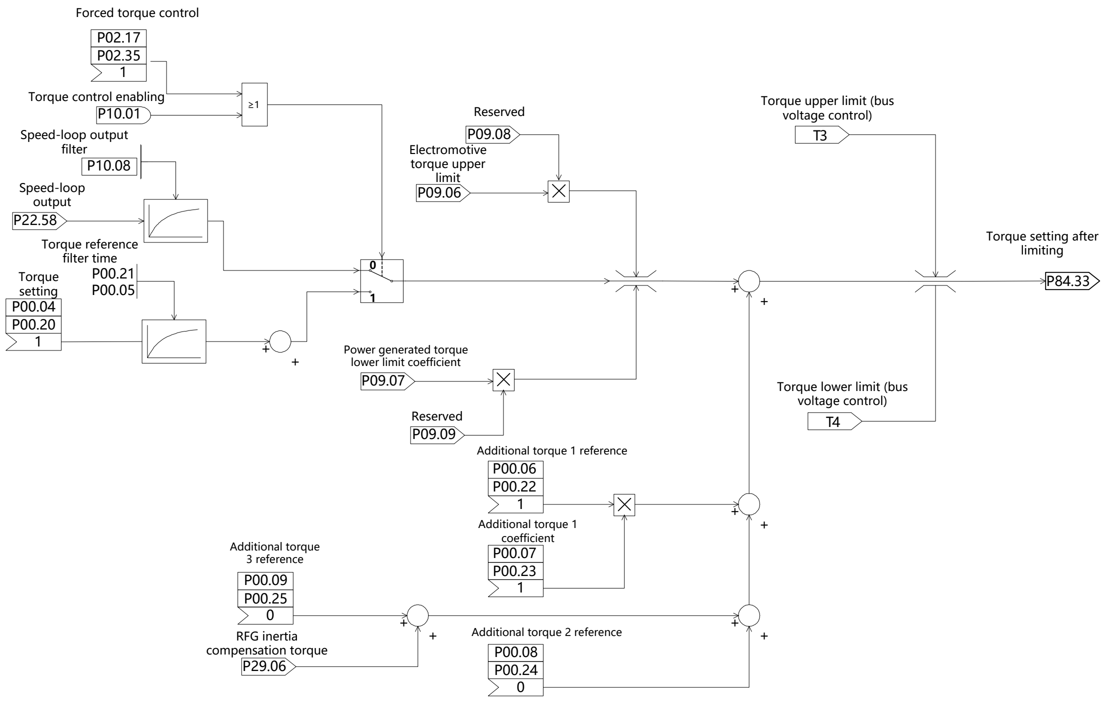


The process sometimes requires the use of a speed regulation setting that takes effect directly without the acceleration or deceleration speed time, while the additional speed is only effective in running, which is directly superimposed to the RFG output speed. The additional speed is effective only in the FVC or SVC control mode.

Channel selection	Function code	Name	Default
P00.00=0	P00.01	Channel 1 speed main setting source	1 (50.00%)
	P00.02	Channel 1 speed auxiliary setting source	0
	P00.03	Channel 1 additional speed reference	0

Channel selection	Function code	Name	Default
	P00.56	High-accuracy speed giving source	0
P00.00=1	P00.17	Channel 2 speed main setting source	1 (50.00%)
	P00.18	Channel 2 speed auxiliary setting source	0
	P00.19	Channel 2 additional speed reference	0
	P00.56	High-accuracy speed giving source	0

6.4.2 Torque reference



Torque reference is formed by the superposition of the main torque and the additional torque.

Related function parameters

Channel selection	Function code	Name	Default
P00.00=0	P00.04	Channel 1 torque main setting source	1 (50.00%)
	P00.05	Channel 1 main torque filter time	0
	P00.06	Channel 1 additional torque 1 giving source	0
	P00.07	Channel 1 additional torque 1 coefficient source	1 (100.0%)
P00.00=1	P00.20	Channel 2 torque main setting source	1 (50.00%)
	P00.21	Channel 2 main torque filter time	0
	P00.22	Channel 2 additional torque 1 giving source	0
	P00.23	Channel 2 additional torque 1 coefficient source	1 (100.0%)

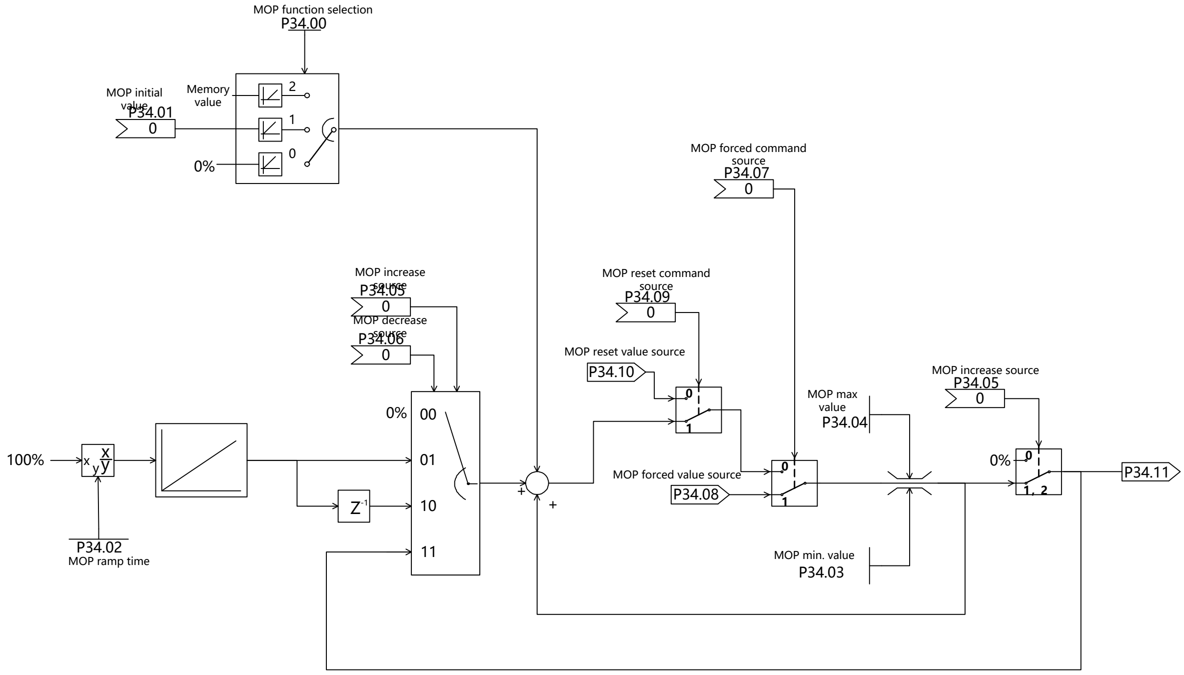
6.4.3 Multi-step speed reference

You can set parameters to enable the inverter unit to run at multiple steps. The inverter unit supports setting 16-step speeds, which are selectable through the combination of bit 0–bit 3, corresponding to multi-step speed 0 to multi-step speed 15.

When the multi-step speed is enabled, the target frequency is the multi-step speed setting, namely, the value of P35.38; otherwise, the target frequency is obtained through the reference configuration. When P35.04 is set to 1, the present number of steps in multi-step speed running is determined by the analogue input value and the setting of P35.22–P35.37.

Multi-step speed	P35.04=1	P35.04=0			
		P35.03	P35.02	P35.01	P35.00
P35.05: Multi-step speed 0	AIIn≤P35.22	0	0	0	0
P35.06: Multi-step speed 1	P35.22≤AIIn≤P35.23	0	0	0	1
P35.07: Multi-step speed 2	P35.23≤AIIn≤P35.24	0	0	1	0
P35.08: Multi-step speed 3	P35.24≤AIIn≤P35.25	0	0	1	1
P35.09: Multi-step speed 4	P35.25≤AIIn≤P35.26	0	1	0	0
P35.10: Multi-step speed 5	P35.26≤AIIn≤P35.27	0	1	0	1
P35.11: Multi-step speed 6	P35.27≤AIIn≤P35.28	0	1	1	0
P35.12: Multi-step speed 7	P35.28≤AIIn≤P35.29	0	1	1	1
P35.13: Multi-step speed 8	P35.29≤AIIn≤P35.30	1	0	0	0
P35.14: Multi-step speed 9	P35.30≤AIIn≤P35.31	1	0	0	1
P35.15: Multi-step speed 10	P35.31≤AIIn≤P35.32	1	0	1	0
P35.16: Multi-step speed 11	P35.32≤AIIn≤P35.33	1	0	1	1
P35.17: Multi-step speed 12	P35.33≤AIIn≤P35.34	1	1	0	0
P35.18: Multi-step speed 13	P35.34≤AIIn≤P35.35	1	1	0	1
P35.19: Multi-step speed 14	P35.35≤AIIn≤P35.36	1	1	1	0
P35.20: Multi-step speed 15	P35.36≤AIIn≤P35.37	1	1	1	1

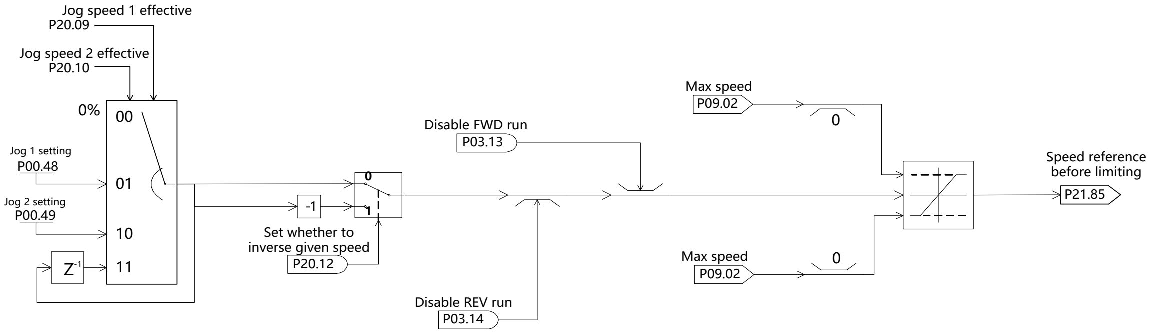
6.4.4 Motorized potentiometer (MOP)



Function code	Name	Description	Setting range	Default
P34.00	MOP function selection	0: Disable 1: Clear at power off 2: Memorize at power off	0–2	1
P34.01	MOP initial value setting	Initial value after power-on. This function code is valid when the power-off clear function is selected. If the power-off memorizing function is selected, the initial value of the MOP is the value before the power-off.	-600.0–600.0	0.0%
P34.02	MOP ramp time	Time taken for the output to increase from 0% to 100% or decrease from 100% to 0%.	0.1–100.0	10.0s
P34.03	MOP min. value	-600.0–600.0% MOP output lower limit.	-600.0–P34.04	-100.0%
P34.04	MOP max value	-600.0–600.0% MOP output upper limit.	P34.03-600.0	100.0%
P34.05	MOP increase source	The output increases or decreases at a set rate when the increase or decrease is effective; and the MOP output remains constant when the increase and decrease are both effective or ineffective. MOP forced command source: The forced value is not effective until the forced command is valid. 0: 0 (ineffective) 1: 1(effective)	0–10	0
P34.06	MOP decrease source		0–10	0
P34.07	MOP forced command source		0–10	0

Function code	Name	Description	Setting range	Default
		2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2		
P34.08	MOP forced value source	0: 0 1: Digital (-600.0–600.0%, 100%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: Reserved 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P34.09	MOP reset command source	MOP reset triggered at the rising edge. The reset value is determined by the function code. 0: 0 1: 1 2: Other-B connector (effective at 0->1) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P34.10	MOP reset value source	0: 0 1: Digital (-600.0–600.0%, 100%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P34.11	MOP output display	-600.0–600.0%	-600.0–600.0	0.0%

6.4.5 Jog reference



The validity of jog reference is determined by the CWs P20.09 and P20.10, while the values of the CWs P20.09 and P20.10 are determined by the start and stop CW sources of different channels.

Channel selection	Start/Stop CW source	Jog command reference	JOG1	JOG2
P00.00=0	P02.01=0: Keypad	JOG key on the keypad, which requires setting P01.56=1	√	X
	P02.01=3: Terminal	P02.47 Terminal JOG1 source P02.48 Terminal JOG2 source	√	√
	P02.01=4: Bus adapter A	P37.94 Bus adapter A CW 1 source	√	√
	P02.01=5: Bus adapter B	P38.94 Bus adapter B CW 1 source	√	√
	P02.01=6: PC	Upper computer command "forward jog" and "reverse jog"	√	X
	P02.01=7: Modbus	3 written to address 0x4200: Forward jog 4 written to address 0x4200: Reverse jog 8 written to address 0x4200: Jog to stop	√	X
	P02.01=8: Customized	P02.04 Channel 1 customized JOG1 source P02.05 Channel 1 customized JOG2 source	√	√
P00.00=1	P02.19=0: Keypad	JOG key on the keypad, which requires setting P01.56=1	√	X
	P02.19=3: Terminal	P02.47 Terminal JOG1 source P02.48 Terminal JOG2 source	√	√
	P02.19=4: Bus adapter A	P37.94 Bus adapter A CW 1 source	√	√
	P02.19=5: Bus adapter B	P38.94 Bus adapter B CW 1 source	√	√
	P02.19=6: PC	Upper computer command "forward jog" and "reverse jog"	√	X
	P02.19=7: Modbus	3 written to address 0x4200: Forward jog 4 written to address 0x4200: Reverse jog 8 written to address 0x4200: Jog to stop	√	X
	P02.19=8: Customized	P02.22 Channel 2 customized JOG1 source P02.22 Channel 2 customized JOG2 source	√	√

Jog related function parameters

Function code	Name	Description	Setting range	Default
P00.48	Jog 1 setting	-	0.00–P09.02	5.00Hz
P00.49	Jog 2 setting	-	0.00–P09.02	5.00Hz
P00.50	Jog ACC time	-	0.0–20.0	1.0s
P00.51	Jog DEC time	-	0.0–20.0	1.0s
P20.09	CW 1 bit 8 (Jog bit 0)	1: Jog 1	0–1	0
P20.10	CW 1 bit 9 (Jog bit 1)	1: Jog 2	0–1	0

6.5 Start mode

Function code	Name	Description	Setting range	Default
P01.00	Running mode of start	0: Direct start 1: Start after DC braking 2: Speed-tracking start 1 (reserved) 3: Speed-tracking start 2 (reserved) 4: Start after short-circuit braking (reserved)	0–4	0

Direct start: Start from the starting frequency specified by P01.01.

Start after DC braking: DC braking (setting parameters P01.03 and P01.04) before starting the motor from the starting frequency. This mode is applicable to the scenarios where small inertial loads may rotate reversely at startup.

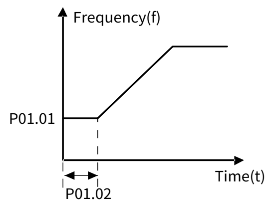
Speed-tracking start: It automatically tracks the speed and direction of the motor, providing a smooth and impact-free start when the motor is rotating. This mode is applicable to the scenarios where high inertia loads may rotate reversely at startup.

6.5.1 Direct start

Direct start: P01.00= 0

If the braking time before start is 0, the VFD runs at the starting frequency of direct start P01.01. This is often applicable to start from a still state.

Direct start



Function code	Name	Description	Setting range	Default
P01.01	Starting frequency	0.00–50.00Hz	0.00–50.00	0.50Hz
P01.02	Hold time of starting frequency	0.0–50.0s	0.0–50.0	0.0s

Note:

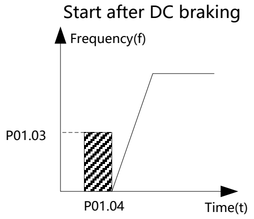
- P01.01 (Starting frequency) is the initial speed at which the VFD starts, setting a proper starting speed increases the torque at starting.

- During the hold time of the starting frequency specified by P01.02, the VFD output frequency is the starting frequency. Then, the VFD runs from the starting frequency to the target frequency. If the target frequency is lower than the starting frequency, the VFD stops running and keeps in the standby state. The starting frequency is not limited by the speed lower limit.

6.5.2 Start after DC braking

Start after DC braking: P01.00= 1

If the DC braking time is not 0, enable the motor to keep at a position by means of DC braking, and then perform ACC start. This is applicable to the scenarios with the motor in slight rotation before start.



Function code	Name	Description	Setting range	Default
P01.03	Braking current before start	-	0.0–100.0	0.0%
P01.04	Braking time before start	-	0.00–50.00	0.00s
P01.05	Prestart DC Brake Kp	-	0–65535	100
P01.06	Prestart DC Brake Ki	-	0–65535	100

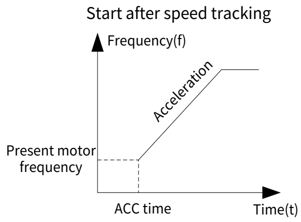
Note:

- The VFD performs DC braking with the braking current before start and it speeds up after the DC braking time. If the set DC braking time is 0, DC braking is invalid.
- Stronger braking current indicates larger braking power. The DC braking current before start is a percentage of the VFD rated current.

6.5.3 Speed-tracking start

Speed-tracking start: P01.00=2

The VFD searches for (and automatically tracks) the present running frequency and direction of the motor and then controls the motor to run from the present frequency to the set frequency, implementing smooth running without impact. This is applicable to the scenarios with the motor in high-speed rotation or with transient grid voltage drop.



Function code	Name	Description	Setting range	Default
P01.33	Demagnetization time for speed tracking	When speed-tracking start is selected, the inverter waits for the de-magnetization time before	0.00–20.00	2.00s

Function code	Name	Description	Setting range	Default
		responding to the start command.		
P01.34	Rotation speed tracking phase compensation coefficient	0.0–200.0%	0.0–200.0	100.0%
P01.35	Rotation speed tracking amplitude compensation	0.0–200.0%	0.0–200.0	100.0%

Note: When P01.00=2, that is, speed-tracking start is selected, the inverter waits for the de-magnetization time before responding to the start command.

6.6 Stop mode

You can select a stop mode by setting P01.15, P01.17, and P01.18.

Function code	Name	Description	Setting range	Default
P01.15	OFF1 stop mode	1: Decelerate to stop (RFG deceleration time) 1: Coast to stop 2: Stop according to max capacity (OFF3 stop time)	0–2	0
P01.17	OFF3 stop mode	0: Decelerate to stop 1: Stop according to max capacity (OFF3 stop time)	0–1	0
P01.18	Stop mode allowed in run	0: OFF1 mode 1: OFF2 mode 2: OFF3 mode	0–2	0

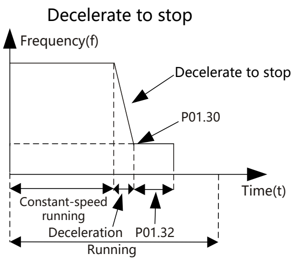
Note:

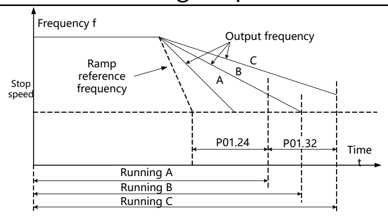
- Set P01.15 or P01.17, and then set P01.18 to select the stop mode.
- After a stop command takes effect, the VFD lowers output frequency based on the DEC mode and the defined DEC time; after the frequency drops to the stop speed (P01.30), the VFD stops.

6.6.1 OFF1 decelerating to stop

When P01.15=0, the OFF1 stop mode is set to the deceleration to stop mode.

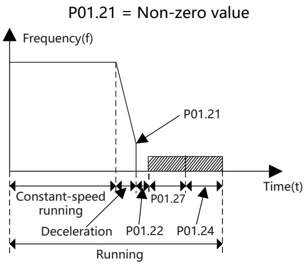
After a stop command takes effect, the VFD lowers output frequency based on the DEC mode and the defined DEC time; after the frequency drops to the stop speed (P01.47), the VFD stops.
Deceleration to stop comes in three ways of stopping: Regular deceleration to stop, DC braking for stop, and short-circuit braking for stop.



Function code	Name	Description	Setting range	Default
P01.20	Stop braking mode	0: DC braking 1: DC braking	0–1	0
P01.21	Starting frequency of braking for stop	During the deceleration to stop, the VFD starts DC braking for stop when the running frequency reaches the frequency specified by P01.09. The frequency should be greater than the stop speed.	0.00–P09.02	0.00Hz
P01.22	Demagnetization time	The VFD blocks the output before starting DC braking for stop. The VFD starts DC braking after this time so as to prevent overcurrent caused by DC braking at high speed.	0.00–50.0	0.00s
P01.23	DC braking current for stop	Percentage of the VFD rated output current. Stronger current indicates greater DC braking effect.	0.0–120.0 (of the motor rated current)	0.0%
P01.24	DC braking time for stop	DC braking duration. If the time is 0, DC braking is invalid, and the VFD decelerates to stop within the specified time.	0.0–50.0	0.0s
P01.25	Short-circuit braking current	of the VFD rated current	0.0–150.0	0.0%
P01.27	Hold time of short-circuit braking for stop	0.0–50.0s	0.0–50.0	0.00s
P01.30	Stop speed	0.00–100.00Hz	0.00–100.00	0.50Hz
P01.31	Stop speed detection mode	0: Detect by the set speed (unique in space voltage vector control mode) 1: Detect according to speed feedback	0–1	0
P01.32	Stop speed detection time		0.00–100.00	0.50s
P01.41	Action when set frequency less than frequency lower limit (valid when frequency lower limit greater than 0)	Processing mode selected when the set frequency is less than the frequency lower limit. 0: Run at the frequency lower limit 1: Stop 2: Sleep	0–2	0

Note: In the mode of decelerating to stop, if the set frequency is lower than the frequency lower limit, you can set the VFD action by setting P01.41, that is, setting the action when the set frequency is less than frequency lower limit (valid when frequency lower limit greater than 0).

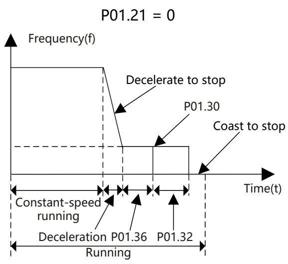
P01.21 (Starting frequency of braking for stop) = Other value but not 0



Short-circuit braking for stop and DC braking can be valid only with this setting. During decelerating to stop, if the running frequency of VFD is lower than the starting frequency of brake for stop (P01.21), the VFD waits for the demagnetization time (P01.22) and checks the value of P01.27. If the value is a non-zero value, the VFD enters short-circuit braking for stop. Then the VFD checks the value of P01.23 (DC braking current for stop). If the value is a non-zero value, the VFD performs DC braking with the time specified by P01.24. When the DC braking time is reached, it coasts to stop.

If the value of P01.27 (Hold time of short-circuit braking for stop) is zero, short-circuit braking for stop is invalid. Similarly, if the value of P01.24 (DC braking time for stop) is zero, DC braking for stop is invalid.

P01.21 = Zero



After the command of deceleration to stop takes effect, the VFD decelerates to stop according to the normal process. When the ramp frequency is less than P01.30 (Stop speed), the VFD waits for a stop speed delay (when the delay is set), and performs stop determination according to the mode specified by P01.31. If P01.31 (Stop speed detection mode)=0, the VFD coasts to stop. If P01.31=1, the VFD needs to check whether the motor output frequency is less than P01.30. If yes, the VFD coasts to stop. If no, the VFD coasts to stop with a delay specified by P01.32.

DC braking for stop

Starting frequency of DC braking for stop: During the deceleration to stop, the VFD starts DC braking for stop when running frequency reaches the starting frequency determined by P01.09.

Wait time before DC braking: The VFD blocks the output before starting DC braking. After this wait time, DC braking is started so as to prevent overcurrent caused by DC braking at high speed.

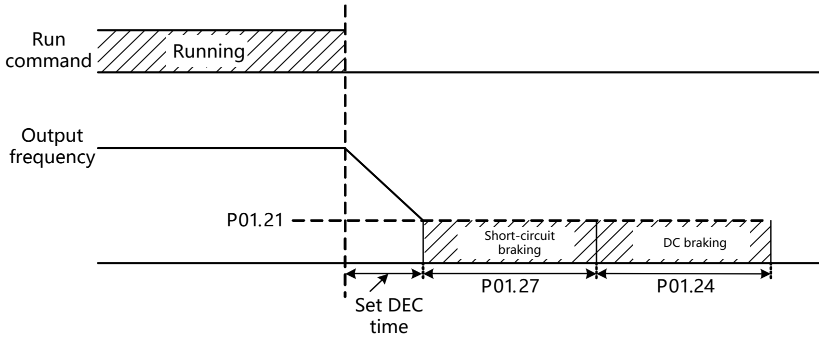
DC braking current for stop: It indicates the applied DC braking energy. Stronger current indicates greater DC braking effect.

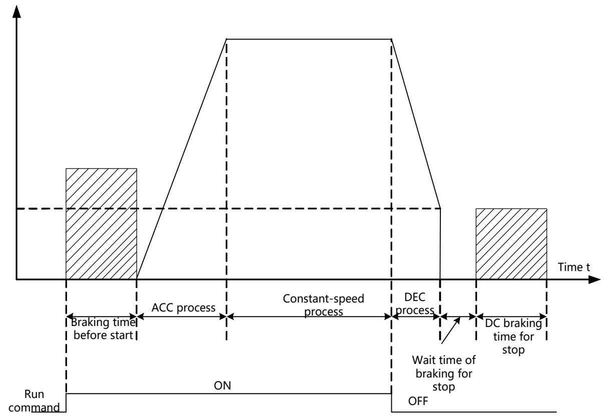
DC braking time for stop: It indicates the hold time of DC braking. If the time is 0, DC braking is invalid, and the VFD decelerates to stop within the specified time.

Hold time of short-circuit braking for stop

For SM control, when the VFD starts in direct start mode (P01.00=0), set P01.25 and P01.27 to a non-zero value to enter short-circuit braking.

During stop, if the VFD running frequency is lower than the starting frequency of brake for stop (P01.21), set P01.25 and P01.27 to a non-zero value to enter short-circuit braking for stop, and then carry out DC braking in the time specified by P01.27.

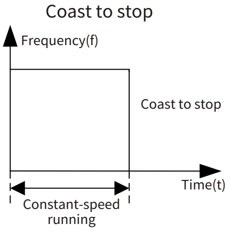




6.6.2 OFF2 coasting to stop

When the OFF2 stop command takes effect, the VFD stops output immediately and the load coasts to stop according to mechanical inertia. The VFD stops by means of stopping output. At this point, the power to the motor is cut off and the driving system is free to brake. Since the stop time is determined by the inertia of the driving system, it is also known as inertial stop.

Coast to stop



Note: The OFF2 command has several sources, and the parameters that are currently effective depend on the control channel settings. For effective parameters, see 6.3.3.1 Emergency stop.

6.6.3 OFF3 quick stop—max capacity stop

OFF3 quick stop—max capacity stop: After receiving the command, the system decelerates to zero according to the OFF3 stop time specified by P01.16, and then blocks the IGBT output. The quick stop command is effective at low level, and the quick stop action is taken when the corresponding effective parameter value is 0.

When P01.15=2 (OFF3 max capacity stop) or P01.17=1 (OFF3 max capacity stop), that is, max capacity stop is activated, the motor reference speed will be forced to zero. That is, the motor decelerates to zero according to its max output capacity. The torque of the motor (P09.06 specifies the giving source of the electromotive torque upper limit) or the current may reach the limit during deceleration.

Function code	Name	Description	Setting range	Default
P01.16	OFF3 stop time	0.0–1000.0s	0.0–1000.0	1.0s

Function code	Name	Description	Setting range	Default
P09.06	Electromotive torque upper limit giving source	0: 0 1: Digital (0.0–300.00%, 180.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1

Note:

- The OFF3 command has several sources. Refer to 6.3.3.2 Quick stop.
- Max capacity stop can occur in an OFF1 stop process or an OFF3 stop process.

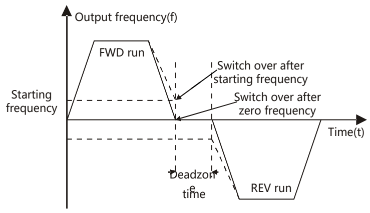
6.6.4 Switchover between FWD run and REV run

Function code	Name	Description	Setting range	Default
P01.28	FWD/REV run deadzone time	0.0–3600.0s	0.0–3600.0s	0.0s
P01.29	FWD/REV run switching mode	0: Switch at zero frequency 1: Switch at the starting frequency (P01.01) 2: Switch after delay for stop speed (P01.30) (switch after braking) When P01.29 = 0 or 1, and the switchover between FWD run and REV run is valid, the VFD decelerates to the switching frequency point. If P01.31=1, check whether the motor output frequency is less than the switching frequency point. If yes, wait the time specified by P01.28, and then control the motor to run in the reverse direction. If no, wait the time specified by P01.32 and then the time specified by P01.28, and then control the motor to run in the reverse direction. When P01.29=2, the DEC process for the switchover between FWD run and REV run is similar to the process of deceleration to stop. In the DEC process for the switchover, you can set related parameters to determine whether to enable short-circuit braking for stop and DC braking based on the work conditions. The difference between the	0–2	0

Function code	Name	Description	Setting range	Default
		two processes is as follows: When the running frequency reaches the stop speed specified by P01.30 or DC braking ends, the deadzone time specified by P01.28 needs to be waited, and then the motor can be controlled to run in the reverse direction.		

Set the VFD FWD/REV run switching mode.

Set P01.28, that is, the transition time for switchover between FWD run and REV run.



Stop speed detection

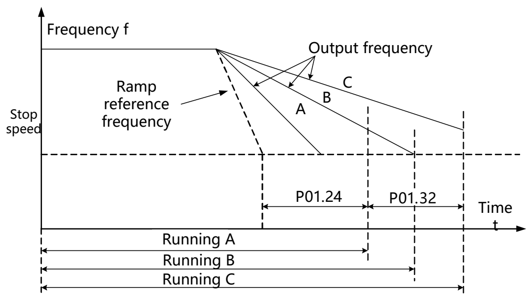
Function code	Name	Description	Setting range	Default
P01.30	Stop speed	0.00–100.00Hz	0.00–100.00	0.50Hz
P01.31	Stop speed detection mode	0: Detect according to speed setting 1: Detect according to speed feedback	0–1	0
P01.32	Feedback speed detection time	0.0–100.0s	0.0–100.0	0.5s

Set the stop speed detection mode of the VFD:

0: Detect according to speed setting (without a stop delay), which is the only means supported in space voltage vector mode

1: Detect according to speed feedback, valid only for vector control

When P01.31 is set to 1, detecting according to speed feedback, if the VFD feedback frequency is less than or equal to the value of P01.30 and the VFD stop speed is detected within the time specified by P01.32, the VFD stops; otherwise, the VFD stops after the time specified by P01.32.



6.6.5 Power-off restart

For any command running channels, if P01.08=1, the VFD memorizes the running status at power-off. If the VFD is running before power-off, the VFD automatically runs with a wait time specified by P01.09 at the next power-on when start conditions are met.

When terminals are uses as the command running channel, you need to set P01.07 to 1, indicating power-on terminal based running protection is effective. The following figure shows the wait time for restart after power-off.

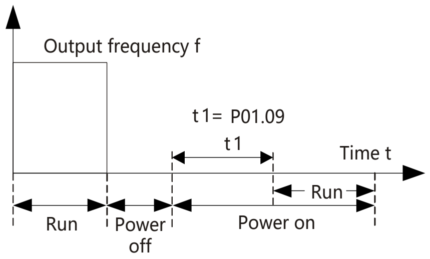
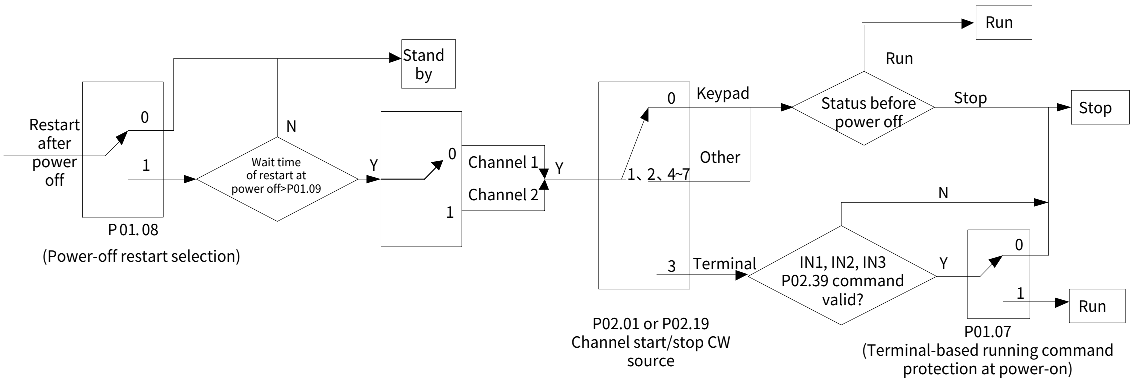


Figure 6-2 Logic diagram for restart after power-off



Function code	Name	Description	Setting range	Default
P01.07	Terminal-based running command protection at power-on	0: Disable restart 1: Enable restart	0–1	0
P01.08	Restart after power off	0: Disable 1: Enable	0–1	0
P01.09	Wait time for restart after power-off	Valid when P01.08 is set to 1.	0.0–3600.0	1.0s

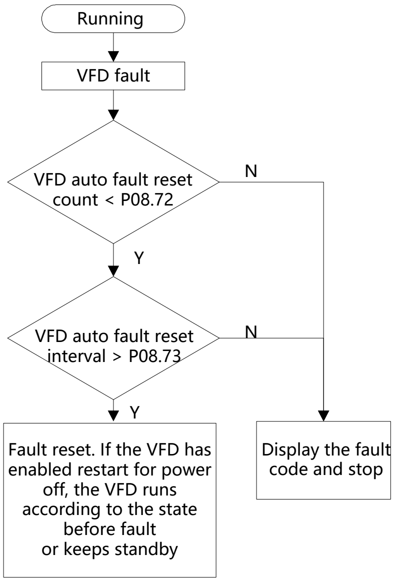
Note:

- If the terminal-based running command protection at power-on is invalid (P01.07=0), though the command running terminal is considered as valid during power-on, the VFD does not run and it keeps the protection state until the terminal is disabled and then enabled.
- If the terminal-based running command protection at power-on is valid (P01.07=1), when the command running terminal is considered as valid during power-on, the VFD is started automatically after the initialization.

6.6.6 Restart after auto fault reset

The VFD supports the function of restart after automatic fault reset. The following figure shows the setting flowchart.

Figure 6-3 Logic diagram for restart after automatic fault reset



Function code	Name	Description	Setting range	Default
P08.72	Max auto fault reset count	When the value is not 0, the system automatically performs reset upon a fault. If the power-off restart function is enabled after the reset, the VFD remains the previous run state as it was before the fault or standby. Otherwise; the VFD keeps standby. The system will not automatically perform reset if the number of faults reported by the system is greater than the value of this function code.	0–10	0
P08.73	Auto fault reset interval	When the number of automatic system fault reset is less than the value of Max auto fault reset count, the system automatically resets the fault that occurred after the automatic fault reset interval has elapsed. The automatic fault reset count is cleared when the system has continuously run more than 1 hour without a fault.	0.1–3600.0	3.0s
P08.74	Auto fault reset count display	It displays the number of automatic fault resets that the present system has performed; if the system has no fault within 1 hour, the number is automatically cleared; when the control box is powered on again, the variable is automatically cleared.	0–10	0

6.7 Start/Stop CW

Select the start/stop CW source for channel 1 or 2 through P02.01 or P02.19.

Function code	Name	Description	Setting range	Default
P02.01	Channel 1 start/stop CW source	0: Keypad 1: Digital 2: Other-C connector (for example, master/slave control commands can be set through a connector) 3: Terminal start/stop module (IN1, IN2, IN3) 4: Bus adapter A 5: Bus adapter B 6: PC (addresses 0x4200, 0x4201) 7: Modbus (addresses 0x4200, 0x4201) 8: Customized	0–8	0
P02.19	Channel 2 start/stop CW source	0: Keypad 1: Digital 2: Other-C connector (for example, master/slave control commands can be set through a connector) 3: Terminal start/stop module (IN1, IN2, IN3) 4: Bus adapter A 5: Bus adapter B 6: PC (addresses 0x4200, 0x4201) 7: Modbus (addresses 0x4200, 0x4201) 8: Customized	0–8	0

Use channel 1 as an example, set P02.01=3, and select the terminal-based start/stop module.

6.7.1 Terminal-based start/stop CW

Obtain the selection of the terminal-based start/stop module channel through function code P02.38:

P02.38=0, selecting terminal-based start/stop command 1 as the channel.

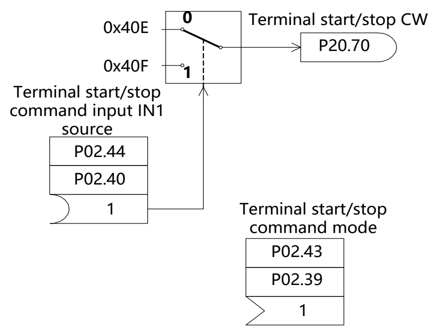
P02.38=1, selecting terminal-based start/stop command 2 as the channel.

Set P02.39 or P02.43 to select the terminal-based start/stop command mode. The terminal-based start/stop command 1 is described, namely, P02.39.

Function code	Name	Description	Setting range	Default
P02.38	Terminal start/stop module channel selection	0: Terminal-based start/stop command 1 1: Terminal-based start/stop command 2 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6	0–10	0

Function code	Name	Description	Setting range	Default
		9: HDI1 10: HDI2		
P02.39	Terminal start/stop command 1 mode	0: Invalid 1: IN1 start (0: Stop; 1: Run) 2: IN1 start, IN2 direction (0: Forward; 1: Reverse) 3: IN1 FWD start, IN2 REV start 4: IN1P start (0->1), IN2 stop 5: IN1P start, IN2 stop, IN3 direction 6: IN1P FWD start, IN2P REV start, IN3 stop **Note:** P indicates the pulse edge and 0->1 indicates the rising edge.	0–6	0
P02.40	Terminal start/stop command 1 input IN1 source	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P02.41	Terminal start/stop command 1 input IN2 source		0–10	0
P02.42	Terminal start/stop command 1 input IN3 source		0–10	0

6.7.1.1 Start/Stop mode 1

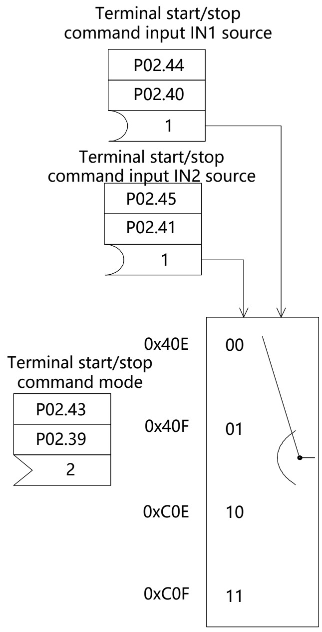


P02.39/P02.43=1

View only IN1 (P02.40 or P02.44) input (0: Stop; 1: Run):

1. IN1=0 indicates the VFD stop command.
2. IN1=0 indicates the VFD run command.

6.7.1.2 Start/Stop mode 2

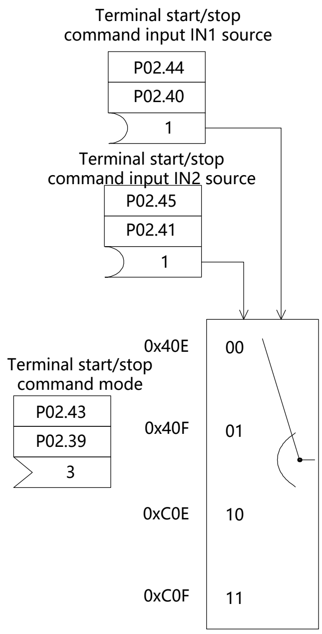


P02.39/P02.43=2

View the inputs for IN1 (P02.40 or P02.44) and IN2 (P02.41 or P02.45). IN1 indicates the run status while IN2 indicates the run direction.

1. IN1=0 indicates the VFD stop command while IN1=1 indicates the VFD run command.
2. IN2=0 indicates the VFD FWD run command while IN2=1 indicates the VFD REV run command.

6.7.1.3 Start/Stop mode 3



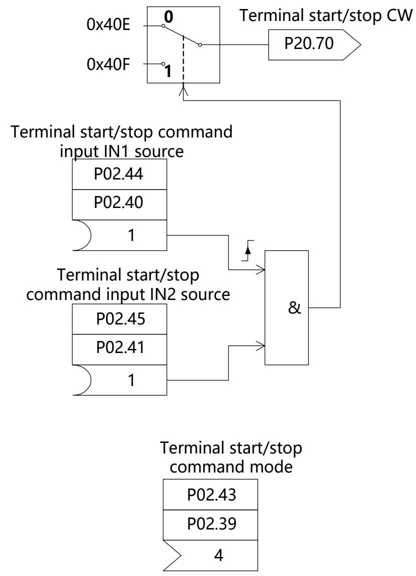
P02.39/P02.43=3

View the inputs for IN1 (P02.40 or P02.44) and IN2 (P02.41 or P02.45):

1. When IN1=0 and IN2=0, the VFD stops, while the stop direction depends on the run direction before the stop.

2. When IN1=0 and IN2=1, the VFD starts in the reverse direction.
3. When IN1=1 and IN2=0, the VFD starts in the forward direction.
4. When IN1=1 and IN2=1, the VFD stops, while the stop direction depends on the run direction before the stop.

6.7.1.4 Start/Stop mode 4

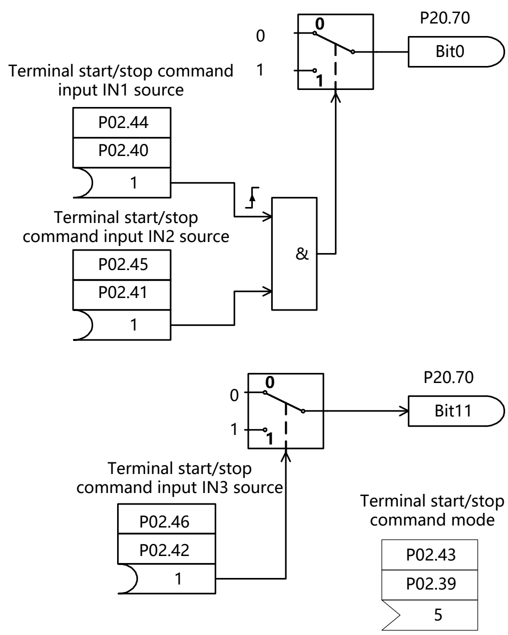


P02.39/P02.43=4

View the inputs for IN1 (P02.40 or P02.44) and IN2 (P02.41 or P02.45):

1. When IN1 rising edge triggered (0->1) and IN2=1, the VFD starts in the forward direction.
2. When IN2=0, the VFD stops.

6.7.1.5 Start/Stop mode 5



P02.39/ P02.43=5

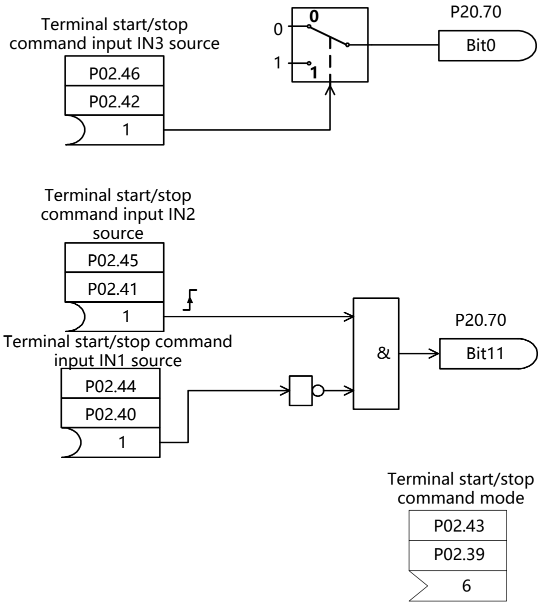
View the inputs for IN1 (P02.40 or P02.44), IN2 (P02.41 or P02.45), and IN3 (P02.42 or P02.46):

1. IN3 indicates the VFD run direction. When IN3=0, the VFD runs in the forward direction. When IN3=1, the

VFD runs in the reverse direction.

2. When IN1 rising edge triggered (0->1) and IN2=1, the VFD starts, in which you need to use IN3 together to check the run direction.
3. When IN2=0, the VFD stops.

6.7.1.6 Start/Stop mode 6



P02.39/P02.43=6

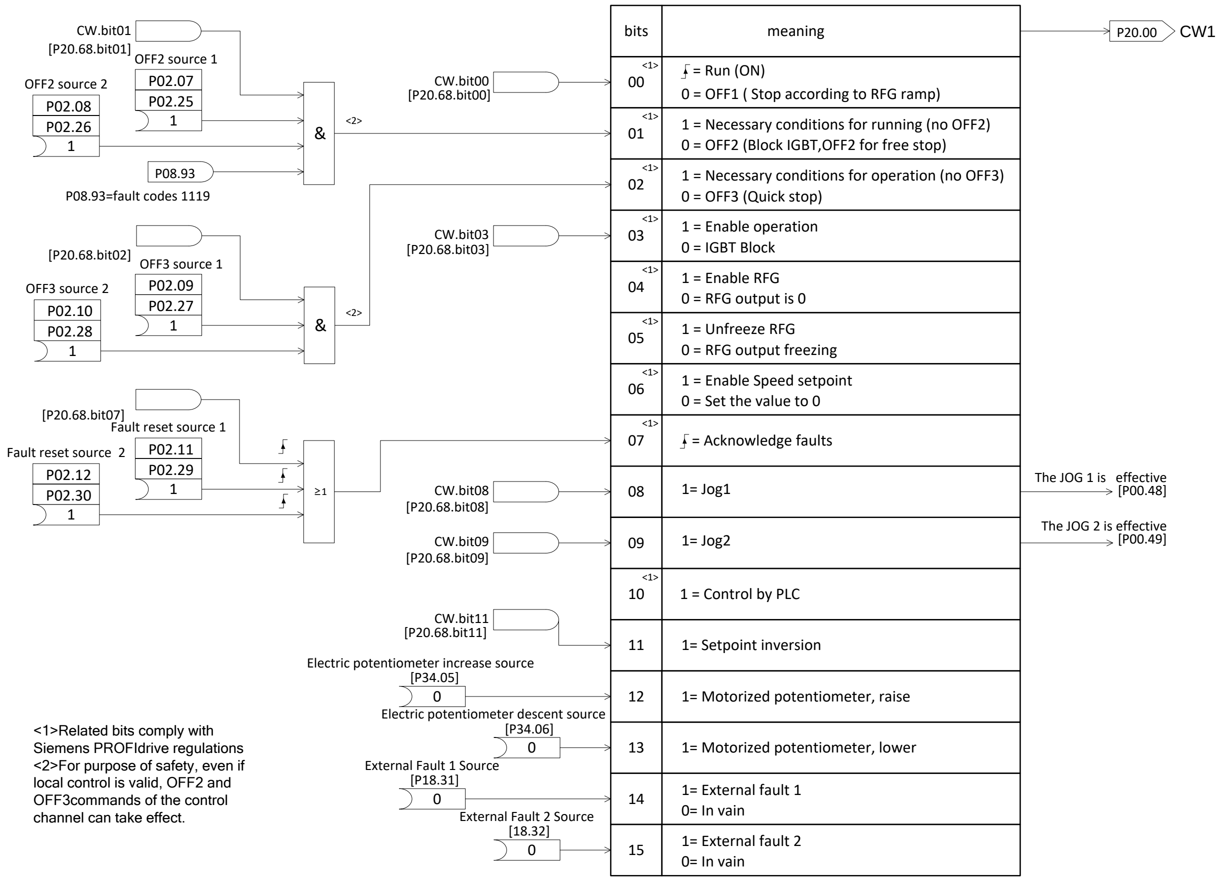
View the inputs for IN1 (P02.40 or P02.44), IN2 (P02.41 or P02.45), and IN3 (P02.42 or P02.46):

1. When IN1 rising edge triggered (0->1), IN2=0, and IN3=1, the VFD starts in the forward direction.
2. When IN=0, IN2 rising edge triggered (0->1), and IN3=1, the VFD starts in the reverse direction.
3. When IN3=0, the VFD stops.

6.7.2 Communication-based start/stop CW

1. When P02.01=2, Other-C connector serves as the start/stop CW source.
2. When P02.01=4 or 5, Other-A (or -B) connector serves as the start/stop CW source.
3. When P02.01=6, PC control (addresses 0x4200, 0x4201) serves as the start/stop CW source.
4. When P02.01=7, Modbus communication (addresses 0x4200, 0x4201) serves as the start/stop CW source.

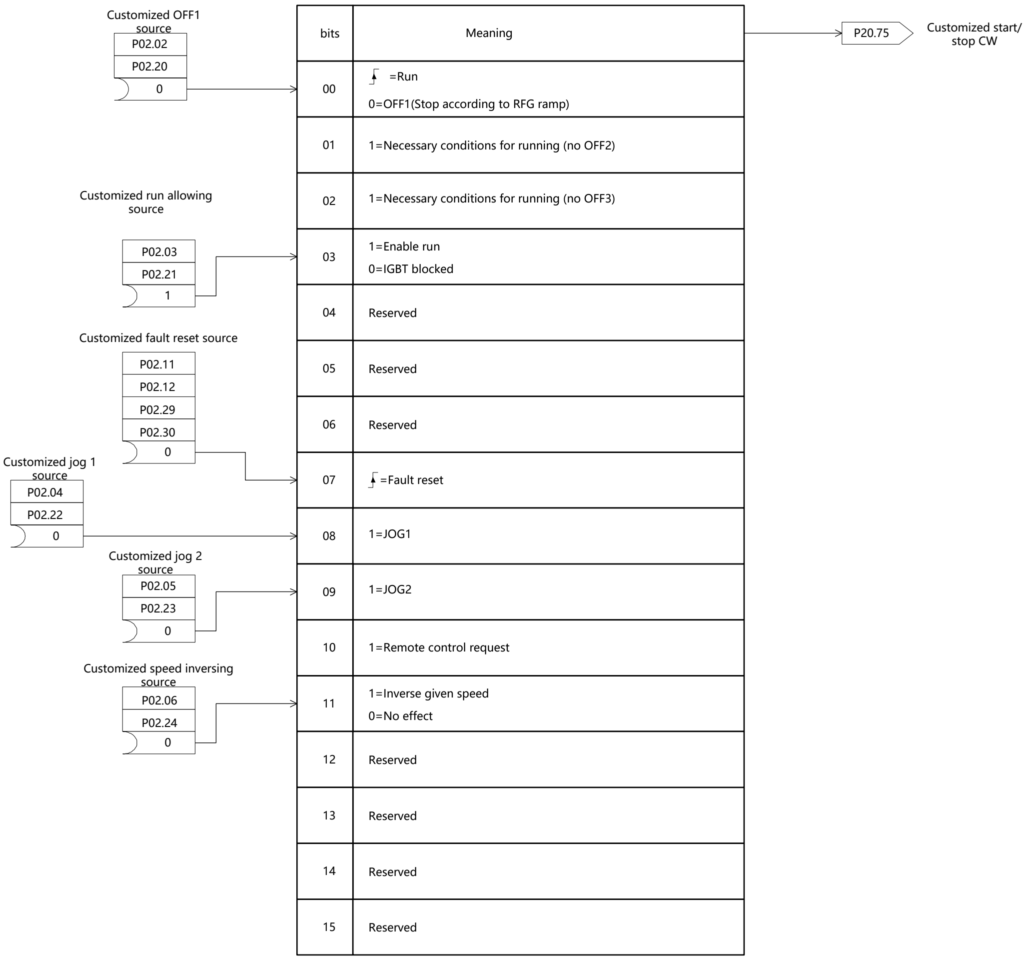
Communication-based start/stop CW 1 is indicated by P20.01–P20.16, each bit of which is described as follows.



6.7.3 Customized CW

When P02.01=8, a customized CW serves as the start/stop CW source.

You can check P20.75 to read customized start/stop CW values (readable but not writable). Customized CW 1 is indicated by P20.01–P20.16, each bit of which is described as follows.



Note:

- Bit 0 is obtained from P02.02 (Channel 1 customized OFF1 source).
- Bit 3 is obtained from P02.03 (Channel 1 customized run allowing source).
- Bit 8 and bit 9 are obtained from P02.04 (Channel 1 customized jog 1 source) and P02.05 (Channel 1 customized jog 2 source).
- Bit 11 is obtained from P02.06 (Channel 1 customized speed inversing source).

6.8 Motor parameters

The product supports the control of three-phase AC asynchronous motors and permanent magnet synchronous motors. The VFD supports the setting of four groups of motor parameters. Motor 1, motor 2, motor 3, and motor 4 correspond to group P14, group P15, group P16, and group P17. The four groups of motor parameters can be switched by setting P03.16 and P03.17.

6.8.1 Motor type selection

Function code	Name	Description	Setting range	Default
P14.00	Type of motor 1	0: Asynchronous motor (AM) 1: Permanent magnet synchronous motor 2: Synchronous reluctance motor (reserved)	0–2	0
P15.00	Type of motor 2	0: Asynchronous motor (AM) 1: Permanent magnet synchronous motor 2: Synchronous reluctance motor	0–2	0
P16.00	Type of motor 3	0: Asynchronous motor (AM) 1: Permanent magnet synchronous motor 2: Synchronous reluctance motor	0–2	0
P17.00	Type of motor 4	0: Asynchronous motor (AM) 1: Permanent magnet synchronous motor 2: Synchronous reluctance motor	0–2	0

Note: The types of motors that are driven at the same type must be the same.

6.8.2 Rated motor parameters

- **Set the rated parameters of three-phase AC asynchronous motors according to the motor nameplate.**

P14.01–P14.05 are AM 1 parameters, P15.01–P15.05 are AM 2 parameters, P16.01–P16.05 are AM 3 parameters, and P17.01–P17.05 are AM 4 parameters.

Function code	Name	Description	Setting range	Default
P14.01	Rated power of AM 1	4.0–6000.0kW	4.0–6000.0	Model depended
P14.02	Rated frequency of AM 1	0.01–655.35Hz	0.01–655.35	50.00Hz
P14.03	Rated speed of AM 1	1–36000rpm	1–36000	Model depended
P14.04	Rated voltage of AM 1	0–20000V	0–20000	Model depended
P14.05	Rated current of AM 1	0.1–6000.0A	0.1–6000.0	Model depended
P15.01	Rated power of AM 2	4.0–6000.0kW	4.0–6000.0	Model depended
P15.02	Rated frequency of AM 2	0.01–655.35Hz	0.01–655.35	50.00Hz
P15.03	Rated speed of AM 2	1–36000rpm	1–36000	Model depended
P15.04	Rated voltage of AM 2	0–20000V	0–20000	Model depended

Function code	Name	Description	Setting range	Default
P15.05	Rated current of AM 2	0.1–6000.0A	0.1–6000.0	Model depended
P16.01	Rated power of AM 3	4.0–6000.0kW	4.0–6000.0	Model depended
P16.02	Rated frequency of AM 3	0.01–655.35Hz	0.01–655.35	50.00Hz
P16.03	Rated speed of AM 3	1–36000rpm	1–36000	Model depended
P16.04	Rated voltage of AM 3	0–20000V	0–20000	Model depended
P16.05	Rated current of AM 3	0.1–6000.0A	0.1–6000.0	Model depended
P17.01	Rated power of AM 4	4.0–6000.0kW	4.0–6000.0	Model depended
P17.02	Rated frequency of AM 4	0.01–655.35Hz	0.01–655.35	50.00Hz
P17.03	Rated speed of AM 4	1–36000rpm	1–36000	Model depended
P17.04	Rated voltage of AM 4	0–20000V	0–20000	Model depended
P17.05	Rated current of AM 4	0.1–6000.0A	0.1–6000.0	Model depended

- **Set the rated parameters of three-phase permanent magnetic synchronous motors according to the motor nameplate.**

P14.20–P14.24 are SM 1 parameters, P15.20–P15.24 are SM 2 parameters, P16.20–P16.24 are SM 3 parameters, and P17.20–P17.24 are SM 4 parameters.

Function code	Name	Description	Setting range	Default
P14.20	Rated power of SM 1	4.0–5000.0kW	4.0–5000.0	Model depended
P14.21	Rated frequency of SM 1	0.01–655.35Hz	0.01–655.35	50.00Hz
P14.22	Number of pole pairs of SM 1	1–50	1–50	2
P14.23	Rated voltage of SM 1	0–20000V	0–20000	Model depended
P14.24	Rated current of SM 1	0.1–1000.0A	0.1–1000.0	Model depended
P15.20	Rated power of SM 2	4.0–5000.0kW	4.0–5000.0	Model depended
P15.21	Rated frequency of SM 2	0.01–655.35Hz	0.01–655.35	50.00Hz
P15.22	Number of pole pairs of SM 2	1–50	1–50	2
P15.23	Rated voltage of SM 2	0–20000V	0–20000	Model depended

Function code	Name	Description	Setting range	Default
P15.24	Rated current of SM 2	0.1–1000.0A	0.1–1000.0	Model depended
P16.20	Rated power of SM 3	4.0–5000.0kW	4.0–5000.0	Model depended
P16.21	Rated frequency of SM 3	0.01–655.35Hz	0.01–655.35	50.00Hz
P16.22	Number of pole pairs of SM 3	1–50	1–50	2
P16.23	Rated voltage of SM 3	0–20000V	0–20000	Model depended
P16.24	Rated current of SM 3	0.1–1000.0A	0.1–1000.0	Model depended
P17.20	Rated power of SM 4	4.0–5000.0kW	4.0–5000.0	Model depended
P17.21	Rated frequency of SM 4	0.01–655.35Hz	0.01–655.35	50.00Hz
P17.22	Number of pole pairs of SM 4	1–50	1–50	2
P17.23	Rated voltage of SM 4	0–20000V	0–20000	Model depended
P17.24	Rated current of SM 4	0.1–1000.0A	0.1–1000.0	Model depended

6.8.3 Motor parameter switchover

You can set P03.16–P03.17 to switch between four groups of motor parameters.

Function code	Name	Description	Setting range	Default
P03.16	Motor selection bit 0 source	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P03.17	Motor selection bit 1 source		0–10	0

- Motor 1 is selected when bit 0=0 and bit 0=1.
- Motor 2 is selected when bit 1=0 and bit 0=1.
- Motor 3 is selected when bit 0=1 and bit 0=1.
- Motor 4 is selected when bit 1=1 and bit 0=1.

Note: The four groups of motor parameters cannot be switched directly during running. You can switch motors only after the VFD has stopped.

6.9 Motor parameter identifying

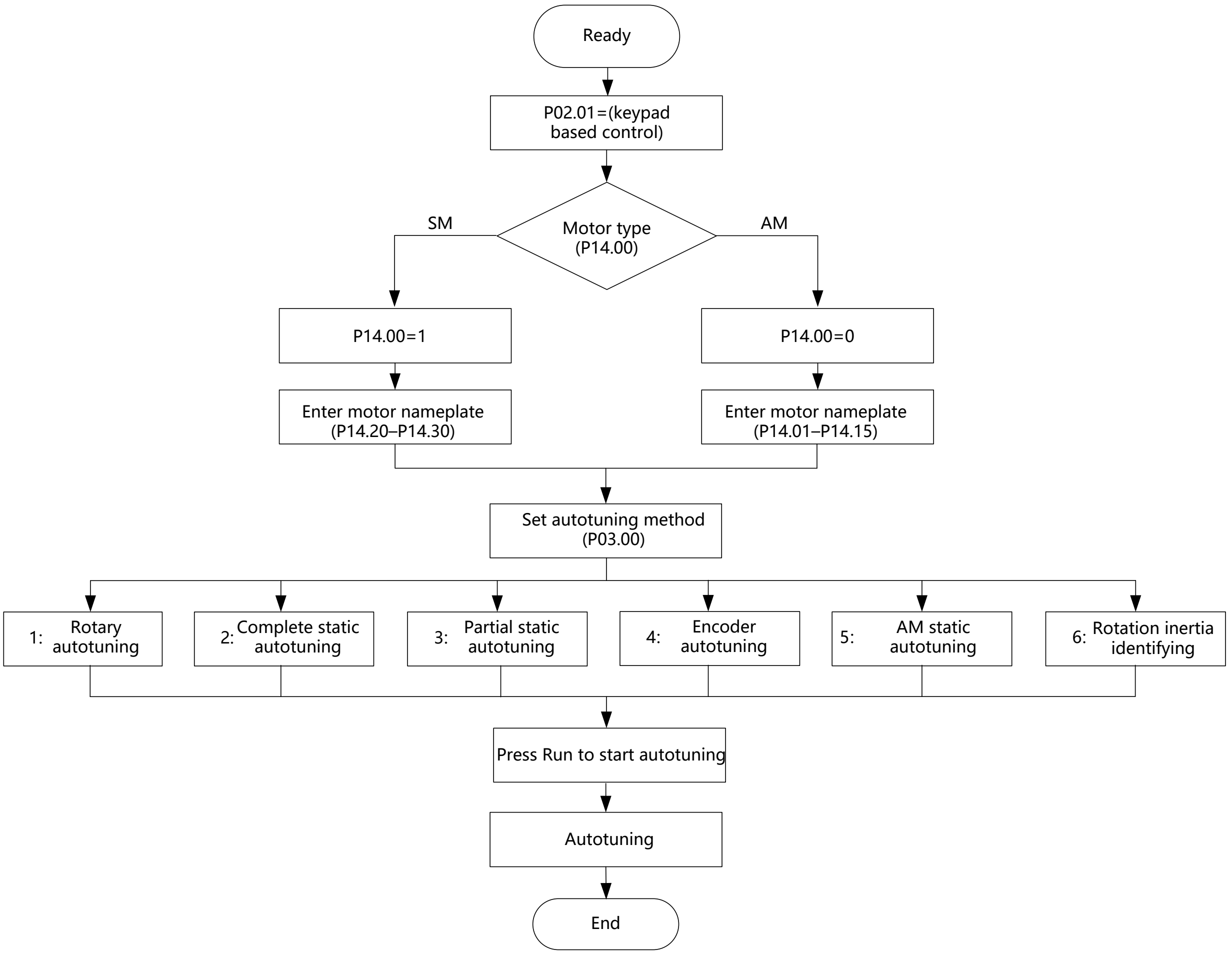
To improve motor control effect, you are recommended to set motor rated parameters according to the motor nameplate after the first power on, and then conduct parameter autotuning. The VFD supports three parameter autotuning modes, which are motor parameter autotuning, motor inertia autotuning, and SM initial magnetic pole angle autotuning. You can select an autotuning mode based on actual conditions.

6.9.1 Motor parameter identifying

	● Check the safety conditions surrounding the motor and load machineries before autotuning as physical injury may occur due to sudden start of motor during autotuning. ● Although the motor does not run during static autotuning, the motor is still supplied with power. Do not touch the motor during autotuning; otherwise, electric shock may occur. Do not touch the motor before autotuning is completed.
	● If the motor has been connected to a load, do not carry out rotary autotuning. Otherwise, the inverter unit may malfunction or mechanical device may be damaged. If rotary autotuning is carried out on a motor which has been connected to a load, incorrect motor parameter settings and motor action exceptions may occur. Disconnect from the load to carry out autotuning if necessary.

The inverter unit can drive both asynchronous motors (AMs) and synchronous motors (SMs), and it supports configuration of four groups of motor parameters, which can be switched over through keypad or other control methods.

The control performance of the inverter unit is based on accurate motor models. Therefore, you need to carry out motor parameter autotuning before running a motor for the first time (taking motor 1 as an example). The procedure is as follows.



Note:

- Motor parameters must be set correctly according to the motor nameplate.
- The motor rated current is at least 1/6 of the driving unit rated current.
- After setting P03.00, you can press the RUN key to enter autotuning, which can be exited by pressing the STOP key.
- In addition, you need to configure a motor according to the standard motor configuration of the VFD. If the power of the motor is greatly different from that of the standard motor configuration, the control performance of the VFD degrades significantly.

Motor parameters have a significant impact on the calculation of the control model, especially in the case of vector control, which requires motor parameter autotuning first.

After setting motor parameters, you can set P03.00 to select the autotuning method. The setting procedure is as follows:

Step 1 Set P02.01 or P02.19 to 0 to select the keypad as the command running channel.

Step 2 Set P03.00 to select one method from four motor parameter autotuning methods.

Step 3 Press the RUN key to give the start command. The motor enters autotuning.

Related function parameters

Function code	Name	Description	Setting range	Default
P03.00	Parameter autotuning	0: No operation 1: Rotary autotuning 2: Complete static autotuning	0–8	0

Function code	Name	Description	Setting range	Default
		3: Partial static autotuning 4: Encoder autotuning 5: AM static autotuning 6: Rotation inertia identifying 7: Friction torque identifying 8: Deadzone identifying		

Note:

- When P03.00 is set to 1, disconnect the motor from the load to put the motor in static and no-load state.
- When P03.00 is set to 2 or 3, there is no need to disconnect the motor from the load.
- Motor autotuning can be carried out on the present motor only. If you need to perform parameter autotuning on another motor, switch motors by setting P00.52.

Table 6-1 Obtained motor parameters in different autotuning methods

<table>
<tr><th rowspan="2">Set value of P03.00</th><th colspan="2">Autotuning parameters</th></tr>
<tr><th>AM 1–AM 4</th><th>SM 1–SM 4</th></tr>
<tr><td>1</td><td>P14.06–P14.14 (motor 1)
P15.06–P15.14 (motor 2)
P16.06–P16.14 (motor 3)
P17.06–P17.14 (motor 4)</td><td>P14.25–P14.28 (motor 1)
P15.25–P15.28 (motor 2)
P16.25–P16.28 (motor 3)
P17.25–P17.28 (motor 4)</td></tr>
<tr><td>2</td><td>P14.06–P14.10 (motor 1)
P15.06–P15.10 (motor 2)
P16.06–P16.10 (motor 3)
P17.06–P17.10 (motor 4)</td><td rowspan="2">P14.25–P14.27 (motor 1)
P15.25–P15.27 (motor 2)
P16.25–P16.27 (motor 3)
P17.25–P17.27 (motor 4)</td></tr>
<tr><td>3</td><td>P14.06–P14.08 (motor 1)
P15.06–P15.08 (motor 2)
P16.06–P16.08 (motor 3)
P17.06–P17.08 (motor 4)</td></tr>
<tr><td>5</td><td>P14.06–P14.08 (motor 1)
P15.06–P15.08 (motor 2)
P16.06–P16.08 (motor 3)
P17.06–P17.08 (motor 4)</td><td>-</td></tr>
</table>

Note: If the autotuned parameters have deviation, SM back-EMF constant P14.28,P15. 28, P16.28 or P17.28 can be calculated.

Back-EMF constant can also be calculated based on the parameters on the motor nameplate, and there are three calculation methods.

Method 1: If the back-EMF coefficient K_e is marked on the nameplate, the calculation is as follows:

$$E= (Ke*nN*2\pi) / 60$$

Method 2 : If the back-EMF E' (unit: V/1000r/min) is marked on the nameplate, the calculation is as follows:

$$E=E'*nN/1000$$

Method 3: If none of the two preceding parameters is marked on the nameplate, the calculation is as follows:

$$E=P/(\sqrt{3}*I)$$

In the preceding formulas, n_N indicates the rated rotation speed, P indicates the rated power, and I indicates the rated current.

6.9.2 Motor inertia identifying

Inertia autotuning is required before inertia compensation enabling. During the autotuning process, the VFD controls the automatic start and stop of the motor and prompts for autotuning completion. After setting P03.00 to select the autotuning method, you can perform motor inertia identifying. The setting procedure is as follows:

Step 1 Set P02.01=0 to select keypad control.

Step 2 Set P03.00=6 to start identifying.

Step 3 Set P29.02 (Inertia identification torque) and set the control mode to torque mode.

Step 4 After the RUN key is pressed to give the VFD start command, the VFD starts inertia identifying and automatically controls the motor start and stop.

Function code	Name	Description	Setting range	Default
P29.02	Inertia identification torque	Due to friction force, it is required to set certain identification torque for the inertia identification to be performed properly. 0.0–100.0% (of the motor rated torque)	0.0–100.0	10.0%

Note: If the motor is running at low speed for a long time, which indicates that P29.02 (Inertia identification torque) is set too low, perform manual stop, increase the value of P29.02, and execute inertia identifying again.

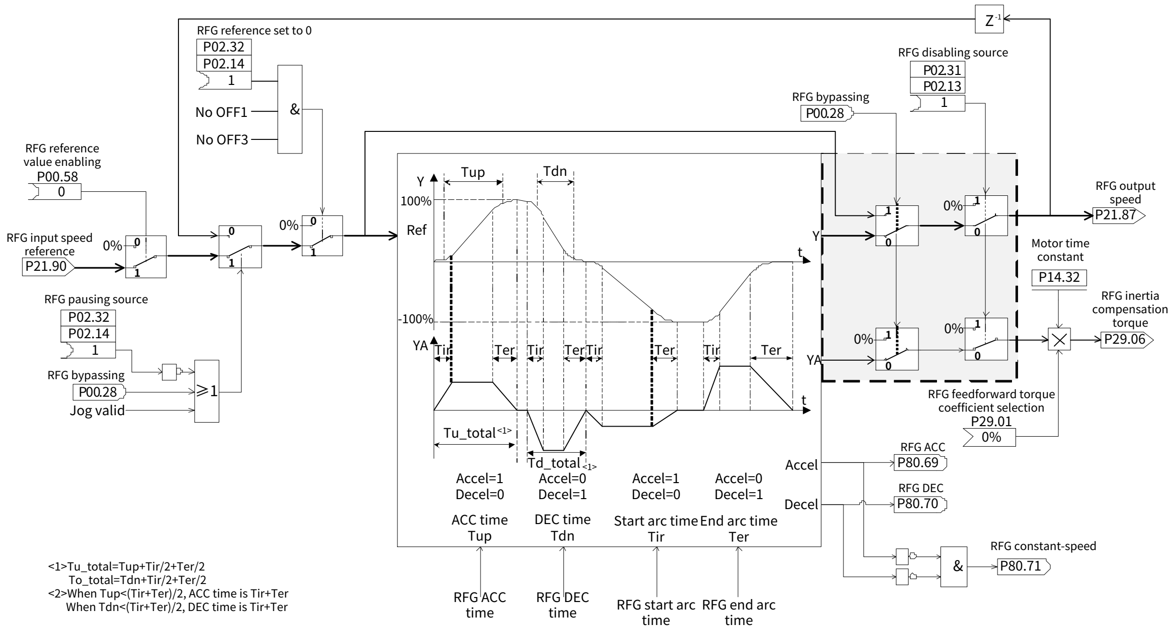
Due to friction force, it is required to set certain identification torque for the inertia identification to be performed properly.

Identifying results are used to optimize the automatic enabling loop parameters. In addition, manual compensation can be enabled by setting P29.03, and the compensation value is directly applied to the torque reference.

Function code	Name	Description	Setting range	Default
P29.03	Enabling inertia compensation	0: Disable 1: Enable	0–1	0
P29.04	Upper limit of inertia compensation torque	The max inertia compensation torque is limited to prevent inertia compensation torque from being too large.	0.0–150.0	10.0%
P29.05	Inertia compensation filter times	Filter times of inertia compensation torque, used to smooth inertia compensation torque.	0–10	7

6.10 Ramp function generator

6.10.1 Ramp pausing, bypassing, zeroing, and disabling



As shown in the preceding function flowchart, the ramp function generator can be paused, bypassed, zeroed, and disabled.

Pause: If the ramp function generator is working, the ramp function generator stops working when paused, keeping the present ramp output value unchanged.

Bypass: When the ramp bypassing flag is set, the given value is output directly without passing through the ramp function generator.

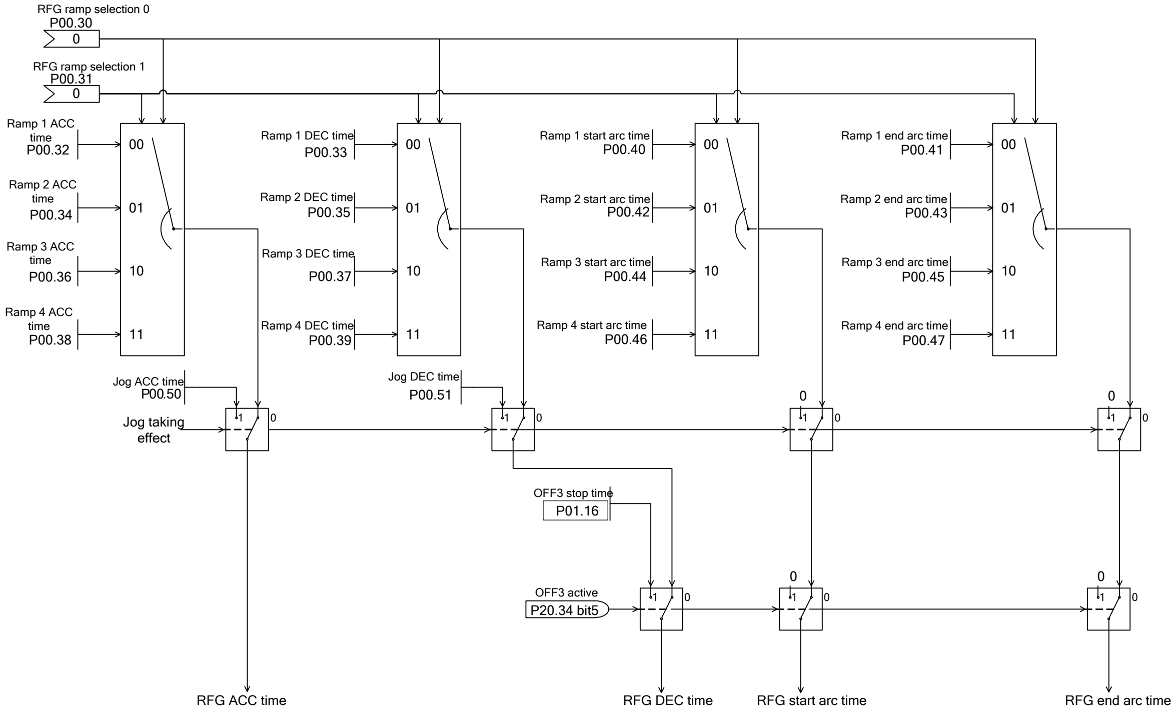
Reference set 0: When setting the reference to 0 is effective, the input of the ramp function generator is forced to 0.

Disable: When disabling the ramp function generator is effective, the output of the ramp function generator is forced to 0.

Related function parameters

Channel selection	Function code	Name	Default
P00.00=0	P00.28	RFG bypass enabling source	0
	P02.13	Channel 1 RFG disabling source	1
	P02.14	Channel 1 RFG pausing invalid source	1
	P02.15	Channel 1 RFG reference zeroing source	1
P00.00=1	P00.28	RFG bypass enabling source	0
	P02.31	Channel 2 RFG disabling source	1
	P02.32	Channel 2 RFG pausing invalid source	1
	P02.33	Channel 2 RFG reference zeroing source	1

6.10.2 ACC/DEC time setting and selection



The product defines a total of four groups of ACC/DEC time, which can be selected by setting P00.30 and P00.31. The first group of ACC/DEC time is used by default.

ACC time: indicates the time taken for the motor to speed up from 0 to the max output frequency (P09.02).

DEC time: indicates the time taken for the motor to speed down from the max output frequency (P09.02) to 0.

Start arc time: indicates the time taken for the motor that is at a constant speed to accelerate from 0 to max ACC (determined by the ACC/DEC time) or decelerate from max ACC to 0.

End arc time: indicates the time taken for the motor that approaches to a constant speed (ACC/DEC process) to transit from the max ACC (determined by the ACC/DEC time) to the constant speed.

P00.31 RFG ramp selection bit 1	P00.30 RFG ramp selection bit 0	ACC time	DEC time	Start arc time	End arc time
0	0	P00.32	P00.33	P00.40	P00.41
0	1	P00.34	P00.35	P00.42	P00.43
1	0	P00.36	P00.37	P00.44	P00.45
1	1	P00.38	P00.39	P00.46	P00.47

Note:

- The entire S-curve ACC time is t2 + 0.5(t1+t3), and if t2 < 0.5(t1+t3), the entire S-curve time is approximately (t1+t3), as actually tested.
- The entire S-curve DEC time is t2_d + 0.5(t1+t3), and if t2_d < 0.5(t1+t3), the entire S-curve time is approximately (t1+t3), as actually tested.

6.11 V/F control

The inverter unit also provides the space voltage vector control function. The space voltage vector control function can be used in cases where mediocre control precision is enough and in cases where a VFD needs to drive multiple motors.

6.11.1 V/F curve

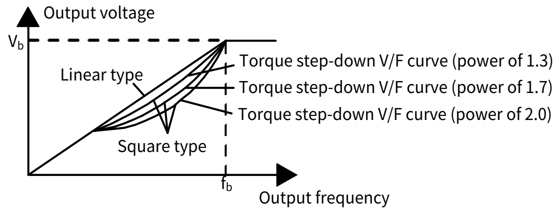
The inverter unit provides multiple V/F curve modes to meet different requirements. You can select V/F curves or set V/F curves as required.

Function code	Name	Description	Setting range	Default
P10.53	V/F curve setting	0: Straight-line V/F curve 1: Multi-point V/F curve 2: Torque-down V/F curve (power of 1.3) 3: Torque-down V/F curve (power of 1.7) 4: Torque-down V/F curve (power of 2.0) 5: Customized V/F curve (V/F separation)	0–5	0

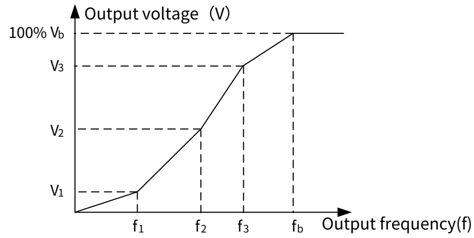
This function code defines motor V/F curves to meet the needs of different loads.

P10.53=0: Straight-line V/F curve. For the load featuring constant moment, such as conveyor belt which runs in straight line, as the whole running process requires constant moment, it is recommended to adopt the straight line V/F curve.

P10.53=2, 3, or 4: Torque-down V/F curve. For the load featuring decreasing moment, such as fan and water pumps, as there is a power (square or cube) relation between its actual torque and speed, it is recommended to adopt the V/F curve corresponding to the power of 1.3, 1.7 or 2.0.

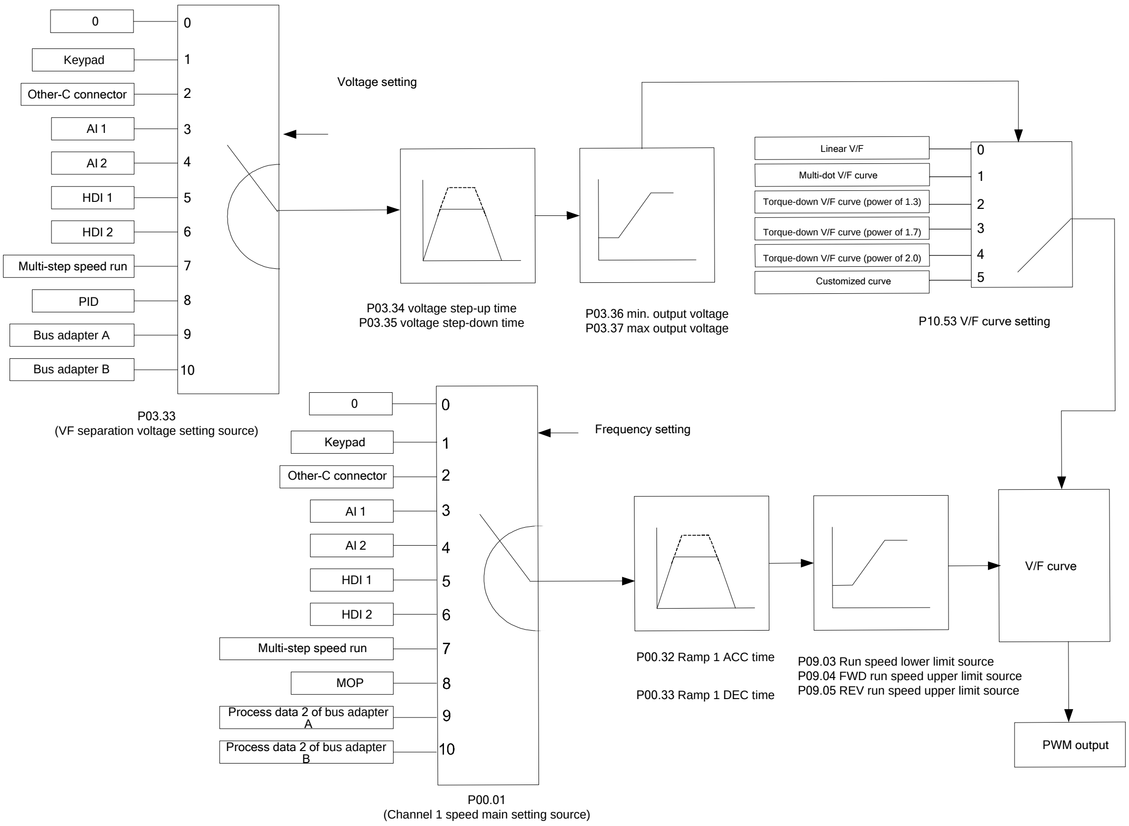


P10.53=1: Multi-point V/F curve. You can change the VFD output V/F curves by setting the voltage and frequency of the three points in the middle. A whole curve consists of five points starting from (0Hz, 0V) and ending at (motor fundamental frequency, motor rated voltage). During setting, follow the rule: 0 ⩽ f1 ⩽ f2 ⩽ f3 ⩽ Motor fundamental frequency, and 0 ⩽ V1 ⩽ V2 ⩽ V3 ⩽ Motor rated voltage



Function code	Name	Description	Setting range	Default
P10.57	V/F frequency point 1	0.00 – V/F frequency point 2	0.00–P10.59	25.0%
P10.58	V/F voltage point 1	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	25.0%
P10.59	V/F frequency point 2	V/F frequency point 1 – V/F frequency point 3	P10.57–P10.61	50.0%
P10.60	V/F voltage point 2	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	50.0%
P10.61	V/F frequency point 3	V/F frequency point 2 – P09.02	P10.59–P09.02	75.0%
P10.62	V/F voltage point 3	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	75.0%

P10.53=5: Customized V/F (V/F separation); in this mode, V can be separated from F, and F can be adjusted through the frequency setting channel specified by P00.01 or the voltage setting channel specified by P03.33 to change the characteristics of the curve.



This type of V/F curve separation can be applied in various variable-frequency power sources. However, exercise caution when setting parameters as improper settings may cause equipment damage.

Function code	Name	Description	Setting range	Default
P03.33	V/F separation voltage setting channel selection	0: 0 1: Keypad (0.0–100.0%, 0.0%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: PID 9: Bus adapter A 10: Bus adapter B	0–10	0

When the V/F curve is separated, select the channel for the output voltage setting.

Note: 100% corresponds to the motor rated voltage.

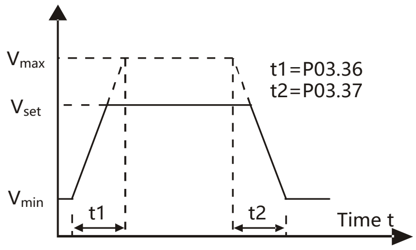
Function code	Name	Description	Setting range	Default
P03.34	V/F separation voltage step-up time	0.0–3600.0s	0.0–3600.0	5.0s
P03.35	V/F separation voltage step-down time	0.0–3600.0s	0.0–3600.0	5.0s

Voltage step-up time means the time needed for the VFD to accelerate from 0V to the motor rated voltage.

Voltage step-down time means the time needed for the VFD to decelerate from the motor rated voltage to 0V.

Function code	Name	Description	Setting range	Default
P03.36	V/F separation min. output voltage	0.0%–P03.37 (relative to motor rated voltage)	0.0–P03.37	0.0%
P03.37	VF separation max output voltage	P03.36–100.0% (of the motor rated voltage)	P03.36-100.0	100.0%

The function codes are used to set the upper and lower limits of output voltage.

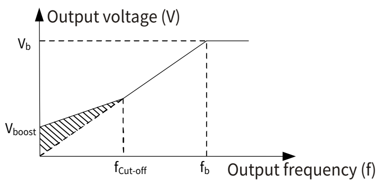


6.11.2 Torque boost

Boost compensation to output voltage can effectively improve the low-speed torque performance in the V/F control. The cut-off frequency of manual torque boost is a percentage of the rated motor frequency f_b. Torque boost can improve the low-frequency torque characteristics in the V/F control.

You need to select torque boost based on the load. The load is proportional to the boost, but the boost cannot be too large. If the torque boost is too large, the motor will run at over-excitation, which may cause increased output current and motor overheating, thus decreasing the efficiency. The default torque boost is 0.0%, which indicates automatic torque boost so that the VFD can regulate the torque boost based on the actual load.

Set P10.55 to determine the torque boost of motor 1. Set P10.56 to determine the torque boost cut-off frequency of motor. Below this frequency threshold, torque boost is valid; exceeding this threshold will invalidate torque boost. See the following figure.



Function code	Name	Description	Setting range	Default
P10.55	Manual torque boost voltage	0.0–10.0% (of motor 1 rated voltage)	0.0–10.0	0.0%
P10.56	Manual torque boost cutoff frequency	0.00–40.00%	0.00–40.00	40.00%

6.11.3 V/F slip compensation gain

Space voltage vector control belongs to an open-loop mode. Sudden motor load changes cause motor speed fluctuation. In cases where strict speed requirements must be met, you can set the slip compensation gain to compensate for the speed change caused by load fluctuation through inverter unit internal output adjustment, increasing motor mechanical rigidity.

Function code	Name	Description	Setting range	Default
P10.63	V/F slip compensation gain	0.0–200.0%	0.0–200.0	100.0%

When using the slip compensation function, you need to calculate the rated slip frequency of the motor as follows: Rated slip frequency = (Rated synchronous rotation speed of motor – Rated rotation speed of motor) x (Number of motor pole pairs)/60, 100% corresponding to the motor rated slip frequency

6.11.4 Oscillation control

Motor oscillation often occurs in space voltage vector control in large-power driving applications. To solve this problem, the inverter unit provides two oscillation factor function codes. You can set the function codes to solve the problem based on the oscillation occurrence frequency.

Function code	Name	Description	Setting range	Default
P10.64	Low frequency suppression oscillation factor	0–100	0–100	10
P10.65	High frequency suppression oscillation factor	0–100	0–100	10
P10.66	Vibration control threshold	0.00–P09.02%	0.00–P09.02	60%

Note: A smaller value indicates better control effect. However, if the value is too small, the inverter unit output current may be too large.

6.11.5 Energy-saving run

During actual running, the inverter unit can search for the max efficiency point to keep the multi-drive system to run in the most efficient state to save energy.

Function code	Name	Description	Setting range	Default
P03.38	Energy-saving run	0: Disable 1: Automatic energy-saving run	0–1	0

Note:

- This function is generally used in light load or no-load cases.
- This function is no applicable to the cases where sudden load changes often occur.

6.11.6 AM IF control

Generally, the IF control mode is valid for AMs. It can be used for SMs only when the frequency is extremely low. IF control is implemented by performing closed-loop control on the total output current of the VFD. The output voltage adapts to the current reference, and open-loop control is separately performed over the frequency of the voltage and current. Set P10.71 to 1 to enable the AM IF mode. You can set related parameters when the IF mode is enabled.

Function code	Name	Description	Setting range	Default
P10.71	IF mode enabling	0: Invalid	0–2	0

Function code	Name	Description	Setting range	Default
		1: Single-loop IF 2: Double-loop IF		
P10.72	IMVF current setting	0.0–200.0%	0.0–200.0	120.0%
P10.73	IF proportional coefficient	0–5000	0–5000	650
P10.74	IF integral coefficient	0–5000	0–5000	350
P10.75	IMVF switching-out speed point	0.00–40.00%	0.00–40.00	20.00%

6.11.7 Pull-in current regulation in SM V/F control

When the SM V/F control mode is enabled, you can set P10.49 to specify the frequency threshold for the switching between pull-in current 1 and pull-in current 2.

Function code	Name	Description	Setting range	Default
P10.49	SM V/F pull-in current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	30.0%
P10.50	SM V/F pull-in current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%
P10.51	SM V/F pull-in current frequency switching point	0.0–200.0%	0.0–200.0	20.0%

6.11.8 V/F flux weakening performance optimization

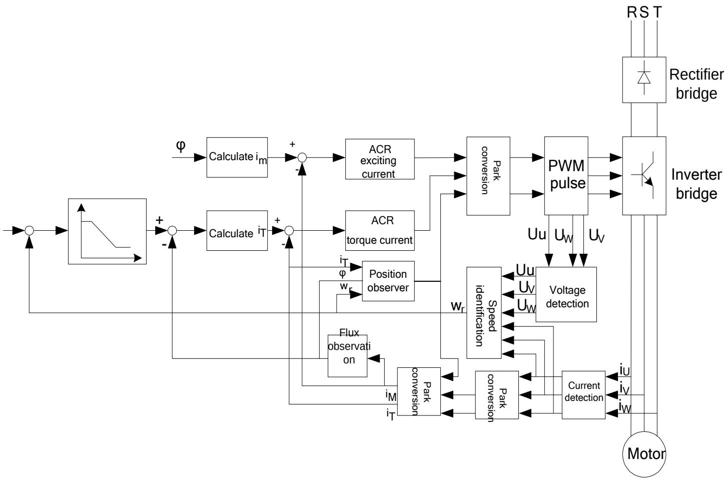
When the AM needs to run with flux weakened, set P10.67 in the V/F control mode to increase the output voltage and maximize the bus voltage utilization, improving the motor acceleration time.

Function code	Name	Description	Setting range	Default
P10.67	V/F constant power zone weakening coefficient	0.0–200.0%	0.0–200.0	100.0%

6.12 Vector control

AMs feature high order, nonlinearity, strong coupling and multi-variables, which increase difficulty to control AMs during actual application. The vector control technology solves this situation as follows: measures and controls the stator current vector of the AM, and then decomposes the stator current vector into exciting current (current component that generates internal magnet field) and torque current (current component that generates torque) based on field orientation principle, and therefore controls the amplitude values and phase positions of the two components (namely, controls the stator current vector of the AM) to realize decoupled control on exciting current and torque current, thus achieving high-performance speed regulation of the AM.

The inverter unit is embedded with the speed sensor-less vector control algorithm, which can be used to drive AMs and permanent-magnet SMs simultaneously. As the core algorithm of vector control is based on accurate motor parameter models, the accuracy of motor parameters affects vector control performance. It is recommended to enter accurate motor parameters and autotune motor parameters before executing vector control.



6.12.1 Speed loop

The following uses motor 1 for example, which is similar to motor 2, motor 3, and motor 4.

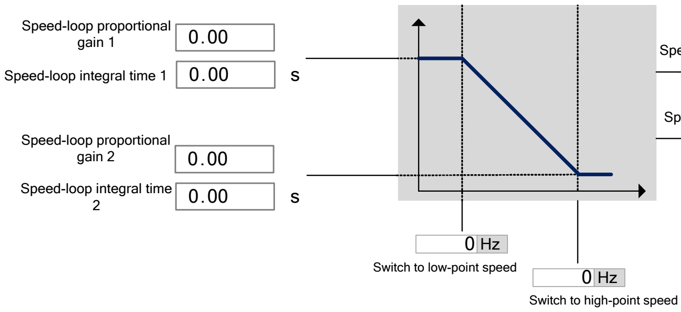
The speed loop dynamic response characteristics in vector control can be adjusted by setting the proportional coefficient and integral time of speed regulator.

The dynamic response of speed regulator can be accelerated by increasing the proportional gain or decreasing the integral time. However, too quick dynamic response of speed regulator can cause oscillations.

Recommended adjustment method: If the default settings cannot meet the requirements, adjust the settings slightly. First, increase the proportional gain to ensure that the system does not oscillate; and then reduce the integration time, so that the system responds fast with small overshoot. Improper PI parameter settings will cause large speed overshoot.

Function code	Name	Description	Setting range	Default
P10.02	Speed-loop proportional gain 1	0.0–200.0	0–200.0	20.0
P10.03	Speed-loop integral time 1	0.000–10.000s	0.001–10.000	0.200s
P10.04	Switching low point speed	0.00%–P10.07	0.00–P10.07	5.00%
P10.05	Speed-loop proportional gain 2	0.0–200.0	0–200.0	20.0
P10.06	Speed-loop integral time 2	0.000–10.000s	0.001–10.000	0.200s
P10.07	Switching high-point speed	P10.04–P09.02	P10.04–P09.02	10.00%

The parameters P10.02–P10.07 are applicable only to vector control. Below the switching low-point speed (P10.04), the speed-loop PI parameters are: P10.02 and P10.03. Above the switching high-point speed (P10.07), the speed-loop PI parameters are: P10.05 and P10.06. PI parameters are obtained according to the linear change of two groups of parameters. See the following figure.



PI parameters have a close relationship with the inertia of the system. Adjust PI parameters depending on different loads to meet various demands.

Function code	Name	Description	Setting range	Default
P10.08	Speed-loop output filter	0–8 (corresponding to 0–2^8/10ms)	0–8	0

Set the speed loop filter time.

Function code	Name	Description	Setting range	Default
P10.09	Electromotive slip compensation coefficient of vector control	50–200%	50–200	200%
P10.10	Power-generation slip compensation coefficient of vector control	50–200%	50–200	200%

Slip compensation coefficient is used to adjust the slip frequency of the vector control and improve the speed control accuracy of the system. Adjusting the parameter properly can control the speed steady-state error.

Function code	Name	Description	Setting range	Default
P24.14	Keypad main page display frequency	0: Display actual running frequency 1: Display ramp reference frequency	0–1	0

Set the speed display selection in vector control.

6.12.2 Current loop

The following uses motor 1 for example, which is similar to motor 2, motor 3, and motor 4.

Function code	Name	Description	Setting range	Default
P10.12	Current loop bandwidth	0–2000Hz	0–2000	400Hz

Note:

- A great current-loop bandwidth indicates strong regulator effect.
- The default limit is P04.05 (Carrier frequency setting) * 15; for example, if the carrier frequency is 2kHz, the current-loop bandwidth can only be set up to 300Hz.
- The current-loop bandwidth is measured in Hz, and it is 200Hz by default. Adjusting the bandwidth can change the current-loop PI parameters. In AM control scenarios, keeping default values for the

current-loop parameters can meet most of the application requirements.

- For SM control, the current-loop parameters have a great impact on the speed control response and instantaneous current convergence, and therefore you need to increase the current-loop parameter values in scenarios such as with current divergence and motor stall.

6.12.3 Rotation speed restriction

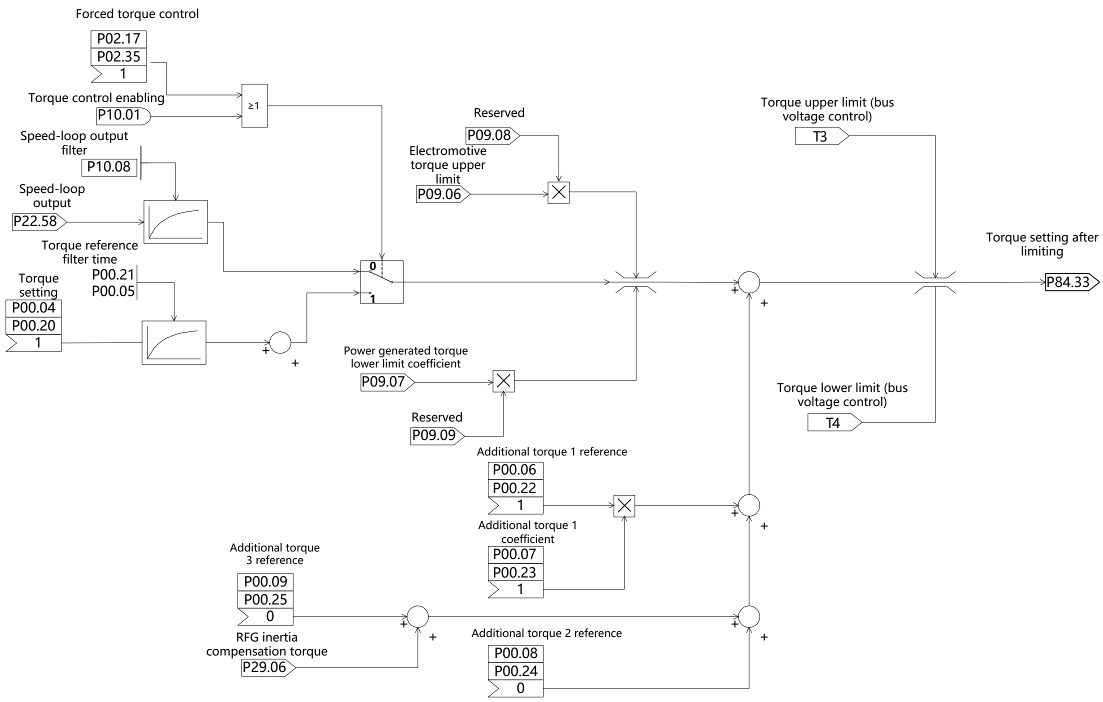
The max output frequency is specified by P09.02, the running frequency lower limit source is specified by P09.03, and the forward/reverse run speed upper limit source is specified by P09.04/P09.05. Set P09.28/P09.29 to set the forward/reverse limit frequency.

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P09.00</td><td>Run speed upper limit display</td><td>Displays the FWD run speed upper limit related to P09.04 or the REV run speed upper limit related to P09.05, depending on whether it is FWD or REV run.</td><td>P09.01–P09.02</td><td>100.00%</td></tr>
<tr><td>P09.01</td><td>Run speed lower limit display</td><td>Displays the run speed lower limit related to P09.03.</td><td>0.00–P09.00</td><td>0.00%</td></tr>
<tr><td>P09.02</td><td>Max output rotation speed</td><td>Basis for a slow or fast ACC/DEC. This percentage is relative to the reference speed specified by P00.55.</td><td>0.00–300.00</td><td>100.00%</td></tr>
<tr><td>P09.03</td><td>Run speed lower limit source</td><td>0: 0
1: Digital (0.00%–P09.00; default: 0.00%)
2: Other-C connector (0.00–99.99; default: 0.00)
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>1</td></tr>
<tr><td>P09.04</td><td>FWD run speed upper limit source</td><td rowspan="2">0: 0
1: Digital (0.00%–P09.00; default: 0.00%)
2: Other-C connector (0.00–99.99; default: 0.00)
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>1</td></tr>
<tr><td>P09.05</td><td>REV run speed upper limit source</td><td>0–10</td><td>1</td></tr>
<tr><td>P09.26</td><td>FWD run speed upper limit display</td><td>Determined by P09.04 source selection</td><td>0.00–327.67</td><td>100.00%</td></tr>
</table>

Function code	Name	Description	Setting range	Default
P09.27	REV run speed upper limit display	Determined by P09.05 (REV run speed upper limit source).	0.00–327.67	100.00%
P09.28	FWD run limit speed setting	0.00–327.67%	0.00–327.67	327.67%
P09.29	REV run limit speed setting	0.00–327.67%	0.00–327.67	327.67%

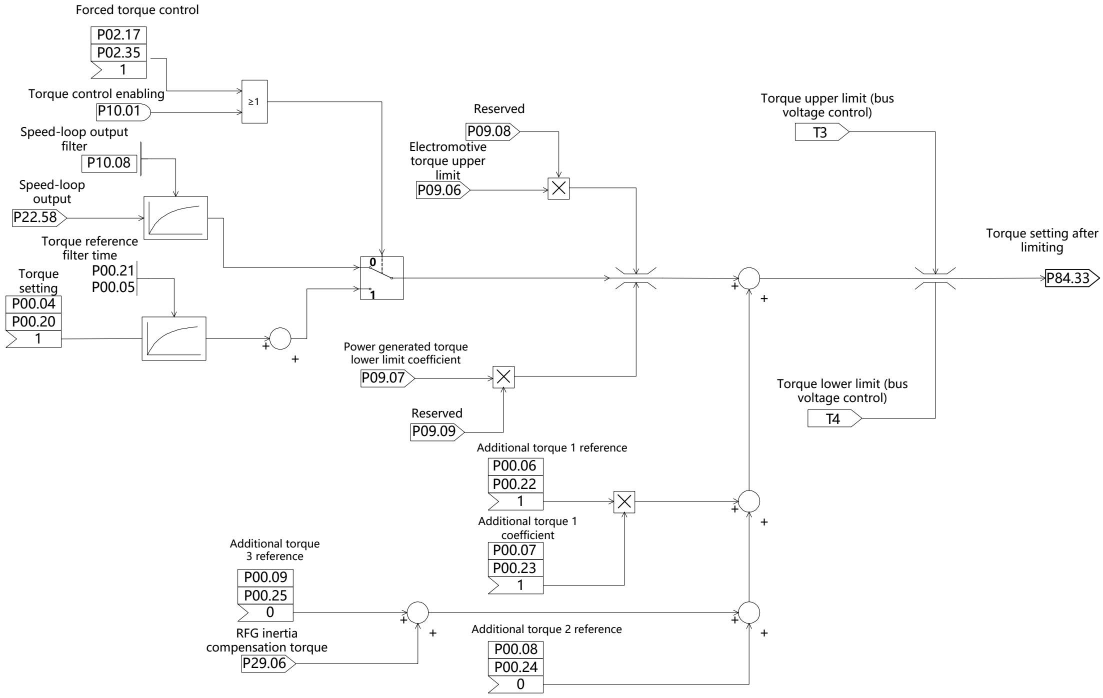
6.12.4 Torque control

The VFD supports torque control and speed control. Speed control aims to stabilize the speed to keep the set speed consistent with the actual running speed, meanwhile, the max load-carrying capacity is restricted by the torque limit. Torque control aims to stabilize the torque to keep the set torque consistent with the actual output torque, meanwhile, the output frequency is restricted by the upper and lower limits.



6.12.4.1 Torque setting method selection

Taking channel 1 for example, you can set P00.04 to select a torque setting method. The torque setting adopts a relative value, 100% corresponds to the motor rated current, and the setting range is -300.0%–300.0%. After giving the start command to the VFD, the VFD runs in the forward direction when the torque reference value is positive and in the reverse direction when the torque reference value is negative.



Function code	Name	Description	Setting range	Default
P00.04	Channel 1 torque main setting source	0: 0 1: Digital (-300.00–300.00%, 50.00%) 2: Other-C connector (0.00–99.99, 31.20) 3: AI1 (100% corresponds to 300.00% of torque) 4: AI2 (100% corresponds to 300.00% of torque) 5: HDI1 (100% corresponds to 300.00% of torque) 6: HDI2 (100% corresponds to 300.00% of torque) 7: Multi-step (100% corresponds to 300.00% of torque) 8: MOP (100% corresponds to 300.00% of torque) 9: Process data 3 of bus adapter A (-300.00–300.00%) 10: Process data 3 of bus adapter B (-300.00–300.00%)	0–10	1
P00.05	Channel 1 main torque filter time	Filter time.	0.00–10.00	0.00s
P00.06	Channel 1 additional torque 1 giving source	0: 0 1: Digital (-300.00–300.00%, 0.00%) 2: Other-C connector (0.00–99.99, 0.00) 3: AI1 (100% corresponds to 300.00% of torque) 4: AI2 (100% corresponds to 300.00%	0–10	0

Function code	Name	Description	Setting range	Default
		of torque) 5: HDI1 (100% corresponds to 300.00% of torque) 6: HDI2 (100% corresponds to 300.00% of torque) 7: Multi-step (100% corresponds to 300.00% of torque) 8: MOP (100% corresponds to 300.00% of torque) 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B		
P00.07	Channel 1 additional torque 1 coefficient source	0: 0 1: Digital (0.0–100.0%, 100.0%) 2: Other-C connector (0.00–99.99, 0.00) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1
P02.17	Channel 1 forced torque control source	0: Invalid 1: Valid 2: Other-B connector (0: Invalid; 1: Valid) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0

6.12.4.2 Switching between speed control and torque control

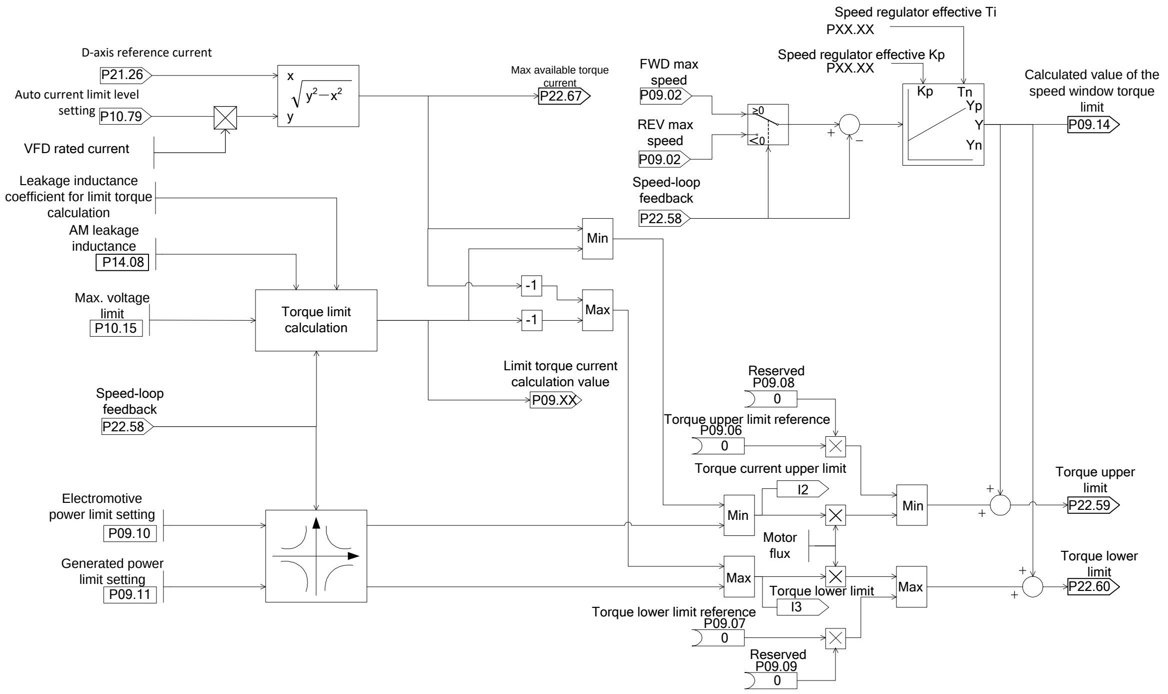
You can switch between speed control and torque control by setting P10.01 (Enabling torque control).

Function code	Name	Description	Setting range	Default
P10.01	Enabling torque control	The function code is invalid in V/F control, and torque control can be used only in vector control. 0: Disable 1: Enable 2: Other-B connector 3: DI1 4: DI2	0–10	0

Function code	Name	Description	Setting range	Default
		5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2		

6.12.4.3 Torque limit setting

The vector control mode supports speed control and torque control, which have different torque upper limits. Set P09.06 (Electromotive torque upper limit giving source). Set P09.07 (Power-generated torque lower limit giving source).



Function code	Name	Description	Setting range	Default
P09.06	Electromotive torque upper limit giving source (restricting speed loop output)	0: 0 1: Digital (0.00–300.00%, 180.00%) 2: Other-C connector (0.00–99.99, 0.00) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1
P09.07	Power-generated torque lower limit giving source (restricting speed	0: 0 1: Digital (0.00–300.00%, -180.00%) 2: Other-C connector (0.00–99.99, 0.00) 3: AI1	0–10	1

Function code	Name	Description	Setting range	Default
	loop output)	4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B		

6.12.4.4 Power limit

Set P09.10 (Electromotive power limit setting). Set P09.11 (Generated power limit setting).

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P09.10</td><td>Electromotive power limit setting</td><td rowspan="2">0: 0
1: Digital (0.00–300.00%, 180.00%)
2: Other-C connector (0.00–99.99, 0.00)
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>1</td></tr>
<tr><td>P09.11</td><td>Generated power limit setting</td><td>0–10</td><td>1</td></tr>
</table>

6.13 Master/slave control

Goodrive880 series VFD master/slave control is different from our original product. It adopts a new design concept, communication data between a master and slaves can be freely configured through connectors. At the same time, Goodrive880 series VFD also defines the master/slave one-click macro function, which can quickly configure master/slave parameters with one click, and can be suitable for most simple master/-slave applications.

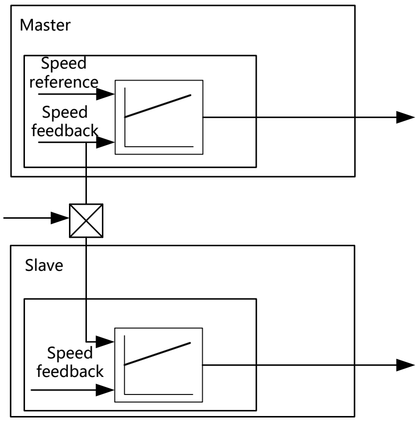
6.13.1 Master speed + slave speed control

Master speed control indicates that slaves follow up the master speed and automatically adjust load balance through droop.

Application: Flexible connection is between the master and slave motors, usually through a belt.

Characteristics: Slave speed always follows up master speed. However, when the master and slave are disconnected, the slave reports a master/slave communication fault and stops, which is suitable the scenarios where master/slave performance requirement is not high and the load response is slow. Figure 6-4 shows the working principle.

Figure 6-4 Master speed + slave speed



The master speed + slave speed control mode can be set through the one-click macro. When the local machine is the master, set P30.49=1; when the local machine is a slave, set P30.49=2.

Set P30.49=1. Then the following function codes are automatically set.

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P30.00</td><td>Enabling master/slave</td><td rowspan="2">0: Disable
1: Enable
2: Other-B connector (0.00–99.99, 0.00)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>1</td></tr>
<tr><td>P30.01</td><td>Master/slave setting</td><td>0–10</td><td>0</td></tr>
<tr><td>P30.06</td><td>Local sent data 0 source</td><td rowspan="5">0: 0
1: Digital (0–65535, 0)
2: Other-C connector (0.00–99.99)
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td rowspan="5">0–10</td><td>2(P20.00) CW sent locally</td></tr>
<tr><td>P30.07</td><td>Local sent data 1 source</td><td>2(P21.06) Frequency reference sent locally</td></tr>
<tr><td>P30.08</td><td>Local sent data 2 source</td><td>2(P21.04) Output torque sent locally</td></tr>
<tr><td>P30.09</td><td>Local sent data 3 source</td><td>2(P21.98) Speed integral sent locally</td></tr>
<tr><td>P30.15</td><td>Local sent data 9 source</td><td>2(P21.04) Output torque sent locally</td></tr>
</table>

Function code	Name	Description	Setting range	Default
P10.01	Enabling torque control	0: Disable 1: Enable 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0

Set P30.49=2. Then the following slave function codes are automatically set.

Function code	Name	Description	Setting range	Default
P00.01	Channel 1 speed main setting source	0: 0 1: Digital (-327.67–P09.02) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B The base value is P00.55, that is, the actual speed reference is the percentage set by this function code multiplied by P00.55. When P00.52=0, this function code is valid.	0–10	2(P30.27)
P02.01	Channel 1 start/stop CW source	0: Keypad 1: Digital (0x0000–0xFFFF) 2: Other-C connector (0.00–99.99; for example, master/slave control commands can be set through a connector) 3: Terminal start/stop module (IN1, IN2, IN3) 4: Bus adapter A 5: Bus adapter B 6: PC (addresses 0x4200, 0x4201) 7: Modbus (addresses 0x4200, 0x4201) 8: Customized	0–8	2(P30.26)
P00.28	RFG bypass enabling source	0: Not bypass 1: Bypass 2: Other-B connector 3: DI1 4: DI2 5: DI3	0–10	1

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td></td><td></td><td>6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td></td><td></td></tr>
<tr><td>P01.01</td><td>Starting frequency</td><td>The function code indicates the initial frequency during VFD start. For details, see the description for P01.02.</td><td>0.00–100.00</td><td>0.00%</td></tr>
<tr><td>P10.01</td><td>Enabling torque control</td><td>0: Disable
1: Enable
2: Other-B connector (0.00–99.99)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
The function code is invalid in V/F control, and torque control can be used only in vector control.</td><td>0–10</td><td>0</td></tr>
<tr><td>P30.00</td><td>Enabling master/slave</td><td rowspan="2">0: Disable
1: Enable
2: Other-B connector (0.00–99.99, 0.00)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
This function code is set to 0 when the system does not implement master/slave; and it can be set to 0 to bypass the local device if the local device fails in master/slave control.</td><td>0–10</td><td>1</td></tr>
<tr><td>P30.01</td><td>Master/slave setting</td><td>0–10</td><td>1</td></tr>
<tr><td>P30.38</td><td>Slave run mode display</td><td>0: Non-slave mode
1: Slave speed mode
2: Slave torque mode
3: Slave speed deviation and torque limit mode
4: Slave speed-loop P mode</td><td>0–4</td><td>1</td></tr>
</table>

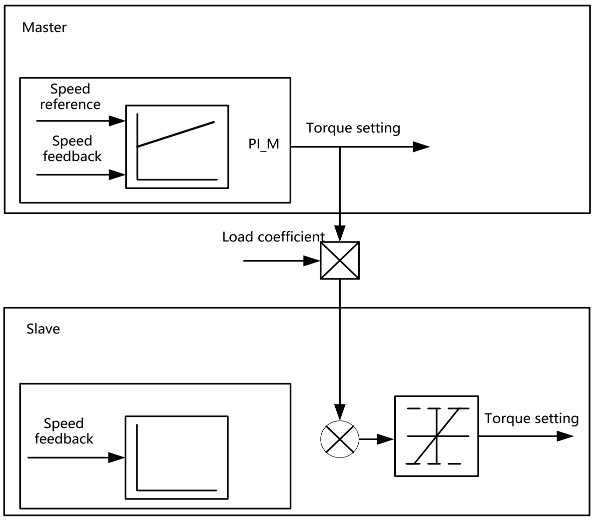
6.13.2 Master speed + slave torque control

In master speed control, the slave speed always follows the master for mechanical reasons; in slave torque control, the torque reference comes from the master so that the torque distribution is completed.

Application: The connection between the master and slave motors must be rigid, usually engaged through a gearbox.

Characteristics: Slave torque always follows master torque, the system runs according to the master speed loop, and the torque response is relatively fast. However, when the master and slave are mechanically disconnected, the slave speed is not controlled and it may reach the upper speed limit, which can be mitigated by adding window control on the slave. Figure 6-5 shows the working principle.

Figure 6-5 Master speed + slave torque control



For a slave, you can choose either ordinary torque control or torque control with a window. If torque control with a window is selected, the master also needs to send the speed to the slave and ensure that the master and slave are the same in ACC/DEC time.

The master speed + slave torque control mode can be set through the one-click macro. When the local machine is the master, set P30.49=1; when the local machine is a slave, set P30.49=3.

Set P30.49=1. Then the following master function codes are automatically set, which is similar to 6.13.1 Master speed + slave speed control.

Set P30.49=3. Then the following slave function codes are automatically set.

Function code	Name	Description	Setting range	Default
P00.04	Channel 1 torque main setting source	0: 0 1: Digital (–300.00–300.00) 2: Other-C connector (0.00–99.99) 3: AI1 (100% corresponds to 300.00% of torque) 4: AI2 (100% corresponds to 300.00% of torque) 5: HDI1 (100% corresponds to 300.00% of torque) 6: HDI2 (100% corresponds to 300.00% of torque) 7: Multi-step (100% corresponds to 300.00% of torque) 8: MOP (100% corresponds to 300.00% of torque) 9: Process data 3 of bus adapter A (-300.00–300.00%)	0–10	2(P30.28)

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td></td><td></td><td>10: Process data 3 of bus adapter B
(-300.00–300.00%)</td><td></td><td></td></tr>
<tr><td>P02.01</td><td>Channel 1 start/stop CW source</td><td>0: Keypad
1: Digital (0x0000–0xFFFF, 0x0000)
2: Other-C connector (0.00–99.99, 0.00)
3: Terminal start/stop module (IN1, IN2, IN3)
4: Bus adapter A
5: Bus adapter B
6: PC (addresses 0x4200, 0x4201)
7: Modbus (addresses 0x4200, 0x4201)
8: Customized</td><td>0–8</td><td>2(P30.26)</td></tr>
<tr><td>P00.28</td><td>RFG bypass enabling source</td><td>0: Not bypass
1: Bypass
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>1</td></tr>
<tr><td>P01.01</td><td>Starting frequency</td><td>0.00–100.00%</td><td>0.00–100.00</td><td>0.00%</td></tr>
<tr><td>P09.04</td><td>FWD run speed upper limit source</td><td rowspan="2">0: 0
1: Digital (0.00%–P09.02, 100.00%)
2: Other-C connector (0.00–99.99)
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td rowspan="2">0–10</td><td rowspan="2">2(P30.27)</td></tr>
<tr><td>P09.05</td><td>REV run speed upper limit source</td></tr>
<tr><td>P10.01</td><td>Enabling torque control</td><td>0: Disable
1: Enable
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
The function code is invalid in V/F control; torque control can be used</td><td>0–10</td><td>1</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td></td><td></td><td>only in vector control.</td><td></td><td></td></tr>
<tr><td>P30.00</td><td>Enabling master/slave</td><td rowspan="2">0: Disable
1: Enable
2: Other-B connector (0.00–99.99)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>1</td></tr>
<tr><td>P30.01</td><td>Master/slave setting</td><td>0–10</td><td>1</td></tr>
<tr><td>P30.38</td><td>Slave run mode display</td><td>0: Non-slave mode
1: Slave speed mode
2: Slave torque mode
3: Slave speed deviation and torque limit mode
4: Slave speed-loop P mode</td><td>0–4</td><td>2</td></tr>
</table>

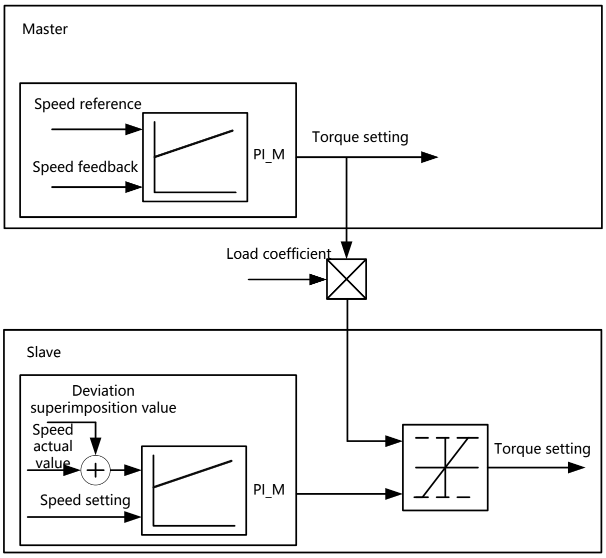
6.13.3 Slave speed deviation and torque limit mode

The master and slave are running in speed control and the speed regulators are PI controllers; however, a speed deviation is superimposed on the slave speed setting on the basis of the master speed setting, while the master torque setting is sent to the slave as the torque limit. The speed deviation superimposed is set according to the specific conditions, usually 5%–10%, and the direction of the additional speed and torque limit depends on the running direction.

Application: When the master and slave motors are connected flexibly, better control results can be achieved.

Characteristics: Since the slave has its own speed regulator, the slave speed is controlled even when the connection between the devices are disconnected (deviation from the set speed will not exceed the additional speed, usually 5–10%). Due to the presence of additional speed, the slave accelerates to tighten the flexible connection at start-up, and then the torque limit takes effect due to the saturation of the speed regulator, limiting the slave torque to the same as the master. In this way, torque distribution is achieved. Figure 6-6 shows the working principle.

Figure 6-6Slave speed deviation + torque limit mode



The slave speed deviation + torque limit mode can be set through the one-click macro. When the local machine is the master, set P30.49=1; when the local machine is a slave, set P30.49=4.

Set P30.49=1. Then the following master function codes are automatically set, which is similar to 6.13.1 Master speed + slave speed control.

Set P30.49=4. Then the following slave function codes are automatically set.

Function code	Name	Description	Setting range	Default
P00.01	Channel 1 speed main setting source	0: 0 1: Digital (-327.67%–P09.02) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	2(P30.27)
P00.04	Channel 1 torque main setting source	0: 0 1: Digital (-300.00–300.00%, 50.00%) 2: Other-C connector (0.00–99.99) 3: AI1 (100% corresponds to 300.00% of torque) 4: AI2 (100% corresponds to 300.00% of torque) 5: HDI1 (100% corresponds to 300.00% of torque) 6: HDI2 (100% corresponds to 300.00% of torque) 7: Multi-step (100% corresponds to 300.00% of torque) 8: MOP (100% corresponds to 300.00% of torque)	0–10	2(P30.28)

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td></td><td></td><td>9: Process data 3 of bus adapter A (-300.00–300.00%)
10: Process data 3 of bus adapter B (-300.00–300.00%)</td><td></td><td></td></tr>
<tr><td>P02.01</td><td>Channel 1 start/stop CW source</td><td>0: Keypad
1: Digital (0x0000–0xFFFF, 0x0000)
2: Other-C connector (0.00–99.99)
3: Terminal start/stop module (IN1, IN2, IN3)
4: Bus adapter A
5: Bus adapter B
6: PC (addresses 0x4200, 0x4201)
7: Modbus (addresses 0x4200, 0x4201)
8: Customized</td><td>0–8</td><td>2(P30.26)</td></tr>
<tr><td>P00.28</td><td>RFG bypass enabling source</td><td>0: Not bypass
1: Bypass
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>1</td></tr>
<tr><td>P01.01</td><td>Starting frequency</td><td>0.00–100.00%</td><td>0.00–100.00</td><td>0.00%</td></tr>
<tr><td>P09.06</td><td>Electromotive torque upper limit giving source (restricting speed loop output)</td><td rowspan="2">0: 0
1: Digital (0.00%–P09.02, 100.00%)
2: Other-C connector (0.00–99.99)
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td rowspan="2">0–10</td><td>2(P30.27)</td></tr>
<tr><td>P09.05</td><td>Power-generated torque lower limit giving source (restricting speed loop output)</td><td>2(P30.35)</td></tr>
<tr><td>P10.01</td><td>Enabling torque control</td><td>0: Disable
1: Enable
2: Other-B connector (0.00–99.99)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td></tr>
<tr><td>P30.00</td><td>Enabling master/slave</td><td>0: Disable</td><td>0–10</td><td>1</td></tr>
</table>

Function code	Name	Description	Setting range	Default
P30.01	Master/slave setting	1: Enable 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1
P30.25	Local received data 9 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00
P30.38	Slave run mode display	0: Non-slave mode 1: Slave speed mode 2: Slave torque mode 3: Slave speed deviation and torque limit mode 4: Slave speed-loop P mode	0–4	3

6.13.4 Master PI + slave P control

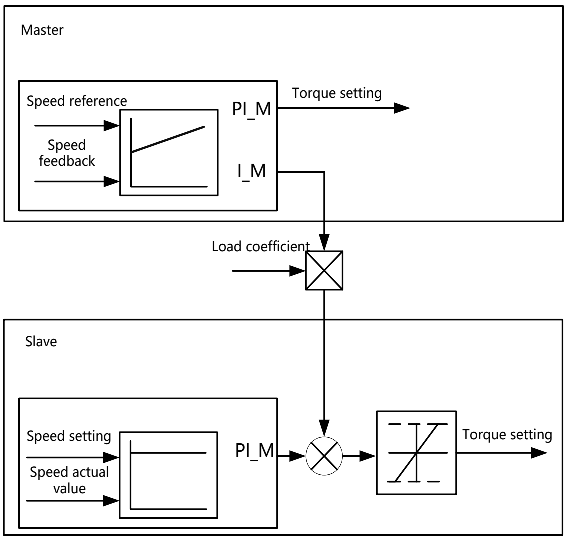
The master and slave are both running in speed control and accept the same speed setting. The master speed regulator adopts the PI controller, while the slave speed regulator adopts the P control module, at the same time, the integral component of the master speed regulator is superimposed onto the output of the slave speed regulator, thus completing the distribution of torque in the steady state process.

Application: The master and slave motors can be either flexibly or rigidly connected.

Characteristics: Since the slave accepts the master giving, but also it has its own speed regulator, this control mode can be applied to rigid connected devices.

The salve can obtain control performance similar to master speed control + slave torque control; slave speed can also be controlled if hard connection fails. Figure 6-7 shows the working principle.

Figure 6-7 Master PI + slave P control



The master speed + slave torque control mode can be set through the one-click macro. When the local machine is the master, set P30.49=1; when the local machine is a slave, set P30.49=5.

Set P30.49=1. Then the following master function codes are automatically set, which is similar to 6.13.1 Master speed + slave speed control.

Set P30.49=5. Then the following slave function codes are automatically set.

Function code	Name	Description	Setting range	Default
P00.01	Channel 1 speed main setting source	0: 0 1: Digital (-327.67%–P09.02) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	2(P30.27)
P02.01	Channel 1 start/stop CW source	0: Keypad 1: Digital (0x0000–0xFFFF, 0x0000) 2: Other-C connector (0.00–99.99) 3: Terminal start/stop module (IN1, IN2, IN3) 4: Bus adapter A 5: Bus adapter B 6: PC (addresses 0x4200, 0x4201) 7: Modbus (addresses 0x4200, 0x4201) 8: Customized	0–8	2(P30.26)
P00.28	RFG bypass enabling source	0: Not bypass 1: Bypass 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1
P01.01	Starting frequency	0.00–100.00%	0.00–100.00	0.00%
P10.01	Enabling torque control	0: Disable 1: Enable 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0

Function code	Name	Description	Setting range	Default
P30.00	Enabling master/slave	0: Disable 1: Enable 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1
P30.01	Master/slave setting		0–10	1
P30.38	Slave run mode display	0: Non-slave mode 1: Slave speed mode 2: Slave torque mode 3: Slave speed deviation and torque limit mode 4: Slave speed-loop P mode	0–4	4

6.13.5 Related function codes

Function code	Name	Description	Setting range	Default
P30.00	Enabling master/slave	0: Disable. This function code is set to 0 when the system does not implement master/slave; and it can be set to 0 to bypass the local device if the local device fails in master/slave control. 1: Enable 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P30.01	Master/slave setting	0: Master 1: Slave 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1	0–10	0

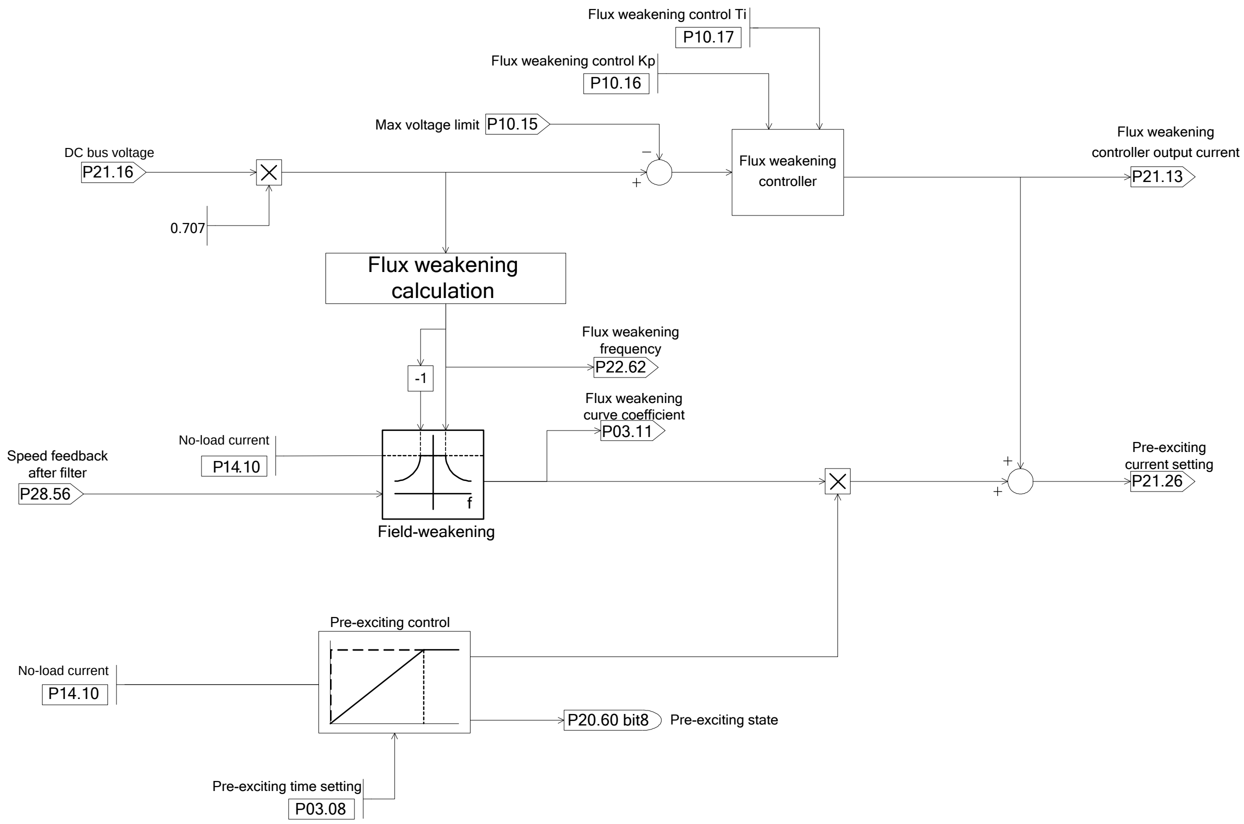
Function code	Name	Description	Setting range	Default
		10: HDI2		
P30.02	Local ID display	0: Master	0–15	0
P30.03	Master/slave role display	0: Master(M) 1: Slave(S)	0–1	0
P30.04	Master/slave system node state 1	Bit1–bit0: Master status (00: Power off; 01: Ready; 10: Running; 11: Fault) Bit3–bit2: Slave 1 status Bit5–bit4: Slave 2 status Bit7–bit6: Slave 3 status Bit9–bit8: Slave 4 status Bit11–bit10: Slave 5 status Bit13–bit12: Slave 6 status Bit15–bit14: Slave 7 status	0x0000–0xFFFF	0x0000
P30.05	Master/slave system node state 2	Bit1–bit0: Slave 8 status Bit3–bit2: Slave 9 status Bit5–bit4: Slave 10 status Bit7–bit6: Slave 11 status Bit9–bit8: Slave 12 status Bit11–bit10: Slave 13 status Bit13–bit12: Slave 14 status Bit15–bit14: Slave 15 status	0x0000–0xFFFF	0x0000
P30.06	Local sent data 0 source	0: 0 1: Keypad (0–65535) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	2(P30.36)
P30.07	Local sent data 1 source		0–10	2(P21.02)
P30.08	Local sent data 2 source		0–10	2(P21.28)
P30.09	Local sent data 3 source		0–10	2(P21.00)
P30.10	Local sent data 4 source		0–10	2(P21.00)
P30.11	Local sent data 5 source		0–10	2(P21.00)
P30.12	Local sent data 6 source		0–10	2(P21.00)
P30.13	Local sent data 7 source		0–10	2(P21.00)
P30.14	Local sent data 8 source		0–10	2(P21.00)
P30.15	Local sent data 9 source		0–10	2(P21.12)
P30.16	Local received data 0 regulation coefficient	0.01–100.00	0.01–100.00	1.00
P30.17	Local received data 1 regulation coefficient	0.01–100.00	0.01–100.00	1.00
P30.18	Local received data 2 regulation coefficient	0.01–100.00	0.01–100.00	1.00
P30.19	Local received data 3	0.01–100.00	0.01–100.00	1.00

Function code	Name	Description	Setting range	Default
	regulation coefficient			
P30.20	Local received data 4 regulation coefficient	0.01–100.00	0.01–100.00	1.00
P30.21	Local received data 5 regulation coefficient	0.01–100.00	0.01–100.00	1.00
P30.22	Local received data 6 regulation coefficient	0.01–100.00	0.01–100.00	1.00
P30.23	Local received data 7 regulation coefficient	0.01–100.00	0.01–100.00	1.00
P30.24	Local received data 8 regulation coefficient	0.01–100.00	0.01–100.00	1.00
P30.25	Local received data 9 regulation coefficient	0.01–100.00	0.01–100.00	1.00
P30.26	Local received data 0 display	Local received data 0 display = Local received data 0 physical value * Local received data 0 regulation coefficient	0x0000–0xFFFF	0x0000
P30.27	Local received data 1 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P30.28	Local received data 2 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P30.29	Local received data 3 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P30.30	Local received data 4 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P30.31	Local received data 5 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P30.32	Local received data 6 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P30.33	Local received data 7 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P30.34	Local received data 8 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P30.35	Local received data 9 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P30.36	Slave CW source display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P30.38	Slave run mode display	0: Non-slave mode 1: Slave speed mode 2: Slave torque mode 3: Slave speed deviation and torque limit mode 4: Slave speed-loop P mode	0–4	0
P30.49	Master/slave function one-click macro	Set this function code to enable one-click configuration of the master and slave control related function codes. When the system is used as the master, the function code is set to 1 or 3, enabling one-click configuration	0–5	0

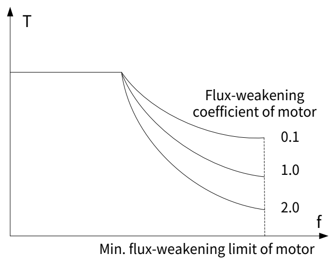
Function code	Name	Description	Setting range	Default
		of the master related function codes; when the system is used as a slave, the function code is set to 2, enabling one-click configuration of slave related function codes. After the configuration is completed, this function code is automatically restored to 0. 0: Invalid 1: One click macro for master speed control 2: One click macro for slave speed control 3: One click macro for slave torque control 4: One click macro for slave speed deviation torque limiting control 5: One click macro for slave speed P + master speed PI control		

6.14 Flux-weakening control

When running at a speed higher than the rated speed, the AM enters the flux weakening state. You can set P10.13 to change the flux-weakening curvature. A great flux-weakening control coefficient indicates a steep curve. The weakening coefficient in constant power zone is used in AM flux-weakening control, while the flux-weakening proportional gain and flux-weakening integral gain are specified by P10.16 and P10.17. The max VFD output voltage is specified by P10.15.



If pre-exciting is performed for the motor when the VFD starts up, a magnetic field is built up inside the motor to improve the torque performance during the start process. The pre-exciting time is specified by P03.19.



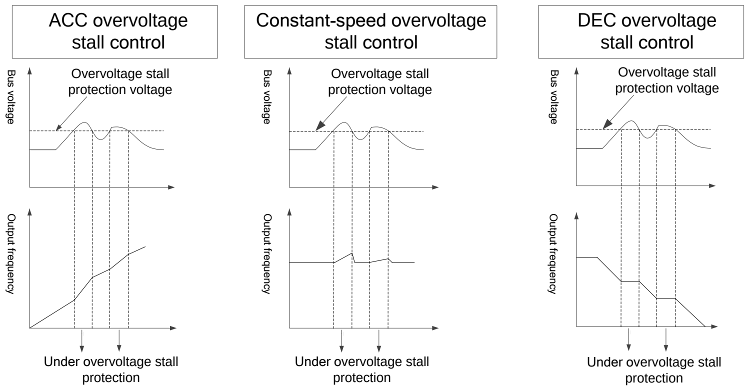
Function code	Name	Description	Setting range	Default
P10.13	Weakening coefficient in constant power zone	When the SM is used in flux-weakening control, the min. weakening point in constant power zone is specified by P10.14.	0.0–200.0	100.0%
P10.14	Lowest weakening point in constant power zone	10–100%	10–100	20%
P10.15	Max voltage limit	Used to set the max VFD output voltage, which is a percentage of the motor rated voltage. Set the value according to onsite conditions.	0.0–120.0	100.0%
P10.16	Flux-weakening proportional gain	0–8000	0–8000	100
P10.17	Flux-weakening integral coefficient	0.0–500.0%	0.0–500.0	100.0%

6.15 Vdc control

6.15.1 Overvoltage control

When the motor is in power generation state (the motor speed is greater than the output frequency), the VFD bus voltage will increase continuously. When the detected bus voltage exceeds the value of P18.11 (Overvoltage stall protection voltage), the overvoltage stall protection function adjusts the output frequency based on the VFD ACC/DEC status (to be specific, if the VFD is in the ACC or constant speed state, the VFD will increase the output frequency; if the VFD is in the DEC state, the VFD will run at a constant speed and it can decelerate the speed only when the overvoltage stall protection function is invalid). In this way, the regenerative energy on the bus can be consumed, preventing against VFD overvoltage. If the function does not meet requirements in the actual application, you can adjust parameters related to the current loop and voltage loop.

Figure 6-8 Actions taken for protection against overvoltage stall



Function code	Name	Description	Setting range	Default
P18.10	Enabling overvoltage stall protection	0: Disable 1: Enable	0–1	1
P18.11	Overvoltage stall protection voltage	Standard bus voltage **Voltage class** / **Overvoltage stall protection voltage** 380V / 690V 734.4V / 1120.0V	P18.25–P18.24	734.4V
P18.12	Overvoltage stall voltage-loop Kp	0–1000	0–1000	60
P18.13	Overvoltage stall voltage-loop Ki	0–1000	0–1000	5
P18.14	Overvoltage stall current-loop Kp	0–1000	0–1000	60
P18.15	Overvoltage stall current-loop Ki	0–1000	0–1000	250

Note: If the braking resistor or dynamic braking unit is used, disable the overvoltage stall control function, that is , set P18.10 to 0.

P18.12 and P18.13 specify the proportional coefficient and integral coefficient of the bus voltage regulator during overvoltage stall.

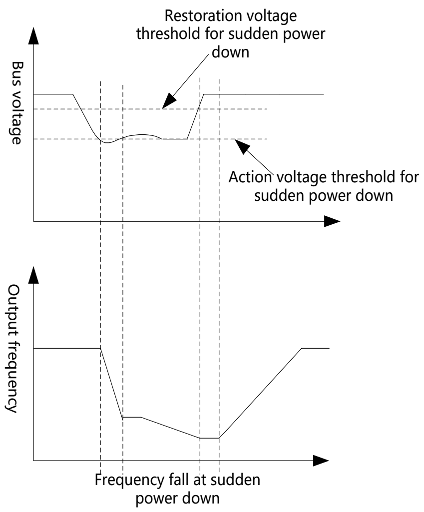
P18.14 and P18.15 specify the proportional coefficient and the integral coefficient of the active current regulator during overvoltage stall.

6.15.2 Undervoltage control

The sudden power-down frequency decrease control (or called undervoltage control) function enables the system to keep running at sudden short-period power down. When power down occurs, if the motor is in the power generation state, the bus voltage is kept around the voltage for sudden power-down frequency decrease, preventing the VFD from stopping due to undervoltage.

If the sudden power-down frequency decrease function cannot meet actual requirements, you can set parameters P18.06–P18.08. The speed loop dynamic response characteristics of vector control can be adjusted by setting the proportional coefficient and integral coefficient of speed regulator. Increasing the proportional or integral gain can accelerate dynamic response of speed loop; however, if the proportional or integral gain is too large, system oscillation and overshoot may occur. If proportional gain is too small, stable oscillation or speed offset may occur.

Figure 6-9 Undervoltage control



<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P18.04</td><td>Voltage of frequency fall at sudden power down</td><td><table><tr><th>Voltage class</th><td>380V</td><td>690V</td></tr><tr><th>Voltage of frequency fall at sudden power down</th><td>432.0V</td><td>752.0V</td></tr></table>If the bus voltage drops to the sudden power down frequency falling point due to the power loss of the grid, the VFD begins to decrease the running frequency according to sudden power down frequency falling rate to make the motor in power generation state. The regenerative power can maintain the bus voltage to ensure normal running of the VFD until the recovery of power.
Default power down frequency falling point: GD880, 80% of bus voltage</td><td>P18.25–P18.24</td><td>432.0V</td></tr>
<tr><td>P18.05</td><td>Frequency decrease ratio at sudden power down</td><td>0.00–100.0% (of the max frequency)</td><td>0.00–100</td><td>3.00%</td></tr>
</table>

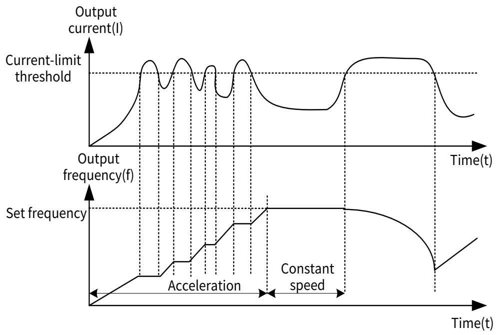
Function code	Name	Description	Setting range	Default
P18.06	Sudden power down voltage loop Kp	0–1000	0–1000	30
P18.07	Sudden power down voltage loop Ki	0–1000	0–1000	40
P18.08	Sudden power down current loop Kp	0–1000	0–1000	25
P18.09	Sudden power down current loop Ki	0–1000	0–1000	150

P18.06 and P18.07 specify the proportional coefficient and the integral coefficient of the bus voltage regulator during undervoltage stall. P18.08 and P18.09 specify the proportional coefficient and the integral coefficient of the active current regulator during overvoltage stall.

6.16 Imax control

During accelerated running, as the load is too large, the actual acceleration rate of motor is lower than that of output frequency, if no measures are taken, the VFD may trip due to overcurrent during acceleration.

The current-limit protection function detects output current during running, and compares it with the current-limit level defined by P18.18, if it exceeds the current-limit level, the VFD will run at stable frequency during accelerated running, or run in decreased frequency during constant-speed running; if it exceeds the current-limit level continuously, the VFD output frequency will drop continuously until reaching lower limit frequency. When the output current is detected to be lower than the current-limit level again, it will continue accelerated running. In some heavy load scenarios, you can increase the value of P18.18 to improve the VFD output torque.



Function code	Name	Description	Setting range	Default
P18.17	Enabling auto current limit	0: Disable; 1: Enable	0–1	1
P18.18	Automatic current limit threshold	Percentage of the VFD rated output current.	50.0–200.0	140.0%
P18.19	Auto current limit frequency falling rate	The current-limit protection function detects output current during running, and compares it with the current-limit level defined by P18.18, if it exceeds the current-limit level, the VFD will run at stable frequency during accelerated running, or run in decreased frequency during constant-speed running; if it	0.00–20.00	20.00%

Function code	Name	Description	Setting range	Default
		exceeds the current-limit level continuously, the VFD output frequency will drop continuously until reaching lower limit frequency. When the output current is detected to be lower than the current-limit level again, it will continue accelerated running.		
P18.27	Hardware current limit point	50–240% (of the VFD rated current) Setting the current limit value above the software overcurrent point disables the hardware current limiting.	50–240	195%

Setting P18.27 to 240% means disabling the hardware current limiting function.

6.17 Droop control

Function code	Name	Description	Setting range	Default
P10.80	Droop enabling source	0: 0 1: Enable 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P10.81	Droop control speed upper limit source	0: 0 1: Digital (0.00–100.00%) 2: Other-C connector (0.00–99.99) 3: AI1 (100% corresponds to the max frequency) 4: AI2 (100% corresponds to max frequency) 5: HDI1 (100% corresponds to max frequency) 6: HDI2 (100% corresponding to the max frequency) 7: Multi-step (100% corresponds to the max frequency) 8: MOP (100% corresponds to the max frequency) 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P10.82	Droop control mode	0: Droop control mode 1 1: Droop control mode 2	0–1	0

Function code	Name	Description	Setting range	Default
P10.83	Droop control fall frequency display	-10.00–10.00Hz	-10.00–10.00	0.00Hz

6.18 Motor protection

6.18.1 Motor overload protection

Function code	Name	Description	Setting range	Default
P14.40	Motor overload protection selection	0: No protection 1: Common motor (with low-speed compensation) 2: Frequency-variable motor (without low-speed compensation)	0–2	2

0: No protection

1: Common motor protection (with low-speed compensation). As the cooling effect of a common motor is degraded at low speed running, the corresponding motor thermal protection value needs to be adjusted properly, the low compensation indicates lowering the overload protection threshold of the motor whose running frequency is lower than 30Hz.

2: Variable-frequency motor protection (without low speed compensation). Because the heat dissipation function for a variable-frequency motor is not impacted by the rotation speed, it is not necessary to adjust the protection value at low speed running.

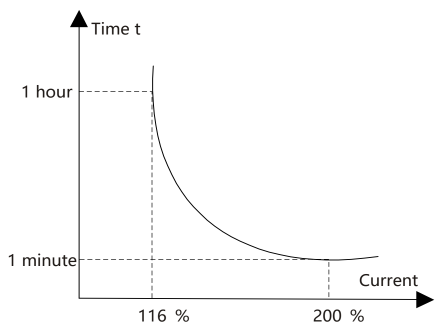
Function code	Name	Description	Setting range	Default
P14.42	Overload protection coefficient of motor 1	20.0–120.0%	20.0–120.0	100.0%

Motor overload multiples M=Iout/(In*K)

"In" is rated motor current, "Iout" is VFD output current, and "K" is motor overload protection coefficient.

A smaller value of "K" indicates a bigger value of "M".

When M=116%, protection is performed after motor overload lasts for 1 hour; when M=200%, protection is performed after motor overload lasts for 60 seconds; and when M⩾400%, protection is performed immediately.



6.18.2 Motor overtemperature protection

The motor temperature can be detected by connecting the VFD carried terminals AO1 and AI1 to a temperature sensor (PT100, PT1000, or KTY84). This function helps to output an overheating alarm and stop the machine. The wiring procedure is as follows:

Step 1 To measure temperature, switch the output of AO1 to current, and connect one end of the temperature resistor to AI1 and AO1, and the other end to GND.

Step 2 Check the value of P21.21 to obtain the actual temperature. When the detected temperature exceeds P14.39 (Motor OT pre-alarm threshold) and digital output terminal function 13 is used, the VFD outputs the ON signal. When the detected temperature exceeds P14.38 (Motor OT protection threshold), the VFD reports the motor overheating (oH) fault.

Function code	Name	Description	Setting range	Default
P14.35	Motor temperature AI sensor type	Ones place: AI1 and AO1 connected sensor type 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Tens place: AI2 and AO2 connected sensor type 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Hundreds place: IO1_AI1, AO1(Type of sensor connected to AI1 and AO1 on IO expansion card 1) 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Thousands place: IO1_AI2, AO2(Type of sensor connected to AI2 and AO2 on IO expansion card 1) 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3	0x0000–0x4444	0x0000
P14.36	Enabling motor temperature AI input	Ones place: 0: Disable 1: AI1 and AO1 enabled for motor temperature sampling Tens place: 0: Disable	0x0000–0x1111	0x0000

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td></td><td></td><td>1: AI2 and AO2 enabled for motor temperature sampling
Hundreds place:
0: Disable
1: AI1 and AO1 on IO expansion card 1 enabled for motor temperature sampling
Thousands place:
0: Disable
1: AI2 and AO2 on IO expansion card 1 enabled for motor temperature sampling
When AI input is selected for motor temperature, the corresponding AO is set to the current mode output (the shorting cap on the control board selects current), and the corresponding AOs of automatically associated settings on the software output different currents. The AD sampling values of AI input address different temperature tables based on sensor types.
For different sensors, AO output current settings are as follows:
<table>
<tr><th>Motor temperature sensor type</th><th>AO output current</th></tr>
<tr><td>PT100</td><td>18mA</td></tr>
<tr><td>KTY84</td><td>5mA</td></tr>
<tr><td>PT100*3</td><td>18mA</td></tr>
<tr><td>PT1000</td><td>6mA</td></tr>
<tr><td>PT1000*3</td><td>2mA</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>P14.37</td><td>Motor overtemperature fault source</td><td>0: 0 (software internally determines whether motor overtemperature has occurred according to the detected motor temperature value)
1: 1 (reporting a motor overtemperature fault)
2: Other-B connector (0.00–99.99)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td></tr>
<tr><td>P14.38</td><td>Motor overtemperature point</td><td>100.0–200.0°C</td><td>100.0–200.0</td><td>200.0°C</td></tr>
</table>

Function code	Name	Description	Setting range	Default
P14.39	Motor overtemperature pre-alarm point	100.0°C–P14.38	100.0–P14.38	180.0°C

6.18.3 Motor stall protection

Motor stall protection is used to check for abnormal motor control, which requires setting P14.43 to enable the motor stall detection function (disable by default), so as to prevent motor damage caused by motor stall, and to prevent the motor from being pulled down because the motor output torque cannot overcome the load torque. However, some applications require the motor to operate in a stall condition, where P14.43 (Enabling motor stall detection) needs to be set to 0 (disabling).

If P14.43 (Enabling motor stall detection) is enabled, when the motor torque reaches the torque limit, the feedback speed is below the set threshold specified by P14.44, and the duration exceeds the P14.45 (Motor stall delay), a motor stall fault is triggered.

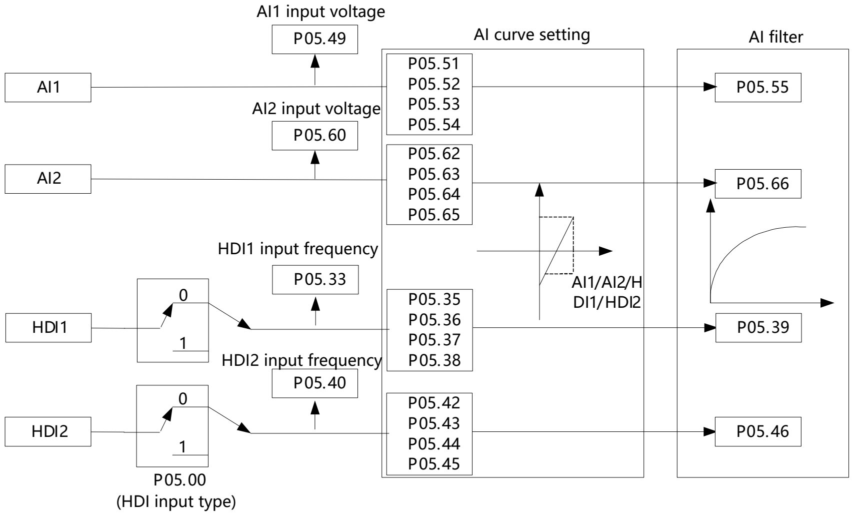
Related function parameters

Function code	Name	Description	Setting range	Default
P14.43	Enabling motor stall detection	0: Disable 1: Enable After this function is enabled, motor stall is detected; otherwise, it is not detected.	0–1	0
P14.44	Motor stall speed setting	0.00–100.00%	0.00–100.00	1.00%
P14.45	Motor stall delay	0.000–20.000s	0.000–20.000	1.000s

6.19 Input and output

6.19.1 Analog input

The inverter unit carries two analog input terminals AI1 and AI2 with input range being 0–10V/0–20mA/4–20mA, and whether AI1 or AI2 uses voltage input or current input can be set through J4 or J5, and two HDI high-speed pulse input terminals. Each input can be filtered separately, and the corresponding reference curve can be set by adjusting the reference corresponds to the max value and min. value. The HDI terminals can be set to work as high-speed pulse input terminals or regular digital input terminals through function code setting.



P05.00	Ones place: HDI1 input type	0: HDI is high-speed pulse input
	Tens place: HDI2 input type	1: HDI is digital input

Related function parameters

Function code	Name	Description	Setting range	Default
P05.51	AI1 curve min. input value	-10.00–P05.53	-10.00–10.00	0.00
P05.52	AI1 curve min. input rate	-600.0%–P05.54	-600.0–600.0	0.0%
P05.53	AI1 curve max input value	P05.51–10.00	-10.00–10.00	10.00
P05.54	AI1 curve max input rate	P05.52–600.0%	-600.0–600.0	100.0%
P05.55	AI1 input filter time	0.000–10.000s	0.000–10.000	0.000s
P05.62	AI2 curve min. input value	-10.00–P05.64	-10.00–10.00	0.00
P05.63	AI2 curve min. input rate	-600.0%–P05.65	-600.0–600.0	0.0%
P05.64	AI2 curve max input value	P05.62-10.00	-10.00–10.00	10.00
P05.65	AI2 curve max input rate	P05.63-600.0%	-600.0–600.0	100.0%
P05.66	AI2 input filter time	0.000–10.000s	0.000–10.000	0.000s
P05.35	HDI1 lower limit frequency	0.000kHz–P05.37	0.000–P05.32	0.000kHz
P05.36	Corresponding setting of HDI1 lower limit frequency	-100.0%–P05.38	-100.0–100.0	0.0%
P05.37	HDI1 upper limit frequency	P05.35–50.000kHz	P05.30–50.000	50.000kHz
P05.38	Corresponding setting of HDI1 upper limit frequency	P05.36-100.0%	-100.0–100.0	100.0%
P05.39	HDI1 input filter time	0.000–10.000s	0.000–10.000	0.030s

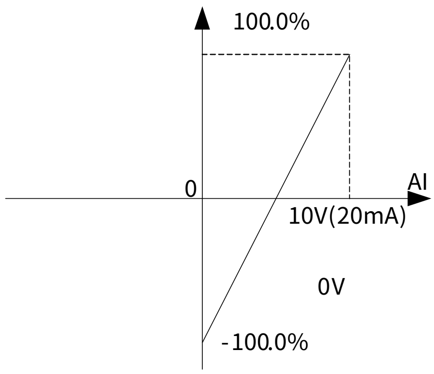
Function code	Name	Description	Setting range	Default
P05.42	HDI2 lower limit frequency	0.000kHz–P05.44	0.000–P05.37	0.000kHz
P05.43	Corresponding setting of HDI2 lower limit frequency	-100.0%–P05.45	-100.0–100.0	0.0%
P05.44	HDI2 upper limit frequency	P05.42–50.000kHz	P05.35-50.000	50.000kHz
P05.45	Corresponding setting of HDI2 upper limit frequency	P05.43–100.0%	-100.0–100.0	100.0%
P05.46	HDI2 input filter time	0.000–10.000s	0.000–10.000	0.030s

The function codes define the relationship between the analog input voltage and its corresponding setting. When the analog input voltage exceeds the range from the upper limit to the lower limit, the upper limit or lower limit is used.

When the analog input is current input, 0–20mA current corresponds to 0–10V voltage.

In different applications, 100.0% of the analog setting corresponds to different nominal values. See the descriptions of each application section for details.

The following figure illustrates the cases of several settings:

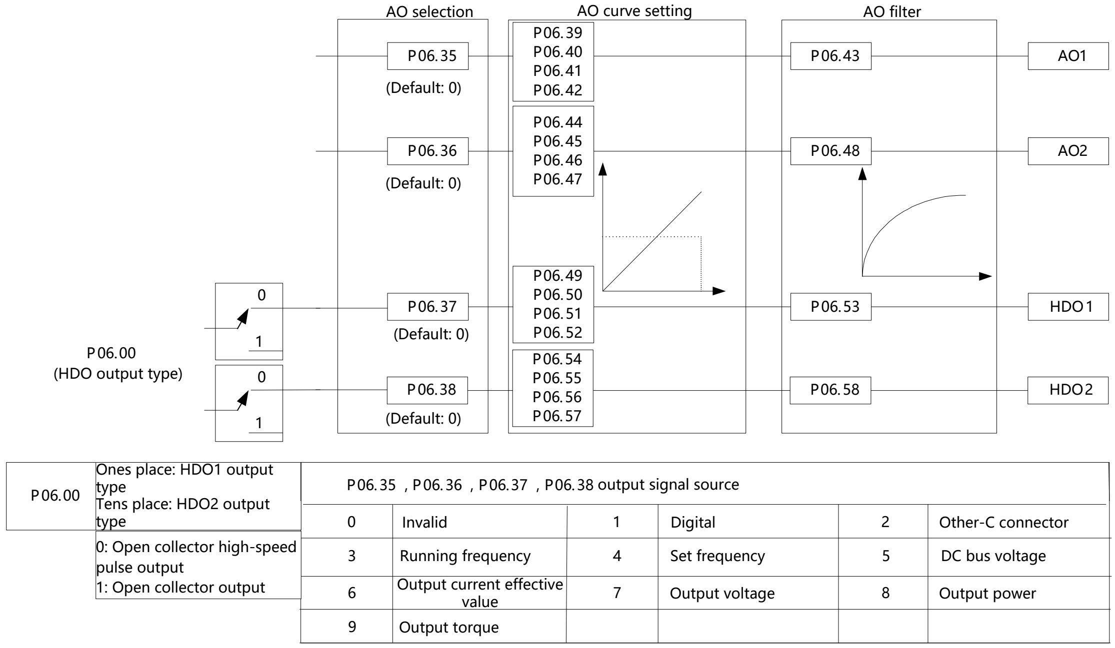


Input filter time: to adjust the sensitivity of analog input. Increasing the value properly can enhance analog input anti-interference but may reduce the sensitivity of analog input.

Note: AI and AI2 support input of 0–10V/0–20mA. When AI and AI2 select input of 0–20mA, the corresponding voltage of 20mA is 10V. When they are used for AI disconnection, 4–20mA are selected as input.

6.19.2 Analog output

The F output terminals AO1 and AO2 with output range being 0–10V/0–20mA/4–20mA, and whether AIO or AO2 uses voltage output or current output can be set through J6 or J7, and two high-speed pulse output terminals. Analog output signals can be filtered separately, and the proportional relation can be adjusted by setting the max value, min. value, and the percentage of their corresponding output. Analog output signals can output running frequency, set frequency, DC bus voltage, output current effective value, output voltage, output power, and output torque at a certain ratio.



Function code	Name	Description	Setting range	Default
P06.35	AO1 signal source	0: Invalid 1: Digital (4096 indicates 100%, for example, 2048 indicates 50%) 2: Other-C connector (4096 indicates 100%, for example, 2048 indicates 50%) 3: Running frequency (motor rated frequency indicates 100%) 4: Set frequency (motor rated frequency indicates 100%) 5: DC bus voltage (unit rated voltage * 1.414 indicates 100%) 6: Output current effective value (motor rated current indicates 100%) 7: Output voltage (unit rated voltage indicates 100%) 8: Output power (motor rated power indicates 100%) 9: Output torque (motor rated torque indicates 100%) 10: Reserved	0–10	0
P06.36	AO2 signal source		0–10	0
P06.37	HDO1-as-HighSpeedPulseOutput signal source		0–10	0
P06.38	HDO2-as-HighSpeedPulseOutput signal source		0–10	0

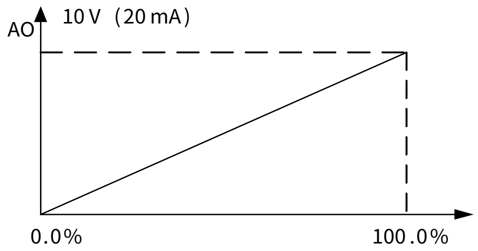
Related function parameters

Function code	Name	Description	Setting range	Default
P06.39	AO1 curve min. output rate	-600.0%–P06.41	-600.0–600.0	0.0%
P06.40	AO1 curve min. output value	0.000V– P06.42	0.000–10.000	0.000V

Function code	Name	Description	Setting range	Default
P06.41	AO1 curve max output rate	P06.39–600.0%	-600.0–600.0	100.0%
P06.42	AO1 curve max output value	P06.40–10.000V	0.000–10.000	10.000V
P06.43	AO1 output filter time	0.000–10.000s	0.000–10.000	0.000s
P06.44	AO2 curve min. output rate	-600.0%–P06.46	-600.0–600.0	0%
P06.45	AO2 curve min. output value	0.000V–P06.47	0.000–10.000	0.000V
P06.46	AO2 curve max output rate	P06.44–600.0%	-600.0–600.0	100.0%
P06.47	AO2 curve max output value	P06.45–10.000V	0.000–10.000	10.000V
P06.48	AO2 output filter time	0.000–10.000s	0.000–10.000	0.000s
P06.49	HDO1-as-high-speed-pulse output lower limit	-600.0%–P06.51	-600.0–P06.51	0.0%
P06.50	HDO1 output corresponding to lower limit	0.00–50.00kHz	0.00–50.00	0.00kHz
P06.51	HDO1-as-high-speed-pulse output upper limit	P06.49-600.0%	P06.49-600.0	100.0%
P06.52	HDO1 output corresponding to upper limit	0.00–50.00kHz	0.00–50.00	50.00kHz
P06.53	HDO1-as-HighSpeedPulseOutput filter time	0.000–10.000s	0.000–10.000	0.000s
P06.54	HDO2-as-HighSpeedPulseOutput lower limit	-600.0%–P06.56	-600.0–P06.56	0.00%
P06.55	HDO2 output corresponding to lower limit	0.00kHz–P00.57	0.00–50.00	0.00kHz
P06.56	HDO2-as-HighSpeedPulseOutput upper limit	P06.54–600.0%	P06.54–600.0	100.0%
P06.57	HDO2 output corresponding to upper limit	P06.55–50.00kHz	0.00–50.00	50.00kHz
P06.58	HDO2-as-high-speed-pulse output filter time	0.000–10.000s	0.000–10.000	0.000s

Used to define the relationship between the output value and analog output. When the output value exceeds the allowed range, the output uses the lower limit or upper limit. When the analog output is current output, 1mA equals 0.5V.

In different cases, the corresponding analog output of 100% of the output value is different. See each application for detailed information.



6.19.3 AI&AO calibration

Note: The following uses only AO1 and AI1 for example.

- **AO voltage calibration**

1. Short the AO terminal short cap to the voltage position, and set P06.25 (AO1 type) to 0 (0–10V).
2. Set P06.35 (AO1 signal source) to 1 (Digital) with the corresponding value set to 0.
3. Using a multimeter, measure the voltage between AO1 and GND, and enter the measured voltage value to P98.21 (AO1 voltage at 0V output).
4. After P06.35 (AO1 signal source) is set to 1 (Digital), go to the next menu and set the digital setting to 4096.
5. Using a multimeter, measure the voltage between AO1 and GND, and enter the measured voltage value to P98.22 (AO1 voltage at 10V output).
6. AO voltage calibration is completed.

Related function parameters

Function code	Name	Description	Setting range	Default
P06.25	AO1 type	0: 0–10V 1: 0–20mA 2: 4–20mA	0–2	0
P06.35	AO1 signal source	0: Invalid 1: Digital (4096 indicates 100%, for example, 2048 indicates 50%) 2: Other-C connector (4096 indicates 100%, for example, 2048 indicates 50%) 3: Running frequency (motor rated frequency indicates 100%) 4: Set frequency (motor rated frequency indicates 100%) 5: DC bus voltage (unit rated voltage * 1.414 indicates 100%) 6: Output current effective value (motor rated current indicates 100%) 7: Output voltage (unit rated voltage indicates 100%) 8: Output power (motor rated power indicates 100%) 9: Output torque (motor rated torque indicates 100%) 10: Reserved	0–10	0
P98.21	AO1 voltage at 0V	-1.000–12.500V	-1.000–12.500	-0.000V

Function code	Name	Description	Setting range	Default
	output			
P98.22	AO1 voltage at 10V output	-1.000–12.500V	-1.000–12.500	10.000V

- **AO current calibration**

1. Short the AO terminal short cap to the Current position, and set P06.25 (AO1 type) to 1 (0–20mA).
2. After P06.35 (AO1 signal source) is set to 1 (Digital), go to the next menu and set the digital setting to 0.
3. Using a multimeter, measure the current between AO1 and GND, and enter the measured current value to P98.23 (AO1 current at 0mA output).
4. After P06.35 (AO1 signal source) is set to 1 (Digital), go to the next menu and set the digital setting to 4096.
5. Using a multimeter, measure the current between AO1 and GND, and enter the measured current value to P98.24 (AO1 current at 20mA output).
6. AO current calibration is completed.

Related function parameters

Function code	Name	Description	Setting range	Default
P06.25	AO1 type	0: 0–10V 1: 0–20mA 2: 4–20mA	0–2	0
P06.35	AO1 signal source	0: Invalid 1: Digital (4096 indicates 100%, for example, 2048 indicates 50%) 2: Other-C connector (4096 indicates 100%, for example, 2048 indicates 50%) 3: Running frequency (motor rated frequency indicates 100%) 4: Set frequency (motor rated frequency indicates 100%) 5: DC bus voltage (unit rated voltage * 1.414 indicates 100%) 6: Output current effective value (motor rated current indicates 100%) 7: Output voltage (unit rated voltage indicates 100%) 8: Output power (motor rated power indicates 100%) 9: Output torque (motor rated torque indicates 100%) 10: Reserved	0–10	0
P98.21	AO1 voltage at 0V output	-1.000–12.500V	-1.000–12.500	-0.000V
P98.22	AO1 voltage at 10V output	-1.000–12.500V	-1.000–12.500	10.000V

- **AI voltage calibration**

1. Set P05.47 (Enabling AI1) to Enable and set P05.48 (AI1 type) to 3 (-10–10V).

2. Using the calibrated AO voltage as the input for the AI terminals, set P06.25 (AO1 type) to 0 (0–10V), set P06.35 (AO1 signal source) to 1 (Digital) with the corresponding value set to 0, and view P98.01 (AI1 voltage AD input value).
3. Set P98.03 (AI1 reference voltage 1 AD value) to the read value of P98.01 (AI1 voltage AD input value).
4. Set P06.25 (AO1 type) to 0 (0–10V), set P06.35 (AO1 signal source) to 1 (Digital) with the corresponding value set to 4096, and view P98.01 (AI1 voltage AD input value).
5. Set P98.05 (AI1 reference voltage 2 AD value) to the read value of P98.01 (AI1 voltage AD input value).
6. AI voltage calibration is completed.

- **AI current calibration**

1. Set P05.47 (Enabling AI1) to Enable and set P05.48 (AI1 type) to 1 (0–20mA).
2. Using the calibrated AO voltage as the input for the AI terminals, set P06.25 (AO1 type) to 1 (0–20mA), set P06.35 (AO1 signal source) to 1 (Digital) with the corresponding value set to 0, and view P98.06 (AI1 current input AD value).
3. Set P98.08 (AI1 reference current 1 AD value) to the read value of P98.06 (AI1 current input AD value).
4. Set P06.25 (AO1 type) to 0 (0–10V), set P06.35 (AO1 signal source) to 1 (Digital) with the corresponding value set to 4096, and view P98.06 (AI1 current input AD value).
5. Set P98.10 (AI1 reference current 2 AD value) to the read value of P98.06 (AI1 current input AD value).
6. AI current calibration is completed.

Related function parameters

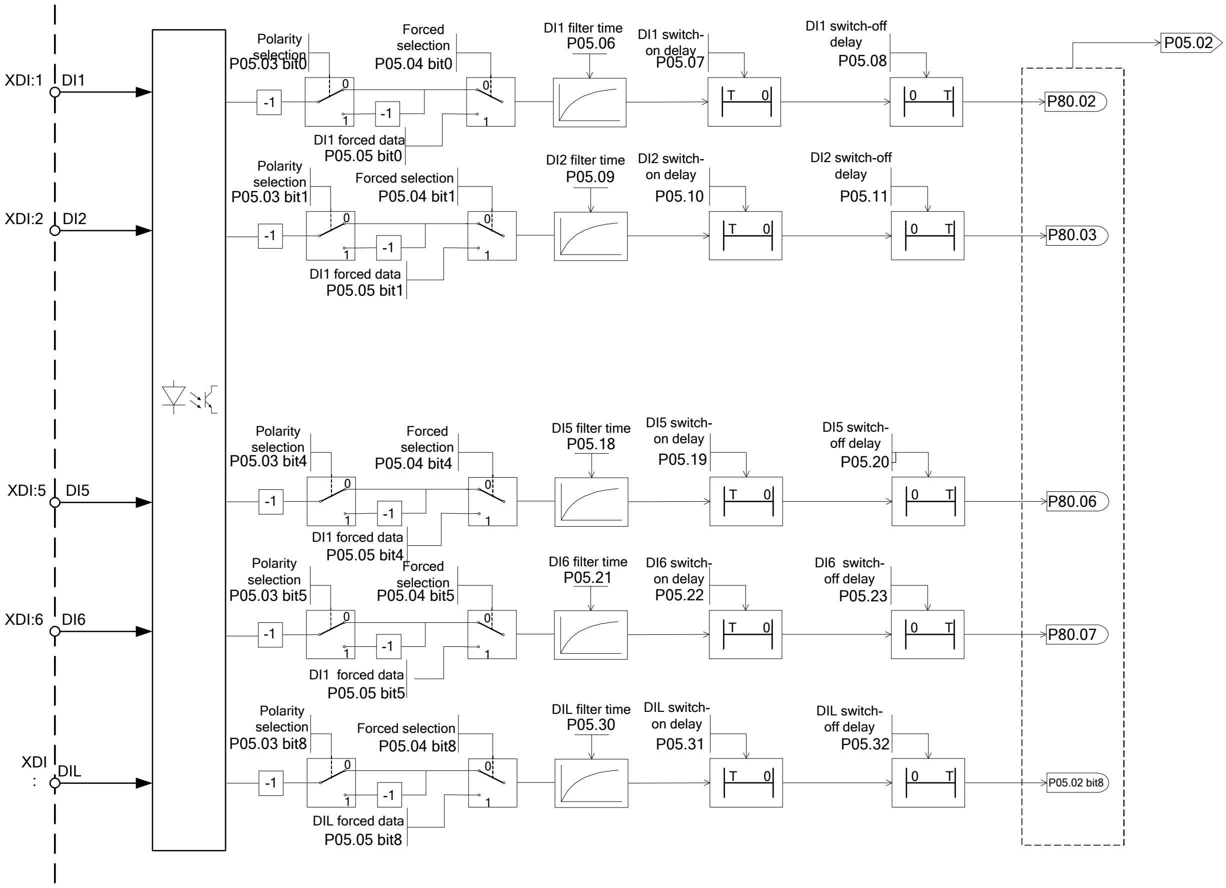
<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P05.47</td><td>Enabling AI1</td><td rowspan="2">0: Disable (AI1/AI2 input forced to 0)
1: Enable
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td rowspan="2">0–10</td><td rowspan="2">0</td></tr>
<tr><td>P05.58</td><td>Enabling AI2</td></tr>
<tr><td>P05.48</td><td>AI1 type</td><td rowspan="2">0: 0–10V
1: 0–20mA
2: 4–20mA
3: -10V–10V</td><td rowspan="2">0–3</td><td rowspan="2">0</td></tr>
<tr><td>P05.59</td><td>AI2 Type</td></tr>
<tr><td>P06.25</td><td>AO1 type</td><td rowspan="2">0: 0–10V
1: 0–20mA
2: 4–20mA</td><td rowspan="2">0–2</td><td rowspan="2">0</td></tr>
<tr><td>P06.26</td><td>AO2 type</td></tr>
<tr><td>P06.35</td><td>AO1 signal source</td><td rowspan="2">0: Invalid
1: Digital (4096 indicates 100%, for example, 2048 indicates 50%)
2: Other-C connector (4096 indicates 100%, for example, 2048 indicates 50%)
3: Running frequency (motor rated frequency indicates 100%)
4: Set frequency (motor rated frequency indicates 100%)</td><td rowspan="2">0–10</td><td rowspan="2">0</td></tr>
<tr><td>P06.36</td><td>AO2 signal source</td></tr>
</table>

Function code	Name	Description	Setting range	Default
		5: DC bus voltage (unit rated voltage * 1.414 indicates 100%) 6: Output current effective value (motor rated current indicates 100%) 7: Output voltage (unit rated voltage indicates 100%) 8: Output power (motor rated power indicates 100%) 9: Output torque (motor rated torque indicates 100%) 10: Reserved		
P98.01	AI1 voltage input AD value	0–4095	0–4095	0
P98.03	AI1 reference voltage 1 AD value	0–4095	0–4095	2048
P98.05	AI1 reference voltage 2 AD value	0–4095	0–4095	4095
P98.06	AI1 current input AD value	0–4095	0–4095	0
P98.08	AI1 reference current 1 AD value	0–4095	0–4095	2048
P98.10	AI2 reference current 2 AD value	0–4095	0–4095	4095
P98.11	AI2 voltage input AD value	0–4095	0–4095	0
P98.13	AI2 reference voltage 1 AD value	0–4095	0–4095	2048
P98.15	AI2 reference voltage 2 AD value	0–4095	0–4095	4095
P98.16	AI2 current input AD value	0–4095	0–4095	0
P98.18	AI2 reference current 1 AD value	0–4095	0–4095	2048
P98.20	AI2 reference current 2 AD value	0–4095	0–4095	4095
P98.21	AO1 voltage at 0V output	-1.000–12.500V	-1.000–12.500	0.000V
P98.22	AO1 voltage at 10V output	-1.000–12.500V	-1.000–12.500	10.000V
P98.23	AO1 current at 0mA output	-2.000–25.000mA	-2.000–25.000	0.000mA
P98.24	AO1 current at 20mA output	-2.000–25.000mA	-2.000–25.000	20.000mA

Function code	Name	Description	Setting range	Default
P98.25	AO2 voltage at 0V output	-1.000–12.500V	-1.000–12.500	0.000V
P98.26	AO2 voltage at 10V output	-1.000–12.500V	-1.000–12.500	10.000V
P98.27	AO2 current at 0mA output	-2.000–25.000mA	-2.000–25.000	0.000mA
P98.28	AO2 current at 20mA output	-2.000–25.000mA	-2.000–25.000	20.000mA

6.19.4 Digital input

The inverter unit carries six programmable digital input terminals, two HDI input terminals, and one DIL terminal. The functions of all the digital input terminals can be programmed through function codes. The HDI input terminals can be selected as either high speed pulse input terminals or normal digital input terminals through function code setting; DIL is a special input terminal, when its input is valid, all other input terminals are forced invalid, namely, the states of DI1–DI6 and HDI1–HDI2 are all 0 after processing.

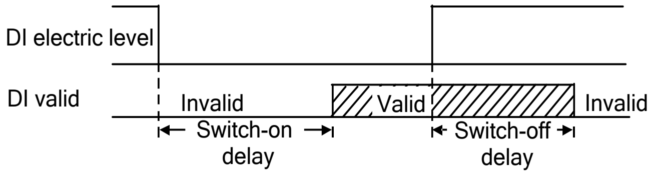


Related function parameters

Function code	Name	Description	Setting range	Default
P05.06	DI1 filter time	0.000–1.000s	0.000–1.000	0.010s
P05.07	DI1 switch-on delay	0.00–360.00s	0.00–360.00	0.00s
P05.08	DI1 switch-off delay	0.00–360.00s	0.00–360.00	0.00s

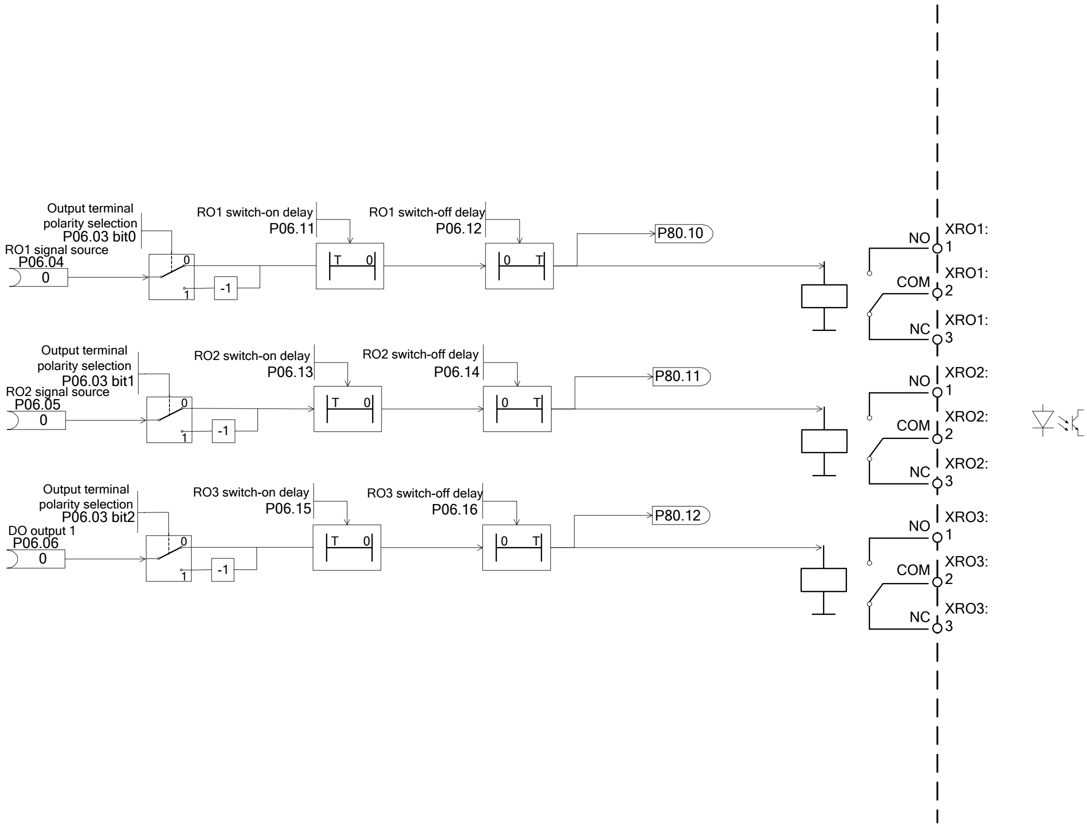
Function code	Name	Description	Setting range	Default
P05.09	DI2 filter time	0.000–1.000s	0.000–1.000	0.010s
P05.10	DI2 switch-on delay	0.00–360.00s	0.00–360.00	0.00s
P05.11	DI2 switch-off delay	0.00–360.00s	0.00–360.00	0.00s
P05.12	DI3 filter time	0.000–1.000s	0.000–1.000	0.010s
P05.13	DI3 switch-on delay	0.00–360.00s	0.00–360.00	0.00s
P05.14	DI3 switch-off delay	0.00–360.00s	0.00–360.00	0.00s
P05.15	DI4 filter time	0.000–1.000s	0.000–1.000	0.010s
P05.16	DI4 switch-on delay	0.00–360.00s	0.00–360.00	0.00s
P05.17	DI4 switch-off delay	0.00–360.00s	0.00–360.00	0.00s
P05.18	DI5 filter time	0.000–1.000s	0.000–1.000	0.010s
P05.19	DI5 switch-on delay	0.00–360.00s	0.00–360.00	0.00s
P05.20	DI5 switch-off delay	0.00–360.00s	0.00–360.00	0.00s
P05.21	DI6 filter time	0.000–1.000s	0.000–1.000	0.010s
P05.22	DI6 switch-on delay	0.00–360.00s	0.00–360.00	0.00s
P05.23	DI6 switch-off delay	0.00–360.00s	0.00–360.00	0.00s
P05.24	HDI1 filter time (digital)	0.000–1.000s	0.000–1.000	0.010s
P05.25	HDI1 switch-on delay (digital)	0.00–360.00s	0.00–360.00	0.00s
P05.26	HDI1 switch-off delay (digital)	0.00–360.00s	0.00–360.00	0.00s
P05.27	HDI2 filter time (digital)	0.000–1.000s	0.000–1.000	0.010s
P05.28	HDI2 switch-on delay (digital)	0.00–360.00s	0.00–360.00	0.00s
P05.29	HDI2 switch-off delay (digital)	0.00–360.00s	0.00–360.00	0.00s
P05.30	DIL filter time (digital)	0.000–1.000s	0.000–1.000	0.010s
P05.31	DIL switch-on delay (digital)	0.00–360.00s	0.00–360.00	0.00s
P05.32	DIL switch-off delay (digital)	0.00–360.00s	0.00–360.00	0.00s

These function codes specify the delay time corresponding to the electrical level changes when the programmable input terminals switch on or switch off.



6.19.5 Digital output

The inverter unit carries three relay output terminals and two high-speed pulse output (HDO) terminals. All the digital output terminal functions can be used for programming through function code setting. The HDO terminals select high-speed pulse output or digital output through function code setting.



- **Digital output terminal function selection**

Function code	Name	Description	Setting range	Default
P06.04	RO1 signal source	0: Low level 1: High level 2: Other-B connector 3: Ready for brake closing 4: Running 5: Running forward 6: Running reversely 7: VFD in fault 8: Frequency reached 9: Running in zero speed 10: Frequency upper limit reached 11: Frequency lower limit reached 12: Frequency level detection FDT 13: VFD alarm	0–16	0
P06.05	RO2 signal source		0–16	0
P06.06	RO3 signal source		0–16	0
P06.09	HDO1-as-DO signal source		0–16	0
P06.10	HDO2-as-DO signal source		0–16	0

Function code	Name	Description	Setting range	Default
		14: Run time reached 15: Brake control 16: STO action		

- **Terminal function parameter setting**

Function code	Name	Description	Setting range	Default
P06.03	Output terminal polarity selection	Bit 0: RO1 Bit1: RO2 Bit 2: RO3 Bit3–bit4: Reserved Bit5: HDO1 Bit6: HDO2	0x00–0x7F	0x00

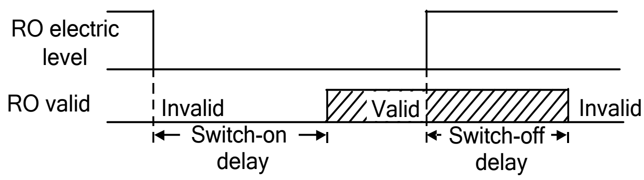
Used to set the output terminal polarity.

When a bit is 0, the terminal is positive; when a bit is 1, the terminal is negative.

Bit6	BIit5	Bit2	Bit1	Bit0
HDO2	HDO1	RO3	R02	RO1

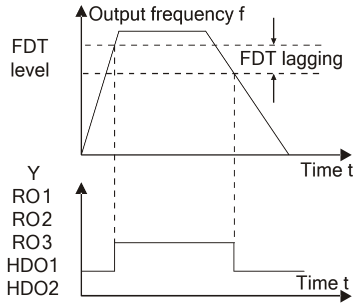
Function code	Name	Description	Setting range	Default
P06.11	RO1 switch-on delay	0.00–360.00s	0.00–360.00	0.00s
P06.12	RO1 switch-off delay	0.00–360.00s	0.00–360.00	0.00s
P06.13	RO2 switch-on delay	0.00–360.00s	0.00–360.00	0.00s
P06.14	RO2 switch-off delay	0.00–360.00s	0.00–360.00	0.00s
P06.15	RO3 switch-on delay	0.00–360.00s	0.00–360.00	0.00s
P06.16	RO3 switch-off delay	0.00–360.00s	0.00–360.00	0.00s
P06.21	HDO1-as-DO switch-off delay	0.00–360.00s	0.00–360.00	0.00s
P06.22	HDO1-as-DO switch-off delay	0.00–360.00s	0.00–360.00	0.00s
P06.23	HDO2-as-DO switch-on delay	0.00–360.00s	0.00–360.00	0.00s
P06.24	HDO2-as-DO switch-off delay	0.00–360.00s	0.00–360.00	0.00s

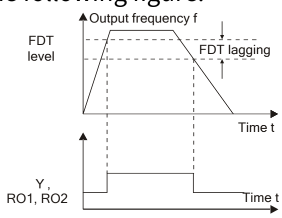
These function codes specify the delay time corresponding to the electrical level changes when the programmable output terminals switch on or switch off.



6.20 Frequency level detection (FDT)

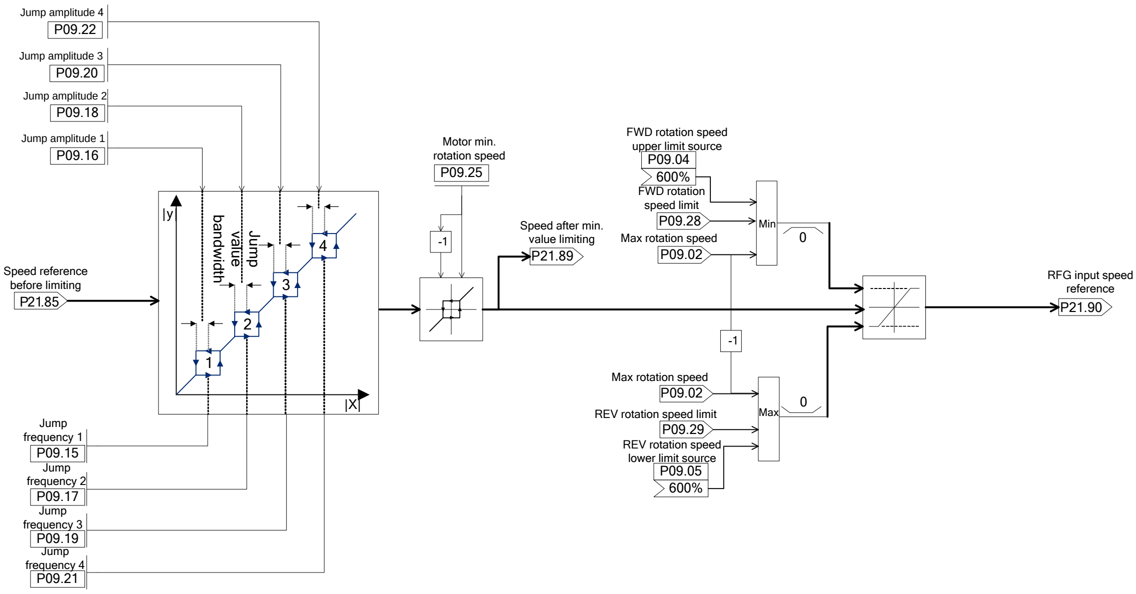
When the output frequency exceeds the corresponding frequency of FDT electrical level, the multifunction digital output terminal continuously outputs the signal of "Frequency level detection FDT". The signal is invalid only when the output frequency decreases to a value lower than the frequency corresponding to (FDT electrical level—FDT lagging detection value). See the following figure.



Function code	Name	Description	Setting range	Default
P03.52	Level detection value source of speed compare value	0: 0 1: Digital (-327.67–P09.02, 100.00%) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B When the output frequency exceeds the corresponding frequency of FDT electrical level, the signal of "Frequency level detection FDT" is valid, and the "Actual speed higher than comparison value" flag of SW1 is 1. The signal is invalid only when the output frequency decreases to a value lower than the frequency corresponding to (FDT electrical level—FDT lagging detection value). See the following figure.  	0–10	0
P03.53	Lagging detection value of speed compare value	-100.0–100.0% (FDT level detection value)	-100.0–100.0	5.0%
P03.54	Frequency arrival detection amplitude	When the output frequency is within the positive and negative detection range of the set frequency, the SW 1 bit 8 "Speed reached" flag is set to 1.	0.00–P09.02	0.50%

6.21 Jump frequency

The VFD can avoid mechanical resonance points by setting jump frequencies. The product supports setting four jump frequency points. If all the jump frequency points are set to 0, this function is invalid. When the set frequency is within the range of jump frequency, the VFD runs at the boundary of jump frequency.



Function code	Name	Description	Setting range	Default
P09.15	Jump rotation speed 1	0.00–100.00% (of the max speed)	0.00–100	0.00%
P09.16	Jump rotation speed amplitude 1	0.00–100.00% (of the max speed)	0.00–100	0.00%
P09.17	Jump rotation speed 2	0.00–100.00% (of the max speed)	0.00–100	0.00%
P09.18	Jump rotation speed amplitude 2	0.00–100.00% (of the max speed)	0.00–100	0.00%
P09.19	Jump rotation speed 3	0.00–100.00% (of the max speed)	0.00–100	0.00%
P09.20	Jump rotation speed amplitude 3	0.00–100.00% (of the max speed)	0.00–100	0.00%
P09.21	Jump rotation speed 4	0.00–100.00% (of the max speed)	0.00–100	0.00%
P09.22	Jump rotation speed amplitude 4	0.00–100.00% (of the max speed)	0.00–100	0.00%

6.22 HMI

6.22.1 User password

Function code	Name	Description	Setting range	Default
P07.00	User password	0–65535	0–65535	0

When you set the function code to a non-zero number, password protection is enabled.

If you set the function code to 00000, the previous user password is cleared and password protection is disabled.

After the user password is set and takes effect, you cannot enter the parameter menu if you enter an incorrect password. Please remember your password and save it in a secure place.

After you exit the function code editing interface, the password protection function is enabled within 1 minute. If password protection is enabled, "0.0.0.0.0" is displayed when you press the PRG/ESC key again to enter the function code editing interface. You need to enter the correct user password to enter the interface.

Note: Restoring the default values may delete the user password. Exercise caution when using this function.

6.22.2 Function selection of LOC/REM

Function code	Name	Description	Setting range	Default
P03.51	LOC/REM (QUICK/JOG on LED keypad) function selection	0: No function 1: Jog 2: Switch between states 3: Switch between forward and reverse rotating 4: Clear the UP/DOWN setting 5: Coast to stop 6: Local and remote switching 7: Quick commissioning mode (based on non-factory parameter settings)	0–7	6

The function code is used to set the function of the LOC/REM key.

0: No function

1: Jog run. Press the LOC/REM key for jog run.

2: Shift key to switch the display state. Press the LOC/REM key to shift the selected function code. For details, see the description for P24.08, P24.09, and P24.10.

3: Forward and reverse run switching. Press the LOC/REM key to switch the direction of the frequency command. It is valid only when the keypad is used as the command channel.

4: Clear the UP/DOWN setting. Press the LOC/REM key to clear the UP/DOWN setting.

5: Coast to stop. Press the LOC/REM key to coast to stop.

6: Local/remote command switching. Switch between local and remote control command channels. Local/remote command switching is primarily used for the LOC/REM key on the LCD keypad (or the QUICK/JOG key on the LED keypad), impacting the control channel and frequency main settings; when the LOC/REM key function is selected as local/remote command switching (P10.10=6), press this key to switch between the local control channel and the remote control channel. When the local command channel is used, the control channel and frequency main giving source are forcibly set to the keypad; when the remote command channel is used, the control channel and frequency main giving source are forcibly set to the control channel specified by P02.00 and the corresponding setting.

7: Quick commissioning mode (based on non-factory parameter settings)

Related function parameters

Function code	Name	Description	Setting range	Default
P24.08	Selection of parameters to be displayed in the stopped state	Bit 0: Set frequency (Hz on, blinking slowly) Bit 1: Bus voltage (V on) Bit 2: Input terminal status	0x0000–0xFFFF	0x000F

Function code	Name	Description	Setting range	Default
		Bit 3: Output terminal status Bit 4: PID reference value (% blinking) Bit 5: PID feedback value (% on) Bit 6: Set torque (% on) Bit 7: AI1 value (V on) Bit 8: AI2 value (V on) Bit 9: High-speed pulse HDI1 frequency Bit 10: High-speed pulse HDI2 frequency Bit 11: Actual step of multi-step speed Bit 12–Bit 15: Reserved		
P24.09	Selection 1 of parameters to be displayed in the running state	Bit 0: Running frequency (Hz on) Bit 1: Set frequency (Hz blinking) Bit 2: Bus voltage (V on) Bit 3: Output voltage (V on) Bit 4: Output current (A on) Bit 5: Running speed (rpm on) Bit 6: Output power (% on) Bit 7: Output torque (% on) Bit 8: PID reference value (% blinking) Bit 9: PID feedback value (% on) Bit 10: Input terminal status Bit 11: Output terminal status Bit 12: Set torque (% on) Bit 13–Bit 14: Reserved Bit 15: Actual step of multi-step speed	0x0000–0xFFFF	0x003F
P24.10	Selection 2 of parameters to be displayed in the running state	Bit 0: AI1 value (V on) Bit 1: AI2 value (V on) Bit 2: High-speed pulse HDI1 frequency Bit 3: High-speed pulse HDI2 frequency Bit 4: Motor overload percentage (% on) Bit 5: VFD overload percentage (% on) Bit 6: Ramp frequency reference (Hz on) Bit 7: Linear speed Bit 8–Bit 15: Reserved	0x0000–0xFFFF	0x0000

In running state, the parameter display is restricted by P24.09 and P24.06. For a 16-bit binary number, if a bit is 1, the parameter corresponding to this bit can be viewed through the >>/SHIFT key during running. If this bit is 0, the parameter corresponding to this bit is not displayed. When setting P24.09 or P24.10, convert the binary number to an hex number before the input to the function code. The method for setting P24.08 is similar to that for P24.09. In stopped state, the parameter display is restricted by P24.08.

6.22.3 Parameter display setting

Setting the following function codes can change the display on the keypad and the number of decimal places.

Function code	Name	Description	Setting range	Default
P24.11	Motor parameter display selection	0: Only display the parameters of the currently selected motor type (parameters of AMs or SMs). 1: Display all motor parameters.	0–1	0
P24.12	Frequency display decimal places	0: None 1: One decimal place 2: Two decimal places This variable is displayed on the keypad main page after P24.09 bit 0 is effective.	0–2	2
P24.13	Linear speed display decimal places	0: None 1: One decimal place By pressing the SHIFT key, this variable is displayed on the keypad main page after P24.10 bit 7 is effective.	0–1	0
P24.14	Keypad main page display frequency	0: Display actual running frequency 1: Display ramp reference frequency	0–1	1

6.23 Bus adapter

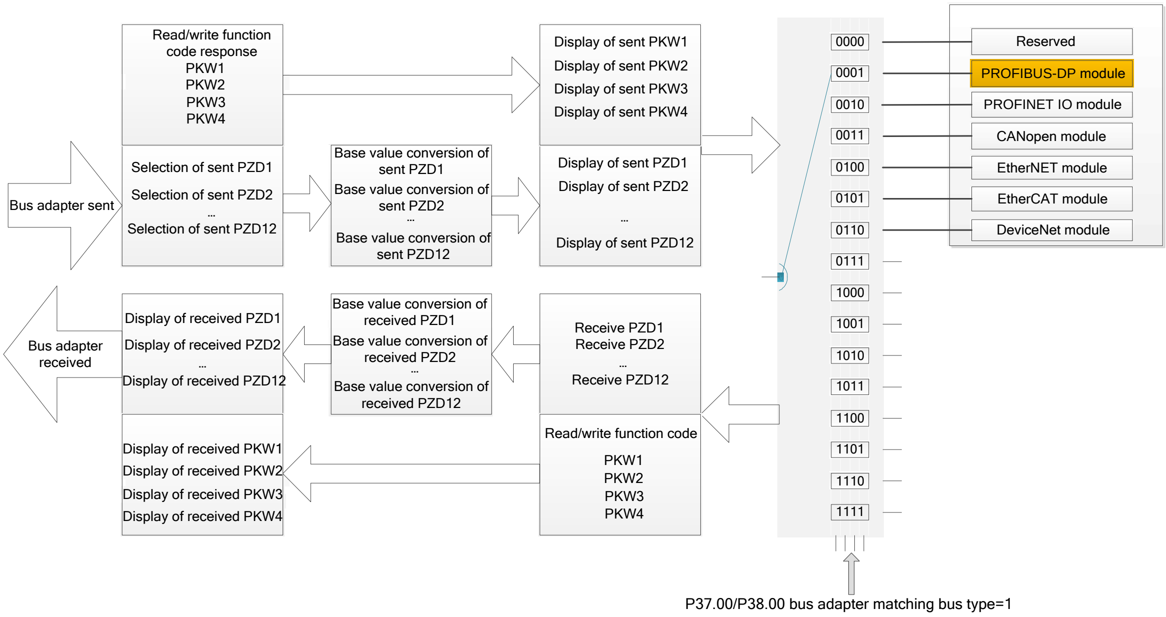
The product has two bus adapters, bus adapter A whose function codes are in group P37 and bus adapter B whose function codes are in group P38.

The supported bus types are as follows.

Function code	Name	Description	Setting range	Default
P37.00/ P38.00	Matching bus type of bus adapter	0: Without 1: PROFIBUS-DP module 2: PROFINET IO module 3: CANopen module 4: EtherNET module 5: EtherCAT module 6: DeviceNet Module The setting of P37.00 must be different from that of P38.00, which is automatically processed in the software; if two identical cards are required, use a redundant bus. For example, if bus adapter B selects the PROFINET module but multiple PROFINET expansion cards are inserted into the card slots, the card with the smallest slot number will automatically be the valid expansion card; other types	0–6	2

Function code	Name	Description	Setting range	Default
		of cards comply with the same rule.		

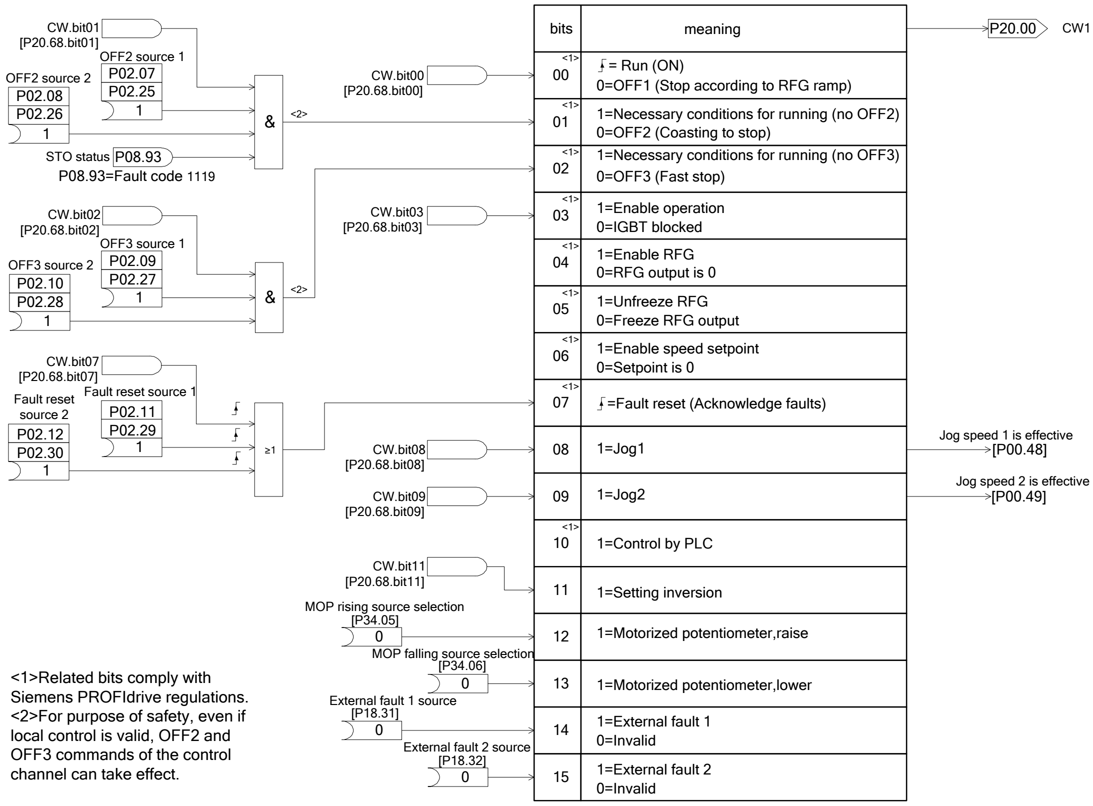
The bus adapter data flow is shown as follows.



Bus adapter CW source

Function code	Name	Description	Setting range	Default
P37.94	Bus adapter A CW 1 source	0: 0 1: Digital (0–65535) 2: Other-C connector (2: P37.82)	0–2	2
P38.94	Bus adapter B CW 1 source	0: 0 1: Digital (0–65535) 2: Other-C connector (2: P38.82)	0–2	2

The default CW source of a bus adapter is PZD1, and the corresponding bit information for CW 1 is as follows.



Note: If the PLC controls start/stop, bit 10 of CW 1 must be set to 1.

Bus adapter communication disconnection is handled as follows:

When the system does not receive correct data frames and the duration of this situation exceeds the communication disconnection detection delay time P37.98 (for bus adapter A) or P38.98 (for bus adapter B), the system bus adapter communication disconnection flag is set, and a fault or alarm can be reported for the communication disconnection.

Function code	Name	Description	Setting range	Default
P37.98	Communication disconnection detection delay for bus adapter A	0: No detection 0.00–60.00s	0.00–60.00	0.00s
P37.99	Communication disconnection handling for bus adapter A	0: Report a fault 1: Report an alarm, keeping the running at the target frequency	0–1	0
P38.98	Communication disconnection detection delay for bus adapter B	0: No detection 0.00–60.00s	0.00–60.00	0.00s
P38.99	Communication disconnection handling for bus adapter B	0: Report a fault 1: Report an alarm, keeping the running at the target frequency	0–1	0

Bus adapter related function codes:

Function code	Name	Description	Setting range	Default
P37.00	Matching bus type of bus adapter	0: Without 1: PROFIBUS-DP module 2: PROFINET IO module 3: CANopen module 4: EtherNET module 5: EtherCAT module 6: DeviceNet Module The setting of P37.00 must be different from that of P38.00, which is automatically processed in the software; if two identical cards are required, use a redundant bus. For example, if bus adapter A selects the DP module but multiple DP expansion cards are inserted into the card slots, the card with the smallest slot number will automatically be the valid expansion card; other types of cards comply with the same rule.	0–6	1
P37.02–P37.13	Sent PZD1 source – Sent PZD12 source	0: 0 1: Digital (0–65535) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP	0–8	2
P37.14, P37.16, P37.18, P37.20, P37.22, P37.24, P37.26, P37.28, P37.30, P37.32, P37.34, P37.36	Conversion base value numerator of sent PZD1 – Conversion base value numerator of sent PZD12	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	1
P37.15, P37.17, P37.19, P37.21, P37.23, P37.25, P37.27, P37.29, P37.31, P37.33,	Conversion base value denominator of sent PZD1 – Conversion base value denominator of sent PZD12	1–65535	1–65535	1

Function code	Name	Description	Setting range	Default
P37.35, P37.37				
P37.38, P37.40, P37.42, P37.44, P37.46, P37.48, P37.50, P37.52, P37.54, P37.56, P37.58, P37.60	Conversion base value numerator of received PZD1 – Conversion base value numerator of received PZD12	Received PZD = (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	1
P37.39, P37.41, P37.43, P37.45, P37.47, P37.49, P37.51, P37.53, P37.55, P37.57, P37.59, P37.61	Conversion base value denominator of received PZD1 – Conversion base value denominator of received PZD12	1–65535	1–65535	1
P37.62–P37.65	Sent PKW1 data display– Sent PKW4 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P37.66–P37.77	Sent PZD1 data display – Sent PZD12 data display	Sent PZD data display = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0x0000–0xFFFF	0x0000
P37.78–P37.81	Received PKW1 data display – Received PKW4 data display	PKW physically received data	0x0000–0xFFFF	0x0000
P37.82	Received PZD1 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P37.83	Received PZD12 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P37.84–P37.93	Received PZD3 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000

Function code	Name	Description	Setting range	Default
	– Received PZD12 data display			
P37.94	Bus adapter A CW 1 source	0: 0 1: Digital (0–65535) 2: Other-C connector (2: P37.82)	0–2	2
P37.96	Bus adapter A received PZD1 polarity	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P37.97	Bus adapter A received PZD2 polarity	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P37.98	Communication disconnection detection delay	0.00–60.00s (0.00: No detection)	0.00–60.00	0.00s
P37.99	Communication disconnection handling	0: Report a fault 1: Report an alarm, keeping the running at the target frequency	0–1	0
P38.00	Matching bus type of bus adapter	0: Without 1: PROFIBUS-DP module 2: PROFINET IO module 3: CANopen module 4: EtherNET module 5: EtherCAT module 6: DeviceNet Module The setting of P37.00 must be different from that of P38.00, which is automatically processed in the software; if two identical cards are required, use a redundant bus. For example, if bus adapter A selects the DP module but multiple DP expansion cards are inserted into the card slots, the card with the smallest slot number will automatically be the valid expansion card; other types of cards comply with the same rule.	0–6	1
P38.02–P38.13	Sent PZD1 source – Sent PZD12 source	0: 0 1: Digital (0–65535) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP	0–8	2
P38.14, P38.16, P38.18, P38.20,	Conversion base value numerator of sent PZD1 –	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	1

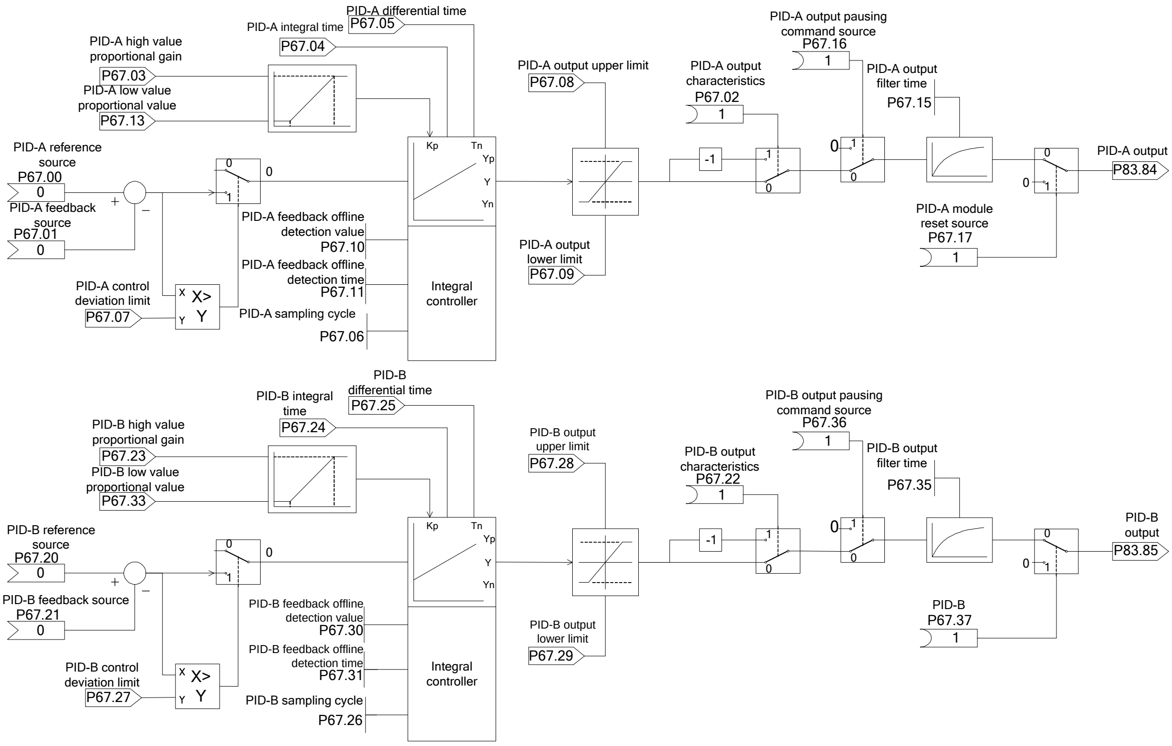
Function code	Name	Description	Setting range	Default
P38.22, P38.24, P38.26, P38.28, P38.30, P38.32, P38.34, P38.36	Conversion base value numerator of sent PZD12			
P38.15, P38.17, P38.19, P38.21, P38.23, P38.25, P38.27, P38.29, P38.31, P38.33, P38.35, P38.37	Conversion base value denominator of sent PZD1 – Conversion base value denominator of sent PZD12	1–65535	1–65535	1
P38.38, P38.40, P38.42, P38.44, P38.46, P38.48, P38.50, P38.52, P38.54, P38.56, P38.58, P38.60	Conversion base value numerator of received PZD1 – Conversion base value numerator of received PZD12	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	1
P38.39, P38.41, P38.43, P38.45, P38.47, P38.49, P38.51, P38.53, P38.55, P38.57, P38.59, P38.61	Conversion base value denominator of received PZD1 – Conversion base value denominator of received PZD12	1–65535	1–65535	1
P38.62–P38.65	Sent PKW1 data display – Sent PKW4 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000

Function code	Name	Description	Setting range	Default
P38.66–P38.77	Sent PZD1 data display – Sent PZD12 data display	Sent PZD data display = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0x0000–0xFFFF	0x0000
P38.78–P38.81	Received PKW1 data display – Received PKW4 data display	PKW physically received data	0x0000–0xFFFF	0x0000
P38.82	Received PZD1 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P38.83	Received PZD12 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P38.84–P38.93	Received PZD3 data display – Received PZD12 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.94	Bus adapter A CW 1 source	0: 0 1: Digital (0–65535) 2: Other-C connector (2: P37.82)	0–2	2
P38.96	Bus adapter A received PZD1 polarity	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P38.97	Bus adapter A received PZD2 polarity	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P38.98	Communication disconnection detection delay	0: No detection 0.00–60.00s	0.00–60.00	0.00s
P38.99	Communication disconnection handling	0: Report a fault 1: Report an alarm, keeping the running at the target frequency	0–1	0

6.24 PID control

PID control, a common mode for process control, is mainly used to adjust the inverter unit output frequency or output voltage through performing scale-division, integral and differential operations on the difference between feedback signal of controlled variables and signal of the target, thus forming a negative feedback system to keep the controlled variables above the target. It is applicable to flow control, pressure control, temperature control, and so on. There are two PID control channels (PID-A and PID-B) for this type of VFD.

The following is the basic schematic block diagram for output frequency regulation.



Introduction to the working principles and control methods for PID control:

Proportional control (Kp): When the feedback deviates from the reference, the output will be proportional to the difference. If such a difference is constant, the regulating variable will also be constant. Proportional control can respond to feedback changes rapidly, however, it cannot eliminate the difference by itself. A larger proportional gain indicates a faster regulating speed, but a too large gain will result in oscillation. To solve this problem, set the integral time to a large value and the differential time to 0, run the system only with proportional control, and then change the reference to observe the difference (that is, static difference) between the feedback signal and reference. If the static difference occurs in the direction of reference change (such as reference increase, where the feedback is always less than the reference after system stabilizes), continue increasing the proportional gain; otherwise, decrease the proportional gain. Repeat this process until the static difference becomes small.

Integral time (Ti): When feedback deviates from reference, the output regulating variable accumulates continuously, if the difference persists, the regulating variable will increase continuously until difference disappears. The integral regulator can be used to eliminate static difference. However, too large regulation may lead to repetitive overshoot, which will cause system instability and oscillation. The feature of oscillation caused by strong integral effect is that the feedback signal fluctuates up and down based on the reference variable, and fluctuation range increases gradually until oscillation occurs. The integral time parameter is generally regulated gradually from large to small until the stabilized system speed fulfills the requirement.

Differential time (Td): When the difference between feedback and reference changes, there is output of the regulating variable that is proportional to the difference variation rate, and this regulating variable is only related to the direction and magnitude of the difference change rather than the direction and magnitude of the difference itself. Differential control is used to control the feedback signal variation based on the change trend. Exercise caution before using the differential regulator since it may enlarge the system interferences, especially those with high change frequency.

6.24.1 General procedure for PID parameter setting

Step 1 Determine proportional gain P.

When determining proportional gain P, first, remove the integral term and derivative term of PID by making Ti=0 and Td=0 (see PID parameter setup for details), thus turning PID into pure proportional control. Set the input to 60%–70% of the max allowable value, and increase proportional gain P gradually from 0 until system oscillation occurred, and then in turn, decrease proportional gain P gradually from current value until system oscillation disappears, record the proportional gain P at this point and set the proportional gain P of PID to 60%–70% of current value. This is the entire commissioning procedure of proportional gain P.

Step 2 Determine integral time Ti.

After proportional gain P is determined, set the initial value of integral time Ti to a large value, and decrease Ti gradually until system oscillation occurs. Then in reverse, increase Ti until system oscillation disappears. Record the value of Ti at this point. Set the integral time constant Ti of PID to 150%–180% of this value. This is the commissioning procedure of integral time constant Ti.

Step 3 Determine derivative time Td.

The differential time Td is generally set to 0.

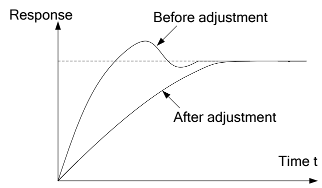
If you need to set Td to another value, the setting method is similar to that for P and Ti, namely, set Td to 30% of the value when there is no oscillation.

Step 4 Empty system load, perform load-carrying joint debugging, and then adjust PID parameters until fulfilling the requirement.

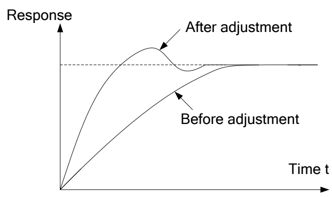
6.24.2 How to fine-tune PID

After setting the parameters controlled by PID, you can adjust these parameters by the following means.

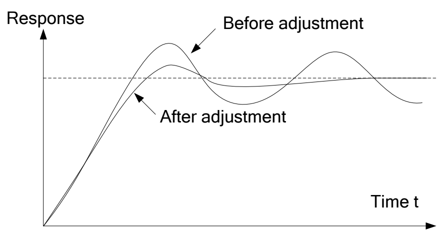
Control overshoot: When overshoot occurred, shorten the derivative time (Td) and prolong integral time (Ti).



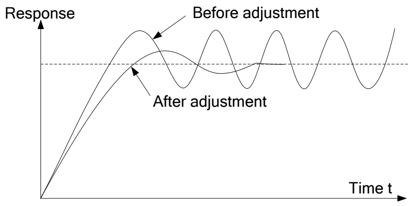
Stabilize the feedback value as fast as possible: When overshoot occurred, shorten integral time (Ti) and prolong derivative time (Td) to stabilize control as fast as possible.



Control long-term vibration: If the cycle of periodic vibration is longer than the set value of integral time (Ti), it indicates the integral action is too strong, prolong the integral time (Ti) to control vibration.



Control short-term vibration: If the vibration cycle is as short almost the same as the set value of differential time (Td), it indicates the differential action is too strong. Shorten the differential time (Td) to control vibration. When the differential time (Td) is set to 0.00 (namely no differential control), and there is no way to control vibration, decrease the proportional gain.



Related function parameters

Function code	Name	Description	Setting range	Default
P67.00	PID-A reference source	0: Invalid 1: Digital (-100.00–100.00, 0.00%) 2: Other-C connector (0.00–99.99, 0.00) 3: AI1 4: AI2 5: High-speed pulse HDI1 6: High-speed pulse HDI2 7: Multi-step speed run 8: MOP 9: Process data 2 of bus adapter A 10: Process data 2 of bus adapter B	0–10	0
P67.20	PID-B reference source	0: Invalid 1: Digital (–100.00–100.00) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: High-speed pulse HDI1 6: High-speed pulse HDI2 7: Multi-step speed run 8: MOP 9: Process data 2 of bus adapter A 10: Process data 2 of bus adapter B	0–10	0

The function code determines the target given channel during the PID process.

The set target of process PID is a relative value, for which 100% equals 100% of the feedback signal of the controlled system.

The system always performs calculation by using a relative value (0–100.0%).

Function code	Name	Description	Setting range	Default
P67.01	PID-A feedback source	0: Invalid 1: Digital 2: Other-C connector 3: AI1 4: AI2 5: High-speed pulse HDI1	0–10	0

Function code	Name	Description	Setting range	Default
		6: High-speed pulse HDI2 7: Multi-step speed run (reserved) 8: MOP 9: Process data 2 of bus adapter A 10: Process data 2 of bus adapter B		
P67.21	PID-B feedback source	0: Invalid 1: Digital 2: Other-C connector 3: AI1 4: AI2 5: High-speed pulse HDI1 6: High-speed pulse HDI2 7: Multi-step speed run (reserved) 8: MOP 9: Process data 2 of bus adapter A 10: Process data 2 of bus adapter B	0–10	0

Select the PID feedback channel.

Note: The reference channel and feedback channel cannot be duplicate. Otherwise, effective PID control cannot be achieved.

Function code	Name	Description	Setting range	Default
P67.02	PID-A output characteristics	0: PID output is positive. 1: PID output is negative. 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P67.22	PID-B output characteristics	0: PID output is positive. 1: PID output is negative. 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0

Select PID output characteristics:

0: PID output is positive. When the feedback signal is greater than the PID reference value, the output frequency of the VFD will decrease to balance the PID. Example: PID control on tension during unwinding.

1: PID output is negative. When the feedback signal is greater than the PID reference value, the output frequency of the VFD will increase to balance the PID. Example: PID control on tension during unwinding.

Function code	Name	Description	Setting range	Default
P67.03	PID-A proportional gain (Kp)	0.00–100.00	0.00–100.00	1.00
P67.23	PID-B Prop Gain(Kp)	0.00–100.00	0.00–100.00	1.00

The function is applied to the proportional gain P of PID input.

P determines the strength of the whole PID adjuster. The value 100 indicates that when the difference between the PID feedback value and given value is 100%, the range within which the PID regulator can regulate the output frequency command is the max frequency (ignoring integral function and differential function).

Function code	Name	Description	Setting range	Default
P67.04	PID-A integral time (Ti)	0.00–10.00s	0.00–10.00	1.00s
P67.24	PID-B integral time (Ti)	0.00–10.00s	0.00–10.00	1.00s

The function codes determine the speed of the integral adjustment on the deviation of PID feedback and reference from the PID regulator.

When the deviation between PID feedback and reference is 100%, the integral regulator works continuously during the time (ignoring proportional and differential functions) to achieve the PID output upper limit. Shorter integral time indicates stronger adjustment.

Function code	Name	Description	Setting range	Default
P67.05	PID-A differential time (Td)	0.00–10.00s	0.00–10.00	0.00s
P67.25	PID-B differential time (Td)	0.00–10.00s	0.00–10.00	0.00s

The function codes determine the strength of the change ratio adjustment on the deviation of PID feedback and reference from the PID regulator.

If the PID feedback changes 100% during the time, the adjustment of the differential regulator (ignoring proportional and integral functions) is the max output frequency (P09.02) or the max voltage (P04.16). Longer differential time indicates stronger adjustment.

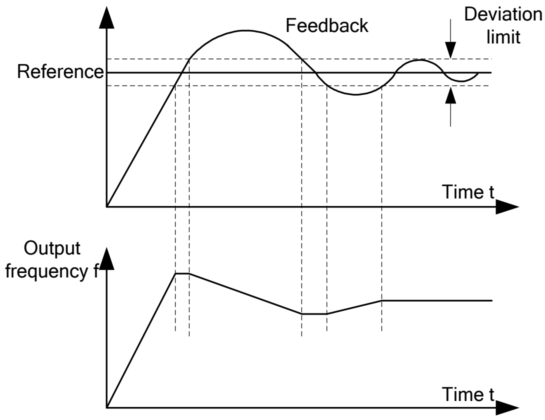
Function code	Name	Description	Setting range	Default
P67.06	PID-A sampling cycle (T)	0.001–1.000s	0.001–1.000	0.001s
P67.26	PID-B sampling cycle (T)	0.001–1.000s	0.001–1.000	0.001s

The function codes indicate the sampling cycle of feedback. The regulator calculates in each sampling cycle. A longer sampling cycle indicates slower response.

Function code	Name	Description	Setting range	Default
P67.07	PID-A control deviation limit	0.1–100.0%	0.1–100.0	0.1%

Function code	Name	Description	Setting range	Default
P67.27	PID-B control deviation limit	0.1–100.0%	0.1–100.0	0.1%

The output of the PID system is relative to the max deviation of the closed loop reference. As shown in the following figure, the PID regulator stops regulating in the range of deviation limit. Set the function parameter properly to adjust the accuracy and stability of the PID system.



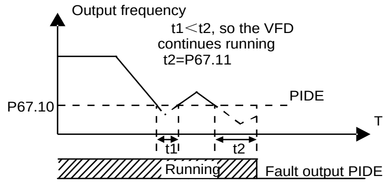
Function code	Name	Description	Setting range	Default
P67.08	PID-A output upper limit	P67.09–100.0% (Max frequency or voltage)	P67.09-100.0	100.0%
P67.09	PID-A output lower limit	-100.0%–P67.08 (Max frequency or voltage)	-100.0–P67.08	0.0%
P67.28	PID-B output upper limit	P67.29–100.0% (Max frequency or voltage)	P67.29-100.0	100.0%
P67.29	PID-B output lower limit	-100.0%–P67.28 (Max frequency or voltage)	-100.0–P67.28	0.0%

The function codes are used to set the upper and lower limits of PID regulator output values.

100.0% corresponds to the max output frequency (P00.03) or max voltage (P04.31).

Function code	Name	Description	Setting range	Default
P67.10	PID-A feedback offline detection value	0.0–100.0%	0.0–100.0	0.0%
P67.11	PID-A feedback offline detection time	0.0–3600.0s	0.0–3600.0	1.0s
P67.30	PID-B feedback offline detection value	0.0–100.0%	0.0–100.0	0.0%
P67.31	PID-B feedback offline detection time	0.0–3600.0s	0.0–3600.0	1.0s

The function codes are used to set the PID feedback offline detection values. When the feedback value is smaller than or equal to the feedback offline detection value, and the duration exceeds the value specified by P67.10, the VFD reports "PID feedback offline fault" and the keypad displays PIDE.



Function code	Name	Description	Setting range	Default
P67.12	PID-A regulation selection	Ones place: 0: Continue integral control after the frequency reaches upper/lower limit 1: Stop integral control after the frequency reaches upper/lower limit Tens place: 0: Same as the main given direction. When PID regulated output is inconsistent with the present running direction, the output is forced to 0. 1: Contrary to the main given direction. When PID regulated output is inconsistent with the present running direction, the closed-loop regulation output is executed at the direction opposite to the present running direction. Hundreds place–thousands place: Reserved	0x0000–0x1111	0x0001
P67.32	PID regulation selection	Ones place: 0: Continue integral control after the frequency reaches upper/lower limit 1: Stop integral control after the frequency reaches upper/lower limit Tens place: 0: Same as the main given direction. When PID regulated output is inconsistent with the present running direction, the output is forced to 0. 1: Contrary to the main given direction. When PID regulated output is inconsistent with the present running direction, the closed-loop regulation output is executed at the direction opposite to the present running direction.	0x0000–0x1111	0x0001

Function code	Name	Description	Setting range	Default
		Hundreds place–thousands place: Reserved		

Ones place:

0: Continue integral control after the frequency reaches upper/lower limit. The integral amount is adjusted in real time in response to changes between the given amount and the feedback amount, unless the internal integral limit has been reached. When the amount trend between the given amount and feedback amount changes, it takes longer time to offset the effect of continued integration so that the amount of integration can follow the trend.

1: Stop integral control after the frequency reaches upper/lower limit, with the integration amount remaining unchanged. When the amount trend between the given amount and feedback amount changes, the amount of integration will soon follow the trend.

Function code	Name	Description	Setting range	Default
P83.84	PID-A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.85	PID-B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000

6.25 Protection functions

Function code	Name	Description	Setting range	Default
P18.00	Protection against phase loss	Ones place: 0: Disable output phase loss detection. 1: Enable output phase loss detection. Tens place: 0: Disable input phase loss detection. 1: Enable input phase loss detection.	0x00–0x11	0x01

Enable phase loss protection.

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P18.03</td><td>Enabling frequency fall at power down</td><td>0: Disable
1: Enable</td><td>0–1</td><td>1</td></tr>
<tr><td>P18.04</td><td>Voltage of frequency fall at sudden power down</td><td><table><tr><th>Voltage class</th><th>Voltage of frequency fall at sudden power down</th></tr><tr><td>380V</td><td>690V</td></tr><tr><td>432V</td><td>752V</td></tr></table></td><td>P18.25–P18.24</td><td>432.0V</td></tr>
<tr><td>P18.05</td><td>Frequency decrease ratio at sudden power down</td><td>0.00%–P09.02</td><td>0.00 –P09.02</td><td>3.00%</td></tr>
</table>

Function code	Name	Description	Setting range	Default
P18.06	Voltage loop proportional coefficient at sudden power down	0–1000	0–1000	60
P18.07	Voltage loop integral coefficient at sudden power down	0–1000	0–1000	5
P18.08	Current loop proportional coefficient at sudden power down	0–1000	0–1000	40
P18.09	Current loop integral coefficient at sudden power down	0–1000	0–1000	5

Set the protection point and regulation coefficient at sudden power down. If the bus voltage drops to the sudden frequency fall point due to grid power down, the VFD decreases the running frequency according to the frequency fall rate at sudden power down, which makes the motor in power generation state. The regenerative power can maintain the bus voltage to ensure normal running of the VFD until the recovery of power.

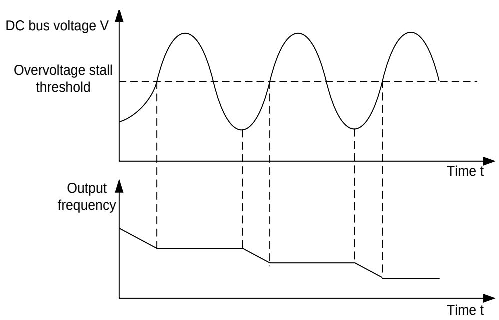
Voltage class	Voltage of frequency fall at sudden power down
380V	690V
432V	752V

Note:

- Adjusting the value of this function code properly can avoid stop that is made for the purpose of protection in grid switchover.
- This function can be enabled only when the input phase loss protection function is disabled.

Function code	Name	Description	Setting range	Default
P18.10	Enabling overvoltage stall protection (VDC control enabling)	0: Disable 1: Enable	0–1	1

Enable overvoltage stall protection.



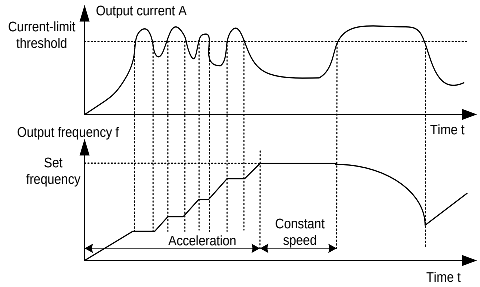
<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P18.11</td><td>Overvoltage stall protection voltage</td><td>P18.25–P18.24<table><tr><th>Voltage class</th><th>Overvoltage stall protection voltage</th></tr><tr><td>380V</td><td>660V</td></tr><tr><td>734.4V</td><td>1120.0V</td></tr></table></td><td>P18.25–P18.24</td><td>734.4V</td></tr>
<tr><td>P18.12</td><td>Overvoltage stall voltage-loop Kp</td><td>0–1000</td><td>0–1000</td><td>60</td></tr>
<tr><td>P18.13</td><td>Overvoltage stall voltage-loop Ki</td><td>0–1000</td><td>0–1000</td><td>5</td></tr>
<tr><td>P18.14</td><td>Overvoltage stall current-loop Kp</td><td>0–1000</td><td>0–1000</td><td>60</td></tr>
<tr><td>P18.15</td><td>Overvoltage stall current-loop Ki</td><td>0–1000</td><td>0–1000</td><td>250</td></tr>
</table>

Set the overvoltage stall protection point and overvoltage stall regulation coefficient.

Function code	Name	Description	Setting range	Default
P18.17	Enabling auto current limit	0: Disable; 1: Enable	0–1	1
P18.18	Automatic current limit threshold	50–200%	50–200	140%
P18.19	Auto current limit frequency falling rate	The current-limit protection function detects output current during running, and compares it with the current-limit level defined by P18.18, if it exceeds the current-limit level, the VFD will run at stable frequency during accelerated running, or run in decreased frequency during constant-speed running; if it exceeds the current-limit level continuously, the VFD output frequency will drop continuously until reaching lower limit frequency. When the output current is detected to be lower than the current-limit level again, it will continue accelerated running.	0.00–20.00	20%
P18.17	Auto current limit regulation Kp	0–1000	0–1000	60
P18.18	Auto current limit regulation Ki	0–1000	0–1000	60

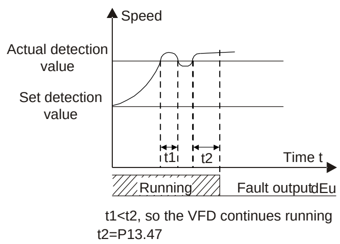
During accelerated running, as the load is too large, the actual acceleration rate of motor is lower than that of output frequency, if no measures are taken, the VFD may trip due to overcurrent during acceleration.

Current-limit protection function detects output current during running, and compares it with the current-limit level defined by P13.18, if it exceeds the current-limit level, the VFD will run at stable frequency during accelerated running, or run in decreased frequency during constant-speed running; if it exceeds the current-limit level continuously, the VFD output frequency will drop continuously until reaching lower limit frequency. When the output current is detected to be lower than the current-limit level again, it will continue accelerated running.



Function code	Name	Description	Setting range	Default
P18.23	Bus overvoltage pre-alarm point	105–120%	105–120	110%
P18.24	Software bus overvoltage point	For 380V models: 800.0V For 660V models: 1200.0V	0–2000.0V	Model depended
P18.25	Software bus undervoltage point	For 380V models: 350.0V For 660V models: 570.0V	0–1000.0V	Model depended
P18.26	Software overcurrent point	50.0–220.0% (of the VFD rated current)	50–220.0	210.0%
P18.27	Hardware current limit point (unit current limit point)	50–200% (of the VFD rated current)	50–200	195%
P18.28	Overspeed detection value	100.0–150.0% (of the max frequency)	100.0–150.0	120.0%
P18.29	Overspeed detection time	The output is valid if the running speed is higher than the speed detection value, with the duration of this situation exceeding the detection time, and the DO output selects overspeed.	0.0 (No detection)–60.0	0.5s

Set the speed deviation detection time.



6.26 Encoder function

The VFD encoder speed measurement requires an encoder expansion card inserted into the main control box. It is recommended that the encoder be inserted in the SLOT1 card slot, and set P48.00=0 to configure the encoder card slot. Check P48.01 to check whether the encoder card is connected successfully.

The VFD supports the speed detecting by the local encoder or by encoder expansion card. The speed detecting method is specified by P48.18.

Method 1 Speed detecting with encoder directly connected

Set P48.18=1 (direct-connected speed detecting). The VFD supports encoder differential and single-ended input (push-pull and open collector). You can check P48.31 to view the encoder detected frequency.

Method 2 Encoder expansion card based speed detecting

Set P48.18=2 (communication based speed detecting). This supports encoder remote connection, and one device configured with multiple encoders.

To check whether the detected speed is normal, do as follows:

Step 1 Restore to default values through the keypad.

Step 2 Set P09.02 (Max output speed) and parameters in P14 according to motor nameplate parameters.

Step 3 Perform motor parameter autotuning. The autotuned parameters are automatically saved to related motor parameters in group P14.

Step 4 Check whether the encoder based speed detecting is normal. Set P48.03 (Encoder pulse count) and set P10.00 to 2 (V/F mode). When P00.01 is 20.00Hz, run the VFD. Then the motor frequency is about 20Hz. Check the value of P48.31 (encoder detected speed). If the speed is negative, the encoder is in the reverse direction, and you need to set P48.04 ones place to 1. If the speed deviation is great, the value of P48.03 (encoder pulse count) is set improperly.

Encoder type display

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P48.00</td><td>Enabling module slot</td><td>This system supports that multiple slots can be inserted with modules of the same type. This function code is used to select the slot at which the module is enabled. P48.00, P49.00, P51.00, and P52.00 cannot be set to the same value.
0: SLOT1
1: SLOT2
2: SLOT3
3: SLOT2-1
4: SLOT2-2
5: SLOT2-3
6: SLOT3-1
7: SLOT3-2
8: SLOT3-3
9: Invalid
Note: After this function code is changed, you need to re-power on the control box for the newly selected card slot to take effect.</td><td>0–9</td><td>9</td></tr>
<tr><td>P48.01</td><td>Unit online state</td><td>This function code shows the online status of all PG cards connected to this control box, and the display content of P48.01 is the same as that of P49.01.<table><tr><td>Bit0</td><td>EC slot 1 module online state
(0: Offline; 1: Online)</td></tr><tr><td>Bit1</td><td>EC slot 2 module online</td></tr></table></td><td>0x00–0x1FF</td><td>0x000</td></tr>
</table>

Function code	Name	Description	Setting range	Default
		state (0: Offline; 1: Online) Bit2 EC slot 3 module online state (0: Offline; 1: Online) Bit3 EC slot 2-1 module online state (0: Offline; 1: Online) Bit4 EC slot 2-2 module online state (0: Offline; 1: Online) Bit5 EC slot 2-3 module online state (0: Offline; 1:Online) Bit6 EC slot 3-1 module online state (0: Offline; 1: Online) Bit7 EC slot 3-2 module online state (0: Offline; 1: Online) Bit8 EC slot 3-3 module online state (0: Offline; 1: Online)		
P48.02	Encoder type display	0: Invalid 1: Incremental encoder 2: Resolver-type encoder 3: Sin/Cos encoder (reserved) 4: Endat absolute encoder (reserved) 5: UVW encoder (reserved)	0–5	0

Note: Optional cards need to be selected.

Function code	Name	Description	Setting range	Default
P48.03	Encoder pulse count (PPR)	0–60000	0–60000	1024

Set the number of pulses per revolution for the encoder.

Function code	Name	Description	Setting range	Default
P48.04	Encoder direction	Ones place: AB direction 0: Forward 1: Reverse Tens place: Z pulse direction 0: Do not inverse 1: Inverse Hundreds place: 0: UVW is forward 1: UVW is reverse	0x000–0x111	0x000

Note: The number of encoder pulses (P48.03) must be set correctly when the VFD uses closed-loop vector control; otherwise, the motor will not run correctly. If the encoder parameters are set and it still does not run properly, change the encoder direction (P48.04).

Function code	Name	Description	Setting range	Default
P48.05	Encoder disconnection fault detection time	0.0–100.0s	0.0–100.0	1.0s
P48.06	Encoder reversal fault detection time	0.0–100.0s	0.0–100.0	1.0s
P48.07	Filter times of encoder detection	Bit0–bit3: Low-speed filter times Bit4–bit7: High-speed filter times High/low speed switching corresponds to P03.02.	0x00–0x99	0x33

P48.05 defines the encoder disconnection fault detection time. If the encoder disconnection time exceeds the set disconnection detection time, the VFD reports the encoder disconnection fault.

P48.06 defines the encoder reversal fault detection time. If the encoder reversal time exceeds the set reversal detection time, the VFD reports the encoder reversal fault.

Note: Adjusting the preceding parameters will affect the sensitivity of encoder fault protection, and it may even cause abnormal actions in some cases. Please adjust carefully.

Function code	Name	Description	Setting range	Default
P48.08	Mounting shaft rotation speed ratio	Speed ratio between encoder mounting shaft and motor	0.000–65.535	1.000

Set the speed ratio between the motor and encoder. Set the value according to onsite conditions.

Function code	Name	Description	Setting range	Default
P48.09	Closed-loop optimization control parameter	Bit 0: Enable Z-pulse calibration Bit 1: Enable encoder angle calibration Bit 2: Enable SVC speed measurement Bit3: Resolver based speed measurement mode selection Bit4: Z pulse capture mode Bit5: Do not detect the encoder initial angle in V/F control Bit 6: Enable the CD signal calibration Bit7: Disable Sin/Cos subdivision speed measurement Bit 8: Do not detect encoder faults during autotuning Bit 9: Enable Z pulse detection optimization Bit 10: Enable the initial Z pulse calibration optimization	0x0000–0xFFFF	0x0003

Function code	Name	Description	Setting range	Default
		Bit 12: Clear the Z pulse arrival signal after stop		

Define the initial angle of Z pulse.

Function code	Name	Description	Setting range	Default
P48.10	Enabling pulse Z disconnection detection	Ones place: Z pulse detection 0: No detection 1: Enable Tens place: UVW pulse detection (for SM) 0: No detection 1: Enable	0x00–0x11	0x00
P48.11	Initial angle of Z pulse	0.00–359.99	0.00–359.99	0.00
P48.12	Pole initial angle	0.00–359.99	0.00–359.99	0.00
P48.14	Motor temperature sensor type	0: PT100 1: KTY84 2: PT100*3 3: PT1000	0–3	0
P48.15	Speed measurement optimization selection	0: No optimization 1: Optimization mode 1 2: Optimization mode 2	0–2	0
P48.16	CD signal zero offset gain	0–65535	0–65535	0
P48.17	Encoder type selection	Ones place: Incremental encoder 0: Without UVW 1: With UVW Tens place: Sin/Cos encoder 0: without CD signal 1: with CD signal	0x00–0x11	0x00
P48.18	Speed detection signal source	Used to select the VFD speed detection signal source. 0: PG card direct connection signal 1: PG card SPI communication (PG card pulse signal comes from the encoder's own speed detection) 2: PG card SPI communication (PG card pulse signal comes from the frequency division input network port pulse reference)	0–2	0
P48.19	Frequency division coefficient	0: 1 1: 1 2: 2 3: 3 … 255: 255	0–255	0

Function code	Name	Description	Setting range	Default
P48.20	Frequency multiplication coefficient	The value is set in relation to the value of P48.03, and it is normally set to n: 2^n=65535/P48.03 The encoder position count value is displayed in P48.68 after the frequency multiplication coefficient is per-unit processed.	0–255	0
P48.21	Pulse filter handling selection	Bit 0: Indicates whether to enable encoder P-channel input filter 0: Do not filter 1: Filter Bit 1: Encoder signal filter mode 0: Self-adaptive filter 1: Use P48.22 as the filter parameter Bit 2: Indicates whether to enable encoder P-channel frequency-division output filter 0: Do not filter 1: Filter Bit 3: Indicates whether to enable filter for pulse reference F-channel frequency-division output 0: Do not filter 1: Filter Bit 4: Indicates whether to enable pulse reference F-channel filter 0: Do not filter 1: Filter Bit 5: Pulse reference F-channel filter mode 0: Self-adaptive filter 1: Use P48.23 as the filter parameter Bit 6–Bit 15: Reserved	0x0000–0xFFFF	0x0011
P48.22	Encoder P-channel filter width	Encoder feedback filter time **Note:** 0 indicates 0.25 μs.	0–63	39μs
P48.23	Pulse reference F-channel filter width	Pulse feedback filter time **Note:** 0 indicates 0.25 μs.	0–63	39μs
P48.24	Pulse reference F-channel pulse count	0–65535	0–65535	1024

Encoder feedback parameters

Function code	Name	Description	Setting range	Default
P48.30	Encoder autotuning frequency	0.00%–P09.02 (Max rotation speed)	0.00–P09.02	10.00%

Function code	Name	Description	Setting range	Default
P48.31	Actual frequency of encoder	-327.67–327.67Hz	-327.67–327.67	0.00Hz
P48.32	Encoder position count value	0–655.35	0–655.35	0.00
P48.33	Encoder Z pulse count value	0–65535	0–65535	0
P48.34	High bit of position reference value	0–30000	0–30000	0
P48.35	Low bit of position reference value	0–65535	0–65535	0
P48.36	High bit of position feedback value	0–30000	0–30000	0
P48.37	Low bit of position feedback value	0–65535	0–65535	0
P48.51	Resolver angle	0–359.99	0–359.99	0.00

Commissioning procedure for closed-loop vector control on AMs:

Step 1 Restore to default values through the keypad.

Step 2 Set P09.02 (Max output speed) and parameters in P14 according to motor nameplate parameters.

Step 3 Perform motor parameter autotuning.

Perform rotary parameter autotuning or static parameter autotuning by setting P03.00 on the keypad. If the motor can be disconnected from load, you can perform rotary parameter autotuning; otherwise, perform static parameter autotuning. The parameters obtained from autotuning are automatically saved to motor parameters in group P14.

Step 4 Verify whether the encoder is installed and set properly.

1. Determine the encoder direction and parameter settings.

Set P48.03 (Encoder pulse count), P10.00=2 (Control mode), P00.01=40% (Speed reference), and run the VFD. At this time, the motor rotation speed is 40% of the max rotation speed. Check whether P48.31 (Encoder actually detected frequency) is correct. If it is negative, the encoder direction is reverse. Set the ones place of P48.04 (Encoder direction) to 1. If the detected speed deviation is great, P48.03 is set improperly. Check whether P48.33 (Encoder Z pulse count value) fluctuates. If yes, it indicates the encoder suffers interference or P48.04 is set improperly. Then check the wiring and the shield layer.

2. Determine the Z pulse direction.

Set P00.01=40%, and set P14.32 (Motor phase setting) to forward and reverse in turn to check whether the difference in P48.33 is less than 5. If the difference remains greater than 5 after reversing the Z pulse direction through P48.04, power off and swap phase A and phase B of the encoder. Then check the difference in P48.33 between forward rotation and reverse rotation. The Z pulse direction only affects the forward/reverse positioning precision of the spindle positioning carried out with Z pulses.

Step 5 Perform closed-loop vector pilot-run.

Set P10.00=3, and perform closed-loop vector control, and adjust P00.10 and speed loop and current loop parameters in group P03 to implement stable run in the entire range.

Step 6 Perform flux-weakening control.

Set the flux-weakening regulator gain P10.16 and set P10.17 (0.0–500.0%), and check the flux-weakening control effect. You can adjust P10.13–P10.15 as needed.

Note: You must re-determine P48.04 (Encoder direction) if the motor or encoder wires are swapped.

6.27 Brake control

Function code	Name	Description	Setting range	Default
P31.00	Brake function selection	0: No holding brake 1: Enable holding brake	0–1	0

Set the effectiveness of brake control.

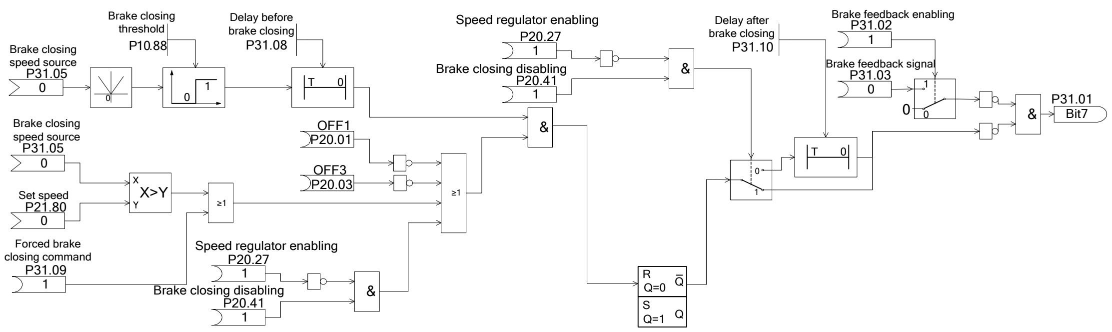
Function code	Name	Description	Setting range	Default
P31.03	Brake feedback source	0: Brake feedback opening signal (brake opened state) 1: Brake feedback closing signal (brake closed state) 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0

Set the brake feedback source.

Function code	Name	Description	Setting range	Default
P31.04	Brake feedback detection time	0.00–10.00s	0.00–10.00	0.00s

If brake control is valid and the digital input terminal selects the brake feedback detection function, and the braking action error time exceeds P31.04, the VFD reports the brake feedback fault (FAE).

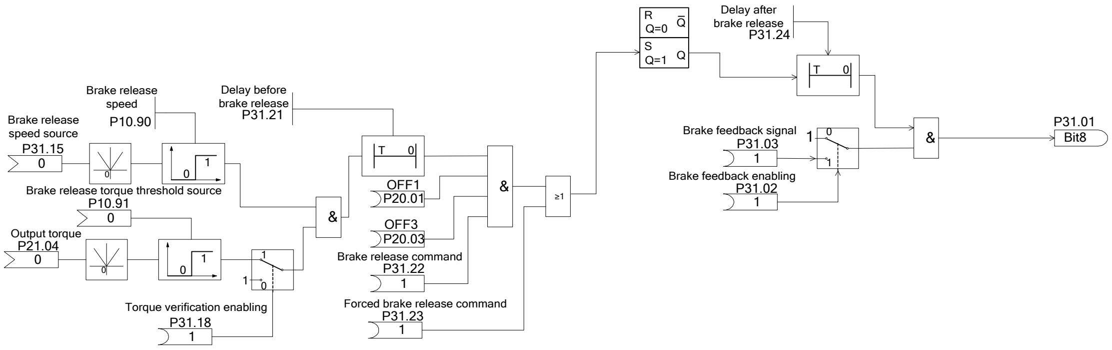
Brake closing control



Function code	Name	Description	Setting range	Default
P31.05	Brake closing speed source	0: 0 1: Digital (0.00–P09.02) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P31.07	Brake closing speed threshold display	Brake closing speed threshold display after enabling.	0.00–P09.02	0.00%
P31.08	Delay before brake closing	0.00–10.00s	0.00–10.00	0.00s
P31.10	Delay after brake closing	0.00–10.00s	0.00–10.00	0.00s

The delay before brake closing is the time from the VFD output frequency to the brake closing set frequency start and to the brake closing command output. The delay after brake closing is the time from the output of the closing command to the completion of the closing action, which is intended to increase the comfort of stopping.

Brake release control



Function code	Name	Description	Setting range	Default
P31.15	Brake release speed source	0: 0 1: Digital (0.00–P09.02) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P31.16	Brake release speed display	Displays the brake release speed actually activated. It is determined by P31.15 (Brake release speed source).	0.00–P09.02	0.00%

Function code	Name	Description	Setting range	Default
P31.17	Brake release speed threshold display	Brake release speed threshold display after enabling.	0.00–P09.02	0.00%
P31.21	Delay before brake release	0.00–10.00s	0.00–10.00	0.00s
P31.24	Delay after brake release	0.00–10.00s	0.00–10.00	0.00s

The delay before brake release is the time from the VFD rotation speed and torque verification passing to the time specified by P31.21 and to the brake release command output. This parameter is set so that the VFD prevents the motor from sliding when the brake is opened, thus changing the comfort level. The delay after brake release is the time from the brake release command sending to the brake opening.

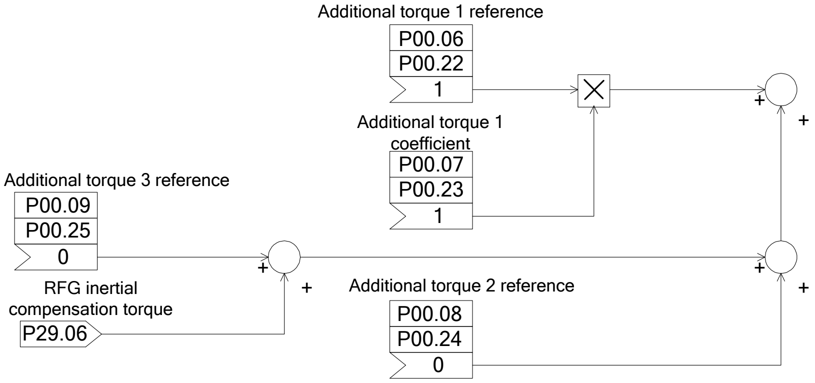
Function code	Name	Description	Setting range	Default
P31.18	Enabling brake release torque verification	0: Invalid 0: Enable	0–1	1
P10.91/ P13.91	Brake release torque threshold source	0: 0 1: Digital (30.00%–300.00%) 2: Other-C connector (optional but not limited to P31.06 brake closing torque memorizing value; current for open loop, while torque for closed loop) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0

If the torque verification function is enabled, and the VFD is in operation, subsequent brake release actions can be triggered only when the torque or current output of the VFD exceeds the set value.

Note: The torque verification function can be enabled only when brake control is in effective.

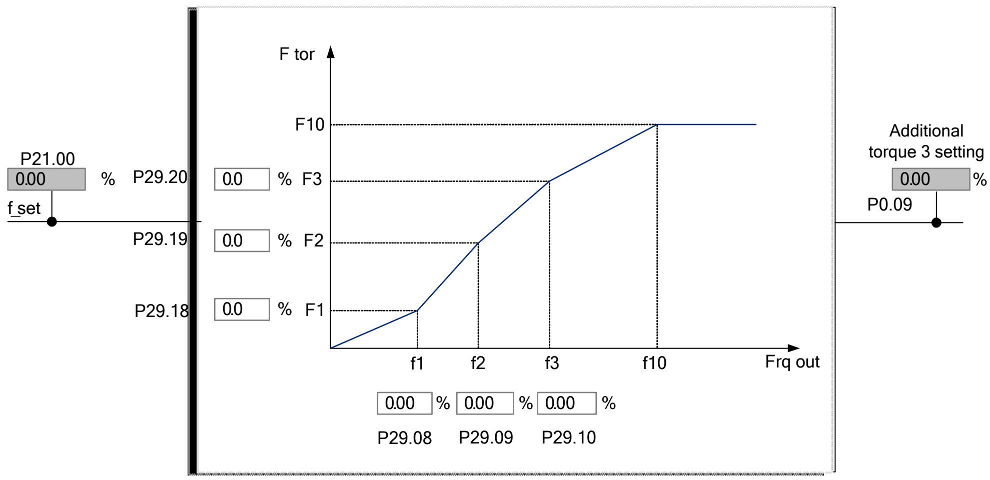
6.28 Friction compensation

If the motor control system want to follow a given RFG curve to accelerate or decelerate, you need to provide the motor with suitable acceleration torque Ta=Te-TL, relying solely on the speed regulator to adjust, usually cannot achieve desired effect, which may cause overshoot at the end of acceleration and speed lagging at the start of acceleration. Acceleration torque compensation can solve this problem, using the recognized rotation inertia and desired acceleration to directly calculate the required acceleration torque, which is superimposed to speed regulator output. This avoids the speed regulator adjustment and improves speed follow-up.



Function code	Name	Description	Setting range	Default
P29.01	RFG feedforward torque coefficient	0.0–100.0%	0.0–100.0	100.0%
P29.02	Inertia identification torque	0.0–100.0%	10.0	10.0%
P29.03	Enabling inertia compensation	0: Disable; 1: Enable	0–1	0
P29.04	Upper limit of inertia compensation torque	0.0–150.0%	10.0	10.0%
P29.05	Inertia compensation filter times	0–10	7	7
P29.06	Inertia compensation torque	0.0–100.0%	10.0	10.0%

The friction characteristic curve compensates for the friction torque generated by the motor and the working equipment. It allows you to pre-adjust the speed controller to optimize control performance. The friction characteristic curve uses 10 fulcrum points, as shown in the following figure, and the pivot coordinates consist of speed and torque parameters. In practical applications, the characteristic curves of speed and torque need to be tested first.



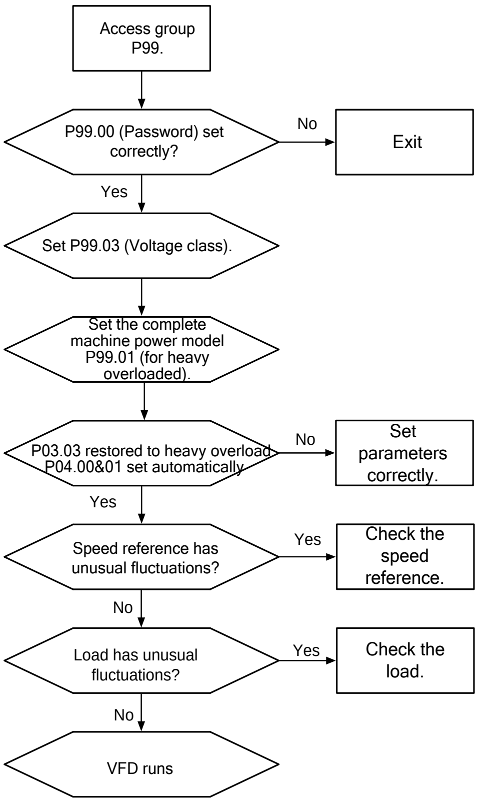
Function code	Name	Description	Setting range	Default
P29.07	Enabling friction torque compensation	0: Disable; 1: Enable	0–1	0
P29.08	Friction torque compensation 1 frequency setting	0.50%–P09.02	0.50–P09.02	10.00%

Function code	Name	Description	Setting range	Default
P29.09	Friction torque compensation 2 frequency setting	0.50%–P09.02	0.50–P09.02	20.00%
P29.10	Friction torque compensation 3 frequency setting	0.50%–P09.02	0.50–P09.02	20.00%
P29.11	Friction torque compensation 4 frequency setting	0.50%–P09.02	0.50–P09.02	40.00%
P29.12	Friction torque compensation 5 frequency setting	0.50%–P09.02	0.50–P09.02	50.00%
P29.13	Friction torque compensation 6 frequency setting	0.50%–P09.02	0.50–P09.02	60.00%
P29.14	Friction torque compensation 7 frequency setting	0.50%–P09.02	0.50–P09.02	70.00%
P29.15	Friction torque compensation 8 frequency setting	0.50%–P09.02	0.50–P09.02	80.00%
P29.16	Friction torque compensation 9 frequency setting	0.50%–P09.02	0.50–P09.02	90.00%
P29.17	Friction torque compensation 10 frequency setting	0.50%–P09.02	0.50–P09.02	100.00%
P29.18	Friction torque compensation 1 torque setting	0.00–100.00%	0.00–100.00	0.00%
P29.19	Friction torque compensation 2 torque setting	0.00–100.00%	0.00–100.00	0.00%
P29.20	Friction torque compensation 3 torque setting	0.00–100.00%	0.00–100.00	0.00%
P29.21	Friction torque compensation 4 torque setting	0.00–100.00%	0.00–100.00	0.00%
P29.22	Friction torque compensation 5 torque setting	0.00–100.00%	0.00–100.00	0.00%
P29.23	Friction torque compensation 6 torque setting	0.00–100.00%	0.00–100.00	0.00%
P29.24	Friction torque compensation 7 torque setting	0.00–100.00%	0.00–100.00	0.00%
P29.25	Friction torque compensation 8 torque setting	0.00–100.00%	0.00–100.00	0.00%

Function code	Name	Description	Setting range	Default
P29.26	Friction torque compensation 9 torque setting	0.00–100.00%	0.00–100.00	0.00%
P29.27	Friction torque compensation 10 torque setting	0.00–100.00%	0.00–100.00	0.00%

6.29 Driving configuration

Before drive commissioning, power configuration, and the matching between control units and power units need to be completed. Set parameters in group P99 (Factory function group) to achieve power unit configuration.

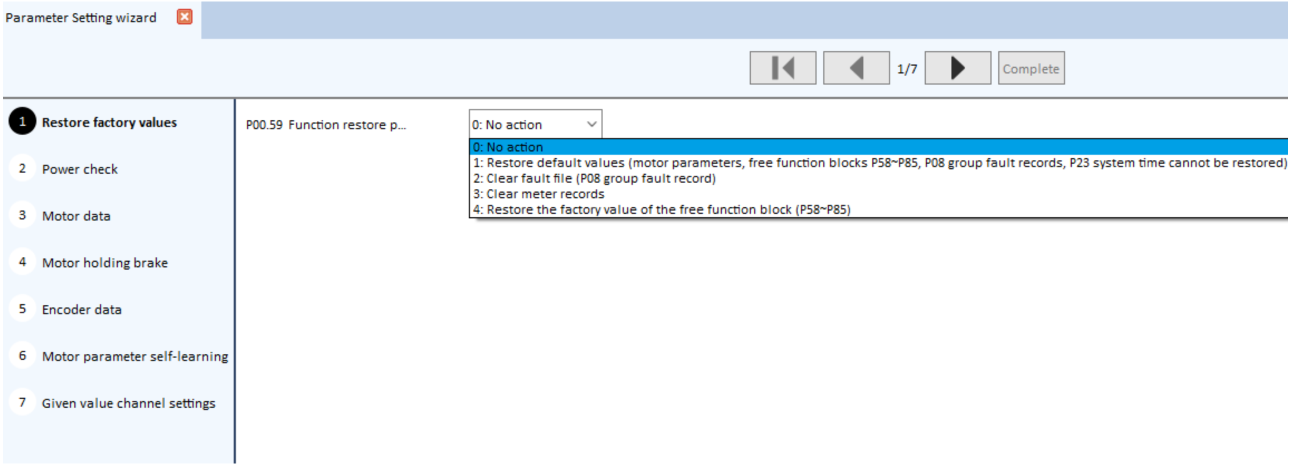


Function code	Name	Description	Setting range	Default
P99.01	Unit model	Each number represents a unit current class and relates to the data calibration for the VFD. This affects the unit rated power and current.	0–34	Model depended
P99.02	Unit rated power	2.2–500.0kW	2.2–500.0	Model depended
P99.03	Unit rated voltage	10–20000V	10–20000	Model depended
P99.04	Unit rated current	0.0–1000.0A	0.0–1000.0	Model depended

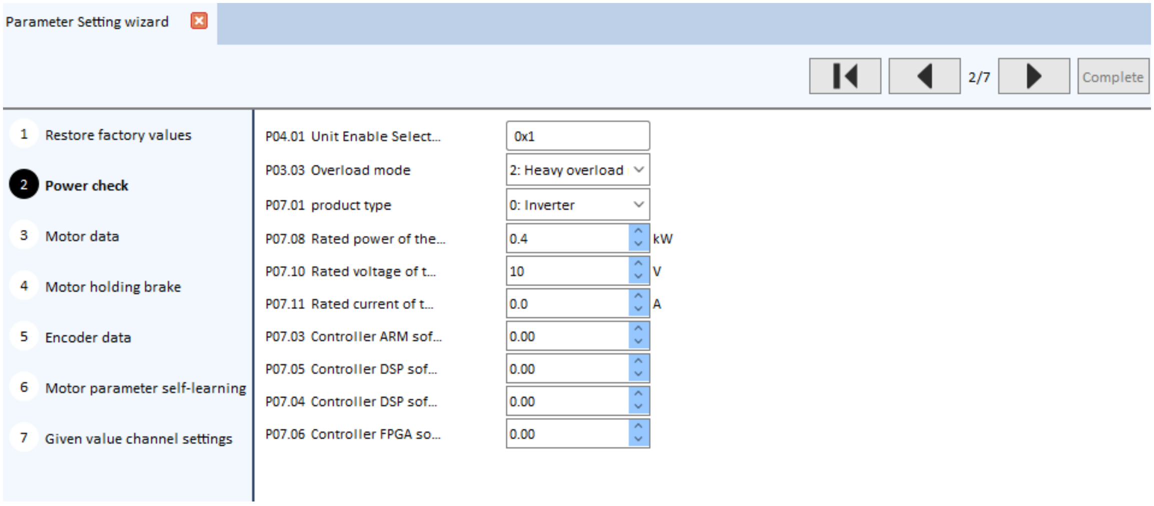
Contact the manufacturer's technician for the manufacturer's password.

Use the upper computer configuration wizard to complete the drive parameter setting:

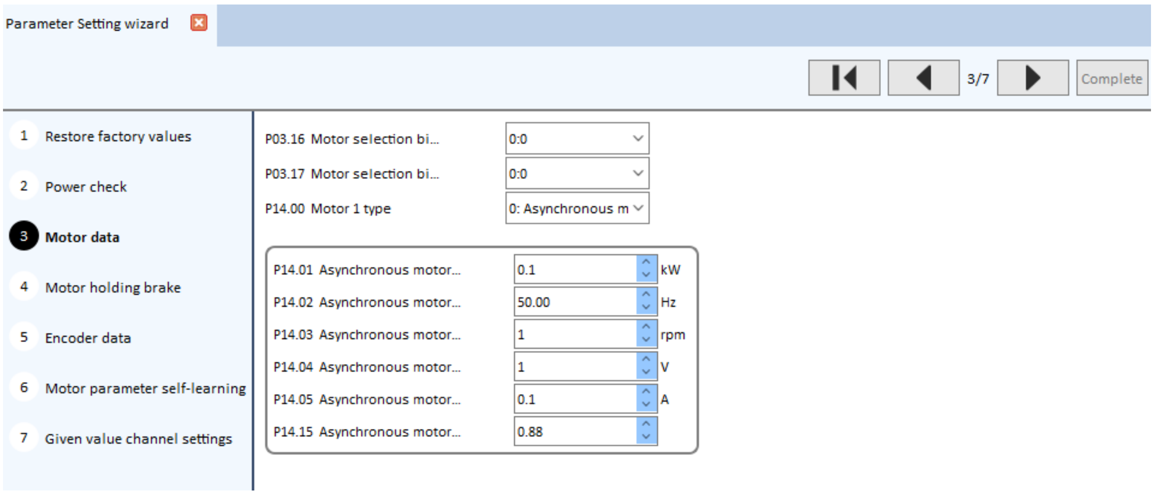
1. Restore to default values.



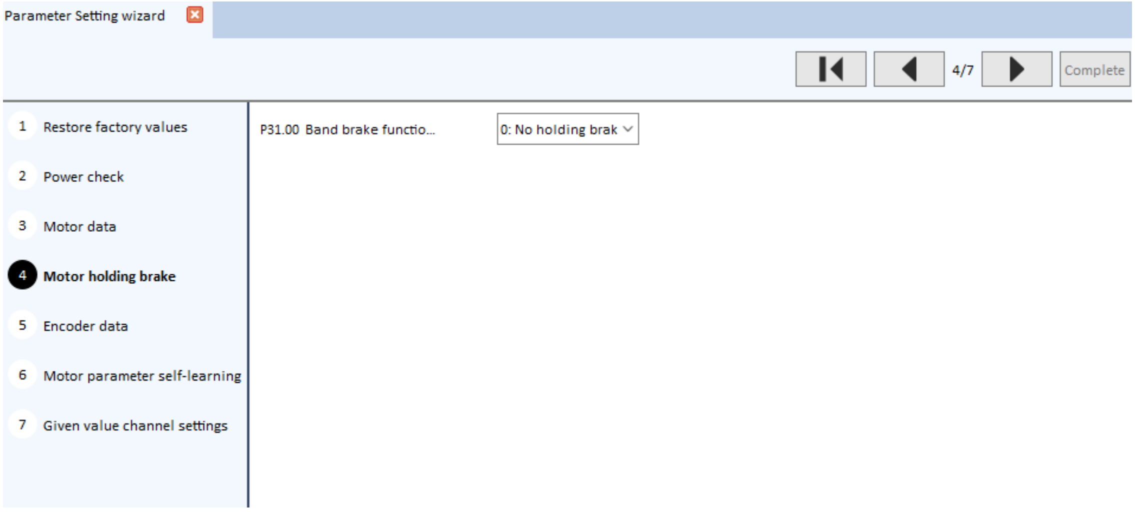
2. Check the power.



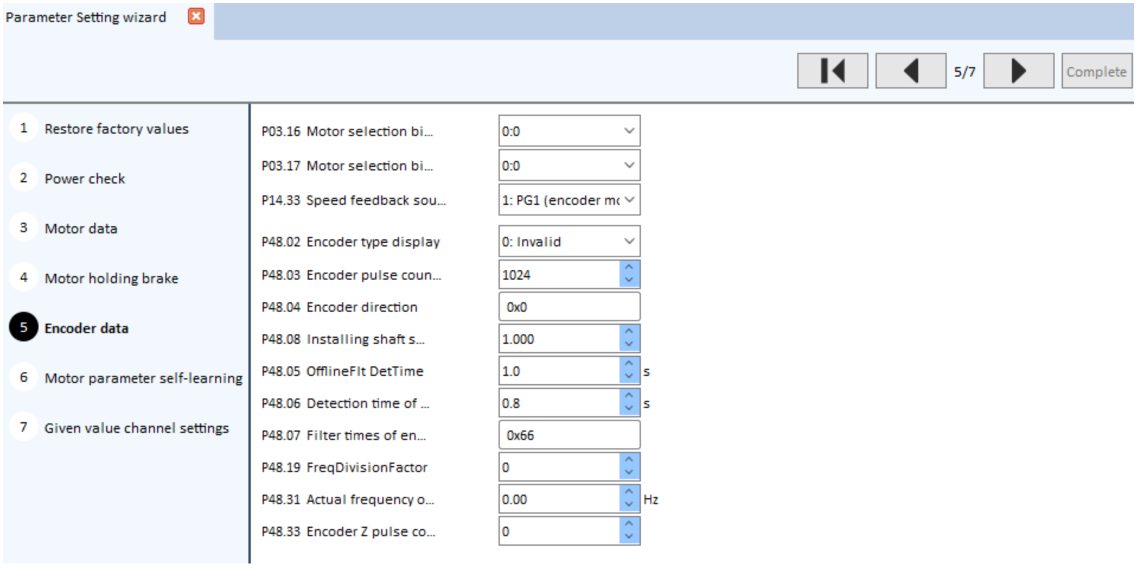
3. Set motor data.



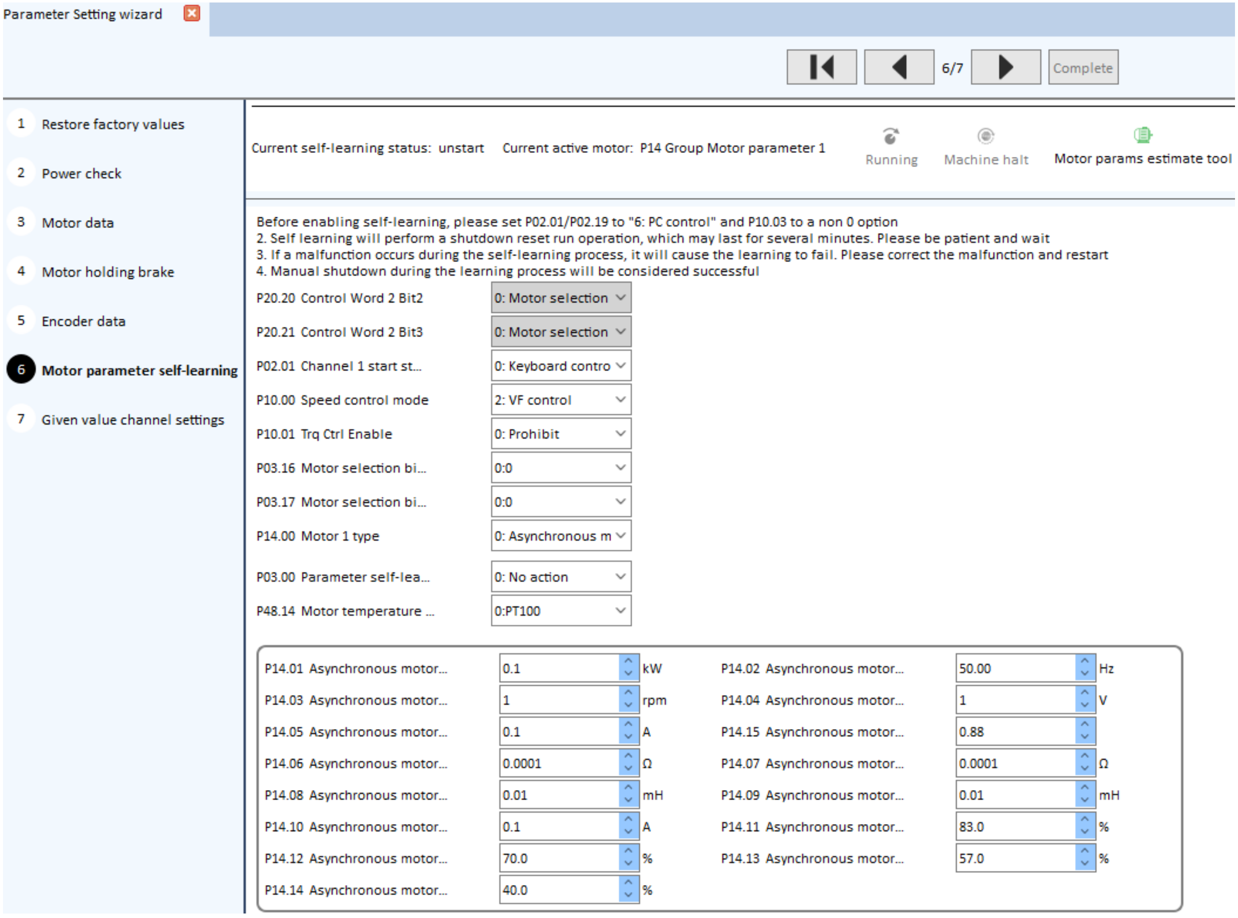
4. Set motor holding brake data.



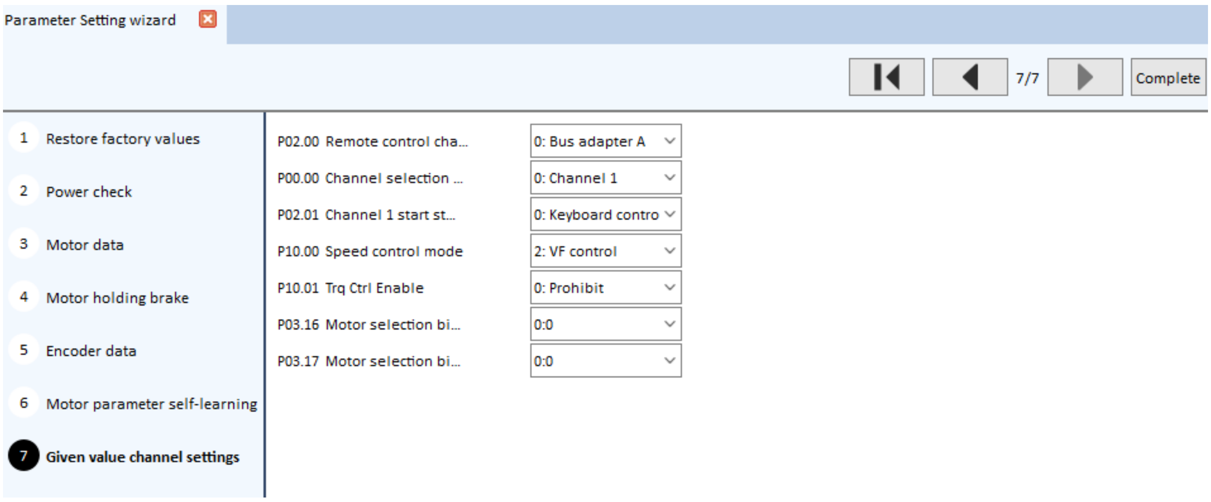
5. Set encoder data.



6. Perform motor parameter autotuning.



7. Set the value giving channels.



6.30 Overload mode

For details about load modes, see the relevant sections in Goodrive880 Series Inverter Unit Hardware Manual.

The controller automatically records the real-time output current of the power module and calculates the load rate. When the module exceeds the permissible load, the "VFD overload" fault is reported. It is necessary to check whether the drive matches the load properly and the output current has exceeded the module's allowable specification.

Typical operating conditions are as follows:

- No overload mode: The max output current never exceeds the drive's no-overload current, and this mode can be used for long periods of time. It can run 60s when the overload is not greater than 1.04 times the no-overload current. It supports the periodic cycle of 300s.
- Light overload mode: Within every 300s, it runs 240s at or below the light overload current of the drive and 60s at or below 1.1 times the light overload current of the drive. It supports the periodic cycle of 300s.
- Heavy overload mode: Within every 300s, it runs 240s at the heavy overload current of the drive and 60s at or below 1.5 times the heavy overload current of the drive. It supports the periodic cycle of 300s.

The overload mode can be set through P03.03. After setting, the whole machine rated current and rated power are shown in the following table.

Function code	Name	Description	Range	Default
P07.45	No-overload mode entire machine current I_N	Rated current in no-overload mode	0.0–60000	Model depended
P07.46	No-overload mode entire machine power P_N	Rated power in no-overload mode	0.4–6553.5	Model depended
P07.47	Light-overload mode entire machine current I_{LD}	Rated current in light-overload mode	0.0–60000	Model depended
P07.48	Light-overload mode entire machine power P_{LD}	Rated power in light-overload mode	0.4–6553.5	Model depended
P07.09	Paralleled units	Number of paralleled units	1–10	Model depended
P07.10	Entire machine rated voltage	Rated voltage	10–20000	Model depended
P07.11	Entire machine rated current I_{HD}	Rated current in heavy-overload mode	0.0–60000	Model depended
P07.12	Entire machine rated power P_{HD}	Rated power in heavy-overload mode	0.4–6553.5	Model depended

6.31 Fan control

The VFD fan has three running modes: normal running mode, continuous running mode after power-on, and speed regulation mode (only for high-power equipment).

Function code	Name	Description	Setting range	Default
P18.46	Fan operating mode	0: Normal mode 1: Permanent running after power-on 2: Speed regulation mode	0–2	0

1. 0: Normal mode

The fan will operate when the machine is running or the unit temperature exceeds the fan start temperature specified by P18.45. The fan will stop running with a 30s delay after the machine is stopped and the temperature is 3 degrees Celsius below the fan start temperature specified by P18.45.

A. Set P18.46=0.

B. Set P18.45 (Temperature to start cooling fan), which takes effect only when the normal operating mode is selected as the fan working mode.

Function code	Name	Description	Setting range	Default
P18.45	Temperature to start cooling fan	50.0–120.0°C	50.0–120.0	50°C

2. Permanent running after power-on mode

The fan is always running after equipment power-on.

Set P18.46=1.

3. Speed regulation mode

The use of speed regulation mode requires one of the following conditions:

Condition 1: Equipment rated power is 380V and unit rated power is greater than 90kW.

Condition 2: Equipment rated voltage is 660V.

Note: For the equipment with a rated voltage of 380V and a unit rated power of less than 90kW, when the fan control mode is the speed regulation mode, "0: Normal mode" is used by default.

The speed regulation mode automatically switches gears according to the temperature and current. There are 4 gears (corresponding different fan rated speed percentages):

- Gear 0: Unit fan output speed is 40%
- Gear 1: Unit fan output speed is 60%
- Gear 2: Unit fan output speed is 80%
- Gear 3: Unit fan output speed is 100%

Setting method: Set P18.46=2.

6.32 Free programming

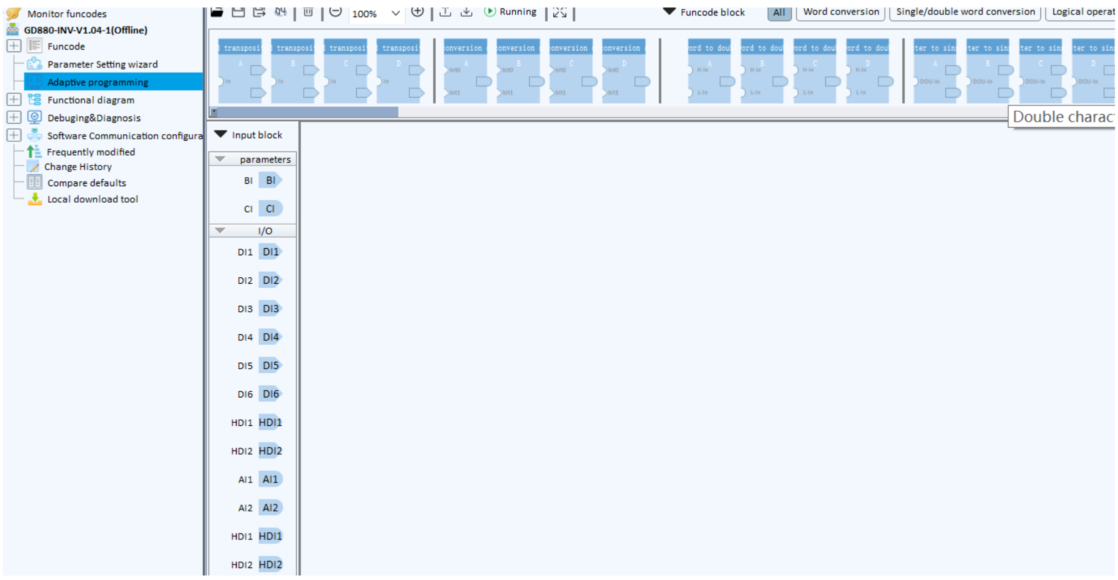
Function code	Name	Description	Setting range	Default
P85.00	Programming system A execution cycle	0: Invalid, while other indicates the execution cycle value. The selection of a free programming module (for example, selecting module 1 in the execution order of programming system A) can only be modified when the system cycle is 0.	0–65535	0ms
P85.01–P85.20	Programming system A module 1 selection – Programming system A module 20 selection	The selected modules are executed in ascending order by their number, with the modules with smaller numbers executed first.	0–162	0
P85.21	Programming system B execution cycle	0: Invalid, while another value indicates the execution cycle value	0–65535	0ms
P85.22–P85.41	Programming system B module 1 selection – Programming system B module 20 selection	-	0–162	0

Free programming settings allow you to customize the functions of the VFD according to the actual needs.

Note: The free programming module can be modified only when the system cycle is 0.

Application function block	Qty	Application function block	Qty	Application function block	Qty
Word-to-bit function	4	Bit-to-word function	3	Word-to-Dword function	3
Dword-to-word function	4	Logical And function	16	Logical Or function	12
Logical Not function	8	Logical XNOR function	4	Logical XOR function	4
PlusMinus module	8	Multiply/Divide module	8	Absolute value module	4
Amplitude limiting module	4	Inverse module	8	Integral module	4
Differential module	4	Filter module	8	Level-to-pulse module	4
Pulse-to-level module	4	Logic delay module	4	Multi-dot curve module	4
PID calculation module	2	Binary selector	8	Digital selector	12
Comparison module	4	RS trigger	4	D trigger	4

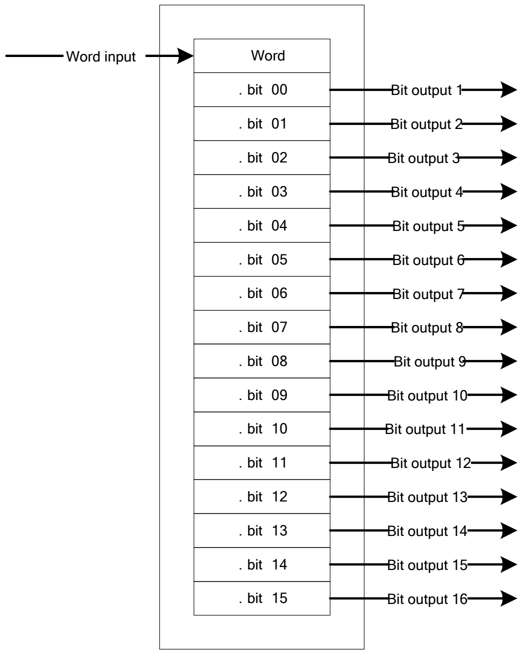
There are more than 162 free programming function blocks, used to implement simple arithmetic logic and other arithmetic functions, combined with the connector to implement the desired functions. The free programming module in the Workshop is shown in the following figure.

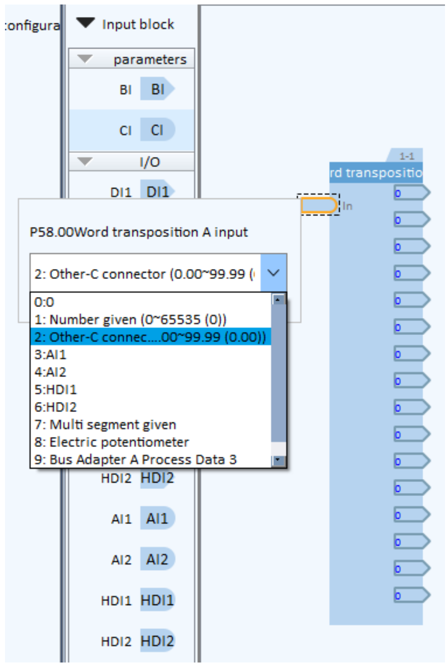


6.32.1 Word and bit conversion

6.32.1.1 Word and bit conversion

In the following, the diagram on the left shows a schematic diagram of word-to-bit conversion, and the diagram on the right shows the word-to-bit conversion programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P58.00	Word-to-bit A input	0: 0 1: Digital (0–65535) 2: Other-C connector (0.00–99.00) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P58.01	Word-to-bit B input		0–10	0
P58.02	Word-to-bit C input		0–10	0
P58.02	Word-to-bit D input		0–10	0

Set the input source for the word-to-bit function block in free programming.

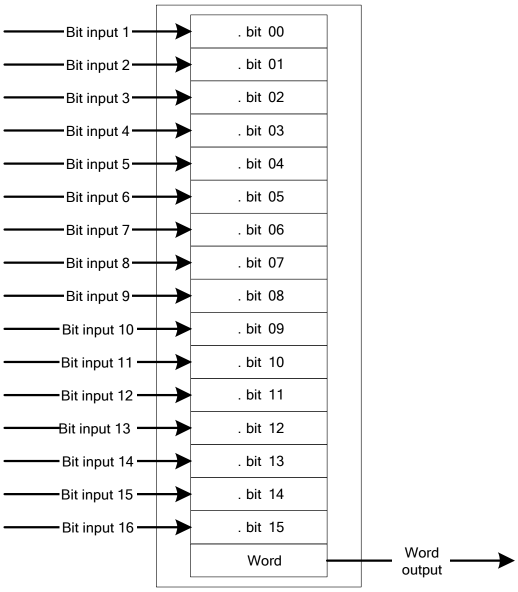
Function code	Name	Description	Setting range	Default
P81.00–P81.15	Word-to-bit A output bit 0 — Word-to-bit A output bit 15	0–1	0–1	0
P81.16–P81.31	Word-to-bit B output bit 0 — Word-to-bit B output bit 15	0–1	0–1	0

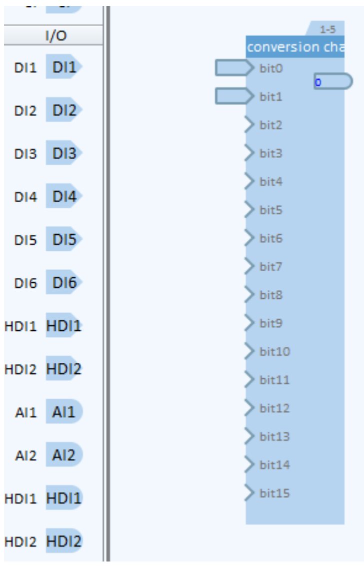
Function code	Name	Description	Setting range	Default
P81.32–P81.47	Word-to-bit C output bit 0 — Word-to-bit C output bit 15	0–1	0–1	0
P81.48–P81.63	Word-to-bit D output bit 0 — Word-to-bit D output bit 15	0–1	0–1	0

Set the output bits for the word-to-bit function block in free programming.

6.32.1.2 Bit-to-word conversion

In the following, the diagram on the left shows a schematic diagram of bit-to-word conversion, and the diagram on the right shows the bit-to-word conversion programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P58.04–P58.19	Bit-to-word A bit 0 input – Bit-to-word A bit 15 input	0: 0 1: 1 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P58.20–P58.35	Bit-to-word B bit 0 input – Bit-to-word B bit 15 input		0–10	0
P58.36–P58.51	Bit-to-word C bit 0 input – Bit-to-word C bit 15 input		0–10	0
P58.52–P58.67	Bit-to-word D bit 0 input – Bit-to-word D bit 15 input		0–10	0

Set the input source for the bit-to-word function block in free programming.

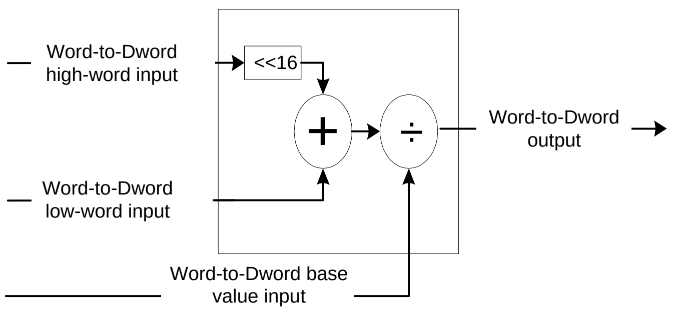
Function code	Name	Description	Setting range	Default
P83.00	Bit-to-word A output	0–65535	0–65535	0
P83.01	Bit-to-word B output	0–65535	0–65535	0
P83.02	Bit-to-word C output	0–65535	0–65535	0
P83.03	Bit-to-word D output	0–65535	0–65535	0

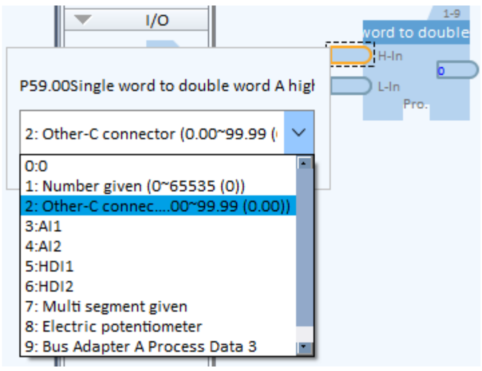
Set the output for the bit-to-word function block in free programming.

6.32.2 Word-Dword conversion

6.32.2.1 Word-to-Dword

In the following, the diagram on the left shows a schematic diagram of word-to-Dword conversion, and the diagram on the right shows the word-to-Dword conversion programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P59.00	Word-to-Dword A high-word input	0: 0 1: Digital (0–65535) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P59.01	Word-to-Dword A low-word input		0–10	0
P59.02	Word-to-Dword A base value input		0–10	0
P59.03	Word-to-Dword B high-word input	Same as that for module A	0–10	0

Function code	Name	Description	Setting range	Default
P59.04	Word-to-Dword B low-word input	Same as that for module A	0–10	0
P59.05	Word-to-Dword B base value input	Same as that for module A	1–65535	4096
P59.06	Word-to-Dword C high-word input	Same as that for module A	0–10	0
P59.07	Word-to-Dword C low-word input	Same as that for module A	0–10	0
P59.08	Word-to-Dword C base value input	Same as that for module A	1–65535	4096
P59.09	Word-to-Dword D high-word input	Same as that for module A	0–10	0
P59.10	Word-to-Dword D low-word input	Same as that for module A	0–10	0
P59.11	Word-to-Dword D base value input	Same as that for module A	1–65535	4096

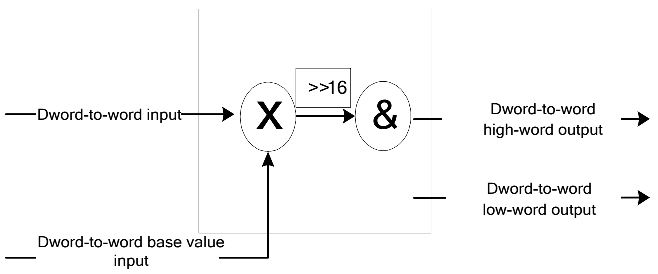
Set the input source for the word-to-Dword function block in free programming.

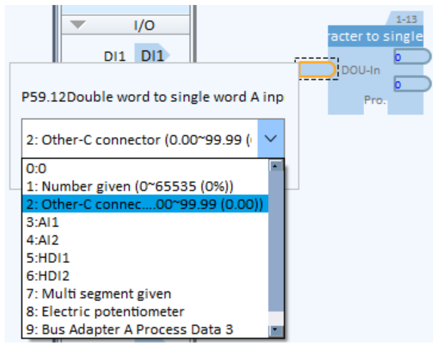
Function code	Name	Description	Setting range	Default
P83.04	Word-to-Dword A output	0–65535	0–65535	0
P83.05	Word-to-Dword B output	0–65535	0–65535	0
P83.06	Word-to-Dword C output	0–65535	0–65535	0
P83.07	Word-to-Dword D output	0–65535	0–65535	0

Set the output for the word-to-Dword function block in free programming.

6.32.2.2 Dword-to-word conversion

In the following, the diagram on the left shows a schematic diagram of Dword-to-word conversion, and the diagram on the right shows the Dword-to-word conversion programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P59.12	Dword-to-word A input	0: 0 1: Digital (0–65535) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P59.13	Dword-to-word A base value input	1–65535	1–65535	1
P59.14	Dword-to-word B input	Same as that for module 1	0–10	0
P59.15	Dword-to-Word B base value input	Same as that for module 1	1–65535	1
P59.16	Dword-to-word C input	Same as that for module 1	0–10	0
P59.17	Dword-to-word C base value input	Same as that for module 1	1–65535	1
P59.18	Dword-to-word D input	Same as that for module 1	0–10	0
P59.19	Dword-to-word D base value input	Same as that for module 1	1–65535	1

Set the input source for the Dword-to-word function block in free programming.

Function code	Name	Description	Setting range	Default
P83.08	Dword-to-word A output high bit	0–65535	0–65535	0
P83.09	Dword-to-word A output low bit	0–65535	0–65535	0
P83.10	Dword-to-word B output high bit	0–65535	0–65535	0
P83.11	Dword-to-word B output low bit	0–65535	0–65535	0
P83.12	Dword-to-word C output high bit	0–65535	0–65535	0
P83.13	Dword-to-word C output low bit	0–65535	0–65535	0
P83.14	Dword-to-word C output high bit	0–65535	0–65535	0
P83.15	Dword-to-word C output low bit	0–65535	0–65535	0

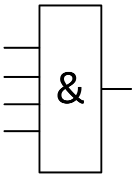
Set the output for the Dword-to-Word function block in free programming.

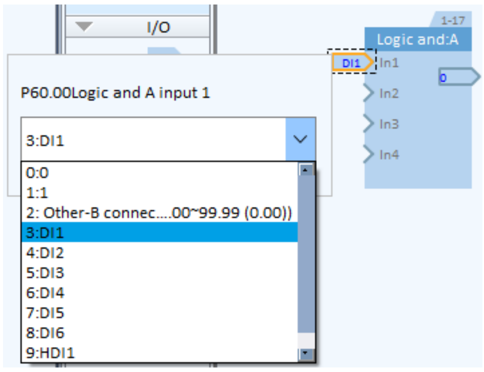
6.32.3 Logical operation

The logical operations in the free programming module include And, Or, Not, XOR, and XNOR. You can implement corresponding functions by setting function codes.

6.32.3.1 And

In the following, the diagram on the left shows a schematic diagram of logical And, and the diagram on the right shows the logical And programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P60.00–P60.03	Logical And A input 1 – Logical And A input 4	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1
P60.04–P60.07	Logical And B input 1 – Logical And B input 4		0–10	1
P60.08–P60.11	Logical And C input 1 – Logical And C input 4		0–10	1
P60.12–P60.15	Logical And D input 1 – Logical And D input 4		0–10	1
P60.16–P60.19	Logical And E input 1 – Logical And E input 4		0–10	1
P60.20–P60.23	Logical And F input 1 – Logical And F input 4		0–10	1
P60.24–P60.27	Logical And G input 1 – Logical And G input 4		0–10	1
P60.28–P60.31	Logical And H input 1 – Logical And H input 4		0–10	1
P60.32–P60.35	Logical And I input 1 – Logical And I input 4		0–10	1
P60.36–P60.39	Logical And J input 1 – Logical And J input 4		0–10	1
P60.40–P60.43	Logical And K input 1 – Logical And K input 4		0–10	1
P60.44–P60.47	Logical And L input 1 – Logical And L input 4		0–10	1
P60.48–P60.51	Logical And M input 1 – Logical And M input 4		0–10	1
P60.52–P60.55	Logical And N input 1 – Logical And N input 4		0–10	1
P60.56–	Logical And O input 1 –		0–10	1

Function code	Name	Description	Setting range	Default
P60.59	Logical And O input 4			
P60.60–P60.63	Logical And P input 1 – Logical And P input 4		0–10	1

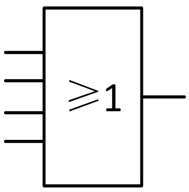
Set the input source for the logical And operation function block in free programming.

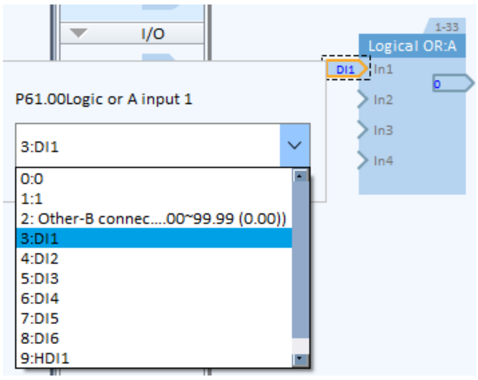
Function code	Name	Description	Setting range	Default
P81.64	Logical And A output	0–1	0–1	0
P81.65	Logical And B output	0–1	0–1	0
P81.66	Logical And C output	0–1	0–1	0
P81.67	Logical And D output	0–1	0–1	0
P81.68	Logical And E output	0–1	0–1	0
P81.69	Logical And F output	0–1	0–1	0
P81.70	Logical And G output	0–1	0–1	0
P81.71	Logical And H output	0–1	0–1	0
P81.72	Logical And I output	0–1	0–1	0
P81.73	Logical And J output	0–1	0–1	0
P81.74	Logical And K output	0–1	0–1	0
P81.75	Logical And L output	0–1	0–1	0
P81.76	Logical And M output	0–1	0–1	0
P81.77	Logical And N output	0–1	0–1	0
P81.78	Logical And O output	0–1	0–1	0
P81.79	Logical And P output	0–1	0–1	0

Set the output for the logical And operation function block in free programming.

6.32.3.2 Logical Or

In the following, the diagram on the left shows a schematic diagram of logical Or, and the diagram on the right shows the logical Or programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P61.00–P61.03	Logical Or A input 1 – Logical Or A input 4	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3	0–10	0
P61.04–P61.07	Logical Or B input 1 – Logical Or B input 4		0–10	0
P61.08–P61.11	Logical Or C input 1 – Logical Or C input 4		0–10	0

Function code	Name	Description	Setting range	Default
P61.12–P61.15	Logical Or D input 1 – Logical Or D input 4	6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P61.16–P61.19	Logical Or E input 1 – Logical Or E input 4		0–10	0
P61.20–P61.23	Logical Or F input 1 – Logical Or F input 4		0–10	0
P61.24–P61.27	Logical Or G input 1 – Logical Or G input 4		0–10	0
P61.28–P61.31	Logical Or H input 1 – Logical Or H input 4		0–10	0
P61.32–P61.35	Logical Or I input 1 – Logical Or I input 4		0–10	0
P61.36–P61.39	Logical Or J input 1 – Logical Or J input 4		0–10	0
P61.40–P61.43	Logical Or K input 1 – Logical Or K input 4		0–10	0
P61.44–P61.47	Logical Or L input 1 – Logical Or L input 4		0–10	0

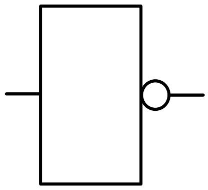
Set the input source for the logical Or operation function block in free programming.

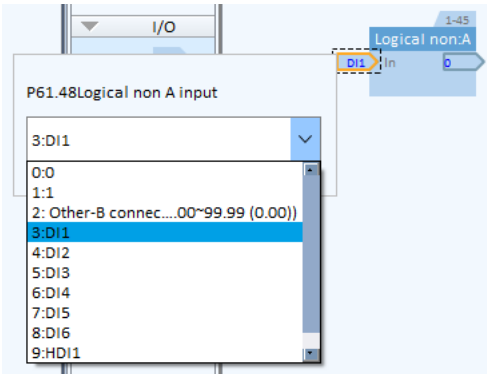
Function code	Name	Description	Setting range	Default
P81.80	Logical Or A output	0–1	0–1	0
P81.81	Logical Or B output	0–1	0–1	0
P81.82	Logical Or C output	0–1	0–1	0
P81.83	Logical Or D output	0–1	0–1	0
P81.84	Logical Or E output	0–1	0–1	0
P81.85	Logical Or F output	0–1	0–1	0
P81.86	Logical Or G output	0–1	0–1	0
P81.87	Logical Or H output	0–1	0–1	0
P81.88	Logical Or I output	0–1	0–1	0
P81.89	Logical Or J output	0–1	0–1	0
P81.90	Logical Or K output	0–1	0–1	0
P81.91	Logical Or L output	0–1	0–1	0

Set the output for the logical Or operation function block in free programming.

6.32.3.3 Logical Not

In the following, the diagram on the left shows a schematic diagram of logical Not, and the diagram on the right shows the logical Not programming block in the Workshop.





<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P61.48</td><td>Logical Not A input</td><td rowspan="8">0: 0
1: 1
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td></tr>
<tr><td>P61.49</td><td>Logical Not B input</td><td>0–10</td><td>0</td></tr>
<tr><td>P61.50</td><td>Logical Not C input</td><td>0–10</td><td>0</td></tr>
<tr><td>P61.51</td><td>Logical Not D input</td><td>0–10</td><td>0</td></tr>
<tr><td>P61.52</td><td>Logical Not E input</td><td>0–10</td><td>0</td></tr>
<tr><td>P61.53</td><td>Logical Not F input</td><td>0–10</td><td>0</td></tr>
<tr><td>P61.54</td><td>Logical Not G input</td><td>0–10</td><td>0</td></tr>
<tr><td>P61.55</td><td>Logical Not H input</td><td>0–10</td><td>0</td></tr>
</table>

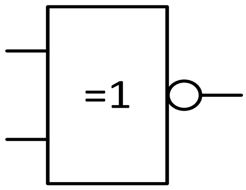
Set the input source for the logical Not operation function block in free programming.

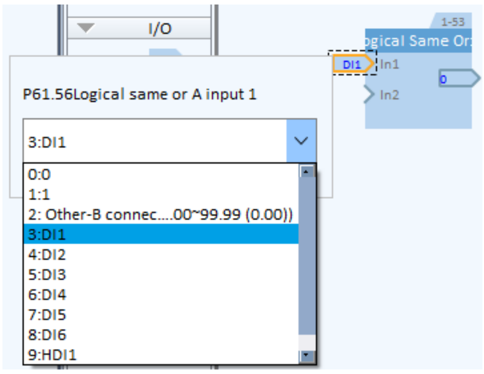
Function code	Name	Description	Setting range	Default
P81.92	Logical Not A output	0–1	0–1	0
P81.93	Logical Not B output	0–1	0–1	0
P81.94	Logical Not C output	0–1	0–1	0
P81.95	Logical Not D output	0–1	0–1	0
P81.96	Logical Not E output	0–1	0–1	0
P81.97	Logical Not F output	0–1	0–1	0
P81.98	Logical Not G output	0–1	0–1	0
P81.99	Logical Not H output	0–1	0–1	0

Set the output for the logical Not operation function block in free programming.

6.32.3.4 Logical XNOR

In the following, the diagram on the left shows a schematic diagram of logical XNOR, and the diagram on the right shows the logical XNOR programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P61.56–P61.57	Logical XNOR A input	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P61.58–P61.59	Logical XNOR B input		0–10	0
P61.60–P61.61	Logical XNOR C input		0–10	0
P61.62–P61.63	Logical XNOR D input		0–10	0

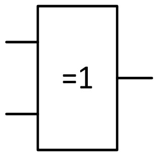
Set the input source for the logical XNOR operation function block in free programming.

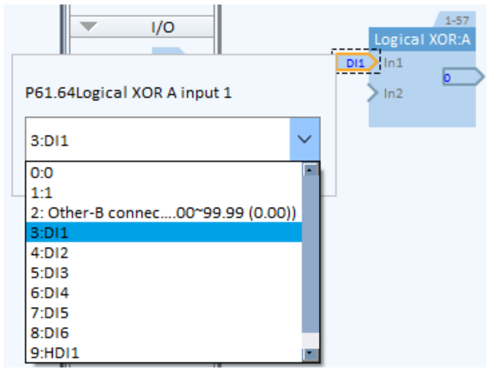
Function code	Name	Description	Setting range	Default
P82.00	Logical XNOR A output	0–1	0–1	0
P82.01	Logical XNOR B output	0–1	0–1	0
P82.02	Logical XNOR C output	0–1	0–1	0
P82.03	Logical XNOR D output	0–1	0–1	0

Set the output for the logical XNOR operation function block in free programming.

6.32.3.5 Logical XOR

In the following, the diagram on the left shows a schematic diagram of logical XOR, and the diagram on the right shows the logical XOR programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P61.64–P61.65	Logical XOR A input	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P61.66–P61.67	Logical XOR B input		0–10	0
P61.68–P61.69	Logical XOR C input		0–10	0
P61.70–P61.71	Logical XOR D input		0–10	0

Set the input source for the logical XOR operation function block in free programming.

Function code	Name	Description	Setting range	Default
P82.04	Logical XOR A output	0–1	0–1	0
P82.05	Logical XOR B output	0–1	0–1	0
P82.06	Logical XOR C output	0–1	0–1	0
P82.07	Logical XOR D output	0–1	0–1	0

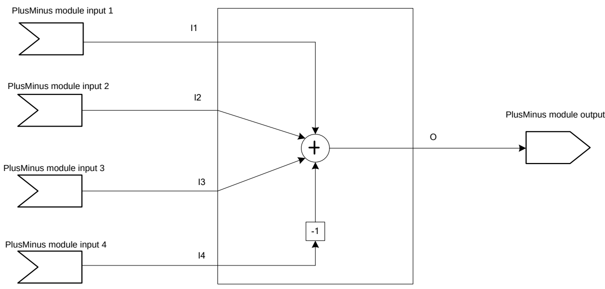
Set the output for the logical XOR operation function block in free programming.

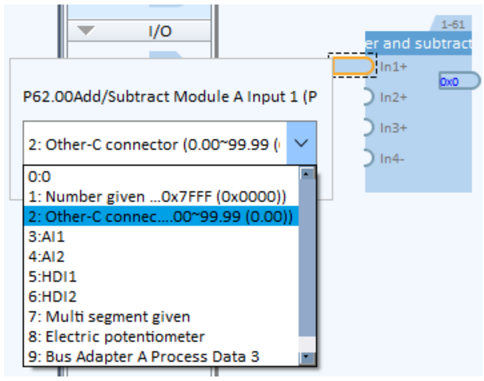
6.32.4 Arithmetic operation

The logical operations in the free programming module include addition, subtraction, multiplication, division, absolute value, amplitude limiting, negation, integration, and differentiation. You can implement corresponding functions by setting function codes.

6.32.4.1 PlusMinus module

In the following, the diagram on the left shows a schematic diagram of PlusMinus module, and the diagram on the right shows the PlusMinus module programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P62.00–P62.02	PlusMinus module A input 1 – PlusMinus module A input 3 (Plus)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P62.03	PlusMinus module A input 4 (Minus)		0–10	0
P62.04–P62.06	PlusMinus module B input 1 – PlusMinus module B input 3 (Plus)		0–10	0
P62.07	PlusMinus module B input 4 (Minus)		0–10	0
P62.08–P62.10	PlusMinus module C input 1 – PlusMinus module C input 3 (Plus)		0–10	0
P62.11	PlusMinus module C input 4 (Minus)		0–10	0
P62.12–P62.14	PlusMinus module D input 1 – PlusMinus module D input 3 (Plus)		0–10	0
P62.15	PlusMinus module D input 4 (Minus)		0–10	0
P62.16–P62.18	PlusMinus module E input 1 – PlusMinus module E input 3 (Plus)		0–10	0
P62.19	PlusMinus module E input 4 (Minus)		0–10	0
P62.20–P62.22	PlusMinus module F input 1 – PlusMinus module F input 3 (Plus)		0–10	0
P62.23	PlusMinus module F input 4 (Minus)		0–10	0

Function code	Name	Description	Setting range	Default
P62.24–P62.26	PlusMinus module G input 1 – PlusMinus module G input 3 (Plus)		0–10	0
P62.27	PlusMinus module G input 4 (Minus)		0–10	0
P62.28–P62.30	PlusMinus module H input 1 – PlusMinus module H input 3 (Plus)		0–10	0
P62.31	PlusMinus module H input 4 (Minus)		0–10	0

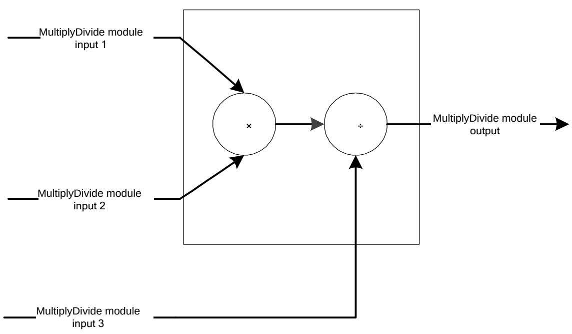
Set the input source for the PlusMinus module function block in free programming.

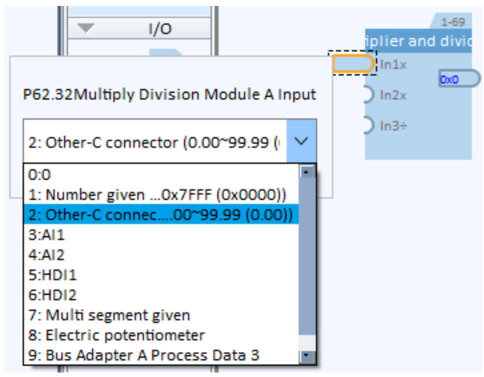
Function code	Name	Description	Setting range	Default
P83.16	PlusMinus module A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.17	PlusMinus module B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.18	PlusMinus module C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.19	PlusMinus module D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.20	PlusMinus module E output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.21	PlusMinus module F output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.22	PlusMinus module G output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.23	PlusMinus module H output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000

Set the output for the PlusMinus module function block in free programming.

6.32.4.2 MultiplyDivide module

In the following, the diagram on the left shows a schematic diagram of MultiplyDivide module, and the diagram on the right shows the MultiplyDivide module programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P62.32–P62.33	MultiplyDivide module A input 1 – MultiplyDivide module A input 2 (Multiply)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P62.34	MultiplyDivide module A input 3 (Divide)		0–10	0
P62.35–P62.36	MultiplyDivide module B input 1 – MultiplyDivide module B input 2 (Multiply)		0–10	0
P62.37	MultiplyDivide module B input 3 (Divide)		0–10	0
P62.38–P62.39	MultiplyDivide module C input 1 – MultiplyDivide module C input 2 (Multiply)		0–10	0
P62.40	MultiplyDivide module C input 3 (Divide)		0–10	0
P62.41–P62.42	MultiplyDivide module D input 1 – MultiplyDivide module D input 2 (Multiply)		0–10	0
P62.43	MultiplyDivide module D input 3 (Divide)		0–10	0
P62.44–P62.45	MultiplyDivide module E input 1 – MultiplyDivide module E input 2 (Multiply)		0–10	0
P62.46	MultiplyDivide module E input 3 (Divide)		0–10	0
P62.47–P62.48	MultiplyDivide module F input 1 – MultiplyDivide module F input 2 (Multiply)		0–10	0
P62.49	MultiplyDivide module F input 3 (Divide)		0–10	0
P62.50–P62.51	MultiplyDivide module G input 1 – MultiplyDivide module G input 2 (Multiply)		0–10	0
P62.52	MultiplyDivide module G input 3 (Divide)		0–10	0
P62.53–P62.54	MultiplyDivide module H input 1 – MultiplyDivide module H input 2 (Multiply)		0–10	0
P62.55	MultiplyDivide module H input 3 (Divide)		0–10	0

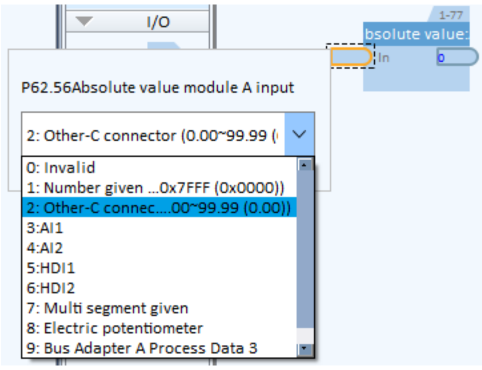
Set the input source for the MultiplyDivide module function block in free programming.

Function code	Name	Description	Setting range	Default
P83.24	MultiplyDivide module A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.25	MultiplyDivide module B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.26	MultiplyDivide module C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.27	MultiplyDivide module D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.28	MultiplyDivide module E output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.29	MultiplyDivide module F output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.30	MultiplyDivide module G output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.31	MultiplyDivide module H output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000

Set the output for the PlusMinus module function block in free programming.

6.32.4.3 Absolute value module

The following figure shows the absolute value module programming block in Workshop.



Function code	Name	Description	Setting range	Default
P62.56	AbsoluteValModule A input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P62.57	AbsoluteValModule B input		0–10	0
P62.58	AbsoluteValModule C input		0–10	0

Function code	Name	Description	Setting range	Default
P62.59	AbsoluteValModule D input		0–10	0

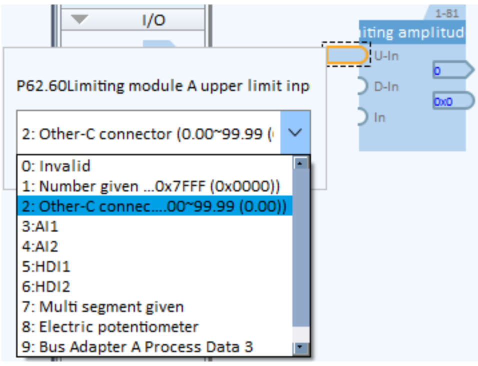
Set the input source for the absolute value module function block in free programming.

Function code	Name	Description	Setting range	Default
P83.32	AbsoluteValModule A output	-	0–65535	0
P83.33	AbsoluteValModule B output	-	0–65535	0
P83.34	AbsoluteValModule C output	-	0–65535	0
P83.35	AbsoluteValModule D output	-	0–65535	0

Set the output for the absolute value module function block in free programming.

6.32.4.4 Amplitude limit module

The following figure shows the amplitude limit module programming block in Workshop.



Function code	Name	Description	Setting range	Default
P62.60	AmplLimModule A upper limit input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P62.61	AmplLimModule A lower limit input		0–10	0
P62.62	AmplLimModule A input		0–10	0
P62.63	AmplLimModule B upper limit input	Same as that for module A	0–10	0
P62.64	AmplLimModule B lower limit input	Same as that for module A	0–10	0

Function code	Name	Description	Setting range	Default
P62.65	AmplLimModule B input	Same as that for module A	0–10	0
P62.66	AmplLimModule C upper limit input	Same as that for module A	0–10	0
P62.67	AmplLimModule C lower limit input	Same as that for module A	0–10	0
P62.68	AmplLimModule C input	Same as that for module A	0–10	0
P62.69	AmplLimModule D upper limit input	Same as that for module A	0–10	0
P62.70	AmplLimModule D lower limit input	Same as that for module A	0–10	0
P62.71	AmplLimModule D input	Same as that for module A	0–10	0

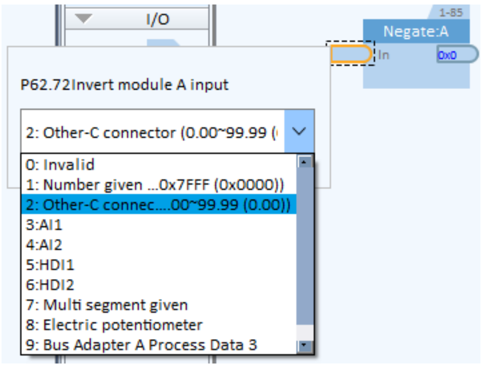
Set the input source and upper/lower limit for the amplitude limit module function block in free programming.

Function code	Name	Description	Setting range	Default
P82.32	AmplLimModule A Flag output	-	0–1	0
P82.33	AmplLimModule B Flag output	-	0–1	0
P82.34	AmplLimModule C Flag output	-	0–1	0
P82.35	AmplLimModule D Flag output	-	0–1	0
P83.56	AmplLimModule A output	-	-0x7FFF–0x7FFF	0x0000
P83.57	AmplLimModule B output	-	-0x7FFF–0x7FFF	0x0000
P83.58	AmplLimModule C output	-	-0x7FFF–0x7FFF	0x0000
P83.59	AmplLimModule D output	-	-0x7FFF–0x7FFF	0x0000

Set the output for the amplitude limit module function block in free programming.

6.32.4.5 Inverse module

The following figure shows the inverse module programming block in Workshop.



Function code	Name	Description	Setting range	Default
P62.72	InvModule A input	0: 0	0–10	0
P62.73	InvModule B input	1: Digital (-0x7FFF–0x7FFF)	0–10	0
P62.74	InvModule C input	2: Other-C connector	0–10	0
P62.75	InvModule D input	3: AI1	0–10	0
P62.76	InvModule E input	4: AI2	0–10	0
P62.77	InvModule F input	5: HDI1	0–10	0
P62.78	InvModule G input	6: HDI2	0–10	0
P62.79	InvModule H input	7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0

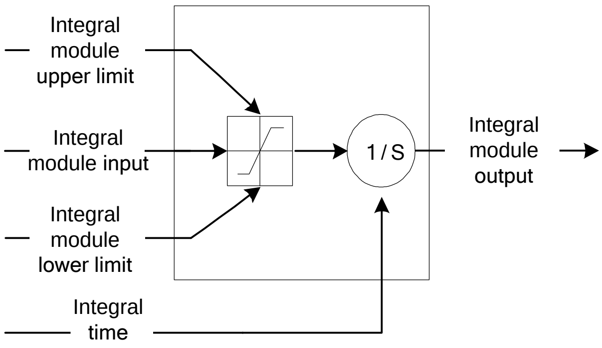
Set the input source for the inverse module function block in free programming.

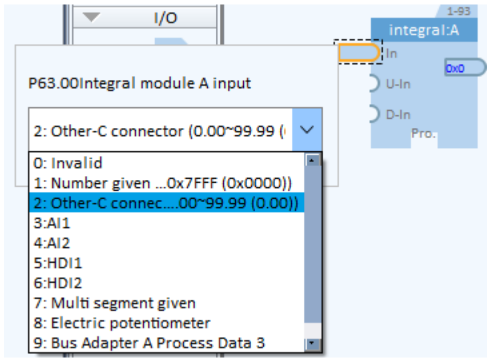
Function code	Name	Description	Setting range	Default
P83.60	InvModule A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.61	InvModule B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.62	InvModule C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.63	InvModule D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.64	InvModule E output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.65	InvModule F output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.66	InvModule G output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.67	InvModule H output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000

Set the output for the inverse module function block in free programming.

6.32.4.6 Integral module

In the following, the diagram on the left shows a schematic diagram of integral module, and the diagram on the right shows the integral module programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P63.00	IntegModule A input	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P63.01	IntegModule A integral time	0.01–100.00s	0.00–100.00	0.00s
P63.02	IntegModule A upper limit input	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P63.03	IntegModule A lower limit input		0–10	0
P63.04–P63.07	IntegModule B output	Same as that for module A	Same as that for module A	0
P63.08–P63.11	Integral module C	Same as that for module A	Same as that for module A	0
P63.12–P63.15	Integral module D	Same as that for module A	Same as that for module A	0

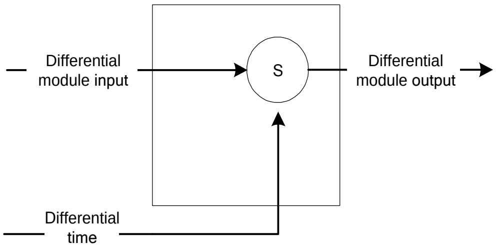
Set the input source, integration time, and upper/lower limit for the integral module function blocks in free programming.

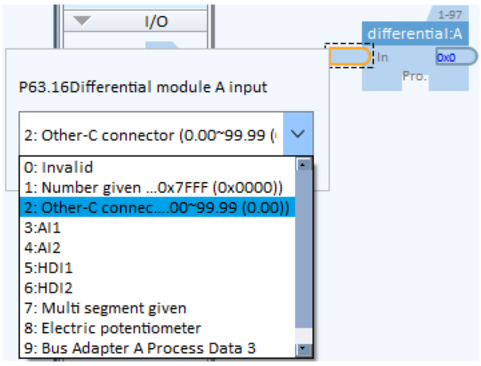
Function code	Name	Description	Setting range	Default
P83.68	IntegModule A output	-	-0x7FFF–0x7FFF	0x0000
P83.69	IntegModule B output	-	-0x7FFF–0x7FFF	0x0000
P83.70	IntegModule C output	-	-0x7FFF–0x7FFF	0x0000
P83.71	IntegModule D output	-	-0x7FFF–0x7FFF	0x0000

Set the output for the integral module function block in free programming.

6.32.4.7 Differential module

In the following, the diagram on the left shows a schematic diagram of differential module, and the diagram on the right shows the differential module programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P63.16	DiffModule A input	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P63.17	DiffModule A differential time	-	0–10	0s
P63.18–P63.19	DiffModule B output	Same as that for module A	Same as that for module A	0
P63.20–P63.21	DiffModule C output	Same as that for module A	Same as that for module A	0
P63.22–P63.23	DiffModule D output	Same as that for module A	Same as that for module A	0

Set the input source and differential time for the differential module function block in free programming Differential time.

Function code	Name	Description	Setting range	Default
P83.72	DiffModule A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000

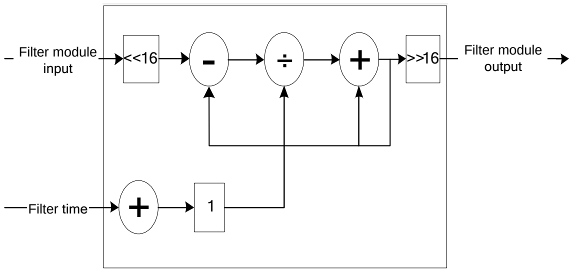
Function code	Name	Description	Setting range	Default
P83.73	DiffModule B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.74	DiffModule C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.75	DiffModule D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000

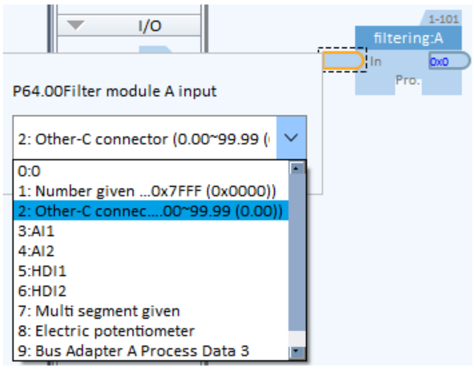
Set the output for the differential module function block in free programming.

6.32.5 Control function

6.32.5.1 Filter module

In the following, the diagram on the left shows a schematic diagram of filter module, and the diagram on the right shows the filter module programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P64.00	FiltModule A input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P64.01	FiltModule A filter time	-	0.000–10.000s	0
P64.02–P64.03	FiltModule B input—FiltModule B filter time	Same as that for module A	Same as that for module A	0
P64.04–P64.05	FiltModule C input—FiltModule C filter time	Same as that for module A	Same as that for module A	0
P64.06–P64.07	FiltModule D input—FiltModule D filter time	Same as that for module A	Same as that for module A	0
P64.08–P64.09	FiltModule E input—FiltModule E filter time	Same as that for module A	Same as that for module A	0

Function code	Name	Description	Setting range	Default
P64.10–P64.11	FiltModule F input—FiltModule F filter time	Same as that for module A	Same as that for module A	0
P64.12–P64.13	FiltModule G input—FiltModule F filter time	Same as that for module A	Same as that for module A	0
P64.14–P64.15	FiltModule H input—FiltModule H filter time	Same as that for module A	Same as that for module A	0

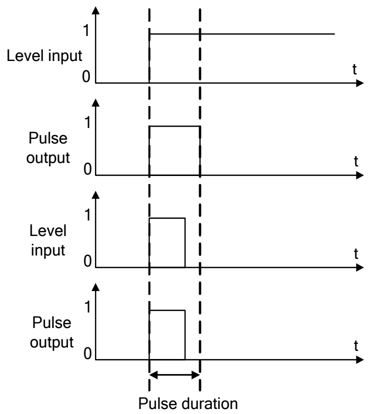
Set the input source and filter time for the filter module function block in free programming.

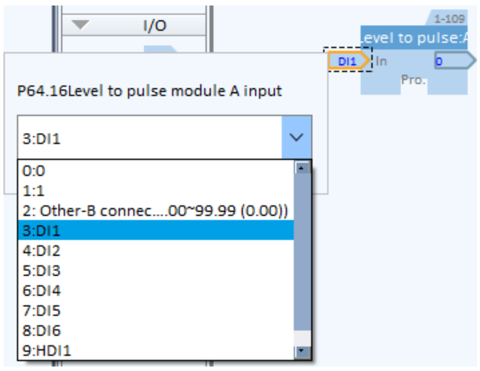
Function code	Name	Description	Setting range	Default
P83.48	FiltModule A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.49	FiltModule B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.50	FiltModule C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.51	FiltModule D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.52	FiltModule E output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.53	FiltModule F output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.54	FiltModule G output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.55	FiltModule H output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000

Set the output for the filter module function block in free programming

6.32.5.2 Level-to-pulse module

In the following, the diagram on the left shows a schematic diagram of level-to-pulse module, and the diagram on the right shows the level-to-pulse module programming block in the Workshop.





If the output that the input rising edge triggers is high, the output is set low after a set period of time. If the input is low, the output is immediately set to low, regardless of whether the duration is reached or not.

Function code	Name	Description	Setting range	Default
P64.16	Level-to-Pulse module A input	0: 0 1: 1 2: Other-B connector 3: DI1	0–10	0

Function code	Name	Description	Setting range	Default
		4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2		
P64.17	Module A pulse width duration	0.00–600.00s	0.00–600.00	0.00s
P64.18–P64.19	Level-to-Pulse module B	Same as that for module A	Same as that for module A	0
P64.20–P64.21	Level-to-Pulse module C	Same as that for module A	Same as that for module A	0
P64.22–P64.23	Level-to-Pulse module D	Same as that for module A	Same as that for module A	0

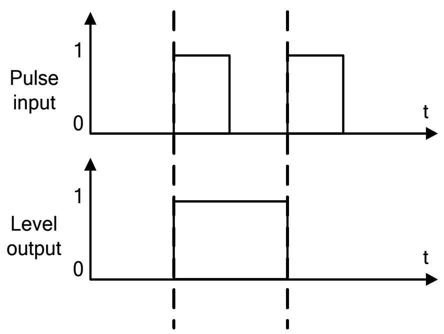
Set the input source and pulse width duration for the level-to-pulse module function block in free programming.

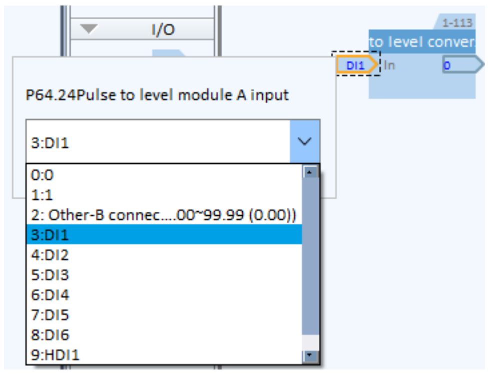
Function code	Name	Description	Setting range	Default
P82.24	Level-to-Pulse module A output	-	0–1	0
P82.25	Level-to-Pulse module B output	-	0–1	0
P82.26	Level-to-Pulse module C output	-	0–1	0
P82.27	Level-to-Pulse module D output	-	0–1	0

Set the output for the level-to-pulse module function block in free programming.

6.32.5.3 Pulse-to-level module

In the following, the diagram on the left shows a schematic diagram of pulse-to-level module, and the diagram on the right shows the pulse-to-level module programming block in the Workshop.





Set 1 (high level) on the first rising edge of the pulse, set 0 (low level) on the second rising edge, and so on. That is, set high level on odd-numbered rising edges and set low level on even-numbered rising edges.

Function code	Name	Description	Setting range	Default
P64.24	Pulse-to-level module A input	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P64.25	Pulse-to-level module B input		0–10	0
P64.26	Pulse-to-level module C input		0–10	0
P64.27	Pulse-to-level module D input		0–10	0

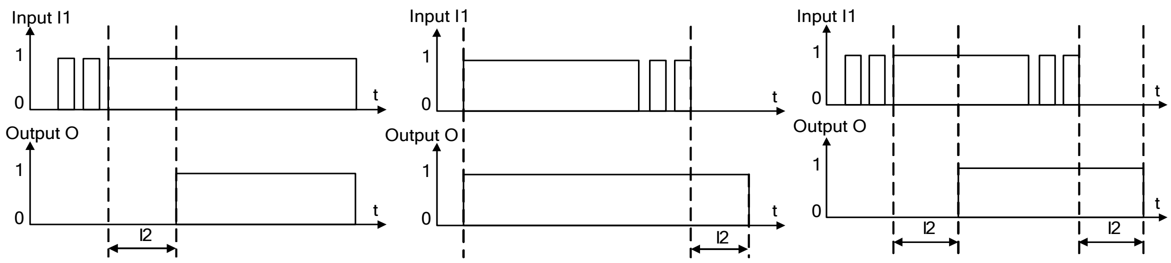
Set the input source for the pulse-to-level module function block in free programming.

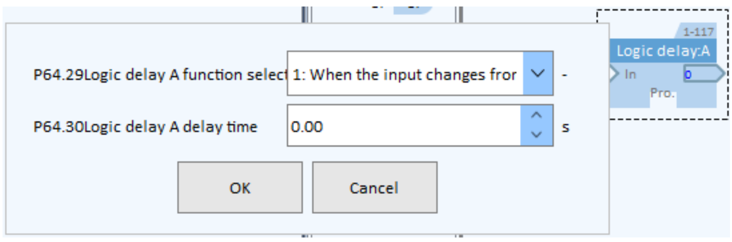
Function code	Name	Description	Setting range	Default
P82.28	Pulse-to-level module A output	-	0–1	0
P82.29	Pulse-to-level module B output	-	0–1	0
P82.30	Pulse-to-level module C output	-	0–1	0
P82.31	Pulse-to-level module D output	-	0–1	0

Set the output for the pulse-to-level module function block in free programming.

6.32.5.4 Logic delay module

In the following, the diagram on the left shows a schematic diagram of logic delay module, and the diagram on the right shows the logic delay module programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P64.28	LogicDelay A input	0: 0 1: 1 2: Other-B connector	0–10	0

Function code	Name	Description	Setting range	Default
		3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2		
P64.29	LogicDelay A function selection	0: When the input changes from 0 to 1, the high time must be maintained at the set delay time in order for the output to be high. 1: When the input changes from 1 to 0, the low time must be maintained at the set delay time in order for the output to be low. 2: When the input changes from 0 to 1 and from 1 to 0, delay processing is performed for each.	0–2	0
P64.30	LogicDelay A delay	0.00–600.00s	0.00–600.00	0.00s
P64.31–P64.33	LogicDelay B	Same as that for module A	-	0
P64.34–P64.36	LogicDelay C	Same as that for module A	-	0
P64.37–P64.39	LogicDelay D	Same as that for module A	-	0

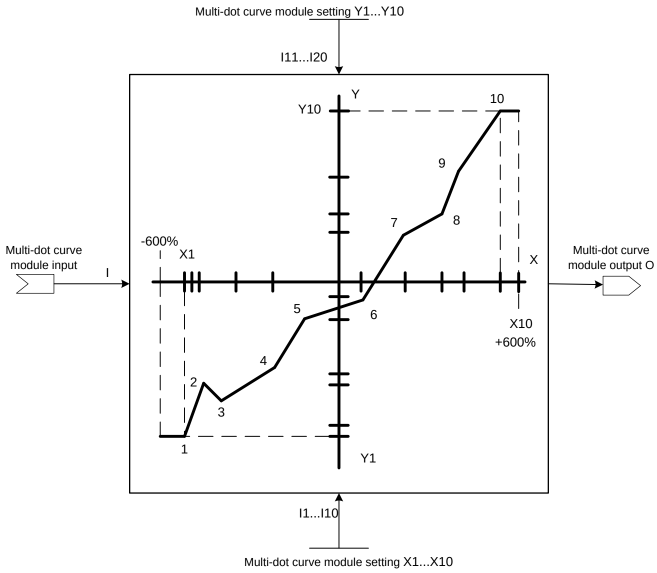
Set the input source and filter time for the logic delay module function block in free programming.

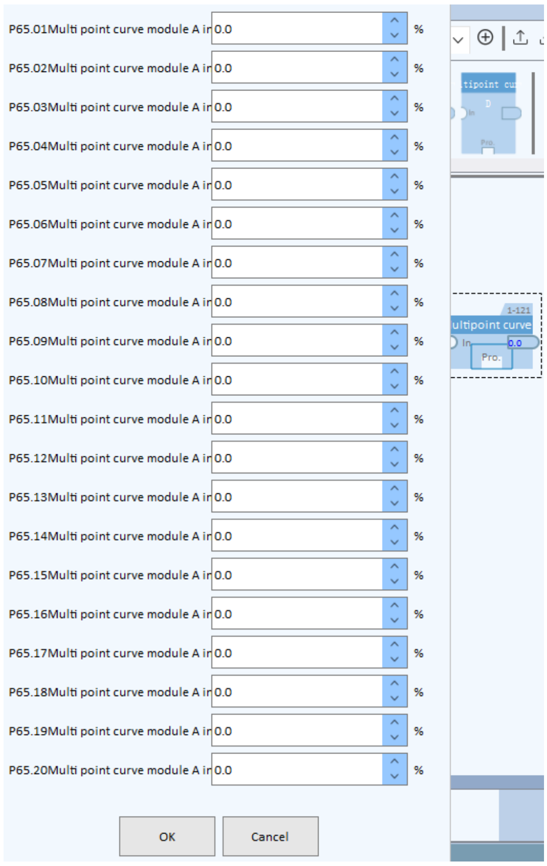
Function code	Name	Description	Setting range	Default
P82.20	LogicDelay A output	-	0–1	0
P82.21	LogicDelay B output	-	0–1	0
P82.22	LogicDelay C output	-	0–1	0
P82.23	LogicDelay D output	-	0–1	0

Set the output for the logic delay module function block in free programming.

6.32.5.5 Multi-dot curve module

In the following, the diagram on the left shows a schematic diagram of multi-dot curve module, and the diagram on the right shows the multi-dot curve module programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P65.00	MultidotCurveModule A input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P65.01–P65.10	MultidotCurveModule A input X1–X10	-	-600.0–600.0	0.0%
P65.11–P65.20	MultidotCurveModule A input Y1–Y10	-	-600.0–600.0	0.0%
P65.21	MultidotCurveModule B input	Same as that for module A	0–10	0
P65.22–P65.31	MultidotCurveModule B input X1–X10	-	-600.0–600.0	0.0%

Function code	Name	Description	Setting range	Default
P65.32–P65.41	MultidotCurveModule B input Y1–Y10	-	-600.0–600.0	0.0%
P65.42	MultidotCurveModule C input	Same as that for module A	0–10	0
P65.43–P65.52	MultidotCurveModule C input X1–X10	-	-600.0–600.0	0.0%
P65.53–P65.62	MultidotCurveModule C input Y1–Y10	-	-600.0–600.0	0.0%
P65.63	MultidotCurveModule D input	Same as that for module A	0–10	0
P65.64–P65.73	MultidotCurveModule D input X1–X10	-	-600.0–600.0	0.0%
P65.74–P65.83	MultidotCurveModule D input Y1–Y10	-	-600.0–600.0	0.0%

Set the input for the multi-dot curve module function block in free programming.

Function code	Name	Description	Setting range	Default
P83.76	MultidotCurveModule A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.77	MultidotCurveModule B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.78	MultidotCurveModule C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.79	MultidotCurveModule D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000

Set the output for the multi-dot curve module function block in free programming.

6.32.5.6 Counter module

Figure 6-10 Count up mode

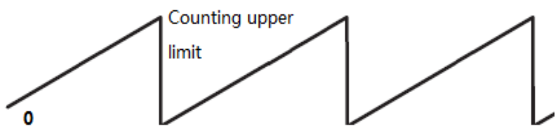
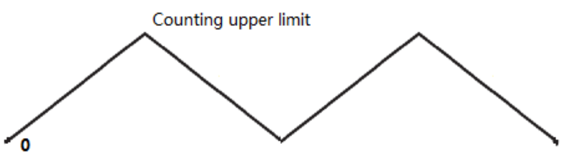


Figure 6-11 Count down mode

Figure 6-12 Count up/down mode



Function code	Name	Description	Setting range	Default
P64.40	CountModule A count mode	0: Invalid 1: Count up mode 2: Count down mode 3: Count up/down mode	0–3	0
P64.41	CountModule A count cycle	The counter value is increased by 1 for every time that is specified by this function code. The value should be greater than the execution period of the free function block; otherwise, it will be automatically limited to the execution period of the free function block.	0–65535	0 ms
P64.42	CountModule A count upper limit	1–65535	1–65535	65535
P64.43	CountModule A start source	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 When this function code takes effective, the counter starts counting. When this function code is ineffective, the counter stops counting, and it counts from 0 for next time of startup.	0–10	0
P64.44–P64.47	CountModule B	Same as that for module A	-	-
P64.48–P64.51	CountModule C	Same as that for module A	-	-
P64.52–P64.55	CountModule D	Same as that for module A	-	-

Set the module, cycle, online, and input source for the counter module function block in free programming.

When P64.43 takes effective, the counter starts counting. When P64.43 is ineffective, the counter stops counting, and it counts from 0 for next time of startup.

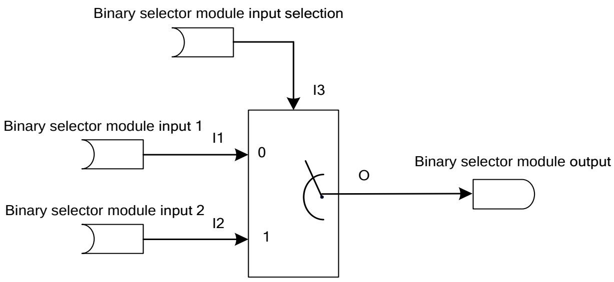
Function code	Name	Description	Setting range	Default
P83.80	CountModule A output	0–65535	0–65535	0
P83.81	CountModule B output	0–65535	0–65535	0
P83.82	CountModule C output	0–65535	0–65535	0
P83.83	CountModule D output	0–65535	0–65535	0

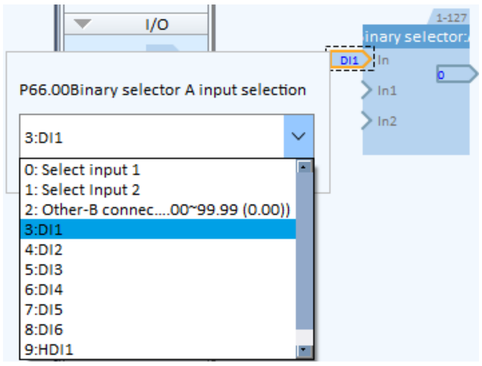
Set the output for the counter module function block in free programming.

6.32.6 Switch functions

6.32.6.1 Binary selector

In the following, the diagram on the left shows a schematic diagram of binary selector module, and the diagram on the right shows the binary selector module programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P66.00	Binary selector A input selection	0: Input 1 1: Input 2 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P66.01	Binary selector A input 1	0: 0	0–10	0
P66.02	Binary selector A input 2	1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P66.03–P66.05	Binary selector B	Same as that for module A	-	-
P66.06–P66.08	Binary selector C	Same as that for module A	-	-
P66.09–P66.11	Binary selector D	Same as that for module A	-	-
P66.12–P66.14	Binary selector E	Same as that for module A	-	-
P66.15–P66.17	Binary selector F	Same as that for module A	-	-

Function code	Name	Description	Setting range	Default
P66.18–P66.20	Binary selector G	Same as that for module A	-	-
P66.21–P66.23	Binary selector H	Same as that for module A	-	-

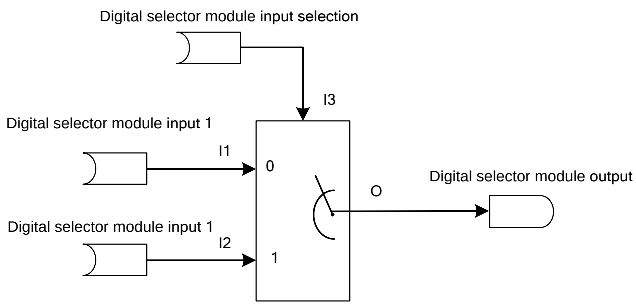
Set the input source for the binary selector function block in free programming.

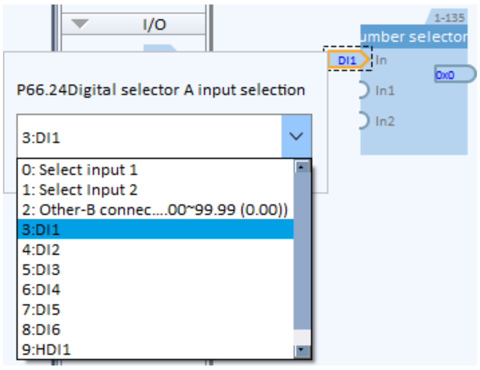
Function code	Name	Description	Setting range	Default
P82.08	Binary selector A output	0–1	0–1	0
P82.09	Binary selector B output	0–1	0–1	0
P82.10	Binary selector C output	0–1	0–1	0
P82.11	Binary selector D output	0–1	0–1	0
P82.12	Binary selector E output	0–1	0–1	0
P82.13	Binary selector F output	0–1	0–1	0
P82.14	Binary selector G output	0–1	0–1	0
P82.15	Binary selector H output	0–1	0–1	0

Set the output for the binary selector function block in free programming.

6.32.6.2 Digital selector

In the following, the diagram on the left shows a schematic diagram of digital selector module, and the diagram on the right shows the digital selector module programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P66.24	DigitSelector A input selection	0: Input 1 1: Input 2 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P66.25	DigitSelector A input 1	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector	0–10	0
P66.26	DigitSelector A input 2		0–10	0

Function code	Name	Description	Setting range	Default
		3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B		
P66.27–P66.29	DigitSelector B	Same as that for module A	-	-
P66.30–P66.32	DigitSelector C	Same as that for module A	-	-
P66.33–P66.35	DigitSelector D	Same as that for module A	-	-
P66.36–P66.38	DigitSelector E	Same as that for module A	-	-
P66.39–P66.41	DigitSelector F	Same as that for module A	-	-
P66.42–P66.44	DigitSelector G	Same as that for module A	-	-
P66.45–P66.47	DigitSelector H	Same as that for module A	-	-
P66.48–P66.50	DigitSelector I	Same as that for module A	-	-
P66.51–P66.53	DigitSelector J	Same as that for module A	-	-
P66.54–P66.56	DigitSelector K	Same as that for module A	-	-
P66.57–P66.59	DigitSelector L	Same as that for module A	-	-

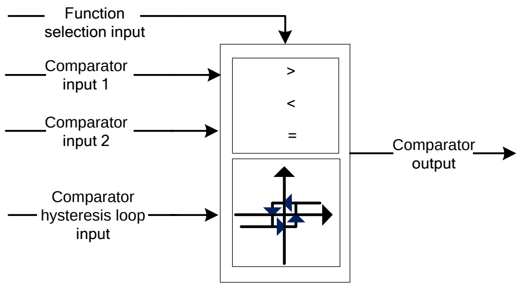
Set the input source for the digital selector function block in free programming.

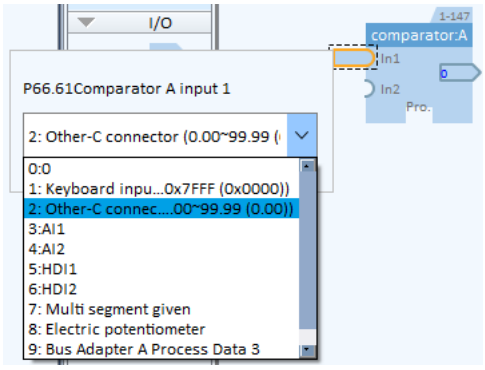
Function code	Name	Description	Setting range	Default
P83.36	DigitSelector A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.37	DigitSelector B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.38	DigitSelector C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.39	DigitSelector D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.40	DigitSelector E output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.41	DigitSelector F output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.42	DigitSelector G output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.43	DigitSelector H output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.44	DigitSelector I output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.45	DigitSelector J output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.46	DigitSelector K output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000
P83.47	DigitSelector L output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000

Set the output for the digital selector function block in free programming.

6.32.6.3 Comparator

In the following, the diagram on the left shows a schematic diagram of comparator module, and the diagram on the right shows the comparator module programming block in the Workshop.





Function code	Name	Description	Setting range	Default
P66.60	Comparator A selection	0: > 1: < 2: =	0–2	0
P66.61	Comparator A input 1	0: 0	0–10	0
P66.62	Comparator A input 2	1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0
P66.63	Comparator A hysteresis loop input	0–65535	0–65535	0
P66.64–P66.67	Comparator B	Same as that for module A	-	-
P66.68–P66.71	Comparator C	Same as that for module A	-	-
P66.72–P66.75	Comparator D	Same as that for module A	-	-

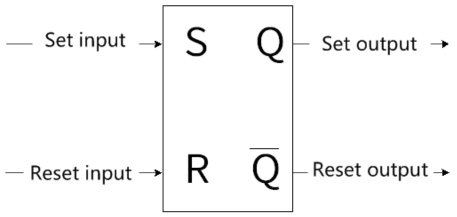
Set the input source for the comparator function block in free programming.

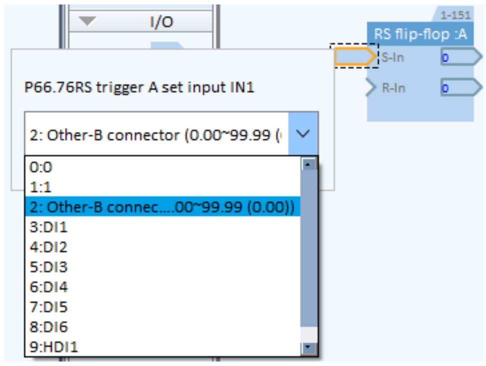
Function code	Name	Description	Setting range	Default
P82.16	Comparator A output	0–1	0–1	0
P82.17	Comparator B output	0–1	0–1	0
P82.18	Comparator A output	0–1	0–1	0
P82.19	Comparator B output	0–1	0–1	0

Set the output for the comparator function block in free programming.

6.32.6.4 RS trigger

In the following, the diagram on the left shows a schematic diagram of RS trigger module, and the diagram on the right shows the RS trigger module programming block in the Workshop.





Input		Output	
IN1	IN2	OUT1	OUT2
0	0	Unchanged	Unchanged
1	0	1	0
X	1	0	1

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P66.76</td><td>RS trigger A set input</td><td rowspan="6">0: 0
1: 1
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td></tr>
<tr><td>P66.77</td><td>RS trigger A reset input</td><td>0–10</td><td>0</td></tr>
<tr><td>P66.78–P66.79</td><td>RS trigger B</td><td>0–10</td><td>0</td></tr>
<tr><td>P66.80–P66.81</td><td>RS trigger C</td><td>0–10</td><td>0</td></tr>
<tr><td>P66.82–P66.83</td><td>RS trigger D</td><td>0–10</td><td>0</td></tr>
</table>

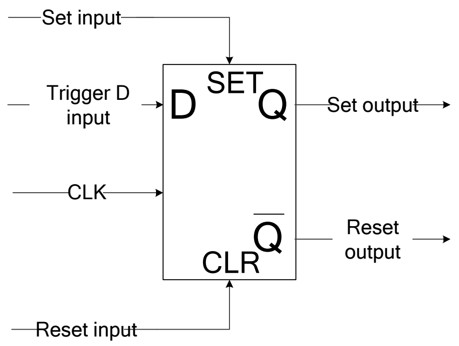
Set the input source for the RS trigger function block in free programming.

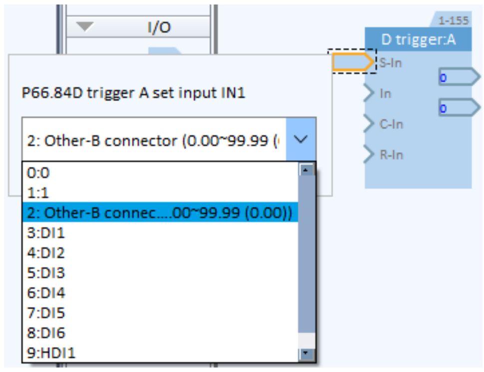
Function code	Name	Description	Setting range	Default
P82.36	RS trigger A set output	0–1	0–1	0
P82.37	RS trigger A reset output	0–1	0–1	0
P82.38	RS trigger B set output	0–1	0–1	0
P82.39	RS trigger B reset output	0–1	0–1	0
P82.40	RS trigger C set output	0–1	0–1	0
P82.41	RS trigger C reset output	0–1	0–1	0
P82.42	RS trigger D set output	0–1	0–1	0
P82.43	RS trigger D reset output	0–1	0–1	0

Set the output for the RS trigger function block in free programming.

6.32.6.5 D trigger

In the following, the diagram on the left shows a schematic diagram of D trigger module, and the diagram on the right shows the D trigger module programming block in the Workshop.





Input				Output	
IN1	IN2	IN3	IN4	OUT1	OUT2
0	IN2	↑	0	IN2	–IN2
X	X	X	1	0	1
0	X	None ↑	0	Retain	Retain
1	X	X	0	1	0

Function code	Name	Description	Setting range	Default
P66.84	D trigger A set input IN1	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0
P66.85	D trigger A input IN2		0–10	0
P66.86	D trigger A clock input IN3		0–10	0
P66.87	D trigger A reset input IN4		0–10	0
P66.88–P66.91	D trigger B set input IN1 – D trigger B reset input IN4		0–10	0
P66.92–P66.95	D trigger C set input IN1 – D trigger C reset input IN4		0–10	0
P66.96–P66.99	D trigger D set input IN1 – D trigger D reset input IN4		0–10	0

Set the input source for the D trigger function block in free programming.

Function code	Name	Description	Setting range	Default
P82.44	D trigger A set output	0–1	0–1	0
P82.45	D trigger A reset output	0–1	0–1	0
P82.46	D trigger B set output	0–1	0–1	0
P82.47	D trigger B reset output	0–1	0–1	0
P82.48	D trigger C set output	0–1	0–1	0
P82.49	D trigger C reset output	0–1	0–1	0
P82.50	D trigger D set output	0–1	0–1	0
P82.51	D trigger D reset output	0–1	0–1	0

Set the output for the D trigger function block in free programming.

7 Fault information

The chapter tells you how to reset faults and check faults history. A complete list of alarms and fault information as well as possible causes and corrective measures are presented in this chapter.

⚠	Only trained and qualified professionals are allowed to carry out the operations mentioned in this chapter. Please carry out operations according to instructions presented in chapter 1 Safety precautions.

7.1 Indications of alarms and faults

Faults are indicated by indicators. See chapter 4 Basic operation guidelines. When the TRIP indicator is on, the alarm or fault code displayed on the keypad indicates the VFD is in abnormal state. This chapter covers most of the alarms and faults, and their possible causes and corrective measures. If you cannot find out the causes of alarms or faults, contact local INVT office.

7.2 Fault reset

The VFD can be reset by pressing the keypad key STOP/RST, digital inputs, or by cutting off the VFD power. After faults are removed, the motor can be started again.

7.3 Fault history

The function codes from P08.00 to P08.05 record the types of the last six faults. The function codes from P08.12 to P08.17 record the types of the last six faults. The function codes P08.18–P08.25, P08.26–P08.33, and P08.34–P08.41 record the running data of the VFD at the last three faults. The function codes P08.75–P08.92 record the time when the last three faults occurred.

Related function parameters

Function code	Name	Description	Setting range	Default
P08.00	Present fault code	DSP faults: E11.nn–E99.nn Unit faults: E01.nn–E10.nn Fault: nn=0–99 Each group supports 32 faults at most. Unit faults: E0100–E1000: Reserved E0101–E1001: Units 1–10-VCE fault (oUT) (reported for models of above 45kW) E0102–E1002: Reserved E0103–E1003: Reserved E0104–E1004: Units 1–10-Hardware overcurrent (HoC) E0105–E1005: Units 1–10-Current limit protection (LC) E0106–E1006: Units 1–10-Zero drift fault (ItE) E0107–E1007: Units 1–10-24V supply fault (E24)	0.00–99.99	0.00
P08.01	Last fault code		0.00–99.99	0.00
P08.02	2nd-last fault code		0.00–99.99	0.00
P08.03	3rd-last fault code		0.00–99.99	0.00
P08.04	4th-last fault code		0.00–99.99	0.00
P08.05	5th-last fault code		0.00–99.99	0.00

Function code	Name	Description	Setting range	Default
		E0108–E1008: Units 1–10-15V fault (E15) E0109–E1009: Unit STO fault F0110–E1010: Reserved E0111–E1011: Units 1–10-Downstream communication fault (dn) E0112–E1012: Units 1–10-Upstream communication fault (UP) E0113–E1013: Reserved E0114–E1014: Reserved E0115–E1015: Reserved The following faults are non-FPGA transfer faults, which are determined by the DSP side. E0116–E1016: Unit overvoltage (ov) E0117–E1017: Unit undervoltage (Lv) E0118–E1018: Unit output phase loss (SPO) (determined by CPU2) E0119–E1019: Unit overtemperature (UoH) Group E11: DSP_CPU1 faults E1100: Reserved E1101: Bus overvoltage (ov) E1102: Bus undervoltage (Lv) E1103: Bus overvoltage alarm (A.ov) E1104: Software overcurrent (SoC) E1105: External fault 2 (EF1) E1106: External fault 2 (EF2) E1107: External fault 3 (EF3) E1108: External fault 4 (EF4) E1109: External fault 5 (EF5) E1110: External alarm 1(EA1) E1111: External alarm 2 (EA2) E1112: External alarm 3 (EA3) E1113: External alarm 4 (EA4) E1114: External alarm 5 (EA5) E1115: Motor overtemperature (oH) E1116: Motor overtemperature alarm (A.oH) E1117: Motor stall fault (StALL) E1118: Reserved E1119: Sto E1120: StL1 E1121: StL2 E1122: Reserved E1123: Brake torque verification timeout (bAo.ot) E1124: Brake feedback disconnection (bAo) E1125: Set frequency below brake closing frequency (bAo.L)		

Function code	Name	Description	Setting range	Default
		E1126: Reserved E1127: Speed deviation fault (dEu) E1128: PG card disconnection fault (EnC) E1129: AI input frequency disconnection fault (F.oFF) E1130: PID feedback disconnection fault (PIdE) E1131: Running time arrival fault (End) E1204: Bus adapter A communication disconnection (E-FbA) E1205: Bus adapter B communication disconnection (E-Fbb) E1206: MODBUS communication fault (E-485) E1207: FPGA heartbeat fault (F.bEAt) E1208: CPU2 heartbeat fault (d.bEAt) E1209: ARM heartbeat fault (A.bEAt) E1210: SD card fault (Sd) E1211: Master/slave-Slave fault (E_SLA) E1212: Master/slave optical-fiber communication fault (E-oF) E1213: CPU2 operating in protected state (CPU-P) E1214: Concurrent online number exception (A.IPn) E.1215: Multiple IP address duplicate (A.IPr) Group E50: DSP_CPU2 faults E5000: Reserved E5001: Software overcurrent (SoC) E5002: Hardware overcurrent (HoC) E5003: Bus overvoltage (ov) E5004: Bus undervoltage (Lv) E5005: Motor overload (oL1) E5006: VFD overload (oL2) E5007: Reserved E5008: Phase loss on input side (SPI) E5009: Reserved E5010: Motor autotuning fault (tE) E5011: Encoder disconnection fault (EnC1o) E5012: Encoder reversal fault (EnC1d) E5013: Wave sealing fault (E-StoP) E5014: Reserved E5015: Encoder Z pulse loss (EnCLo) E5016: Encoder speed deviation fault (SPdE) E5017: Encoder mal-adjustment fault (dEtUn)		

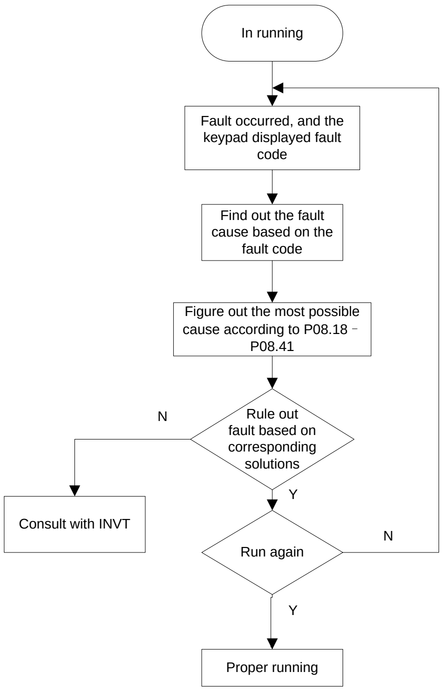
Function code	Name	Description	Setting range	Default
		E5018: To-ground short-circuit fault (EtH1) E5019: To-ground short-circuit fault (EtH2) E5027: Motor mal-adjustment fault (SSTO) E5028: Unit current imbalance fault (A.AvF) E5101: Unit current imbalance alarm (A.AvF) E5101: Unit current imbalance alarm (A.AvF) E5102: Current limit alarm (A.LC) E5103: Encoder hardware disconnection protection alarm (A.EnoF) E5104: Overload alarm (A.OL)		
P08.06	RT fault code 1	Real time (RT) faults only record fault codes, excluding the parameters at the fault time; the difference between the current fault code and the real time fault code is that if the current inverter is already in the fault state, the other faults will not be logged by the current fault code and the real time fault code will still be logged. The difference between the present fault code and the real-time fault code is as follows: if the inverter is already in a fault state, the present fault code will not record other faults, while the real-time fault code will still record.	0.00–99.99	0.00
P08.07	RT fault code 2		0.00–99.99	0.00
P08.08	RT fault code 3		0.00–99.99	0.00
P08.09	RT fault code 4		0.00–99.99	0.00
P08.10	RT fault code 5		0.00–99.99	0.00
P08.11	RT fault code 6		0.00–99.99	0.00
P08.12	Present alarm code 1	DSP-CPU2 alarm codes: A50.nn–A99.nn DSP-CPU1 alarm codes: A11.nn–A49.nn Unit alarm codes: A01.nn–A10.nn Alarm: nn=0–99	0.00–99.99	0.00
P08.13	Last alarm code 2		0.00–99.99	0.00
P08.14	2nd-last alarm code 3		0.00–99.99	0.00
P08.15	3rd-last alarm code 4		0.00–99.99	0.00
P08.16	4th-last alarm code 5		0.00–99.99	0.00
P08.17	5th-last alarm code 6		0.00–99.99	0.00
P08.18	Run speed at present fault	-327.68–327.67%	-327.68–327.67	0.00%
P08.19	Ramp reference speed at present fault	-327.68–327.67%	-327.68–327.67	0.00%
P08.20	Output current at present fault	0–20000V	0–20000	0V
P08.21	Output current at present fault	0.0–6000.0A	0.0–6000.0	0.0A
P08.22	Bus voltage at present fault	0.0–6000.0V	0.0–6000.0	0.0V
P08.23	Max temperature at present fault	-20.0–120.0°C	-20.0–120.0	0.0°C
P08.24	Input terminal state at present fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000

Function code	Name	Description	Setting range	Default
P08.25	Output terminal state at present fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P08.26	Running frequency at last fault	-327.68–327.67%	-327.68–327.67	0.00%
P08.27	Ramp reference frequency at last fault	-327.68–327.67%	-327.68–327.67	0.00%
P08.28	Output voltage at last fault	0–20000V	0–20000	0V
P08.29	Output current at last fault	0.0–6000.0A	0.0–6000.0	0.0A
P08.30	Bus voltage at last fault	0.0–6000.0V	0.0–6000.0	0.0V
P08.31	Max temperature at last fault	-20.0–120.0°C	-20.0–120.0	0.0°C
P08.32	Input terminal state at last fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P08.33	Output terminal state at last fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P08.34	Running frequency at 2nd-last fault	-327.68–327.67%	-327.68–327.67	0.00%
P08.35	Ramp reference frequency at 2nd-last fault	-327.68–327.67%	-327.68–327.67	0.00%
P08.36	Output voltage at 2nd-last fault	0–20000V	0–20000	0V
P08.37	Output current at 2nd-last fault	0.0–6000.0A	0.0–6000.0	0.0A
P08.38	Bus voltage at 2nd-last fault	0.0–6000.0V	0.0–6000.0	0.0V
P08.39	Max temperature at 2nd-last fault	-20.0–120.0°C	-20.0–120.0	0.0°C
P08.40	Input terminal state at 2nd-last fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P08.41	Output terminal state at 2nd-last fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P08.75	Present fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01
P08.76	Present fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00
P08.77	Present fault occur second	Records the second when the fault occurred.	Sec 0–59	0
P08.78	Last fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01
P08.79	Last fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00
P08.80	Last fault occur second	Records the second when the fault occurred.	Sec 0–59	0

Function code	Name	Description	Setting range	Default
P08.81	2nd-last fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01
P08.82	2nd-last fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00
P08.83	2nd-last Fault occur second	Records the second when the fault occurred.	Sec 0–59	0
P08.84	3rd-last fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01
P08.85	3rd-last fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00
P08.86	3rd-last fault occur second	Records the second when the fault occurred.	Sec 0–59	0
P08.87	4th-last fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01
P08.88	4th-last fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00
P08.89	4th-last Fault occur second	Records the second when the fault occurred.	Sec 0–59	0
P08.90	5th-last fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01
P08.91	5th-last fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00
P08.92	5th-last fault occur second	Records the second when the fault occurred.	Sec 0–59	0
P08.93	Abnormal state exception code	DSP faults: E11.nn–E99.nn Unit faults: E01.nn–E10.nn Fault: nn=0–99 Displays fault code or alarm code or 0. It displays the fault code when there is a fault, it displays the alarm code when there is no fault, and it displays 0 when there is no fault nor alarm. This function code differs from P08.00 in that it will be cleared after the fault is reset and P08.00 will not be cleared.	0.00–99.99	0.00

7.4 Faults and solutions

The following describes fault handling.



When a fault occurred, handle the fault as follows:

Step 1 Check whether there is any exception on the keypad. If yes, contact the local INVT office.

Step 2 If no, check function code group P07 for the corresponding fault record parameters to determine the real state when the fault occurred.

Step 3 See the following table for a detailed solution and check for exceptions.

Step 4 Rectify the fault or ask for help.

Step 5 Ensure the fault has been rectified, perform fault reset, and run it again.

7.4.1 Whole machine fault

Fault no.	Fault code	Fault type	Possible cause	Solution
E.11.01	ov	Bus overvoltage	•Abnormal input voltage. •Large energy feedback. •DEC is too fast. •Load inertia torque is great. •The motor is restarted during rotating after sudden power down. •Th variable-frequency speed regulation system power is small.	•Check the input power. •Check whether load DEC time is too short; or the motor starts during rotating; or additional dynamic brake components are required. •Select a variable-frequency speed regulation system with larger power.
E.11.02	Lv	Bus undervoltage	•Grid voltage is too low.	•Check the grid input power.
E.11.03	A.ov	Bus overvoltage alarm	•Abnormal input voltage. •The setting is too low.	•Check the input power. •Check whether load DEC

Fault no.	Fault code	Fault type	Possible cause	Solution
			●DEC is too fast. ●Load inertia torque is great. ●The motor is restarted during rotating after sudden power down. ●Th variable-frequency speed regulation system power is small.	time is too short; or the motor starts during rotating; or additional dynamic brake components are required. ●Select a variable-frequency speed regulation system with larger power.
E.11.04	SoC	Software overcurrent	●ACC/DEC is too fast. ●Grid voltage is too low. ●VFD power is too small. ●Load transient or exception occurred. ●To-ground short circuit or output phase loss occurred. ●There is strong external interference.	●Increase ACC/DEC time. ●Check the input power. ●Select a VFD with larger power. ●Check whether the load is short circuited (to-ground short circuit or line-to-line short circuit) or the rotation is not smooth. ●Check the output wiring. ●Check whether there is strong interference.
E.11.05	EF1	External fault 1	●SI external fault input terminal action	●Check external device input. ●Check parameter settings in group P05—Input terminal functions.
E.11.06	EF2	External fault 2	●SI external fault input terminal action	●Check external device input. ●Check parameter settings in group P05—Input terminal functions.
E11.07	EF3	External fault 3	●SI external fault input terminal action	●Check external device input. ●Check parameter settings in group P05—Input terminal functions.
E11.08	EF4	External fault 4	●SI external fault input terminal action	●Check external device input. ●Check parameter settings in group P05—Input terminal functions.
E11.09	EF5	External fault 5	●SI external fault input terminal action	●Check external device input. ●Check parameter settings in group P05—Input terminal functions.
E11.10	EA1	External alarm 1	●SI external alarm input terminal action	●Check external device input.

Fault no.	Fault code	Fault type	Possible cause	Solution
				•Check parameter settings in group P05—Input terminal functions.
E11.11	EA2	External alarm 2	•SI external alarm input terminal action	•Check external device input. •Check parameter settings in group P05—Input terminal functions.
E11.12	EA3	External alarm 1	•SI external alarm input terminal action	•Check external device input. •Check parameter settings in group P05—Input terminal functions.
E11.13	EA4	External alarm 2	•SI external alarm input terminal action	•Check external device input. •Check parameter settings in group P05—Input terminal functions.
E11.14	EA5	External alarm 2	•SI external alarm input terminal action	•Check external device input. •Check parameter settings in group P05—Input terminal functions.
E.11.15	oH	Motor overtemperature fault	•Long-time overload running or exception occurred. •The temperature detection resistance is abnormal. •The motor overtemperature protection point is set improperly. •Ambient temperature is too high.	•Check the motor, and perform maintenance on the motor. •Check whether the temperature sensor is proper. •Set the motor overtemperature protection point again. •Lower the ambient temperature.
E.11.16	A.oH	Motor overtemperature alarm	•Long-time overload running or exception occurred. •The temperature detection resistance is abnormal. •The motor overtemperature protection point is set improperly. •Ambient temperature is too high.	•Check the motor, and perform maintenance on the motor. •Check whether the temperature sensor is proper. •Set the motor overtemperature protection point again. •Lower the ambient temperature.
E.11.17	StALL	Motor stall fault	•Motor stall detection has been enabled. The motor outputs high torque at low frequency for a period of time longer than the timeout time.	•Check the load and drive unit rating parameters. •Check the encoder in closed-loop control. •Check the motor rotor for

Fault no.	Fault code	Fault type	Possible cause	Solution
				foreign objects affecting its rotation.
E.11.19	STo	Safe torque off	•STO terminal disconnection.	•Check the external controller.
E.11.20	STL1	Exception occurred to safe circuit of channel 1	•Motor overload or insufficient motor power.	•Check the load and drive unit rating parameters. •Check the encoder in closed-loop control.
E.11.21	STL2	Exception occurred to safe circuit of channel 2 Brake torque verification timeout. Brake feedback disconnection.	•STO terminal disconnection. •The brake function has been enabled, and torque verification has been enabled, but the output torque is less than the set torque for a long period of time. •The brake feedback circuit is disconnected or in poor contact. •The brake feedback detection time is too short.	•Check the external controller. •Check whether the torque verification current and moment force settings are too small, and torque verification fault detection time is too short. •Check whether the motor rated power is set correctly. •Check the brake feedback circuit •Increase the detection time to a proper value.
E.11.23	bAo. ot			
E.11.24	bAo			
E.11.25	bAo.L	Set frequency below brake closing frequency	•Set frequency below brake closing frequency	•Check parameter settings.
E.11.27	dEU	Speed deviation fault	•Load too heavy or stalled.	•Check the load to ensure it is proper, and increase the detection time. •Check whether the control parameters are set properly.
E.11.28	EnC	PG card disconnection alarm	•Closed-loop vector control, encoder signal disconnection, encoder damage	•Check the encoder wiring and re-connect the wires. •Check the encoder for output.
E.11.29	F. oFF	AI input frequency disconnection fault	•When the analog is frequency reference, the analog signal is lost. •The frequency giving source is lost.	•Check analog input. •Check the frequency giving source.
E.11.30	PIdE	PID feedback offline fault	•PID feedback offline. •PID feedback source disappears.	•Check PID feedback signal wires. •Check PID feedback source.
E.11.31	End	Running time reached	•Actual VFD running time longer than internally set running time.	•Contact the supplier and adjust the set running time.

Fault no.	Fault code	Fault type	Possible cause	Solution
E.12.04	E-FbA	Bus adapter A communication disconnection	•Incorrect parameter settings. •Line contact is poor. •Communication module damage. •The peripheral interference is too large.	•Check the related settings. •Check the line. •Replace the module with another. •Check the surrounding environment, and eliminate interference effects.
E.12.05	E-Fbb	Bus adapter B communication disconnection	•Incorrect parameter settings. •Line contact is poor. •Communication module damage. •The peripheral interference is too large.	•Check the related settings. •Check the line. •Replace the module with another. •Check the surrounding environment, and eliminate interference effects.
E.12.06	E-485	RS485 communication fault	•Incorrect baud rate •Communication line fault. •Incorrect communication address. •Communication suffers from strong interference.	•Set a proper baud rate. •Check the communication port cable. •Set the communication address correctly. •Replace or change the wiring to enhance the anti-interference capacity.
E.12.07	F.bEAt	FPGA heartbeat fault	•FPGA heartbeat is lost. •The communication between the FPGA and DSP is abnormal.	•FPGA internal program is missing or abnormal. •Main control board hardware is damaged.
E.12.08	d.bEAt	CPU2 heartbeat fault	•The DSP does not work for a short period of time.	•Replace the control board.
E.12.09	A. bEAt	ARM heartbeat alarm	•The ARM does not work for a short period of time.	•Check the ARM chip accessory switch is in the ON position. •Replace the control board.
E.12.10	Sd	SD card fault	•The SD card is not inserted or has poor contact.	•Check the SD card insertion status.
E.12.11	E-SLA	Master/slave–Slave fault	•A fault has occurred to the slave, or a master/slave optical fiber communication fault has occurred in the adjacent place.	•Check the slave. •Check the optical fiber wiring.
E.12.12	E-oF	Master/slave optical fiber communication fault	•The communication cable is not connected properly. •The optical fiber is damaged.	•Check and adjust the wiring.
E.12.13	A. CPUP	CPU2 run protection alarm	•The device enters an overvoltage stall, power-down frequency fall, or current limit state.	•Check whether the bus voltage is too high or low. •Check whether the overvoltage stall point, power-down frequency

Fault no.	Fault code	Fault type	Possible cause	Solution
				fall point, or current limit point is set appropriately.
E.12.14	A. IPn	Concurrent online number exception	•The number of online control boxes searched does not match the setting.	•Check and adjust the wiring.
E.12.15	A. IPr	Multiple IP address duplicate	•There are two or more duplicate control box IP addresses that are found.	•Check and adjust the wiring.
E.50.01	SoC	Software overcurrent	•ACC/DEC is too fast. •Grid voltage is too low. •VFD power is too small. •Load transient or exception occurred. •To-ground short circuit or output phase loss occurred. •There is strong external interference. •Abnormal input voltage. •Large energy feedback.	•Increase ACC/DEC time. •Check the input power. •Select a VFD with larger power. •Check whether the load is short circuited (to-ground short circuit or line-to-line short circuit) or the rotation is not smooth. •Check the output wiring. •Check whether there is strong interference. •Check the input power. •Check whether load DEC time is too short; or the motor starts during rotating;☒ or additional dynamic brake components are required.
E.50.03	ov	Bus overvoltage		
E.50.04	Lv	Bus undervoltage	•Grid voltage is too low.	•Check the grid input power.
E.50.05	oL1	Motor overload	•Grid voltage is too low. •Motor rated current is set incorrectly. •Motor stall or load jumps violently.	•Check the grid voltage. •Set the motor rated current. •Check the load and adjust torque boost.
E.50.06	oL2	VFD overload	•ACC is too fast. •The motor is restarted during rotating. •Grid voltage is too low. •Load is too heavy.	•Increase ACC time. •Avoid restart after stop. •Check the grid voltage. •Select a VFD with larger power. •Select a proper motor.
E.50.08	SPI	Phase loss on input side	•Phase loss or violent fluctuation occurred on inputs R, S, and T.	•Check the input power. •Check the installation wiring.
E.50.10	tE	Motor-autotuning fault	•The motor capacity does not match the VFD capacity. •Incorrect motor parameter setting. •The parameters gained from autotuning deviate sharply from	•Change the VFD model. •Set proper motor type and nameplate parameters. •Empty the motor load and re-perform autotuning. •Check motor wiring and

Fault no.	Fault code	Fault type	Possible cause	Solution
			the standard parameters. ●Autotuning timeout.	parameter settings. ●Check whether the upper limit frequency is larger than 2/3 of the rated frequency.
E.50.11	EnC1o	Encoder disconnection fault	●Closed-loop vector control, encoder signal disconnection, encoder damage	●Check the encoder wiring and re-connect the wires. ●Check the encoder for output.
E.50.12	EnC1d	Encoder reversal fault	●Closed-loop vector control, encoder signal disconnection, encoder damage, or incorrect VFD wiring	●Check and adjust the encoder wiring.
E50.13	E-StoP	Wave sealing fault	●Excessive running current causes FPGA wave sealing (software overcurrent).	●Adjust parameters.
E.50.15	EnCLo	Encoder Z pulse loss	●The motor capacity does not match the VFD capacity. ●Incorrect motor parameter setting. ●The parameters gained from autotuning deviate sharply from the standard parameters. ●Autotuning timeout.	●Change the VFD model. ●Set proper motor type and nameplate parameters. ●Empty the motor load and re-perform autotuning. ●Check motor wiring and parameter settings. ●Check whether the upper limit frequency is larger than 2/3 of the rated frequency.
E.50.16	SPdE	Encoder speed deviation fault	●The load is too heavy or stalled.	●Check the load to ensure it is proper, and increase the detection time. ●Check whether the control parameters are set properly.
E.50.17	dEtUn	Encoder mal-adjustment fault	●Control parameters of the synchronous motor are set improperly. ●Autotuned parameters are not accurate. ●The VFD is not connected to the motor.	●Check the load and ensure the load is normal. ●Check whether control parameters are set correctly. ●Increase the maladjustment detection time.
E.50.18	EtH1	To-ground short-circuit fault	●The output of the VFD is short circuited to the ground. ●Current detection circuit fault. ●Actual motor power setup deviates sharply from the VFD power.	●Check whether the motor wiring is normal. ●Replace the hall component. ●Replace the sub control board. ●Reset the motor parameters properly.

Fault no.	Fault code	Fault type	Possible cause	Solution
E.50.19	EtH2	To-ground short-circuit fault	•The output of the VFD is short circuited to the ground. •Current detection circuit fault. •Actual motor power setup deviates sharply from the VFD power.	•Check whether the motor wiring is normal. •Replace the hall component. •Replace the sub control board. •Reset the motor parameters properly.
E50.27	SSTO	Motor mal-adjustment fault	•Control parameters of the synchronous motor are set improperly. •Autotuned parameters are not accurate. •The VFD is not connected to the motor.	•Check the load and ensure the load is normal. •Check whether control parameters are set correctly. •Increase the maladjustment detection time.
E50.28	A. AvF	Unit current imbalance fault	•The unit output current difference is great when paralleled.	•Check whether the unit cable length is consistent. •Replace the unit.
E5101	A. AvE	Unit current imbalance alarm	•Paralleled unit current imbalance.	•Check whether the unit cable length is consistent. •Replace the unit.
E5102	A. LC	Current limit alarm	•ACC is too fast. •Grid voltage is too low. •Th variable-frequency speed regulation system power is small. •Load transient or exception occurred.	•Increase ACC/DEC time. •Increase input power. •Select a variable-frequency speed regulation system with larger power. •Check the load or reduce the load sudden change.
E5103	A. EnoF	Encoder hardware disconnection protection alarm	•Encoder disconnection.	•Check the encoder wiring.
E5104	A. OL	Overload alarm	•ACC is too fast. •The motor is restarted during rotating. •Grid voltage is too low. •Load is too heavy. •Power is too small.	•Increase DEC time. •Avoid restart after stop. •Check the grid voltage. •Select a variable-frequency speed regulation system with larger power.

7.4.2 Unit fault

Fault no.	Fault code	Fault type	Possible cause	Solution
E.01.01–E.10.01	m. oUt	Unit-m Vce detection fault	•Unit internal IGBT is damaged. •Strong interference. •External short circuit	•Ask for technical support. •Check and remove the external interference source. •Check the external circuit and eliminate the load fault.

Fault no.	Fault code	Fault type	Possible cause	Solution
			occurred.	
E.01.04–E.10.04	m. HoC	Unit-m hardware overcurrent fault	•Unit internal IGBT is damaged. •Inverter ACC time is too fast. •Short circuit occurred at the unit output side.	•Ask for technical support. •Update the parameter settings and restart. •Check the external circuit and eliminate the short circuit fault.
E.01.05–E.10.05	m. LC	Unit-m current limit protection	•Unit in continuous overload running.	•Check the inverter unit load and reduce the load power.
E.01.06–E.10.06	m.ItE	Unit-m current check fault	•Unit current detection component is damaged. •Interference	•Ask for technical support. •Check for and remove the external interference source. •Replace the unit.
E.01.07–E.10.07	m.E24	Unit-m power supply fault	•Switch power supply working voltage is too low.	•Ask for technical support.
E.01.08–E.10.08	m.E15			
E.01.11–E.10.11	m.dn	Unit-m downstream communication fault	•The master and slave address settings do not match. •The slave communication mode is set improperly. •The communication cable is not connected properly.	•Check related settings. •Check the communication mode selection. •Check and adjust the wiring.
E.01.12–E.10.12	m.UP	Unit-m upstream communication fault	•The master and slave address settings do not match. •The master communication mode is set improperly. •The communication cable is not connected properly.	•Check related settings. •Check the communication mode selection. •Check and adjust the wiring.
E.01.16–E.10.16	m.ov	Unit-m bus overvoltage fault	•Grid voltage is too high.	•Check the input power.
E.01.17–E.10.17	m.Lv	Unit-m bus undervoltage fault	•Grid voltage is too low.	•Check the input power.
E.01.18–E.10.18	m.SPo	Unit-m output phase loss fault	•UVW phase loss output. •The loads of three phases are seriously asymmetrical.	•Check the output wiring. •Check the motor and cable.
E.01.19–E.10.19	m. oH	Unit-m IGBT overheating fault	•VFD transient overcurrent. •Inter-phase or to-ground short circuit occurred among output three phases. •Air duct is blocked or fan is damaged. •Ambient temperature is too high. •Control board cable or add-on is loosened. •Auxiliary power damage or	•See solutions for overcurrent. •Perform wiring again. •Ventilate the air duct or replace the fan. •Lower the ambient temperature. •Check and connect again. •Ask for technical support. •Ask for technical support. •Ask for technical support.

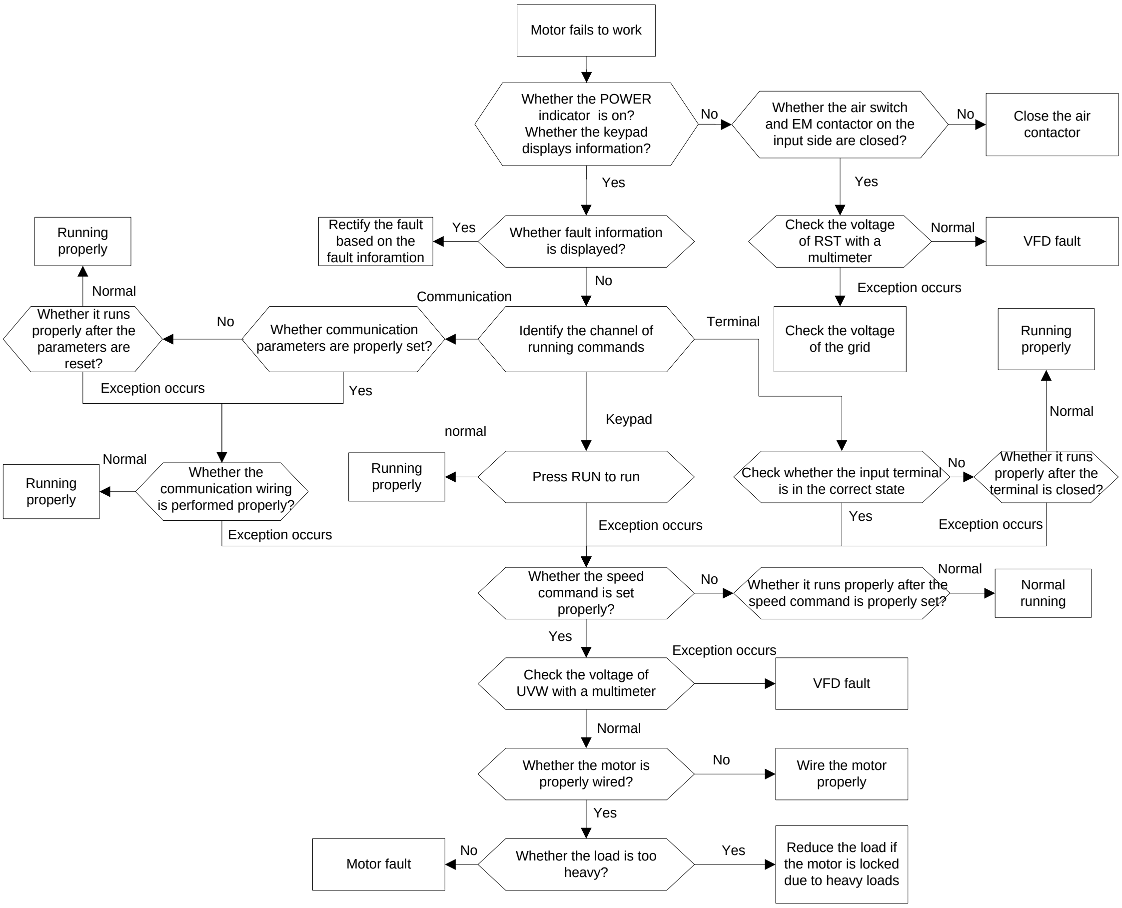
Fault no.	Fault code	Fault type	Possible cause	Solution
			drive undervoltage. ●The short through of bridge arm of power modules occurred. ●Abnormal control board.	

7.4.3 Other status

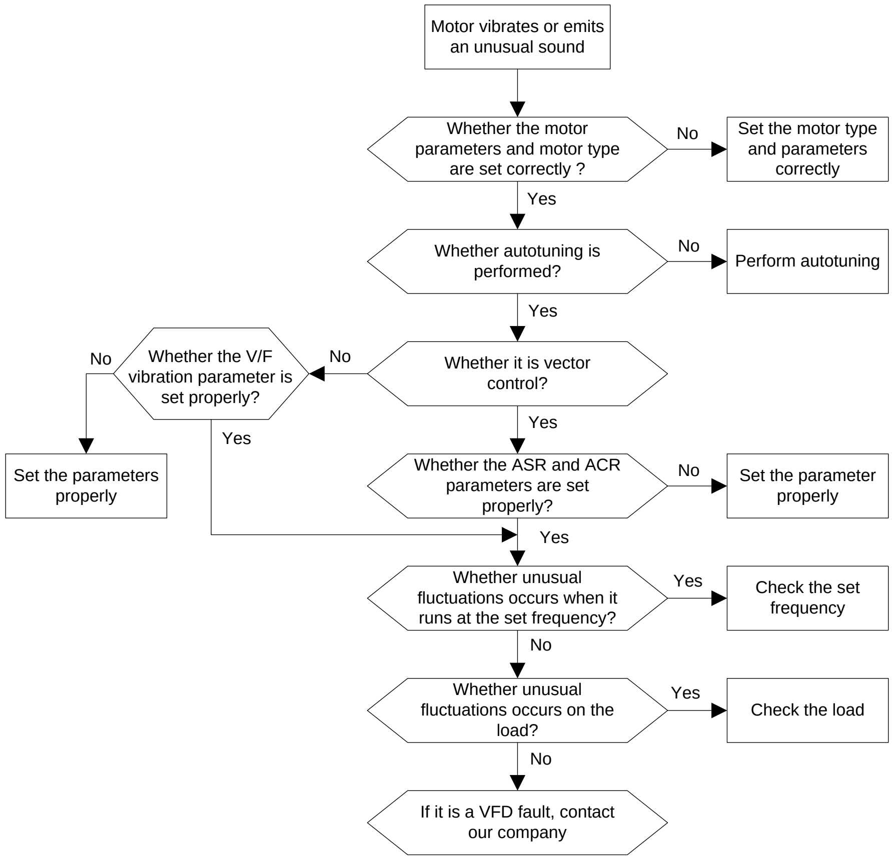
Displayed code	Status type	Possible cause	Solution
PoFF	Power-on failure	The optical fiber can communicate normally, but the bus voltage is too low.	Check the grid conditions.

7.5 Analysis on common faults

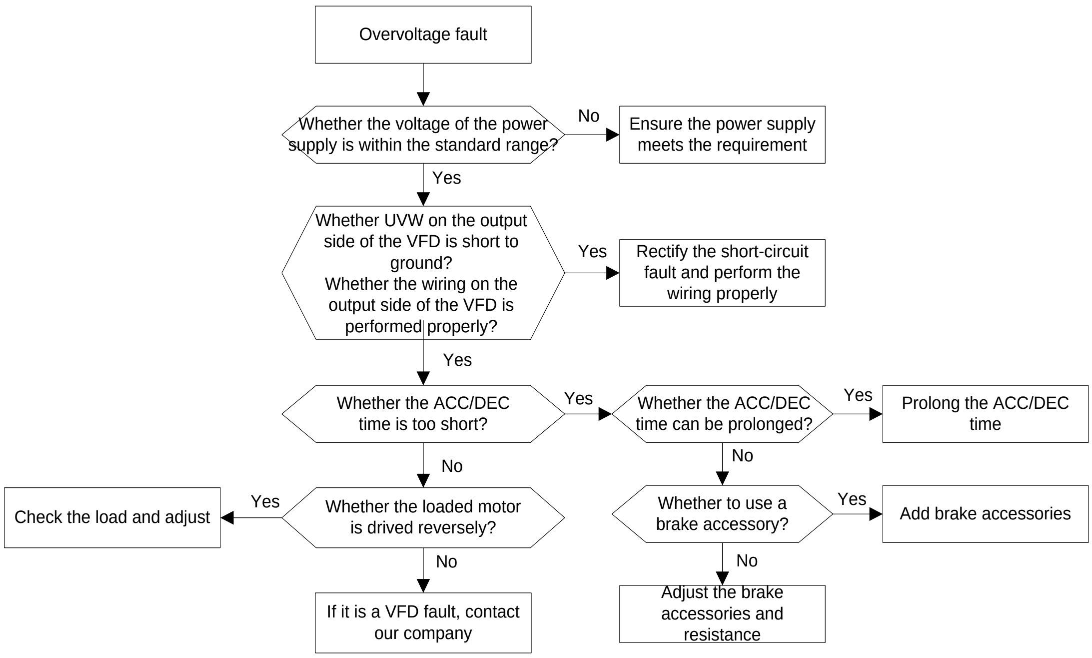
7.5.1 Motor fails to work



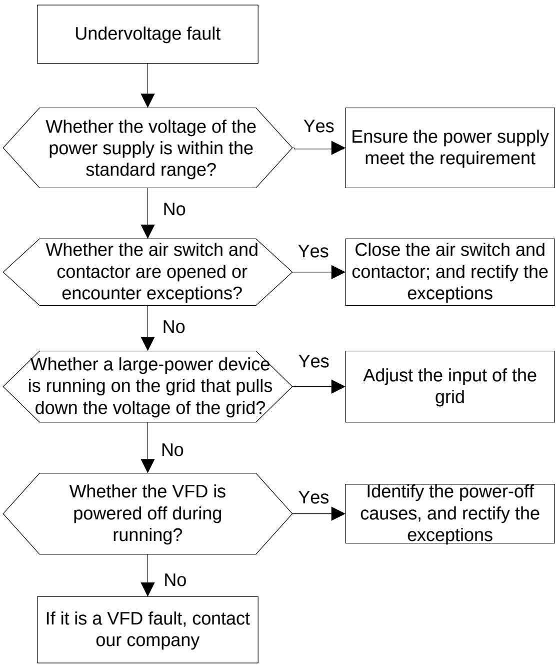
7.5.2 Motor vibrates



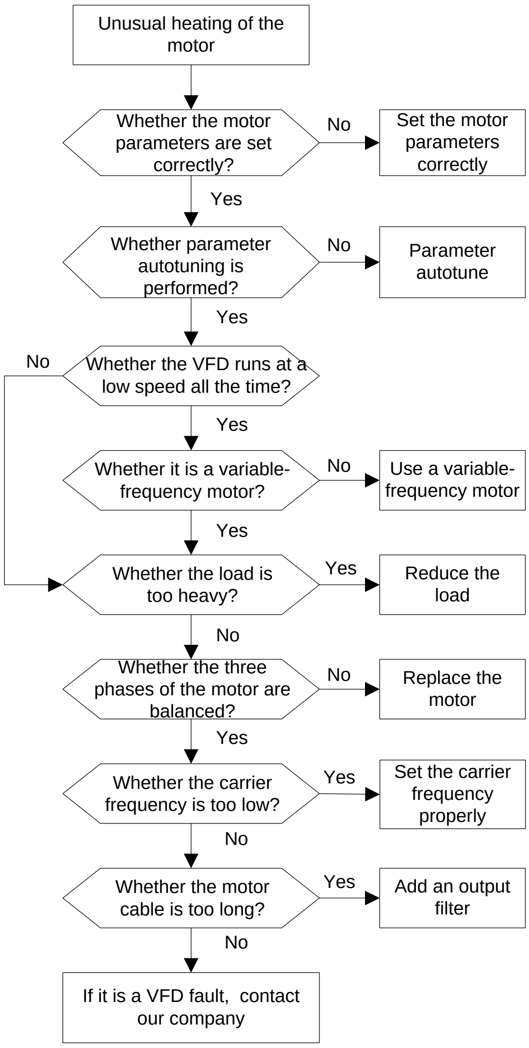
7.5.3 Overvoltage



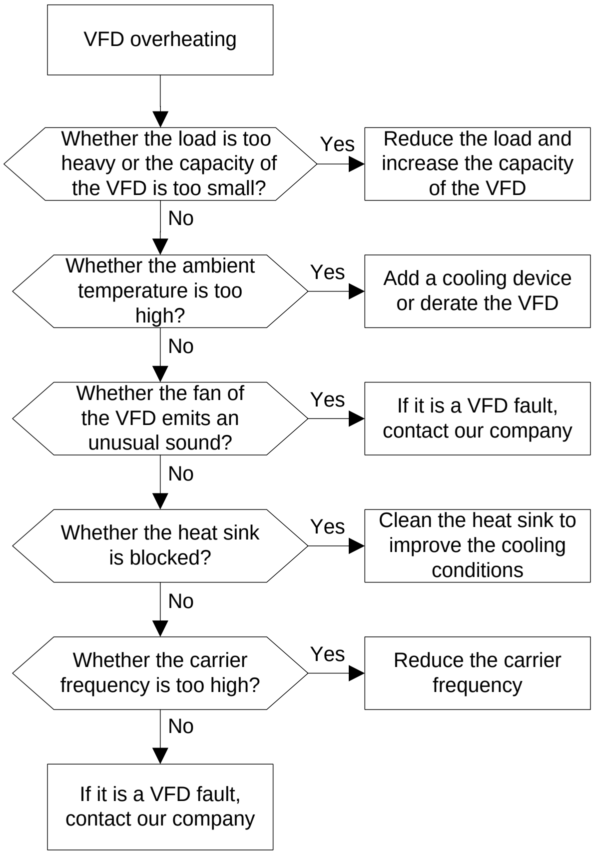
7.5.4 Undervoltage



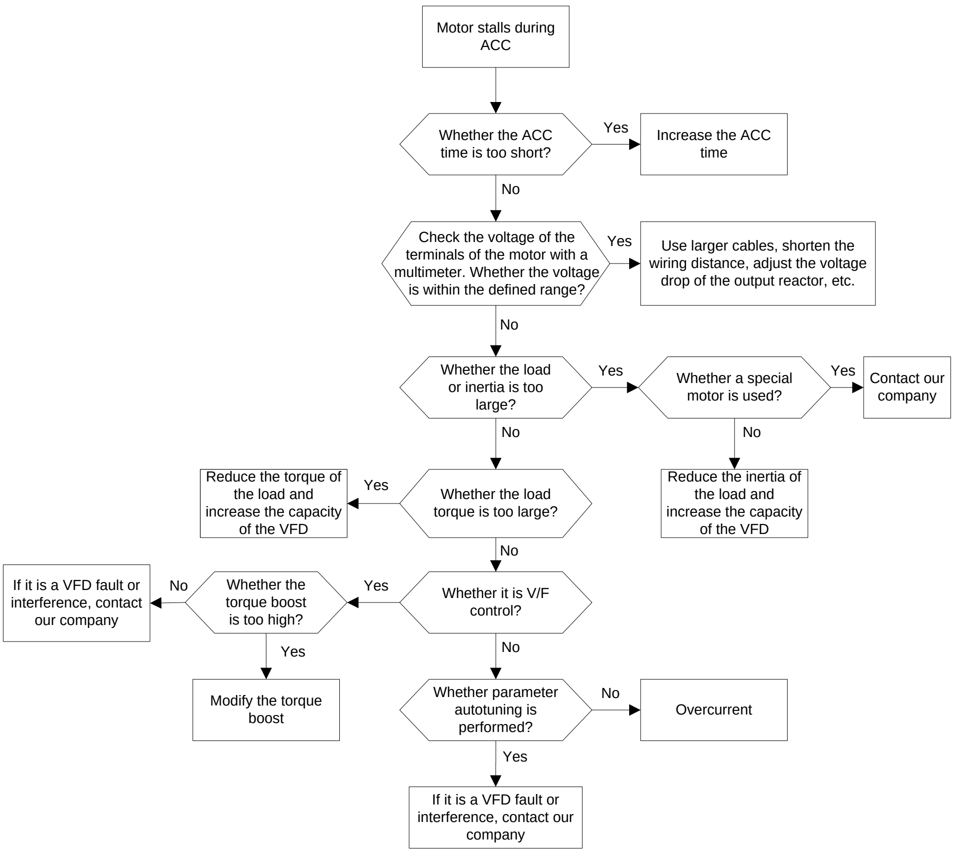
7.5.5 Motor overheating



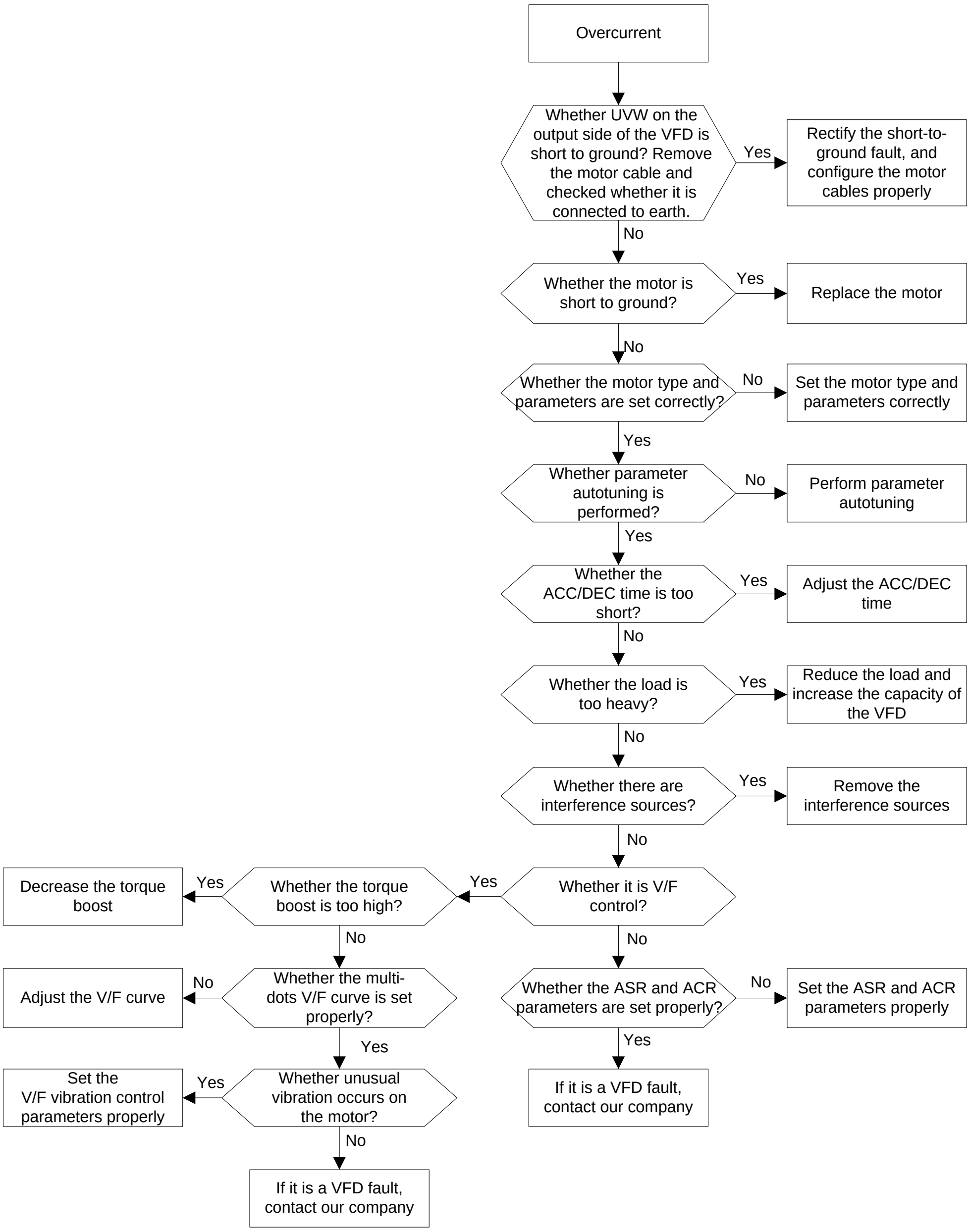
7.5.6 VFD overheating (checking whether the fan is inverted)



7.5.7 Motor stalls during ACC



7.5.8 Overcurrent



8 Communication

8.1 Modbus protocol

This chapter describes the communication of the VFD.

The VFD provides RS485 communication interfaces and adopts the master-slave communication based on the international standard Modbus communication protocol. You can implement centralized control (setting commands for controlling the VFD, modifying the running frequency and related function code parameters, and monitoring the working state and fault information of the VFD) through PC/PLC, upper control computer, or other devices to meet specific application requirements.

8.1.1 Modbus protocol introduction

Modbus is a communication protocol for use with electronic controllers. By using this protocol, a controller can communicate with other devices through transmission lines. It is a general industrial standard. With this standard, control devices produced by different manufacturers can be connected to form an industrial network and be monitored in a centralized way.

The Modbus protocol provides two transmission modes, namely American Standard Code for Information Interchange (ASCII) and remote terminal units (RTU). On one Modbus network, all the device transmission modes, baud rates, data bits, check bits, end bits, and other basic parameters must be set consistently.

A Modbus network is a control network with one master and multiple slaves, that is, on one Modbus network, there is only one device serving as the master, and other devices are the slaves. The master can communicate with any single slave or with all slaves. For separate access commands, a slave needs to return a response. For broadcast information, slaves do not need to return responses.

8.1.2 Application of Modbus

The VFD uses the Modbus RTU mode and communicates through RS485 interfaces.

8.1.2.1 RS485

RS485 interfaces work in half-duplex mode and transmit data signals in the differential transmission way, which is also referred to as balanced transmission. An RS485 interface uses a twisted pair, where one wire is defined as A (+), and the other B (-). Generally, if the positive electrical level between the transmission drives A and B ranges from +2V to +6V, the logic is "1"; and if it ranges from -2V to -6V, the logic is "0".

The 485+ terminal on the terminal block of the VFD corresponds to A, and 485- corresponds to B.

The communication baud rate (P42.01) indicates the number of bits sent in a second, and the unit is bit/s (bps). A higher baud rate indicates faster transmission and poorer anti-interference capability. When a twisted pair of 0.56mm (24AWG) is used, the maximum transmission distance varies according to the baud rate, as described in the following table.

Baud rate	Max transmission distance	Baud rate	Max transmission distance
2400bps	1800m	9600bps	800m
4800bps	1200m	19200bps	600m

In long-distance RS485 communication, it is recommended that you use shielded cables, and use the shielding layer as the ground wire.

When there are fewer devices and the transmission distance is short, the whole network works well without terminal load resistors. The performance, however, degrades as the distance increases. Therefore, it is recommended that you use a 120Ω terminal resistor when the transmission distance is long.

8.1.2.2 RTU mode

1. RTU communication frame structure

When a controller is set to use the RTU communication mode on a Modbus network, every byte (8 bits) in the message includes 2 hexadecimal characters (each includes 4 bits). Compared with the ASCII mode, the RTU mode achieves transmission of more data at the same baud rate.

Code system

- 1 start bit
- 7 or 8 data bits; the minimum valid bit is transmitted first. Each frame domain of 8 bits includes 2 hexadecimal characters (0–9, A–F).
- 1 odd/even check bit; this bit is not provided if no check is needed.
- 1 stop bit (with check performed), 2 bits (without check)

Error detection domain

- Cyclic redundancy check (CRC)

The following table describes the data format.

11-bit character frame (Bits 1 to 8 are data bits)

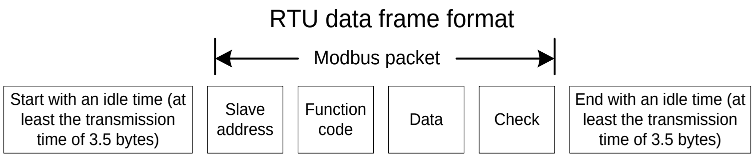
Start bit	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit8	Check bit	Stop bit

10-bit character frame (Bits 1 to 7 are data bits)

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

In a character frame, only the data bits carry information. The start bit, check bit, and end bit are used to facilitate the transmission of the data bits to the destination device. In practical applications, you must set the data bits, parity check bits, and stop bits consistently.

In RTU mode, the transmission of a new frame always starts from an idle time (the transmission time of 3.5 bytes). On a network where the transmission rate is calculated based on the baud rate, the transmission time of 3.5 bytes can be easily obtained. After the idle time ends, the data domains are transmitted in the following sequence: slave address, operation command code, data, and CRC check character. Each byte transmitted in each domain includes 2 hexadecimal characters (0–9, A–F). The network devices always monitor the communication bus. After receiving the first domain (address information), each network device identifies the byte. After the last byte is transmitted, a similar transmission interval (the transmission time of 3.5 bytes) is used to indicate that the transmission of the frame ends. Then, the transmission of a new frame starts.



The information of a frame must be transmitted in a continuous data flow. If there is an interval greater than the transmission time of 1.5 bytes before the transmission of the entire frame is complete, the receiving device deletes the incomplete information, and mistakes the subsequent byte for the address domain of a new frame. Similarly, if the transmission interval between two frames is shorter than the transmission time of 3.5 bytes, the receiving device mistakes it for the data of the last frame. The CRC check value is incorrect due to the disorder of the frames, and thus a communication fault occurs.

The following table describes the standard structure of an RTU frame.

START (frame header)	T1-T2-T3-T4 (transmission time of 3.5 bytes)
ADDR (slave address domain)	Communication address: 0–247 (decimal system) (0 is the broadcast address)

CMD (function domain)	03H: read slave parameters 06H: write slave parameters
Data domain DATA (N-1)…DATA(0)	Data of 2*N bytes, main content of the communication as well as the core of data exchanging.
CRC CHK LSB	Detection value: CRC (16 bits)
CRC CHK MSB	
END (frame tail)	T1-T2-T3-T4 (transmission time of 3.5 bytes)

2. RTU communication frame error check methods

During the transmission of data, errors may occur due to various factors. Without check, the data receiving device cannot identify data errors and may make an incorrect response. The incorrect response may cause severe problems. Therefore, the data must be checked.

The check is implemented as follows: The transmitter calculates the to-be-transmitted data based on a specific algorithm to obtain a result, adds the result to the rear of the message, and transmits them together. After receiving the message, the receiver calculates the data based on the same algorithm to obtain a result, and compares the result with that transmitted by the transmitter. If the results are the same, the message is correct. Otherwise, the message is considered incorrect.

The error check of a frame includes two parts, namely, bit check on individual bytes (that is, odd/even check using the check bit in the character frame), and whole data check (CRC check).

Bit check on individual bytes (odd/even check)

You can select the bit check mode as required, or you can choose not to perform the check, which will affect the check bit setting of each byte.

Definition of even check: Before the data is transmitted, an even check bit is added to indicate whether the number of "1" in the to-be-transmitted data is odd or even. If it is even, the check bit is set to "0"; and if it is odd, the check bit is set to "1".

Definition of odd check: Before the data is transmitted, an odd check bit is added to indicate whether the number of "1" in the to-be-transmitted data is odd or even. If it is odd, the check bit is set to "0"; and if it is even, the check bit is set to "1".

For example, the data bits to be sent are "11001110", including five "1". If the even check is applied, the even check bit is set to "1"; and if the odd check is applied, the odd check bit is set to "0". During the transmission of the data, the odd/even check bit is calculated and placed in the check bit of the frame. The receiving device performs the odd/even check after receiving the data. If it finds that the odd/even parity of the data is inconsistent with the preset information, it determines that a communication error occurs.

CRC

A frame in the RTU format includes an error detection domain based on the CRC calculation. The CRC domain checks all the content of the frame. The CRC domain consists of two bytes, including 16 binary bits. It is calculated by the transmitter and added to the frame. The receiver calculates the CRC of the received frame, and compares the result with the value in the received CRC domain. If the two CRC values are not equal to each other, errors occur in the transmission.

During CRC, 0xFFFF is stored first, and then a process is invoked to process a minimum of 6 contiguous bytes in the frame based on the content in the current register. CRC is valid only for the 8-bit data in each character. It is invalid for the start, stop, and check bits.

During the generation of the CRC values, the "exclusive or" (XOR) operation is performed on the each 8-bit character and the content in the register. The result is placed in the bits from the least significant bit (LSB) to the most significant bit (MSB), and 0 is placed in the MSB. Then, LSB is detected. If LSB is 1, the XOR operation is performed on the current value in the register and the preset value. If LSB is 0, no operation is performed. This process is repeated for 8 times. After the last bit (8th bit) is detected and processed, the XOR operation is performed on the next 8-bit byte and the current content in the register. The final values in the register are the CRC values obtained after operations are performed on all the bytes in the frame.

The calculation adopts the international standard CRC check rule. You can refer to the related standard CRC algorithm to compile the CRC calculation program as required.

The following example is a simple CRC calculation function for your reference (using the C programming 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;
   }
 }
 return(crc_value);
}
```

In the ladder logic, CKSM uses the table look-up method to calculate the CRC value according to the content in the frame. The program of this method is simple, and the calculation is fast, but the ROM space occupied is large. Use this program with caution in scenarios where there are space occupation requirements on programs.

8.1.3 RTU command code and communication data

8.1.3.1 Command code 03H, reading N words (continuously up to 16 words)

The command code 03H is used by the master to read data from the VFD. The count of data to be read depends on the "data count" in the command. A maximum of 16 pieces of data can be read. The addresses of the read parameters must be contiguous. Each piece of data occupies 2 bytes, that is, one word. The command format is presented using the hexadecimal system (a number followed by "H" indicates a hexadecimal value). One hexadecimal value occupies one byte.

The 03H command is used to read information including the parameters and running status of the VFD.

For example, if the master reads two contiguous pieces of data (that is, to read content from the data addresses 0004 H and 0005 H) from the VFD whose address is 01H, the command frame structure is described in the following.

RTU master command (from the master to the VFD) is as follows:

START	T1-T2-T3-T4 (transmission time of 3.5 bytes)
ADDR (address)	01H
CMD (command code)	03H

Start address MSB	00H
Start address LSB	04H
Data count MSB	00H
Data count LSB	02H
CRC LSB	85H
CRC MSB	CAH
END	T1-T2-T3-T4 (transmission time of 3.5 bytes)

The value in START and END is "T1-T2-T3-T4 (transmission time of 3.5 bytes)", indicating that the RS485 needs to stay idle for at least the transmission time of 3.5 bytes. An idle time is required to distinguish on message from another to ensure that the two messages are not regarded as one.

"ADDR" is "01H", indicating that the command is sent to the VFD whose address is 01H. "ADDR" occupies one byte.

"CMD" is "03H", indicating that the command is used to read data from the VFD. "CMD" occupies one byte.

"Start address" means reading data from the address and it occupies two bytes with the MSB on the left and LSB on the right.

"Data count" indicates the count of data to be read (unit: word). "Start address" is "0004H" and "Data count" is "0002H", which indicates reading data from the addresses 0004H and 0005H.

CRC check occupies two bytes, with the LSB on the left, and MSB on the right.

RTU slave response (from the VFD to the master) is as follows:

START	T1-T2-T3-T4 (transmission time of 3.5 bytes)
ADDR	01H
CMD	03H
Number of bytes	04H
MSB of data in 0004H	13H
LSB of data in 0004H	88H
MSB of data in 0005H	00H
LSB of data in 0005H	00H
CRC LSB	7EH
CRC MSB	9DH
END	T1-T2-T3-T4 (transmission time of 3.5 bytes)

The definition of the response information is described as follows:

"ADDR" is "01H", indicating that the command is sent from the VFD whose address is 01H. "ADDR" occupies one byte.

"CMD" is "03H", indicating that the message is a VFD response to the 03H command from the master for reading data. "CMD" occupies one byte.

"Number of bytes" indicates the number of bytes between a byte (not included) and the CRC byte (not included). The value "04" indicates that there are four bytes of data between "Number of bytes" and "CRC LSB", that is, "MSB of data in 0004H", "LSB of data in 0004H", "MSB of data in 0005H", and "LSB of data in 0005H".

A piece of data contains two bytes, with the MSB on the left and LSB on the right. From the response, the data in 0004H is 1388H, and that in 0005H is 0000H.

CRC check occupies two bytes, with the LSB on the left, and MSB on the right.

8.1.3.2 Command code 06H, writing a word

This command is used by the master to write data to the VFD. One command can be used to write only one piece of data. It is used to modify the parameters and running mode of the VFD.

For example, if the master writes 5000 (1388H) to 0004H of the VFD whose address is 02H, the frame structure is as follows.

RTU master command (from the master to the VFD) is as follows:

START	T1-T2-T3-T4 (transmission time of 3.5 bytes)
ADDR	02H
CMD	06H
MSB of data writing address	00H
LSB of data writing address	04H
MSB of data content	13H
LSB of data content	88H
CRC LSB	C5H
CRC MSB	6EH
END	T1-T2-T3-T4 (transmission time of 3.5 bytes)

RTU slave response (from the VFD to the master) is as follows:

START	T1-T2-T3-T4 (transmission time of 3.5 bytes)
ADDR	02H
CMD	06H
MSB of data writing address	00H
LSB of data writing address	04H
MSB of data content	13H
LSB of data content	88H
CRC LSB	C5H
CRC MSB	6EH
END	T1-T2-T3-T4 (transmission time of 3.5 bytes)

Note: The sections 8.1.3.1 and 8.1.3.2 mainly describe the command formats. For the detailed application, see the examples in section 8.1.3.7.

8.1.3.3 Command code 08H, diagnosis

Sub-function code description:

Sub-function code	Description
0000	Returned data based on query information

For example, to query about the circuit detection information about the VFD whose address is 01H, the query and return strings are the same, and the format is described as follows.

RTU master command:

START	T1-T2-T3-T4 (transmission time of 3.5 bytes)
ADDR	01H
CMD	08H
Sub-function code MSB	00H
Sub-function code LSB	00H
MSB of data content	12H
LSB of data content	ABH
CRC CHK LSB	ADH
CRC CHK MSB	14H
END	T1-T2-T3-T4 (transmission time of 3.5 bytes)

RTU slave response:

START	T1-T2-T3-T4 (transmission time of 3.5 bytes)
ADDR	01H
CMD	08H
Sub-function code MSB	00H
Sub-function code LSB	00H
MSB of data content	12H
LSB of data content	ABH
CRC CHK LSB	ADH
CRC CHK MSB	14H
END	T1-T2-T3-T4 (transmission time of 3.5 bytes)

8.1.3.4 Data address definition

This section describes the address definition of communication data. The addresses are used for controlling the running, obtaining the state information, and setting related function parameters of the VFD.

- **Function code address format rules**

The address of a function code consists of two bytes, with the high-order byte on the left and low-order byte on the right. The high-order byte ranges from –00 to ffH, and the low-order byte also ranges from –00 to ffH. The high-order byte is the hexadecimal form of the group number before the dot mark, and low-order byte is that of the number behind the dot mark. Take P05.06 as an example. The group number is 05, that is, the MSB of the parameter address is the hexadecimal form of 05; and the number behind the dot mark is 06, that is, the LSB is the hexadecimal form of 05. Therefore, the function code address is 0506H in the hexadecimal form. For P10.01, the parameter address is 0A01H.

Function code	Name	Description	Setting range	Default
P10.00	Speed control mode	0: SVC mode 0 1: SVC mode 1 2: V/F control 3: Closed-loop vector control mode	0–3	2
P10.01	Enabling torque control	The function code is invalid in V/F control, and torque control can be used only in vector control. 0: Disable 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0

Note: The parameters in group P99 are set by the manufacturer and cannot be read or modified. Some parameters cannot be modified when the VFD is running; some cannot be modified regardless of the VFD status. Pay attention to the setting range, unit, and description of a parameter when modifying it.

- **Addresses of other Modbus functions**

In addition to modifying the parameters of the VFD, the master can also control the VFD, such as starting and stopping it, and monitoring the operation status of the VFD.

Other function parameter list:

Address definition	Function	Data description	R/W
4000H	VFD status 1	0001H: Forward running	R
		0002H: Running reversely	R
		0003H: Stopped	R
		0004H: Faulty	R
		0005H: In POFF state	R
		For the UDP/IP protocol, this information is given in handshake information, but whether it is the master's UDP/IP protocol or another protocol, needs to be obtained by querying the address.	R
4001H	VFD status 2	See function parameter P20.34 Status word 1.	R
4002H	VFD status 3	See function parameter P20.51 Status word 2.	R
4003H	Reserved	None	R
4004H	Device code	880	R
4005H	Remote/local status	0: Local status	R
		1: Remote status	R
4006H	VFD readiness status	0: Invalid	R
		1: Ready for running	R
		2: Power-on fault	R
		3: Power down	R
		4: Power-down fault	R
4007H	Unit bypass status	0: No bypass unit	R
		1: With bypass unit	R
4008H	Bypass unit	Each bit indicates a bypass unit number.	R
4009H	A1 unit version	See the unit version format.	R
400AH	A2 unit version	See the unit version format.	R
400BH	A3 unit version	See the unit version format.	R
400CH	A4 unit version	See the unit version format.	R
400DH	A5 unit version	See the unit version format.	R
400EH	A6 unit version	See the unit version format.	R
400FH	A7 unit version	See the unit version format.	R
4010H	A8 unit version	See the unit version format.	R
4011H	A9 unit version	See the unit version format.	R
4012H	A10 unit version	See the unit version format.	R
4013H	A1 unit temperature	0.0–100.0°C	R
4014H	A2 unit temperature	0.0–100.0°C	R
4015H	A3 unit temperature	0.0–100.0°C	R
4016H	A4 unit temperature	0.0–100.0°C	R
4017H	A5 unit temperature	0.0–100.0°C	R
4018H	A6 unit temperature	0.0–100.0°C	R

Address definition	Function	Data description	R/W
4019H	A7 unit temperature	0.0–100.0°C	R
401AH	A8 unit temperature	0.0–100.0°C	R
401BH	A9 unit temperature	0.0–100.0°C	R
401CH	A10 unit temperature	0.0–100.0°C	R
401DH	A1 unit bus	0–1400V	R
401EH	A2 unit bus	0–1400V	R
401FH	A3 unit bus	0–1400V	R
4020H	A4 unit bus	0–1400V	R
4021H	A5 unit bus	0–1400V	R
4022H	A6 unit bus	0–1400V	R
4023H	A7 unit bus	0–1400V	R
4024H	A8 unit bus	0–1400V	R
4025H	A9 unit bus	0–1400V	R
4026H	A10 unit bus	0–1400V	R
4027H	Actual step of multi-step speed setting	0–15	R
4028H	Actual ACC/DEC time group	1–5	R
4029H	Valid unit count	0–10	R
402AH	Present fault code 1	P08: Fault record parameter group	R
402BH	Present fault code 2		R
402CH	Present fault code 3		R
402DH	Present fault code 4		R
402EH	Present fault code 5		R
402FH	Present fault code 6		R
4030H	Present minor fault code 1		R
4031H	Present minor fault code 2		R
4032H	Present minor fault code 3		R
4033H	Present minor fault code 4		R
4034H	Present minor fault code 5		R
4035H	Present minor fault code 6		R

Address definition	Function	Data description	R/W
4036H	Present alarm code 1		R
4037H	Present alarm code 2		R
4038H	Present alarm code 3		R
4039H	Present alarm code 4		R
403AH	Present alarm code 5		R
403BH	Present alarm code 6		R
403CH	Running frequency at present fault		R
403DH	Ramp reference frequency at present fault		R
403EH	Output current at present fault		R
403FH	Output current at present fault		R
4040H	Bus voltage at present fault		R
4041H	Max temperature at present fault		R
4042H	Input terminal state at present fault		R
4043H	Output terminal state at present fault		R
4044H	Running frequency at last fault		R
4045H	Ramp reference frequency at last fault		R
4046H	Output voltage at last fault		R
4047H	Output current at last fault		R
4048H	Bus voltage at last fault		R
4049H	Max temperature at last fault		R
404AH	Input terminal state at last fault		R
404BH	Output terminal state at last fault		R

Address definition	Function	Data description		R/W
404CH	Running frequency at 2nd-last fault			R
404DH	Ramp reference frequency at 2nd-last fault			R
404EH	Output voltage at 2nd-last fault			R
404FH	Output current at 2nd-last fault			R
4050H	Bus voltage at 2nd-last fault			R
4051H	Max temperature at 2nd-last fault			R
4052H	Input terminal state at 2nd-last fault			R
4053H	Output terminal state at 2nd-last fault			R
4054H	Present control command channel	-		R
4055H	Parameter autotuning auxiliary bit	Used as the parameter autotuning auxiliary status on the upper computer display.		R
4200H	CW 1	Bit0	0: OFF1, decelerating to stop. 0->1: ON	W
		Bit1	0: Block IGBT; OFF2, coasting to stop 1: Normal	
		Bit2	0: OFF3, fast stop 1: Normal	
		Bit3	0: Disable running. Enter "Disable running". 1: Enable running	
		Bit4	0: Ramp function generator output is 0 1: Normal	
		Bit5	0: Ramp function generator output maintains the value of the previous beat. 1: Normal	
		Bit6	0: Ramp function generator input is forced to 0. 1: Normal	
		Bit7	0: Invalid 0->1: Fault reset	
		Bit8	0: Invalid 1: Jog 1	
		Bit9	0: Invalid 1: Jog 2	
		Bit10	0: Invalid 1: Valid (PZD command enabling bit)	

<table>
<tr><th>Address definition</th><th>Function</th><th colspan="2">Data description</th><th>R/W</th></tr>
<tr><td rowspan="5"></td><td rowspan="5"></td><td>Bit11</td><td>0: Invalid
1: Inverse given speed</td><td rowspan="5"></td></tr>
<tr><td>Bit12</td><td rowspan="2">Bit13 Bit12
00: Invalid
01: Increase MOP output according to setting
10: Decrease MOP output according to setting
11: Keep output value unchanged</td></tr>
<tr><td>Bit13</td></tr>
<tr><td>Bit14</td><td>0: Invalid
1: Trigger external fault 1</td></tr>
<tr><td>Bit15</td><td>0: Invalid
1: Trigger external fault 2</td></tr>
<tr><td rowspan="16">4201H</td><td rowspan="16">CW 2</td><td>Bit0</td><td>0: Invalid
1: Enable droop</td><td rowspan="16">W</td></tr>
<tr><td>Bit1</td><td>0: Invalid
1: Forcibly use rotation speed tracking</td></tr>
<tr><td>Bit2</td><td rowspan="2">Bit3bit2: 0x00 Motor 1
Bit3bit2: 0x01 Motor 2
Bit3bit2: 0x10 Motor 3
Bit3bit2: 0x11 Motor 4</td></tr>
<tr><td>Bit3</td></tr>
<tr><td>Bit4</td><td>Multi-step speed selection 1</td></tr>
<tr><td>Bit5</td><td>Multi-step speed selection 2</td></tr>
<tr><td>Bit6</td><td>Multi-step speed selection 3</td></tr>
<tr><td>Bit7</td><td>Multi-step speed selection 4</td></tr>
<tr><td>Bit8</td><td>0: Remove speed-loop integral
1: Normalize speed-loop integral</td></tr>
<tr><td>Bit9</td><td>0: Speed regulator output is 0, and motor rotates freely
1: Speed regulator is normal, ensuring a closed loop speed control</td></tr>
<tr><td>Bit10</td><td>0: Control mode determined by related function codes
1: Vector control is forced to work in torque mode</td></tr>
<tr><td>Bit11</td><td>0: Master
1: Master/slave transmission command—enable slave</td></tr>
<tr><td>Bit12</td><td>0: Invalid
1: Trigger external alarm 1</td></tr>
<tr><td>Bit13</td><td>0: Invalid
1: Trigger external alarm 2</td></tr>
<tr><td>Bit14</td><td>0: Trigger channel 1
1: Trigger channel 2</td></tr>
<tr><td>Bit15</td><td>0: Force brake closing
1: Force brake opening</td></tr>
<tr><td>4202H</td><td>Reserved</td><td colspan="2">-</td><td>-</td></tr>
<tr><td>4203H</td><td>Reserved</td><td colspan="2">-</td><td>-</td></tr>
<tr><td>4204H</td><td>Command to read fault records</td><td colspan="2">Read the fault records stored in the fault black box.</td><td>W</td></tr>
</table>

Address definition	Function	Data description	R/W
4300H	Speed reference	-300.00%–300.00%	W
4301H	PID reference	PID reference 0–1000, 1000 corresponding to 100.0%	W
4302H	PID feedback	PID feedback 0–1000, 1000 corresponding to 100.0%	W
4303H	Torque setting	-100.0%–100.0%	W
4304H	FWD rotation upper-limit frequency setting	-300.00%–300.00%	W
4305H	REV rotation upper-limit frequency setting	-300.00%–300.00%	W
4306H	Electromotive torque upper limit	-100.0%–100.0%	W
4307H	Braking torque upper limit	-100.0%–100.0%	W
4308H	Special CW	0x0000–0xFFFF	W
4309H	Virtual input terminal command	0x0000–0xFFFF	W
430AH	V/F separation	0.0–100.0%	W
430BH	Oscilloscope sampling frequency	Configure the oscilloscope sampling frequency. 0: 2K, once every 0.5ms 1: 1K, once every 1ms 2: 0.5K, once every 2ms 3: 0.25K, once every 4ms 4: 0.125K, once every 8ms Once the ARM reaches 64 points, all channels are uploaded uniformly.	W

The Read/Write (R/W) characteristics indicate whether a function parameter can be read and written. For example, "Communication-based control command" can be written, and therefore the command code 06H is used to control the VFD. The R characteristic indicates that a function parameter can only be read, and W indicates that a function parameter can only be written.

Note: Some parameters in the preceding table are valid only after they are enabled. For example, in the case of running and stopping operations, the "Channel 1 start/stop CW source" (P02.01) should be set to "Modbus"; the values given through Modbus communication will be summarized in group P84 "Word Data Set 2-Summary of Data of CO type", and you can select the required values through the data connector.

8.1.3.5 Fieldbus scale

In practical applications, communication data is represented in the hexadecimal form, but hexadecimal values cannot represent decimals. For example, 50.12 Hz cannot be represented in the hexadecimal form. In such cases, multiply 50.12 by 100 to obtain an integer 5012, and then 50.12 can be represented as 1394H in the hexadecimal form (5012 in the decimal form).

In the process of multiplying a non-integer by a multiple to obtain an integer, the multiple is referred to as a fieldbus scale.

The fieldbus scale depends on the number of decimal places in the value specified in "Setting range" or "Default". If there are *n* decimal places in the value, the fieldbus scale *m* is the *n*th-power of 10. Take the following as an example, where *m* is 10.

Function code	Name	Description	Setting range	Default
P01.09	Wait time for restart after power-off	0.0–3600.0s (valid only when P1.08=1)	0.0–3600.0	1.0s
P01.28	FWD/REV run deadzone time	0.0–3600.0s	0.0–3600.0	0.0s

The value specified in "Setting range" or "Default" contains one decimal place, and therefore the fieldbus scale is 10. If the value received by the upper computer is 50, "Delay of auto fault reset" of the VFD is 5.0 (5.0=50/10).

To set the wait time for restart after power-off to 5.0s through Modbus communication, you need first to multiply 5.0 by 10 according to the scale to obtain an integer 50, that is, 32H in the hexadecimal form, and then send the following write command:

01	**06**	**01 10**	**00 32**	**08 26**
VFD address	Write command	Parameter address	Parameter data	CRC

After receiving the command, the VFD converts 50 into 5.0 based on the fieldbus scale, and then sets "Wake-up-from-sleep delay" to 5.0s.

For another example, after the upper computer sends the "Wake-up-from-sleep delay" parameter read command, the master receives the following response from the VFD:

01	**03**	**02**	**00 32**	**39 91**
VFD address	Read command	2-byte data	Parameter data	CRC

The parameter data is 0032H, that is, 50, and therefore 5.0 is obtained based on the fieldbus scale (50/10=5.0). In this case, the master identifies that "Wake-up-from-sleep delay" is 5.0s.

8.1.3.6 Error message response

Operation errors may occur in communication-based control. For example, some parameters can only be read, but a write command is sent. In this case, the VFD returns an error message response.

Error message responses are sent from the VFD to the master. The following table lists the codes and definitions of the error message responses.

Code	Name	Definition
01H	Invalid command	The command code received by the upper computer is not allowed to be executed. The possible causes are as follows: ・ The function code is applicable only on new devices and is not implemented on this device. ・ The slave is in faulty state when processing this request.
02H	Invalid data Address	For the VFD, the data address in the request of the upper computer is not allowed. In particular, the combination of the register address and the number of the to-be-sent bytes is invalid.
03H	Invalid data value	The received data domain contains a value that is not allowed. The value indicates the error of the remaining structure in the combined request. **Note:** It does not mean that the data item submitted for storage in the register includes a value unexpected by the program.
04H	Operation failure	The parameter setting is invalid in the write operation. For example, a function input terminal cannot be set repeatedly.

Code	Name	Definition
05H	Incorrect password	The password entered in the password verification address is different from that is specified by P07.00.
06H	Data frame error	The data frame sent from the upper computer is incorrect in the length, or in the RTU format, the value of the CRC check bit is inconsistent with the CRC value calculated by the lower computer.
07H	Parameter read-only	The parameter to be modified in the write operation of the upper computer is a read-only parameter.
08H	Parameter cannot be modified in running	The parameter to be modified in the write operation of the upper computer cannot be modified during the running of the VFD.
09H	Password protection	If the upper computer does not provide the correct password to unlock the system to perform a read or write operation, the error of "system being locked" is reported.

When returning a response, the slave uses a function code domain and fault address to indicate whether it is a normal response (no error) or exception response (an error occurs). In a normal response, the slave returns the corresponding function code and data address or sub-function code. In an exception response, the slave returns a code that is equal to a normal code, but the first bit is logic 1.

For example, if the master sends a request message to a slave for reading a group of function code address data, the following code is generated:

0 0 0 0 0 0 1 1 (03H in the hexadecimal form)

In a normal response, the slave returns the same function code. In an exception response, the slave returns the following code:

1 0 0 0 0 0 1 1 (83H in the hexadecimal form)

In addition to the modification of the code, the slave returns a byte of exception code that describes the cause of the exception. After receiving the exception response, the typical processing of the master is to send the request message again or modify the command based on the fault information.

For example, to set the "Channel 1 speed main setting source" (P00.01, the parameter address is 0001H) to 11 for the VFD whose address is 01H, the command is as follows:

01	06	00 01	00 0B	99 CD
VFD address	Write command	Parameter address	Parameter data	CRC

However, the "Running command channel" ranges from 0 to 10. The value 11 is out of the setting range. In this case, the VFD returns an error message response as shown in the following:

01	86	03	99 CD
VFD address	Exception response code	Error code	CRC

The exception response code 86H (generated based on the highest-order bit "1" of the write command 06H) indicates that it is an exception response to the write command (06H). The error code is 03H, which indicates "Illegal data value", meaning "the received data field contains values that are not allowed".

8.1.3.7 Read/Write operation examples

For the formats of the read and write commands, see sections 8.1.3.1 Command code 03H, reading N words (continuously up to 16 words) and 8.1.3.2 Command code 06H, writing a word.

1. Example of reading command 03H

Example 1: Read SW 1 of the VFD whose address is 01H. According to the other function parameter table, the parameter address for the VFD SW 1 is 4000H (16384), with the address MSB being A3H (163) and the address LSB being 54H (84).

The read command transmitted to the VFD is as follows:

01	03	A3 54	00 01	E7 9E
VFD address	Read command	Parameter address	Parameter data	CRC

Assume that the following response is returned:

01	03	02	00 04	B9 87
VFD address	Read command	2-byte data	Parameter data	CRC

The data content returned by the VFD is 0004H, which indicates that the VFD is in the stopped state.

Example 2: View information about the VFD whose address is 03H, including present fault type to 5th-last fault type, corresponding to P08.00–P08.05, of which the parameter addresses are 0800H–0805H (contiguous 6 parameter addresses starting from 0320H).

The command transmitted to the VFD is as follows:

03	03	00 08	00 06	C6 4A
VFD address	Read command	Start address	6 parameters in total	CRC

Assume that the following response is returned:

03	03	0C	00 70	00 00	00 00	00 00	00 00	00 00	BB B0
VFD address	Read command	Number of bytes	Present fault type	Last fault type	2nd-last fault type	3rd-last fault type	4th-last fault type	5th-last fault type	CRC

According to the returned data, all the fault types are 0070H, that is, 112 in the decimal form, which means Unit 1 communication fault (E01.12).

2. Example of writing command 06H

Example 1: Set the VFD whose address is 03H to run forward. According to the other function parameter table, the address of "Communication-based control command" is 4200H, and 0001H indicates forward running. See the following figure.

Function	Address definition	Data description	R/W
Communication-based control command	4200H	0001H: Forward running	W
		0002H: Reverse running	
		0003H: Forward jogging	
		0004: Reverse jogging	
		0005H: Stop	
		0006H: Coast to stop (in emergency)	
		0007H: Fault reset	
		0008H: Jogging stop	

The command sent from the master is as follows:

03	06	A8 60	00 01	69 96
VFD address	Write command	Parameter address	Forward running	CRC

If the operation is successful, the following response (same as the command transmitted from the master) is returned:

03	06	A8 60	00 01	69 96
VFD address	Write command	Parameter address	Forward running	CRC

Example 2: Set the max output frequency to 100Hz for the VFD with the address of 03H.

Function code	Name	Description	Setting range	Default	Modify
P09.02	Max output rotation speed	P09.00-300.00% Basis for a slow or fast ACC/DEC. This percentage is relative to the reference speed specified by P00.55.	P09.00-300.00	100.00%	◎

According to the number of decimal places, the fieldbus scale of the "Max output rotation speed" (P09.02) is 100. Multiply 100 by 100. The value 10000 is obtained, and it is 2710H in the hexadecimal form.

The command sent from the master is as follows:

03	06	09 02	27 10	30 48
VFD address	Write command	Parameter address	Parameter data	CRC

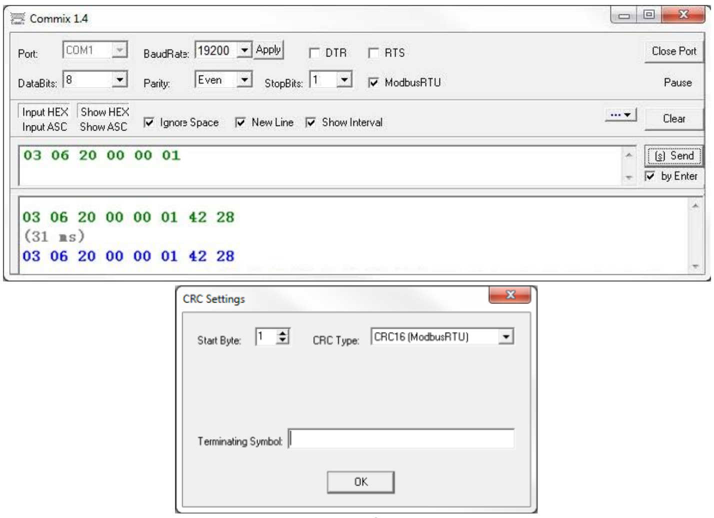
If the operation is successful, the following response (same as the command transmitted from the master) is returned:

03	06	09 02	27 10	30 48
VFD address	Write command	Parameter address	Parameter data	CRC

Note: In the preceding command description, spaces are added to a command just for explanatory purposes. In practical applications, no space is required in the commands.

3. Example of Modbus communication commissioning

In the following example, a PC is used as the master, an RS232-RS485 converter is used for signal conversion, and the PC serial port used by the converter is COM1 (an RS232 port). The host controller commissioning software is the serial port commissioning assistant Commix1.4, which can be downloaded from the Internet. Download a version that can automatically execute the CRC check function. The following figure shows the interface of Commix.



4.

Set **Port** to **COM1**. Set **BaudRate** consistently with P14.01. **DataBits**, **Parity**, and **StopBits** must be set consistently with P14.02. If the RTU mode is selected, choose **Input HEX** and **Show HEX**. To implement automatic CRC, you need to choose **ModbusRTU**, and set **Start Byte** to **1** and **CRC Type** to **CRC16 (MODBU**

SRTU) in the **CRC Settings** window. After the automatic CRC is enabled, do not enter CRC in commands. Otherwise, command errors may occur due to repeated CRC.

The commissioning command for setting the VFD whose address is 03H to run forward is as follows.

03	06	A8 60	00 01	69 96
VFD address	Write command	Parameter address	Forward running	CRC

Note:

- The VFD address (P42.03) must be set to 03.
- Set Channel Selection Source (P00.00) to Channel 1 and Channel 1 Start/Stop CW Source (P02.01) to Modbus.
- Click **Send**. If the line configuration and settings are correct, a response transmitted from the VFD is received.

8.1.4 Common communication faults

Common communication faults include the following:

- No response is returned.
- The VFD returns an exception response.

Possible causes of no response include the following:

- The serial port is set incorrectly. For example, the adapter uses the serial port COM1, but COM2 is selected for the communication.
- The settings of the baud rates, data bits, end bits, and check bits are inconsistent with those set on the VFD.
- The positive pole (+) and negative pole (-) of the RS485 bus are connected reversely.

8.1.5 Related function codes

Function code	Name	Description	Setting range	Default
P42.00	Unit online state	Reserved	0–3	0
P42.01	Modbus Baud Rate	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps 6: 57600bps 7: 115200bps	0–7	4
P42.02	Data bit check setting	0: No check (N, 8, 1) for RTU 1: Even check (E, 8, 1) for RTU 2: Odd check (O, 8, 1) for RTU 3: No check (N, 8, 2) for RTU 4: Even check (E, 8, 2) for RTU 5: Odd check (O, 8, 2) for RTU	0–5	1
P42.03	Modbus local address	1–247	1–247	1
P42.04	Communication response delay	0–200ms	0–200	5ms
P42.05	Communication timeout time	0.0: Invalid; 0.1–60.0s	0.1–60.0	0.0s

Function code	Name	Description	Setting range	Default
P42.06	Transmission error processing	0: Report an alarm and coast to stop 1: Keep running without reporting an alarm 2: Stop in enabled stop mode without reporting an alarm (applicable only to communication mode) 3: Stop in enabled stop mode without reporting an alarm (applicable to any mode)	0–3	0

8.2 PROFIBUS protocol

PROFIBUS is an international open fieldbus standard that can implement data exchange between various automation components. It is widely applicable to automation in various industries, such as the manufacturing, process, building, transportation, and power industries. It provides effective solutions for implementing integrated automation and intelligentization of field devices.

PROFIBUS consists of three mutually compatible components, namely PROFIBUS-Decentralised Peripherals (DP), PROFIBUS-Process Automation (PA), and PROFIBUS-Fieldbus Message Specification (FMS). It adopts the master/slave mode and is generally used for periodic data exchange between VFD devices.

The transmission media of a PROFIBUS field bus are twisted pairs (complying with the RS-485 standard), paired cables, or optical cables. The baud rate ranges from 9.6kbit/s to 12Mbit/s. The maximum length of a fieldbus cable must be within the range of 100m to 1200m, and the specific length depends on the selected transmission rate. A maximum of 31 nodes can be connected to one PROFIBUS network segment when no repeater is used. If repeaters are used, a maximum of 127 nodes (including the repeaters and master nodes) can be connected.

In PROFIBUS communication, tokens are transmitted between master nodes or by master nodes to slave nodes. Single-master or multi-master systems are supported. The node to respond to the command of a master is selected by the master node, generally a programmable logic controller (PLC). For cyclic master/slave user data transmission and non-cyclic master-master data transmission, a master can also transmit commands to multiple nodes in broadcast mode. When the broadcast mode is adopted, the nodes do not need to transmit feedback signals to the master. On PROFIBUS networks, nodes cannot communicate with each other.

The PROFIBUS protocol is described in details in the EN 50170 standard. For details, refer to the EN 50170 standard.

8.2.1 System configuration

- **System configuration**

After correctly installing the communication card, you need to configure the master station and VFD so that the master station can communicate with the communication card.

One device description file (GSD file) is required for each PROFIBUS slave on the PROFIBUS bus. The GSD file is used to describe the characteristics of a PROFIBUS-DP device. The software provided for users includes information about the GSD file of the VFD. You can obtain the type definition files (GSD files) of master machines from our local office.

Parameter number	Name	Option	Default	Remarks
0	Module type	Read only	PROFIBUS-DP	This parameter displays the communication card type detected by the VFD. You cannot modify the value of this parameter. If this parameter is not defined, communication between the communication card and VFD cannot be established.
1	Node address	0–99	2	In a PROFIBUS network, each device corresponds to a unique node address. The node address selection switch is used to define the node address, the value of this parameter cannot be adjusted, and it is used to only display the node address that is set.
2	Baud rate setting	0: 9.6kbit/s 1: 19.2kbit/s 2: 45.45kbit/s 3: 93.75kbit/s 4: 187.5kbit/s 5: 500kbit/s 6: 1.5Mbit/s 7: 3Mbit/s 8: 6Mbit/s 9: 9Mbit/s 10: 12Mbit/s	6	-
3	PZD2	0–65535	0	-
4	PZD3	0–65535	0	-
…	…	0–65535	0	-
13	PZD12	0–65535	0	-

Master station and VFD should be configured so that the master station can communicate with the communication card after correctly installing communication card.

- **Module type**

This parameter displays the communication card type detected by the VFD. You cannot modify the value of this parameter. If this parameter is not defined, communication between the communication card and VFD cannot be established.

- **Node address**

In a PROFIBUS network, each device corresponds to a unique node address, using the node address selection switch to define the node address (switch is not in the 0 position), and this parameter is only used to display the node address that is set. If the node address selection switch is set to 0, you can use this parameter to define the node address.

In a PROFIBUS network, each device corresponds to a unique node address. The node address selection switch is used to define the node address, the value of this parameter cannot be adjusted, and it is used to only display the node address that is set.

- **GSD file**

One device description file (GSD file) is required for each PROFIBUS slave on the PROFIBUS bus. The GSD file is used to describe the characteristics of a PROFIBUS-DP device. The GSD file contains all device defined parameters, including the supported baud rate, supported information length, sent/received data quantity, and diagnosis data meaning..

A CD with a GSD file for this fieldbus adapter will be provided. You can copy the GSD file to the corresponding subdirectories on the configuration tool software. For details about the operation and how to configure the PROFIBUS system, see the instructions for the related system configuration software.

8.2.2 PROFIBUS-DP networking

- **PROFIBUS-DP**

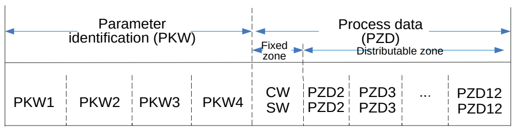
A PROFIBUS-DP network is a distributed I/O system that enables the master to use a large number of peripheral modules and onsite devices. Periodic data transmission: The master reads input information from a slave and sends feedback signals to the slave. EC-TX803 communication card supports the PROFIBUS-DP protocol.

- **Service access points (SAP)**

PROFIBUS-DP accesses services at the PROFIBUS Data Link Layer (Layer 2) through the service access points (SAPs). Functions of each SAP are clearly defined. For more information about SAPs, see the related PROFIBUS master user manuals, that is, PROFIdrive—PROFIBUS models or EN50170 standards (PROFIBUS protocol) for variable-speed drives.

- **PROFIBUS-DP information frame data structure**

The PROFIBUS-DP system allows fast data exchange between the master and VFD devices. For access to VFD devices, data is always read and written in the master/slave mode. VFD devices always function as slaves, and one address is clearly defined for each slave. PROFIBUS transmits 16-bit packets periodically with the structure shown in the following figure:



Parameter zone:

PKW1—Parameter identification

PKW2—Array index number

PKW3—Parameter value 1

PKW4—Parameter value 2

Process data:

CW–control word

SW–status word

PZD—process data (user specified)

(When the PZD is sent from the master to a slave, it is a reference value; and when the PZD is received by a slave from the master, it is an actual value.)

PZD zone: The PZD zone in communication packets is designed for controlling and monitoring VFDs. The master and slave always process the received PZD with the highest priority. The processing of PZD takes priority over that of PKW, and the master and slave always transmit the latest valid data on the interfaces.

CW and SW

Using CWs is the basic method for the fieldbus system to control VFD devices. It is sent from the fieldbus master to a VFD device. In this case, the adapter module functions as a gateway. The VFD device responds to the bit code information of the CW and feeds status information back to the master through an SW.

Refer to the VFD operation manual for the bit code information.

Reference value: The VFD may receive control information in multiple channels, including analog and digital input terminals, VFD control panel, and communication modules (such as RS485 and EC-TX803 communication card). To enable the control over VFD devices through PROFIBUS, you need to set communication cards as the controllers of the VFD devices.

Actual value: An actual value is a 16-bit word that includes information about VFD device operation. The monitoring function is defined through VFD parameters. The conversion scale of an integer transmitted as an actual value sent to the master depends on the set function.

Note: A VFD device always checks the bytes of a CW and reference value.

Task packet (master station → VFD)

Control word (CW): The first two words of PZD is VFD control word (CW).

VFD CWs

CW	Bit	Value	State/Description
CW 1	Bit0	0	OFF1 (RFG ramp stop)
		0->1	Run
	Bit1	0	OFF2 (Coast to stop)
		1	Necessary conditions for running
	Bit2	0	OFF3 (Quick stop)
		1	Necessary conditions for running
	Bit3	0	IGBT blocked
		1	Run allowing
	Bit4	0	Disable ramp function generator (RFG output is 0)
		1	Enable ramp function generator
	Bit5	0	Freeze ramp function generator output
		1	Ramp function generator works
	Bit6	0	Speed reference is 0 (disable setting)
		1	Enable speed reference
	Bit7	0->1	Fault reset
	Bit8	0	Jog 1 off (execute OFF1 based stop)
		0->1	Jog 1 run
	Bit9	0	Jog 2 off (execute OFF1 based stop)
		0->1	Jog 2 run
	Bit10	1	Remote control request (PZD commands and PZD process data enabling bits)
	Bit11	1	Inverse set speed
	Bit12	1	MOP rising command
	Bit13	1	MOP falling command
	Bit14	1	Trigger external fault 1
	Bit15	1	Trigger external fault 2
CW 2	Bit0	1	Enabling droop
	Bit1	0	The corresponding function code specifies whether to track the rotation speed.
		1	Forcibly use rotation speed tracking
	Bit3 bit2	00	Select motor 1
		01	Select motor 2
		10	Select motor 3
		11	Select motor 4
	Bit4	1	Multi-step speed selection bit 0

CW	Bit	Value	State/Description
	Bit5	1	Multi-step speed selection bit 1
	Bit6	1	Multi-step speed selection bit 2
	Bit7	1	Multi-step speed selection bit 3
	Bit8	0	Remove speed-loop integral
		1	Normalize speed-loop integral
	Bit9	0	Speed regulator output is 0, and motor rotates freely
		1	Speed regulator is normal, ensuring a closed loop speed control
	Bit10	0	Control mode determined by related function codes
		1	Vector control is forced to work in torque mode
	Bit11	0	Master/slave transmission command - enable slave
		1	Master
	Bit12	1	Trigger external alarm 1
	Bit13	1	Trigger external alarm 2
	Bit14	0	Trigger channel 1
		1	Trigger channel 2
	Bit15	0	Force brake closing
		1	Force brake opening

Reference value (REF): PZD2–PZD12 in a PZD task packet can be the main reference values. When the speed or torque source in the reference configuration P00.01 or P00.04 is set to 9 or 10 (Process data 3 of bus adapter A or B), PZD3 is used as the reference value source by default. The table below shows the function codes for received PZDs.

Function code	Name	Description	Setting range	Default
P37.82	Received PZD1 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P37.83	Received PZD2 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P37.84	Received PZD3 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.85	Received PZD4 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.86	Received PZD5 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.87	Received PZD6 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.88	Received PZD7 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.89	Received PZD8 data display	Received PZD data display = PZD physically received data with base	0x0000–0xFFFF	0x0000

Function code	Name	Description	Setting range	Default
		value processed		
P37.90	Received PZD9 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.91	Received PZD10 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.92	Received PZD11 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.93	Received PZD12 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000

Response message (VFD → master station)

Status word (SW): The first two words in a PZD response packet are VFD SWs. The VFD SW definition is as follows.

VFD SWs

SW	Bit	Value	State/Description
SW 1	Bit0	0	Not ready for brake closing (initialization not complete or faulty)
		1	Ready for brake closing and switching on (Ready to switch on, set to 1 if there is no fault with weak electricity) – Lockout for startup or ready to switch on
	Bit1	0	OFF1 activate ramp stop
		1	Ready to run, OFF1 not activated (set to 1 if ready to run, ready to switch on, and bus establishment)
	Bit2	0	Disable running
		1	Enable running (set to 1 if the run command is valid, determined through CW)
	Bit3	0	No fault
		1	Fault
	Bit4	0	OFF2 activated
		1	OFF2 not active
	Bit5	0	OFF3 activated
		1	OFF3 not activated
	Bit6	1	Disable brake closing or switching on (disable switching on, same meaning as bit0, mutually exclusive) (OFF1, OFF2, 0FF3, run not allowed, set to 1 upon a fault)
	Bit7	0	Neither an alarm nor a minor fault
		1	Alarm and minor fault activated
	Bit8	0	Actual value different from reference value
		1	Actual value equals reference value (speed reached)
	Bit9	0	Local (responds only to PLC CW OFF1, OFF2, OFF3, not to others)
		1	Remote (control by PLC, related to bit 10 of CW 1)
	Bit10	0	Actual speed lower than compared value
		1	Actual speed higher than comparison value (FDT level detection value)

SW	Bit	Value	State/Description
	Bit11	0	Torque or current not reach limit
		1	Torque or current reached limit
	Bit12	0	Command channel 1 effective
		1	Command channel 2 effective
	Bit13	0	IGBT blocked
		1	IGBT triggered
	Bit14	0	Running speed is positive
		1	Running speed is negative
	Bit15	0	Brake opened
		1	Brake closed
SW 2	Bit0	0	Invalid
		1	Jog run
	Bit1	0	Invalid
		1	P.OFF
	Bit2	0	Pre-charge resistor switch disconnected (Pre-charge resistor connected)
		1	Pre-charge resistor switch closed
	Bit3	0	Unit fan stop
		1	Unit fan run
	Bit4	1	Output voltage (P21.07) reached limit (motor rated voltage)
	Bit5	0	Ramp bypass
		1	Ramp activated
	Bit6	1	External fault 1
	Bit7	1	External fault 2
	Bit8	0	Reserved
	Bit9	0	Reserved
	Bit10	0	Reserved
	Bit11	0	Reserved
	Bit12	0	Reserved
	Bit13	0	Reserved
	Bit14	0	Reserved
	Bit15	0	Reserved

Actual value (ACT): PZD1–PZD12 in a PZD task packet can be the VFD running data feedback sources, where the default values of PZD1 and PZP2 are Other-C connector connected to P20.34 (SW 1) and P20.51 (SW 2) by default.

VFD actual status value

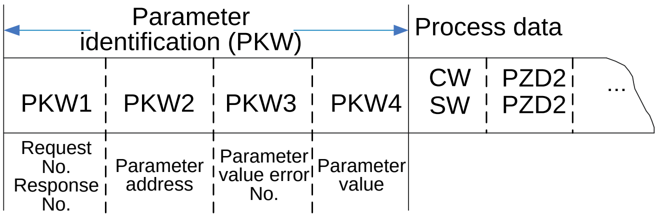
<table>
<tr><th>Word</th><th>Name</th><th>function selection</th></tr>
<tr><td>PZD1 source (typically sent SW 1)</td><td rowspan="8">0: 0
1: Digital (0–65535)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running</td><td>2</td></tr>
<tr><td>PZD2 source (typically sent SW 2)</td><td>2</td></tr>
<tr><td>PZD3 source</td><td>0</td></tr>
<tr><td>PZD4 source</td><td>0</td></tr>
<tr><td>PZD5 source</td><td>0</td></tr>
<tr><td>PZD6 source</td><td>0</td></tr>
<tr><td>PZD7 source</td><td>0</td></tr>
<tr><td>PZD8 source</td><td>0</td></tr>
</table>

Word	Name	function selection
PZD9 source	8: MOP	0
PZD10 source		0
PZD11 source		0
PZD12 source		0

PKW zone: The PKW zone describes the processing mode of the parameter identification interface. A PKW interface is not a physical interface but a mechanism that defines the transmission mode (such reading and writing a parameter value) of a parameter between two communication ends.

PKW zone structure

Structure of the PKW zone



Parameter identification zone:

In the periodic PROFIBUS-DP communication, the PKW zone consists of four 16-bit words. The following table lists the definition of each word.

First word PKW1 (16 bits)		
Bits 15–00	Task or response ID flag	0–7
Second word PKW2 (16 bits)		
Bits 15–00	Basic parameter address	0–247
Third word PKW3 (16 bits)		
Bits 15–00	Value (most significant word) of a parameter or error code of the returned value	00
Fourth word PKW4 (16 bits)		
Bits 15–00	Value (least significant word) of a parameter	0–65535

Note: If the master requests the value of a parameter, the values in PKW3 and PKW4 of the packet that the master transmits to the VFD are no longer valid.

Task request and response: When transmitting data to a slave, the master uses a request number, and the slave uses a response number to accept or reject the request.

The following table lists the definition of the task ID flag PKW1.

Request No. (from the master to a slave)		Response signal	
Request	Function	Correct response	Incorrect response
0	No task.	0	3
1	Requesting the value of a parameter	1, 2	3
2	Modifying a parameter value (one word) [modifying the value only on RAM]	1	3 or 4
3	Modifying a parameter value (two words) [modifying the value only on RAM]	2	3 or 4
4	Modifying a parameter value (one word) [modifying the value on both RAM and EEPROM]	1	3 or 4
5	Modifying a parameter value (two words) [modifying the value on both RAM and EEPROM]	2	3 or 4

Note: Request 2 "Modifying a parameter value (one word) [modifying the value only on RAM]", request 3 "Modifying a parameter value (two words) [modifying the value only on RAM]", and request 5"Modifying a parameter value (two words) [modifying the value on both RAM and EEPROM] are not supported currently.

The following table lists the definition of the response ID flag PKW1.

Response No. (from a slave to the master)	
Response No.	**Function**
0	No response
1	Transmitting the value of a parameter (one word)
2	Transmitting the value of a parameter (two words)
3	The task cannot be executed and one of the following error number is returned: 0: Invalid command 1: Parameter value cannot be modified (read only) 2: Out of range 3: Incorrect sub-index number 4: Setting not allowed (only reset allowed) 5: Invalid data type 6: Task cannot be executed in the operating state 7: Request not supported 8: Request cannot be completed due to communication errors 9: Error in writing to the fixed storage area 10: Request failed due to timeout 11: PZD cannot be allocated to the parameter 12: No control word bit can be allocated 13: Other error
4	No parameter modifying permission

PKW examples:

Example 1: Reading the value of a parameter

You can set PKW1 to 1 and PKW2 to 0900 to read the running frequency upper limit (the address is P09.00), and the value is returned in PKW4.

Request (master station → VFD)

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		...	PZD12	
Request	00	01	03	84	00	00	13	88	xx	xx	xx	xx	xx	xx	...	xx	xx

0900: Parameter address

0001: Request for parameter value reading

Response (VFD → master station)

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		...	PZD12	
Response	00	01	03	84	00	00	13	88	xx	xx	xx	xx	xx	xx	...	xx	xx

5000: Parameter value of P09.00

0001: Response (parameter value updated)

Example 2: Modifying the value of a parameter (on both RAM and EEPROM)

You can set PKW1 to 2 and PKW2 to 0900 to modify the running frequency upper limit (the address is P09.00), and the value to be modified (50.00) is in PKW4.

Request (master station → VFD)

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		...	PZD12	
Request	00	02	03	84	00	00	13	88	xx	xx	xx	xx	xx	xx	...	xx	xx

5000: Parameter value of address 4

0002: Request for parameter value modifying

Response (VFD → master station)

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		...	PZD12	
Response	00	02	03	84	00	00	13	88	xx	xx	xx	xx	xx	xx	...	xx	xx

0002: Response (parameter value refreshed)

PZD examples: The transmission of the PZD zone is implemented through VFD function code settings. For details about related function codes, see the INVT VFD operation manual.

Example 1: Reading the process data of VFD

In the example, PZD3 is set to "8: Running rotation speed" by setting P21.14 to 8. This operation is forcible. The setting remains until the parameter is set to another option.

Request (master station → VFD)

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		…	PZD12	
Request	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	00	0A	…	xx	xx

Example 2: Writing process data to a VFD device

In this example, "2: PID reference" is taken from PZD3 by setting P21.03 to 2. The parameter specified in each request frame is updated with the information contained in PZD3 until another parameter is specified.

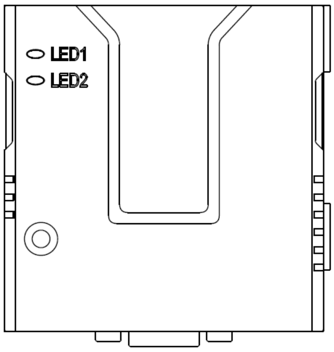
Request (master station → VFD)

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		…	PZD12	
Request	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	00	00	…	xx	xx

Then the content of PZD3 is traction reference within each request frame until a parameter is reselected.

8.2.3 Fault information

EC-TX803 communication card provides two fault indicators, of which the functions are listed.



LED no.	Name	Color	Function
1	STATUS Bus status indicator	Green	On: The expansion module is connected with the master device and data exchange can be performed. Off: The expansion module is disconnected from the master device.
2	FAULT Fault indicator	Red	On: The expansion module is offline and data exchange cannot be performed. Blinking (On: 500ms; Off: 500ms): Configuration error occurs. The length of the user parameter data set during the initialization of the communication card is different from that during the network configuration. Blinking (On: 250ms; Off: 250ms): User parameter data is incorrect. The length or content of the user parameter data set during the initialization of the communication card is different from that during the network configuration. Blinking (On: 125ms; Off: 125ms): An error occurs in the ASIC initialization of PROFIBUS communication. Off: No fault

8.2.4 Related function codes

Function code	Name	Description	Setting range	Default
P37.00	Matching bus type of bus adapter	0: Without 1: PROFIBUS-DP module 2: PROFINET IO module 3: CANopen module 4: EtherNET module 5: EtherCAT module 6: DeviceNet Module The setting of this function code must be different from that of P38.00, which is automatically processed in the software; if two identical cards are required, use a redundant bus. For example, if bus adapter A selects the DP module but multiple DP expansion cards are inserted into the card slots, the card with the smallest	0–6	1

Function code	Name	Description	Setting range	Default
		slot number will automatically be the valid expansion card; other types of cards comply with the same rule.		
P37.01	Sent PZD sign selection	Bit 0–Bit 11 correspond to whether sent PZD1–PZD12 are signed. If a sent PZD is signed, the corresponding bit should be set to 1.	0x0000–0x0FFF	0x0000
P37.02	Sent PZD1 source	0: 0 1: Digital (0–65535) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP	0–8	2
P37.03	Sent PZD2 source		0–8	2
P37.04	Sent PZD3 source		0–8	2
P37.05	Sent PZD4 source		0–8	2
P37.06	Sent PZD5 source		0–8	2
P37.07	Sent PZD6 source		0–8	2
P37.08	Sent PZD7 source		0–8	2
P37.09	Sent PZD8 source		0–8	2
P37.10	Sent PZD9 source		0–8	2
P37.11	Sent PZD10 source		0–8	2
P37.12	Sent PZD11 source		0–8	2
P37.13	Sent PZD12 source		0–8	0
P37.82	Received PZD 1 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P37.83	Received PZD 2 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P37.84	Received PZD 3 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.85	Received PZD 4 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.86	Received PZD 5 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.87	Received PZD 6 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.88	Received PZD 7 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.89	Received PZD 8 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.90	Received PZD 9 data display	Received PZD data display = PZD physically received data with base	0x0000–0xFFFF	0x0000

Function code	Name	Description	Setting range	Default
		value processed		
P37.91	Received PZD 10 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.92	Received PZD 11 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.93	Received PZD 12 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.94	CW1 source	0: 0 1: Digital (0–65535) 2: Other-C connector	0–2	2
P37.95	Received PZD sign selection	Bit 0–Bit 11 correspond to whether received PZD1–PZD12 are signed. If the corresponding bit is set to 1, the PZD is signed.	0x0000–0x0FFF	0x0000
P37.96	Received PZD1 polarity selection	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P37.97	Received PZD2 polarity selection	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P37.98	Communication disconnection detection delay	0: No detection; 0.00–60.00s	0.00–60.00	0.00s
P37.99	Communication disconnection handling	0: Report a fault 1: Report an alarm, keeping the running at the target frequency	0–1	0

8.3 PROFINET protocol

8.3.1 Communication settings

The communication card can function only as a PROFINET slave. Before communication, VFD function codes need to be set. The procedure is as follows:

Step 1 Set the communication timeout time.

By default, the communication timeout time is 0, and communication timeout detection is disabled. You can disable communication timeout detection or set the timeout time according to the needs. Once set, timeout detection is activated.

Note: The detection is only applicable to PROFINET communication.

Step 2 Set the control method.

If the VFD needs to be controlled, the control method needs to be set to PROFINET communication control. For example, if P00.01=2 (communication) and P00.02=1, the VFD start or stop can be controlled. In short, if a value needs to be set through PROFINET communication, the corresponding function code should be modified to PROFINET communication control.

Step 3 GSD file

One device description file named GSD file is required for each PROFIBUS slave on the PROFIBUS bus. The

GSD file is used to describe the characteristics of a PROFIBUS device. The GSD file contains all device defined parameters, including the supported information length, and input/output data quantity.

Note: If a VFD needs to be controlled, related function nodes must be set and the setting method is PROFINET communication.

8.3.2 Packet format

Table 8-1 describes the RT frame (non-synchronous) structure.

Table 8-1 RT frame structure

Data header	Ethernet type	VLAN	Ethernet type	Frame identifier	RT user data	Period counter	Data status	Transmission status	FCS
	2 bytes	2 bytes	2 bytes	2 bytes	36–1440 bytes	2 bytes	1 bytes	1 bytes	4 bytes
	0x8100	-	0x8892	-	-	-	-	-	-
	VLAN flag		-	-	-	APDU status			-

Data header			
Preamble 7 bytes	Synchronous 1 bytes	Source MAC address 6 bytes	Destination MAC address 6 bytes

Table 8-2 describes the IRT communication protocol and IRT frame (non-synchronous) structure.

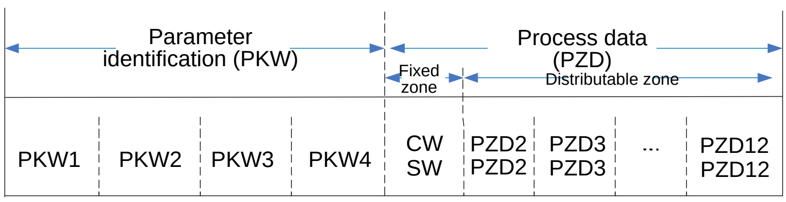
Table 8-2 IRT frame structure

Data header				Ethernet type	VLAN	Ethernet type	Frame identifier	IRT user data	FCS
Preamble 7 bytes	Synchronous 1 bytes	Source MAC address 6 bytes	Destination MAC address 6 bytes	2 bytes	2 bytes	2 bytes	2 bytes	36–1440 bytes	4 bytes

8.3.3 PROFINET IO communication

EC-TX109 supports 16-word sending/receiving, and the format for packet transmission with the VFD is shown in Figure 8-1.

Figure 8-1 Packet structure



Through the preceding 32 IOs, you can set the reference parameters, monitor status values, send control commands and monitor operation status of the VFD, and read and write VFD function parameters.

1. Parameter zone:

PKW1—Parameter identification

PKW2—Array index number

PKW3—Parameter value 1

PKW4—Parameter value 2

2. Process data:

CW—control word (from the master to a slave)

SW—status word (from a slave to the master)

PZD—process data (user specified)

(When the PZD is sent from the master to a slave, it is a reference value; and when the PZD is received by a slave from the master, it is an actual value.)

PZD zone: The PZD zone in communication packets is designed for controlling and monitoring VFDs. The master and slave always process the received PZD with the highest priority. The processing of PZD takes priority over that of PKW, and the master and slave always transmit the latest valid data on the interfaces.

3. CW and SW

Using CWs is the basic method for the fieldbus system to control VFD devices. It is sent from the fieldbus master to a VFD device. In this case, the adapter module functions as a gateway. The VFD device responds to the bit code information of the CW and feeds status information back to the master through an SW.

Reference value: The VFD device may receive control information in multiple channels, including analog and digital input terminals, VFD control panel, and communication modules (such as RS485 and CH-PA01 adapter modules). To enable the control over VFD devices through PROFINET, you need to set communication cards as the controllers of the VFD devices.

Actual value: An actual value is a 16-bit word that includes information about VFD device operation. The monitoring function is defined through VFD parameters. The conversion scale of an integer transmitted as an actual value sent to the master depends on the set function.

Note: A VFD device always checks the bytes of a CW and reference value.

8.3.4 Task packet (master station -> VFD)

Control word (CW): The first two words in a PZD packet are VFD CWs. CW 2 can be selected according to received PZD 2.

VFD CWs:

CW	Bit	Value	State/Description
CW 1	Bit0	0	OFF1 (RFG ramp stop)
		0->1	Run
	Bit1	0	OFF2 (Coast to stop)
		1	Necessary conditions for running
	Bit2	0	OFF3 (Quick stop)
		1	Necessary conditions for running
	Bit3	0	IGBT blocked
		1	Run allowing
	Bit4	0	Disable ramp function generator (RFG output is 0)
		1	Enable ramp function generator
	Bit5	0	Freeze ramp function generator output
		1	Ramp function generator works
	Bit6	0	Speed reference is 0 (disable setting)
		1	Enable speed reference
	Bit7	0->1	Fault reset
	Bit8	0	Jog 1 off (execute OFF1 based stop)
		0->1	Jog 1 run
	Bit9	0	Jog 2 off (execute OFF1 based stop)
		0->1	Jog 2 run
	Bit10	1	Remote control request (PZD commands and PZD process data enabling bits)

CW	Bit	Value	State/Description
	Bit11	1	Inverse set speed
	Bit12	1	MOP rising command
	Bit13	1	MOP falling command
	Bit14	1	Trigger external fault 1
	Bit15	1	Trigger external fault 2
CW 2	Bit0	1	Enabling droop
	Bit1	0	The corresponding function code specifies whether to track the rotation speed.
		1	Forcibly use rotation speed tracking
	Bit3 bit2	00	Select motor 1
		01	Select motor 2
		10	Select motor 3
		11	Select motor 4
	Bit4	1	Multi-step speed selection bit 0
	Bit5	1	Multi-step speed selection bit 1
	Bit6	1	Multi-step speed selection bit 2
	Bit7	1	Multi-step speed selection bit 3
	Bit8	0	Remove speed-loop integral
		1	Normalize speed-loop integral
	Bit9	0	Speed regulator output is 0, and motor rotates freely
		1	Speed regulator is normal, ensuring a closed loop speed control
	Bit10	0	Control mode determined by related function codes
		1	Vector control is forced to work in torque mode
	Bit11	0	Master/slave transmission command - enable slave
		1	Master
	Bit12	1	Trigger external alarm 1
	Bit13	1	Trigger external alarm 2
	Bit14	0	Trigger channel 1
		1	Trigger channel 2
	Bit15	0	Force brake closing
		1	Force brake opening

Reference value (REF): PZD2–PZD12 in a PZD task packet can be the main reference values. When the speed or torque source in the reference configuration P00.01 or P00.04 is set to 9 or 10 (Process data 3 of bus adapter A or B), PZD3 is used as the reference value source by default. The table below shows the function codes for received PZDs.

Function code	Name	Description	Setting range	Default
P38.82	Received PZD 1 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P38.83	Received PZD 2 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P38.84	Received PZD 3 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000

Function code	Name	Description	Setting range	Default
P38.85	Received PZD 4 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.86	Received PZD 5 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.87	Received PZD 6 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.88	Received PZD 7 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.89	Received PZD 8 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.90	Received PZD 9 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.91	Received PZD 10 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.92	Received PZD 11 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.93	Received PZD 12 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000

Response message (VFD → master station)

Status word (SW): The first two words in a PZD response packet are VFD SWs. The VFD SW definition is as follows.

VFD SWs:

SW	Bit	Value	State/Description
SW 1	Bit0	0	Not ready for brake closing (initialization not complete or faulty)
		1	Ready for brake closing and switching on (Ready to switch on, set to 1 if there is no fault with weak electricity) – Lockout for startup or ready to switch on
	Bit1	0	OFF1 activate ramp stop
		1	Ready to run OFF1 not activated, ready to run (set to 1 if ready to run, ready to switch on, and bus established)
	Bit2	0	Disable running
		1	Enable running (set to 1 if the run command is valid, determined through CW)
	Bit3	0	No fault
		1	Fault
	Bit4	0	OFF2 activated
		1	OFF2 not active

SW	Bit	Value	State/Description
	Bit5	0	OFF3 activated
		1	OFF3 not activated
	Bit6	1	Disable brake closing or switching on (disable switching on, same meaning as bit0, mutually exclusive) (OFF1, OFF2, 0FF3, run not allowed, set to 1 upon a fault)
	Bit7	0	Neither an alarm nor a minor fault
		1	Alarm and minor fault activated
	Bit8	0	Actual value different from reference value
		1	Actual value equals reference value (speed reached)
	Bit9	0	Local (responds only to PLC CW OFF1, OFF2, OFF3, not to others)
		1	Remote (control by PLC, related to bit 10 of CW 1)
	Bit10	0	Actual speed lower than compared value
		1	Actual speed higher than comparison value (FDT level detection value)
	Bit11	0	Torque or current not reach limit
		1	Torque or current reached limit
	Bit12	0	Command channel 1 effective
		1	Command channel 2 effective
	Bit13	0	IGBT blocked
		1	IGBT triggered
	Bit14	0	Running speed is positive
		1	Running speed is negative
	Bit15	0	Brake opened
		1	Brake closed
SW 2	Bit0	0	Invalid
		1	Jog run
	Bit1	0	Invalid
		1	P.OFF
	Bit2	0	Pre-charge resistor switch disconnected (Pre-charge resistor connected)
		1	Pre-charge resistor switch closed
	Bit3	0	Unit fan stop
		1	Unit fan run
	Bit4	1	Output voltage (P21.07) reached limit (motor rated voltage)
	Bit5	0	Ramp bypass
		1	Ramp activated
	Bit6	1	External fault 1
	Bit7	1	External fault 2
	Bit8–bit15	0	Reserved

Actual value (ACT): PZD1–PZD12 in a PZD task packet can be the VFD running data feedback sources, where the default values of PZD1 and PZP2 are Other-C connector connected to P20.34 (SW 1) and P20.51 (SW 2) by default.

VFD actual status values:

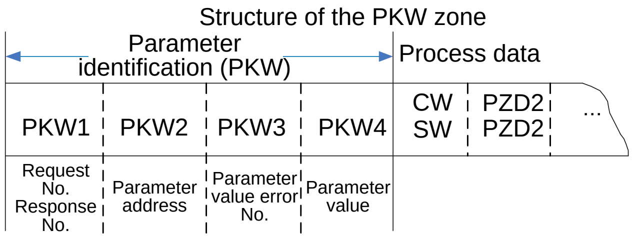
Name	Parameter description	Function selection
PZD1 source (typically sent SW 1)	0: 0 1: Digital (0–65535)	2
PZD2 source (typically sent SW 2)		2

Name	Parameter description	Function selection
PZD3 source	2: Other-C connector	0
PZD4 source	3: AI1	0
PZD5 source	4: AI2	0
PZD6 source	5: HDI1	0
PZD7 source	6: HDI2	0
PZD8 source	7: Multi-step running	0
PZD9 source	8: MOP	0
PZD10 source		0
PZD11 source		0
PZD12 source		0

8.3.5 PKW zone

PKW zone: The PKW zone describes the processing mode of the parameter identification interface. A PKW interface is not a physical interface but a mechanism that defines the transmission mode (such reading and writing a parameter value) of a parameter between two communication ends.

Figure 8-2 PKW zone



In the periodic communication, the PKW zone consists of four 16-bit words. The following table lists the definition of each word.

First word PKW1 (16 bits)		
Bits 15–00	Task or response ID flag	0–7
Second word PKW2 (16 bits)		
Bits 15–00	Basic parameter address	0–247
Third word PKW3 (16 bits)		
Bits 15–00	Value (most significant word) of a parameter or error code of the returned value	00
Fourth word PKW4 (16 bits)		
Bits 15–00	Value (least significant word) of a parameter	0–65535

Note: If the master requests the value of a parameter, the values in PKW3 and PKW4 of the packet that the master transmits to the VFD are no longer valid.

Task request and response: When transmitting data to a slave, the master uses a request number, and the slave uses a response number to accept or reject the request.

Table 8-3 Task ID flag PKW1 definition

Request No. (from the master to a slave)		Response signal	
Request	Function	Acceptance	Rejection
0	No task.	0	-
1	Requesting the value of a parameter	1 or 2	3
2	Modifying a parameter value (one word) [modifying the	1	3 or 4

Request No. (from the master to a slave)		Response signal	
Request	Function	Acceptance	Rejection
	value only on RAM]		
3	Modifying a parameter value (two words) [modifying the value only on RAM]	2	3 or 4
4	Modifying a parameter value (one word) [modifying the value on both RAM and EEPROM]	1	3 or 4
5	Modifying a parameter value (two words) [modifying the value on both RAM and EEPROM]	2	3 or 4

Note: Request 2 "Modifying a parameter value (one word) [modifying the value only on RAM]", request 3 "Modifying a parameter value (two words) [modifying the value only on RAM]", and request 5"Modifying a parameter value (two words) [modifying the value on both RAM and EEPROM] are not supported currently.

Table 8-4 Response ID flag PKW1 definition

Response (from a slave to the master)	
Response No.	Function
0	No response
1	Transmitting the value of a parameter (one word)
2	Transmitting the value of a parameter (two words)
3	The task cannot be executed and one of the following error number is returned: 0: Invalid command 1: Parameter value cannot be modified (read only) 2: Out of range 3: Incorrect sub-index number 4: Setting not allowed (only reset allowed) 5: Invalid data type 6: Task cannot be executed in the operating state 7: Request not supported 8: Request cannot be completed due to communication errors 9: Error in writing to the fixed storage area 10: Request failed due to timeout 11: PZD cannot be allocated to the parameter 12: No control word bit can be allocated 13: Other error
4	No parameter modifying permission

8.3.6 Related function codes

Function code	Name	Description	Setting range	Default
P38.00	Matching bus type of bus adapter	0: Without 1: PROFIBUS-DP module 2: PROFINET IO module 3: CANopen module 4: EtherNET module 5: EtherCAT module 6: DeviceNet Module The setting of this function code must be different from that of P38.00, which is	0–6	1

Function code	Name	Description	Setting range	Default
		automatically processed in the software; if two identical cards are required, use a redundant bus. For example, if bus adapter A selects the DP module but multiple DP expansion cards are inserted into the card slots, the card with the smallest slot number will automatically be the valid expansion card; other types of cards comply with the same rule.		
P38.01	Sent PZD sign selection	Bit 0–Bit 11 correspond to whether sent PZD1–PZD12 are signed. If a sent PZD is signed, the corresponding bit should be set to 1.	0x0000–0x0FFF	0x0000
P38.02	Sent PZD1 source	0: 0 1: Digital (0–65535) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP	0–8	2
P38.03	Sent PZD2 source		0–8	2
P38.04	Sent PZD3 source		0–8	2
P38.05	Sent PZD4 source		0–8	2
P38.06	Sent PZD5 source		0–8	2
P38.07	Sent PZD6 source		0–8	2
P38.08	Sent PZD7 source		0–8	2
P38.09	Sent PZD8 source		0–8	2
P38.10	Sent PZD9 source		0–8	2
P38.11	Sent PZD10 source		0–8	2
P38.12	Sent PZD11 source		0–8	2
P38.13	Sent PZD12 source		0–8	0
P38.82	Received PZD 1 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P38.83	Received PZD 2 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000
P38.84	Received PZD 3 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.85	Received PZD 4 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.86	Received PZD 5 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.87	Received PZD 6 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P37.88	Received PZD 7 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.89	Received PZD 8	Received PZD data display = PZD	0x0000–0xFFFF	0x0000

Function code	Name	Description	Setting range	Default
	data display	physically received data with base value processed		
P38.90	Received PZD 9 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.91	Received PZD 10 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.92	Received PZD 11 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.93	Received PZD 12 data display	Received PZD data display = PZD physically received data with base value processed	0x0000–0xFFFF	0x0000
P38.94	CW1 source	0: 0 1: Digital (0–65535) 2: Other-C connector (2: P37.82)	0–2	2
P38.95	Received PZD sign selection	Bit 0–Bit 11 correspond to whether received PZD1–PZD12 are signed. If the corresponding bit is set to 1, the PZD is signed.	0x0000–0x0FFF	0x0000
P38.96	Received PZD1 polarity selection	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P38.97	Received PZD2 polarity selection	0x0000–0xFFFF	0x0000–0xFFFF	0x0000
P38.98	Communication disconnection detection delay	0: No detection; 0.00–60.00s	0.00–60.00	0.00s
P38.99	Communication disconnection handling	0: Report a fault 1: Report an alarm, keeping the running at the target frequency	0–1	0

8.4 CANopen protocol

See the manual for CANopen communication expansion module.

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th></tr>
<tr><td>P43.00</td><td>Unit online state</td><td><table>
<tr><td>Bit0</td><td>EC slot 1 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit1</td><td>EC slot 2 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit2</td><td>EC slot 3 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit3</td><td>EC slot 2-1 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit4</td><td>EC slot 2-2 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit5</td><td>EC slot 2-3 module online state</td></tr>
</table></td><td>0x000–0x1FF</td><td>0x000</td></tr>
</table>

Function code	Name	Description	Setting range	Default
		(0: Offline; 1:Online) Bit6: EC slot 3-1 module online state (0: Offline; 1: Online) Bit7: EC slot 3-2 module online state (0: Offline; 1: Online) Bit8: EC slot 3-3 module online state (0: Offline; 1: Online)		
P43.01	CANopen communication address	0–127	0–127	2
P43.02	CANopen communication baud rate	0: 1000kbps 1: 800kbps 2: 500kbps 3: 250kbps 4: 125kbps 5: 100kbps 6: 50kbps 7: 20kbps	0–7	3
P43.03–P43.09	Reserved	-	-	-
P43.10	Present effective card slot	Used to display the card slot that is currently effective. When there are two or more card slots inserted with CANopen cards, only the CANopen card at one card slot is effective, and the CANopen cards at the other card slots are used for redundancy. Bit0: EC slot 1 module effective state (0: Ineffective; 1: Effective) Bit1: EC slot 2 module effective state (0: Ineffective; 1: Effective) Bit2: EC slot 3 module effective state (0: Ineffective; 1: Effective) Bit3: EC slot 2-1 module effective state (0: Ineffective; 1: Effective) Bit4: EC slot 2-2 module effective state (0: Ineffective; 1: Effective) Bit5: EC slot 2-3 module effective state (0: Ineffective; 1: Effective) Bit6: EC slot 3-1 module effective state (0: Ineffective; 1: Effective) Bit7: EC slot 3-2 module effective state (0: Ineffective; 1: Effective) Bit8: EC slot 3-3 module effective state (0: Ineffective; 1: Effective)	0x0000–0xFFFF	0x0000

8.5 Ethernet communication

You can easily set, upload, and download all VFD parameters by using the upper computer. You can also monitor more than 100 internal information waveforms of the VFD in real time.

The VFD provides the "black box" function. The VFD can save the waveform information generated within 0.2s before the most recent fault that causes its stop. You can obtain the waveform information from the upper computer and analyze fault causes.

Function code	Name	Description	Setting range	Default
P44.00	Reserved	-	-	-
P44.01	PC disconnection handling	0: No handling 1: Stop When PC channel control is in use, this function code determines whether the VFD stops if the PC is disconnected.	0–1	0
P44.02	TCP/IP address 1	0–255	0–255	192
P44.03	TCP/IP address 2	0–255	0–255	168
P44.04	TCP/IP address 3	0–255	0–255	0
P44.05	TCP/IP address 4	0–255 (you need to re-power on for the IP address change to take effect)	0–255	1
P44.06	TCP/IP subnet mask address 1	0–255	0–255	255
P44.07	TCP/IP subnet mask address 2	0–255	0–255	255
P44.08	TCP/IP subnet mask address 3	0–255	0–255	255
P44.09	TCP/IP subnet mask address 4	0–255	0–255	0
P44.10	TCP/IP GW address 1	0–255	0–255	192
P44.11	TCP/IP GW address 2	0–255	0–255	168
P44.12	TCP/IP GW address 3	0–255	0–255	1
P44.13	TCP/IP GW address 4	0–255	0–255	1
P44.14	Keypad monitor site number	When monitoring multiple main control boxes with a keypad, modifying this function code can complete the switchover between the main control boxes with different site numbers. Press the PRG and DATA keys simultaneously to return to the local monitor interface and reset the function code to enter the monitored site interface again.	0–255	1

9 Parameter list

The function parameters are divided into groups by function, and each group includes several function codes (each function code identifies a function parameter). A three-level menu style is applied to function codes. For example, "P00.08" indicates the 8th function code in group P00. Group P29 consists of factory function parameters, which are user inaccessible.

The function group numbers correspond to the level-1 menus, the function codes correspond to the level-2 menus, and the function parameters correspond to the level-3 menus.

1. The content of the function code table is as follows:

Column 1 "Function code ": Code of the function group and parameter

Column 2 "Name": Full name of the function parameter.

Column 3 "Description": Detailed description of the function parameter.

Column 4 "Setting range": Setting range of the function parameter

Column 5 "Default": Initial value set in factory

Column 6 "Modify": Whether the function parameter can be modified, and conditions for the modification

"○" indicates that the value of the parameter can be modified when the VFD is in stopped or running state.

"◎" indicates that the value of the parameter cannot be modified when the VFD is in running state.

"●" indicates that the value of the parameter is detected and recorded, and cannot be modified.

(The VFD automatically checks and constrains the modification of parameters, which helps prevent incorrect modifications.)

2. The parameters adopt the decimal system (DEC). If the hexadecimal system is adopted, all bits are mutually independent on data during parameter editing, and the setting ranges at some bits can be hexadecimal (0–F).
3. "Default" indicates the factory setting of the function parameter. If the value of the parameter is detected or recorded, the value cannot be restored to the factory setting.
4. To better protect parameters, the VFD provides the password protection function. After a password is set (that is, P07.00 is set to a non-zero value), "0. 0. 0. 0. 0." is displayed when you press the PRG/ESC key to enter the function code editing interface. You need to enter the correct user password to enter the interface. For the factory parameters, you need to enter the correct factory password to enter the interface. (You are not advised to modify the factory parameters. Incorrect parameter setting may cause operation exceptions or even damage to the VFD.) If password protection is not in locked state, you can change the password any time. You can set P07.00 to 0 to cancel the user password. When P07.00 is set to a non-zero value during power-on, parameters are prevented from being modified by using the user password function.
5. When you modify function parameters through serial communication, the user password protection function is also applicable and compliant with the same rule.

Group P00—Given value configuration

Function code	Name	Description	Setting range	Default	Modify
P00.00	Channel selection source	0: Channel 1 1: Channel 2 2: Other-B connector	0–10	0	○

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
Used to select the given value and control channel source. 0 indicates selection of channel 1, and 1 indicates selection of channel 2.</td><td></td><td></td><td></td></tr>
<tr><td>P00.01</td><td>Channel 1 speed main setting source</td><td rowspan="2">0: 0
1: Digital (-327.67–P09.02)
2: Other-C connector (0.00–99.99)
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B
The base value is P00.55, that is, the actual speed reference is the percentage set by this function code multiplied by P00.55. This function code is valid when P00.52 is 0.</td><td>0–10</td><td>1</td><td>○</td></tr>
<tr><td>P00.02</td><td>Channel 1 speed auxiliary setting source</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P00.03</td><td>Channel 1 additional speed reference</td><td>0: 0
1: Digital (-20.00–+20.00)
2: Other-C connector (0.00–99.99)
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B
The process sometimes requires the use of a speed regulation setting that takes effect directly without ACC/DEC time. This function code setting is only valid during running, and when it takes effect, it is directly superimposed on the RFG output speed. The</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

Function code	Name	Description	Setting range	Default	Modify
		additional speed is only valid during speed control, that is, it is not valid when given separately, and it needs to be used together with other speed settings.			
P00.04	Channel 1 torque main setting source	0: 0 1: Digital (-300.00 – +300.00%) 2: Other-C connector (0.00–99.99) 3: AI1 (100% corresponds to 300.0% of torque) 4: AI2 (100% corresponds to 300.0% of torque) 5: HDI1 (100% corresponds to 300.0% of torque) 6: HDI2 (100% corresponds to 300.0% of torque) 7: Multi-step (100% corresponds to 300.0% of torque) 8: MOP (100% corresponds to 300.0% of torque) 9: Process data 3 of bus adapter (-300.00–+300.00%) 10: Process data 3 of bus adapter (-300.00–+300.00%)	0–10	1	○
P00.05	Channel 1 main torque filter time	0.00–10.00s	0.00–10.00	0.00s	○
P00.06	Channel 1 additional torque 1 giving source	0: 0 1: Digital (-300.00–300.00%) 2: Other-C connector (0.00–99.99) 3: AI1 (100% corresponds to 300.0% of torque) 4: AI2 (100% corresponds to 300.0% of torque) 5: HDI1 (100% corresponds to 300.0% of torque) 6: HDI2 (100% corresponds to 300.0% of torque) 7: Multi-step (100% corresponds to 300.0% of torque) 8: MOP (100% corresponds to 300.0% of torque) 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P00.07	Channel 1 additional torque 1 coefficient source	0: 0 1: Digital (0.0–100.0%) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2	0–10	1	○

Function code	Name	Description	Setting range	Default	Modify
		7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P00.08	Channel 1 additional torque 2 giving source	0: 0 1: Digital (-300.00–+300.00%) 2: Other-C connector (0.00–99.99) 3: AI1 (100% corresponds to 300.0% of torque) 4: AI2 (100% corresponds to 300.0% of torque) 5: HDI1 (100% corresponds to 300.0% of torque) 6: HDI2 (100% corresponds to 300.0% of torque) 7: Multi-step (100% corresponds to 300.0% of torque) 8: MOP (100% corresponds to 300.0% of torque) 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P00.09	Channel 1 additional torque 3 giving source	0: 0 1: Digital (-300.00–+300.00%) 2: Other-C connector (0.00–99.99) 3: AI1 (100% corresponds to 300.0% of torque) 4: AI2 (100% corresponds to 300.0% of torque) 5: HDI1 (100% corresponds to 300.0% of torque) 6: HDI2 (100% corresponds to 300.0% of torque) 7: Multi-step (100% corresponds to 300.0% of torque) 8: MOP (100% corresponds to 300.0% of torque) 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	2	○
P00.10–P00.16	Reserved	-	-	-	-
P00.17	Channel 2 speed main setting source	0: 0 1: Digital (-327.67%–P09.02) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running	0–10	1	○
P00.18	Channel 2 speed auxiliary setting source		0–10	0	○

Function code	Name	Description	Setting range	Default	Modify
		8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B The base value is P00.55, that is, the actual speed reference is the percentage set by this function code multiplied by P00.55.			
P00.19	Channel 2 additional speed reference	0: 0 1: Digital (–20.00 – +20.00) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B The process sometimes requires the use of a speed regulation setting that takes effect directly without ACC/DEC time. This function code setting is only valid during running, and when it takes effect, it is directly superimposed on the RFG output speed. The additional speed is only valid during speed control, that is, it is not valid when given separately, and it needs to be used together with other speed settings.	0–10	0	○
P00.20	Channel 2 torque main setting source	0: 0 1: Digital (–300.00 – +300.00) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1	○
P00.21	Channel 2 main torque filter time	0.00–10.00s	0.00–10.00	0.00s	○
P00.22	Channel 2 additional torque 1 giving source	0: 0 1: Digital (–300.00 – +300.00) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2	0–10	0	○

Function code	Name	Description	Setting range	Default	Modify
		5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P00.23	Channel 2 additional torque 1 coefficient source	0: 0 1: Digital (0.0–100.0%) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1	○
P00.24	Channel 2 additional torque 2 giving source	0: 0 1: Digital (-300.00 – +300.00%) 2: Other-C connector (0.00–99.99) 3: AI1 (100% corresponds to 300.00% of torque) 4: AI2 (100% corresponds to 300.00% of torque) 5: HDI1 (100% corresponds to 300.00% of torque) 6: HDI2 (100% corresponds to 300.00% of torque) 7: Multi-step (100% corresponds to 3000.0% of torque) 8: MOP (100% corresponds to 300.00% of torque) 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P00.25	Channel 2 additional torque 3 giving source			2	○
P00.26–P00.27	Reserved	-	-	-	-
P00.28	RFG bypass enabling source	0: Not bypass 1: Bypass 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P00.29	S-curve function	0: Linear	0–1	0	◎

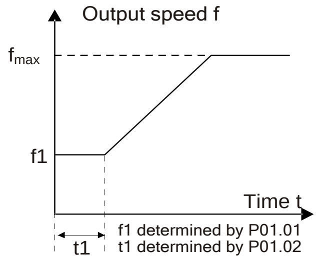
<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td>flowchart display</td><td>1: S curve</td><td></td><td></td><td></td></tr>
<tr><td>P00.30</td><td>RFG ramp selection bit 0</td><td rowspan="2">0: 0
1: 1
2: Other-B connector (0.00–99.99)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
<table><tr><th>RFG ramp selection bit 1</th><th>RFG ramp selection bit 0</th><th>ACC/DEC time selection or Start/End arc time selection</th></tr><tr><td>0</td><td>0</td><td>Ramp 1 time</td></tr><tr><td>0</td><td>1</td><td>Ramp 2 time</td></tr><tr><td>1</td><td>0</td><td>Ramp 3 time</td></tr><tr><td>1</td><td>1</td><td>Ramp 4 time</td></tr></table></td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P00.31</td><td>RFG ramp selection bit 1</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P00.32</td><td>Ramp 1 ACC time</td><td>The entire S-curve ACC time is t2 + 0.5(t1+t3), and if t2 < 0.5(t1+t3), the entire S-curve time is approximately (t1+t3), as actually tested. t1: Start segment arc time; t2: Ramp ACC time; t3: End segment arc time. ACC time: indicates the time taken to speed up from 0rpm to the max frequency (P09.02).
0.1–3600.0s</td><td>0.1–3600.0</td><td>Model depended</td><td>○</td></tr>
<tr><td>P00.33</td><td>Ramp 1 DEC time</td><td>0.1–3600.0s</td><td>0.1–3600.0</td><td>Model depended</td><td>○</td></tr>
<tr><td>P00.34</td><td>Ramp 2 ACC time</td><td>0.1–3600.0s</td><td>0.1–3600.0</td><td>Model depended</td><td>○</td></tr>
<tr><td>P00.35</td><td>Ramp 2 DEC time</td><td>0.1–3600.0s</td><td>0.1–3600.0</td><td>Model depended</td><td>○</td></tr>
<tr><td>P00.36</td><td>Ramp 3 ACC time</td><td>0.1–3600.0s</td><td>0.1–3600.0</td><td>Model depended</td><td>○</td></tr>
<tr><td>P00.37</td><td>Ramp 3 DEC time</td><td>0.1–3600.0s</td><td>0.1–3600.0</td><td>Model depended</td><td>○</td></tr>
<tr><td>P00.38</td><td>Ramp 4 ACC time</td><td>0.1–3600.0s</td><td>0.1–3600.0</td><td>Model depended</td><td>○</td></tr>
<tr><td>P00.39</td><td>Ramp 4 DEC time</td><td>0.1–3600.0s</td><td>0.1–3600.0</td><td>Model depended</td><td>○</td></tr>
<tr><td>P00.40</td><td>Ramp 1 start segment arc time</td><td>0.0–2000.0s</td><td>0.0–2000.0</td><td>0.0s</td><td>◎</td></tr>
</table>

Function code	Name	Description	Setting range	Default	Modify
P00.41	Ramp 1 end segment arc time	0.0–2000.0s	0.0–2000.0	0.0s	◎
P00.42	Ramp 2 start segment arc time	0.0–2000.0s	0.0–2000.0	0.0s	◎
P00.43	Ramp 2 end segment arc time	0.0–2000.0s	0.0–2000.0	0.0s	◎
P00.44	Ramp 3 start segment arc time	0.0–2000.0s	0.0–2000.0	0.0s	◎
P00.45	Ramp 3 end segment arc time	0.0–2000.0s	0.0–2000.0	0.0s	◎
P00.46	Ramp 4 start segment arc time	0.0–2000.0s	0.0–2000.0	0.0s	◎
P00.47	Ramp 4 end segment arc time	0.0–2000.0s	0.0–2000.0	0.0s	◎
P00.48	Jog 1 setting	Specifies the target frequency during jogging. -327.67%–P09.02	-327.67–P09.02	5.00%	◎
P00.49	Jog 2 setting	Specifies the target frequency during jogging. -327.67%–P09.02	-327.67–P09.02	5.00%	◎
P00.50	Jog ACC time	ACC time: indicates the time taken to speed up from 0rpm to the max frequency (P09.02). 0.0–20.0s	0.0–20.0	1.0s	◎
P00.51	Jog DEC time	DEC time: indicates the time taken to speed down from the max frequency (P09.02) to 0rpm. 0.0–20.0s	0.0–20.0	1.0s	◎
P00.52	Main speed giving method	0: Percentage (%) 1: Frequency (Hz) 2: Rotation speed (rpm)	0–2	0	○
P00.53	Main frequency reference	When P00.52=1, you can set this function code to specify the main frequency reference.	-3276.7–3276.7	0.0Hz	○
P00.54	Main rotation speed reference	When P00.52=2, you can set this function code to specify the main rotation speed reference.	-32767–32767	0rpm	○
P00.55	Rotation speed reference percentage base value	The default value is the rated speed of the selected motor, and this base value multiplied by the speed reference percentage is the actual speed reference. After a motor switch occurs, this function code displays the selected motor reference setting. 0–65535rpm	0–65535	Model depended	●
P00.56	High-accuracy	0: 0	0–10	0	○

Function code	Name	Description	Setting range	Default	Modify
	speed giving source	1: Digital (-3.000–3.000%, 0.000%) 2: Other-C connector (0.00–99.99) 3: AI1 (100.0% corresponds to 3.000%*P00.55) 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B When the accuracy of a given speed is not sufficient, this function code can be set to improve the accuracy of the given speed.			
P00.57	Enabling linear interpolator (reserved)	0: Disable 1: Enable	0–1	0	○
P00.58	Reference enabling source	0: Disable reference. After the reference is disabled, according to the running command, the output frequency is 0. 1: Enable reference	0–1	1	○
P00.59	Function parameter restore	0: No operation 1: Restore to default values(motor parameters, free function blocks P58–P85, group P08 for fault records, and group P23 for system time cannot be restored) 2: Clear fault records; group P08 for fault records 3: Clear electric meter records 4: Restore to default values for free function blocks(P58–P85) 5: Clear EEPROM function code area **Note:** After the function code version number is changed, you can set the function code to restore the default values. Option 5 is not for users.	0–5	0	◎

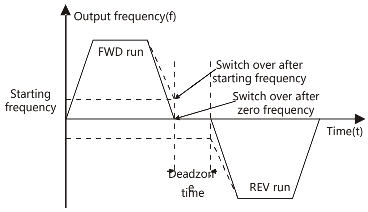
Group P01—Start/stop control

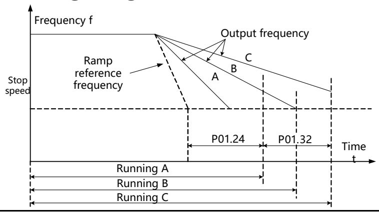
Function code	Name	Description	Setting range	Default	Modify
P01.00	Running mode of start	0: Direct start 1: Start after DC braking	0–4	0	◎

Function code	Name	Description	Setting range	Default	Modify
		2: Speed tracking restart 1 (reserved) 3: Speed tracking restart 2 (reserved) 4: Start after short-circuit braking (reserved) **Note:** It is recommended to drive SMs in direct start mode.			
P01.01	Starting frequency	The function code indicates the initial frequency during VFD start. See P01.02 (Starting frequency hold time) for detailed information. Setting range: 0.00–100.00%	0.00–100.00	0.00%	◎
P01.02	Hold time of starting frequency	Setting a proper starting frequency can increase the torque during VFD start. During the hold time of the starting frequency, the output frequency of the VFD is the starting frequency. And then, the VFD runs from the starting frequency to the set frequency. If the set frequency is lower than the starting frequency, the VFD stops running and keeps in the standby state. The starting frequency is not limited in the lower limit frequency.  Setting range: 0.0–50.0s	0.0–50.0	0.0s	◎
P01.03	Braking current before start	If P01.00=1, before start, the VFD performs DC braking according to the set DC braking current before start, when the set DC braking time before start elapses, it accelerates from the starting frequency. If the set DC braking time is 0, DC braking is invalid, and the direct start mode is used. Stronger braking current indicates larger braking power. The DC braking current before start is a	0.0–100.0	0.0%	◎

Function code	Name	Description	Setting range	Default	Modify
		percentage of the VFD rated output current. Setting range: 0.0–100.0%			
P01.04	DC braking time before start	Setting range: 0.00–50.00s	0.00–50.00	0.00s	◎
P01.05	Prestart DC Brake Kp	Setting range: 0–65535	0–65535	100	◎
P01.06	Prestart DC Brake Ki	Setting range: 0–65535	0–65535	100	◎
P01.07	Terminal-based running command protection at power-on	0: Disable restart 1: Enable restart When the command running channel is terminal, whether the system can start automatically after power down depends on function codes P01.07 and P01.08; if both of these function codes are enabled, the terminal running command is still valid, and the device starts automatically after the power-off restart time specified by P01.10; otherwise, it does not start, and the running command needs to be enabled again to trigger the running command to be valid.	0–1	0	○
P01.08	Restart after power off	0: Disable 1: Enable When the command running channel is not terminal, and the system is powered on again after power off, if the running command is valid before the power off and P01.08 is enabled, the device will automatically start after the power-off restart wait time specified by P01.10. This function is not valid at tooling test power-on and power-off, and it is valid at actual strong electricity power-on and power-off.	0–1	0	○
P01.09	Wait time for restart after power-off	0.0–3600.0s (valid when P1.08 ones place is 1)	0.0–3600.0	1.0s	○
P01.10–P01.14	Reserved	-	-	-	-
P01.15	OFF1 stop mode	1: Decelerate to stop (RFG deceleration time)	0–2	0	○

Function code	Name	Description	Setting range	Default	Modify
		1: Coast to stop 2: Stop according to max capacity (OFF3 stop time)			
P01.16	OFF3 stop time	0.0–1000.0s	0.0–1000.0	1.0s	○
P01.17	OFF3 stop mode	0: Decelerate to stop 1: Stop according to max capacity (OFF3 stop time)	0–1	1	○
P01.18	Stop mode allowed in run	0: OFF1 mode 1: OFF2 mode 2: OFF3 mode	0–2	0	○
P01.19	Reserved	-	-	-	-
P01.20	Stop braking mode	0: DC braking 1: Short-circuit braking (reserved)	0–1	0	◎
P01.21	Starting frequency of braking for stop	Starting frequency of DC braking for stop: During the deceleration to stop, the VFD starts DC braking for stop when running frequency reaches the starting frequency determined by P01.09. The frequency should be greater than the stop speed. Wait time before DC braking: The VFD blocks the output before starting DC braking. After this wait time, DC braking is started so as to prevent overcurrent caused by DC braking at high speed. DC braking current for stop: It indicates the applied DC braking energy. Stronger current indicates greater DC braking effect. DC braking time for stop: It indicates the hold time of DC braking. If the time is 0, DC braking is invalid, and the VFD decelerates to stop within the specified time. Setting range of P01.21: 0.00Hz–P09.02 Setting range of P01.22: 0.0–50.0s Setting range of P01.23: 0.0–120.0% (of the motor rated current) Setting range of P01.24: 0.0–50.0s (When it is set to 0, DC braking is invalid, and the VFD decelerates to stop within the specified time)	0.00–P09.02	0.00%	○
P01.22	Demagnetization time (Wait time before DC braking for stop)		0.0–50.0	0.0s	○
P01.23	DC braking current for stop		0.0–120.0	0.0%	○
P01.24	DC braking time for stop		0.0–50.0	0.0s	○
P01.25	Short-circuit braking current	0.0–150.0% (of the VFD rated current)	0.0–150.0	0.0%	○

Function code	Name	Description	Setting range	Default	Modify
	(reserved)				
P01.26	Hold time of short-circuit braking for start (reserved)	0.00–50.00s	0.0–50.00	0.00s	○
P01.27	Hold time of short-circuit braking for stop (reserved)	0.00–50.00s	0.0–50.00	0.00s	○
P01.28	FWD/REV run deadzone time	Setting range: 0.0–3600.0s Specifies the transition time specified in P01.29 during switchover between FWD run and REV run. 	0.0–3600.0	0.0s	○
P01.29	FWD/REV run switching mode	0: Switch at zero frequency 1: Switch at the starting frequency (P01.01) 2: Switch after delay for stop speed (P01.30) (switch after braking) When P01.29 = 0 or 1, and the switchover between FWD run and REV run is valid, the VFD decelerates to the switching frequency point. If P01.31 = 1, check whether the motor output frequency is less than the switching frequency point. If yes, wait the time specified by P01.28, and then control the motor to run in the reverse direction. If no, wait the time specified by P01.32 and then the time specified by P01.28, and then control the motor to run in the reverse direction. When P01.29=2, the DEC process for the switchover between FWD run and REV run is similar to the process of deceleration to stop. In the DEC process for the switchover, you can set related parameters to determine whether to enable short-circuit braking for	0–2	0	◎

Function code	Name	Description	Setting range	Default	Modify
		stop and DC braking based on the work conditions. The difference between the two processes is as follows: When the running frequency reaches the stop speed specified by P01.30 or DC braking ends, the deadzone time specified by P01.28 needs to be waited, and then the motor can be controlled to run in the reverse direction.			
P01.30	Stop speed	0.00–100.00%	0.00–100.00	1.00%	◎
P01.31	Stop speed detection mode	0: Detect according to speed setting (without stop delay, only this mode is applicable to V/F) 1: Detect according to speed feedback	0–1	0	◎
P01.32	Stop speed detection time	When P01.31 is set to 1, detecting according to speed feedback, if the VFD feedback frequency is less than or equal to the value of P01.30 and the VFD stop speed is detected within the time specified by P01.32, the VFD stops; otherwise, the VFD stops after the time specified by P01.32. Setting range: 0.00–100.00s 	0.00–100.00	0.50s	◎
P01.33	Demagnetization time for speed tracking	When speed-tracking start is selected, the inverter waits for the de-magnetization time before responding to the start command. Setting range: 0.00–20.00s	0.00–20.00	2.00s	○
P01.34	Rotation speed tracking phase compensation	0.0–200.0%	0.0–200.0	100.0%	○
P01.35	Rotation speed tracking amplitude compensation	0.0–200.0%	0.0–200.0	100.0%	○
P01.36	Stop speed delay	0.0–600.0s	0.0–600.0	0.0s	○
P01.37–P01.40	Reserved	-	-	-	-
P01.41	Action if setting below frequency	Processing mode selected when the set frequency is less than the	0–2	0	◎

Function code	Name	Description	Setting range	Default	Modify
	lower limit	frequency lower limit. This function code is valid when the frequency lower limit is greater than 0. 0: Run at the frequency lower limit 1: Stop 2: Sleep			
P01.42	Open-loop 0Hz output selection	0: Output without voltage 1: Output with voltage 2: Output with the DC braking current for stop	0–2	0	○
P01.43	Run readiness wait time	After the bus voltage is established, it will wait for the time specified by P01.43 before responding to the running command. Setting range: 0.0–3600.0s	0.0–3600.0	1.0s	○
P01.44	Duration of this run	The timing starts after this power-on run, and when the run time is reached, the multi-function digital output terminal outputs a "run time arrival" signal. Setting range: 0–65535min The setting 0 indicates this function code is ineffective.	0–65535	0min	○

Group P02—Control channel configuration

Function code	Name	Description	Setting range	Default	Modify
P02.00	Remote control channel selection	0: Bus adapter A 1: Bus adapter B 2: Modbus (addresses 0x4200, 0x4201) 3: Terminal start/stop module (IN1, IN2, IN3) Local/remote command switching is primarily used for the LOC/REM key on the LCD keypad (or the QUICK/JOG key on the LED keypad), impacting the control channel and frequency main settings; when the LOC/REM key function is selected as local/remote command switching (P01.56=6), press this key to switch between the local control channel and the remote control channel.	0–3	0	◎

Function code	Name	Description	Setting range	Default	Modify
		When the local command channel is used, the control channel and frequency main giving source are forcibly set to the keypad; when the remote command channel is used, the control channel and frequency main giving source are forcibly set to the control channel specified by P02.00 and the corresponding setting.			
P02.01	Channel 1 start/stop CW source	0: Keypad 1: Digital (0x0000–0xFFFF) 2: Other-C connector (for example, master/slave control commands can be set through a connector) 3: Terminal start/stop module (IN1, IN2, IN3) 4: Bus adapter A 5: Bus adapter B 6: PC (addresses 0x4200, 0x4201) 7: Modbus (addresses 0x4200, 0x4201) 8: Customized	0–8	0	◎
P02.02	Channel 1 customized OFF1 source	It is effective at the rising edge. 0: 0 1: 1 2: Other-B connector (effective at 0->1) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P02.03	Channel 1 customized run allowing source	0: Disable running 1: Enable running 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1	○

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P02.04</td><td>Channel 1 customized jog 1 source</td><td rowspan="2">0: 0
1: 1
2: Other-B connector (0: Invalid; 1: Valid)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P02.05</td><td>Channel 1 customized jog 2 source</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P02.06</td><td>Channel 1 customized speed inversing source</td><td>0: Do not inverse
1: Inverse
2: Other-B connector (0.00–99.99)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P02.07</td><td>Channel 1 OFF2 source 1</td><td rowspan="2">0: OFF2 is valid
1: OFF2 is invalid (1: Necessary conditions for running)
2: Other-B connector (0: OFF2 is valid; 1: Necessary conditions for running)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>1</td><td>○</td></tr>
<tr><td>P02.08</td><td>Channel 1 OFF2 source 2</td><td>0–10</td><td>1</td><td>○</td></tr>
<tr><td>P02.09</td><td>Channel 1 OFF3 source 1</td><td rowspan="2">0: OFF3 is valid
1: OFF3 is invalid (1: Necessary conditions for running)
2: Other-B connector (0: OFF3 is valid; 1: Necessary conditions for running)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5</td><td>0–10</td><td>1</td><td>○</td></tr>
<tr><td>P02.10</td><td>Channel 1 OFF3 source 2</td><td>0–10</td><td>1</td><td>○</td></tr>
</table>

Function code	Name	Description	Setting range	Default	Modify
		8: DI6 9: HDI1 10: HDI2			
P02.11	Channel 1 fault reset source 1	0: Fault reset is invalid 1: Fault reset is valid (effective at 0->1) 2: Other-B connector (0: Fault reset is invalid; 1: Fault reset is valid) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P02.12	Channel 1 fault reset source 2		0–10	0	○
P02.13	Channel 1 RFG disabling source	Channel 1 RFG disabling source 0: RFG disabling is valid 1: RFG disabling is invalid 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1	○
P02.14	Channel 1 RFG pausing invalid source	0: RFG pausing is valid 1: RFG pausing is invalid 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 Ramp pausing takes effect only when P00.28 (RFG bypass enabling source) =0 (Disable bypass).	0–10	1	○
P02.15	Source of setting channel 1 RFG reference to 0	0: Setting RFG reference to 0 is valid 1: Setting RFG reference to 0 is invalid 2: Other-B connector (0.00–99.99) 3: DI1	0–10	1	○

Function code	Name	Description	Setting range	Default	Modify
		4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2			
P02.16	Channel 1 forced rotation speed tracking source	0: Invalid 1: Valid 2: Other-B connector (0: Invalid; 1: Valid) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P02.17	Channel 1 forced torque control source		0–10	0	○
P02.18	Channel 1 speed regulator enabling source	0: Disable 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1	○
P02.19	Channel 2 start/stop CW source	0: Keypad 1: Digital (0–65535) 2: Other-C connector (for example, master/slave control commands can be set through a connector) 3: Terminal start/stop module (IN1, IN2, IN3) 4: Bus adapter A 5: Bus adapter B 6: PC (addresses 0x4200, 0x4201) 7: Modbus (addresses 0x4200, 0x4201) 8: Customized	0–8	0	○
P02.20	Channel 2 customized OFF1 source	It is effective at the rising edge. 0: 0 1: 1 2: Other-B connector (effective at 0->1)	0–10	0	○

Function code	Name	Description	Setting range	Default	Modify
		3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2			
P02.21	Channel 2 customized run allowing source	0: Disable running 1: Enable running 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1	○
P02.22	Channel 2 customized JOG1 source	0: 0 1: 1 2: Other-B connector (0: Invalid; 1: Valid) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P02.23	Channel 2 customized JOG2 source		0–10	0	○
P02.24	Channel 2 customized speed inversing source	0: Do not inverse 1: Inverse 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P02.25	Channel 2 OFF2 source 1	0: OFF2 is valid 1: OFF2 is invalid (1: Necessary conditions for running) 2: Other-B connector (0: OFF2 is valid; 1: Necessary conditions for running)	0–10	1	○
P02.26	Channel 2 OFF2 source 2		0–10	1	○

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td></td><td></td><td></td></tr>
<tr><td>P02.27</td><td>Channel 2 OFF3 source 1</td><td rowspan="2">0: OFF3 is valid
1: OFF3 is invalid (1: Necessary conditions for running)
2: Other-B connector (0: OFF3 is valid; 1: Necessary conditions for running)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>1</td><td>○</td></tr>
<tr><td>P02.28</td><td>Channel 2 OFF3 source 2</td><td>0–10</td><td>1</td><td>○</td></tr>
<tr><td>P02.29</td><td>Channel 1 fault reset source 1</td><td rowspan="2">0: Fault reset is invalid
1: Fault reset is valid (effective at 0->1)
2: Other-B connector (0: Fault reset is invalid; 1: Fault reset is valid)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P02.30</td><td>Channel 2 fault reset source 1</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P02.31</td><td>Channel 2 RFG disabling source</td><td>0: RFG disabling is valid
1: RFG disabling is invalid
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>1</td><td>○</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P02.32</td><td>Channel 2 RFG pausing invalid source</td><td>0: RFG pausing is valid
1: RFG pausing is invalid
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
Ramp pausing takes effect only when P00.28 (RFG bypass enabling source) =0 (Disable bypass).</td><td>0–10</td><td>1</td><td>○</td></tr>
<tr><td>P02.33</td><td>Source of setting channel 2 RFG reference to 0</td><td>0: Setting RFG reference to 0 is valid
1: Setting RFG reference to 0 is invalid
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>1</td><td>○</td></tr>
<tr><td>P02.34</td><td>Channel 2 forced rotation speed tracking source</td><td rowspan="2">0: Invalid
1: Valid
2: Other-B connector (0: Invalid; 1: Valid)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P02.35</td><td>Channel 2 forced torque control source</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P02.36</td><td>Channel 2 speed regulator enabling source</td><td>0: Disable
1: Enable
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>1</td><td>○</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P02.37</td><td>Reserved</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>P02.38</td><td>Terminal start/stop module channel selection</td><td>0: Terminal-based start/stop command 1
1: Terminal-based start/stop command 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P02.39</td><td>Terminal start/stop command 1 mode</td><td>0: Invalid
1: IN1 start (0: Stop; 1: Run)
2: IN1 start, IN2 direction (0: Forward; 1: Reverse)
3: IN1 FWD start, IN2 REV start
4: IN1P start (0->1), IN2 stop
5: IN1P start, IN2 stop, IN3 direction
6: IN1P FWD start, IN2P REV start, IN3 stop
<table>
<tr><th>Terminal start/stop mode</th><th>IN1 input</th><th>IN2 input</th><th>IN3 input</th><th>Start command OFF1 output</th><th>Given direction DIR output</th></tr>
<tr><td>0: Invalid</td><td>X</td><td>X</td><td>X</td><td>0: Stop</td><td>0: Forward</td></tr>
<tr><td rowspan="2">1: IN1 start</td><td>1</td><td>X</td><td>X</td><td>1: Run</td><td>0: Forward</td></tr>
<tr><td>0</td><td>X</td><td>X</td><td>0: Stop</td><td>0: Forward</td></tr>
<tr><td rowspan="2">2: IN1 start, IN2 direction</td><td>0</td><td>N</td><td>X</td><td>0: Stop</td><td>N=IN2</td></tr>
<tr><td>1</td><td>N</td><td>X</td><td>1: Run</td><td>N=IN2</td></tr>
<tr><td rowspan="4">3: IN1 FWD start, IN2 REV start</td><td>0</td><td>0</td><td>X</td><td>0: Stop</td><td>Depends on the run direction before stop</td></tr>
<tr><td>0</td><td>1</td><td>X</td><td>1: Run</td><td>1: Reverse</td></tr>
<tr><td>1</td><td>0</td><td>X</td><td>1: Run</td><td>0: Forward</td></tr>
<tr><td>1</td><td>1</td><td>X</td><td>0: Stop</td><td>Depends on the run direction before stop</td></tr>
<tr><td rowspan="2">4: IN1P start, IN2 stop</td><td>X</td><td>0</td><td>X</td><td>0: Stop</td><td>0: Forward</td></tr>
<tr><td>0->1</td><td>1</td><td>X</td><td>1: Run</td><td>0: Forward</td></tr>
<tr><td rowspan="2">5: IN1P start, IN2 stop, IN3 direction</td><td>X</td><td>0</td><td>N</td><td>0: Stop</td><td>N=IN3</td></tr>
<tr><td>0->1</td><td>1</td><td>N</td><td>1: Run</td><td>N=IN3</td></tr>
<tr><td rowspan="3">6: IN1P FWD start, IN2P REV start, IN3 stop</td><td>X</td><td>X</td><td>0</td><td>0: Stop</td><td>Depends on the run direction before stop</td></tr>
<tr><td>0->1</td><td>0</td><td>1</td><td>1: Run</td><td>0: Forward</td></tr>
<tr><td>0</td><td>0->1</td><td>1</td><td>1: Run</td><td>1: Reverse</td></tr>
</table></td><td>0–6</td><td>0</td><td>◎</td></tr>
<tr><td>P02.40</td><td>Terminal start/stop command 1 IN1 source</td><td>0: 0
1: 1
2: Other-B connector
3: DI1</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

Function code	Name	Description	Setting range	Default	Modify
P02.41	Terminal start/stop command 1 IN2 source	4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P02.42	Terminal start/stop command 1 IN3 source		0–10	0	○
P02.43	Terminal start/stop command 2 mode	0: Invalid 1: IN1 start 2: IN1 start, IN2 direction 3: IN1 FWD start, IN2 REV start 4: IN1P start, IN2 stop 5: IN1P start, IN2 stop, IN3 direction 6: IN1P FWD start, IN2P REV start, IN3 stop	0–6	0	◎
P02.44	Terminal start/stop command 2 input IN1 source	0: 0 1: 1 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P02.45	Terminal start/stop command 2 input IN2 source		0–10	0	○
P02.46	Terminal start/stop command 2 input IN3 source		0–10	0	○
P02.47	Terminal JOG1 source	0: 0 1: 1 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P02.48	Terminal JOG2 source		0–10	0	○
P02.48–P02.52	Reserved	-	-	-	-

Group P03—Control configuration

Function code	Name	Description	Setting range	Default	Modify
P03.00	Parameter autotuning	0: No operation 1: Rotary autotuning 2: Complete static autotuning 3: Partial static autotuning	0–8	0	◎

Function code	Name	Description	Setting range	Default	Modify
		4: Encoder autotuning 5: AM static autotuning 6: Rotation inertia identifying 7: Friction torque identifying 8: Deadzone identifying			
P03.01	PWM selection	Ones place: PWM mode selection 0: SPWM in the entire process 1: Switch from SVPWM to DPWM Tens place: PWM low-speed carrier frequency limit 0: Low-speed carrier frequency limit mode 1 1: Low-speed carrier frequency limit mode 2 2: No limit on low-speed carrier frequency Hundreds place: Deadzone compensation method 0: Compensation method 1 1: Compensation method 2 (only for vector control) 2: Compensation method 3 (only for vector control) Thousands place: SVPWM mode selection 0: Traditional SPWM 1: SVPWM using three-order harmonic injection method	0x0000–0x1221	0x1101	◎
P03.02	Overmodulation selection	Ones place: 0: Overmodulation is invalid 1: Overmodulation is valid Tens place: 0: Deepened overmodulation is invalid 1: Deepened overmodulation is valid Hundreds place: Carrier frequency limit 0: Yes 1: No Thousands place: Reserved	0x0000–0x1111	0x1001	◎
P03.03	Overload mode	0: No overload mode 1: Light overload mode 2: Heavy overload mode	0–2	1	◎
P03.04	AVR function	0: Invalid 1: Valid during the whole process	0–1	1	○
P03.05	Magnetic flux braking	Used to enable the magnetic flux braking. Magnetic flux braking can be used for motor stop, as well as for motor rotation speed change. The current of the stator other than the rotor increases during magnetic flux braking. Therefore, the cooling is better.	99–150	99	○

Function code	Name	Description	Setting range	Default	Modify
		99: Invalid 100–150: A larger coefficient indicates stronger braking.			
P03.06	Reserved	-	-	-	○
P03.07	Reserved	-	-	-	○
P03.08	Internal pre-exciting time	Pre-exciting is performed for the motor when the VFD starts up. A magnetic field is built up inside the motor to improve the torque performance during the start process (this is valid in vector control). Setting range: 0.000–10.000s Pre-exciting time is related to motor power. Pre-exciting can be evaluated according to the following formula: T_{flux}(ms)=Lr(mH)/Rr(Ω) **Note:** If the external signal functioning time is less than the internal pre-exciting time, the internal pre-exciting time is used as the pre-exciting time. In V/F control, the system pre-exciting is invalid; when rotation speed tracking is successful, the system pre-exciting is invalid.	0.000–10.000	Model depended	○
P03.09	Speed-loop integral enabling source	0: Remove integral 1: Enable integral 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1	○
P03.10	Speed-loop integral pausing source	0: Pause integral 1: Do not pause integral 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6	0–10	1	○

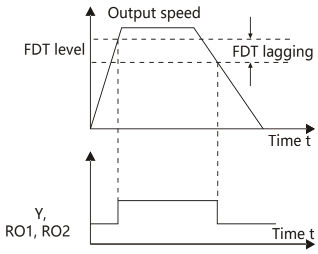
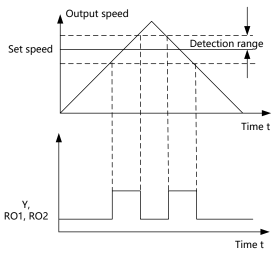
Function code	Name	Description	Setting range	Default	Modify
		9: HDI1 10: HDI2			
P03.11	Speed-loop integral forced enabling source	0: Do not force integral 1: Force integral 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 When the function is enabled, the speed-loop integral is the set forcible value.	0–10	0	○
P03.12	Speed-loop integral forced value source	0: 0 1: Digital (0.0–100.0(0.0%)) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B When the function is enabled, the speed-loop integral is the set forcible value.	0–0	1	○
P03.13	FWD run disabling source	0: Enable 1: Disable 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P03.14	REV run disabling source		0–10	0	◎
P03.15	Given speed inversing source	0: Do not inverse 1: Inverse 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4	0–10	0	○

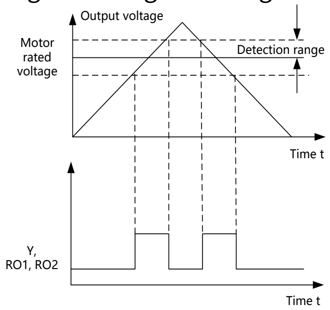
Function code	Name	Description	Setting range	Default	Modify
		7: DI5 8: DI6 9: HDI1 10: HDI2 When the given speed is forward, it will change to reverse; when the given speed is reverse, it will change to forward.			
P03.16	Motor selection bit 0 source	0: 0 1: 1	0–10	0	◎
P03.17	Motor selection bit 1 source	2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 Motor selection: Bit1bit0: 00 Motor 1 Bit1bit0: 01 Motor 2 Bit1bit0: 10 Motor 3 Bit1bit0: 11 Motor 4	0–10	0	◎
P03.18	Enabling switchover from FVC to SVC	0: Disable 1: Enable	0–1	0	○
P03.19	Speed upper limit for switchover from FVC to SVC	P03.20-100.00%	P03.20-100.00	25.00%	○
P03.20	Speed lower limit for switchover from FVC to SVC	0.00–P03.19	0.00–P03.19	15.00	○
P03.21	Enabling SVC rotation speed open-loop	0: Disable (SVC control used in the entire process) 1: Enable (IF at low frequency, SVC at high frequency)	0–1	0	◎
P03.22	Constant-run torque current for SVC rotation speed open-loop	0.00–400.00%	0.00–400.00	50.00%	◎
P03.23	ACC torque for SVC rotation speed open-loop	0.00–400.00%	0.00–400.00	0.00%	◎
P03.24	Magnetic flux filter time for SVC rotation speed open-loop	0.000–1.000s	0.000–1.000	10.010s	◎

Function code	Name	Description	Setting range	Default	Modify
P03.25	Switch-out frequency point for SVC rotation speed open-loop	0.00–100.00%	0.00–100.00	5.00	◎
P03.26	Hysteresis loop range for SVC rotation speed open-loop	0.00–100.00%	0.00–100.00	50.00	◎
P03.27	Wait time for SVC rotation speed open-loop	0.000–10.000s	0.000–10.000	0.500s	◎
P03.28	SVC rotation speed open-loop gain	0–65535	0–65535	0	◎
P03.29	Slip coefficient for SVC rotation speed open-loop	0–65535	0–65535	0	◎
P03.30	Oscillation suppression coefficient for SVC rotation speed open-loop	0–65535	0–65535	0	◎
P03.31–P03.32	Reserved	-	-	-	-
P03.33	VF separation voltage setting source	0: 0 1: Digital (0.0–100.0%(0.0%) of the motor rated voltage) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	◎
P03.34	V/F separation voltage step-up time	Time taken to accelerate from 0V to the motor rated voltage. 0.0–3600.0s	0.0–3600.0	5.0s	○
P03.35	V/F separation voltage step-down time	Time taken to decelerate from the motor rated voltage to 0V. 0.0–3600.0s	0.0–3600.0	5.0s	○
P03.36	V/F separation min. output voltage	0.0%–P03.37 (Motor rated voltage)	0.0–P03.37	0.0%	◎
P03.37	VF separation max output voltage	P03.36–100.0% (of the motor rated voltage)	P03.36-100.0	100.0%	◎
P03.38	Energy-saving run	0: Disable 1: Automatic energy-saving run	0–1	0	◎

Function code	Name	Description	Setting range	Default	Modify
P03.39	AM VF energy-saving mode	0: Max efficiency 1: Optimal power factor 2: Max ratio of torque to current	0–2	0	○
P03.40	AM VF energy-saving optimization coefficient	0.0–400.0%	0.0–400.0	100.0%	○
P03.41–P03.48	Reserved	-	-	-	-
P03.49	Function parameter copy	0: No operation 1: Upload function parameters(P00–P99 and connector parameters) from the local to the keypad 2: Download parameters (including motor parameters) from the keypad to the local address 3: Download parameters (including only non-motor parameters) from the keypad to the local address 4: Download parameters (including only motor parameters) from the keypad to the local address **Note:** After any operation among 1–4 is complete, the parameter restores to 0. The upload and download functions are not applicable to group P99 (factory parameters). Only the LCD keypad (but not LED keypad) has the parameter copying function.	0–4	0	◎
P03.50	Keypad Up/Down setting control	LED ones place: Frequency control enabling selection 0: Both the ∧/∨ key and digital potentiometer (rotary knob on the LED keypad) can be used for the control. 1: Only the ∧/∨ key can be used for the control. 2: Only the digital potentiometer can be used for the control. 3: Both the ∧/∨ key and digital potentiometer can be used for the control. LED tens place: Frequency control selection 0: Valid only for keypad based	0x0000–0x1213	0x0000	○

Function code	Name	Description	Setting range	Default	Modify
		setting 1: Valid for all frequency setting methods LED hundreds place: Action selection for stop 0: Setting is valid. 1: Valid during running, cleared after stop 2: Valid during running, cleared after a stop command is received LED thousands place: Indicates whether to enable the integral function through the ∧/∨ key and digital potentiometer. 0: Enable the integral function (Longer keypad retention time indicates faster frequency change.) 1: Disable the integral function			
P03.51	Keypad LOC/REM function selection	0: No function 1: Jog 2: Switch between states 3: Switch between forward and reverse rotating 4: Clear the UP/DOWN setting 5: Coast to stop 6: Local and remote switching 7: Quick commissioning mode (base on non-factory parameter settings) Function selection for the LOC/REM key (QUICK/JOG on LED keypad)	0–7	6	○
P03.52	Level detection value source of speed compare value	0: 0 1: Digital (-327.67–P09.02, 100.00%) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B When the output speed exceeds the corresponding speed of FDT electrical level, the signal of "Speed level detection FDT" is valid, and the "Actual speed higher	0–10	0	○

Function code	Name	Description	Setting range	Default	Modify
		than comparison value" flag of SW1 is 1. The signal is invalid only when the output speed decreases to a value lower than the speed corresponding to (FDT electrical level—FDT lagging detection value). See the following figure. 			
P03.53	Lagging detection value of speed compare value	-100.0–100.0% (FDT level detection value)	-100.0–100.0	5.0%	○
P03.54	Frequency arrival detection amplitude	When the output speed is within the positive and negative detection range of the set speed, the SW 1 bit 8 "Speed reached" flag is set to 1.  Setting range: 0.00%–P09.02	0.00–P09.02	0.50%	○
P03.55	Overspeed detection value	100.0–150.0% (of the motor rated speed)	100.0–150.0	120.0%	○
P03.56	Overspeed detection time	0: No detection If the running speed is higher than the speed detection value, with the duration of this situation exceeding the detection time, the "Motor overspeed" flag of SW 2 is set to 1.	0.0–60.0	0.5s	○
P03.57	Motor zero-speed detection time	If the motor feedback speed is lower than the stop speed, with the duration of this situation exceeding the delay time specified by this function code, the "Motor zero-speed" flag of SW 2 is set to 1, and if time is 0, motor zero-speed detection is not performed.	0.0–600.0	0.5s	○

Function code	Name	Description	Setting range	Default	Modify
P03.58	Speed deviation setting	If the difference between the ramp reference speed and motor feedback speed is greater than the set speed deviation, when this situation reaches the set delay time, the "Speed deviation too large" flag of SW 2 is set to 1.	0.00–50.00	5.00%	○
P03.59	Speed deviation duration	Speed deviation detection is not performed when the time is 0.	0.0–600.0	0.5s	○
P03.60	Output voltage reaching detection amplitude	When the output voltage is within the positive and negative detection range of the motor rated voltage, the SW 2 bit 4 "Output voltage reaching limit" flag is set.  	0–100	5V	○

Group P04—Unit configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P04.00	Parallel mode	0: Standalone 1: Paralleled	0–1	0	●
P04.01	Unit enabling selection	Binary is used for unit enabling. A max of 10 power units can be configured.	0x000–0x3FF	0x001	◎
P04.02	Unit current balance selection (reserved)	0: Disable 1: Enable	0–1	0	◎
P04.03	Unit current balance threshold (reserved)	Ratio of relative to the unit rated current. If the difference between max unit current and min. unit current is greater than this value, the unit current balance fault is reported. Setting range: 0–30%	0–30	10%	◎
P04.04	Actual effective carrier frequency	Actual value of CPU2 that is obtained after regulation due to the low-speed carrier frequency decrease and temperature caused carrier frequency decrease. It is	0.8–12.0	Model depended	●

Function code	Name	Parameter description	Setting range	Default	Modify
		transferred to CPU1 for display. Low-frequency carrier frequency decrease: 1. For the power less than 75kw, the default carrier frequency is 4k, and the carrier frequency is decreased to 2k for running at low frequency (3–5hz). 2. For the power greater than 75kw, the default carrier frequency is 1.5k, and the carrier frequency is decreased to 1.0k for running at low frequency. Low-frequency carrier frequency decrease is automatically made online, and the ACC segment and DEC segment are switched automatically. Setting range: 0.8–12.0kHz			
P04.05	Carrier frequency setting	Set the function code to set the carrier frequency. The actually effective carrier frequency is the value of P04.04. Setting range: 0.8–12.0kHz	0.8–12.0	Model depended	○
P04.06	Enabling temperature caused carrier frequency reduction	0: Disable 1: Enable If the carrier frequency is relatively high, the motor loss decreases, and the motor temperature rise decreases, but the VFD loss increases, the VFD temperature rise increases, and disturbance increases. Temperature caused carrier frequency regulation indicates that when the VFD detects that the heat sink temperature exceeds the temperature point of carrier frequency reduction specified by P04.09, it automatically decreases the carrier frequency to lower the VFD temperature rise. When the temperature decreases to a specified value, the carrier frequency restores to the setting of P04.05. This function can reduce the VFD overheat alarm reporting chances.	0–1	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P04.07	Carrier frequency upper limit of temperature caused carrier frequency reduction	Max allowable carrier frequency of temperature caused carrier frequency reduction. The min. value is 0.8k. Setting range: 0.8–12.0kHz	0.8–12.0	4.0kHz	◎
P04.08	Carrier frequency lower limit of temperature caused carrier frequency reduction	Min. allowable carrier frequency of temperature caused carrier frequency reduction. Setting range: 0.8–12.0kHz	0.8–12.0	1.0kHz	◎
P04.09	Temperature point of temperature caused carrier frequency reduction	When temperature caused carrier frequency reduction is performed gradually, if the default setting is used, when the detected heat sink temperature reaches 75°C (margin 5°C), the delay is 10min, the carrier frequency decreases by 0.1kHz unit it reaches the min. value 0.8k. When the detection temperature is less than 65 °C, the delay time is 10min and the carrier frequency increases by 0.1 kHz until the set carrier frequency is reached. Setting range: 40.0–85.0°C	40.0–85.0	70.0°C	○
P04.10	Interval of temperature caused carrier frequency reduction	0–30min	0–30	10min	○
P04.11	Unit narrow pulse limit	0–10μs	0–10	3μs	◎
P04.12	Unit overtemperature point	The user-specified overtemperature point cannot exceed the value determined by the model. Setting range: P04.13–105.0°C	P04.13-105.0	1.0°C	○
P04.13	Unit overtemperature pre-alarm point	0.0°C–P04.12	0.0°C–P04.12	70.0°C	○
P04.14	Enabling deadzone compensation	0: Disable 1: Deadzone compensation mode 1 2: Deadzone compensation mode 2	0– 2	1	◎
P04.15	Unit online exit selection (reserved)	Binary is used for enabling online exit for a unit that encounters a major fault. A max of 10 power units can be configured.	0x000–0x3FF	0x000	○

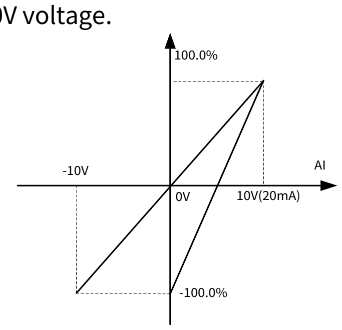
Function code	Name	Parameter description	Setting range	Default	Modify
		Bit0: 0: Disable online exit for unit 1 1: Enable online exit for unit 1 Bit*n*: 0: Disable online exit for unit *n* 1: Enable online exit for unit *n*			
P04.16–P04.17	Reserved	-	-	-	-

Group P05—Input terminal functions

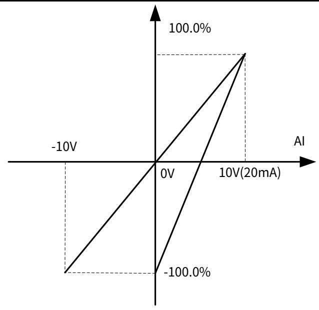
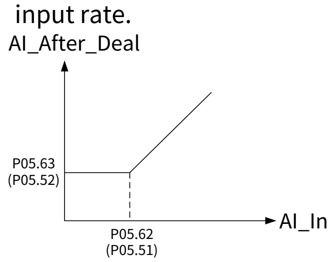
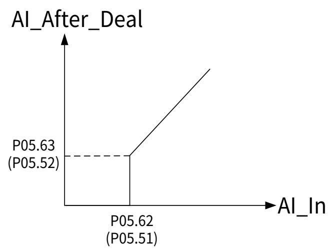
Function code	Name	Parameter description	Setting range	Default	Modify
P05.00	HDI input type	Ones place: HDI1 input type 0: HDI1 is high-speed pulse input 1: HDI1 is digital input Tens place: HDI2 input type 0: HDI2 is high-speed pulse input 1: HDI2 is digital input	0x00–0x11	0x00	◎
P05.01	Input terminal physical state value	When the terminal has no external signal, the hardware considers all high levels by default. When the input terminal physical state is logical 0, it indicates that the terminal input is valid. Bit 0: DI1 Bit1: DI2 Bit 2: DI3 Bit 3: DI4 Bit4: DI5 Bit5: DI6 Bit6: HDI1 Bit7: HDI2 Bit8: DIL	0x00–0x1FF	0x1FF	●
P05.02	Input terminal processed state value	Input terminal post-processing status value = Input terminal physical status value after bit-by-bit reversal -> Input terminal polarity selection -> Input terminal forcible selection -> Input terminal forcible data -> Filter -> Switch-on delay -> Switch-off delay The logical high in software indicates the terminal input is valid. DIL is a special input terminal, when its input is valid, all other input terminals are forced invalid, namely, the states of DI1–	0x00–0x1FF	0x00	●

Function code	Name	Parameter description	Setting range	Default	Modify
		DI6 and HDI1–HDI2 are all 0 after processing.			
P05.03	Input terminal polarity	0x000–0x1FF	0x000–0x1FF	0x000	○
P05.04	Input terminal forced selection	0x000–0x1FF	0x000–0x1FF	0x000	○
P05.05	Input terminal forced data	0x000–0x1FF	0x000–0x1FF	0x000	○
P05.06	DI1 filter time	0.000–1.000s	0.000–1.000	0.010s	○
P05.07	DI1 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.08	DI1 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.09	DI2 filter time	0.000–1.000s	0.000–1.000	0.010s	○
P05.10	DI2 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.11	DI2 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.12	DI3 filter time	0.000–1.000s	0.000–1.000	0.010s	○
P05.13	DI3 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.14	DI3 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.15	DI4 filter time	0.000–1.000s	0.000–1.000	0.010s	○
P05.16	DI4 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.17	DI4 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.18	DI5 filter time	0.000–1.000s	0.000–1.000	0.010s	○
P05.19	DI5 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.20	DI5 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.21	DI6 filter time	0.000–1.000s	0.000–1.000	0.010s	○
P05.22	DI6 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.23	DI6 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.24	HDI1 filter time (digital)	0.000–1.000s	0.000–1.000	0.010s	○
P05.25	HDI1 switch-on delay (digital)	0.00–360.00s	0.00–360.00	0.00s	○
P05.26	HDI1 switch-off delay (digital)	0.00–360.00s	0.00–360.00	0.00s	○
P05.27	HDI2 filter time (digital)	0.000–1.000s	0.000–1.000	0.010s	○
P05.28	HDI2 switch-on delay (digital)	0.00–360.00s	0.00–360.00	0.00s	○
P05.29	HDI2 switch-off delay (digital)	0.00–360.00s	0.00–360.00	0.00s	○

Function code	Name	Parameter description	Setting range	Default	Modify
P05.30	DIL filter time	0.000–1.000s	0.000–1.000	0.010s	○
P05.31	DIL switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.32	DIL switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P05.33	HDI1 input physical value	The HDI1 high speed pulse input physical value, which displays the input frequency value. 0.000–65.535kHz	0.000–65.535	0.000kHz	●
P05.34	HDI1 input ratio	The ratio of high-speed pulse input to HDI1, the percentage of final input processed by the HDI module.	-100.00–100.00	0.00%	●
P05.35	HDI1 lower limit frequency	0.000kHz–P05.37	0.000–P05.32	0.000kHz	○
P05.36	Corresponding setting of HDI1 lower limit frequency	-100.0%–P05.38	-100.0–P05.38	0.0%	○
P05.37	HDI1 upper limit frequency	P05.35 –50.000kHz	P05.35-50.000	50.000kHz	○
P05.38	Corresponding setting of HDI1 upper limit frequency	P05.36-100.0%	P05.36-100.0	100.0%	○
P05.39	HDI1 input filter time	0.000–10.000s	0.000–10.000	0.030s	○
P05.40	HDI2 input physical value	Displays the input frequency value.	0.000–65.535	0.000kHz	●
P05.41	HDI2 input ratio	Percentage of final input processed by the HDI module.	-100.00–100.00	0.00%	●
P05.42	HDI2 lower limit frequency	0.000kHz–P05.44	0.000–P05.44	0.000kHz	○
P05.43	Corresponding setting of HDI2 lower limit frequency	-100.0%–P05.45	-100.0– P05.45	0.0%	○
P05.44	HDI2 upper limit frequency	P05.42 –50.000kHz	P05.42-50.000	50.000kHz	○
P05.45	Corresponding setting of HDI2 upper limit frequency	P05.43–100.0%	P05.43-100.0	100.0%	○
P05.46	HDI2 input filter time	0.000–10.000s	0.000–10.000	0.030s	○
P05.47	Enabling AI1	0: Disable (AI1 input forced to 0) 1: Enable 2: Other-B connector 3: DI1 4: DI2	0–10	1	○

Function code	Name	Parameter description	Setting range	Default	Modify
		5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2			
P05.48	AI1 type	Specifies the type of input signal for AI1 or AI2. After selecting the type, short connect the corresponding jumper on the hardware side of the control box. 0: 0–10V 1: 0–20mA 2: 4–20mA; used only for AI disconnection determination 3: -10V–10V	0–3	0	◎
P05.49	AI1 input physical value	Displays input analog voltage value. When the analog input is current input, 0–20mA current corresponds to 0–10V voltage.	-32.76–32.76	0	●
P05.50	AI1 input ratio	The final output processed by the AI module. If AI is disabled, the value is 0.	-655.3–655.3	0.0%	●
P05.51	AI1 curve min. input value	Setting range of P05.51: -10.00–P05.53	-10.00–P05.53	0.00	○
P05.52	AI1 curve min. input rate	Setting range of P05.52: -600.0%–P05.54	-600.0–P05.54	0.0%	○
P05.53	AI1 curve max input value	Setting range of P05.53: P05.51–10.00	P05.51–10.00	10.00	○
P05.54	AI1 curve max input rate	Setting range of P05.54: P05.52–600.0% The mapping between analog input voltage and analog input current is as follows: When the analog input is current input, 0–20mA current corresponds to 0–10V voltage. 	P05.52-600.0	100.0%	○
P05.55	AI1 input filter time	0.000–10.000s	0.000–10.000	0.000s	○
P05.56	AI1 denoise threshold	Set the denoise threshold. When AI input fluctuation is less than the	0.0–20.0	0.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
		set threshold, the corresponding AI rate does not change and remains at the original value.			
P05.57	AI1 set zero-cross threshold	The AI value is considered to be 0 when the AI input value is less than the set threshold.	-1.0–1.0	0.0%	○
P05.58	Enabling AI2	0: Disable (AI2 input forced to 0) 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1	○
P05.59	AI2 Type	Set the type of input signal for AI1 or AI2. After selecting the type, short connect the corresponding jumper on the hardware side of the control box. 0: 0–10V 1: 0–20mA 2: 4–20mA 3: -10V–+10V	0–3	0	◎
P05.60	AI2 input physical value	-32.76–+32.76	-32.76–+32.76	0.00	●
P05.61	AI2 input ratio	If AI is disabled, the value is 0, value after AI2 processing.	-655.3–+655.3	0.0%	●
P05.62	AI2 curve min. input value	Setting range of P05.62: -10.00–P05.64 Setting range of P05.63: -600.0%–P05.65 Setting range of P05.64: P05.62–10.00 Setting range of P05.65: P05.63–600.0% The mapping between analog input voltage and analog input current is as follows: When the analog input is current input, 0–20mA current corresponds to 0–10V voltage.	-10.00– P05.64	0.00	○
P05.63	AI2 curve min. input rate		-600.0–P05.65	0.0%	○
P05.64	AI2 curve max input value		P05.62-10.00	10.00	○
P05.65	AI2 curve max input rate		P05.63-600.0	100.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
					
P05.66	AI2 input filter time	0.000–10.000s	0.000–10.000	0.000s	○
P05.67	AI2 denoise threshold	0.0–20.0%	0.0–20.0	0.0%	○
P05.68	AI2 set zero-cross threshold	The AI value is considered to be 0 when the AI input value is less than the set threshold.	-1.0–1.0	0.0%	○
P05.69	Selection at AI below min. input	Ones place: Selection when AI1 is below min. input 0: Min. input rate 1: 0.0% Tens place: Selection when AI2 is below min. input 0: Min. input rate 1: 0.0% **Note:** ● 0: When the AI input is lower than the AI curve min. input value, the AI1 input rate is displayed as the AI curve min. input rate.  ● 1: When the AI input is lower than the AI curve min. input value, the AI1 input rate is displayed as 0. 	0x00–0x11	0x00	○
P05.70	Enabling AI disconnection monitoring	Set whether to enable disconnection monitoring. This function is only available for signal	0x00–0x11	0x00	○

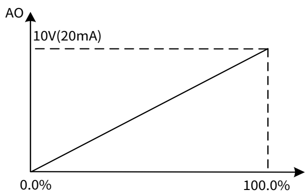
Function code	Name	Parameter description	Setting range	Default	Modify
		of 4–20mA. Ones place: Enable/disable AI1 disconnection monitoring 0: Disable 1: Enable Tens place: Enable/disable AI2 disconnection monitoring 0: Disable 1: Enable			
P05.71	AI1 disconnection monitoring threshold	0.00–4.00mA	0.00–4.00	2.00mA	○
P05.72	AI2 disconnection monitoring threshold	0.00–4.00mA	0.00–4.00	2.00mA	○
P05.73	AI1 disconnection monitoring delay	0.00–10.00s	0.00–10.00	1.00s	○
P05.74	AI2 disconnection monitoring delay	0.00–10.00s	0.00–10.00	1.00s	○
P05.75	AI disconnection monitoring flag	Ones place: AI1 disconnection monitoring flag 0: Reset 1: Set, AI1 disconnection Tens place: AI2 disconnection monitoring flag 0: Reset 1: Set, AI2 disconnection	0x00–0x11	0x00	●

Group P06—Output terminal functions

Function code	Name	Parameter description	Setting range	Default	Modify
P06.00	HDO output type	Ones place: HDO1 output type selection 0: Open collector high-speed pulse output 1: Open collector output Tens place: HDO2 output type selection 0: Open collector high-speed pulse output 1: Open collector output	0x00–0x11	0x00	◎
P06.01	Output terminal signal source state	Bit 0: RO1 Bit1: RO2 Bit 2: RO3 Bit3–bit4: Reserved Bit5: HDO1 Bit6: HDO2	0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
P06.02	Output terminal processed state value	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P06.03	Output terminal polarity selection	HDO2, HDO1, DO2, DO1, RO3, RO2, RO1 in sequence Bit 0: RO1 Bit1: RO2 Bit 2: RO3 Bit3: DO1 (reserved) Bit4: DO2 (reserved) Bit5: HDO1 Bit6: HDO2	0x00–0x7F	0x00	○
P06.04	RO1 signal source	0: Low level 1: High level 2: Other-B connector 3: Ready for brake closing 4: Running 5: Running forward 6: Running reversely 7: VFD in fault 8: Speed reached 9: Running in zero speed 10: Speed upper limit reached 11: Speed lower limit reached 12: Frequency level detection FDT 13: VFD alarm 14: Run time reached 15: Brake control (1: Brake release command sent already) 16: STO action	0–16	0	○
P06.05	RO2 signal source		0–16	0	○
P06.06	RO3 signal source		0–16	0	○
P06.07–P06.08	Reserved		0–16	0	○
P06.09	HDO1-as-DO signal source		0–16	0	○
P06.10	HDO2-as-DO signal source		0–16	0	○
P06.11	RO1 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P06.12	RO1 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P06.13	RO2 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P06.14	RO2 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P06.15	RO3 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P06.16	RO3 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P06.17–P06.20	Reserved	-	-	-	-
P06.21	HDO1-as-DO switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P06.22	HDO1-as-DO switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○

Function code	Name	Parameter description	Setting range	Default	Modify
P06.23	HDO2-as-DO switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P06.24	HDO2-as-DO switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P06.25	AO1 type	The setting of this function code needs to correspond to the shorting cap connection on the control board. 0: 0–10V 1: 0–20mA 2: 4–20mA	0–2	0	◎
P06.26	AO2 type		0–2	0	◎
P06.27	AO1 output value	Displays AO1 analog voltage value. When the analog output is current output, 0.5V voltage corresponds to 1mA current. The AO1 output value is the value of the AO1 output rate after the curve transition.	0.000–65.535	0.000	●
P06.28	AO1 signal source output rate	Displays the AO1 output percentage, corresponding to "AO1 signal source". The percentage displayed is only relevant to "AO1 signal source".	-999.9–+999.9	0.0%	●
P06.29	AO1 output value	Displays AO2 analog voltage value. When the analog output is current output, 0.5V voltage corresponds to 1mA current. The AO2 output value is the value of the AO2 output rate after the curve transition.	0.000–65.535	0.000	●
P06.30	AO2 signal source output rate	Displays the AO2 output percentage, corresponding to "AO2 signal source". The percentage displayed is only relevant to "AO2 signal source".	-999.9–+999.9	0.0%	●
P06.31	HDO1-as-high-speed-pulse output value	Displays HDO1 output value, unit kHz. The HDO1 output value is the value of the HDO1 output rate after the curve transition.	0.000–65.535	0.000kHz	●
P06.32	HDO1-as-high-speed-pulse output rate	Displays the percentage of the HDO1 output, corresponding to the "HDO1 signal source" (100% corresponds to 50kHz). The percentage displayed is only relevant to "HDO1 signal source".	0.00–655.35	0.00%	●
P06.33	HDO2-as-high-speed-pulse output value	Displays HDO2 output value, unit kHz. The HDO2 output value is the value of the HDO2 output rate after the curve transition.	0.000–65.535	0.000kHz	●

Function code	Name	Parameter description	Setting range	Default	Modify
P06.34	HDO2-as-high-speed-pulse output rate	Displays the percentage of the HDO2 output, corresponding to the "HDO2 signal source" (100% corresponds to 50kHz). The percentage displayed is only relevant to "HDO2 signal source".	0.00–655.35	0.00%	●
P06.35	AO1 signal source	0: Invalid 1: Digital (4096 indicates 100%, for example, 2048 indicates 50%) 2: Other-C connector (4096 indicates 100%, for example, 2048 indicates 50%) 3: Running frequency (motor rated frequency indicates 100%) 4: Set frequency (motor rated frequency indicates 100%) 5: DC bus voltage (unit rated voltage * 1.414 indicates 100%) 6: Output current effective value (motor rated current indicates 100%) 7: Output voltage (unit rated voltage indicates 100%) 8: Output power (motor rated power indicates 100%) 9: Output torque (motor rated torque indicates 100%) 10: Reserved	0–10	0	○
P06.36	AO2 signal source		0–10	0	○
P06.37	HDO1-as-HighSpeedPulseOutput signal source		0–10	0	○
P06.38	HDO2-as-HighSpeedPulseOutput signal source		0–10	0	○
P06.39	AO1 curve min. output rate	Setting range of P06.39: -600.0%–P06.41 Setting range of P06.40: 0.000–P06.42 Setting range of P06.41: P06.39–600.0% Setting range of P06.42: P06.40–10.000 When the analog output is current output, 1mA equals 0.5V. The mapping between the output value and the analog output is as follows: 	-600.0–P06.41	0.0%	○
P06.40	AO1 curve min. output value		0.000–P06.42	0.000V	○
P06.41	AO1 curve max output rate		P06.3900.0	100.0%	○
P06.42	AO1 curve max output value		P06.4010.000	10.000V	○
P06.43	AO1 output filter time	0.000–10.000s	0.000–10.000	0.000s	○

Function code	Name	Parameter description	Setting range	Default	Modify
P06.44	AO2 curve min. output rate	-600.0%–P06.46	-600.0–P06.46	0.0%	○
P06.45	AO2 curve min. output value	0.000V–P06.47	0.000–P06.47	0.000V	○
P06.46	AO2 curve max output rate	P06.44–600.0%	P06.44-600.0	100.0%	○
P06.47	AO2 curve max output value	P06.45–10.000V	P06.45-10.000	10.000V	○
P06.48	AO2 output filter time	0.000–10.000s	0.000–10.000	0.000s	○
P06.49	HDO1-as-high-speed-pulse output lower limit	-600.0%–P06.51	-600.0–P06.51	0.0%	○
P06.50	HDO1 output corresponding to lower limit	0.00–50.00kHz	0.00–50.00	0.00kHz	○
P06.51	HDO1-as-high-speed-pulse output upper limit	P06.49-600.0%	P06.49-600.0	100.0%	○
P06.52	HDO1 output corresponding to upper limit	0.00–50.00kHz	0.00–50.00	50.00kHz	○
P06.53	HDO1-as-HighSpeedPulseOutput filter time	0.000–10.000s	0.000–10.000	0.000s	○
P06.54	HDO2-as-HighSpeedPulseOutput lower limit	-600.0%–P06.56	-600.0–P06.56	0.00%	○
P06.55	HDO2 output corresponding to lower limit	0.00kHz–P00.57	0.00–P00.57	0.00kHz	○
P06.56	HDO2-as-HighSpeedPulseOutput upper limit	P06.54–600.0%	P06.54–600.0	100.0%	○
P06.57	HDO2 output corresponding to upper limit	P06.55–50.00kHz	P06.55-50.00	50.00kHz	○
P06.58	HDO2-as-high-speed-pulse output filter time	0.000–10.000s	0.000–10.000	0.000s	○

Group P07—System information

Function code	Name	Parameter description	Setting range	Default	Modify
P07.00	User password	0–65535	0–65535	0	○
P07.01	Product category	0: Inverter	0–5	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
		1: Basic rectifier 2: Regenerative rectifier 3: Active rectifier 4: 3PH braking 5: DC/DC			
P07.02	Reserved	-	-	-	●
P07.03	Controller ARM software version	Software version	0.00–655.35	0.00	●
P07.04	Controller DSP software version (CPU1)	Software version	0.00–655.35	0.00	●
P07.05	Controller DSP software version (CPU2)	Software version	0.00–655.35	0.00	●
P07.06	Controller FPGA software version	Software version	0.00–655.35	0.00	●
P07.07	Function code version	Function code version	0.00–655.35	0.00	●
P07.08	Entire machine rated power	Entire machine rated power = Unit rated power * Number of enabled units Setting range: 0.4–6553.5kW	0.4–6553.5	Model depended	●
P07.09	Paralleled units	This function code displays the number of units to be configured for the present power class; whether the units are enabled is specified by function code P04.01. You should install the number of units according to the display of P07.09 and also set P04.01 to enable corresponding units.	1–10	Model depended	●
P07.10	Entire machine rated voltage	10–20000V	10–20000	Model depended	●
P07.11	Entire machine rated current	Entire machine rated current = Unit rated current * Number of enabled units * 0.95 Setting range: 0.0–6000.0A	0.0–6000.0	Model depended	●
P07.12	EC slot 1 type	0: No card 1: DP card 2: PN card 3: CANopen card 4: NET card 5: Incremental PG card with UVW 6: Programmable card 7: Bluetooth card 8: Resolver PG card 9: Incremental PG card 10: WIFI card	0–15	0	●
P07.13	EC slot 1 software version		0–655.35	0.00	●
P07.14	EC slot 2 type		0–15	0	●
P07.15	EC slot 2 software version		0–655.35	0.00	●
P07.16	EC slot 3 type		0–15	0	●
P07.17	EC slot 3 software version		0–655.35	0.00	●
P07.18	EC slot 4 type		0–15	0	●
P07.19	EC slot 4 software		0–655.35	0.00	●

Function code	Name	Parameter description	Setting range	Default	Modify
	version	11: IO card			
P07.20	EC slot 5 type	12: Sin/Cos PG card	0–15	0	●
P07.21	EC slot 5 software version	13: Absolute PG card	0–655.35	0.00	●
		14: Reserved			
P07.22	EC slot 6 type	15: CAN card	0–15	0	●
P07.23	EC slot 6 software version		0–655.35	0.00	●
P07.24	EC slot 7 type		0–15	0	●
P07.25	EC slot 7 software version		0–655.35	0.00	●
P07.26	EC slot 8 type		0–15	0	●
P07.27	EC slot 8 software version		0–655.35	0.00	●
P07.28	EC slot 9 type		0–15	0	●
P07.29	EC slot 9 software version		0–655.35	0.00	●
P07.30	FPGA software version of unit 1	Software version	0.00–655.35	0.00	●
P07.31	FPGA software version of unit 2	Software version	0.00–655.35	0.00	●
P07.32	FPGA software version of unit 3	Software version	0.00–655.35	0.00	●
P07.33	FPGA software version of unit 4	Software version	0.00–655.35	0.00	●
P07.34	FPGA software version of unit 5	Software version	0.00–655.35	0.00	●
P07.35	FPGA software version of unit 6	Software version	0.00–655.35	0.00	●
P07.36	FPGA software version of unit 7	Software version	0.00–655.35	0.00	●
P07.37	FPGA software version of unit 8	Software version	0.00–655.35	0.00	●
P07.38	FPGA software version of unit 9	Software version	0.00–655.35	0.00	●
P07.39	FPGA software version of unit 10	Software version	0.00–655.35	0.00	●
P07.40	Per-unit voltage base value	Motor rated voltage	0–20000	Model depended	●
P07.41	Per-unit current base value	Motor rated current	0.1–6000.0	Model depended	●
P07.42	Per-unit rotation speed base value	Motor rated speed	1–36000	Model depended	●
P07.43	Per-unit frequency base value	Motor rated frequency	0.01–P09.02	50.00Hz	●
P07.44	Per-unit power base value	Motor rated power	4.0–6000.0	Model depended	●
P07.45	No-overload mode	The max current exceeds 6553.5A	0.0–60000.0	Model	●

Function code	Name	Parameter description	Setting range	Default	Modify
	entire machine current	and therefore it is adjusted to no decimals. Setting range: 0.0–60000.0A		depended	
P07.46	No-overload mode entire machine power	Entire machine rated power = Unit rated power * Number of enabled units Setting range: 0.4–6553.5kW	0.4–6553.5	Model depended	●
P07.47	Light-overload mode entire machine current	The max current exceeds 6553.5A and therefore it is adjusted to no decimals. Setting range: 0–65535A	0–65535	Model depended	●
P07.48	Light-overload mode entire machine power	Entire machine rated power = Unit rated power * Number of enabled units Setting range: 0.4–6553.5kW	0.4–6553.5	Model depended	●
P07.49–P07.50	Reserved	-	-	-	-
P07.51	Ethernet Online State	0: Offline 1: Online	0–1	0	●
P07.52	Factory bar code 1	0–65535	0–65535	0	●
P07.53	Factory bar code 2	0–65535	0–65535	0	●
P07.54	Factory bar code 3	0–65535	0–65535	0	●
P07.55	Factory bar code 4	0–65535	0–65535	0	●
P07.56	Factory bar code 5	0–65535	0–65535	0	●
P07.57	Factory bar code 6	0–65535	0–65535	0	●

Group P08—Fault recording

Function code	Name	Parameter description	Setting range	Default	Modify
P08.00	Present fault code		0.00–99.99	0.00	●
P08.01	Last fault code		0.00–99.99	0.00	●
P08.02	2nd-last fault code		0.00–99.99	0.00	●
P08.03	3rd-last fault code		0.00–99.99	0.00	●
P08.04	4th-last fault code		0.00–99.99	0.00	●
P08.05	5th-last fault code	DSP faults: E11.nn–E99.nn Unit faults: E01.nn–E10.nn Fault: nn=0–99 Each group supports 32 faults at most. Unit faults: E0100–E1000: Reserved E0101–E1001: Units 1–10-VCE fault (oUT) (reported for models of above 45kW) E0102–E1002: Reserved E0103–E1003: Reserved E0104–E1004: Units 1–10-Hardware overcurrent (HoC) E0105–E1005: Units 1–10-Current limit protection (LC) E0106–E1006: Units 1–10-Zero drift	0.00–99.99	0.00	●

Function code	Name	Parameter description	Setting range	Default	Modify
		fault (ItE) E0107–E1007: Units 1–10-24V supply fault (E24) E0108–E1008: Units 1–10-15V fault (E15) E0109–E1009: Unit STO fault F0110–E1010: Reserved E0111–E1011: Units 1–10-Downstream communication fault (dn) E0112–E1012: Units 1–10-Upstream communication fault (UP) E0113–E1013: Reserved E0114–E1014: Reserved E0115–E1015: Reserved The following faults are non-FPGA transfer faults, which are determined by the DSP side. E0116–E1016: Unit overvoltage (ov) E0117–E1017: Unit undervoltage (Lv) E0118–E1018: Unit output phase loss (SPO) (determined by CPU2) E0119–E1019: Unit overtemperature (UoH) Group E11: DSP_CPU1 faults E1100: Reserved E1101: Bus overvoltage (ov) E1102: Bus undervoltage (Lv) E1103: Bus overvoltage alarm (A.ov) E1104: Software overcurrent (SoC) E1105: External fault 2 (EF1) E1106: External fault 2 (EF2) E1107: External fault 3 (EF3) E1108: External fault 4 (EF4) E1109: External fault 5 (EF5) E1110: External alarm 1(EA1) E1111: External alarm 2 (EA2) E1112: External alarm 3 (EA3) E1113: External alarm 4 (EA4) E1114: External alarm 5 (EA5) E1115: Motor overtemperature (oH) E1116: Motor overtemperature alarm (A.oH) E1117: Motor stall fault (StALL)			

Function code	Name	Parameter description	Setting range	Default	Modify
		E1118: Reserved E1119: Sto E1120: StL1 E1121: StL2 E1122: Reserved E1123: Brake torque verification timeout (bAo.ot) E1124: Brake feedback disconnection (bAo) E1125: Set frequency below brake closing frequency (bAo.L) E1126: Reserved E1127: Speed deviation fault (dEu) E1128: PG card disconnection fault (EnC) E1129: AI input frequency disconnection fault (F.oFF) E1130: PID feedback disconnection fault (PIdE) E1131: Running time arrival fault (End) E1204: Bus adapter A communication disconnection (E-FbA) E1205: Bus adapter B communication disconnection (E-Fbb) E1206: MODBUS communication fault (E-485) E1207: FPGA heartbeat fault (F.bEAt) E1208: CPU2 heartbeat fault (d.bEAt) E1209: ARM heartbeat fault (A.bEAt) E1210: SD card fault (Sd) E1211: Master/slave-Slave fault (E_SLA) E1212: Master/slave optical-fiber communication fault (E-oF) E1213: CPU2 operating in protected state (CPU-P) E1214: Concurrent online number exception (A.IPn) E.1215: Multiple IP address duplicate (A.IPr) Group E50: DSP_CPU2 faults E5000: Reserved			

Function code	Name	Parameter description	Setting range	Default	Modify
		E5001: Software overcurrent (SoC) E5002: Hardware overcurrent (HoC) E5003: Bus overvoltage (ov) E5004: Bus undervoltage (Lv) E5005: Motor overload (oL1) E5006: VFD overload (oL2) E5007: Reserved E5008: Phase loss on input side (SPI) E5009: Reserved E5010: Motor autotuning fault (tE) E5011: Encoder disconnection fault (EnC1o) E5012: Encoder reversal fault (EnC1d) E5013: Wave sealing fault (E-StoP) E5014: Reserved E5015: Encoder Z pulse loss (EnCLo) E5016: Encoder speed deviation fault (SPdE) E5017: Encoder mal-adjustment fault (dEtUn) E5018: To-ground short-circuit fault (EtH1) E5019: To-ground short-circuit fault (EtH2) E5027: Motor mal-adjustment fault (SSTO) E5028: Unit current imbalance fault (A.AvF) E5101: Unit current imbalance alarm (A.AvF) E5101: Unit current imbalance alarm (A.AvF) E5102: Current limit alarm (A.LC) E5103: Encoder hardware disconnection protection alarm (A.EnoF) E5104: Overload alarm (A.OL)			
P08.06	RT fault code 1	Real time (RT) faults only record fault codes, excluding the parameters at the fault time. The difference between the present fault code and the real-time fault code is as follows: if the inverter is already in a fault state, the present	0.00–99.99	0.00	●
P08.07	RT fault code 2		0.00–99.99	0.00	●
P08.08	RT fault code 3		0.00–99.99	0.00	●
P08.09	RT fault code 4		0.00–99.99	0.00	●
P08.10	RT fault code 5		0.00–99.99	0.00	●
P08.11	RT fault code 6		0.00–99.99	0.00	●

Function code	Name	Parameter description	Setting range	Default	Modify
		fault code will not record other faults, while the real-time fault code will still record.			
P08.12	Present alarm code 1	DSP-CPU2 alarm codes: A50.nn–A99.nn DSP-CPU1 alarm codes: A11.nn–A49.nn Unit alarm codes: A01.nn–A10.nn Alarm: nn=0–99	0.00–99.99	0.00	●
P08.13	Last alarm code 2		0.00–99.99	0.00	●
P08.14	2nd-last alarm code 3		0.00–99.99	0.00	●
P08.15	3rd-last alarm code 4		0.00–99.99	0.00	●
P08.16	4th-last alarm code 5		0.00–99.99	0.00	●
P08.17	5th-last alarm code 6		0.00–99.99	0.00	●
P08.18	Run speed at present fault	-327.68–327.67%	-327.68–327.67	0.00%	●
P08.19	Ramp reference speed at present fault	-327.68–327.67%	-327.68–327.67	0.00%	●
P08.20	Output current at present fault	0–20000V	0–20000	0V	●
P08.21	Output current at present fault	0.0–6000.0A	0.0–6000.0	0.0A	●
P08.22	Bus voltage at present fault	0.0–6000.0V	0.0–6000.0	0.0V	●
P08.23	Max temperature at present fault	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P08.24	Input terminal state at present fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P08.25	Output terminal state at present fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P08.26	Running frequency at last fault	-327.68–327.67%	-327.68–327.67	0.00%	●
P08.27	Ramp reference frequency at last fault	-327.68–327.67%	-327.68–327.67	0.00%	●
P08.28	Output voltage at last fault	0–20000V	0–20000	0V	●
P08.29	Output current at last fault	0.0–6000.0A	0.0–3000.0	0.0A	●
P08.30	Bus voltage at last fault	0.0–6000.0V	0.0–2000.0	0.0V	●
P08.31	Max temperature at last fault	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P08.32	Input terminal state at last fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
P08.33	Output terminal state at last fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P08.34	Running frequency at 2nd-last fault	-327.68–327.67%	-327.68–327.67	0.00%	●
P08.35	Ramp reference frequency at 2nd-last fault	-327.68–327.67%	-327.68–327.67	0.00%	●
P08.36	Output voltage at 2nd-last fault	0–20000V	0–20000	0V	●
P08.37	Output current at 2nd-last fault	0.0–6000.0A	0.0–6000.0	0.0A	●
P08.38	Bus voltage at 2nd-last fault	0.0–6000.0V	0.0–6000.0	0.0V	●
P08.39	Max temperature at 2nd-last fault	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P08.40	Input terminal state at 2nd-last fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P08.41	Output terminal state at 2nd-last fault	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P08.42	Fault code 1 selection	XX.YY	00.00–99.99	00.00	○
P08.43	Fault code 1 change range	0: Change the severity of the fault code selected by the previous function code 1: Change the severity of a fault subcode, which is set by the previous function code, for all units	0–1	0	○
P08.44	Fault code 1 exception severity change	0: No exception handling 1: Only display an alarm 2: Stop according to the stop mode 3: Coast to stop Set it to 2 or 3 for a major fault such as overcurrent or overvoltage. The handling methods in the fault table lists the possible exception severity modification range for each fault and its factory exception class.	0–3	3	○
P08.45	Fault code 2 selection	Same as fault code 1	00.00–99.99	00.00	○
P08.46	Fault code 2 mask bit selection	Same as fault code 1	0–1	0	○
P08.47	Fault code 2 exception severity change	Same as fault code 1	0–3	3	○
P08.48	Fault code 3 selection	Same as fault code 1	00.00–99.99	00.00	○

Function code	Name	Parameter description	Setting range	Default	Modify
P08.49	Fault code 3 mask bit selection	Same as fault code 1	0–1	0	○
P08.50	Fault code 3 exception severity change	Same as fault code 1	0–3	3	○
P08.51	Fault code 4 selection	Same as fault code 1	00.00–99.99	00.00	○
P08.52	Fault code 4 mask bit selection	Same as fault code 1	0–1	0	○
P08.53	Fault code 4 exception severity change	Same as fault code 1	0–3	3	○
P08.54	Fault code 5 selection	Same as fault code 1	00.00–99.99	00.00	○
P08.55	Fault code 5 mask bit selection	Same as fault code 1	0–1	0	○
P08.56	Fault code 5 exception severity change	Same as fault code 1	0–3	3	○
P08.57	Fault code 6 selection	Same as fault code 1	00.00–99.99	00.00	○
P08.58	Fault code 6 mask bit selection	Same as fault code 1	0–1	0	○
P08.59	Fault code 6 exception severity change	Same as fault code 1	0–3	3	○
P08.60	Fault code 7 selection	Same as fault code 1	00.00–99.99	00.00	○
P08.61	Fault code 7 mask bit selection	Same as fault code 1	0–1	0	○
P08.62	Fault code 7 exception severity change	Same as fault code 1	0–3	3	○
P08.63	Fault code 8 selection	Same as fault code 1	00.00–99.99	00.00	○
P08.64	Fault code 8 mask bit selection	Same as fault code 1	0–1	0	○
P08.65	Fault code 8 exception severity change	Same as fault code 1	0–3	3	○
P08.66	Fault code 9 selection	Same as fault code 1	00.00–99.99	00.00	○
P08.67	Fault code 9 mask bit selection	Same as fault code 1	0–1	0	○
P08.68	Fault code 9 exception severity change	Same as fault code 1	0–3	3	○

Function code	Name	Parameter description	Setting range	Default	Modify
P08.69	Fault code 10 selection	Same as fault code 1	00.00–99.99	00.00	○
P08.70	Fault code 10 mask bit selection	Same as fault code 1	0–1	0	○
P08.71	Fault code 10 exception severity change	Same as fault code 1	0–3	3	○
P08.72	Max auto fault reset count	When the value is not 0, the system automatically performs reset upon a fault. If the power-off restart function is enabled after the reset, the VFD remains the previous run state as it was before the fault or standby. Otherwise; the VFD keeps standby. The system will not automatically perform reset if the number of faults reported by the system is greater than the value of this function code. The restart is after speed tracking, and therefore this function can only be simulated in debugging mode.	0–10	0	○
P08.73	Auto fault reset interval	When the number of automatic system fault reset is less than the value of Max auto fault reset count, the system automatically resets the fault that occurred after the automatic fault reset interval has elapsed. The automatic fault reset count is cleared when the system has continuously run more than 1 hour without a fault.	0.1–3600.0	3.0s	○
P08.74	Auto fault reset count display	It displays the number of automatic fault resets that the present system has performed; if the system has no fault within 1 hour, the number is automatically cleared; when the control box is powered on again, the variable is automatically cleared.	0–10	0	●
P08.75	Present fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01	●
P08.76	Present fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00	●
P08.77	Present fault occur second	Records the second when the fault occurred.	Sec 0–59	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P08.78	Last fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01	●
P08.79	Last fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00	●
P08.80	Last fault occur second	Records the second when the fault occurred.	Sec 0–59	0	●
P08.81	2nd-last fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01	●
P08.82	2nd-last fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00	●
P08.83	2nd-last Fault occur second	Records the second when the fault occurred.	Sec 0–59	0	●
P08.84	3rd-last fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01	●
P08.85	3rd-last fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00	●
P08.86	3rd-last fault occur second	Records the second when the fault occurred.	Sec 0–59	0	●
P08.87	4th-last fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01	●
P08.88	4th-last fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00	●
P08.89	4th-last Fault occur second	Records the second when the fault occurred.	Sec 0–59	0	●
P08.90	5th-last fault occur month.day	Records the month and date when the fault occurred.	Mon Day 1.01–12.31	1.01	●
P08.91	5th-last fault occur hour.minute	Records the hour and minute when the fault occurred.	Hour Min 0.00–23.59	0.00	●
P08.92	5th-last fault occur second	Records the second when the fault occurred.	Sec 0–59	0	●
P08.93	Abnormal state exception code	DSP faults: E11.nn–E99.nn Unit faults: E01.nn–E10.nn Fault: nn=0–99 Displays fault code or alarm code or 0. It displays the fault code when there is a fault, it displays the alarm code when there is no fault, and it displays 0 when there is no fault nor alarm. This function code differs from P08.00 in that it will be cleared after the fault is reset and P08.00 will not be cleared.	0.00–99.99	0.00	●
P08.94–P08.96	Reserved	-	-	-	-

Group P09—Limit value configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P09.00	Run speed upper limit display	Displays the FWD run speed upper limit specified by P09.04 or the REV run speed upper limit specified by P09.05, depending on whether it is FWD or REV run.	P09.01–P09.02	100.00%	●
P09.01	Run speed lower limit display	Displays the run speed lower limit specified by P09.03.	0.00–P09.02	0.00%	●
P09.02	Max output rotation speed	Basis for a slow or fast ACC/DEC. This percentage is relative to the reference speed specified by P00.55.	P09.00-300.00	100.00%	◎
P09.03	Run speed lower limit source	0: 0 1: Digital (0–P09.00) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1	◎
P09.04	FWD run speed upper limit source	0: 0 1: Digital (0.00–P09.02, 100.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1	○
P09.05	REV run speed upper limit source		0–10	1	○
P09.06	Electromotive torque upper limit giving source (restricting speed loop output)	0: 0 1: Digital (0.00–300.00%, 180.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1	○
P09.07	Power-generated torque lower limit	0: 0 1: Digital (-300.00–0.00, -180.00%)	0–10	1	○

Function code	Name	Parameter description	Setting range	Default	Modify
	giving source (restricting speed loop output)	2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P09.08–P09.09	-	-	-	-	-
P09.10	Electromotive power limit setting	0: 0 1: Digital (0.00–300.00%, 200.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1	○
P09.11	Generated power limit setting		0–10	1	○
P09.12–P09.13	-	-	-	-	-
P09.14	Torque control frequency upper limit coefficient	This function code adjusts the upper frequency limits for P09.04 and P09.05 so that CPU2 can use them.	0.00–3.00	1.10	○
P09.15	Jump rotation speed 1	0.00%–P09.02	0.00–P09.02	0.00%	○
P09.16	Jump rotation speed amplitude 1	0.00%–P09.02	0.00–P09.02	0.00%	○
P09.17	Jump rotation speed 2	0.00%–P09.02	0.00–P09.02	0.00%	○
P09.18	Jump rotation speed amplitude 2	0.00%–P09.02	0.00–P09.02	0.00%	○
P09.19	Jump rotation speed 3	0.00%–P09.02	0.00–P09.02	0.00%	○
P09.20	Jump rotation speed amplitude 3	0.00%–P09.02	0.00–P09.02	0.00%	○
P09.21	Jump rotation speed 4	0.00%–P09.02	0.00–P09.02	0.00%	○
P09.22	Jump rotation speed amplitude 4	0.00%–P09.02	0.00–P09.02	0.00%	○
P09.23–P09.24	Reserved	-	-	-	-
P09.25	Running speed	The larger one between the	0.00–100.00	0.00%	◎

Function code	Name	Parameter description	Setting range	Default	Modify
	lower limit setting	running speed lower limit specified by P09.01 and the lower limit specified by this function code is used as the final speed lower limit.			
P09.26	FWD run speed upper limit display	Determined by P09.04 source selection	0.00–327.67	100.00%	●
P09.27	REV run speed upper limit display	Determined by P09.05 (REV run speed upper limit source).	0.00–327.67	100.00%	●
P09.28	FWD run limit speed setting	0.00–327.67%	0.00–327.67	100.00%	◎
P09.29	REV run limit speed setting	0.00–327.67%	0.00–327.67	100.00%	◎
P09.30	Electromotive torque upper limit display	-300.00–300.00%	-300.00–300.00	0.00%	●
P09.31	Generated torque upper limit display	-300.00–300.00%	-300.00–300.00	0.00%	●
P09.32	Electromotive power upper limit display	0.00–327.67%	0.00–327.67	0.00%	●
P09.33	Generated power upper limit display	0.00–327.67%	0.00–327.67	0.00%	●
P09.34–P09.35	Reserved	-	-	-	-

Group P10—Motor 1 control parameters

Function code	Name	Parameter description	Setting range	Default	Modify
P10.00	Speed control mode	0: SVC mode 0 1: SVC mode 1 2: V/F control 3: Closed-loop vector control mode	0–3	2	◎
P10.01	Enabling torque control	The function code is invalid in V/F control; torque control can be used only in vector control. 0: Disable 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5	0–10	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		8: DI6 9: HDI1 10: HDI2			
P10.02	Speed-loop proportional gain 1	0.0–200.0	0.0–200.0	20.0	○
P10.03	Speed-loop integral time 1	0.000–10.000s	0.000–10.000	0.200s	○
P10.04	Switching low point speed	0.00%–P10.07	0.00–P10.07	5.00%	○
P10.05	Speed-loop proportional gain 2	0.0–200.0	0.0–200.0	20.0	○
P10.06	Speed-loop integral time 2	0.000–10.000s	0.000–10.000	0.200s	○
P10.07	Switching high-point speed	P10.04–P09.02 (Running speed upper limit)	P10.04–P09.02	10.00%	○
P10.08	Speed-loop output filter	0–8 (corresponding to 0–2^8/10ms)	0–8	0	○
P10.09	Electromotive slip compensation coefficient	50–200%	50–200	100%	○
P10.10	Generated slip compensation coefficient	50–200%	50–200	100%	○
P10.11	Reserved	-	-	-	-
P10.12	Current loop bandwidth	The default limit is 1/10 of the carrier frequency setting; for example, for carrier frequency 2kHz, the current loop bandwidth can only be set up to 200Hz; the current loop bandwidth, in Hz, is 200Hz by default. Adjusting the bandwidth changes the PI parameters of the current loop.	0–2000	400Hz	○
P10.13	Weakening coefficient in constant power zone	0.0–200.0%	0.0–200.0	100.0%	○
P10.14	Lowest weakening point in constant power zone	10–100%	10–100	20%	○
P10.15	Max voltage limit	85.0–120.0%	85.0–120.0	97.0%	○
P10.16	Flux-weakening proportional gain	0–8000	0–8000	1000	○
P10.17	Weakening flux integral coefficient	0.0–500.0%	0.0–500.0	100.0%	○
P10.18	Speed-loop differential gain	0.00–10.00s	0.00–10.00	0.00s	○

Function code	Name	Parameter description	Setting range	Default	Modify
P10.19	Vector control loop optimization	Bit 0: Enable voltage feedforward compensation (valid in FVC) Bit 1: Enable axis-d voltage cross decoupling (valid in FVC) Bit 2: Enable axis-q voltage cross decoupling (valid in FVC) Bit 3: Enable FVC interference feedforward compensation Bit4: 0: Uq limit 120% 1: Uq limit is determined by Ud Bit 5–Bit 15: Reserved	0x00–0x1F	0x17	○
P10.20	SVC optimization mode	Bit 0: Enable old SVC0 Bit 1–Bit 3: Reserved Bit 4: Enable SVC1 angle compensation Bit 5–Bit 15: Reserved **Note:** (1) Valid only when P10.00=0; (2) Valid for both AMs and SMs.	0x00–0x1F	0x10	◎
P10.21	Closed-loop speed observation band width	1.0–200.0	1.0–200.0	30.0	◎
P10.22	Speed overshoot suppression gain	0–400	0–400	0	◎
P10.23	High-frequency current-loop proportional coefficient	0–20000	0–20000	1000	○
P10.24	Integral coefficient of high-frequency current loop	0–20000	0–20000	1000	○
P10.25	Current-loop high-frequency switching threshold	0.0–100.0%	0.0–100.0	100.0%	○
P10.26–P10.29	Reserved	-	-	-	-
P10.30	SM injected-current decrease ratio	0.0–100.0% (of the motor rated current)	0.0–100.0	80.0%	○
P10.31	SM magnetic pole detection mode	0: Invalid 1: High frequency superimposition (reserved) 2: Pulse superposition SM initial magnetic pole detection mode. For a static SM: Magnetic pole	0–2	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		identification -> Pre-excitation -> Start mode (pre-excitation is optional for magnetic pole identification). For an SM with the rotation speed tracked: Direct speed tracking is activated when rotating; when the SM is in static state, follow the preceding rule.			
P10.32	SM SVC injection current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	30.0%	○
P10.33	SM SVC injection current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P10.34	SM SVC pull-in current switching point	SM SVC pull-in current switching point 0.0–200.0%	0.0–200.0	20.0%	○
P10.35	SM high-frequency superposition frequency	200–1000Hz	200–1000	500Hz	◎
P10.36	SM high-frequency superposition voltage	0.0–300.0% (of the motor rated voltage)	0.0–300.0	100.0%	◎
P10.37	SM autotuning frequency selection	Indicates whether to use high or low frequency for SM autotuning. 0: Low frequency 200Hz 1: High frequency 500Hz	0–1	0	○
P10.38	SM control parameter 0	0.0–400.0	0.0–400.0	0.0	○
P10.39	SM control parameter 1	Bit 0: Enable counter-emf self-adaptation (only applicable to PM-SVC1) Bit 1: Enable SM weakening flux optimization (working with P03.22 to adjust the compensation) Bit 2: Enable current loop parameter optimization Bit3: Disable current loop bandwidth limit Bit 4: Enable MTPA Bit 5: Reserved Bit 6: Enable SVC0 stator resistance self-adaption Bit 7: Enable SM initial position identifying optimization Bit 8–Bit 15: Reserved	0x0000–0xFFFF	0x0000	◎
P10.40	SM max flux weakening current	0.0–200.0%	0.0–200.0	100.0%	◎
P10.41	SM mal-adjustment detection time	0.0–10.0s	0.0–10.0	0.5s	○

Function code	Name	Parameter description	Setting range	Default	Modify
P10.42	SM high-frequency compensation coefficient	0.0–100.0%	0.0–100.0	0.0%	○
P10.43	SM high-frequency injection current	0.0–300.0% (of the VFD rated current)	0.0–300.0	20.0%	◎
P10.44	SM SVC observer speed feedback bandwidth	10.0–200.0rad/s SM SVC observer speed feedback bandwidth	10.0–200.0	62.5rad/s	◎
P10.45	SM counter-emf self-adapt bandwidth	1.00–100.00Hz SM counter-emf self-adapt bandwidth	1.00–100.00	1.00Hz	◎
P10.46	SM FVC injection current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	20.0%	○
P10.47	SM FVC injection current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P10.48	SM FVC pull-in current switching point	0.0–200.0% (of the motor rated current)	0.0–200.0	20.0%	○
P10.49	SM V/F pull-in current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	30.0%	○
P10.50	SM V/F pull-in current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P10.51	SM V/F pull-in current frequency switching point	0.0–200.0%	0.0–200.0	20.0%	○
P10.52	Reserved	-	-	-	-
P10.53	V/F curve setting	0: Straight-line V/F curve 1: Multi-point V/F curve 2: Torque-down V/F curve (power of 1.3) 3: Torque-down V/F curve (power of 1.7) 4: Torque-down V/F curve (power of 2.0) 5: Customized V/F curve (V/F separation)	0–5	0	◎
P10.54	Reserved	-	-	-	-
P10.55	Manual torque boost voltage	0.0–10.0% (of motor 1 rated voltage)	0.0–10.0	0.1%	○
P10.56	Manual torque boost cutoff frequency	0.00–40.00	0.00–40.00	40.00%	○
P10.57	V/F frequency point 1	0.00%–P10.59	0.00–P10.59	25.00%	○
P10.58	V/F voltage point 1	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	25.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P10.59	V/F frequency point 2	P10.57–P10.61	P10.57–P10.61	50.00%	○
P10.60	V/F voltage point 2	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	50.0%	○
P10.61	V/F frequency point 3	P10.59–P09.02	P10.59–P09.02	75.00%	○
P10.62	V/F voltage point 3	Rated voltage of motor 1	0.0–110.0	75.0%	○
P10.63	V/F slip compensation gain	0.0–200.0%	0.0–200.0	100.0%	○
P10.64	Low frequency suppression oscillation factor	0–100	0–100	10	○
P10.65	High frequency suppression oscillation factor	0–100	0–100	10	○
P10.66	Vibration control threshold	0.00%–P09.02	0.00–P09.02	60.00%	○
P10.67	V/F constant power zone weakening coefficient	0.0–200.0%	0.0–200.0	100.0%	○
P10.68	Oscillation suppression mode	0: Oscillation suppression mode 1 1: Oscillation suppression mode 2	0–1	1	○
P10.69	VF reactive closed-loop proportional coefficient	0–3000	0–3000	50	○
P10.70	VF reactive closed-loop integral time	0–3000	0–3000	30	○
P10.71	IF mode enabling	0: Invalid 1: Single-loop IF 2: Double-loop IF	0–2	0	◎
P10.72	IMVF current setting	0.0–200.0% (of the motor rated current)	0.0–200.0	100.0%	○
P10.73	IF proportional coefficient	0–5000	0–5000	350	○
P10.74	IF integral coefficient	0–5000	0–5000	150	○
P10.75	IMVF switching-out speed point	0.00–40.00%	0.00–40.00	20.00%	○
P10.76–P10.78	Reserved	-	-	-	-
P10.79	Auto current limit level setting	50–200% (switched by motor)	50–200	140%	○
P10.80	Droop enabling source	0: 0 1: Enable	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2			
P10.81	Droop control speed upper limit source	0: 0 1: Digital 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P10.82	Droop control mode	0: Droop control mode 1 1: Droop control mode 2	0–1	0	◎
P10.83	Droop control fall frequency display	-10.00–10.00Hz	-10.00–10.00	0.00Hz	●
P10.84	Torque upper limit coefficient selection	0: 0 1: Digital (0–100%, 100%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1	◎
P10.85	Torque lower limit coefficient selection		0–10	1	◎
P10.86	Electromotive power limit coefficient	0–100%	0–100	100%	○
P10.87	Generated power limit coefficient	0–100%	0–100	100%	○
P10.88	Brake closing speed threshold setting	Specifies the brake closing speed threshold. The value must be greater than the starting frequency specified by P01.01; otherwise, the set brake closing delay is invalid.	0.00–P09.02	0.00%	◎
P10.89	Brake closing torque memory value	Displays the torque (in percentage) when the last brake closing command was sent, which can be	0.00–300.00	0.00%	●

Function code	Name	Parameter description	Setting range	Default	Modify
		used as a given value for the brake release torque.			
P10.90	Brake release speed threshold setting	Specifies the brake release speed threshold. Note that the VFD does not start if the brake release threshold is below the starting frequency.	0.00–P09.02	0.00%	◎
P10.91	Brake release torque threshold source	0: 0 1: Digital (0.00–300.00(30.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B This function code sets the source of torque during brake release. Check whether the brake release torque is reached by comparing the motor actual torque with the torque value set by this function code. **Note:** In open-loop control, the torque verification is determined by comparing the output current with the value set by the function code; in closed-loop control, the torque verification is determined by comparing the output torque filtered value with the value set by the function code. 2: Other-C connector (optional but not limited to P31.10 brake closing torque memory value; current for open loop, while torque for closed loop)	0–10	1	◎
P10.92	Torque limit source before brake release	0: 0 1: Digital (0.00–300.00, 30.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running	0–10	1	○

Function code	Name	Parameter description	Setting range	Default	Modify
		8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B When the holding brake function is enabled, this torque limit starts from the VFD startup until the delay after the brake release ends.			
P10.93–P10.94	Reserved	-	-	-	-

Group P11—Motor 2 control parameters

Function code	Name	Parameter description	Setting range	Default	Modify
P11.00	Speed control mode	0: SVC mode 0 1: SVC mode 1 2: V/F control 3: Closed-loop vector control mode	0–3	2	◎
P11.01	Enabling torque control	The function code is invalid in V/F control, and torque control can be used only in vector control. 0: Disable 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P11.02	Speed-loop proportional gain 1	0.0–200.0	0.0–200.0	20.0	○
P11.03	Speed-loop integral time 1	0.000–10.000s	0.000–10.000	0.200s	○
P11.04	Switching low point speed	0.00%–P10.07	0.00–P10.07	5.00%	○
P11.05	Speed-loop proportional gain 2	0.0–200.0	0.0–200.0	20.0	○
P11.06	Speed-loop integral time 2	0.000–10.000s	0.000–10.000	0.200s	○
P11.07	Switching high-point speed	P10.04–P09.02 (Running speed upper limit)	P10.04–P09.02	10.00%	○
P11.08	Speed-loop output filter	0–8 (corresponding to 0–2^8/10ms)	0–8	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P11.09	Electromotive slip compensation coefficient	50–200%	50–200	100%	○
P11.10	Generated slip compensation coefficient	50–200%	50–200	100%	○
P11.11	Reserved	-	-	-	-
P11.12	Current loop bandwidth	The default limit is 1/10 of the carrier frequency setting; for example, for carrier frequency 2kHz, the current loop bandwidth can only be set up to 200Hz; the current loop bandwidth, in Hz, is 200Hz by default. Adjusting the bandwidth changes the PI parameters of the current loop.	0–2000	400Hz	○
P11.13	Weakening coefficient in constant power zone	0.0–200.0%	0.0–200.0	100.0%	○
P11.14	Lowest weakening point in constant power zone	10–100%	10–100	20%	○
P11.15	Max voltage limit	85.0–120.0%	85.0–120.0	97.0%	○
P11.16	Flux-weakening proportional gain	0–8000	0–8000	1000	○
P11.17	Weakening flux integral coefficient	0.0–500.0%	0.0–500.0	100.0%	○
P11.18	Speed-loop differential gain	0.00–10.00s	0.00–10.00	0.00s	○
P11.19	Vector control loop optimization	Bit 0: Enable voltage feedforward compensation (valid in FVC) Bit 1: Enable axis-d voltage cross decoupling (valid in FVC) Bit 2: Enable axis-q voltage cross decoupling (valid in FVC) Bit 3: Enable FVC interference feedforward compensation Bit4: 0: Uq limit 120% 1: Uq limit is determined by Ud Bit 5–Bit 15: Reserved	0x00–0x1F	0x17	○
P11.20	SVC optimization mode	Bit 0: Enable old SVC0 Bit 1–Bit 3: Reserved Bit 4: Enable SVC1 angle compensation Bit 5–Bit 15: Reserved **Note:** (1) Valid only when	0x00–0x1F	0x10	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		P10.00=0; (2) Valid for both AMs and SMs.			
P11.21	Closed-loop speed observation band width	1.0–200.0	1.0–200.0	30.0	◎
P11.22	Speed overshoot suppression gain	0–400	0–400	0	◎
P11.23	High-frequency current-loop proportional coefficient	0–20000	0–20000	1000	○
P11.24	Integral coefficient of high-frequency current loop	0–20000	0–20000	1000	○
P11.25	Current-loop high-frequency switching threshold	0.0–100.00% (of the max speed)	0.0–100.0	100.0%	○
P11.26–P11.29	Reserved	-	-	-	-
P11.30	SM injected-current decrease ratio	0.0–100.0% (of the motor rated current)	0.0–100.0	80.0%	○
P11.31	SM magnetic pole detection mode	0: Invalid 1: High frequency superimposition (reserved) 2: Pulse superposition SM initial magnetic pole detection mode. For a static SM: Magnetic pole identification -> Pre-excitation -> Start mode (pre-excitation is optional for magnetic pole identification). For an SM with the rotation speed tracked: Direct speed tracking is activated when rotating; when the SM is in static state, follow the preceding rule.	0–2	0	◎
P11.32	SM SVC injection current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	30.0%	○
P11.33	SM SVC injection current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P11.34	SM SVC pull-in current switching point	SM SVC pull-in current switching point 0.0–200.0%	0.0–200.0	20.0%	○
P11.35	SM high-frequency superposition frequency	200–1000Hz	200–1000	500Hz	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P11.36	SM high-frequency superposition voltage	0.0–300.0% (of the motor rated voltage)	0.0–300.0	100.0%	◎
P11.37	SM autotuning frequency selection	Indicates whether to use high or low frequency for SM autotuning. 0: Low frequency 200Hz 1: High frequency 500Hz	0–1	0	○
P11.38	SM control parameter 0	0.0–400.0	0.0–400.0	0.0	○
P11.39	SM control parameter 1	Bit 0: Enable counter-emf self-adaptation (only applicable to PM-SVC1) Bit 1: Enable SM weakening flux optimization (working with P03.22 to adjust the compensation) Bit 2: Enable current loop parameter optimization Bit3: Disable current loop bandwidth limit Bit 4: Enable MTPA Bit 5: Reserved Bit 6: Enable SVC0 stator resistance self-adaption Bit 7: Enable SM initial position identifying optimization Bit 8–Bit 15: Reserved	0x0000–0xFFFF	0x0000	◎
P11.40	SM max flux weakening current	0.0–200.0%	0.0–200.0	100.0%	◎
P11.41	SM mal-adjustment detection time	0.0–10.0s	0.0–10.0	0.5s	○
P11.42	SM high-frequency compensation coefficient	0.0–100.0%	0.0–100.0	0.0%	○
P11.43	SM high-frequency injection current	0.0–300.0% (of the VFD rated current)	0.0–300.0	20.0%	◎
P11.44	SM SVC observer speed feedback bandwidth	10.0–200.0rad/s SM SVC observer speed feedback bandwidth	10.0–200.0	62.5rad/s	◎
P11.45	SM counter-emf self-adapt bandwidth	1.00–100.00Hz SM counter-emf self-adapt bandwidth	1.00–100.00	1.00Hz	◎
P11.46	SM FVC injection current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	20.0%	○
P11.47	SM FVC injection current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P11.48	SM FVC pull-in current switching point	0.0–200.0% (of the motor rated current)	0.0–200.0	20.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P11.49	SM V/F pull-in current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	30.0%	○
P11.50	SM V/F pull-in current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P11.51	SM V/F pull-in current frequency switching point	0.0–200.0%	0.0–200.0	20.0%	○
P11.52	Reserved	-	-	-	-
P11.53	V/F curve setting	0: Straight-line V/F curve 1: Multi-point V/F curve 2: Torque-down V/F curve (power of 1.3) 3: Torque-down V/F curve (power of 1.7) 4: Torque-down V/F curve (power of 2.0) 5: Customized V/F curve (V/F separation)	0–5	0	◎
P11.54	Reserved	-	-	-	-
P11.55	Manual torque boost voltage	0.0–10.0% (of motor 1 rated voltage)	0.0–10.0	0.1%	○
P11.56	Manual torque boost cutoff frequency	0.00–40.00%	0.00–40.00	40.00%	○
P11.57	V/F frequency point 1	0.00%–P10.59	0.00–P10.59	25.00%	○
P11.58	V/F voltage point 1	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	25.0%	○
P11.59	V/F frequency point 2	P10.57–P10.61	P10.57–P10.61	50.00%	○
P11.60	V/F voltage point 2	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	50.0%	○
P11.61	V/F frequency point 3	P10.59–P09.02	P10.59–P09.02	75.00%	○
P11.62	V/F voltage point 3	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	75.0%	○
P11.63	V/F slip compensation gain	0.0–200.0%	0.0–200.0	100.0%	○
P11.64	Low frequency suppression oscillation factor	0–100	0–100	10	○
P11.65	High frequency suppression oscillation factor	0–100	0–100	10	○

Function code	Name	Parameter description	Setting range	Default	Modify
P11.66	Vibration control threshold	0.00%–P09.02 (Max rotation speed)	0.00–P09.02	60.00%	○
P11.67	V/F constant power zone weakening coefficient	0.0–200.0%	0.0–200.0	100.0%	○
P11.68	Oscillation suppression mode	0: Oscillation suppression mode 1 1: Oscillation suppression mode 2	0–1	1	○
P11.69	VF reactive closed-loop proportional coefficient	0–3000	0–3000	50	○
P11.70	VF reactive closed-loop integral time	0–3000	0–3000	30	○
P11.71	IF mode enabling	0: Invalid 1: Single-loop IF 2: Double-loop IF	0–2	0	◎
P11.72	IMVF current setting	0.0–200.0% (of the motor rated current)	0.0–200.0	100.0%	○
P11.73	IF proportional coefficient	0–5000	0–5000	350	○
P11.74	IF integral coefficient	0–5000	0–5000	150	○
P11.75	IMVF switching-out frequency point	0.00–40.00%	0.00–40.00	20.00%	○
P11.76–P11.78	Reserved	-	-	-	-
P11.79	Auto current limit level setting	50–00% (switched by motor)	50–200	140%	○
P11.80	Droop enabling source	0: 0 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P11.81	Droop control speed upper limit source	0: 0 1: Digital (0.00–100.00, 100.00% corresponds to 10.00Hz) 2: Other-C connector 3: AI1 4: AI2	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P11.82	Droop control mode	0: Droop control mode 1 1: Droop control mode 2	0–1	0	◎
P11.83	Droop control fall frequency display	-10.00–10.00Hz	-10.00–10.00	0.00Hz	●
P11.84	Torque upper limit coefficient selection	0: 0 1: Digital (0–100%, 100%) 2: Other-C connector	0–10	1	◎
P11.85	Torque lower limit coefficient selection	3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1	◎
P11.86	Electromotive power limit coefficient	0–100%	0–100	100%	○
P11.87	Generated power limit coefficient	0–100%	0–100	100%	○
P11.88	Brake closing speed threshold setting	Specifies the brake closing speed threshold. The value must be greater than the starting frequency specified by P01.01; otherwise, the set brake closing delay is invalid.	0.00–P09.02	0.00%	◎
P11.89	Brake closing torque memory value	Displays the torque (in percentage) when the last brake closing command was sent, which can be used as a given value for the brake release torque.	0.00–300.00	0.00%	●
P11.90	Brake release speed threshold setting	Specifies the brake release speed threshold. Note that the VFD does not start if the brake release threshold is below the starting frequency.	0.00–P09.02	0.00%	◎
P11.91	Brake release torque threshold source	0: 0 1: Digital (0.00–300.00%, 30.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2	0–10	1	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B This function code sets the source of torque during brake release. Check whether the brake release torque is reached by comparing the motor actual torque with the torque value set by this function code. **Note:** In open-loop control, the torque verification is determined by comparing the output current with the value set by the function code; in closed-loop control, the torque verification is determined by comparing the output torque filtered value with the value set by the function code. 2: Other-C connector (optional but not limited to P31.10 brake closing torque memory value; current for open loop, while torque for closed loop)			
P11.92	Torque limit source before brake release	0: 0 1: Digital (0.00–300.00, 30.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B When the holding brake function is enabled, this torque limit starts from the VFD startup until the delay after the brake release ends.	0–10	1	○
P11.93–P11.94	Reserved	-	-	-	-

Group P12—Motor 3 control parameters

Function code	Name	Parameter description	Setting range	Default	Modify
P12.00	Speed control mode	0: SVC mode 0 1: SVC mode 1 2: V/F control 3: Closed-loop vector control mode	0–3	2	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P12.01	Enabling torque control	The function code is invalid in V/F control, and torque control can be used only in vector control. 0: Disable 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P12.02	Speed-loop proportional gain 1	0.0–200.0	0.0–200.0	20.0	○
P12.03	Speed-loop integral time 1	0.000–10.000s	0.000–10.000	0.200s	○
P12.04	Switching low point speed	0.00%–P10.07	0.00–P10.07	5.00%	○
P12.05	Speed-loop proportional gain 2	0.0–200.0	0.0–200.0	20.0	○
P12.06	Speed-loop integral time 2	0.000–10.000s	0.000–10.000	0.200s	○
P12.07	Switching high-point speed	P10.04–P09.02 (Running speed upper limit)	P10.04–P09.02	10.00%	○
P12.08	Speed-loop output filter	0–8 (corresponding to 0–2^8/10ms)	0–8	0	○
P12.09	Electromotive slip compensation coefficient	50–200%	50–200	100%	○
P12.10	Generated slip compensation coefficient	50–200%	50–200	100%	○
P12.11	Reserved	-	-	-	-
P12.12	Current loop bandwidth	The default limit is 1/10 of the carrier frequency setting; for example, for carrier frequency 2kHz, the current loop bandwidth can only be set up to 200Hz; the current loop bandwidth, in Hz, is 200Hz by default. Adjusting the bandwidth changes the PI parameters of the current loop.	0–2000	400Hz	○
P12.13	Weakening coefficient in constant power zone	0.0–200.0%	0.0–200.0	100.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P12.14	Lowest weakening point in constant power zone	10–100%	10–100	20%	○
P12.15	Max voltage limit	85.0–120.0%	85.0–120.0	97.0%	○
P12.16	Flux-weakening proportional gain	0–8000	0–8000	1000	○
P12.17	Weakening flux integral coefficient	0.0–500.0%	0.0–500.0	100.0%	○
P12.18	Speed-loop differential gain	0.00–10.00s	0.00–10.00	0.00s	○
P12.19	Vector control loop optimization	Bit 0: Enable voltage feedforward compensation (valid in FVC) Bit 1: Enable axis-d voltage cross decoupling (valid in FVC) Bit 2: Enable axis-q voltage cross decoupling (valid in FVC) Bit 3: Enable FVC interference feedforward compensation Bit4: 0: Uq limit 120% 1: Uq limit is determined by Ud Bit 5–Bit 15: Reserved	0x00–0x1F	0x17	○
P12.20	SVC optimization mode	Bit 0: Enable old SVC0 Bit 1–Bit 3: Reserved Bit 4: Enable SVC1 angle compensation Bit 5–Bit 15: Reserved **Note:** (1) Valid only when P10.00=0; (2) Valid for both AMs and SMs.	0x00–0x1F	0x10	◎
P12.21	Closed-loop speed observation band width	1.0–200.0	1.0–200.0	30.0	◎
P12.22	Speed overshoot suppression gain	0–400	0–400	0	◎
P12.23	High-frequency current-loop proportional coefficient	0–20000	0–20000	1000	○
P12.24	Integral coefficient of high-frequency current loop	0–20000	0–20000	1000	○
P12.25	Current-loop high-frequency switching threshold	0.0–100.00% (of the max speed)	0.0–100.0	100.0%	○
P12.26–P12.29	Reserved	-	-	-	-

Function code	Name	Parameter description	Setting range	Default	Modify
P12.30	SM injected-current decrease ratio	0.0–100.0% (of the motor rated current)	0.0–100.0	80.0%	○
P12.31	SM magnetic pole detection mode	0: Invalid 1: High frequency superimposition (reserved) 2: Pulse superposition SM initial magnetic pole detection mode. For a static SM: Magnetic pole identification -> Pre-excitation -> Start mode (pre-excitation is optional for magnetic pole identification). For an SM with the rotation speed tracked: Direct speed tracking is activated when rotating; when the SM is in static state, follow the preceding rule.	0–2	0	◎
P12.32	SM SVC injection current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	30.0%	○
P12.33	SM SVC injection current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P12.34	SM SVC pull-in current switching point	SM SVC pull-in current switching point 0.0–200.0%	0.0–200.0	20.0%	○
P12.35	SM high-frequency superposition frequency	200–1000Hz	200–1000	500Hz	◎
P12.36	SM high-frequency superposition voltage	0.0–300.0% (of the motor rated voltage)	0.0–300.0	100.0%	◎
P12.37	SM autotuning frequency selection	Indicates whether to use high or low frequency for SM autotuning. 0: Low frequency 200Hz 1: High frequency 500Hz	0–1	0	○
P12.38	SM control parameter 0	0.0–400.0	0.0–400.0	0.0	○
P12.39	SM control parameter 1	Bit 0: Enable counter-emf self-adaptation (only applicable to PM-SVC1) Bit 1: Enable SM weakening flux optimization (working with P03.22 to adjust the compensation) Bit 2: Enable current loop parameter optimization Bit3: Disable current loop bandwidth limit Bit 4: Enable MTPA	0x0000–0xFFFF	0x0000	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		Bit 5: Reserved Bit 6: Enable SVC0 stator resistance self-adaption Bit 7: Enable SM initial position identifying optimization Bit 8–Bit 15: Reserved			
P12.40	SM max flux weakening current	0.0–200.0%	0.0–200.0	100.0%	◎
P12.41	SM mal-adjustment detection time	0.0–10.0s	0.0–10.0	0.5s	○
P12.42	SM high-frequency compensation coefficient	0.0–100.0%	0.0–100.0	0.0%	○
P12.43	SM high-frequency injection current	0.0–300.0% (of the VFD rated current)	0.0–300.0	20.0%	◎
P12.44	SM SVC observer speed feedback bandwidth	10.0–200.0rad/s SM SVC observer speed feedback bandwidth	10.0–200.0	62.5rad/s	◎
P12.45	SM counter-emf self-adapt bandwidth	1.00–100.00Hz SM counter-emf self-adapt bandwidth	1.00–100.00	1.00Hz	◎
P12.46	SM FVC injection current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	20.0%	○
P12.47	SM FVC injection current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P12.48	SM FVC pull-in current switching point	0.0–200.0% (of the motor rated current)	0.0–200.0	20.0%	○
P12.49	SM V/F pull-in current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	30.0%	○
P12.50	SM V/F pull-in current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P12.51	SM V/F pull-in current frequency switching point	0.0–200.0%	0.0–200.0	20.0%	○
P12.52	Reserved	-	-	-	-
P12.53	V/F curve setting	0: Straight-line V/F curve 1: Multi-point V/F curve 2: Torque-down V/F curve (power of 1.3) 3: Torque-down V/F curve (power of 1.7) 4: Torque-down V/F curve (power of 2.0) 5: Customized V/F curve (V/F separation)	0–5	0	◎
P12.54	Reserved	-	-	-	-

Function code	Name	Parameter description	Setting range	Default	Modify
P12.55	Manual torque boost voltage	0.0–10.0% (of motor 1 rated voltage)	0.0–10.0	0.1%	○
P12.56	Manual torque boost cutoff frequency	0.00–40.00	0.00–40.00	40.00%	○
P12.57	V/F frequency point 1	0.00%–P10.59	0.00–P10.59	25.00%	○
P12.58	V/F voltage point 1	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	25.0%	○
P12.59	V/F frequency point 2	P10.57–P10.61	P10.57–P10.61	50.00%	○
P12.60	V/F voltage point 2	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	50.0%	○
P12.61	V/F frequency point 3	P10.59–P09.02	P10.59–P09.02	75.00%	○
P12.62	V/F voltage point 3	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	75.0%	○
P12.63	V/F slip compensation gain	0.0–200.0%	0.0–200.0	100.0%	○
P12.64	Low frequency suppression oscillation factor	0–100	0–100	10	○
P12.65	High frequency suppression oscillation factor	0–100	0–100	10	○
P12.66	Vibration control threshold	0.00%–P09.02 (Max rotation speed)	0.00–P09.02	60.00%	○
P12.67	V/F constant power zone weakening coefficient	0.0–200.0%	0.0–200.0	100.0%	○
P12.68	Oscillation suppression mode	0: Oscillation suppression mode 1 1: Oscillation suppression mode 2	0–1	1	○
P12.69	VF reactive closed-loop proportional coefficient	0–3000	0–3000	50	○
P12.70	VF reactive closed-loop integral time	0–3000	0–3000	30	○
P12.71	IF mode enabling	0: Invalid 1: Single-loop IF 2: Double-loop IF	0–2	0	◎
P12.72	IMVF current setting	0.0–200.0% (of the motor rated current)	0.0–200.0	100.0%	○
P12.73	IF proportional coefficient	0–5000	0–5000	350	○

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P12.74</td><td>IF integral coefficient</td><td>0–5000</td><td>0–5000</td><td>150</td><td>○</td></tr>
<tr><td>P12.75</td><td>IMVF switching-out frequency point</td><td>0.00–40.00%</td><td>0.00–40.00</td><td>20.00%</td><td>○</td></tr>
<tr><td>P12.76–P12.78</td><td>Reserved</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>P12.79</td><td>Auto current limit level setting</td><td>50–00% (switched by motor)</td><td>50–200</td><td>140%</td><td>○</td></tr>
<tr><td>P12.80</td><td>Droop enabling source</td><td>0: 0
1: Enable
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P12.81</td><td>Droop control speed upper limit source</td><td>0: 0
1: Digital (0.00–100.00, 100.00% corresponds to 10.00Hz)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P12.82</td><td>Droop control mode</td><td>0: Droop control mode 1
1: Droop control mode 2</td><td>0–1</td><td>0</td><td>◎</td></tr>
<tr><td>P12.83</td><td>Droop control fall frequency display</td><td>-10.00–10.00Hz</td><td>-10.00–10.00</td><td>0.00Hz</td><td>●</td></tr>
<tr><td>P12.84</td><td>Torque upper limit coefficient selection</td><td rowspan="2">0: 0
1: Digital (0–100%, 100%)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>1</td><td>◎</td></tr>
<tr><td>P12.85</td><td>Torque lower limit coefficient selection</td><td>0–10</td><td>1</td><td>◎</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
P12.86	Electromotive power limit coefficient	0–100%	0–100	100%	○
P12.87	Generated power limit coefficient	0–100%	0–100	100%	○
P12.88	Brake closing speed threshold setting	Specifies the brake closing speed threshold. The value must be greater than the starting frequency specified by P01.01; otherwise, the set brake closing delay is invalid.	0.00–P09.02	0.00%	◎
P12.89	Brake closing torque memory value	Displays the torque (in percentage) when the last brake closing command was sent, which can be used as a given value for the brake release torque.	0.00–300.00	0.00%	●
P12.90	Brake release speed threshold setting	Specifies the brake release speed threshold. Note that the VFD does not start if the brake release threshold is below the starting frequency.	0.00–P09.02	0.00%	◎
P12.91	Brake release torque threshold source	0: 0 1: Digital (0.00–300.00%, 30.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B This function code sets the source of torque during brake release. Check whether the brake release torque is reached by comparing the motor actual torque with the torque value set by this function code. **Note:** In open-loop control, the torque verification is determined by comparing the output current with the value set by the function code; in closed-loop control, the torque verification is determined by comparing the output torque filtered value with the value set by the function code. 2: Other-C connector (optional but	0–10	1	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		not limited to P31.10 brake closing torque memory value; current for open loop, while torque for closed loop)			
P12.92	Torque limit source before brake release	0: 0 1: Digital (0.00–300.00, 30.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B When the holding brake function is enabled, this torque limit starts from the VFD startup until the delay after the brake release ends.	0–10	1	○
P12.93–P12.94	Reserved	-	-	-	-

Group P13—Motor 4 control parameters

Function code	Name	Parameter description	Setting range	Default	Modify
P13.00	Speed control mode	0: SVC mode 0 1: SVC mode 1 2: V/F control 3: Closed-loop vector control mode	0–3	2	◎
P13.01	Enabling torque control	The function code is invalid in V/F control, and torque control can be used only in vector control. 0: Disable 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P13.02	Speed-loop proportional gain 1	0.0–200.0	0.0–200.0	20.0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P13.03	Speed-loop integral time 1	0.000–10.000s	0.000–10.000	0.200s	○
P13.04	Switching low point speed	0.00%–P10.07	0.00–P10.07	5.00%	○
P13.05	Speed-loop proportional gain 2	0.0–200.0	0.0–200.0	20.0	○
P13.06	Speed-loop integral time 2	0.000–10.000s	0.000–10.000	0.200s	○
P13.07	Switching high-point speed	P10.04–P09.02 (Running speed upper limit)	P10.04–P09.02	10.00%	○
P13.08	Speed-loop output filter	0–8 (corresponding to 0–2^8/10ms)	0–8	0	○
P13.09	Electromotive slip compensation coefficient	50–200%	50–200	100%	○
P13.10	Generated slip compensation coefficient	50–200%	50–200	100%	○
P13.11	Reserved	-	-	-	-
P13.12	Current loop bandwidth	The default limit is 1/10 of the carrier frequency setting; for example, for carrier frequency 2kHz, the current loop bandwidth can only be set up to 200Hz; the current loop bandwidth, in Hz, is 200Hz by default. Adjusting the bandwidth changes the PI parameters of the current loop.	0–2000	400Hz	○
P13.13	Weakening coefficient in constant power zone	0.0–200.0%	0.0–200.0	100.0%	○
P13.14	Lowest weakening point in constant power zone	10–100%	10–100	20%	○
P13.15	Max voltage limit	85.0–120.0%	85.0–120.0	97.0%	○
P13.16	Flux-weakening proportional gain	0–8000	0–8000	1000	○
P13.17	Weakening flux integral coefficient	0.0–500.0%	0.0–500.0	100.0%	○
P13.18	Speed-loop differential gain	0.00–10.00s	0.00–10.00	0.00s	○
P13.19	Vector control loop optimization	Bit 0: Enable voltage feedforward compensation (valid in FVC) Bit 1: Enable axis-d voltage cross decoupling (valid in FVC) Bit 2: Enable axis-q voltage cross decoupling (valid in FVC)	0x00–0x1F	0x17	○

Function code	Name	Parameter description	Setting range	Default	Modify
		Bit 3: Enable FVC interference feedforward compensation Bit4: 0: Uq limit 120% 1: Uq limit is determined by Ud Bit 5–Bit 15: Reserved			
P13.20	SVC optimization mode	Bit 0: Enable old SVC0 Bit 1–Bit 3: Reserved Bit 4: Enable SVC1 angle compensation Bit 5–Bit 15: Reserved **Note:** (1) Valid only when P10.00=0; (2) Valid for both AMs and SMs.	0x00–0x1F	0x10	◎
P13.21	Closed-loop speed observation band width	1.0–200.0	1.0–200.0	30.0	◎
P13.22	Speed overshoot suppression gain	0–400	0–400	0	◎
P13.23	High-frequency current-loop proportional coefficient	0–20000	0–20000	1000	○
P13.24	Integral coefficient of high-frequency current loop	0–20000	0–20000	1000	○
P13.25	Current-loop high-frequency switching threshold	0.0–100.00% (of the max speed)	0.0–100.0	100.0%	○
P13.26–P13.29	Reserved	-	-	-	-
P13.30	SM injected-current decrease ratio	0.0–100.0% (of the motor rated current)	0.0–100.0	80.0%	○
P13.31	SM magnetic pole detection mode	0: Invalid 1: High frequency superimposition (reserved) 2: Pulse superposition SM initial magnetic pole detection mode. For a static SM: Magnetic pole identification -> Pre-excitation -> Start mode (pre-excitation is optional for magnetic pole identification) For an SM with the rotation speed tracked: Direct speed tracking is activated when rotating; when the SM is in static state, follow the	0–2	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		preceding rule			
P13.32	SM SVC injection current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	30.0%	○
P13.33	SM SVC injection current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P13.34	SM SVC pull-in current switching point	SM SVC pull-in current switching point 0.0–200.0%	0.0–200.0	20.0%	○
P13.35	SM high-frequency superposition frequency	200–1000Hz	200–1000	500Hz	◎
P13.36	SM high-frequency superposition voltage	0.0–300.0% (of the motor rated voltage)	0.0–300.0	100.0%	◎
P13.37	SM autotuning frequency selection	Indicates whether to use high or low frequency for SM autotuning. 0: Low frequency 200Hz 1: High frequency 500Hz	0–1	0	○
P13.38	SM control parameter 0	0.0–400.0	0.0–400.0	0.0	○
P13.39	SM control parameter 1	Bit 0: Enable counter-emf self-adaptation (only applicable to PM-SVC1) Bit 1: Enable SM weakening flux optimization (working with P03.22 to adjust the compensation) Bit 2: Enable current loop parameter optimization Bit3: Disable current loop bandwidth limit Bit 4: Enable MTPA Bit 5: Reserved Bit 6: Enable SVC0 stator resistance self-adaption Bit 7: Enable SM initial position identifying optimization Bit 8–Bit 15: Reserved	0x0000–0xFFFF	0x0000	◎
P13.40	SM max flux weakening current	0.0–200.0%	0.0–200.0	100.0%	◎
P13.41	SM mal-adjustment detection time	0.0–10.0s	0.0–10.0	0.5s	○
P13.42	SM high-frequency compensation coefficient	0.0–100.0%	0.0–100.0	0.0%	○
P13.43	SM high-frequency injection current	0.0–300.0% (of the VFD rated current)	0.0–300.0	20.0%	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P13.44	SM SVC observer speed feedback bandwidth	10.0–200.0rad/s SM SVC observer speed feedback bandwidth	10.0–200.0	62.5rad/s	◎
P13.45	SM counter-emf self-adapt bandwidth	1.00–100.00Hz SM counter-emf self-adapt bandwidth	1.00–100.00	1.00Hz	◎
P13.46	SM FVC injection current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	20.0%	○
P13.47	SM FVC injection current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P13.48	SM FVC pull-in current switching point	0.0–200.0% (of the motor rated current)	0.0–200.0	20.0%	○
P13.49	SM V/F pull-in current 1	-100.0–100.0% (of the motor rated current)	-100.0–100.0	30.0%	○
P13.50	SM V/F pull-in current 2	-100.0–100.0% (of the motor rated current)	-100.0–100.0	10.0%	○
P13.51	SM V/F pull-in current frequency switching point	0.0–200.0%	0.0–200.0	20.0%	○
P13.52	Reserved	-	-	-	-
P13.53	V/F curve setting	0: Straight-line V/F curve 1: Multi-point V/F curve 2: Torque-down V/F curve (power of 1.3) 3: Torque-down V/F curve (power of 1.7) 4: Torque-down V/F curve (power of 2.0) 5: Customized V/F curve (V/F separation)	0–5	0	◎
P13.54	Reserved	-	-	-	-
P13.55	Manual torque boost voltage	0.0–10.0% (of motor 1 rated voltage)	0.0–10.0	0.1%	○
P13.56	Manual torque boost cutoff frequency	0.00–40.00%	0.00–40.00	40.00%	○
P13.57	V/F frequency point 1	0.00%–P10.59	0.00–P10.59	25.00%	○
P13.58	V/F voltage point 1	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	25.0%	○
P13.59	V/F frequency point 2	P10.57–P10.61	P10.57–P10.61	50.00%	○
P13.60	V/F voltage point 2	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	50.0%	○
P13.61	V/F frequency point 3	P10.59–P09.02	P10.59–P09.02	75.00%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P13.62	V/F voltage point 3	0.0–110.0% (of motor 1 rated voltage)	0.0–110.0	75.0%	○
P13.63	V/F slip compensation gain	0.0–200.0%	0.0–200.0	100.0%	○
P13.64	Low frequency suppression oscillation factor	0–100	0–100	10	○
P13.65	High frequency suppression oscillation factor	0–100	0–100	10	○
P13.66	Vibration control threshold	0.00%–P09.02 (Max rotation speed)	0.00–P09.02	60.00%	○
P13.67	V/F constant power zone weakening coefficient	0.0–200.0%	0.0–200.0	100.0%	○
P13.68	Oscillation suppression mode	0: Oscillation suppression mode 1 1: Oscillation suppression mode 2	0–1	1	○
P13.69	VF reactive closed-loop proportional coefficient	0–3000	0–3000	50	○
P13.70	VF reactive closed-loop integral time	0–3000	0–3000	30	○
P13.71	IF mode enabling	0: Invalid 1: Single-loop IF 2: Double-loop IF	0–2	0	◎
P13.72	IMVF current setting	0.0–200.0% (of the motor rated current)	0.0–200.0	100.0%	○
P13.73	IF proportional coefficient	0–5000	0–5000	350	○
P13.74	IF integral coefficient	0–5000	0–5000	150	○
P13.75	IMVF switching-out frequency point	0.00–40.00%	0.00–40.00	20.00%	○
P13.76–P13.78	Reserved	-	-	-	-
P13.79	Auto current limit level setting	50–00% (switched by motor)	50–200	140%	○
P13.80	Droop enabling source	0: 0 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		9: HDI1 10: HDI2			
P13.81	Droop control speed upper limit source	0: 0 1: Digital (0.00–100.00, 100.00% corresponds to 10.00Hz) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P13.82	Droop control mode	0: Droop control mode 1 1: Droop control mode 2	0–1	0	◎
P13.83	Droop control fall frequency display	-10.00–10.00Hz	-10.00–10.00	0.00Hz	●
P13.84	Torque upper limit coefficient selection	0: 0 1: Digital (0–100%, 100%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	1	◎
P13.85	Torque lower limit coefficient selection		0–10	1	◎
P13.86	Electromotive power limit coefficient	0–100%	0–100	100%	○
P13.87	Generated power limit coefficient	0–100%	0–100	100%	○
P13.88	Brake closing speed threshold setting	Specifies the brake closing speed threshold. The value must be greater than the starting frequency specified by P01.01; otherwise, the set brake closing delay is invalid.	0.00–P09.02	0.00%	◎
P13.89	Brake closing torque memory value	Displays the torque (in percentage) when the last brake closing command was sent, which can be used as a given value for the brake release torque.	0.00–300.00	0.00%	●
P13.90	Brake release speed threshold setting	Specifies the brake release speed threshold. Note that the VFD does not start if the brake release threshold is below the starting frequency.	0.00–P09.02	0.00%	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P13.91	Brake release torque threshold source	0: 0 1: Digital (0.00–300.00%, 30.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B This function code sets the source of torque during brake release. Check whether the brake release torque is reached by comparing the motor actual torque with the torque value set by this function code. **Note:** In open-loop control, the torque verification is determined by comparing the output current with the value set by the function code; in closed-loop control, the torque verification is determined by comparing the output torque filtered value with the value set by the function code. 2: Other-C connector (optional but not limited to P31.10 brake closing torque memory value; current for open loop, while torque for closed loop)	0–10	1	◎
P13.92	Torque limit source before brake release	0: 0 1: Digital (0.00–300.00, 30.00%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B When the holding brake function is enabled, this torque limit starts from the VFD startup until the delay after the brake release ends.	0–10	1	○
P13.93–P13.94	Reserved	-	-	-	-

Group P14—Parameters of motor 1

Function code	Name	Parameter description	Setting range	Default	Modify
P14.00	Type of motor 1	0: Asynchronous motor (AM) 1: Permanent magnet synchronous motor 2: Synchronous reluctance motor (reserved)	0–2	0	◎
P14.01	Rated power of AM 1	0.1–6000.0kW	0.1–6000.0	Model depended	◎
P14.02	Rated frequency of AM 1	0.01–655.35Hz	0.01–655.35	50.00Hz	◎
P14.03	Rated speed of AM 1	1–36000rpm	1–36000	Model depended	◎
P14.04	Rated voltage of AM 1	0–20000V	0–20000	Model depended	◎
P14.05	Rated current of AM 1	0.1–6000.0A	0.1–6000.0	Model depended	◎
P14.06	Stator resistance of AM 1	0.0001–6.5535Ω (by motor power)	0.0001–6.5535	Model depended	○
P14.07	Rotor resistance of AM 1	0.0001–6.5535Ω (by motor power)	0.0001–6.5535	Model depended	○
P14.08	AM 1 stator-rotor leakage inductance	0.01–655.35mH	0.01–655.35	Model depended	○
P14.09	AM 1 stator-rotor mutual inductance	0.01–655.35mH	0.01–655.35	Model depended	○
P14.10	No-load current of AM 1	0.1–6000.0A	0.1–6000.0	Model depended	○
P14.11	Magnetic saturation coefficient 1 of iron core of AM 1	0.0–100.0%	0.0–100.0	83.0%	◎
P14.12	Magnetic saturation coefficient 2 of iron core of AM 1	0.0–100.0%	0.0–100.0	70.0%	◎
P14.13	Magnetic saturation coefficient 3 of iron core of AM 1	0.0–100.0%	0.0–100.0	57.0%	◎
P14.14	Magnetic saturation coefficient 4 of iron core of AM 1	0.0–100.0%	0.0–100.0	40.0%	◎
P14.15	AM 1 power factor	0.70–1.00	0.70–1.00	0.88	◎
P14.16	AM reserved parameter 1	0–65535	0–65535	0	○
P14.17	AM reserved parameter 2	0–65535	0–65535	0	○
P14.18	AM reserved	0–65535	0–65535	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
	parameter 3				
P14.19	AM reserved parameter 4	0–65535	0–65535	0	○
P14.20	Rated power of SM 1	4.0–5000.0kW	4.0–5000.0	Model depended	◎
P14.21	Rated frequency of SM 1	0.01Hz–655.35Hz	0.01–655.35	50.00Hz	◎
P14.22	Number of pole pairs of SM 1	1–50	1–50	2	◎
P14.23	Rated voltage of SM 1	0–20000V	0–20000	Model depended	◎
P14.24	Rated current of SM 1	0.1–1000.0A	0.1–1000.0	Model depended	◎
P14.25	Stator resistance of SM 1	0.0001–6.5535Ω (by power)	0.0001–6.5535	Model depended	○
P14.26	Direct-axis inductance of SM 1	0.001–65.535mH	0.001–65.535	Model depended	○
P14.27	Quadrature-axis inductance of SM 1	0.001–65.535mH	0.001–65.535	Model depended	○
P14.28	SM 1 rated counter-emf	0–20000V	0–20000	Model depended	○
P14.29	Initial pole position of SM 1 (reserved)	0x0000–0xFFFF	0000–0xFFFF	0	●
P14.30	Identification current of SM 1 (reserved)	0–50% (of the motor rated current)	0–50	10%	●
P14.31	System inertia of motor 1	0.000–30.000kg.m^2 After inertial autotuning, the autotuned inertia parameter is saved to this function code.	0.000–30.000	0.000kg.m^2	○
P14.32	Motor phase setting	0: U, V, W 1: U, W, V	0–1	0	◎
P14.33	Speed feedback source	0: Without 1: PG1; encoder module 1, corresponding to group P48.00 2: PG2; encoder module 2, corresponding to group P49.00 In closed-loop control, this function code specifies the PG card that the speed feedback comes from.	0–2	1	◎
P14.34	Rotation speed reference percentage base value	The default value is the motor rated rotation speed. 0–65535rpm	0–65535	Model depended	○
P14.35	Motor temperature AI sensor type	Ones place: AI1 and AO1 connected sensor type	0x0000–0x4444	0x0000	○

Function code	Name	Parameter description	Setting range	Default	Modify
		0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Tens place: AI2 and AO2 connected sensor type 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Hundreds place: IO1_AI1, AO1(Type of sensor connected to AI1 and AO1 on IO expansion card 1) 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Thousands place: IO1_AI2, AO2(Type of sensor connected to AI2 and AO2 on IO expansion card 1) 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 This function code sets the type of motor temperature sensor during analog input.			
P14.36	Enabling motor temperature AI input	Ones place: 0: Disable 1: AI1 and AO1 enabled for motor temperature sampling Tens place: 0: Disable 1: AI2 and AO2 enabled for motor temperature sampling Hundreds place: 0: Disable 1: AI1 and AO1 on IO expansion card 1 enabled for motor temperature sampling Thousands place: 0: Disable 1: AI2 and AO2 on IO expansion	0x0000–0x1111	0x0000	○

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>card 1 enabled for motor temperature sampling
When AI input is selected for motor temperature, the corresponding AO is set to the current mode output (the shorting cap on the control board selects current), and the corresponding AOs of automatically associated settings on the software output different currents. The AD sampling values of AI input address different temperature tables based on sensor types.
For different sensors, AO output current settings are as follows:
<table>
<tr><th>Motor temperature sensor type</th><th>AO output current</th></tr>
<tr><td>PT100</td><td>18mA</td></tr>
<tr><td>KTY84</td><td>5mA</td></tr>
<tr><td>PT100*3</td><td>18mA</td></tr>
</table></td><td></td><td></td><td></td></tr>
<tr><td>P14.37</td><td>Motor OT fault source</td><td>0: 0
1: 1 (Motor overtemperature fault)
2: Other-B connector (0.00–99.99)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
Note: The value 0 indicates software internally determines whether motor overtemperature has occurred according to the detected motor temperature value. There may be multiple motor temperature sources, from which the max value is taken as the final motor temperature.</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P14.38</td><td>Motor overtemperature point</td><td>100.0–200.0°C</td><td>100.0–200.0</td><td>200.0°C</td><td>○</td></tr>
<tr><td>P14.39</td><td>Motor overtemperature pre-alarm point</td><td>100.0–P14.38°C</td><td>100.0–P14.38</td><td>180.0°C</td><td>○</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
P14.40	Motor overload protection selection	0: No protection 1: Common motor (with low-speed compensation) 2: Frequency-variable motor (without low-speed compensation)	0–2	2	◎
P14.41	Motor overload protection current	20.0–120.0%	20.0–120.0	100.0%	○
P14.42	Overload protection coefficient of motor	20.0–150.0% Specifies the motor overload protection coefficient. A small motor overload protection coefficient indicates a great overload multiplication (M). When M=116%, protection is performed after motor overload lasts for 1 hour; when M=150%, protection is performed after motor overload lasts for 12 minutes; when M=200%, protection is performed after motor overload lasts for 60 seconds; and when M⩾400%, protection is performed immediately.	20.0–150.0	100.0%	○
P14.43	Enabling motor stall detection	0: Disable 1: Enable After this function is enabled, motor stall is detected; otherwise, it is not detected. When the motor torque reaches the torque limit, if the feedback speed is below the set threshold specified by P14.44, and the duration exceeds the P14.45 (Motor stall delay) stall fault is triggered.	0–1	0	◎
P14.44	Motor stall speed setting	0.00–100.00%	0.00–100.00	1.00%	◎
P14.45	Motor stall delay	0.000–20.000s	0.000–20.000	1.000s	◎
P14.46	Output LC filter configuration selection	0: Without 1: With	0–1	0	○
P14.47	Output LC filter inductance	0.01–300.00mH	0.01–300.00	10.00 mH	○
P14.48	Output LC filter capacitance	0.1–1000.0μF	0.1–1000.0	5.0μF	○
P14.49	Enabling load observer	0: Disable 1: Enable	0–1	0	◎
P14.50	Load observer proportional gain regulation	0–1000%	0–1000	100%	○

Function code	Name	Parameter description	Setting range	Default	Modify
	coefficient				
P14.51	Load observer integral gain regulation coefficient	0–1000%	0–1000	10%	○
P14.52	Load observer use inertia regulation coefficient	20–1000%	20–1000	100%	◎
P14.53–P14.54	Reserved	-	-	-	-

Group P15—Parameters of motor 2

Function code	Name	Parameter description	Setting range	Default	Modify
P15.00	Type of motor 2	0: Asynchronous motor (AM) 1: Permanent magnet synchronous motor 2: Synchronous reluctance motor	0–2	0	○
P15.01	Rated power of AM 2	0.1–6000.0kW	0.1–6000.0	Model depended	◎
P15.02	Rated frequency of AM 2	0.01–655.35Hz	0.01–655.35	50.00Hz	◎
P15.03	Rated speed of AM 2	1–36000rpm	1–36000	Model depended	◎
P15.04	Rated voltage of AM 2	0–20000V	0–20000	Model depended	◎
P15.05	Rated current of AM 2	0.1–6000.0A	0.1–6000.0	Model depended	◎
P15.06	Stator resistance of AM 2	0.0001–6.5535Ω (by motor power)	0.0001–6.5535	Model depended	○
P15.07	Rotor resistance of AM 2	0.0001–6.5535Ω (by motor power)	0.0001–6.5535	Model depended	○
P15.08	AM 2 stator-rotor leakage inductance	0.01–655.35mH	0.01–655.35	Model depended	○
P15.09	AM 2 stator-rotor mutual inductance	0.01–655.35mH	0.01–655.35	Model depended	○
P15.10	No-load current of AM 2	0.1–6000.0A	0.1–6000.0	Model depended	○
P15.11	Magnetic saturation coefficient 1 of iron core of AM 2	0.0–100.0%	0.0–100.0	83.0%	◎
P15.12	Magnetic saturation coefficient 2 of iron core of AM 2	0.0–100.0%	0.0–100.0	70.0%	◎
P15.13	Magnetic saturation coefficient 3 of iron core of AM 2	0.0–100.0%	0.0–100.0	57.0%	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P15.14	Magnetic saturation coefficient 4 of iron core of AM 2	0.0–100.0%	0.0–100.0	40.0%	◎
P15.15	AM 2 power factor	0.7–1.00	0.7–1.00	0.88	◎
P15.16	AM reserved parameter 1	0–65535	0–65535	0	○
P15.17	AM reserved parameter 2	0–65535	0–65535	0	○
P15.18	AM reserved parameter 3	0–65535	0–65535	0	○
P15.19	AM reserved parameter 4	0–65535	0–65535	0	○
P15.20	Rated power of SM 2	4.0–5000.0kW	4.0–5000.0	Model depended	◎
P15.21	Rated frequency of SM 2	0.01–655.35Hz	0.01–655.35	50.00Hz	◎
P15.22	Number of pole pairs of SM 2	1–50	1–50	2	◎
P15.23	Rated voltage of SM 2	0–20000V	0–20000	Model depended	◎
P15.24	Rated current of SM 2	0.1–1000.0A	0.1–1000.0	Model depended	◎
P15.25	Stator resistance of SM 2	0.0001–6.5535Ω (by power)	0.0001–6.5535	Model depended	○
P15.26	Direct-axis inductance of SM 2	0.001–65.535mH	0.001–65.535	Model depended	○
P15.27	Quadrature-axis inductance of SM 2	0.001–65.535mH	0.001–65.535	Model depended	○
P15.28	Counter-emf constant of SM 2	0–20000V	0–20000	Model depended	○
P15.29	Initial pole position of SM 2 (reserved)	0x0000–0xFFFF	0x0000–FFFF	0x0000	●
P15.30	Identification current of SM 2 (reserved)	0–50% (of the motor rated current)	0–50	10%	●
P15.31	Motor system inertia	0.000–30.000kg.m^2 After inertial autotuning, the autotuned inertia parameter is saved to this function code.	0.000–30.000	0.000kg.m^2	○
P15.32	Motor phase setting	0: U, V, W 1: U, W, V	0–1	0	◎
P15.33	Speed feedback source	In closed-loop control, this function code specifies the PG card that the speed feedback comes from. 0: Without 1: PG1 (encoder module 1, corresponding to group P48.00)	0–2	1	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		2: PG2 (encoder module 2, corresponding to group P49.00)			
P15.34	Rotation speed reference percentage base value	The default value is the motor rated rotation speed. 0–65535rpm	0–65535	Model depended	○
P15.35	Motor temperature AI sensor type	Ones place: AI1 and AO1 connected sensor type 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Tens place: AI2 and AO2 connected sensor type 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Hundreds place: IO1_AI1, AO1(Type of sensor connected to AI1 and AO1 on IO expansion card 1) 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Thousands place: IO1_AI2, AO2(Type of sensor connected to AI2 and AO2 on IO expansion card 1) 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 This function code sets the type of motor temperature sensor during analog input.	0x0000–0x4444	0x0000	○
P15.36	Enabling motor temperature AI input	Ones place: 0: Disable 1: AI1 and AO1 enabled for motor temperature sampling Tens place: 0: Disable 1: AI2 and AO2 enabled for motor	0x0000–0x1111	0x0000	○

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>temperature sampling
Hundreds place:
0: Disable
1: AI1 and AO1 on IO expansion card 1 enabled for motor temperature sampling
Thousands place:
0: Disable
1: AI2 and AO2 on IO expansion card 1 enabled for motor temperature sampling
When AI input is selected for motor temperature, the corresponding AO is set to the current mode output (the shorting cap on the control board selects current), and the corresponding AOs of automatically associated settings on the software output different currents. The AD sampling values of AI input address different temperature tables based on sensor types.
For different sensors, AO output current settings are as follows:
<table><tr><th>Motor temperature sensor type</th><th>AO output current</th></tr><tr><td>PT100</td><td>18mA</td></tr><tr><td>KTY84</td><td>5mA</td></tr><tr><td>PT100*3</td><td>18mA</td></tr></table></td><td></td><td></td><td></td></tr>
<tr><td>P15.37</td><td>Motor overtemperature fault source</td><td>0: 0
1: 1 (Motor overtemperature fault)
2: Other-B connector (0.00–99.99)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
Note: The value 0 indicates software internally determines whether motor overtemperature has occurred according to the detected motor temperature value. There may be multiple motor temperature sources, from which</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
		the max value is taken as the final motor temperature.			
P15.38	Motor overtemperature point	100.0–200.0°C	100.0–200.0	200.0°C	○
P15.39	Motor overtemperature pre-alarm point	100.0–P15.38°C	100.0–P15.38	180.0°C	○
P15.40	Motor overload protection selection	0: No protection 1: Common motor (with low-speed compensation) 2: Frequency-variable motor (without low-speed compensation)	0–2	2	◎
P15.41	Motor overload protection current	20.0–120.0% (of the motor rated current)	20.0–120.0	100.0%	○
P15.42	Overload protection coefficient of motor	20.0–150.0% Specifies the motor overload protection coefficient. A small motor overload protection coefficient indicates a great overload multiplication (M). When M=116%, protection is performed after motor overload lasts for 1 hour; when M=150%, protection is performed after motor overload lasts for 12 minutes; when M=200%, protection is performed after motor overload lasts for 60 seconds; and when M⩾400%, protection is performed immediately.	20.0–150.0	100.0%	○
P15.43	Enabling motor stall detection	0: Disable 1: Enable After this function is enabled, motor stall is detected; otherwise, it is not detected. When the motor torque reaches the torque limit, if the feedback speed is below the set threshold specified by P15.44, and the duration exceeds the P15.45 (Motor stall delay) stall fault is triggered.	0–1	0	◎
P15.44	Motor stall speed setting	0.00–100.00%	0.00–100.00	1.00%	◎
P15.45	Motor stall delay	0.000–20.000s	0.000–20.000	1.000s	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P15.46	Output LC filter configuration selection	0: Without 1: With	0–1	0	○
P15.47	Output LC filter inductance	0.01–300.00mH	0.01–300.00	10.00 mH	○
P15.48	Output LC filter capacitance	0.1–1000.0μF	0.1–1000.0	5.0μF	○
P15.49	Enabling load observer	0: Disable 1: Enable	0–1	0	◎
P15.50	Load observer proportional gain regulation coefficient	0–1000%	0–1000	100%	○
P15.51	Load observer integral gain regulation coefficient	0–1000%	0–1000	10%	○
P15.52	Load observer use inertia regulation coefficient	20–1000%	20–1000	100%	◎
P15.53–P15.54	Reserved	-	-	-	-

Group P16—Parameters of motor 3

Function code	Name	Parameter description	Setting range	Default	Modify
P16.00	Type of motor 3	0: Asynchronous motor (AM) 1: Permanent magnet synchronous motor 2: Synchronous reluctance motor	0–2	0	○
P16.01	Rated power of AM 3	0.1–6000.0kW	0.1–6000.0	Model depended	◎
P16.02	Rated frequency of AM 3	0.01–655.35Hz	0.01–655.35	50.00Hz	◎
P16.03	Rated speed of AM 3	1–36000rpm	1–36000	Model depended	◎
P16.04	Rated voltage of AM 3	0–20000V	0–20000	Model depended	◎
P16.05	Rated current of AM 3	0.1–6000.0A	0.1–6000.0	Model depended	◎
P16.06	Stator resistance of AM 3	0.0001–6.5535Ω (by motor power)	0.0001–6.5535	Model depended	○
P16.07	Rotor resistance of AM 3	0.0001–6.5535Ω (by motor power)	0.0001–6.5535	Model depended	○

Function code	Name	Parameter description	Setting range	Default	Modify
P16.08	AM 3 stator-rotor leakage inductance	0.01–655.35mH	0.01–655.35	Model depended	○
P16.09	AM 3 stator-rotor mutual inductance	0.01–655.35mH	0.01–655.35	Model depended	○
P16.10	No-load current of AM 3	0.1–6000.0A	0.1–6000.0	Model depended	○
P16.11	Magnetic saturation coefficient 1 of iron core of AM 3	0.0–100.0%	0.0–100.0	83.0%	◎
P16.12	Magnetic saturation coefficient 2 of iron core of AM 3	0.0–100.0%	0.0–100.0	70.0%	◎
P16.13	Magnetic saturation coefficient 3 of iron core of AM 3	0.0–100.0%	0.0–100.0	57.0%	◎
P16.14	Magnetic saturation coefficient 4 of iron core of AM 3	0.0–100.0%	0.0–100.0	40.0%	◎
P16.15	AM 3 power factor	0.7–1.00	0.7–1.00	0.88	◎
P16.16	AM reserved parameter 1	0–65535	0–65535	0	○
P16.17	AM reserved parameter 2	0–65535	0–65535	0	○
P16.18	AM reserved parameter 3	0–65535	0–65535	0	○
P16.19	AM reserved parameter 4	0–65535	0–65535	0	○
P16.20	Rated power of SM 3	4.0–5000.0kW	4.0–5000.0	Model depended	◎
P16.21	Rated frequency of SM 3	0.01–655.35Hz	0.01–655.35	50.00Hz	◎
P16.22	Number of pole pairs of SM 3	1–50	1–50	2	◎
P16.23	Rated voltage of SM 3	0–20000V	0–20000	Model depended	◎
P16.24	Rated current of SM 3	0.1–1000.0A	0.1–1000.0	Model depended	◎
P16.25	Stator resistance of SM 3	0.0001–6.5535Ω (by power)	0.0001–6.5535	Model depended	○
P16.26	Direct-axis inductance of SM 3	0.001–65.535mH	0.001–65.535	Model depended	○
P16.27	Quadrature-axis inductance of SM 3	0.001–65.535mH	0.001–65.535	Model depended	○

Function code	Name	Parameter description	Setting range	Default	Modify
P16.28	Counter-emf constant of SM 3	0–20000V	0–20000	Model depended	○
P16.29	Initial pole position of SM 3 (reserved)	0x0000–0xFFFF	0x0000–FFFF	0x0000	●
P16.30	Identification current of SM 3 (reserved)	0–50% (of the motor rated current)	0–50	10%	●
P16.31	Motor system inertia	0.000–30.000kg.m^2 After inertial autotuning, the autotuned inertia parameter is saved to this function code.	0.000–30.000	0.000kg.m^2	○
P16.32	Motor phase setting	0: U, V, W 1: U, W, V	0–1	0	◎
P16.33	Speed feedback source	In closed-loop control, this function code specifies the PG card that the speed feedback comes from. 0: Without 1: PG1 (encoder module 1, corresponding to group P48.00) 2: PG2 (encoder module 2, corresponding to group P49.00)	0–2	1	◎
P16.34	Rotation speed reference percentage base value	The default value is the motor rated rotation speed. 0–65535rpm	0–65535	Model depended	○
P16.35	Motor temperature AI sensor type	Ones place: AI1 and AO1 connected sensor type 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Tens place: AI2 and AO2 connected sensor type 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Hundreds place: IO1_AI1, AO1(Type of sensor connected to AI1 and AO1 on IO expansion card 1) 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3	0x0000–0x4444	0x0000	○

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>Thousands place: IO1_AI2, AO2(Type of sensor connected to AI2 and AO2 on IO expansion card 1)
0: PT100
1: KTY84
2: PT100*3
3: PT1000
4: PT1000*3
This function code sets the type of motor temperature sensor during analog input.</td><td></td><td></td><td></td></tr>
<tr><td>P16.36</td><td>Enabling motor temperature AI input</td><td>Ones place:
0: Disable
1: AI1 and AO1 enabled for motor temperature sampling
Tens place:
0: Disable
1: AI2 and AO2 enabled for motor temperature sampling
Hundreds place:
0: Disable
1: AI1 and AO1 on IO expansion card 1 enabled for motor temperature sampling
Thousands place:
0: Disable
1: AI2 and AO2 on IO expansion card 1 enabled for motor temperature sampling
When AI input is selected for motor temperature, the corresponding AO is set to the current mode output (the shorting cap on the control board selects current), and the corresponding AOs of automatically associated settings on the software output different currents. The AD sampling values of AI input address different temperature tables based on sensor types.
For different sensors, AO output current settings are as follows:<table><tr><th>Motor temperature sensor type</th><th>AO output current</th></tr><tr><td>PT100</td><td>18mA</td></tr><tr><td>KTY84</td><td>5mA</td></tr><tr><td>PT100*3</td><td>18mA</td></tr></table></td><td>0x0000–0x1111</td><td>0x0000</td><td>○</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
P16.37	Motor overtemperature fault source	0: 0 1: 1 (Motor overtemperature fault) 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 **Note:** The value 0 indicates software internally determines whether motor overtemperature has occurred according to the detected motor temperature value. There may be multiple motor temperature sources, from which the max value is taken as the final motor temperature.	0–10	0	○
P16.38	Motor overtemperature point	100.0–200.0°C	100.0–200.0	200.0°C	○
P16.39	Motor overtemperature pre-alarm point	100.0–P15.38°C	100.0–P15.38	180.0°C	○
P16.40	Motor overload protection selection	0: No protection 1: Common motor (with low-speed compensation) 2: Frequency-variable motor (without low-speed compensation)	0–2	2	◎
P16.41	Motor overload protection current	20.0–120.0% (of the motor rated current)	20.0–120.0	100.0%	○
P16.42	Overload protection coefficient of motor	20.0–150.0% Specifies the motor overload protection coefficient. A small motor overload protection coefficient indicates a great overload multiplication (M). When M=116%, protection is performed after motor overload lasts for 1 hour; when M=150%, protection is performed after motor overload lasts for 12 minutes; when M=200%, protection is performed after motor overload lasts for 60 seconds; and when M⩾400%, protection is performed immediately.	20.0–150.0	100.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P16.43	Enabling motor stall detection	0: Disable 1: Enable After this function is enabled, motor stall is detected; otherwise, it is not detected. When the motor torque reaches the torque limit, if the feedback speed is below the set threshold specified by P16.44, and the duration exceeds the P16.45 (Motor stall delay) stall fault is triggered.	0–1	0	◎
P16.44	Motor stall speed setting	0.00–100.00%	0.00–100.00	1.00%	◎
P16.45	Motor stall delay	0.000–20.000s	0.000–20.000	1.000s	◎
P16.46	Output LC filter configuration selection	0: Without 1: With	0–1	0	○
P16.47	Output LC filter inductance	0.01–300.00mH	0.01–300.00	10.00 mH	○
P16.48	Output LC filter capacitance	0.1–1000.0μF	0.1–1000.0	5.0μF	○
P16.49	Enabling load observer	0: Disable 1: Enable	0–1	0	◎
P16.50	Load observer proportional gain regulation coefficient	0–1000%	0–1000	100%	○
P16.51	Load observer integral gain regulation coefficient	0–1000%	0–1000	10%	○
P16.52	Load observer use inertia regulation coefficient	20–1000%	20–1000	100%	◎
P16.53–P16.54	Reserved	-	-	-	-

Group P17—Parameters of motor 4

Function code	Name	Parameter description	Setting range	Default	Modify
P17.00	Type of motor 4	0: Asynchronous motor (AM) 1: Permanent magnet synchronous motor 2: Synchronous reluctance motor	0–2	0	○
P17.01	Rated power of AM 4	0.1–6000.0kW	0.1–6000.0	Model depended	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P17.02	Rated frequency of AM 4	0.01–655.35Hz	0.01–655.35	50.00Hz	◎
P17.03	Rated speed of AM 4	1–36000rpm	1–36000	Model depended	◎
P17.04	Rated voltage of AM 4	0–20000V	0–20000	Model depended	◎
P17.05	Rated current of AM 4	0.1–6000.0A	0.1–6000.0	Model depended	◎
P17.06	Stator resistance of AM 4	0.0001–6.5535Ω (by motor power)	0.0001–6.5535	Model depended	○
P17.07	Rotor resistance of AM 4	0.0001–6.5535Ω (by motor power)	0.0001–6.5535	Model depended	○
P17.08	AM 4 stator-rotor leakage inductance	0.01–655.35mH	0.01–655.35	Model depended	○
P17.09	AM 4 stator-rotor mutual inductance	0.01–655.35mH	0.01–655.35	Model depended	○
P17.10	No-load current of AM 4	0.1–6000.0A	0.1–6000.0	Model depended	○
P17.11	Magnetic saturation coefficient 1 of iron core of AM 4	0.0–100.0%	0.0–100.0	83.0%	◎
P17.12	Magnetic saturation coefficient 2 of iron core of AM 4	0.0–100.0%	0.0–100.0	70.0%	◎
P17.13	Magnetic saturation coefficient 3 of iron core of AM 4	0.0–100.0%	0.0–100.0	57.0%	◎
P17.14	Magnetic saturation coefficient 4 of iron core of AM 4	0.0–100.0%	0.0–100.0	40.0%	◎
P17.15	AM 4 power factor	0.7–1.00	0.7–1.00	0.88	◎
P17.16	AM reserved parameter 1	0–65535	0–65535	0	○
P17.17	AM reserved parameter 2	0–65535	0–65535	0	○
P17.18	AM reserved parameter 3	0–65535	0–65535	0	○
P17.19	AM reserved parameter 4	0–65535	0–65535	0	○
P17.20	Rated power of SM 4	4.0–5000.0kW	4.0–5000.0	Model depended	◎
P17.21	Rated frequency of SM 4	0.01–655.35Hz	0.01–655.35	50.00Hz	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P17.22	Number of pole pairs of SM 4	1–50	1–50	2	◎
P17.23	Rated voltage of SM 4	0–20000V	0–20000	Model depended	◎
P17.24	Rated current of SM 4	0.1–1000.0A	0.1–1000.0	Model depended	◎
P17.25	Stator resistance of SM 4	0.0001–6.5535Ω (by power)	0.0001–6.5535	Model depended	○
P17.26	Direct-axis inductance of SM 4	0.001–65.535mH	0.001–65.535	Model depended	○
P17.27	Quadrature-axis inductance of SM 4	0.001–65.535mH	0.001–65.535	Model depended	○
P17.28	Counter-emf constant of SM 4	0–20000V	0–20000	Model depended	○
P17.29	Initial pole position of SM 4 (reserved)	0x0000–0xFFFF	0x0000–FFFF	0x0000	●
P17.30	Identification current of SM 4 (reserved)	0–50% (of the motor rated current)	0–50	10%	●
P17.31	Motor system inertia	0.000–30.000kg.m^2 After inertial autotuning, the autotuned inertia parameter is saved to this function code.	0.000–30.000	0.000kg.m^2	○
P17.32	Motor phase setting	0: U, V, W 1: U, W, V	0–1	0	◎
P17.33	Speed feedback source	In closed-loop control, this function code specifies the PG card that the speed feedback comes from. 0: Without 1: PG1 (encoder module 1, corresponding to group P48.00) 2: PG2 (encoder module 2, corresponding to group P49.00)	0–2	1	◎
P17.34	Rotation speed reference percentage base value	The default value is the motor rated rotation speed. 0–65535rpm	0–65535	Model depended	○
P17.35	Motor temperature AI sensor type	Ones place: AI1 and AO1 connected sensor type 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Tens place: AI2 and AO2 connected sensor type 0: PT100	0x0000–0x4444	0x0000	○

Function code	Name	Parameter description	Setting range	Default	Modify
		1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Hundreds place: IO1_AI1, AO1(Type of sensor connected to AI1 and AO1 on IO expansion card 1) 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 Thousands place: IO1_AI2, AO2(Type of sensor connected to AI2 and AO2 on IO expansion card 1) 0: PT100 1: KTY84 2: PT100*3 3: PT1000 4: PT1000*3 This function code sets the type of motor temperature sensor during analog input.			
P17.36	Enabling motor temperature AI input	Ones place: 0: Disable 1: AI1 and AO1 enabled for motor temperature sampling Tens place: 0: Disable 1: AI2 and AO2 enabled for motor temperature sampling Hundreds place: 0: Disable 1: AI1 and AO1 on IO expansion card 1 enabled for motor temperature sampling Thousands place: 0: Disable 1: AI2 and AO2 on IO expansion card 1 enabled for motor temperature sampling When AI input is selected for motor temperature, the corresponding AO is set to the current mode output (the shorting cap on the control board selects current), and the corresponding AOs of automatically associated settings	0x0000–0x1111	0x0000	○

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>on the software output different currents. The AD sampling values of AI input address different temperature tables based on sensor types.
For different sensors, AO output current settings are as follows:
<table><tr><th>Motor temperature sensor type</th><th>AO output current</th></tr><tr><td>PT100</td><td>18mA</td></tr><tr><td>KTY84</td><td>5mA</td></tr><tr><td>PT100*3</td><td>18mA</td></tr></table></td><td></td><td></td><td></td></tr>
<tr><td>P17.37</td><td>Motor overtemperature fault source</td><td>0: 0
1: 1 (Motor overtemperature fault)
2: Other-B connector (0.00–99.99)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
Note: The value 0 indicates software internally determines whether motor overtemperature has occurred according to the detected motor temperature value. There may be multiple motor temperature sources, from which the max value is taken as the final motor temperature.</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P17.38</td><td>Motor overtemperature point</td><td>100.0–200.0°C</td><td>100.0–200.0</td><td>200.0°C</td><td>○</td></tr>
<tr><td>P17.39</td><td>Motor overtemperature pre-alarm point</td><td>100.0–P15.38°C</td><td>100.0–P15.38</td><td>180.0°C</td><td>○</td></tr>
<tr><td>P17.40</td><td>Motor overload protection selection</td><td>0: No protection
1: Common motor (with low-speed compensation)
2: Frequency-variable motor (without low-speed compensation)</td><td>0–2</td><td>2</td><td>◎</td></tr>
<tr><td>P17.41</td><td>Motor overload protection current</td><td>20.0–120.0% (of the motor rated current)</td><td>20.0–120.0</td><td>100.0%</td><td>○</td></tr>
<tr><td>P17.42</td><td>Overload protection coefficient of motor</td><td>20.0–150.0%
Specifies the motor overload protection coefficient. A small motor overload protection</td><td>20.0–150.0</td><td>100.0%</td><td>○</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
		coefficient indicates a great overload multiplication (M). When M=116%, protection is performed after motor overload lasts for 1 hour; when M=150%, protection is performed after motor overload lasts for 12 minutes; when M=200%, protection is performed after motor overload lasts for 60 seconds; and when M⩾400%, protection is performed immediately.			
P17.43	Enabling motor stall detection	0: Disable 1: Enable After this function is enabled, motor stall is detected; otherwise, it is not detected. When the motor torque reaches the torque limit, if the feedback speed is below the set threshold specified by P17.44, and the duration exceeds the P17.45 (Motor stall delay) stall fault is triggered.	0–1	0	◎
P17.44	Motor stall speed setting	0.00–100.00%	0.00–100.00	1.00%	◎
P17.45	Motor stall delay	0.000–20.000s	0.000–20.000	1.000s	◎
P17.46	Output LC filter configuration selection	0: Without 1: With	0–1	0	○
P17.47	Output LC filter inductance	0.01–300.00mH	0.01–300.00	10.00 mH	○
P17.48	Output LC filter capacitance	0.1–1000.0μF	0.1–1000.0	5.0μF	○
P17.49	Enabling load observer	0: Disable 1: Enable	0–1	0	◎
P17.50	Load observer proportional gain regulation coefficient	0–1000%	0–1000	100%	○
P17.51	Load observer integral gain regulation coefficient	0–1000%	0–1000	10%	○
P17.52	Load observer use inertia regulation coefficient	20–1000%	20–1000	100%	◎
P17.53–P17.54	Reserved	-	-	-	-

Group P18—Protection configuration

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P18.00</td><td>Protection against phase loss</td><td>Ones place:
0: Disable output phase loss detection.
1: Enable output phase loss detection.
Tens place:
0: Disable input phase loss detection.
1: Enable input phase loss detection.</td><td>0x00–0x11</td><td>0x01</td><td>○</td></tr>
<tr><td>P18.01</td><td>SPO switch-on detection delay time</td><td>Note: The SPO detection is started only after the VFD runs for the delay time P11.28 to avoid false alarms caused by the unstable frequency.</td><td>0.0–60.0(s)</td><td>5.0</td><td>○</td></tr>
<tr><td>P18.02</td><td>SPO unbalance factor</td><td>0–10</td><td>0–10</td><td>6</td><td>○</td></tr>
<tr><td>P18.03</td><td>Enabling frequency fall at power down</td><td>0: Disable
1: Run</td><td>0–1</td><td>1</td><td>◎</td></tr>
<tr><td>P18.04</td><td>Voltage of frequency fall at sudden power down</td><td>If the bus voltage drops to the sudden power down frequency falling point due to the power loss of the grid, the VFD begins to decrease the running frequency according to sudden power down frequency falling rate to make the motor in power generation state. The regenerative power can maintain the bus voltage to ensure normal running of the VFD until the recovery of power.
Default frequency falling point at sudden power down:
80% of bus voltage (GD880)<table><tr><th>Voltage class</th><td>380V</td><td>690V</td></tr><tr><th>Voltage of frequency fall at sudden power down</th><td>432V</td><td>752V</td></tr></table></td><td>P18.25–P18.24</td><td>432.0V</td><td>○</td></tr>
<tr><td>P18.05</td><td>Frequency decrease ratio at sudden power down</td><td>0.00%–P09.02</td><td>0.00–P09.02</td><td>3.00%</td><td>○</td></tr>
<tr><td>P18.06</td><td>Sudden power down voltage loop Kp</td><td>0–1000</td><td>0–1000</td><td>30</td><td>○</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P18.07</td><td>Sudden power down voltage loop Ki</td><td>0–1000</td><td>0–1000</td><td>40</td><td>○</td></tr>
<tr><td>P18.08</td><td>Sudden power down current loop Kp</td><td>0–1000</td><td>0–1000</td><td>25</td><td>○</td></tr>
<tr><td>P18.09</td><td>Sudden power down current loop Ki</td><td>0–1000</td><td>0–1000</td><td>150</td><td>○</td></tr>
<tr><td>P18.10</td><td>Enabling overvoltage stall protection</td><td>0: Disable
1: Enable</td><td>0–1</td><td>1</td><td>○</td></tr>
<tr><td>P18.11</td><td>Overvoltage stall protection voltage</td><td>P18.25–P18.24<table><tr><th>Voltage class</th><th>Overvoltage stall protection voltage</th></tr><tr><td>380V</td><td>660V</td></tr><tr><td>734.4V</td><td>1120.0V</td></tr></table></td><td>P18.25–P18.24</td><td>734.4V</td><td>○</td></tr>
<tr><td>P18.12</td><td>Overvoltage stall voltage-loop Kp</td><td>0–1000</td><td>0–1000</td><td>60</td><td>○</td></tr>
<tr><td>P18.13</td><td>Overvoltage stall voltage-loop Ki</td><td>0–1000</td><td>0–1000</td><td>5</td><td>○</td></tr>
<tr><td>P18.14</td><td>Overvoltage stall current-loop Kp</td><td>0–1000</td><td>0–1000</td><td>60</td><td>○</td></tr>
<tr><td>P18.15</td><td>Overvoltage stall current-loop Ki</td><td>0–1000</td><td>0–1000</td><td>250</td><td>○</td></tr>
<tr><td>P18.16</td><td>VDC control frequency limit value</td><td>VDC control frequency limit value, overvoltage stall frequency limit, and power down frequency limit.</td><td>0.00–P09.02</td><td>20.00%</td><td>○</td></tr>
<tr><td>P18.17</td><td>Enabling auto current limit</td><td>0: Disable
1: Enable</td><td>0–1</td><td>1</td><td>○</td></tr>
<tr><td>P18.18</td><td>Auto current limit level display</td><td>Automatic current limit level percentage display, set in the motor control parameter group, with the value switched by motor. 50–200% (of the VFD rated current)</td><td>50–200</td><td>140%</td><td>●</td></tr>
<tr><td>P18.19</td><td>Auto current limit frequency falling rate</td><td>0.00 indicates overcurrent stall is invalid.
Reserved. The actual frequency falling rate is given by the PI regulator.</td><td>0.00–20.00</td><td>20.00%</td><td>○</td></tr>
<tr><td>P18.20</td><td>Auto current limit regulation Kp</td><td>0–1000</td><td>0–1000</td><td>60</td><td>○</td></tr>
<tr><td>P18.21</td><td>Auto current limit regulation Ki</td><td>0–1000</td><td>0–1000</td><td>60</td><td>○</td></tr>
<tr><td>P18.22</td><td>Current limit detection time</td><td>The VFD reports an overload fault when the VFD enters the current limit state and the current limit</td><td>0.000–20.000</td><td>0.100s</td><td>◎</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
		duration exceeds the current limit detection time.			
P18.23	Bus overvoltage pre-alarm point	105–140% (of standard bus voltage)	105–140	140%	○
P18.24	Software bus overvoltage point	For 380V models: 800.0V For 660V models: 1200.0V	0.0–2000.0	Model depended	○
P18.25	Software bus undervoltage point	For 380V models: 350.0V For 660V models: 570.0V	0.0–1000.0	Model depended	○
P18.26	Software overcurrent point	50.0–220.0% (of the VFD rated current)	50.0–220.0	210.0%	○
P18.27	Hardware current limit point	Setting the current limit value above the software overcurrent point disables the hardware current limiting.	50–240	195%	◎
P18.28	Speed deviation detection value	0–65535	0–65535	0	○
P18.29	Speed deviation detection time	0–65535	0–65535	0	○
P18.30	Enabling output current imbalance pre-alarm	0–65535	0–65535	0	○
P18.31	External fault 1 source	0: No fault 1: Fault occurred 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P18.32	External fault 2 source		0–10	0	○
P18.33	External fault 3 source		0–10	0	○
P18.34	External fault 4 source		0–10	0	○
P18.35	External fault 5 source		0–10	0	○
P18.36	External alarm 1 source	0: No alarm 1: Alarm occurred 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P18.37	External alarm 2 source		0–10	0	○
P18.38	External alarm 3 source		0–10	0	○
P18.39	External alarm 4 source		0–10	0	○
P18.40	External alarm 5 source		0–10	0	○
P18.41	Max current control module current limit value	Max current control module current limit value = Auto current limit percentage display * VFD rated current	0.0–6553.5	0.0A	●

Function code	Name	Parameter description	Setting range	Default	Modify
P18.42	Max current control module output frequency	Max current control module current limit (Current limit regulator output frequency)	0.0–6553.5	0.0Hz	●
P18.43	VDC control module output	VDC control module output frequency	-300.00–300.00	0.00%	●
P18.44	STO selection	Ones place: 0: Disable STO function 1: Enable STO function(after STO outputs enabling signal, STO circuit starts working) Tens place: 0: Lock upon STO alarm 1: No lock on STO alarm "Lock upon STO alarm" indicates the STO alarm must be reset after the VFD recovers from the STO fault. "No lock on STO alarm" indicates that the STO alarm disappears automatically after the VFD recovers from the STO fault. StL1 and StL2 faults require a reset after they occur, and Sto faults cover StL1 and StL2 faults.	0x00–0x11	0x01	○
P18.45	Temperature to start cooling fan	50.0–120.0°C If the fan running mode is 0, the fan starts running when the unit temperature exceeds the fan startup temperature.	50.0–120.0	50.0°C	○
P18.46	Fan operating mode	0: Normal mode 1: Permanent running after power-on 2: Speed regulation mode Normal running: The fan will operate when the machine is running or the unit temperature exceeds the fan startup temperature. The fan will stop running with a 30s delay after the machine is stopped and the temperature is below the fan startup temperature. Fan speed regulation mode: Adjusts the fan speed according to the unit temperature.	0–2	0	○
P18.47–P18.48	Reserved	-	-	-	-

Group P20—CW and SW

Function code	Name	Parameter description	Setting range	Default	Modify
P20.00	CW 1	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.01	CW 1 bit 0	0: OFF1, decelerating to stop. 1: No OFF1	0–1	0	●
P20.02	CW 1 bit 1	0: Block IGBT; OFF2, coasting to stop 1: No OFF2	0–1	0	●
P20.03	CW 1 bit 2	0: OFF3, fast stop 1: No OFF3	0–1	0	●
P20.04	CW 1 bit 3	0: Disallow running (enter run disallowing) 1: Enable running	0–1	0	●
P20.05	CW 1 bit 4	0: Ramp function generator output is 0 1: Enable ramp function generator	0–1	0	●
P20.06	CW 1 bit 5	0: Ramp function generator output maintains the value of the previous beat. 1: Start ramp function generator	0–1	0	●
P20.07	CW 1 bit 6	0: Ramp function generator target speed is 0 1: Ramp function generator input speed is valid	0–1	0	●
P20.08	CW 1 bit 7	0: No fault reset 1: Fault reset	0–1	0	●
P20.09	CW 1 bit 8	0: No jog 1 1: Jog 1	0–1	0	●
P20.10	CW 1 bit 9	0: No jog 2 1: Jog 2	0–1	0	●
P20.11	CW 1 bit 10	0: PLC remote control is invalid 1: PLC remote control is valid; PZD command enabling bit	0–1	0	●
P20.12	CW 1 bit 11	0: Do not inverse given speed 1: Inverse given speed	0–1	0	●
P20.13	CW 1 bit 12	0: MOP bit0=0, MOP does not rise 1: MOP bit0=1, MOP rises	0–1	0	●
P20.14	CW 1 bit 13	Bit13 bit12 00: Invalid 01: Increase MOP output according to setting 10: Decrease MOP output according to setting 11: Keep output value unchanged	0–1	0	●
P20.15	CW 1 bit 14	0: Do not trigger external fault 1 1: Trigger external fault 1	0–1	0	●
P20.16	CW 1 bit 15	0: Do not trigger external fault 2	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
		1: Trigger external fault 2			
P20.17	CW 2	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.18	CW 2 bit 0	0: Disable droop 1: Enable droop	0–1	0	●
P20.19	CW 2 bit 1	0: Do not force speed tracking 1: Force speed tracking	0–1	0	●
P20.20	CW 2 bit 2	0: Motor selection bit0=0 1: Motor selection bit0=1 P20.20: Motor selection, bit 0 P20.21: Motor selection, bit 1 Bit1bit0: 00 Motor 1 Bit1bit0: 01 Motor 2 Bit1bit0: 10 Motor 3 Bit1bit0: 11 Motor 4	0–1	0	●
P20.21	CW 2 bit 3		0–1	0	●
P20.22	CW 2 bit 4	Multi-step speed bit 0	0–1	0	●
P20.23	CW 2 bit 5	Multi-step speed bit 1	0–1	0	●
P20.24	CW 2 bit 6	Multi-step speed bit 2	0–1	0	●
P20.25	CW 2 bit 7	Multi-step speed bit 3	0–1	0	●
P20.26	CW 2 bit 8	0: Remove speed-loop integral 1: Normalize speed-loop integral	0–1	0	●
P20.27	CW 2 bit 9	0: Speed regulator output is 0, and motor rotates freely 1: Speed regulator is normal, ensuring a closed loop speed control	0–1	0	●
P20.28	CW 2 bit 10	0: Control mode determined by related function codes 1: Vector control is forced to work in torque mode	0–1	0	●
P20.29	CW 2 bit 11	0: Do not trigger external alarm 1 1: Trigger external alarm 1	0–1	0	●
P20.30	CW 2 bit 12	0: Do not trigger external alarm 2 1: Trigger external alarm 2	0–1	0	●
P20.31	CW 2 bit 13	0: Trigger channel 1 1: Trigger channel 2	0–1	0	●
P20.32	CW 2 bit 14	0: Force brake closing 1: Force brake opening	0–1	0	●
P20.33	CW 2 bit 15	0: Force brake closing 1: Force brake opening	0–1	0	●
P20.34	SW 1	Status word 1 (send the VFD status to the PLC) Combination of P20.35–P20.50	0x0000–0xFFFF	0	●
P20.35	SW 1 bit 0	0: Not ready for brake closing 1: Ready for brake closing	0–1	0	●
P20.36	SW 1 bit 1	0: OFF1 activated 1: Ready to run, OFF1 not activated	0–1	0	●
P20.37	SW 1 bit 2	0: Disable running	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
		1: Enable running			
P20.38	SW 1 bit 3	0: No fault 1: Faulty	0–1	0	●
P20.39	SW 1 bit 4	0: OFF2 activated 1: OFF2 not activated	0–1	0	●
P20.40	SW 1 bit 5	0: OFF3 activated 1: OFF3 not activated	0–1	0	●
P20.41	SW 1 bit 6	0: Enable brake closing 1: Disable brake closing, starting-up blocked	0–1	0	●
P20.42	SW 1 bit 7	0: Neither an alarm nor a minor fault 1: Alarm and minor fault activated	0–1	0	●
P20.43	SW 1 bit 8	0: Actual value different from reference value 1: Actual value equals reference value (speed arrival)	0–1	0	●
P20.44	SW 1 bit 9	0: Local (Control channels other than remote control, such as upper computer or keypad) 1: Remote (Control channels listed by P02.00: bus Adapter A, bus Adapter B, Modbus communication, and terminal)	0–1	0	●
P20.45	SW 1 bit 10	0: Actual speed lower than compared value 1: Actual speed higher than comparison value (FDT level detection value)	0–1	0	●
P20.46	SW 1 bit 11	0: Torque or current not reach limit 1: Torque or current reaches limit	0–1	0	●
P20.47	SW 1 bit 12	0: Command channel 1 effective 1: Command channel 2 effective	0–1	0	●
P20.48	SW 1 bit 13	0: IGBT blocked 1: IGBT triggered	0–1	0	●
P20.49	SW 1 bit 14	0: Running speed is positive 1: Running speed is negative	0–1	0	●
P20.50	SW 1 bit 15	0: Brake closed 1: Brake opened	0–1	0	●
P20.51	SW 2	Status word 2 (send the VFD status to the PLC) Combination of P20.52–P20.67	0x0000–0xFFFF	0	●
P20.52	SW 2 bit 0	0: Not in jog state 1: Jog	0–1	0	●
P20.53	SW 2 bit 1	0: Not in P.OFF state 1: P.OFF	0–1	0	●
P20.54	SW 2 bit 2	0: Pre-charge resistor switch disconnected (Pre-charge resistor	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
		connected, pre-charging in progress) 1: Pre-charge resistor switch closed (Pre-charge complete)			
P20.55	SW 2 bit 3	0: Unit fan stop 1: Unit fan run	0–1	0	●
P20.56	SW 2 bit 4	0: Output voltage (P21.07) has not reach limit (motor rated voltage) 1: Output voltage (P21.07) reached limit (motor rated voltage)	0–1	0	●
P20.57	SW 2 bit 5	0: Ramp bypassed 1: Ramp activated	0–1	0	●
P20.58	SW 2 bit 6	0: No external fault 1 1: External fault 1	0–1	0	●
P20.59	SW 2 bit 7	0: No external fault 2 1: External fault 2	0–1	0	●
P20.60	SW 2 bit 8	0: Pre-exciting not completed 1: Pre-exciting completed	0–1	0	●
P20.61	SW 2 bit 9	0: Not in parameter identification 1: In parameter identification	0–1	0	●
P20.62	SW 2 bit 10	0: No STO fault 1: STO fault	0–1	0	●
P20.63	SW 2 bit 11	0: Non flux weakening 1: Flux weakening	0–1	0	●
P20.64	SW 2 bit 12	0: The motor does not exceed the speed limit. 1: The motor exceeds the speed limit.	0–1	0	●
P20.65	SW 2 bit 13	0: Motor not in zero speed 1: Motor in zero speed If the motor feedback speed is lower than the stop speed, with the duration of this situation exceeding the delay time specified, the flag bit is set to 1.	0–1	0	●
P20.66	SW 2 bit 14	0: Rotation speed follows reference 1: Speed deviation too great If the difference between the ramp reference speed and motor feedback speed is greater than the set speed deviation, when this situation reaches the set delay time, the flag bit is set to 1.	0–1	0	●
P20.67	SW 2 bit 15	0–1	0–1	0	●
P20.68	Actual start/stop CW	P02.01 or P02.19 specifies which command control channel is used. This function code displays the output of the command channel.	0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
		After some processing, the final control word will be displayed in P20.00.			
P20.69	Panel start/stop CW 1	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.70	Terminal start/stop CW 1	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.71	Bus adapter A start/stop CW 1	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.72	Bus adapter B start/stop CW 1	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.73	PC start/stop CW 1	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.74	Modbus start/stop CW 1	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.75	Customized start/stop CW 1	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.76	Actual start/stop CW 2	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.77	Modbus start/stop CW 2	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.78–P20.83	Reserved	-	-	-	-
P20.84	SW 1 polarity selection	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	◎
P20.85	Value after SW 1 polarity selection	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.86	SW 2 polarity selection	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	◎
P20.87	Value after SW 2 polarity selection	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P20.88–P20.89	Reserved	-	-	-	-

Group P21—Real time data 1

Function code	Name	Parameter description	Setting range	Default	Modify
P21.00	Reference speed percentage	Ratio of the given speed to the reference speed specified by P00.55.	-327.67–327.67	0.00%	●
P21.01	Stator speed percentage	Ratio of the stator speed to the reference speed specified by P00.55.	-327.67–327.67	0.00%	●
P21.02	Rotor speed percentage	Ratio of the rotor speed to the reference speed specified by P00.55.	-327.67–327.67	0.00%	●

Function code	Name	Parameter description	Setting range	Default	Modify
P21.03	Ram reference speed percentage	Percentage relative to the reference speed specified by P00.55.	-327.67–327.67	0.00%	●
P21.04	Reference frequency	Reference frequency (target frequency)	0.00–655.35	0.00Hz	●
P21.05	Stator frequency	Two decimal places, unsigned; stator frequency	0.00–655.35	0.00Hz	●
P21.06	Rotor frequency	Running frequency (rotor frequency)	0.00–655.35	0.00Hz	●
P21.07	Reference speed	0–65535rpm	0–65535	0rpm	●
P21.08	Stator speed	0–65535rpm	0–65535	0rpm	●
P21.09	Rotor speed	Rotor speed (estimated speed)	0–65535	0rpm	●
P21.10	Encoder 1 feedback speed percentage	Percentage relative to the reference speed specified by P00.55.	-327.67–327.67	0.00%	●
P21.11	Encoder 2 feedback speed percentage	Percentage relative to the reference speed specified by P00.55.	-327.67–327.67	0.00%	●
P21.12	Output torque percentage	-200.00–200.00%	-200.00–200.00	0.00%	●
P21.13	Output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.14	Output voltage	0–65535V	0–65535	0V	●
P21.15	Input voltage	0.0–6553.5V	0.0–6553.5	0.0V	●
P21.16	DC bus voltage	0.0–6553.5V	0.0–6553.5	0.0V	●
P21.17	Output power	One decimal place, signed	-3276.8–3276.7	0.0%	●
P21.18	Output power factor	-1.000–1.000	-1.000–1.000	0.000	●
P21.19–P21.20	Reserved	-	-	-	-
P21.21	Output torque actual value high bit	Output torque actual value = Output torque actual value high bit *2^16 + Output torque actual value low bit (Nm)	-32767–32767	0Nm	●
P21.22	Actual output torque value low bit	Output torque actual value = Output torque actual value high bit *2^16 + Output torque actual value low bit (Nm)	-32767–32767	0Nm	●
P21.23	Linear speed display	Linear speed = Mechanical rotation speed * Rotational speed display coefficient Rotation speed = 60 * Running frequency/Number of motor pole pairs	0–65535	0	●
P21.24	Motor temperature	-40.0–200.0°C	-40.0–200.0	0.0°C	●
P21.25	Ambient temperature	-40.0–125.0°C	-40.0–125.0	0.0°C	●

Function code	Name	Parameter description	Setting range	Default	Modify
P21.26	D-axis reference current	-3276.8–3276.7A	-3276.8–3276.7	0.0A	●
P21.27	D-axis feedback current	Output current reactive component	-3276.8–3276.7	0.0A	●
P21.28	Q-axis reference current	-3276.8–3276.7A	-3276.8–3276.7	0.0A	●
P21.29	Q-axis feedback current	Output current active component	-3276.8–3276.7	0.0A	●
P21.30	D-axis voltage reference	-327.68–327.67%	-327.68–327.67	0.00%	●
P21.31	Q-axis voltage reference	-327.68–327.67%	-327.68–327.67	0.00%	●
P21.32	Input terminal status	Bit 0: DI1 Bit1: DI2 Bit 2: DI3 Bit 3: DI4 Bit4: DI5 Bit5: DI6 Bit6: HDI1 Bit7: HDI2	0x00–0xFF	0x00	●
P21.33	Output terminal status	Bit 0: RO1 Bit1: RO2 Bit 2: RO3 Bit 3: DO1 Bit4: DO2 Bit5: HDO1 Bit6: HDO2	0x00–0xFF	0x00	●
P21.34	AI1 display (%)	The final output processed by the AI module. If AI is disabled, the value is 0.	-655.3–655.3	0.0%	●
P21.35	AI2 display (%)	The final output processed by the AI module. If AI is disabled, the value is 0.	-655.3–655.3	0.0%	●
P21.36	AI3 display (%) (reserved)	The final output processed by the AI module. If AI is disabled, the value is 0.	-655.3–655.3	0.0%	●
P21.37	HDI1 display (kHz)	Displays the input frequency value.	0.000–65.535	0.000kHz	●
P21.38	HDI2 display (kHz)	Displays the input frequency value.	0.000–65.535	0.000kHz	●
P21.39	AO1 display (%)	Displays the AO1 output percentage, corresponding to "AO1 signal source".	-999.9–999.9	0.0%	●
P21.40	AO2 display (%)	Displays the AO2 output percentage, corresponding to "AO2 signal source".	-999.9–999.9	0.0%	●
P21.41	HDO1(kHz)	Displays the HDO1 output value. Unit: kHz	0.000–65.535	0.000kHz	●
P21.42	HDO2(kHz)	Display the HDO2 output value. Unit: kHz	0.000–65.535	0.000kHz	●

Function code	Name	Parameter description	Setting range	Default	Modify
P21.43	PID reference	0.0–100.0%	0.0–100.0	0.0%	●
P21.44	PID feedback	0.0–100.0%	0.0–100.0	0.0%	●
P21.45	Electricity consumption high bit	0–59999MWh	0–59999	0MWh	●
P21.46	Electricity consumption low bit	0.0–999.9kWh	0.0–999.9	0.0kWh	●
P21.47	Local accumulative running time	0–65535h	0–65535	0h	●
P21.48	Unit online state	Binary is used for indicating the unit online state. A max of 10 power units can be configured.	0x0000–0x03FF	0x0000	●
P21.49	Unit 1 temperature	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P21.50	Unit 2 temperature	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P21.51	Unit 3 temperature	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P21.52	Unit 4 temperature	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P21.53	Unit 5 temperature	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P21.54	Unit 6 temperature	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P21.55	Unit 7 temperature	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P21.56	Unit 8 temperature	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P21.57	Unit 9 temperature	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P21.58	Unit 10 temperature	-20.0–120.0°C	-20.0–120.0	0.0°C	●
P21.59	Unit 1 output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.60	Unit 2 output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.61	Unit 3 output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.62	Unit 4 output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.63	Unit 5 output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.64	Unit 6 output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.65	Unit 7 output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.66	Unit 8 output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.67	Unit 9 output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.68	Unit 10 output current	0.0–6553.5A	0.0–6553.5	0.0A	●
P21.69	Unit 1 state	Bit0: Unit ready Bit1: Running Bit2: Fault	0x0000–0xFFFF	0x0000	●
P21.70	Unit 2 state		0x0000–0xFFFF	0x0000	●
P21.71	Unit 3 state		0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
P21.72	Unit 4 state		0x0000–0xFFFF	0x0000	●
P21.73	Unit 5 state		0x0000–0xFFFF	0x0000	●
P21.74	Unit 6 state		0x0000–0xFFFF	0x0000	●
P21.75	Unit 7 state		0x0000–0xFFFF	0x0000	●
P21.76	Unit 8 state		0x0000–0xFFFF	0x0000	●
P21.77	Unit 9 state		0x0000–0xFFFF	0x0000	●
P21.78	Unit 10 state		0x0000–0xFFFF	0x0000	●
P21.79	System time (Year)	Displays system time: year	Year 2022–9999	2022	●
P21.80	System time(month.day)	Displays system time: month.day	Mon Day 1.01–12.31	1.01	●
P21.81	System time(hour.minute)	Displays system time: hour.minute	Hour Min 0.00–23.59	0.00	●
P21.82	Torque reference value display	Main torque + Additional torque + Limit	-300.00–300.00	0.00%	●
P21.83	Main set speed	-327.67–327.67%	-327.67–327.67	0.00%	●
P21.84	Auxiliary set speed	-327.67–327.67%	-327.67–327.67	0.00%	●
P21.85	Reference speed (main + auxiliary)	Main setting + Auxiliary setting	-327.67–327.67	0.00%	●
P21.86	RFG-through-interpolator output speed	Ramp function generator output speed (speed of P21.82 after being processed by interpolator)	-327.67–327.67	0.00%	●
P21.87	RFG output speed	Ramp function generator output speed	-327.67–327.67	0.00%	●
P21.88	VF module input speed	VF module input speed (output speed after ramp curve, additional speed giving, and linear interpolator processing)	-327.67–327.67	0.00%	●
P21.89	After-min. limit speed	-327.67–327.67%	-327.67–327.67	0.00%	●
P21.90	After-max limit speed	Setting after limiting.	-327.67–327.67	0.00%	●
P21.91	FWD max speed	0.00–327.67%	0.00–327.67	0.00%	●
P21.92	REV max speed	-327.67–0.00%	-327.67–0.00	0.00%	●
P21.93	Additional speed setting module speed 1	-327.67–327.67%	-327.67–327.67	0.00%	●
P21.94	Additional speed setting module speed 2	-327.67–327.67%	-327.67–327.67	0.00%	●
P21.95	After-frequency-jump reference speed	-327.67–327.67%	-327.67–327.67	0.00%	●
P21.96	Main torque display	Main torque reference value after filter time.	-300.00–300.00	0.00%	●
P21.97	Additional torque 1 display	Additional torque 1 reference that is obtained after multiplying the coefficient.	-300.00–300.00	0.00%	●

Function code	Name	Parameter description	Setting range	Default	Modify
P21.98	High-accuracy speed reference display	Displays the speed of the setting source specified by P00.56.	-3.000–3.000	0.000%	●
P21.99	Unit max temperature display	Displays the max temperature of units 1–10.	-20.0–120.0	0.0°C	●

Group P22—Real time data 2

Function code	Name	Parameter description	Setting range	Default	Modify
P22.00	GD880 main state machine display	0: Invalid 1: Power-on detection state 2: Power-on blocking state 3: Startup preparation state 4: Pre-charge state 5: Running preparation 6: Demagnetization waiting 7: Startup state 8: Fault state	0–8	0	●
P22.01	Speed regulator input percentage	Ramp reference frequency + Additional frequency	-327.67–327.67	0.00%	●
P22.02	Reserved	-	-	-	-
P22.03	Output current percentage	0.00–300.00% (of the motor rated current)	0.00–300.00	0.00%	●
P22.04–P22.05	Reserved	-	-	-	-
P22.06	Q-axis reference current percentage	Percentage relative to the motor rated current. It is the speed regulator output current percentage.	-300.00–300.00	0.00%	●
P22.07	Q-axis feedback current percentage	Output current active component percentage, a percentage relative to the motor rated current.	-300.00–300.00	0.00%	●
P22.08	Reserved	-	-	-	-
P22.09	D-axis reference current percentage	Percentage relative to the motor rated current.	-300.00–300.00	0.00%	●
P22.10	D-axis feedback current percentage	Output current active component percentage, a percentage relative to the motor rated current.	-300.00–300.00	0.00%	●
P22.11–P22.18	-	-	-	-	-
P22.19	Performance task execution time 1	External interruption time.	0–65535	0μs	●
P22.20	Performance task execution time 2	Control module time.	0–65535	0μs	●
P22.21	Performance task execution time 3	Current loop time.	0–65535	0μs	●

Function code	Name	Parameter description	Setting range	Default	Modify
P22.22	Performance task execution time 4	Sampling calculation time.	0–65535	0μs	●
P22.23	Performance task execution time 5	Parameter high task time.	0–65535	0μs	●
P22.24	Performance task execution time 6	Data interaction high task time.	0–65535	0μs	●
P22.25	Performance task execution time 7	Parameter low task time.	0–65535	0μs	●
P22.26	Performance task execution time 8	Oscilloscope task time.	0–65535	0μs	●
P22.27	Performance task execution time 9	Data interaction low task time.	0–65535	0μs	●
P22.28	Performance task execution time 10	0–65535μs	0–65535	0μs	●
P22.29	Function task execution time 1	0–65535μs	0–65535	0μs	●
P22.30	Function task execution time 2	0–65535μs	0–65535	0μs	●
P22.31	Function task execution time 3	0–65535μs	0–65535	0μs	●
P22.32	Function task execution time 4	0–65535μs	0–65535	0μs	●
P22.33	Function task execution time 5	0–65535μs	0–65535	0μs	●
P22.34	Function task execution time 6	0–65535μs	0–65535	0μs	●
P22.35	Function task execution time 7	0–65535μs	0–65535	0μs	●
P22.36	Function task execution time 8	0–65535μs	0–65535	0μs	●
P22.37	Function task execution time 9	0–65535μs	0–65535	0μs	●
P22.38	Function task execution time 10	0–65535μs	0–65535	0μs	●
P22.39	Output UV voltage	Special for fault oscilloscope. It can only be viewed from the upper computer fault oscilloscope.	-32767–32767	0V	●
P22.40	Output VW voltage	Special for fault oscilloscope. It can only be viewed from the upper computer fault oscilloscope.	-32767–32767	0V	●
P22.41	Output WU voltage	Special for fault oscilloscope. It can only be viewed from the upper computer fault oscilloscope.	-32767–32767	0V	●
P22.42	Output phase-U current	Special for fault oscilloscope. It can only be viewed from the upper computer fault oscilloscope.	-3276.7–3276.7	0.0A	●
P22.43	Output phase-V current	Special for fault oscilloscope. It can only be viewed from the upper computer fault oscilloscope.	-3276.7–3276.7	0.0A	●

Function code	Name	Parameter description	Setting range	Default	Modify
P22.44	Output phase-W current	Special for fault oscilloscope. It can only be viewed from the upper computer fault oscilloscope.	-3276.7–3276.7	0.0A	●
P22.45–P22.47	Reserved	-	-	-	-
P22.48	Feedforward Torque	Friction torque feedforward + Inertia compensation feedforward	-300.00–300.00	0.00%	●
P22.49	Additional torque 2 display	Reference of additional torque 2.	-300.00–300.00	0.00%	●
P22.50	Additional torque 3 display	Reference of additional torque 3.	-300.00–300.00	0.00%	●
P22.51	Oscillation suppression frequency	VF control parameter display.	-300.00–300.00	0.00%	●
P22.52	Slip frequency	VF control parameter display.	-300.00–300.00	0.00%	●
P22.53	Current limit output frequency	VF control parameter display.	-300.00–300.00	0.00%	●
P22.54	Overvoltage/undervoltage stall frequency	VF control parameter display.	-300.00–300.00	0.00%	●
P22.55	Torque boost voltage	VF control parameter display.	-3000.0–3000.0	0.0V	●
P22.56	Speed loop reference	SVC control parameter display.	-300.00–300.00	0.00%	●
P22.57	Speed loop feedback	SVC control parameter display.	-300.00–300.00	0.00%	●
P22.58	Speed loop integral output	SVC control parameter display.	-300.00–300.00	0.00%	●
P22.59	Actual torque upper limit	SVC control parameter display.	-300.00–300.00	0.00%	●
P22.60	Actual torque lower limit	SVC control parameter display.	-300.00–300.00	0.00%	●
P22.61	Weakening flux Id output value	SVC control parameter display.	-300.00–300.00	0.00%	●
P22.62	Weakening flux frequency point	SVC control parameter display.	-300.00–300.00	0.00%	●
P22.63	VDC restricted output upper limit	SVC control parameter output: overvoltage stall module output	-300.00–300.00	0.00%	●
P22.64	VDC restricted output lower limit	SVC control module output: power-down frequency falling module output	-300.00–300.00	0.00%	●
P22.65	Electromotive power restricted output	-300.00–300.00%	-300.00–300.00	0.00%	●
P22.66	Generated power restricted output	-300.00–300.00%	-300.00–300.00	0.00%	●
P22.67	Max available torque current	-300.00–300.00%	-300.00–300.00	0.00%	●

Function code	Name	Parameter description	Setting range	Default	Modify
P22.68	Feedforward Torque	-300.00–300.00%	-300.00–300.00	0.00%	●
P22.69	State Flag 1	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P22.70	State Flag 2	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P22.71	State Flag 3	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P22.72	State Flag 4	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●

Group P23—SD card configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P23.00	RTC_Year	These function codes can be used to set the system time. The system always accumulates time from the present value. and the real-time time of the system can be viewed through group P21.	Year 2022–9999	2022	○
P23.01	RTC_Month. RTC_Day		Mon Day 1.01–12.31	1.01	○
P23.02	RTC_Hour. RTC_Min		Hour Min 0.0–23.59	0.0	○
P23.03	RTC_Sec		Sec 0–59	0	○
P23.04	Enabling RTC reset	After setting the RTC time through P23.00–P23.03, you can use this function code to generate a rising edge to allow the reset system time to take effect. Set the function code to 0 and then 1 to create a rising edge.	0–1	0	○
P23.05	SD card save period	This function code specifies the saving period for the running-related parameters, including target frequency (Hz), running frequency (Hz), output voltage (V), input voltage (V), output current (A), input current (A), output power (%), and input power (%).	0.0–5.0	0.5min	○
P23.06	Reserved	-	-	-	-
P23.07	Saving SD card function codes to	0: Function code file 0 1: Function code file 1 2: Function code file 2 When the SD card function parameter copy function code is set to 1, the function codes are saved to the file specified by this function code.	0–2	0	○
P23.08	Restoring SD card function codes from	0: Function code file 0 1: Function code file 1 2: Function code file 2 When the SD card function	0–2	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		parameter copy function code is set to 2, 3, or 4, the function codes are downloaded from the file specified by this function code to the local			
P23.09	SD card function parameter copy	0: No operation 1: Local function parameters (P00–P99 and connector parameters) are uploaded to the SD card. After the upload is complete, the SD card will generate a parameter file (unreadable) and a report file (.csv); after the function code is set to 1, the SD card will save the function code configuration file (number of function code groups, number of function codes, and other information) and then the function code file. 2: Download parameters (including motor parameters) from the SD card to the local 3: Download parameters (including only non-motor parameters) from the SD card to the local address 4: Download parameters (including only motor parameters) from the SD card to the local address **Note:** After any operation among 1–4 is complete, the parameter restores to 0. The upload and download functions are not applicable to group P99.	0–4	0	◎
P23.10	Enabling no-SD-card insertion alarm	0: Disable. No alarm when no SD card inserted. 1: Enable. Alarm when no SD card inserted.	0–1	0	○
P23.11	SD card state feedback	Bit0: When the system powers up, if the SD card is not inserted or the SD card is invalid, the value is 1. Bit1: SD card initialization successful, waiting for SD card operation Bit2: SD card reading failed Bit3: SD card writing failed Bit4: File opening failed Bit5: File creation failed Bit6: SD card last operation	0x0000–0x3FFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
		successful Bit7: Less than 2G of space left Bit8: Save function code configuration file - end of execution Bit9: Save function code configuration file - disallow saving the configuration file Bit10: Save function code to SD card - end of execution Bit11: Save function code to SD card - state of disabling parameter copy Bit12: Restore function code from SD card - end of execution Bit12: Restore function code from SD card - state of disabling function code restoring			

Group P24—Parameter display setting

Function code	Name	Parameter description	Setting range	Default	Modify
P24.00	Output current filter time	0.000–10.000s	0.000–10.000	0.050s	○
P24.01	Output torque filter time	0.000–10.000s	0.000–10.000	0.500s	○
P24.02	Output power filter time	0.000–10.000s	0.000–10.000	0.500s	○
P24.03	Bus voltage filter time	0.000–10.000s	0.000–10.000	0.010s	○
P24.04	Output voltage filter time	0.000–10.000s	0.000–10.000	0.500s	○
P24.05	Running frequency filter time (reserved)	0.000–10.000s	0.000–10.000	0.500s	○
P24.06	Running rotation speed filter time (reserved)	0.000–10.000s	0.000–10.000	0.500s	○
P24.07	Linear speed display coefficient	Linear speed = Mechanical rotation speed * Rotational speed display coefficient	0.1–999.9	1.0	○
P24.08	Selection of parameters displayed in stopped state	Bit 0: Set frequency (Hz on, blinking slowly) Bit 1: Bus voltage (V on) Bit 2: Input terminal status Bit 3: Output terminal status Bit 4: PID reference value (% blinking)	0x0000–0xFFFF	0x000F	○

Function code	Name	Parameter description	Setting range	Default	Modify
		Bit 5: PID feedback value (% on) Bit 6: Set torque (% on) Bit 7: AI1 value (V on) Bit 8: AI2 value (V on) Bit 9: High-speed pulse HDI1 frequency Bit 10: High-speed pulse HDI2 frequency Bit 11: Actual step of multi-step speed Bit 12–Bit 15: Reserved			
P24.09	Selection 1 of parameters displayed in running state	Bit 0: Running frequency (Hz on) Bit 1: Set frequency (Hz blinking) Bit 2: Bus voltage (V on) Bit 3: Output voltage (V on) Bit 4: Output current (A on) Bit 5: Running speed (rpm on) Bit 6: Output power (% on) Bit 7: Output torque (% on) Bit 8: PID reference value (% blinking) Bit 9: PID feedback value (% on) Bit 10: Input terminal status Bit 11: Output terminal status Bit 12: Set torque (% on) Bit 13–Bit 14: Reserved Bit 15: Actual step of multi-step speed	0x0000–0xFFFF	0x003F	○
P24.10	Selection 2 of parameters displayed in running state	Bit 0: AI1 value (V on) Bit 1: AI2 value (V on) Bit 2: High-speed pulse HDI1 frequency Bit 3: High-speed pulse HDI2 frequency Bit 4: Motor overload percentage (% on) Bit 5: VFD overload percentage (% on) Bit 6: Ramp frequency reference (Hz on) Bit 7: Linear speed Bit 8–Bit 15: Reserved	0x0000–0xFFFF	0x0000	○
P24.11	Motor parameter display selection	0: Only display the parameters of the currently selected motor type (parameters of AMs or SMs). 1: Display all motor parameters.	0–1	0	○
P24.12	Frequency display decimal places	0: None 1: One 2: Two	0–2	2	○

Function code	Name	Parameter description	Setting range	Default	Modify
		This variable is displayed on the keypad main page after P24.09 bit 0 is effective.			
P24.13	Linear speed display decimal places	0: None 1: One By pressing the SHIFT key, this variable is displayed on the keypad main page after P24.10 bit 7 is effective.	0–1	0	○
P24.14	Keypad main page display frequency	0: Display actual running frequency 1: Display ramp reference frequency	0–1	1	○
P24.15	Motor power display calibration coefficient	Used to adjust the power display value of motor 1. However, it does not affect the control performance of the VFD.	0.00–3.00	1.00	○
P24.16–P24.29	Reserved	-	-	-	-
P24.30	Set DSPmap address 1	0–65535	0–65535	0	○
P24.31	Set DSPmap address 2	0–65535	0–65535	0	○
P24.32	Set DSPmap address 3	0–65535	0–65535	0	○
P24.33	Set DSPmap address 4	0–65535	0–65535	0	○
P24.34	Set DSPmap address 5	0–65535	0–65535	0	○
P24.35	Set DSPmap address 6	0–65535	0–65535	0	○
P24.36	Set DSPmap address 7	0–65535	0–65535	0	○
P24.37	Set DSPmap address 8	0–65535	0–65535	0	○
P24.38	Displayed map address area data 1	0–65535	0–65535	0	○
P24.39	Displayed map address area data 2	0–65535	0–65535	0	○
P24.40	Displayed map address area data 3	0–65535	0–65535	0	○
P24.41	Displayed map address area data 4	0–65535	0–65535	0	○
P24.42	Displayed map address area data 5	0–65535	0–65535	0	○
P24.43	Displayed map address area data 6	0–65535	0–65535	0	○
P24.44	Displayed map	0–65535	0–65535	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
	address area data 7				
P24.45	Displayed map address area data 8	0–65535	0–65535	0	○

Group P29—Friction compensation

Function code	Name	Parameter description	Setting range	Default	Modify
P29.00	Enabling tension control (Reserved)	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	◎
P29.01	RFG feedforward torque coefficient	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	◎
P29.02	Inertia identification torque	Inertia identification torque (used during rotation inertia autotuning).	0.0–100.0	10.0%	○
P29.03	Enabling inertia compensation	0: Disable 1: Enable	0–1	0	○
P29.04	Upper limit of inertia compensation torque	0.0–150.0%	0.0–150.0	10.0%	○
P29.05	Inertia compensation filter times	0–10	0–10	7	○
P29.06	Inertia compensation torque	0.0–100.0%	0.0–100.0	10.0%	○
P29.07	Enabling friction torque compensation	0: Disable 1: Enable	0–1	0	○
P29.08	Friction torque compensation 1 frequency setting	0.50%–P09.02	0.50–P09.02	10.00%	○
P29.09	Friction torque compensation 2 frequency setting	0.50%–P09.02	0.50–P09.02	20.00%	○
P29.10	Friction torque compensation 3 frequency setting	0.50%–P09.02	0.50–P09.02	20.00%	○
P29.11	Friction torque compensation 4 frequency setting	0.50%–P09.02	0.50–P09.02	40.00%	○
P29.12	Friction torque compensation 5 frequency setting	0.50%–P09.02	0.50–P09.02	50.00%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P29.13	Friction torque compensation 6 frequency setting	0.50%–P09.02	0.50–P09.02	60.00%	○
P29.14	Friction torque compensation 7 frequency setting	0.50%–P09.02	0.50–P09.02	70.00%	○
P29.15	Friction torque compensation 8 frequency setting	0.50%–P09.02	0.50–P09.02	80.00%	○
P29.16	Friction torque compensation 9 frequency setting	0.50%–P09.02	0.50–P09.02	90.00%	○
P29.17	Friction torque compensation 10 frequency setting	0.50%–P09.02	0.50–P09.02	100.00%	○
P29.18	Friction torque compensation 1 torque setting	0.00–100.00%	0.00–100.00	0.00%	○
P29.19	Friction torque compensation 2 torque setting	0.00–100.00%	0.00–100.00	0.00%	○
P29.20	Friction torque compensation 3 torque setting	0.00–100.00%	0.00–100.00	0.00%	○
P29.21	Friction torque compensation 4 torque setting	0.00–100.00%	0.00–100.00	0.00%	○
P29.22	Friction torque compensation 5 torque setting	0.00–100.00%	0.00–100.00	0.00%	○
P29.23	Friction torque compensation 6 torque setting	0.00–100.00%	0.00–100.00	0.00%	○
P29.24	Friction torque compensation 7 torque setting	0.00–100.00%	0.00–100.00	0.00%	○
P29.25	Friction torque compensation 8 torque setting	0.00–100.00%	0.00–100.00	0.00%	○
P29.26	Friction torque compensation 9 torque setting	0.00–100.00%	0.00–100.00	0.00%	○
P29.27	Friction torque compensation 10 torque setting	0.00–100.00%	0.00–100.00	0.00%	○
P29.28	Friction torque compensation value display	0.00–100.00%	0.00–100.00	0.00%	●

Function code	Name	Parameter description	Setting range	Default	Modify
P29.29–P29.30	Reserved	-	-	-	-

Group P30—Master/slave control

Function code	Name	Parameter description	Setting range	Default	Modify
P30.00	Enabling master/slave	0: Disable. This function code is set to 0 when the system does not implement master/slave; and it can be set to 0 to bypass the local device if the local device fails in master/slave control. 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P30.01	Master/slave setting	0: Master 1: Slave 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P30.02	Local ID display	0: Master	0–15	0	●
P30.03	Master/slave role display	Used to display the value of P30.01. 0: Master 1: Slave	0–1	0	●
P30.04	Master/slave system node state 1	Bit1bit0: Master status (00: Power off; 01: Ready; 10: Running; 11: Fault) Bit3bit2: Slave 1 status Bit5bit4: Slave 2 status Bit7bit6: Slave 3 status Bit9bit8: Slave 4 status Bit11bit10: Slave 5 status Bit13bit12: Slave 6 status Bit15bit14: Slave 7 status	0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
P30.05	Master/slave system node state 2	Bit1bit0: Slave 8 status Bit3bit2: Slave 9 status Bit5bit4: Slave 10 status Bit7bit6: Slave 11 status Bit9bit8: Slave 12 status Bit11bit10: Slave 13 status Bit13bit12: Slave 14 status Bit15bit14: Slave 15 status	0x0000–0xFFFF	0x0000	●
P30.06	Local sent data 0 source	0: 0 1: Digital (0–65535) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B **Note:** Status information for each master and slave is automatically transmitted to each other and does not need to be set separately.	0–10	2 (30.36)	○
P30.07	Local sent data 1 source		0–10	2 (21.02)	○
P30.08	Local sent data 2 source		0–10	2 (21.28)	○
P30.09	Local sent data 3 source		0–10	2 (21.00)	○
P30.10	Local sent data 4 source		0–10	2 (21.00)	○
P30.11	Local sent data 5 source		0–10	2 (21.00)	○
P30.12	Local sent data 6 source		0–10	2 (21.00)	○
P30.13	Local sent data 7 source		0–10	2 (21.00)	○
P30.14	Local sent data 8 source		0–10	2 (21.00)	○
P30.15	Local sent data 9 source		0–10	2 (21.12)	○
P30.16	Local received data 0 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00	○
P30.17	Local received data 1 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00	○
P30.18	Local received data 2 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00	○
P30.19	Local received data 3 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00	○
P30.20	Local received data 4 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00	○
P30.21	Local received data 5 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00	○
P30.22	Local received data 6 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00	○

Function code	Name	Parameter description	Setting range	Default	Modify
P30.23	Local received data 7 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00	○
P30.24	Local received data 8 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00	○
P30.25	Local received data 9 regulation coefficient	-100.00–100.00	-100.00–100.00	1.00	○
P30.26	Local received data 0 display	Master received data 0 display = Master received data 0 physical value * Master received data 0 regulation coefficient **Note:** P30.26–P30.30 can only display positive numbers, while P30.31–P30.35 can display both positive and negative numbers. You can choose which will be used based on the sign of the data received and the sign of the coefficients.	0x0000–0xFFFF	0x0000	●
P30.27	Local received data 1 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P30.28	Local received data 2 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P30.29	Local received data 3 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P30.30	Local received data 4 display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P30.31	Local received data 5 display	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P30.32	Local received data 6 display	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P30.33	Local received data 7 display	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P30.34	Local received data 8 display	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P30.35	Local received data 9 display	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P30.36	Slave CW source display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P30.37	Reserved	-	-	-	-
P30.38	Slave run mode display	0: Non-slave mode 1: Slave speed mode 2: Slave torque mode 3: Slave speed deviation and torque limit mode 4: Slave speed-loop P mode	0–4	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
		Change according to the settings of P30.49.			
P30.39	Master/slave proportional coefficient P1	0.000–65.535	0.000–65.535	0.050	○
P30.40	Master/slave integral coefficient I1	0.00s–655.35s	0.00–655.35	5.00s	○
P30.41	Master/slave PI switching low-point frequency	0.00Hz–P30.44	0.00–P30.44	5.00Hz	○
P30.42	Master/slave proportional coefficient P2	0.000–65.535	0.000–65.535	0.050	○
P30.43	Master/slave integral coefficient I2	0.0–50.0	0.0–50.0	5.0	○
P30.44	Master/slave PI switching high-point frequency	P30.41–P09.02	P30.41–P09.02	10.00Hz	○
P30.45	PI control deviation limit	0.0–80.0%	0.0–80.0	0.0%	○
P30.46	Deviation lower limit in PI integral enabling	0.0–100.0%	0.0–100.0	0.0%	○
P30.47	Master/slave pre-exciting state display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P30.48	Slave fault handling	0: Report a fault, and both the master and slave stop. 1: After a slave failure, the master alarms but continues to run. After a master failure, all master and slave devices fail and stop. 2: Ignore. After a slave failure, the master continues to run. After a master failure, all master and slave devices fail and shut down.	0–2	0	○
P30.49	Master/slave function one-click macro	0: Invalid 1: One click macro for master speed control 2: One click macro for slave speed control 3: One click macro for slave torque control 4: One click macro for slave speed deviation torque limiting control 5: One click macro for slave speed P	0–5	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		+ master speed PI control Set this function code to enable one-click configuration of the master and slave control related function codes. When the system is used as the master, the function code is set to 1 or 3, enabling one-click configuration of the master related function codes; when the system is used as a slave, the function code is set to 2, enabling one-click configuration of slave related function codes. After the configuration is completed, this function code is automatically restored to 0. The details are as follows. **0: Invalid** **1: One click macro for master speed control** The macro function code settings are as follows: P30.00=1 (Enabling master/slave) P30.01=0 (Master/slave mode) P30.06=2 (P30.36); control word 1 sent from the local to slave P30.07=2 (P21.03); ramp speed percentage sent from the local P30.08=2 (P21.28); Q-axis current reference sent from the local P30.09=2 (P21.12); output torque sent from the local, used for forward limiting P30.15=2 (P21.12); output torque sent from the local, used for reverse limiting P30.16=1.00 (the system restores to default settings) P30.17=1.00 (the system restores to default settings) P30.18=1.00 (the system restores to default settings) P30.19=1.00 (the system restores to default settings) P30.20=1.00 (the system restores to default settings) P30.21=1.00 (the system restores to default settings)			

Function code	Name	Parameter description	Setting range	Default	Modify
		P30.22=1.00 (the system restores to default settings) P30.23=1.00 (the system restores to default settings) P30.24=1.00 (the system restores to default settings) P30.25=1.00 (the system restores to default settings) P10.00/P11.00/P12.00/P13.00=2 (VF control) P10.01/P11.01/P12.01/P13.01=0 (speed mode) P00.00=0 (Channel 1) P00.01=1 (Keypad set frequency, frequency setting restored to default) P00.28=0 (Ramp not bypassed) P02.01=0 (Keypad sets start/stop) **2: One click macro for slave speed control** The macro function code settings are as follows: P30.00=1 (Enabling master/slave) P30.01=1 (Slave mode) P30.06=2 (P30.26); slave forwards received variables P30.07=2 (P30.27); slave forwards received variables P30.08=2 (P30.28); slave forwards received variables P30.09=2(P30.29); slave forwards received variables P30.10=2(P30.30); slave forwards received variables P30.11=2(P30.31); slave forwards received variables P30.12=2(P30.32); slave forwards received variables P30.13=2(P30.33); slave forwards received variables P30.14=2(P30.34); slave forwards received variables P30.15=2(P30.35); slave forwards received variables P30.16=1.00 (the system restores to default settings) P30.17=1.00 (the system restores to default settings)			

Function code	Name	Parameter description	Setting range	Default	Modify
		P30.18=1.00 (the system restores to default settings) P30.19=1.00 (the system restores to default settings) P30.20=1.00 (the system restores to default settings) P30.21=1.00 (the system restores to default settings) P30.22=1.00 (the system restores to default settings) P30.23=1.00 (the system restores to default settings) P30.24=1.00 (the system restores to default settings) P30.25=1.00 (the system restores to default settings) P10.00/P11.00/P12.00/P13.00=2 (VF control) P10.01/P11.01/P12.01/P13.01=0 (speed mode) P00.00=0 (Channel 1) P00.28=1 (Ramp bypassed) P01.01=0; Slave starting frequency set to 0 P00.01=2 (P30.27); the connector sets the frequency, coming from master/slave received data 1 P02.01=2 (P30.26); the connector sets the start and stop, coming from master/slave received data 0 **3: One click macro for slave torque control** The macro function code settings are as follows: P30.00=1 (Enabling master/slave) P30.01=1 (Slave mode) P30.06=2 (P30.26); slave forwards received variables P30.07=2 (P30.27); slave forwards received variables P30.08=2 (P30.28); slave forwards received variables P30.09=2(P30.29); slave forwards received variables P30.10=2(P30.30); slave forwards received variables P30.11=2(P30.31); slave forwards received variables			

Function code	Name	Parameter description	Setting range	Default	Modify
		P30.12=2(P30.32); slave forwards received variables P30.13=2(P30.33); slave forwards received variables P30.14=2(P30.34); slave forwards received variables P30.15=2(P30.35); slave forwards received variables P30.16=1.00 (the system restores to default settings) P30.17=1.00 (the system restores to default settings) P30.18=1.00 (the system restores to default settings) P30.19=1.00 (the system restores to default settings) P30.20=1.00 (the system restores to default settings) P30.21=1.00 (the system restores to default settings) P30.22=1.00 (the system restores to default settings) P30.23=1.00 (the system restores to default settings) P30.24=1.00 (the system restores to default settings) P30.25=1.00 (the system restores to default settings) P10.00/P11.00/P12.00/P13.00=1 (Vector 1 control) P10.01/P11.01/P12.01/P13.01=1 (Torque mode) P00.00=0 (Channel 1) P00.28=0 (Ramp not bypassed) P01.01=0 (Slave starting frequency set to 0) P02.01=2 (P30.26); the connector sets the start and stop, coming from master/slave received data 0 P09.04=2 (P30.27); the connector sets the forward run rotation frequency upper limit, coming from master/slave received data 1 P09.05=2 (P30.27); the connector sets the reverse run rotation frequency upper limit, coming from master/slave received data 1 P00.04=2 (P30.28); the connector			

Function code	Name	Parameter description	Setting range	Default	Modify
		sets the torque, coming from master/slave received data 2 **4: One click macro for slave speed deviation torque limiting control** The macro function code settings are as follows: P30.00=1 (Enabling master/slave) P30.01=1 (Slave mode) P30.06=2 (P30.26); slave forwards received variables P30.07=2 (P30.27); slave forwards received variables P30.08=2 (P30.28); slave forwards received variables P30.09=2(P30.29); slave forwards received variables P30.10=2(P30.30); slave forwards received variables P30.11=2(P30.31); slave forwards received variables P30.12=2(P30.32); slave forwards received variables P30.13=2(P30.33); slave forwards received variables P30.14=2(P30.34); slave forwards received variables P30.15=2(P30.35); slave forwards received variables P30.16=1.00 (the system restores to default settings) P30.17=1.00 (the system restores to default settings) P30.18=1.00 (the system restores to default settings) P30.19=1.00 (the system restores to default settings) P30.20=1.00 (the system restores to default settings) P30.21=1.00 (the system restores to default settings) P30.22=1.00 (the system restores to default settings) P30.23=1.00 (the system restores to default settings) P30.24=1.00 (the system restores to default settings) P30.25=-1.00; received data 9 conversion coefficient set to -1.00			

Function code	Name	Parameter description	Setting range	Default	Modify
		P10.00/P11.00/P12.00/P13.00=2 (VF control) P10.01/P11.01/P12.01/P13.01=0 (speed mode) P00.28=1 (Ramp bypassed) P00.00=0 (Channel 1) P02.01=2 (P30.26); the connector sets the start and stop, coming from master/slave received data 0 P00.01=2 (P30.27); the connector sets the frequency, coming from master/slave received data 1 P09.06=2 (P30.28); the connector sets the torque limit, coming from master/slave received data 3 P09.07=2 (P30.35); the connector sets the torque limit, coming from master/slave received data 9, negative torque **5: One click macro for slave speed P + master speed PI control** The macro function code settings are as follows: P30.00=1 (Enabling master/slave) P30.01=1 (Slave mode) P30.06=2 (P30.26); slave forwards received variables P30.07=2 (P30.27); slave forwards received variables P30.08=2 (P30.28); slave forwards received variables P30.09=2(P30.29); slave forwards received variables P30.10=2(P30.30); slave forwards received variables P30.11=2(P30.31); slave forwards received variables P30.12=2(P30.32); slave forwards received variables P30.13=2(P30.33); slave forwards received variables P30.14=2(P30.34); slave forwards received variables P30.15=2(P30.35); slave forwards received variables P30.16=1.00 (the system restores to default settings) P30.17=1.00 (the system restores to			

Function code	Name	Parameter description	Setting range	Default	Modify
		default settings) P30.18=1.00 (the system restores to default settings) P30.19=1.00 (the system restores to default settings) P30.20=1.00 (the system restores to default settings) P30.21=1.00 (the system restores to default settings) P30.22=1.00 (the system restores to default settings) P30.23=1.00 (the system restores to default settings) P30.24=1.00 (the system restores to default settings) P30.25=-1.00; received data 9 conversion coefficient set to -1.00 P10.00=0 (Vector control) P10.01=0 (Speed mode) P00.28=1 (Ramp bypassed) P00.00=0 (Channel 1) P02.01=2 (P30.26); the connector sets the start and stop, coming from master/slave received data 0 P00.01=2 (P30.27); the connector sets the frequency, coming from master/slave received data 1 P30.37=2 (P30.29); the connector speed integral comes from master/slave received data 3			

Group P31—Brake control

Function code	Name	Parameter description	Setting range	Default	Modify
P31.00	Brake function selection	0: No holding brake 1: Enabling the holding brake function (shutting down overvoltage stall and current limiting)	0–1	0	◎
P31.01	Brake state display	Displays the status word for the mechanical brake. Bit0: Brake-closing speed reached Bit1: Forcible brake-closing command is valid Bit2: Brake feedback; brake feedback signal "1" indicates that the brake release feedback is	0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
		normal and "0" indicates that the brake closing feedback is normal. Bit3: Brake release speed reached Bit4: Brake release torque verification passed Bit5: Forcible brake release command is valid Bit6: Brake release command is valid Bit7: Brake-closing command has been sent; "1" indicates brake closing, "0" indicates brake release Bit8: Brake release command has been sent; "1" indicates brake release, "0" indicates brake closing Bit9: Brake status after brake release/closing delay; "1" indicates the brake release state, "0" indicates the brake closing state			
P31.02	Brake feedback enabling source	0: Invalid 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P31.03	Brake feedback source	0: Brake feedback opening signal (brake closed state) 1: Brake feedback closing signal (brake opened state) 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P31.04	Brake feedback detection time	0.10–10.00s	0.10–10.00	0.20s	○
P31.05	Brake closing speed source	0: 0 1: Digital (0.00–P09.02) 2: Other-C connector (Running	0–10	2	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		speed percentage specified by P21.02) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P31.06	Brake closing speed display	0.00%–P09.02 Displays the actually activated brake closing speed, determined by P31.04.	0.00–P09.02	0.00%	●
P31.07	Brake closing speed threshold setting	0.00%–P09.02 Specifies the brake closing speed threshold. It is set in the motor control parameter group, with the value switched by motor. The value must be greater than the starting frequency specified by P01.01; otherwise, the set brake closing delay is invalid.	0.00–P09.02	0.00%	●
P31.08	Delay before brake closing	0.00–10.00s	0.00–10.00s	0.00s	○
P31.09	Forced brake closing command source	0: Invalid 1: Force brake closing 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P31.10	Delay after brake closing	0.00–10.00s	0.00–10.00s	0.00s	○
P31.11	Brake closing torque memory value	Displays the torque (in percentage) when the last brake closing command was sent. This value can be used as a given value for the release torque, switchable by motor.	0.00–300.00	0.00%	●
P31.12–P31.14	Reserved	-	-	-	-
P31.15	Brake release speed source	0: 0 1: Digital (0.00–P09.02)	0–10	2	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B This function code is used to select the source of the motor real-time speed, which can be the ramp reference frequency or the actual running frequency, and the real-time speed is compared with P31.17 (Release speed setting) to determine whether the release speed is reached.			
P31.16	Brake release speed display	0.00%–P09.02 Displays the brake release speed actually activated. It is determined by P31.15 (Brake release speed source).	0.00–P09.02	0.00%	●
P31.17	Brake release speed threshold display	0.00%–P09.02 Specifies the brake release speed threshold. It is set in the motor control parameter group, with the value switched by motor. **Note:** The VFD does not start if the brake release threshold is below the starting frequency.	0.00–P09.02	0.00%	●
P31.18	Enabling brake release torque verification	0: Invalid 0: Enable	0–1	1	◎
P31.19	Reserved	-	-	-	-
P31.20	Brake release torque threshold display	0.00–300.00% This function code sets the source of torque during brake release. Check whether the brake release torque is reached by comparing the motor actual torque with the torque value set by this function code. **Note:** In open-loop control, the torque verification is determined by comparing the output current with the value set by the function code; in closed-loop control, the	0.00–300.00	30.00%	●

Function code	Name	Parameter description	Setting range	Default	Modify
		torque verification is determined by comparing the output torque filtered value with the value set by the function code. It is optional but not limited to P31.10 brake closing torque memory value; current for open loop, while torque for closed loop.			
P31.21	Delay before brake release	0.00–10.00s	0.00–10.00	0.00s	○
P31.22	Brake release command source	0: Invalid 1: Brake release 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P31.23	Forced brake release command source	0: Invalid 1: Forced brake release 2: Other-B connector (0.00–99.99) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	◎
P31.24	Delay after brake release	0.00–10.00s	0.00–10.00	0.00s	○
P31.25	Enabling forward torque	0: Invalid 1: Enable When the function is enabled: if open loop vector or V/F control is activated, the speed mode is used in the full process. For reverse rotation in this mode, special handling is made, forward rotation before brake release, while reverse rotation after brake release. If closed-loop vector control is activated, torque mode is run first, and the speed mode is automatically used when torque	0–1	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		verification passes.			
P31.26	Reserved	-	-	-	-
P31.27	Display of torque limit value before brake release	When the holding brake function is enabled, this torque limit starts from the VFD startup until the delay after the brake release ends. When the holding brake function is enabled, this value can be used for torque output limit before brake release, while the limit is canceled after brake release. It is set in the motor control parameter group, with the value switched by motor.	0.00–300.00	0.00%	●
P31.28	Torque verification timeout time	If the torque verification is enabled but not passed, the timer starts after the inverter is started; if the time exceeds the timeout specified by this function code, the inverter stops and reports the torque verification timeout fault.	0.01–60.00	1.00s	○
P31.29–P31.33	Reserved	-	-	-	-
P31.34	Anti-snag quick stop mode	0: Use OFF 3 to quickly stop at the designated time. 1: According to the setting of this group, output braking torque for stop.	0–1	0	○
P31.35	Electric braking output torque	0.00–300.00%	0.00–300.00%	180.00%	○
P31.36	Braking torque ACC time	0.000–9.000s	0.000–9.000s	1.000s	○
P31.37	Braking torque end frequency	0.00–30.00Hz	0.00–30.00Hz	0.10Hz	○
P31.38	Apply time of electric braking for quick stop	0.00–20.00s	0.00–20.00s	2.00s	○
P31.39	Reserved	-	-	-	-
P31.40	Zero servo protection mode	0: Disable zero servo 1: Zero servo input slows down 2: Zero servo input is always valid (keep running at zero speed) 3: Keep the zero speed (with the duration set through P31.45) and then enter the slow lowering mode The zero servo function needs to be used in closed-loop vector control	0–3	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		(P10.00=3). During stop, the VFD checks whether the pulse value is greater than P31.41. If yes, the VFD reports the brake failure alarm. After the brake failure alarm protection input delay specified by P31.42 (if the pulse value is greater than triple the zero servo tolerance pulse threshold specified by P31.42 within the period, the delay specified by P31.42 is skipped), if P31.40=1 (Zero servo input slows down), the VFD runs downward slowly at the frequency specified by P31.43, and it coasts to stop when the slow lowering hold time specified by P31.44 is reached. Then the VFD performs detection again and repeats the preceding steps, which are cyclical. If P31.40=3, the hold time is specified by P31.45. When the set time is reached, the zero servo input slows down. In zero servo mode, common faults can be automatically reset.			
P31.41	Zero servo tolerance pulse threshold	0–60000	0–60000	20000	○
P31.42	Brake failure alarm protection input delay	After this delay, protection is put into service.	0.000–20.000	0.500s	○
P31.43	Slow lowering running frequency	Brake failure protection frequency	P31.17-20.00	8.00%	○
P31.44	Slow lowering hold time	0.0–30.0s	0.0–30.0	2.0s	○
P31.45	Zero-servo zero-speed hold time	0–60s (min)	0–60	10s	○
P31.46	Brake failure alarm protection reset method	0: Only for downward running 1: Both for upward and downward running	0–1	0	○
P31.47	Brake control method	0: Ramp pausing method 1: Target frequency modifying method	0–1	1	◎
P31.48	Brake feedback fault handling	0: Report a fault 1: Report an alarm 2: Ignore	0–2	1	○

Function code	Name	Parameter description	Setting range	Default	Modify
P31.49	Brake function one-click macro	0: Invalid 1: Brake function one-click macro The macro function code settings are as follows: P06.04= 5; brake output to RO1 P31.02=1; brake feedback enabled P31.03=3; brake feedback comes from DI1 P31.22=4; brake release command comes from DI2 P31.00=1; brake enabled	0–1	0	◎

Group P33—Blackbox channel configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P33.00	Blackbox channel 1 selection	0: 0 1: Digital (0–65535) 2: Other-C connector (0.00–99.99) 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B Customize additional data that is required in the event of a fault. Up to 512 data records can be saved to the SD card and FLASH at a 0.5ms cycle. If you select the option of reading fault oscilloscope on the upper computer oscilloscope page, the channel is set to so that the data stored on the SD card can be displayed in waveform on the upper computer. The upper computer oscilloscope channel name can be dynamically obtained through the set index of the function code.	0–10	2 (21.00)	○
P33.01	Blackbox channel 2 selection		0–10	2 (21.01)	○
P33.02	Blackbox channel 3 selection		0–10	2 (21.04)	○
P33.03	Blackbox channel 4 selection		0–10	2 (21.05)	○
P33.04	Blackbox channel 5 selection		0–10	2 (21.07)	○
P33.05	Blackbox channel 6 selection		0–10	2 (21.09)	○
P33.06	Blackbox channel 7 selection		0–10	2 (21.10)	○
P33.07	Blackbox channel 8 selection		0–10	2 (22.43)	○
P33.08	Blackbox channel 9 selection		0–10	2 (22.44)	○
P33.09	Blackbox channel 10 selection		0–10	2 (22.45)	○

Group P34—MOP

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P34.00</td><td>MOP function selection</td><td>0: Disable
1: Clear at power off
2: Memorize at power off</td><td>0–2</td><td>1</td><td>◎</td></tr>
<tr><td>P34.01</td><td>MOP initial value</td><td>Initial value after power-on. This function code is valid when the power-off clear function is selected. If the power-off memorizing function is selected, the initial value of the MOP is the value before the power-off.</td><td>-600.0–600.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P34.02</td><td>MOP ramp time</td><td>Time taken for the output to increase from 0% to 100% or decrease from 100% to 0%.</td><td>0.1–100.0</td><td>10.0s</td><td>○</td></tr>
<tr><td>P34.03</td><td>MOP min. value</td><td>MOP output lower limit.</td><td>-600.0–P34.04</td><td>-100.0%</td><td>○</td></tr>
<tr><td>P34.04</td><td>MOP max value</td><td>MOP output upper limit.</td><td>P34.03-600.0</td><td>100.0%</td><td>○</td></tr>
<tr><td>P34.05</td><td>MOP increase source</td><td rowspan="3">0: 0 (ineffective)
1: 1(effective)
2: Other-B connector (0.00–99.99)
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
The output increases or decreases at a set rate when the increase or decrease is effective; and the MOP output remains constant when the increase and decrease are both effective or ineffective.
MOP forced command source: The forced value is not effective until the forced command is valid.</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P34.06</td><td>MOP decrease source</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P34.07</td><td>MOP forced command source</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P34.08</td><td>MOP forced value source</td><td>0: 0
1: Digital (-600.0–600.0%, 0.0%)
2: Other-C connector (0.00–99.99)
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: Reserved
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
P34.09	MOP reset command source	MOP reset triggered at the rising edge. The reset value is determined by the function code. 0: 0 1: 1 2: Other-B connector (effective at 0->1) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P34.10	MOP reset value source	0: 0 1: Digital (-600.0–600.0%, 0.0%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P34.11	MOP output display	-600.0–600.0%	-600.0–600.0	0.0%	●

Group P35—Multi-step speed control

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P35.00</td><td>Multi-step selection bit 0</td><td rowspan="4">0: 0
1: 1
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
<table><tr><th>Bit3</th><th>Bit2</th><th>Bit1</th><th>Bit0</th><th>Multi-step speed run</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>Multi-step speed 0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>Multi-step speed 1</td></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td><td>Multi-step speed 2</td></tr></table></td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P35.01</td><td>Multi-step selection bit 1</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P35.02</td><td>Multi-step selection bit 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P35.03</td><td>Multi-step selection bit 3</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>0</td><td>0</td><td>1</td><td>1</td><td>Multi-step speed 3</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>0</td><td>Multi-step speed 4</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>1</td><td>Multi-step speed 5</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>0</td><td>Multi-step speed 6</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>1</td><td>Multi-step speed 7</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>0</td><td>Multi-step speed 8</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>1</td><td>Multi-step speed 9</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>0</td><td>Multi-step speed 10</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>1</td><td>Multi-step speed 11</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>0</td><td>Multi-step speed 12</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>1</td><td>Multi-step speed 13</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>0</td><td>Multi-step speed 14</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>1</td><td>Multi-step speed 15</td></tr>
</table>
</td><td></td><td></td><td></td></tr>
<tr><td>P35.04</td><td>Step-speed giving method</td><td>0: Terminal. The present number of steps in multi-step speed running is determined by setting bit 0–bit 3.
1: Analog. The present number of steps in multi-step speed running is determined by the analogue input and the setting of P35.22–P35.37.</td><td>0–1</td><td>0</td><td>○</td></tr>
<tr><td>P35.05</td><td>Multi-step speed 0</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.06</td><td>Multi-step speed 1</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.07</td><td>Multi-step speed 2</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.08</td><td>Multi-step speed 3</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.09</td><td>Multi-step speed 4</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.10</td><td>Multi-step speed 5</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.11</td><td>Multi-step speed 6</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.12</td><td>Multi-step speed 7</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.13</td><td>Multi-step speed 8</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.14</td><td>Multi-step speed 9</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.15</td><td>Multi-step speed 10</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.16</td><td>Multi-step speed 11</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.17</td><td>Multi-step speed 12</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.18</td><td>Multi-step speed 13</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.19</td><td>Multi-step speed 14</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.20</td><td>Multi-step speed 15</td><td>-100.0–100.0%</td><td>-100.0–100.0</td><td>0.0%</td><td>○</td></tr>
<tr><td>P35.21</td><td>Multi-step speed input source</td><td>0: AI1
1: AI2
<table>
<tr><th>AI input range</th><th>Multi-step speed run</th></tr>
<tr><td>AI≤P35.22</td><td>Multi-step 0 (P35.05)</td></tr>
<tr><td>P35.22<AI≤P35.23</td><td>Multi-step 1 (P35.06)</td></tr>
</table>
</td><td>0–1</td><td>0</td><td>○</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
		P35.23<AI≤P35.24 | Multi-step 2 (P35.07) P35.24<AI≤P35.25 | Multi-step 3 (P35.08) P35.25<AI≤P35.26 | Multi-step 4 (P35.09) P35.26<AI≤P35.27 | Multi-step 5 (P35.10) P35.27<AI≤P35.28 | Multi-step 6 (P35.11) P35.28<AI≤P35.29 | Multi-step 7 (P35.12) P35.29<AI≤P35.30 | Multi-step 8 (P35.13) P35.30<AI≤P35.31 | Multi-step 9 (P35.14) P35.31<AI≤P35.32 | Multi-step 10 (P35.15) P35.32<AI≤P35.33 | Multi-step 11 (P35.16) P35.33<AI≤P35.34 | Multi-step 12 (P35.17) P35.34<AI≤P35.35 | Multi-step 13 (P35.18) P35.35<AI≤P35.36 | Multi-step 14 (P35.19) P35.36<AI≤P35.37 | Multi-step 15 (P35.20)			
P35.22	Analog quantity to step 0	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.23	Analog quantity to step 1	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.24	Analog quantity to step 2	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.25	Analog quantity to step 3	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.26	Analog quantity to step 4	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.27	Analog quantity to step 5	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.28	Analog quantity to step 6	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.29	Analog quantity to step 7	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.30	Analog quantity to step 8	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.31	Analog quantity to step 9	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.32	Analog quantity to step 10	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.33	Analog quantity to step 11	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.34	Analog quantity to step 12	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.35	Analog quantity to step 13	-100.0–100.0%	-100.0–100.0	0.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P35.36	Analog quantity to step 14	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.37	Analog quantity to step 15	-100.0–100.0%	-100.0–100.0	0.0%	○
P35.38	Present multi-step speed value	Displays the currently selected multi-step speed value.	-100.0–100.0	0.0%	●
P35.39	Enabling multi-step speed	0: Multi-step speed is invalid 1: Multi-step speed is valid When the multi-step speed is enabled, the target frequency is the multi-step speed setting, namely, the value of P35.38; otherwise, the target frequency is obtained through the reference configuration.	0–1	0	◎

Group P37—Bus adapter A

Function code	Name	Parameter description	Setting range	Default	Modify
P37.00	Matching bus type of bus adapter	0: Without 1: PROFIBUS-DP module 2: PROFINET IO module 3: CANopen module 4: EtherNET module 5: EtherCAT module 6: DeviceNet Module The setting of P37.00 must be different from that of P38.00, which is automatically processed in the software; if two identical cards are required, use a redundant bus. For example, if bus adapter A selects the DP module but multiple DP expansion cards are inserted into the card slots, the card with the smallest slot number will automatically be the valid expansion card; other types of cards comply with the same rule.	0–6	1	◎
P37.01	Sent PZD sign selection	Bit 0–bit 11 correspond to whether sent PZD1–PZD12 are signed. If a sent PZD is signed, the corresponding bit should be set to 1.	0x0000–0x0FFF	0x0000	○
P37.02	Sent PZD1 source	0: Digital (0–65535)	0–8	2	○
P37.03	Sent PZD2 source	1: Other-C connector	0–8	2	○
P37.04	Sent PZD3 source	2: AI1	0–8	2	○

Function code	Name	Parameter description	Setting range	Default	Modify
P37.05	Sent PZD4 source	3: AI2 4: HDI1 5: HDI2 6: Multi-step running 7: MOP 8: MOP	0–8	2	○
P37.06	Sent PZD5 source		0–8	2	○
P37.07	Sent PZD6 source		0–8	2	○
P37.08	Sent PZD7 source		0–8	2	○
P37.09	Sent PZD8 source		0–8	2	○
P37.10	Sent PZD9 source		0–8	2	○
P37.11	Sent PZD10 source		0–8	2	○
P37.12	Sent PZD11 source		0–8	2	○
P37.13	Sent PZD12 source		0–8	2	○
P37.14	Sent PZD1 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.15	Sent PZD1 conversion base value denominator	1–65535	1–65535	16384	○
P37.16	Sent PZD2 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.17	Sent PZD2 conversion base value denominator	1–65535	1–65535	16384	○
P37.18	Sent PZD3 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.19	Sent PZD3 conversion base value denominator	1–65535	1–65535	16384	○
P37.20	Sent PZD4 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.21	Sent PZD4 conversion base value denominator	1–65535	1–65535	16384	○
P37.22	Sent PZD5 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.23	Sent PZD5 conversion base value denominator	1–65535	1–65535	16384	○
P37.24	Sent PZD6 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○

Function code	Name	Parameter description	Setting range	Default	Modify
P37.25	Sent PZD6 conversion base value denominator	1–65535	1–65535	16384	○
P37.26	Sent PZD7 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.27	Sent PZD7 conversion base value denominator	1–65535	1–65535	16384	○
P37.28	Sent PZD8 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.29	Sent PZD8 conversion base value denominator	1–65535	1–65535	16384	○
P37.30	Sent PZD9 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.31	Sent PZD9 conversion base value denominator	1–65535	1–65535	16384	○
P37.32	Sent PZD10 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.33	Sent PZD10 conversion base value denominator	1–65535	1–65535	16384	○
P37.34	Sent PZD11 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.35	Sent PZD11 conversion base value denominator	1–65535	1–65535	16384	○
P37.36	Sent PZD12 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P37.37	Sent PZD12 conversion base value denominator	1–65535	1–65535	16384	○
P37.38	Received PZD1 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○

Function code	Name	Parameter description	Setting range	Default	Modify
P37.39	Received PZD1 conversion base value denominator	1–65535	1–65535	16384	○
P37.40	Received PZD2 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P37.41	Received PZD2 conversion base value denominator	1–65535	1–65535	16384	○
P37.42	Received PZD3 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P37.43	Received PZD3 conversion base value denominator	1–65535	1–65535	16384	○
P37.44	Received PZD4 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P37.45	Received PZD4 conversion base value denominator	1–65535	1–65535	16384	○
P37.46	Received PZD5 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P37.47	Received PZD5 conversion base value denominator	1–65535	1–65535	16384	○
P37.48	Received PZD6 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P37.49	Received PZD6 conversion base value denominator	1–65535	1–65535	16384	○
P37.50	Received PZD7 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○

Function code	Name	Parameter description	Setting range	Default	Modify
P37.51	Received PZD7 conversion base value denominator	1–65535	1–65535	16384	○
P37.52	Received PZD8 conversion base value numerator	0–65535 Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P37.53	Received PZD8 conversion base value denominator	1–65535	1–65535	16384	○
P37.54	Received PZD9 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P37.55	Received PZD9 conversion base value denominator	1–65535	1–65535	16384	○
P37.56	Received PZD10 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P37.57	Received PZD10 conversion base value denominator	1–65535	1–65535	16384	○
P37.58	Received PZD11 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P37.59	Received PZD11 conversion base value denominator	1–65535	1–65535	16384	○
P37.60	Received PZD12 conversion base value numerator	Received PZD data display = Received PZD * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P37.61	Received PZD12 conversion base value denominator	1–65535	1–65535	16384	○
P37.62	Sent PKW1 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.63	Sent PKW2 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
P37.64	Sent PKW3 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.65	Sent PKW4 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.66	Sent PZD1 data display	Sent PZD data display = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0x0000–0xFFFF	0x0000	●
P37.67	Sent PZD2 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.68	Sent PZD3 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.69	Sent PZD4 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.70	Sent PZD5 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.71	Sent PZD6 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.72	Sent PZD7 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.73	Sent PZD8 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.74	Sent PZD9 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.75	Sent PZD10 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.76	Sent PZD11 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.77	Sent PZD12 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.78	Received PKW1 data display	PKW physically received data	0x0000–0xFFFF	0x0000	●
P37.79	Received PKW2 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.80	Received PKW3 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.81	Received PKW4 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P37.82	Received PZD 1 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P37.83	Received PZD 2 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
P37.84	Received PZD 3 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P37.85	Received PZD 4 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P37.86	Received PZD 5 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P37.87	Received PZD 6 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P37.88	Received PZD 7 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0XFFFF	0x0000	●
P37.89	Received PZD 8 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P37.90	Received PZD 9 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P37.91	Received PZD 10 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P37.92	Received PZD 11 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P37.93	Received PZD 12 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P37.94	CW1 source	0: 0 1: Digital (0–65535, 0) 2: Other-C connector (0.00–99.99, 37.82)	0–2	2	◎
P37.95	Received PZD sign selection	Bit 0–bit 11 correspond to whether received PZD1–PZD12 are signed. If the corresponding bit is set to 1, the PZD is signed.	0x0000–0x0FFF	0x0000	○
P37.96	Received PZD1	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	○

Function code	Name	Parameter description	Setting range	Default	Modify
P37.97	Received PZD2	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	○
P37.98	Communication disconnection detection delay	0: No detection 0.00–60.00s	0.00–60.00	0.00s	○
P37.99	Communication disconnection handling	0: Report a fault 1: Report an alarm, keeping the running at the target frequency	0–1	0	○

Group P38—Bus adapter B

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P38.00</td><td>Matching bus type of bus adapter</td><td>0: Without
1: PROFIBUS-DP module
2: PROFINET IO module
3: CANopen module
4: EtherNET module
5: EtherCAT module
6: DeviceNet Module
The setting of P37.00 must be different from that of P38.00, which is automatically processed in the software; if two identical cards are required, use a redundant bus.
For example, if bus adapter B selects the PROFINET module but multiple PROFINET expansion cards are inserted into the card slots, the card with the smallest slot number will automatically be the valid expansion card; other types of cards comply with the same rule.</td><td>0–6</td><td>2</td><td>◎</td></tr>
<tr><td>P38.01</td><td>Sent PZD sign selection</td><td>Bit 0–bit 11 correspond to whether sent PZD1–PZD12 are signed. If a sent PZD is signed, the corresponding bit should be set to 1.</td><td>0x0000–0x0FFF</td><td>0x0000</td><td>○</td></tr>
<tr><td>P38.02</td><td>Sent PZD1 source</td><td rowspan="12">0: 0
1: Digital (0–65535)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP</td><td>0–8</td><td>2(P20.34)</td><td>○</td></tr>
<tr><td>P38.03</td><td>Sent PZD2 source</td><td>0–8</td><td>0</td><td>○</td></tr>
<tr><td>P38.04</td><td>Sent PZD3 source</td><td>0–8</td><td>0</td><td>○</td></tr>
<tr><td>P38.05</td><td>Sent PZD4 source</td><td>0–8</td><td>0</td><td>○</td></tr>
<tr><td>P38.06</td><td>Sent PZD5 source</td><td>0–8</td><td>0</td><td>○</td></tr>
<tr><td>P38.07</td><td>Sent PZD6 source</td><td>0–8</td><td>0</td><td>○</td></tr>
<tr><td>P38.08</td><td>Sent PZD7 source</td><td>0–8</td><td>0</td><td>○</td></tr>
<tr><td>P38.09</td><td>Sent PZD8 source</td><td>0–8</td><td>0</td><td>○</td></tr>
<tr><td>P38.10</td><td>Sent PZD9 source</td><td>0–8</td><td>0</td><td>○</td></tr>
<tr><td>P38.11</td><td>Sent PZD10 source</td><td>0–8</td><td>0</td><td>○</td></tr>
<tr><td>P38.12</td><td>Sent PZD11 source</td><td>0–8</td><td>0</td><td>○</td></tr>
<tr><td>P38.13</td><td>Sent PZD12 source</td><td>0–8</td><td>0</td><td>○</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
P38.14	Sent PZD1 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.15	Sent PZD1 conversion base value denominator	1–65535	1–65535	16384	○
P38.16	Sent PZD2 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.17	Sent PZD2 conversion base value denominator	1–65535	1–65535	16384	○
P38.18	Sent PZD3 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.19	Sent PZD3 conversion base value denominator	1–65535	1–65535	16384	○
P38.20	Sent PZD4 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.21	Sent PZD4 conversion base value denominator	1–65535	1–65535	16384	○
P38.22	Sent PZD5 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.23	Sent PZD5 conversion base value denominator	1–65535	1–65535	16384	○
P38.24	Sent PZD6 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.25	Sent PZD6 conversion base value denominator	1–65535	1–65535	16384	○
P38.26	Sent PZD7 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.27	Sent PZD7 conversion base value denominator	1–65535	1–65535	16384	○

Function code	Name	Parameter description	Setting range	Default	Modify
P38.28	Sent PZD8 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.29	Sent PZD8 conversion base value denominator	1–65535	1–65535	16384	○
P38.30	Sent PZD9 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.31	Sent PZD9 conversion base value denominator	1–65535	1–65535	16384	○
P38.32	Sent PZD10 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.33	Sent PZD10 conversion base value denominator	1–65535	1–65535	16384	○
P38.34	Sent PZD11 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.35	Sent PZD11 conversion base value denominator	1–65535	1–65535	16384	○
P38.36	Sent PZD12 conversion base value numerator	Sent PZD = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0–65535	16384	○
P38.37	Sent PZD12 conversion base value denominator	1–65535	1–65535	16384	○
P38.38	Received PZD1 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P38.39	Received PZD1 conversion base value denominator	1–65535	1–65535	16384	○
P38.40	Received PZD2 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○

Function code	Name	Parameter description	Setting range	Default	Modify
P38.41	Received PZD2 conversion base value denominator	1–65535	1–65535	16384	○
P38.42	Received PZD3 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P38.43	Received PZD3 conversion base value denominator	1–65535	1–65535	16384	○
P38.44	Received PZD4 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P38.45	Received PZD4 conversion base value denominator	1–65535	1–65535	16384	○
P38.46	Received PZD5 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P38.47	Received PZD5 conversion base value denominator	1–65535	1–65535	16384	○
P38.48	Received PZD6 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P38.49	Received PZD6 conversion base value denominator	1–65535	1–65535	16384	○
P38.50	Received PZD7 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P38.51	Received PZD7 conversion base value denominator	1–65535	1–65535	16384	○
P38.52	Received PZD8 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○

Function code	Name	Parameter description	Setting range	Default	Modify
P38.53	Received PZD8 conversion base value denominator	1–65535	1–65535	16384	○
P38.54	Received PZD9 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P38.55	Received PZD9 conversion base value denominator	1–65535	1–65535	16384	○
P38.56	Received PZD10 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P38.57	Received PZD10 conversion base value denominator	1–65535	1–65535	16384	○
P38.58	Received PZD11 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P38.59	Received PZD11 conversion base value denominator	1–65535	1–65535	16384	○
P38.60	Received PZD12 conversion base value numerator	Received PZD = Link (Received PZD source) * Received PZD conversion base value numerator / Received PZD conversion base value denominator	0–65535	16384	○
P38.61	Received PZD12 conversion base value denominator	1–65535	1–65535	16384	○
P38.62	Sent PKW1 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.63	Sent PKW2 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.64	Sent PKW3 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.65	Sent PKW4 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.66	Sent PZD1 data display	Sent PZD data display = Link (Sent PZD source) * Sent PZD conversion base value numerator / Sent PZD conversion base value denominator	0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
P38.67	Sent PZD2 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.68	Sent PZD3 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.69	Sent PZD4 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.70	Sent PZD5 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.71	Sent PZD6 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.72	Sent PZD7 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.73	Sent PZD8 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.74	Sent PZD9 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.75	Sent PZD10 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.76	Sent PZD11 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.77	Sent PZD12 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.78	Received PKW1 data display	Displays physically received data.	0x0000–0xFFFF	0x0000	●
P38.79	Received PKW2 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.80	Received PKW3 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.81	Received PKW4 data display	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P38.82	Received PZD 1 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.83	Received PZD 2 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.84	Received PZD 3 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.85	Received PZD 4 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.86	Received PZD 5 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
P38.87	Received PZD 6 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.88	Received PZD 7 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.89	Received PZD 8 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.90	Received PZD 9 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.91	Received PZD 10 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.92	Received PZD 11 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.93	Received PZD 12 data display	Received PZD data display = PZD physically received data with base value processed + Data with polarity processed	0x0000–0xFFFF	0x0000	●
P38.94	CW1 source	0: 0 1: Digital (0–65535) 2: Other-C connector	0–2	2	◎
P38.95	Received PZD sign selection	Bit 0–bit 11 correspond to whether received PZD1–PZD12 are signed. If the corresponding bit is set to 1, the PZD is signed.	0x0000–0xFFFF	0x0000	○
P38.96	Bus adapter A received PZD1 polarity	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	◎
P38.97	Bus adapter A received PZD2 polarity	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	◎
P38.98	Communication disconnection detection delay	0.00: No detection 0.00–60.00s	0.00–60.00	0.00s	○
P38.99	Communication disconnection handling	0: Report a fault 1: Keep the running at the target frequency	0–1	0	○

Group P40—Profibus-DP module

Function code	Name	Parameter description	Setting range	Default	Modify
P40.00	Unit online state	Bit0: EC slot 1 module online state (0: Offline; 1: Online) Bit1: EC slot 2 module online state (0: Offline; 1: Online) Bit2: EC slot 3 module online state (0: Offline; 1: Online) Bit3: EC slot 2-1 module online state (0: Offline; 1: Online) Bit4: EC slot 2-2 module online state (0: Offline; 1: Online) Bit5: EC slot 2-3 module online state (0: Offline; 1:Online) Bit6: EC slot 3-1 module online state (0: Offline; 1: Online) Bit7: EC slot 3-2 module online state (0: Offline; 1: Online) Bit8: EC slot 3-3 module online state (0: Offline; 1: Online)	0x00–0x1FF	0x00	●
P40.01	EC site No.	1–127	1–127	2	◎
P40.02	DP_ID	INVT: 0x0D55 Siemens: 0x8045 ABB: 0x0812	0x0000–0xFFFF	0x8045	○
P40.03–P40.09	Reserved	-	-	-	-
P40.10	Present effective card slot	Used to display the card slot that is currently effective. When there are two or more card slots inserted with DP cards, only the DP card at one card slot is effective, and the DP cards at the other card slots are used for redundancy. Bit0: EC slot 1 module effective state (0: Ineffective; 1: Effective) Bit1: EC slot 2 module effective state (0: Ineffective; 1: Effective) Bit2: EC slot 3 module effective state (0: Ineffective; 1: Effective) Bit3: EC slot 2-1 module effective state (0: Ineffective; 1: Effective) Bit4: EC slot 2-2 module effective state (0: Ineffective; 1: Effective) Bit5: EC slot 2-3 module effective state (0: Ineffective; 1: Effective) Bit6: EC slot 3-1 module effective state (0: Ineffective; 1: Effective) Bit7: EC slot 3-2 module effective state (0: Ineffective; 1: Effective) Bit8: EC slot 3-3 module effective state (0: Ineffective; 1: Effective)	0x0000–0xFFFF	0x0000	●

Group P41—Profinet-IO module

Function code	Name	Parameter description	Setting range	Default	Modify
P41.00	Unit online state	The function code shows the online status of the module, each bit represents the online status of an expansion slot. If multiple PN cards are online, there are multiple bits are set to 1 at the same time. See the following: Bit0: EC slot 1 module online state (0: Offline; 1: Online) Bit1: EC slot 2 module online state (0: Offline; 1: Online) Bit2: EC slot 3 module online state (0: Offline; 1: Online) Bit3: EC slot 2-1 module online state (0: Offline; 1: Online) Bit4: EC slot 2-2 module online state (0: Offline; 1: Online) Bit5: EC slot 2-3 module online state (0: Offline; 1:Online) Bit6: EC slot 3-1 module online state (0: Offline; 1: Online) Bit7: EC slot 3-2 module online state (0: Offline; 1: Online) Bit8: EC slot 3-3 module online state (0: Offline; 1: Online)	0x00–0x1FF	0x00	●
P41.01	Profinet slave site No. (Reserved)	This variable is automatically assigned by the PLC.	1–127	1	●
P41.02–P41.09	Reserved	-	-	-	-
P41.10	Present effective card slot	Used to display the card slot that is currently effective. When there are two or more card slots inserted with PN cards, only the PN card at one card slot is effective, and the PN cards at the other card slots are used for redundancy. Bit0: EC slot 1 module effective state (0: Ineffective; 1: Effective) Bit1: EC slot 2 module effective state (0: Ineffective; 1: Effective) Bit2: EC slot 3 module effective state (0: Ineffective; 1: Effective) Bit3: EC slot 2-1 module effective state (0: Ineffective; 1: Effective) Bit4: EC slot 2-2 module effective state (0: Ineffective; 1: Effective) Bit5: EC slot 2-3 module effective state (0: Ineffective; 1: Effective) Bit6: EC slot 3-1 module effective state (0: Ineffective; 1: Effective) Bit7: EC slot 3-2 module effective state (0: Ineffective; 1: Effective) Bit8: EC slot 3-3 module effective state (0: Ineffective; 1: Effective)	0x0000–0xFFFF	0x0000	●

Group P42—Modbus RTU module

Function code	Name	Parameter description	Setting range	Default	Modify
P42.00	Unit online state (reserved)	Reserved	0–3	0	●
P42.01	Modbus Baud Rate	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps 6: 57600bps 7: 115200bps	0–7	4	○
P42.02	Modbus Data Format	0: No check (N, 8, 1) for RTU 1: Even check (E, 8, 1) for RTU 2: Odd check (O, 8, 1) for RTU 3: No check (N, 8, 2) for RTU 4: Even check (E, 8, 2) for RTU 5: Odd check (O, 8, 2) for RTU	0–5	1	○
P42.03	Modbus local address	1–247	1–247	1	○
P42.04	Modbus response delay	The function code indicates the communication response delay, that is, the interval from the time when the VFD completes receiving data to the time when it sends response data to the upper computer. If the response delay is shorter than the system processing time, the system sends response data to the upper computer after processing data. If the delay is longer than the system processing time, the system does not send response data to the upper computer until the delay is reached although data has been processed.	0–200	5ms	○
P42.05	Modbus communication timeout time	0.0: Invalid It is set to invalid usually. When continuous communication is required, you can set the function code to monitor communication status.	0.0–60.0	0.0s	○
P42.06	Modbus transmission error handling	0: Report an alarm and coast to stop 1: Keep running without reporting an alarm 2: Stop in enabled stop mode with reporting an alarm, applicable only to communication mode	0–3	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		3: Stop in enabled stop mode without reporting an alarm, applicable to any mode			
P42.07–P42.10	Reserved	-	-	-	-

Group P43—CANopen module

Function code	Name	Parameter description	Setting range	Default	Modify
P43.00	Unit online state	Bit0: EC slot 1 module online state (0: Offline; 1: Online) Bit1: EC slot 2 module online state (0: Offline; 1: Online) Bit2: EC slot 3 module online state (0: Offline; 1: Online) Bit3: EC slot 2-1 module online state (0: Offline; 1: Online) Bit4: EC slot 2-2 module online state (0: Offline; 1: Online) Bit5: EC slot 2-3 module online state (0: Offline; 1:Online) Bit6: EC slot 3-1 module online state (0: Offline; 1: Online) Bit7: EC slot 3-2 module online state (0: Offline; 1: Online) Bit8: EC slot 3-3 module online state (0: Offline; 1: Online)	0x00–0x1FF	0x00	●
P43.01	CANopen communication address	0–127	0–127	2	○
P43.02	CANopen communication baud rate (kbps)	0: 1000kbps 1: 800kbps 2: 500kbps 3: 250kbps 4: 125kbps 5: 100kbps 6: 50kbps 7: 20kbps	0–7	3	○
P43.03–P43.09	Reserved	-	-	-	●
P43.10	Present effective card slot	Used to display the card slot that is currently effective. When there are two or more card slots inserted with CANopen cards, only the CANopen card at one card slot is effective, and the CANopen cards at the other card slots are used for redundancy. Bit0: EC slot 1 module effective state (0: Ineffective; 1: Effective)	0x0000–0xFFFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
		Bit1: EC slot 2 module effective state (0: Ineffective; 1: Effective) Bit2: EC slot 3 module effective state (0: Ineffective; 1: Effective) Bit3: EC slot 2-1 module effective state (0: Ineffective; 1: Effective) Bit4: EC slot 2-2 module effective state (0: Ineffective; 1: Effective) Bit5: EC slot 2-3 module effective state (0: Ineffective; 1: Effective) Bit6: EC slot 3-1 module effective state (0: Ineffective; 1: Effective) Bit7: EC slot 3-2 module effective state (0: Ineffective; 1: Effective) Bit8: EC slot 3-3 module effective state (0: Ineffective; 1: Effective)			

Group P44—Ethernet module—Ethernet communication group

Function code	Name	Parameter description	Setting range	Default	Modify
P44.00	Reserved	-	-	-	-
P44.01	PC disconnection handling	0: No handling 1: Stop When PC channel control is in use, this function code determines whether the VFD stops if the PC is disconnected.	0–1	1	○
P44.02	TCP/IP address 1	0–255	0–255	192	◎
P44.03	TCP/IP address 2	0–255	0–255	168	◎
P44.04	TCP/IP address 3	0–255	0–255	0	◎
P44.05	TCP/IP address 4	You need to re-power on for the IP address change to take effect.	0–255	1	◎
P44.06	TCP/IP subnet mask address 1	0–255	0–255	255	◎
P44.07	TCP/IP subnet mask address 2	0–255	0–255	255	◎
P44.08	TCP/IP subnet mask address 3	0–255	0–255	255	◎
P44.09	TCP/IP subnet mask address 4	0–255	0–255	0	◎
P44.10	TCP/IP GW address 1	0–255	0–255	192	◎
P44.11	TCP/IP GW address 2	0–255	0–255	168	◎
P44.12	TCP/IP GW address 3	0–255	0–255	1	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P44.13	TCP/IP GW address 4	0–255	0–255	1	◎
P44.14	Keypad monitor site number	When monitoring multiple main control boxes with a keypad, modifying this function code can complete the switchover between the main control boxes with different site numbers. Press the PRG and DATA keys simultaneously to return to the local monitor interface and reset the function code to enter the monitored site interface again.	0–255	1	◎
P44.15	Enabling device online search	0: Disable search 1: Enable search When this function code is set to 1, the device starts searching for other devices online. Any device that is in the same gateway as the device is searched and displayed in the list on the keypad.	0–1	0	◎
P44.16	Online device quantity	Displays the number of devices searched by the P44.15.	1–255	1	●
P44.17	Online device state 1	Bit1bit0: Master status (00: Power off; 01: Ready; 10: Running; 11: Fault) Bit3bit2: Device 1 status Bit5bit4: Device 2 status Bit7bit6: Device 3 status Bit9bit8: Device 4 status Bit11bit10: Device 5 status Bit13bit12: Device 6 status Bit15bit14: Device 7 status	0x0000–0xFFFF	0x0000	●
P44.18	Online device state 2	Bit1bit0: Device 8 status Bit3bit2: Device 9 status Bit5bit4: Device 10 status Bit7bit6: Device 11 status Bit9bit8: Device 12 status Bit11bit10: Device 13 status Bit13bit12: Device 14 status Bit15bit14: Device 15 status	0x0000–0xFFFF	0x0000	●
P44.19–P44.20	Reserved	-	-	-	-

Group P48—Encoder module 1 configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P48.00	Enabling module slot	This system supports that multiple slots can be inserted with modules of the same type. This function code is used to select the slot at which the module is enabled. P48.00, P49.00, P51.00, and P52.00 cannot be set to the same value. 0: SLOT1 1: SLOT2 2: SLOT3 3: SLOT2-1 4: SLOT2-2 5: SLOT2-3 6: SLOT3-1 7: SLOT3-2 8: SLOT3-3 9: Invalid **Note:** After this function code is changed, you need to re-power on the control box for the newly selected card slot to take effect.	0–9	9	◎
P48.01	Unit online state	Displays the online status of all PG cards connected to this control box, and the display content of P48.01 is the same as that of P49.01. Bit0: EC slot 1 module online state (0: Offline; 1: Online) Bit1: EC slot 2 module online state (0: Offline; 1: Online) Bit2: EC slot 3 module online state (0: Offline; 1: Online) Bit3: EC slot 2-1 module online state (0: Offline; 1: Online) Bit4: EC slot 2-2 module online state (0: Offline; 1: Online) Bit5: EC slot 2-3 module online state (0: Offline; 1:Online) Bit6: EC slot 3-1 module online state (0: Offline; 1: Online) Bit7: EC slot 3-2 module online state (0: Offline; 1: Online) Bit8: EC slot 3-3 module online state (0: Offline; 1: Online)	0x00–0x1FF	0x00	●
P48.02	Encoder type display	0: Invalid 1: Incremental encoder 2: Resolver-type encoder 3: Sin/Cos encoder (reserved) 4: Endat absolute encoder (reserved) 5: UVW encoder (reserved)	0–5	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P48.03	Encoder pulse count (PPR)	0–60000	0–60000	1024	◎
P48.04	Encoder direction	Ones place: AB direction 0: Forward 1: Reverse Tens place: Z pulse direction (reserved) 0: Forward 1: Reverse Hundreds: CD/UVW pole signal direction 0: Forward 1: Reverse	0x000–0x111	0x000	◎
P48.05	Encoder disconnection fault detection time	0.0–10.0s	0–10.0	1.0s	○
P48.06	Encoder reversal fault detection time	0.0–100.0s	0–100.0	0.8s	○
P48.07	Filter times of encoder detection	Ones place: Low-speed filter times Tens place: High-speed filter times High/low speed switching corresponds to P03.02.	0x00–0xFF	0x66	○
P48.08	Mounting shaft rotation speed ratio	Speed ratio between encoder mounting shaft and motor	0.000–65.535	1.000	○
P48.09	Closed-loop optimization control parameter	Bit 0: Enable Z-pulse calibration Bit 1: Enable encoder angle calibration Bit 2: Enable SVC speed measurement Bit3: Resolver based speed measurement mode selection Bit4: Z pulse capture mode Bit5: Do not detect the encoder initial angle in V/F control Bit 6: Enable the CD signal calibration Bit7: Disable Sin/Cos subdivision speed measurement Bit 8: Do not detect encoder faults during autotuning Bit 9: Enable Z pulse detection optimization Bit 10: Enable the initial Z pulse calibration optimization Bit 11: Update initial angle Bit 12: Clear the Z pulse arrival signal after stop	0x0000–0xFFFF	0x0003	○
P48.10	Enabling pulse Z disconnection detection	Ones place: Z pulse detection 0: No detection 1: Enable	0x00–0x11	0x10	○

Function code	Name	Parameter description	Setting range	Default	Modify
		Tens place: UVW pulse detection (for SM) 0: No detection 1: Enable			
P48.11	Initial angle of Z pulse	0–359.99	0–359.99	0.00	○
P48.12	Pole initial angle	0–359.99	0–359.99	0.00	○
P48.13	Reserved	-	-	-	-
P48.14	Motor temperature sensor type	Specifies the type of motor temperature sensor connected to the encoder. 0: PT100 1: KTY84 2: PT100*3 3: PT1000	0–3	0	◎
P48.15	Speed measurement optimization selection	0: No optimization 1: Optimization mode 1 (dsp observer) 2: Optimization mode 2 (dspM method speed measurement)	0–2	1	◎
P48.16	CD signal zero offset gain	0–65535	0–65535	0	○
P48.17	Encoder type selection	Ones place: Incremental encoder 0: Without UVW 1: With UVW Tens place: Sin/Cos encoder 0: without CD signal 1: with CD signal	0x00–0x11	0x00	◎
P48.18	Speed detection signal source	Used to select the VFD speed detection signal source. 0: PG card direct connection signal 1: PG card SPI communication (speed detection signal comes from the encoder's own speed detection) 2: PG card SPI communication (speed detection signal comes from the frequency division input network port pulse reference)	0–2	0	◎
P48.19	Frequency division coefficient	0: 1 1: 1 2: 2 3: 3 …	0–255	0	○
P48.20	Frequency multiplication coefficient	The value is set in relation to the value of P48.03, and it is normally set to *n*: 2^n=65535/P48.03 The encoder position count value is displayed in P48.68 after the	0–255	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		frequency multiplication coefficient is per-unit processed.			
P48.21	Pulse filter handling selection	Bit 0: Indicates whether to enable encoder P-channel input filter 0: Do not filter 1: Filter Bit 1: Encoder signal filter mode 0: Self-adaptive filter 1: Use P48.22 as the filter parameter Bit 2: Indicates whether to enable encoder P-channel frequency-division output filter 0: Do not filter 1: Filter Bit 3: Indicates whether to enable filter for pulse reference F-channe frequency-division output 0: Do not filter 1: Filter Bit 4: Indicates whether to enable pulse reference F-channel filter 0: Do not filter 1: Filter Bit 5: Pulse reference F-channel filter mode 0: Self-adaptive filter 1: Use P48.23 as the filter parameter Bit 6: Frequency-divided output source selection 0: Encoder 1: Pulse reference Bit 7– bit 15: Reserved	0x0000–0xFFFF	0x0011	○
P48.22	Encoder P-channel filter width	Encoder feedback filter width. **Note:** 0 indicates 0.25 μs.	0–63	2	○
P48.23	Pulse reference F-channel filter width	Pulse feedback filter width. **Note:** 0 indicates 0.25 μs.	0–63	2	○
P48.24	Pulse reference F-channel pulse count	0–65535	0–65535	1024	○
P48.25	Pulse reference command mode	Bit 0–bit1: 00: Orthogonal 01: Pulse + direction 10: Positive pulse 11: Positive pulse + negative	0x00–0x0F	0x00	○

Function code	Name	Parameter description	Setting range	Default	Modify
		pulse Bit2: 0: Forward 1: Reverse Bit3: 0: Inactive high 1: inactive low			
P48.26	Enabling SM angle compensation	0–1	0–1	0	○
P48.27	Frequency point of speed measurement mode switchover	0.00–630.00Hz SPI speed measurement mode: M-method when below switching point, pg measurement value when above switching point.	0.00–630.00	1.00Hz	○
P48.28	SM angle compensation coefficient	-200.0–200.0%	-200.0–200.0	100.0%	○
P48.29	Motor rotation turns in magnetic pole angle autotuning	Motor rotation turns in initial pole angle autotuning	1–128	2	◎
P48.30	Encoder autotuning frequency	0.00% –P09.02	0.00–P09.02	10.00%	●
P48.31	Actual frequency of encoder	-327.67–327.67Hz	-327.67–327.67	0.00Hz	●
P48.32	Encoder position count value	0–65535	0–65535	0	●
P48.33	Encoder Z pulse count value	0–65535	0–65535	0	●
P48.34	High bit of position reference value	0–30000	0–30000	0	●
P48.35	Low bit of position reference value	0–65535	0–65535	0	●
P48.36	High bit of position feedback value	0–30000	0–30000	0	●
P48.37	Low bit of position feedback value	0–65535	0–65535	0	●
P48.38	Position deviation	-32768–32767	-32768–32767	0	●
P48.39	Position of position reference point	0–65535	0–65535	0	●
P48.40	Present position setting of spindle	0.00–359.99	0.00–359.99	0.00	●
P48.41	Present position when spindle stops accurately	0–65535	0–65535	0	●
P48.42	Encoder Z pulse direction	0–1	0–1	0	●
P48.43	Encoder Z pulse angle	0.00–359.99	0.00–359.99	0.00	●

Function code	Name	Parameter description	Setting range	Default	Modify
P48.44	Encoder Z pulse error times	0–65535	0–65535	0	●
P48.45	High bit of encoder pulse count value	0–65535	0–65535	0	●
P48.46	Low bit of encoder pulse count value	0–65535	0–65535	0	●
P48.47	Pulse command frequency	-327.67–327.67Hz	-327.67–327.67	0.00Hz	●
P48.48	Pulse command feedforward	0.00–655.35Hz	0.00–655.35	0.00Hz	●
P48.49	Position regulator output	0–65535	0–65535	0	●
P48.50	Count value of resolver	0–65535	0–65535	0	●
P48.51	Resolver angle	0.00–359.99	0.00–359.99	0.00	●
P48.52	Closed-loop SM pole angle	0.00–359.99	0.00–359.99	0.00	●
P48.53	High-order bit of count value of pulse reference	0–65535	0–65535	0	●
P48.54	Low-order bit of count value of pulse reference	0–65535	0–65535	0	●
P48.55	Spindle DEC Ratio	0.000–65.535	0.000–65.535	0.000	●
P48.56	Encoder UVW sectors	0–7	0–7	0	●
P48.57	Encoder PPR display	0–65535	0–65535	0	●
P48.58	Angle compensation value of SM	-180.0–180.0	-180.0–180.0	0.0	●
P48.59	F-channel Z Pulse value	0–65535	0–65535	0	●
P48.60	Autotuned Z pulse initial angle	Z pulse initial angle obtained from encoder autotuning	0–65535	0	●
P48.61	Initial pole zero point position from autotuning	Initial pole zero point position obtained from encoder autotuning.	0–65535	0	●
P48.62	SW 3	0–65535	0–65535	0	●
P48.63–P48.64	Reserved	-	-	-	-
P48.65	Enabling encoder module 1 temperature measurement	0: Invalid 1: Enable	0–1	0	○
P48.66	PG card disconnection fault handling	0: Report a fault 1: Report an alarm (for open/closed loop switchover) 2: Ignore	0–2	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P48.67	Turns display	0–65535	0–65535	0	●
P48.68	Encoder position count per-unit value	Value of P48.32 (Encoder position count value) that is obtained after the base value conversion. (P48.32>>2)*2^(P48.20 Frequency multiplication coefficient)	0–65535	0	●
P48.69	Clearing Z pulse count value	Indicates whether to clear the Z pulse count value specified by P48.53 and P48.54. 0: Do not clear 1: Clear	0–1	0	◎
P48.70–P48.73	Reserved	-	-	-	-

Group P49—Encoder module 2 configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P49.00	Enabling module slot	This system supports that multiple slots can be inserted with modules of the same type. This function code is used to select the slot at which the module is enabled. (P48.00, P49.00, P51.00, and P52.00 cannot be set to the same value.) 0: SLOT1 1: SLOT2 2: SLOT3 3: SLOT2-1 4: SLOT2-2 5: SLOT2-3 6: SLOT3-1 7: SLOT3-2 8: SLOT3-3 9: Invalid **Note:** After this function code is changed, you need to re-power on the control box for the newly selected card slot to take effect.	0–9	9	◎
P49.01	Unit online state	This function code shows the online status of all PG cards connected to this control box, and the display content of P48.01 is the same as that of P49.01. Bit0: EC slot 1 module online state (0: Offline; 1: Online)	0x00–0x1FF	0x00	●

Function code	Name	Parameter description	Setting range	Default	Modify
		Bit1: EC slot 2 module online state (0: Offline; 1: Online) Bit2: EC slot 3 module online state (0: Offline; 1: Online) Bit3: EC slot 2-1 module online state (0: Offline; 1: Online) Bit4: EC slot 2-2 module online state (0: Offline; 1: Online) Bit5: EC slot 2-3 module online state (0: Offline; 1:Online) Bit6: EC slot 3-1 module online state (0: Offline; 1: Online) Bit7: EC slot 3-2 module online state (0: Offline; 1: Online) Bit8: EC slot 3-3 module online state (0: Offline; 1: Online)			
P49.02	Encoder type display	0: Invalid 1: Incremental encoder 2: Resolver-type encoder 3: Sin/Cos encoder 4: Endat absolute encoder 5: UVW encoder	0–5	0	●
P49.03	Encoder pulse count (PPR)	0–60000	0–60000	1024	◎
P49.04	Encoder direction	Ones place: AB direction 0: Forward 1: Reverse Tens place: Z pulse direction (reserved) 0: Forward 1: Reverse Hundreds: CD/UVW pole signal direction 0: Forward 1: Reverse	0x000–0x111	0x000	◎
P49.05	Encoder disconnection fault detection time	0.0–10.0s	0–10.0	1.0s	○
P49.06	Encoder reversal fault detection time	0.0–100.0s	0–100.0	0.8s	○
P49.07	Filter times of encoder detection	Ones place: Low-speed filter times Tens place: High-speed filter times High/low speed switching corresponds to P03.02.	0x00–0xFF	0x66	○
P49.08	Mounting shaft rotation speed ratio	0.000–65.535	0.000–65.535	1.000	○

Function code	Name	Parameter description	Setting range	Default	Modify
P49.09	Motor temperature sensor type	0: PT100 1: KTY84 2: PT100*3 3: PT1000 Specifies the type of motor temperature sensor connected to the encoder.	0–3	0	○
P49.10	Closed-loop optimization control parameter	Bit 0: Enable Z-pulse calibration Bit 1: Enable encoder angle calibration Bit 2: Enable SVC speed measurement Bit3: Resolver based speed measurement mode selection Bit4: Z pulse capture mode Bit5: Do not detect the encoder initial angle in V/F control Bit 6: Enable the CD signal calibration Bit7: Disable Sin/Cos subdivision speed measurement Bit 8: Do not detect encoder faults during autotuning Bit 9: Enable Z pulse detection optimization Bit 10: Enable the initial Z pulse calibration optimization Bit 11: Update initial angle Bit 12: Clear the Z pulse arrival signal after stop	0x0000–0xFFFF	0x0003	○
P49.11	Enabling pulse Z disconnection detection	Ones place: Z pulse detection 0: No detection 1: Enable Tens place: UVW pulse detection (for SM) 0: No detection 1: Enable	0x00–0x11	0x10	○
P49.12	Initial angle of Z pulse	0–359.99	0–359.99	0.00	○
P49.13	Pole initial angle	0–359.99	0–359.99	0.00	○
P49.14	Motor temperature sensor type	0: PT100 1: KTY84 2: PT100*3 3: PT1000	0–3	0	◎
P49.15	Speed measurement optimization selection	0: No optimization 1: Optimization mode 1 (dsp observer) 2: Optimization mode 2 (dspM method speed measurement)	0–2	1	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P49.16	CD signal zero offset gain	0–65535	0–65535	0	○
P49.17	Encoder type selection	Ones place: Incremental encoder 0: Without UVW 1: With UVW Tens place: Sin/Cos encoder 0: without CD signal 1: with CD signal	0x00–0x11	0x00	◎
P49.18	Speed measurement signal source	Used to select the VFD speed measurement signal source. 0: PG card direct connection signal 1: PG card SPI communication (PG card pulse signal comes from the encoder's own speed measurement) 2: PG card SPI communication (PG card pulse signal comes from the frequency division input network port pulse reference)	0–2	0	◎
P49.19	Frequency division coefficient	0–255	0–255	0	○
P49.20	Frequency multiplication coefficient	The value is set in relation to the value of P49.03, and it is normally set to *n*: 2^n=65535/P49.03 The encoder position count value is displayed in P49.68 after the frequency multiplication coefficient is per-unit processed.	0–255	0	○
P49.21	Pulse filter handling selection	Bit 0: Indicates whether to enable encoder P-channel input filter 0: Do not filter 1: Filter Bit 1: Encoder signal filter mode 0: Self-adaptive filter 1: Use P24.18 as the filter parameter Bit 2: Indicates whether to enable encoder P-channel frequency-division output filter 0: Do not filter 1: Filter Bit 3: Indicates whether to enable filter for pulse reference F-channel frequency-division output 0: Do not filter	0x0000–0xFFFF	0x0011	○

Function code	Name	Parameter description	Setting range	Default	Modify
		1: Filter Bit 4: Indicates whether to enable pulse reference F-channel filter 0: Do not filter 1: Filter Bit 5: Pulse reference F-channel filter mode 0: Self-adaptive filter 1: Use P24.19 as the filter parameter Bit 6–bit 15: Reserved			
P49.22	Encoder P-channel filter width	Encoder feedback filter width. **Note:** 0 indicates 0.25 μs.	0–63	2	○
P49.23	Pulse reference F-channel filter width	Pulse feedback filter width. **Note:** 0 indicates 0.25 μs.	0–63	2	○
P49.24	Pulse reference F-channel pulse count	0–65535	0–65535	1024	○
P49.25	Pulse reference command mode	Bit 0–bit1: 00: Orthogonal 01: Pulse + direction 10: Positive pulse 11: Positive pulse + negative pulse Bit2: 0: Forward 1: Reverse Bit3: 0: Inactive high 1: Inactive low	0x00–0x0F	0x00	○
P49.26	Enabling SM angle compensation	0–1	0–1	0	○
P49.27	Frequency point of speed measurement mode switchover	0.00–630.00Hz	0.00–630.00	1.00Hz	○
P49.28	SM angle compensation coefficient	-200.0–200.0%	-200.0–200.0	100.0%	○
P49.29	Motor rotation turns in initial pole angle autotuning	1–128	1–128	2	◎
P49.30	Encoder autotuning frequency	0.00%–P09.02	0.00–P09.02	10.00%	●
P49.31	Actual frequency of encoder	-327.67–327.67Hz	-327.67–327.67	0.00Hz	●
P49.32	Encoder position count value	0–65535	0–65535	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P49.33	Encoder Z pulse count value	0–65535	0–65535	0	●
P49.34	High bit of position reference value	0–30000	0–30000	0	●
P49.35	Low bit of position reference value	0–65535	0–65535	0	●
P49.36	High bit of position feedback value	0–30000	0–30000	0	●
P49.37	Low bit of position feedback value	0–65535	0–65535	0	●
P49.38	Position deviation	-32768–32767	-32768–32767	0	●
P49.39	Position of position reference point	0–65535	0–65535	0	●
P49.40	Present position setting of spindle	0.00–359.99	0.00–359.99	0.00	●
P49.41	Present position when spindle stops accurately	0–65535	0–65535	0	●
P49.42	Encoder Z pulse direction	0–1	0–1	0	●
P49.43	Encoder Z pulse angle	0.00–359.99	0.00–359.99	0.00	●
P49.44	Encoder Z pulse error times	0–65535	0–65535	0	●
P49.45	High bit of encoder pulse count value	0–65535	0–65535	0	●
P49.46	Low bit of encoder pulse count value	0–65535	0–65535	0	●
P49.47	Pulse command frequency	-327.67–327.67Hz	-327.67–327.67	0.00Hz	●
P49.48	Pulse command feedforward	0.00–655.35Hz	0.00–655.35	0.00Hz	●
P49.49	Position regulator output	0–65535	0–65535	0	●
P49.50	Count value of resolver	0–65535	0–65535	0	●
P49.51	Resolver angle	0.00–359.99	0.00–359.99	0.00	●
P49.52	Closed-loop SM pole angle	0.00–359.99	0.00–359.99	0.00	●
P49.53	High-order bit of count value of pulse reference	0–65535	0–65535	0	●
P49.54	Low-order bit of count value of pulse reference	0–65535	0–65535	0	●
P49.55	Spindle DEC Ratio	0.000–65.535	0.000–65.535	0.000	●

Function code	Name	Parameter description	Setting range	Default	Modify
P49.56	Encoder UVW sectors	0–7	0–7	0	●
P49.57	Encoder PPR display	0–65535	0–65535	0	●
P49.58	Angle compensation value of SM	-180.0–180.0	-180.0–180.0	0.0	●
P49.59	F-channel Z pulse value	0–65535	0–65535	0	●
P49.60	Z pulse initial angle obtained from encoder autotuning	0–65535	0–65535	0	●
P49.61	Initial pole zero point position obtained from encoder autotuning	0–65535	0–65535	0	●
P49.62	SW 3	0–65535	0–65535	0	●
P49.63–P49.64	Reserved	-	-	-	-
P49.65	Enabling encoder module 1 temperature measurement	0: Invalid 1: Enable	0–1	0	○
P49.66	PG card disconnection fault handling	0: Report a fault 1: Report an alarm (for open/closed loop switchover) 2: Ignore	0–2	0	○
P49.67	Turns display	0–65535	0–65535	0	●
P49.68	Encoder position count per-unit value	Value of P49.32 (Encoder position count value) that is obtained after the base value conversion. (P48.32>>2)*2^(P49.20 Frequency multiplication coefficient)	0–65535	0	●
P49.69	Clearing Z pulse count value	Indicates whether to clear the Z pulse count value specified by P49.53 and P49.54. 0: Do not clear 1: Clear	0–1	0	◎
P49.70–P49.73	Reserved	-	-	-	-

Group P51—IO expansion card 1 configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P51.00	Module slot selection	This system supports that multiple slots can be inserted with modules of the same type. This function code is used to	0–9	9	◎

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>select the slot at which the module is enabled. (P48.00, P49.00, P51.00, and P52.00 cannot be set to the same value.)
0: SLOT1
1: SLOT2
2: SLOT3
3: SLOT2-1
4: SLOT2-2
5: SLOT2-3
6: SLOT3-1
7: SLOT3-2
8: SLOT3-3
9: Invalid</td><td></td><td></td><td></td></tr>
<tr><td>P51.01</td><td>Unit online state</td><td><table>
<tr><td>Bit0</td><td>EC slot 1 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit1</td><td>EC slot 2 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit2</td><td>EC slot 3 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit3</td><td>EC slot 2-1 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit4</td><td>EC slot 2-2 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit5</td><td>EC slot 2-3 module online state (0: Offline; 1:Online)</td></tr>
<tr><td>Bit6</td><td>EC slot 3-1 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit7</td><td>EC slot 3-2 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit8</td><td>EC slot 3-3 module online state (0: Offline; 1: Online)</td></tr>
</table></td><td>0x00–0x1FF</td><td>0x00</td><td>●</td></tr>
<tr><td>P51.02</td><td>Input terminal physical state value</td><td>0x0000–0x0007</td><td>0x0000–0x0007</td><td>0x0007</td><td>●</td></tr>
<tr><td>P51.03</td><td>Input terminal processed state value</td><td>0x0000–0x0007</td><td>0x0000–0x0007</td><td>0x0000</td><td>●</td></tr>
<tr><td>P51.04</td><td>Input terminal polarity</td><td>0: Keep
1: Inverse<table>
<tr><td>DI1</td><td>Bit0</td></tr>
<tr><td>DI2</td><td>Bit1</td></tr>
<tr><td>DI3</td><td>Bit2</td></tr>
</table></td><td>0x00–0x07</td><td>0x00</td><td>○</td></tr>
<tr><td>P51.05</td><td>Input terminal forced selection</td><td>0x00–0x07</td><td>0x00–0x07</td><td>0x00</td><td>○</td></tr>
<tr><td>P51.06</td><td>Input terminal forced data</td><td>0x00–0x07</td><td>0x00–0x07</td><td>0x00</td><td>○</td></tr>
<tr><td>P51.07</td><td>DI1 filter time</td><td>0.000–1.000s</td><td>0.000–1.000</td><td>0.010s</td><td>○</td></tr>
<tr><td>P51.08</td><td>DI1 switch-on delay</td><td>0.00–360.00s</td><td>0.00–360.00</td><td>0.00s</td><td>○</td></tr>
<tr><td>P51.09</td><td>DI1 switch-off delay</td><td>0.00–360.00s</td><td>0.00–360.00</td><td>0.00s</td><td>○</td></tr>
<tr><td>P51.10</td><td>DI2 filter time</td><td>0.000–1.000s</td><td>0.000–1.000</td><td>0.010s</td><td>○</td></tr>
<tr><td>P51.11</td><td>DI2 switch-on delay</td><td>0.00–360.00s</td><td>0.00–360.00</td><td>0.00s</td><td>○</td></tr>
<tr><td>P51.12</td><td>DI2 switch-off delay</td><td>0.00–360.00s</td><td>0.00–360.00</td><td>0.00s</td><td>○</td></tr>
<tr><td>P51.13</td><td>DI3 filter time</td><td>0.000–1.000s</td><td>0.000–1.000</td><td>0.010s</td><td>○</td></tr>
<tr><td>P51.14</td><td>DI3 switch-on delay</td><td>0.00–360.00s</td><td>0.00–360.00</td><td>0.00s</td><td>○</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
P51.15	DI3 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P51.16	Enabling AI1	0: Disable (AI1 input forced to 0) 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–1	1	○
P51.17	AI1 type	Specifies the type of input signal for AI1. After selecting the type, short connect the corresponding jumper on the hardware side of the control box. 0: 0–10V 1: 0–20mA 2: 4–20mA; used only for AI disconnection determination	0–4	0	◎
P51.18	AI1 input physical value	-32.76–32.76	-32.76–32.76	0.00	●
P51.19	AI1 input ratio	-327.6–327.6%	-327.6–327.6	0.0%	●
P51.20	AI1 curve min. input value	-20.00–20.00	-20.00–20.00	0.00	○
P51.21	AI1 curve min. input rate	-600.0–600.0%	-600.0–600.0	0.0%	○
P51.22	AI1 curve max input value	-20.00–20.00	-20.00–20.00	10.00	○
P51.23	AI1 curve max input rate	-600.0–600.0%	-600.0–600.0	100.0%	○
P51.24	AI1 input filter time	0.000–10.000s	0.000–10.000	0.000s	○
P51.25	AI1 denoise threshold	0.0–20.0%	0.0–20.0	0.0%	○
P51.26	AI1 set zero-cross threshold	The AI value is considered to be 0 when the AI input value is less than the set threshold.	0.0–1.0	0.0%	○
P51.27	Enabling AI2	0: Disable (AI2 input forced to 0) 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1	○

Function code	Name	Parameter description	Setting range	Default	Modify
P51.28	AI2 Type	Set the type of input signal for AI1 or AI2. After selecting the type, short connect the corresponding jumper on the hardware side of the control box. 0: 0–10V 1: 0–20mA 2: 4–20mA; used only for AI disconnection determination	0–2	0	◎
P51.29	AI2 input physical value	-32.76–32.76	-32.76–32.76	0.00	●
P51.30	AI2 input ratio	-327.6–327.6%	-327.6–327.6	0.0%	●
P51.31	AI2 curve min. input value	-20.00–20.00	-20.00–20.00	0.00	○
P51.32	AI2 curve min. input rate	-600.0–600.0%	-600.0–600.0	0.0%	○
P51.33	AI2 curve max input value	-20.00–20.00	-20.00–20.00	10.00	○
P51.34	AI2 curve max input rate	-600.0–600.0%	-600.0–600.0	100.0%	○
P51.35	AI2 input filter time	0.000–10.000s	0.000–10.000	0.000s	○
P51.36	AI2 denoise threshold	0.0–20.0%	0.0–20.0	0.0%	○
P51.37	AI2 set zero-cross threshold	The AI value is considered to be 0 when the AI input value is less than the set threshold.	0.0–1.0	0.0%	○
P51.38	Selection at AI below min. input	Ones place: Selection when AI1 is below min. input 0: Min. input rate 1: 0.0% Tens place: Selection when AI2 is below min. input 0: Min. input rate 1: 0.0%	0x00–0x11	0x00	○
P51.39	Enabling AI disconnection monitoring	Ones place: Enable/disable AI1 disconnection monitoring 0: Disable 1: Enable Tens place: Enable/disable AI2 disconnection monitoring 0: Disable 1: Enable	0x000–0x111	0x000	○
P51.40	AI1 disconnection monitoring threshold	0.000–4.000	0.000–4.000	2.000	○
P51.41	AI2 disconnection monitoring threshold	0.000–4.000	0.000–4.000	2.000	○

Function code	Name	Parameter description	Setting range	Default	Modify
P51.42	AI1 disconnection monitoring delay	0.00–10.00s	0.00–10.00	1.00s	○
P51.43	AI2 disconnection monitoring delay	0.00–10.00s	0.00–10.00	1.00s	○
P51.44	AI disconnection monitoring flag	Ones place: AI1 disconnection monitoring flag 0: Reset 1: Set, AI1 disconnection Tens place: AI2 disconnection monitoring flag 0: Reset 1: Set, AI2 disconnection	0x00–0x11	0x00	●
P51.45	RO signal source state value	0x0000–0xFFFF	0x0000–0xFFFF	0x000	●
P51.46	RO output processed state value	0x0000–0xFFFF	0x0000–0xFFFF	0x000	●
P51.47	RO output terminal polarity selection	0–1	0–1	0	○
P51.48	RO output signal source	0: Low level 1: High level 2: Other-B connector 3: Ready for brake closing 4: Running 5: Running forward 6: Running reversely 7: VFD in fault 8: Frequency reached 9: Running in zero speed 10: Frequency upper limit reached 11: Frequency lower limit reached 12: Frequency level detection FDT 13: VFD alarm 14: Run time reached 15: Brake control 16: STO action	0–16	0	○
P51.49	RO output switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P51.50	RO output switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P51.51	AO1 type	0: 0–10V 1: 0–20mA 2: 4–20mA	0–2	0	◎
P51.52	AO2 type	0: 0–10V 1: 0–20mA 2: 4–20mA	0–2	0	◎
P51.53	AO1 output value	Displays AO1 analog voltage	0.000–65.535	0.000	●

Function code	Name	Parameter description	Setting range	Default	Modify
		value. When the analog output is current output, 0.5V voltage corresponds to 1mA current. The AO1 output value is the value of the AO1 output rate after the curve transition.			
P51.54	AO1 signal source output rate	Displays the AO1 output percentage, corresponding to "AO1 signal source". The percentage displayed is only relevant to "AO1 signal source".	-999.9–999.9%	0.0%	●
P51.55	AO1 output value	Displays AO1 analog voltage value. When the analog output is current output, 0.5V voltage corresponds to 1mA current. The AO1 output value is the value of the AO1 output rate after the curve transition.	0.000–65.535	0.000	●
P51.56	AO2 signal source output rate	Displays the AO1 output percentage, corresponding to "AO1 signal source". The percentage displayed is only relevant to "AO1 signal source".	-999.9–999.9%	0%	●
P51.57	AO1 signal source	1: Digital 2: Other-C connector 3: Running frequency(motor rated frequency indicates 100%) 4: Set frequency(motor rated frequency indicates 100%) 5: DC bus voltage(unit rated voltage *1.414 indicates 100%) 6: Output current effective value (motor rated current indicates 100%) 7: Output voltage(unit rated voltage indicates 100%) 8: Output power(motor rated power indicates 100%) 9: Output torque(motor rated torque indicates 100%) 10: Reserved	0–10	0	○
P51.58	AO2 signal source		0–10	0	○
P51.59	AO1 curve min. output rate	-600.0%–P51.61	-600.0–600.0	0.0%	○
P51.60	AO1 curve min. output value	0.000–P51.62	0.000–20.000	0.000	○
P51.61	AO1 curve max output rate	P51.59–600.0%	-600.0–600.0	100.0%	○
P51.62	AO1 curve max output value	P51.60-20.00	P51.60-20.00	10.00	○
P51.63	AO1 output filter time	0.000–10.000s	0.000–10.000	0.000s	○

Function code	Name	Parameter description	Setting range	Default	Modify
P51.64	AO2 curve min. output rate	-600.0%–P51.66	-600.0–600.0	0.0%	○
P51.65	AO2 curve min. output value	0.00–P51.67	0.00–P51.67	0.00	○
P51.66	AO2 curve max output rate	P51.64-600.0%	-600.0–600.0	100.0%	○
P51.67	AO2 curve max output value	P51.65-20.000	0.000–20.000	10.000	○
P51.68	AO2 output filter time	0.000–10.000s	0.000–10.000	0.000s	○

Group P52—IO expansion card 2 configuration

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P52.00</td><td>Module slot selection</td><td>This system supports that multiple slots can be inserted with modules of the same type. This function code is used to select the slot at which the module is enabled. (P48.00, P49.00, P51.00, and P52.00 cannot be set to the same value.)
0: SLOT1
1: SLOT2
2: SLOT3
3: SLOT2-1
4: SLOT2-2
5: SLOT2-3
6: SLOT3-1
7: SLOT3-2
8: SLOT3-3
9: Invalid</td><td>0–9</td><td>9</td><td>◎</td></tr>
<tr><td>P52.01</td><td>Unit online state</td><td><table>
<tr><td>Bit0</td><td>EC slot 1 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit1</td><td>EC slot 2 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit2</td><td>EC slot 3 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit3</td><td>EC slot 2-1 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit4</td><td>EC slot 2-2 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit5</td><td>EC slot 2-3 module online state (0: Offline; 1:Online)</td></tr>
<tr><td>Bit6</td><td>EC slot 3-1 module online state (0: Offline; 1: Online)</td></tr>
<tr><td>Bit7</td><td>EC slot 3-2 module online state (0: Offline; 1: Online)</td></tr>
</table></td><td>0x00–0x1FF</td><td>0x00</td><td>●</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
		Bit8: EC slot 3-3 module online state (0: Offline; 1: Online)			
P52.02	Input terminal physical state value	0x0000–0x0007	0x0000–0x0007	0x0007	●
P52.03	Input terminal processed state value	0x0000–0x0007	0x0000–0x0007	0x0000	●
P52.04	Input terminal polarity	0: Keep 1: Inverse DI1: Bit0 DI2: Bit1 DI3: Bit2	0x00–0x07	0x00	○
P52.05	Input terminal forced selection	0x00–0x07	0x00–0x07	0x00	○
P52.06	Input terminal forced data	0x00–0x07	0x00–0x07	0x00	○
P52.07	DI1 filter time	0.000–1.000s	0.000–1.000	0.010s	○
P52.08	DI1 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P52.09	DI1 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P52.10	DI2 filter time	0.000–1.000s	0.000–1.000	0.010s	○
P52.11	DI2 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P52.12	DI2 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P52.13	DI3 filter time	0.000–1.000s	0.000–1.000	0.010s	○
P52.14	DI3 switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P52.15	DI3 switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P52.16	Enabling AI1	0: Disable (AI1 input forced to 0) 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1	○
P52.17	AI1 type	Set the type of input signal for AI1 or AI2. After selecting the type, short connect the corresponding jumper on the hardware side of the control box. 0: 0–10V 1: 0–20mA 2: 4–20mA; used only for AI disconnection determination	0–2	0	◎
P52.18	AI1 input physical value	-32.76–32.76	-32.76–32.76	0.00	●
P52.19	AI1 input ratio	-327.6–327.6%	-327.6–327.6	0.0%	●

Function code	Name	Parameter description	Setting range	Default	Modify
P52.20	AI1 curve min. input value	-20.00–20.00	-20.00–20.00	-10.00	○
P52.21	AI1 curve min. input rate	-600.0–600.0%	-600.0–600.0	-100.0%	○
P52.22	AI1 curve max input value	-20.00–20.00	-20.00–20.00	10.00	○
P52.23	AI1 curve max input rate	-600.0–600.0%	-600.0–600.0	100.0%	○
P52.24	AI1 input filter time	0.000–10.000s	0.000–10.000	0.000s	○
P52.25	AI1 denoise threshold	0.0–20.0%	0.0–20.0	0.2%	○
P52.26	AI1 set zero-cross threshold	The AI value is considered to be 0 when the AI input value is less than the set threshold.	0.0–1.0	0.0%	○
P52.27	Enabling AI2	0: Disable (AI1 input forced to 0) 1: Enable 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1	○
P52.28	AI2 Type	Set the type of input signal for AI1 or AI2. After selecting the type, short connect the corresponding jumper on the hardware side of the control box. 0: 0–10V 1: 0–20mA 2: 4–20mA; used only for AI disconnection determination	0–2	0	◎
P52.29	AI2 input physical value	-32.76–32.767	-32.76–32.767	0.000	●
P52.30	AI2 input ratio	-327.6–327.6%	-327.6–327.6	0.0%	●
P52.31	AI2 curve min. input value	-20.00–20.00	-20.00–20.00	-10.00	○
P52.32	AI2 curve min. input rate	-600.0–600.0%	-600.0–600.0	-100.0%	○
P52.33	AI2 curve max input value	-20.00–20.00	-20.00–20.00	10.00	○
P52.34	AI2 curve max input rate	-600.0–600.0%	-600.0–600.0	100.0%	○
P52.35	AI2 input filter time	0.000–10.000s	0.000–10.000	0.000s	○
P52.36	AI2 denoise threshold	0.0–20.0%	0.0–20.0	0.2%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P52.37	AI2 set zero-cross threshold	The AI value is considered to be 0 when the AI input value is less than the set threshold.	0.0–1.0	0.0%	○
P52.38	Selection at AI below min. input	Ones place: Selection when AI1 is below min. input 0: Min. input rate 1: 0.0% Tens place: Selection when AI2 is below min. input 0: Min. input rate 1: 0.0%	0x00–0x11	0x00	○
P52.39	Enabling AI disconnection monitoring	Ones place: Enable/disable AI1 disconnection monitoring 0: Disable 1: Enable Tens place: Enable/disable AI2 disconnection monitoring 0: Disable 1: Enable	0x00–0x11	0x00	○
P52.40	AI1 disconnection monitoring threshold	0.000–4.000mA	0.000–4.000	2.000mA	○
P52.41	AI2 disconnection monitoring threshold	0.000–4.000mA	0.000–4.000	2.000mA	○
P52.42	AI1 disconnection monitoring delay	0.00–10.00s	0.00–10.00	1.00s	○
P52.43	AI2 disconnection monitoring delay	0.00–10.00s	0.00–10.00	1.00s	○
P52.44	AI disconnection monitoring flag	Ones place: AI1 disconnection monitoring flag 0: Reset 1: Set, AI1 disconnection Tens place: AI2 disconnection monitoring flag 0: Reset 1: Set, AI2 disconnection	0x00–0x11	0x00	●
P52.45	RO signal source state value	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P52.46	RO output processed state value	0x0000–0xFFFF	0x0000–0xFFFF	0x0000	●
P52.47	RO output terminal polarity selection	0–1	0–1	0	○
P52.48	RO output signal source	0: Low level 1: High level 2: Other-B connector 3: Ready for brake closing 4: Running	0–16	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		5: Running forward 6: Running reversely 7: VFD in fault 8: Frequency reached 9: Running in zero speed 10: Frequency upper limit reached 11: Frequency lower limit reached 12: Frequency level detection FDT 13: VFD alarm 14: Run time reached 15: Brake control 16: STO action			
P52.49	RO output switch-on delay	0.00–360.00s	0.00–360.00	0.00s	○
P52.50	RO output switch-off delay	0.00–360.00s	0.00–360.00	0.00s	○
P52.51	AO1 type	0: 0–10V 1: 0–20mA 2: 4–20mA	0–2	0	◎
P52.52	AO2 type	0: 0–10V 1: 0–20mA 2: 4–20mA	0–2	0	◎
P52.53	AO1 output value	Displays AO1 analog voltage value. When the analog output is current output, 0.5V voltage corresponds to 1mA current. The AO1 output value is the value of the AO1 output rate after the curve transition.	0.000–65.535	0.000	●
P52.54	AO1 signal source output rate	Displays the AO1 output percentage, corresponding to "AO1 signal source". The percentage displayed is only relevant to "AO1 signal source".	-999.9–999.9%	0.0%	●
P52.55	AO1 output value	Displays AO1 analog voltage value. When the analog output is current output, 0.5V voltage corresponds to 1mA current. The AO1 output value is the value of the AO1 output rate after the curve transition.	0.000–65.535	0.000	●
P52.56	AO2 signal source output rate	Displays the AO1 output percentage, corresponding to "AO1 signal source". The percentage displayed is only	-999.9–999.9	0.0%	●

Function code	Name	Parameter description	Setting range	Default	Modify
		relevant to "AO1 signal source".			
P52.57	AO1 signal source	0: Invalid	0–10	0	○
P52.58	AO2 signal source	1: Digital 2: Other-C connector 3: Running frequency (motor rated frequency indicates 100%) 4: Set frequency (motor rated frequency indicates 100%) 5: DC bus voltage (unit rated voltage * 1.414 indicates 100%) 6: Output current effective value (motor rated current indicates 100%) 7: Output voltage (unit rated voltage indicates 100%) 8: Output power (motor rated power indicates 100%) 9: Output torque (motor rated torque indicates 100%) 10: Reserved	0–10	0	○
P52.59	AO1 curve min. output rate	-600.0%–P52.61	-600.0–600.0	0.0%	○
P52.60	AO1 curve min. output value	0.000–P52.62	0.000–20.000	0.000	○
P52.61	AO1 curve max output rate	P52.59-600.0%	-600.0–600.0	100.0%	○
P52.62	AO1 curve max output value	P52.60-20.00	P52.60-20.00	10.00	○
P52.63	AO1 output filter time	0.000–10.000s	0.000–10.000	0.000s	○
P52.64	AO2 curve min. output rate	-600.0%–P52.66	-600.0–600.0	0.0%	○
P52.65	AO2 curve min. output value	0.00–P52.67	0.00–P52.67	0.00	○
P52.66	AO2 curve max output rate	P52.64-600.0%	-600.0–600.0	100.0%	○
P52.67	AO2 curve max output value	P52.65-20.000	0.000–20.000	10.000	○
P52.68	AO2 output filter time	0.000–10.000s	0.000–10.000s	0.000s	○

Group P58—Word-to-bit function block configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P58.00	Word-to-bit A input	0: 0	0–10	0	○
P58.01	Word-to-bit B input	1: Digital (0–65535)	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P58.02	Word-to-bit C input	2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P58.03	Word-to-bit D input		0–10	0	○
P58.04	Input to bit 0 of bit-to-word A	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P58.05	Input to bit 1 of bit-to-word A		0–10	0	○
P58.06	Input to bit 2 of bit-to-word A		0–10	0	○
P58.07	Input to bit 3 of bit-to-word A		0–10	0	○
P58.08	Input to bit 4 of bit-to-word A		0–10	0	○
P58.09	Input to bit 5 of bit-to-word A		0–10	0	○
P58.10	Input to bit 6 of bit-to-word A		0–10	0	○
P58.11	Input to bit 7 of bit-to-word A		0–10	0	○
P58.12	Input to bit 8 of bit-to-word A		0–10	0	○
P58.13	Input to bit 9 of bit-to-word A		0–10	0	○
P58.14	Input to bit 10 of bit-to-word A		0–10	0	○
P58.15	Input to bit 11 of bit-to-word A		0–10	0	○
P58.16	Input to bit 12 of bit-to-word A		0–10	0	○
P58.17	Input to bit 13 of bit-to-word A		0–10	0	○
P58.18	Input to bit 14 of bit-to-word A		0–10	0	○
P58.19	Input to bit 15 of bit-to-word A		0–10	0	○
P58.20	Input to bit 0 of bit-to-word B	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3	0–10	0	○
P58.21	Input to bit 1 of bit-to-word B		0–10	0	○
P58.22	Input to bit 2 of bit-to-word B		0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P58.23	Input to bit 3 of bit-to-word B	6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P58.24	Input to bit 4 of bit-to-word B		0–10	0	○
P58.25	Input to bit 5 of bit-to-word B		0–10	0	○
P58.26	Input to bit 6 of bit-to-word B		0–10	0	○
P58.27	Input to bit 7 of bit-to-word B		0–10	0	○
P58.28	Input to bit 8 of bit-to-word B		0–10	0	○
P58.29	Input to bit 9 of bit-to-word B		0–10	0	○
P58.30	Input to bit 10 of bit-to-word B		0–10	0	○
P58.31	Input to bit 11 of bit-to-word B		0–10	0	○
P58.32	Input to bit 12 of bit-to-word B		0–10	0	○
P58.33	Input to bit 13 of bit-to-word B		0–10	0	○
P58.34	Input to bit 14 of bit-to-word B		0–10	0	○
P58.35	Input to bit 15 of bit-to-word B		0–10	0	○
P58.36	Input to bit 0 of bit-to-word C	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P58.37	Input to bit 1 of bit-to-word C		0–10	0	○
P58.38	Input to bit 2 of bit-to-word C		0–10	0	○
P58.39	Input to bit 3 of bit-to-word C		0–10	0	○
P58.40	Input to bit 4 of bit-to-word C		0–10	0	○
P58.41	Input to bit 5 of bit-to-word C		0–10	0	○
P58.42	Input to bit 6 of bit-to-word C		0–10	0	○
P58.43	Input to bit 7 of bit-to-word C		0–10	0	○
P58.44	Input to bit 8 of bit-to-word C		0–10	0	○
P58.45	Input to bit 9 of bit-to-word C		0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P58.46	Input to bit 10 of bit-to-word C		0–10	0	○
P58.47	Input to bit 11 of bit-to-word C		0–10	0	○
P58.48	Input to bit 12 of bit-to-word C		0–10	0	○
P58.49	Input to bit 13 of bit-to-word C		0–10	0	○
P58.50	Input to bit 14 of bit-to-word C		0–10	0	○
P58.51	Input to bit 15 of bit-to-word C		0–10	0	○
P58.52	Input to bit 0 of bit-to-word D	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P58.53	Input to bit 1 of bit-to-word D		0–10	0	○
P58.54	Input to bit 2 of bit-to-word D		0–10	0	○
P58.55	Input to bit 3 of bit-to-word D		0–10	0	○
P58.56	Input to bit 4 of bit-to-word D		0–10	0	○
P58.57	Input to bit 5 of bit-to-word D		0–10	0	○
P58.58	Input to bit 6 of bit-to-word D		0–10	0	○
P58.59	Input to bit 7 of bit-to-word D		0–10	0	○
P58.60	Input to bit 8 of bit-to-word D		0–10	0	○
P58.61	Input to bit 9 of bit-to-word D		0–10	0	○
P58.62	Input to bit 10 of bit-to-word D		0–10	0	○
P58.63	Input to bit 11 of bit-to-word D		0–10	0	○
P58.64	Input to bit 12 of bit-to-word D		0–10	0	○
P58.65	Input to bit 13 of bit-to-word D		0–10	0	○
P58.66	Input to bit 14 of bit-to-word D		0–10	0	○
P58.67	Input to bit 15 of bit-to-word D		0–10	0	○

Group P59—Word and Dword conversion function block configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P59.00	Word-to-Dword A high-word input	0: 0 1: Digital (0–65535) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P59.01	Word-to-Dword A low-word input		0–10	0	○
P59.02	Word-to-Dword A base value input	Output=((High word<<16)+Low word)/Base value	1–65535	4096	○
P59.03	Word-to-Dword B high-word input	Same as that for module 1	0–10	0	○
P59.04	Word-to-Dword B low-word input	Same as that for module 1	0–10	0	○
P59.05	Word-to-Dword B base value input	Same as that for module 1	1–65535	4096	○
P59.06	Word-to-Dword C high-word input	Same as that for module 1	0–10	0	○
P59.07	Word-to-Dword C low-word input	Same as that for module 1	0–10	0	○
P59.08	Word-to-Dword C base value input	Same as that for module 1	1–65535	4096	○
P59.09	Word-to-Dword D high-word input	Same as that for module 1	0–10	0	
P59.10	Word-to-Dword D low-word input	Same as that for module 1	0–10	0	
P59.11	Word-to-Dword D base value input	Same as that for module 1	1–65535	4096	
P59.12	Dword-to-word A input	0: 0 1: Digital (0–65535%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P59.13	Dword-to-word A base value input	1–65535	1–65535	1	○

Function code	Name	Parameter description	Setting range	Default	Modify
P59.14	Dword-to-word B input	Same as that for module 1	0–10	0	○
P59.15	Dword-to-Word B base value input	Same as that for module 1	1–65535	1	○
P59.16	Dword-to-word C input	Same as that for module 1	0–10	0	○
P59.17	Dword-to-word C base value input	Same as that for module 1	1–65535	1	○
P59.18	Dword-to-word D input	Same as that for module 1	0–10	0	○
P59.19	Dword-to-word D base value input	Same as that for module 1	1–65535	1	○

Group P60—Logical And function block configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P60.00	Logical And A input 1	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	1	○
P60.01	Logical And A input 2		0–10	1	○
P60.02	Logical And A input 3		0–10	1	○
P60.03	Logical And A input 4		0–10	1	○
P60.04	Logical And B input 1		0–10	1	○
P60.05	Logical And B input 2		0–10	1	○
P60.06	Logical And B input 3		0–10	1	○
P60.07	Logical And B input 4		0–10	1	○
P60.08	Logical And C input 1		0–10	1	○
P60.09	Logical And C input 2		0–10	1	○
P60.10	Logical And C input 3		0–10	1	○
P60.11	Logical And C input 4		0–10	1	○
P60.12	Logical And D input 1		0–10	1	○
P60.13	Logical And D input 2		0–10	1	○
P60.14	Logical And D input 3		0–10	1	○
P60.15	Logical And D input 4		0–10	1	○
P60.16	Logical And E input 1		0–10	1	○
P60.17	Logical And E input 2		0–10	1	○
P60.18	Logical And E input 3		0–10	1	○
P60.19	Logical And E input 4		0–10	1	○
P60.20	Logical And F input 1		0–10	1	○
P60.21	Logical And F input 2		0–10	1	○
P60.22	Logical And F input 3		0–10	1	○
P60.23	Logical And F input 4		0–10	1	○
P60.24	Logical And G input 1		0–10	1	○
P60.25	Logical And G input 2		0–10	1	○
P60.26	Logical And G input 3		0–10	1	○
P60.27	Logical And G input 4		0–10	1	○
P60.28	Logical And H input 1		0–10	1	○
P60.29	Logical And H input 2		0–10	1	○

Function code	Name	Parameter description	Setting range	Default	Modify
P60.30	Logical And H input 3		0–10	1	○
P60.31	Logical And H input 4		0–10	1	○
P60.32	Logical And I input 1		0–10	1	○
P60.33	Logical And I input 2		0–10	1	○
P60.34	Logical And I input 3		0–10	1	○
P60.35	Logical And I input 4		0–10	1	○
P60.36	Logical And J input 1		0–10	1	○
P60.37	Logical And J input 2		0–10	1	○
P60.38	Logical And J input 3		0–10	1	○
P60.39	Logical And J input 4		0–10	1	○
P60.40	Logical And K input 1		0–10	1	○
P60.41	Logical And K input 2		0–10	1	○
P60.42	Logical And K input 3		0–10	1	○
P60.43	Logical And K input 4		0–10	1	○
P60.44	Logical And L input 1		0–10	1	○
P60.45	Logical And L input 2		0–10	1	○
P60.46	Logical And L input 3		0–10	1	○
P60.47	Logical And L input 4		0–10	1	○
P60.48	Logical And M input 1		0–10	1	○
P60.49	Logical And M input 2		0–10	1	○
P60.50	Logical And M input 3		0–10	1	○
P60.51	Logical And M input 4		0–10	1	○
P60.52	Logical And N input 1		0–10	1	○
P60.53	Logical And N input 2		0–10	1	○
P60.54	Logical And N input 3		0–10	1	○
P60.55	Logical And N input 4		0–10	1	○
P60.56	Logical And O input 1		0–10	1	○
P60.57	Logical And O input 2		0–10	1	○
P60.58	Logical And O input 3		0–10	1	○
P60.59	Logical And O input 4		0–10	1	○
P60.60	Logical And P input 1		0–10	1	○
P60.61	Logical And P input 2		0–10	1	○
P60.62	Logical And P input 3		0–10	1	○
P60.63	Logical And P input 4		0–10	1	○

Group P61—Logical Or function block configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P61.00	Logical Or A input 1	0: 0	0–10	0	○
P61.01	Logical Or A input 2	1: 1	0–10	0	○
P61.02	Logical Or A input 3	2: Other-B connector	0–10	0	○
P61.03	Logical Or A input 4	3: DI1	0–10	0	○
P61.04	Logical Or B input 1	4: DI2	0–10	0	○
P61.05	Logical Or B input 2	5: DI3	0–10	0	○
P61.06	Logical Or B input 3	6: DI4	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P61.07	Logical Or B input 4	7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P61.08	Logical Or C input 1		0–10	0	○
P61.09	Logical Or C input 2		0–10	0	○
P61.10	Logical Or C input 3		0–10	0	○
P61.11	Logical Or C input 4		0–10	0	○
P61.12	Logical Or D input 1		0–10	0	○
P61.13	Logical Or D input 2		0–10	0	○
P61.14	Logical Or D input 3		0–10	0	○
P61.15	Logical Or D input 4		0–10	0	○
P61.16	Logical Or E input 1		0–10	0	○
P61.17	Logical Or E input 2		0–10	0	○
P61.18	Logical Or E input 3		0–10	0	○
P61.19	Logical Or E input 4		0–10	0	○
P61.20	Logical Or F input 1		0–10	0	○
P61.21	Logical Or F input 2		0–10	0	○
P61.22	Logical Or F input 3		0–10	0	○
P61.23	Logical Or F input 4		0–10	0	○
P61.24	Logical Or G input 1		0–10	0	○
P61.25	Logical Or G input 2		0–10	0	○
P61.26	Logical Or G input 3		0–10	0	○
P61.27	Logical Or G input 4		0–10	0	○
P61.28	Logical Or H input 1		0–10	0	○
P61.29	Logical Or H input 2		0–10	0	○
P61.30	Logical Or H input 3		0–10	0	○
P61.31	Logical Or H input 4		0–10	0	○
P61.32	Logical Or I input 1		0–10	0	○
P61.33	Logical Or I input 2		0–10	0	○
P61.34	Logical Or I input 3		0–10	0	○
P61.35	Logical Or I input 4		0–10	0	○
P61.36	Logical Or J input 1		0–10	0	○
P61.37	Logical Or J input 2		0–10	0	○
P61.38	Logical Or J input 3		0–10	0	○
P61.39	Logical Or J input 4		0–10	0	○
P61.40	Logical Or K input 1		0–10	0	○
P61.41	Logical Or K input 2		0–10	0	○
P61.42	Logical Or K input 3		0–10	0	○
P61.43	Logical Or K input 4		0–10	0	○
P61.44	Logical Or L input 1		0–10	0	○
P61.45	Logical Or L input 2		0–10	0	○
P61.46	Logical Or L input 3		0–10	0	○
P61.47	Logical Or L input 4		0–10	0	○
P61.48	Logical Not A input		0–10	0	○
P61.49	Logical Not B input		0–10	0	○
P61.50	Logical Not C input		0–10	0	○
P61.51	Logical Not D input		0–10	0	○
P61.52	Logical Not E input		0–10	0	○
P61.53	Logical Not F input		0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P61.54	Logical Not G input		0–10	0	○
P61.55	Logical Not H input		0–10	0	○
P61.56	Logical XNOR A input 1		0–10	0	○
P61.57	Logical XNOR A input 2		0–10	0	○
P61.58	Logical XNOR B input 1		0–10	0	○
P61.59	Logical XNOR B input 2		0–10	0	○
P61.60	Logical XNOR C input 1		0–10	0	○
P61.61	Logical XNOR C input 2		0–10	0	○
P61.62	Logical XNOR D input 1		0–10	0	○
P61.63	Logical XNOR D input 2		0–10	0	○
P61.64	Logical XOR A input 1		0–10	0	○
P61.65	Logical XOR A input 2		0–10	0	○
P61.66	Logical XOR B input 1		0–10	0	○
P61.67	Logical XOR B input 2		0–10	0	○
P61.68	Logical XOR C input 1		0–10	0	○
P61.69	Logical XOR C input 2		0–10	0	○
P61.70	Logical XOR D input 1		0–10	0	○
P61.71	Logical XOR D input 2		0–10	0	○

Group P62—Arithmetic function block configuration 1

Function code	Name	Parameter description	Setting range	Default	Modify
P62.00	PlusMinus module A input 1 (Plus)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running	0–10	0	○
P62.01	PlusMinus module A input 2 (Plus)		0–10	0	○
P62.02	PlusMinus module A input 3 (Plus)		0–10	0	○
P62.03	PlusMinus module A input 4 (Minus)		0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P62.04	PlusMinus module B input 1 (Plus)	8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.05	PlusMinus module B input 2 (Plus)		0–10	0	○
P62.06	PlusMinus module B input 2 (Plus)		0–10	0	○
P62.07	PlusMinus module B input 4 (Minus)		0–10	0	○
P62.08	PlusMinus module C input 1 (Plus)		0–10	0	○
P62.09	PlusMinus module C input 2 (Plus)		0–10	0	○
P62.10	PlusMinus module C input 3 (Plus)		0–10	0	○
P62.11	PlusMinus module C input 4 (Minus)		0–10	0	○
P62.12	PlusMinus module D input 1 (Plus)		0–10	0	○
P62.13	PlusMinus module D input 2 (Plus)		0–10	0	○
P62.14	PlusMinus module D input 3 (Plus)		0–10	0	○
P62.15	PlusMinus module D input 4 (Minus)		0–10	0	○
P62.16	PlusMinus module E input 1 (Plus)		0–10	0	○
P62.17	PlusMinus module E input 2 (Plus)		0–10	0	○
P62.18	PlusMinus module E input 3 (Plus)		0–10	0	○
P62.19	PlusMinus module E input 4 (Minus)		0–10	0	○
P62.20	PlusMinus module F input 1 (Plus)		0–10	0	○
P62.21	PlusMinus module F input 2 (Plus)		0–10	0	○
P62.22	PlusMinus module F input 2 (Plus)		0–10	0	○
P62.23	PlusMinus module F input 4 (Minus)		0–10	0	○
P62.24	PlusMinus module G input 1 (Plus)		0–10	0	○
P62.25	PlusMinus module G input 2 (Plus)		0–10	0	○
P62.26	PlusMinus module G input 3 (Plus)		0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P62.27	PlusMinus module G input 4 (Minus)		0–10	0	○
P62.28	PlusMinus module H input 1 (Plus)		0–10	0	○
P62.29	PlusMinus module H input 2 (Plus)		0–10	0	○
P62.30	PlusMinus module H input 3 (Plus)		0–10	0	○
P62.31	PlusMinus module H input 4 (Minus)		0–10	0	○
P62.32	MultiplyDivide module A input 1 (Multiply)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.33	MultiplyDivide module A input 2 (Multiply)		0–10	0	○
P62.34	MultiplyDivide module A input 3 (Divide)	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.35	MultiplyDivide module B input 1 (Multiply)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.36	MultiplyDivide module B input 2 (Multiply)		0–10	0	○
P62.37	MultiplyDivide module B input 3 (Divide)	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P62.38	MultiplyDivide module C input 1 (Multiply)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.39	MultiplyDivide module C input 2 (Multiply)		0–10	0	○
P62.40	MultiplyDivide module C input 3 (Divide)	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.41	MultiplyDivide module D input 1 (Multiply)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.42	MultiplyDivide module D input 2 (Multiply)		0–10	0	○
P62.43	MultiplyDivide module D input 3 (Divide)	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P62.44	MultiplyDivide module E input 1 (Multiply)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.45	MultiplyDivide module E input 2 (Multiply)		0–10	0	○
P62.46	MultiplyDivide module E input 3 (Divide)	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.47	MultiplyDivide module F input 1 (Multiply)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.48	MultiplyDivide module F input 2 (Multiply)		0–10	0	○
P62.49	MultiplyDivide module F input 3 (Divide)	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P62.50	MultiplyDivide module G input 1 (Multiply)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.51	MultiplyDivide module G input 2 (Multiply)		0–10	0	○
P62.52	MultiplyDivide module G input 3 (Divide)	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.53	MultiplyDivide module H input 1 (Multiply)	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.54	MultiplyDivide module H input 2 (Multiply)		0–10	0	○
P62.55	MultiplyDivide module H input 3 (Divide)	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P62.56	AbsoluteValModule A input	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.57	AbsoluteValModule B input		0–10	0	○
P62.58	AbsoluteValModule C input		0–10	0	○
P62.59	AbsoluteValModule D input		0–10	0	○
P62.60	AmplLimModule A upper limit input	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.61	AmplLimModule A lower limit input		0–10	0	○
P62.62	AmplLimModule A input		0–10	0	○
P62.63	AmplLimModule B upper limit input	Same as that for module A	0–10	0	○
P62.64	AmplLimModule B lower limit input	Same as that for module A	0–10	0	○
P62.65	AmplLimModule B input	Same as that for module A	0–10	0	○
P62.66	AmplLimModule C upper limit input	Same as that for module A	0–10	0	○
P62.67	AmplLimModule C lower limit input	Same as that for module A	0–10	0	○
P62.68	AmplLimModule C input	Same as that for module A	0–10	0	○
P62.69	AmplLimModule D upper limit input	Same as that for module A	0–10	0	○
P62.70	AmplLimModule D lower limit input	Same as that for module A	0–10	0	○
P62.71	AmplLimModule D input	Same as that for module A	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P62.72	InvModule A input	A positive number is changed to a negative number, while a negative number is changed to a positive number. 0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P62.73	InvModule B input		0–10	0	○
P62.74	InvModule C input		0–10	0	○
P62.75	InvModule D input		0–10	0	○
P62.76	InvModule E input		0–10	0	○
P62.77	InvModule F input		0–10	0	○
P62.78	InvModule G input		0–10	0	○
P62.79	InvModule H input		0–10	0	○

Group P63—Arithmetic function block configuration 2

Function code	Name	Parameter description	Setting range	Default	Modify
P63.00	IntegModule A input	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P63.01	IntegModule A integral time	0.01–100.00s	0.01–100.00	0.00s	○
P63.02	IntegModule A upper limit input	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		B			
P63.03	IntegModule A lower limit input	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P63.04	IntegModule B input	Same as that for module A	0–10	0	○
P63.05	IntegModule B integral time	Same as that for module A	0.01–100.00	0.00s	○
P63.06	IntegModule B upper limit input	Same as that for module A	0–10	0	○
P63.07	IntegModule B lower limit input	Same as that for module A	0–10	0	○
P63.08	IntegModule C Inp	Same as that for module A	0–10	0	○
P63.09	IntegModule C integral time	Same as that for module A	0.01–100.00	0.00s	○
P63.10	IntegModule C upper limit input	Same as that for module A	0–10	0	○
P63.11	IntegModule C lower limit input	Same as that for module A	0–10	0	○
P63.12	IntegModule D input	Same as that for module A	0–10	0	○
P63.13	IntegModule D integral time	Same as that for module A	0.01–100.00	0.00s	○
P63.14	IntegModule D upper limit input	Same as that for module A	0–10	0	○
P63.15	IntegModule D lower limit input	Same as that for module A	0–10	0	○
P63.16	DiffModule A input	0: Invalid 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P63.17	DiffModule A differential time	0–10s	0–10	0s	○
P63.18	DiffModule B input	Same as that for module A	0–10	0	○
P63.19	DiffModule B differential time	Same as that for module A	0–10	0s	○
P63.20	DiffModule C input	Same as that for module A	0–10	0	○
P63.21	DiffModule C differential time	Same as that for module A	0–10	0s	○
P63.22	DiffModule D input	Same as that for module A	0–10	0	○
P63.23	DiffModule D differential time	Same as that for module A	0–10	0s	○

Group P64—Control function block configuration 1

Function code	Name	Parameter description	Setting range	Default	Modify
P64.00	FiltModule A input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P64.01	FiltModule A filter time	0.000–10.000s	0.000–10.000	0.000s	○
P64.02	FiltModule B input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P64.03	FiltModule B filter time	0.000–10.000s	0.000–10.000	0.000s	○
P64.04	FiltModule C input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P64.05	FiltModule C filter time	0.000–10.000s	0.000–10.000	0.000s	○
P64.06	FiltModule D input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P64.07	FiltModule D filter time	0.000–10.000s	0.000–10.000	0.000s	○
P64.08	FiltModule E input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P64.09	FiltModule E filter time	0.000–10.000s	0.000–10.000	0.000s	○
P64.10	FiltModule F input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P64.11	FiltModule F filter time	0.000–10.000s	0.000–10.000	0.000s	○
P64.12	FiltModule G input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P64.13	FiltModule G filter time	0.000–10.000s	0.000–10.000	0.000s	○
P64.14	FiltModule H input	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P64.15	FiltModule H filter time	0.000–10.000s	0.000–10.000	0.000s	○
P64.16	Level-to-Pulse module A input	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P64.17	Module A pulse width duration	If the output that the input rising edge triggers is high, the output is set low after a set period of time. If the input is low, the output is immediately set to low, regardless of whether the duration is reached or not.	0.00–600.00	0.00s	○
P64.18	Level-to-Pulse module B input	Same as that for module A	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P64.19	Module B pulse width duration	Same as that for module A	0.00–600.00	0.00s	○
P64.20	Level-to-Pulse Module C input	Same as that for module A	0–10	0	○
P64.21	Module C pulse width duration	Same as that for module A	0.00–600.00	0.00s	○
P64.22	Level-to-Pulse module D input	Same as that for module A	0–10	0	○
P64.23	Module D pulse width duration	Same as that for module A	0.00–600.00	0.00s	○
P64.24	Pulse-to-level module A input	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 Set 1 (high level) on the first rising edge of the pulse, set 0 (low level) on the second rising edge, and so on. That is, set high level on odd-numbered rising edges and set low level on even-numbered rising edges.	0–10	0	○
P64.25	Pulse-to-level module B input		0–10	0	○
P64.26	Pulse-to-level module C input		0–10	0	○
P64.27	Pulse-to-level module D input		0–10	0	○
P64.28	LogicDelay A input	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P64.29	LogicDelay A function selection	0: When the input changes from 0 to 1, the high time must be maintained at the set delay time in order for the output to be high. 1: When the input changes from 1 to 0, the low time must be maintained at the set delay time in order for the output to be low. 2: When the input changes from 0 to 1 and from 1 to 0, delay processing is performed for each.	0–2	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P64.30	LogicDelay A delay	0.00–600.00s	0.00–600.00	0.00s	○
P64.31	LogicDelay B input	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P64.32	LogicDelay B function selection	0: When the input changes from 0 to 1, the high time must be maintained at the set delay time in order for the output to be high. 1: When the input changes from 1 to 0, the low time must be maintained at the set delay time in order for the output to be low. 2: When the input changes from 0 to 1 and from 1 to 0, filter processing is performed for each.	0–2	0	○
P64.33	LogicDelay B delay	0.00–600.00s	0.00–600.00	0.00s	○
P64.34	LogicDelay C input	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P64.35	LogicDelay C function selection	0: When the input changes from 0 to 1, the high time must be maintained at the set delay time in order for the output to be high. 1: When the input changes from 1 to 0, the low time must be maintained at the set delay time in order for the output to be low. 2: When the input changes from 0 to 1 and from 1 to 0, filter processing is performed for each.	0–2	0	○
P64.36	LogicDelay C delay	0.00–600.00s	0.00–600.00	0.00s	○
P64.37	LogicDelay D input	0: 0 1: 1 2: Other-B connector 3: DI1	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2			
P64.38	LogicDelay D function selection	0: When the input changes from 0 to 1, the high time must be maintained at the set delay time in order for the output to be high. 1: When the input changes from 1 to 0, the low time must be maintained at the set delay time in order for the output to be low. 2: When the input changes from 0 to 1 and from 1 to 0, filter processing is performed for each.	0–2	0	○
P64.39	LogicDelay D delay	0.00–600.00s	0.00–600.00	0.00s	○
P64.40	CountModule A count mode	0: Invalid 1: Count up mode 2: Count down mode 3: Count up/down mode	0–3	0	○
P64.41	CountModule A count cycle	The counter value is increased by 1 for every time that is specified by this function code. The value should be greater than the execution period of the free function block; otherwise, it will be automatically limited to the execution period of the free function block.	0–65535	0ms	○
P64.42	CountModule A count upper limit	1–65535	1–65535	0	○
P64.43	CountModule A start source	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 When this function code takes effective, the counter starts counting. When this function	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		code is ineffective, the counter stops counting, and it counts from 0 for next time of startup.			
P64.44	CountModule B count mode	0: Invalid 1: Count up mode 2: Count down mode 3: Count up/down mode	0–3	0	○
P64.45	CountModule B count cycle	Same as that for module A	0–65535ms	0ms	○
P64.46	CountModule B count upper limit	Same as that for module A	1–65535	0	○
P64.47	CountModule B start source	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 When this function code takes effective, the counter starts counting. When this function code is ineffective, the counter stops counting, and it counts from 0 for next time of startup.	0–10	0	○
P64.48	CountModule C Count Mode	0: Invalid 1: Count up mode 2: Count down mode 3: Count up/down mode	0–3	0	○
P64.49	CountModule C count cycle	Same as that for module A	0–65535ms	0ms	○
P64.50	CountModule C count upper limit	Same as that for module A	1–65535	0	○
P64.51	CountModule C start source	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 When this function code takes effective, the counter starts	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		counting. When this function code is ineffective, the counter stops counting, and it counts from 0 for next time of startup.			
P64.52	CountModule D count mode	0: Invalid 1: Count up mode 2: Count down mode 3: Count up/down mode	0–3	0	○
P64.53	CountModule D count cycle	Same as that for module A	0–65535ms	0ms	○
P64.54	CountModule D count upper limit	Same as that for module A	1–65535	0	○
P64.55	CountModule D start source	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 When this function code takes effective, the counter starts counting. When this function code is ineffective, the counter stops counting, and it counts from 0 for next time of startup.	0–10	0	○

Group P65—Control function block configuration 2

Function code	Name	Parameter description	Setting range	Default	Modify
P65.00	MultidotCurveModule A input	0: 0 1: Digital (-600.0–600.0%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P65.01	MultidotCurveModule A input X1	-600.0–600.0%	-600.0–600.0	0.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P65.02	MultidotCurveModule A input X2	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.03	MultidotCurveModule A input X3	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.04	MultidotCurveModule A input X4	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.05	MultidotCurveModule A input X5	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.06	MultidotCurveModule A input X6	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.07	MultidotCurveModule A input X7	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.08	MultidotCurveModule A input X8	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.09	MultidotCurveModule A input X9	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.10	MultidotCurveModule A input X10	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.11	MultidotCurveModule A input Y1	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.12	MultidotCurveModule A input Y2	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.13	MultidotCurveModule A input Y3	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.14	MultidotCurveModule A input Y4	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.15	MultidotCurveModule A input Y5	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.16	MultidotCurveModule A input Y6	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.17	MultidotCurveModule A input Y7	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.18	MultidotCurveModule A input Y8	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.19	MultidotCurveModule A input Y9	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.20	MultidotCurveModule A input Y10	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.21	MultidotCurveModule B input	0: 0 1: Digital (-600.0–600.0%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		10: Process data 3 of bus adapter B			
P65.22	MultidotCurveModule B input X1	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.23	MultidotCurveModule B input X2	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.24	MultidotCurveModule B input X3	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.25	MultidotCurveModule B input X4	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.26	MultidotCurveModule B input X5	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.27	MultidotCurveModule B input X6	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.28	MultidotCurveModule B input X7	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.29	MultidotCurveModule B input X8	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.30	MultidotCurveModule B input X9	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.31	MultidotCurveModule B input X10	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.32	MultidotCurveModule B input Y1	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.33	MultidotCurveModule B input Y2	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.34	MultidotCurveModule B input Y3	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.35	MultidotCurveModule B input Y4	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.36	MultidotCurveModule B input Y5	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.37	MultidotCurveModule B input Y6	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.38	MultidotCurveModule B input Y7	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.39	MultidotCurveModule B input Y8	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.40	MultidotCurveModule B input Y9	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.41	MultidotCurveModule B input Y10	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.42	MultidotCurveModule C input	0: 0 1: Digital (-600.0–600.0%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B			
P65.43	MultidotCurveModule C input X1	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.44	MultidotCurveModule C input X2	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.45	MultidotCurveModule C input X3	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.46	MultidotCurveModule C input X4	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.47	MultidotCurveModule C input X5	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.48	MultidotCurveModule C input X6	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.49	MultidotCurveModule C input X7	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.50	MultidotCurveModule C input X8	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.51	MultidotCurveModule C input X9	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.52	MultidotCurveModule C input X10	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.53	MultidotCurveModule C input Y1	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.54	MultidotCurveModule C input Y2	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.55	MultidotCurveModule C input Y3	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.56	MultidotCurveModule C input Y4	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.57	MultidotCurveModule C input Y5	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.58	MultidotCurveModule C input Y6	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.59	MultidotCurveModule C input Y7	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.60	MultidotCurveModule C input Y8	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.61	MultidotCurveModule C input Y9	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.62	MultidotCurveModule C input Y10	-600.0–600.0%	-600.0–600.0	0.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P65.63	MultidotCurveModule D input	0: 0 1: Digital (-600.0–600.0%) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P65.64	MultidotCurveModule D input X1	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.65	MultidotCurveModule D input X2	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.66	MultidotCurveModule D input X3	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.67	MultidotCurveModule D input X4	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.68	MultidotCurveModule D input X5	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.69	MultidotCurveModule D input X6	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.70	MultidotCurveModule D input X7	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.71	MultidotCurveModule D input X8	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.72	MultidotCurveModule D input X9	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.73	MultidotCurveModule D input X10	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.74	MultidotCurveModule D input Y1	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.75	MultidotCurveModule D input Y2	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.76	MultidotCurveModule D input Y3	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.77	MultidotCurveModule D input Y4	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.78	MultidotCurveModule D input Y5	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.79	MultidotCurveModule D input Y6	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.80	MultidotCurveModule D input Y7	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.81	MultidotCurveModule D input Y8	-600.0–600.0%	-600.0–600.0	0.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P65.82	MultidotCurveModule D input Y9	-600.0–600.0%	-600.0–600.0	0.0%	○
P65.83	MultidotCurveModule D input Y10	-600.0–600.0%	-600.0–600.0	0.0%	○

Group P66—Switch function block configuration

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P66.00</td><td>Binary selector A input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.01</td><td>Binary selector A input 1</td><td rowspan="2">0: 0
1: 1
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.02</td><td>Binary selector A input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.03</td><td>Binary selector B input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.04</td><td>Binary selector B input 1</td><td rowspan="2">0: 0
1: 1
2: Other-B connector
3: DI1
4: DI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.05</td><td>Binary selector B input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
		5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2			
P66.06	Binary selector C input selection	0: Input 1 1: Input 2 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P66.07	Binary selector C input 1	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P66.08	Binary selector C input 2		0–10	0	○
P66.09	Binary selector D input selection	0: Input 1 1: Input 2 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P66.10	Binary selector D input 1	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6	0–10	0	○
P66.11	Binary selector D input 2		0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		9: HDI1 10: HDI2			
P66.12	Binary selector E input selection	0: Input 1 1: Input 2 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P66.13	Binary selector E input 1	0: 0 1: 1	0–10	0	○
P66.14	Binary selector E input 2	2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P66.15	Binary selector F input selection	0: Input 1 1: Input 2 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P66.16	Binary selector F input 1	0: 0 1: 1	0–10	0	○
P66.17	Binary selector F input 2	2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P66.18	Binary selector G input selection	0: Input 1 1: Input 2 2: Other-B connector 3: DI1	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2			
P66.19	Binary selector G input 1	0: 0 1: 1	0–10	0	○
P66.20	Binary selector G input 2	2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P66.21	Binary selector H input selection	0: Input 1 1: Input 2 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P66.22	Binary selector H input 1	0: 0 1: 1	0–10	0	○
P66.23	Binary selector H input 2	2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P66.24	DigitSelector A input selection	0: Input 1 1: Input 2 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5	0–10	0	○

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>8: DI6
9: HDI1
10: HDI2</td><td></td><td></td><td></td></tr>
<tr><td>P66.25</td><td>DigitSelector A input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.26</td><td>DigitSelector A input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.27</td><td>DigitSelector B input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.28</td><td>DigitSelector B input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.29</td><td>DigitSelector B input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.30</td><td>DigitSelector C input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P66.31</td><td>DigitSelector C input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.32</td><td>DigitSelector C input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.33</td><td>DigitSelector D input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.34</td><td>DigitSelector D input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.35</td><td>DigitSelector D input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.36</td><td>DigitSelector E input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.37</td><td>DigitSelector E input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.38</td><td>DigitSelector E input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td></td><td></td><td></td></tr>
<tr><td>P66.39</td><td>DigitSelector F input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.40</td><td>DigitSelector F input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.41</td><td>DigitSelector F input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.42</td><td>DigitSelector G input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.43</td><td>DigitSelector G input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.44</td><td>DigitSelector G input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>10: Process data 3 of bus adapter B</td><td></td><td></td><td></td></tr>
<tr><td>P66.45</td><td>DigitSelector H input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.46</td><td>DigitSelector H input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.47</td><td>DigitSelector H input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.48</td><td>DigitSelector I input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.49</td><td>DigitSelector I input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.50</td><td>DigitSelector I input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.51</td><td>DigitSelector J input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td></td><td></td><td>3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td></td><td></td><td></td></tr>
<tr><td>P66.52</td><td>DigitSelector J input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.53</td><td>DigitSelector J input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.54</td><td>DigitSelector K input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.55</td><td>DigitSelector K input 1</td><td rowspan="2">0: 0
1: Digital (-0x7FFF–0x7FFF)
2: Other-C connector
3: AI1
4: AI2
5: HDI1
6: HDI2
7: Multi-step running
8: MOP
9: Process data 3 of bus adapter A
10: Process data 3 of bus adapter B</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.56</td><td>DigitSelector K input 2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.57</td><td>DigitSelector L input selection</td><td>0: Input 1
1: Input 2
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

Function code	Name	Parameter description	Setting range	Default	Modify
		9: HDI1 10: HDI2			
P66.58	DigitSelector L input 1	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P66.59	DigitSelector L input 2		0–10	0	○
P66.60	Comparator A selection	0: ＞ 1: ＜ 2: ＝	0–2	0	○
P66.61	Comparator A input 1	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P66.62	Comparator A input 2		0–10	0	○
P66.63	Comparator A hysteresis loop input	0–65535	0–65535	0	○
P66.64	Comparator B selection	0: ＞ 1: ＜ 2: ＝	0–2	0	○
P66.65	Comparator B input 1	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P66.66	Comparator B input 2		0–10	0	○
P66.67	Comparator B hysteresis loop input	0–65535	0–65535	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P66.68	Comparator C selection	0: ＞ 1: ＜ 2: ＝	0–2	0	○
P66.69	Comparator C input 1	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P66.70	Comparator C input 2		0–10	0	○
P66.71	Comparator C hysteresis loop input	0–65535	0–65535	0	○
P66.72	Comparator D selection	0: ＞ 1: ＜ 2: ＝	0–2	0	○
P66.73	Comparator D input 1	0: 0 1: Digital (-0x7FFF–0x7FFF) 2: Other-C connector 3: AI1 4: AI2 5: HDI1 6: HDI2 7: Multi-step running 8: MOP 9: Process data 3 of bus adapter A 10: Process data 3 of bus adapter B	0–10	0	○
P66.74	Comparator D input 2		0–10	0	○
P66.75	Comparator D hysteresis loop input	0–65535	0–65535	0	○
P66.76	RS trigger A set input IN1	0: 0 1: 1 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2 Truth table:	0–10	0	○
P66.77	RS trigger A reset input IN2		0–10	0	○
P66.78	RS trigger B set input IN1		0–10	0	○
P66.79	RS trigger B reset input IN2		0–10	0	○
P66.80	RS trigger C set input IN1		0–10	0	○
P66.81	RS trigger C reset input IN2		0–10	0	○
P66.82	RS trigger D set input IN1		0–10	0	○

<table>
<tr><th>Function code</th><th>Name</th><th>Parameter description</th><th>Setting range</th><th>Default</th><th>Modify</th></tr>
<tr><td>P66.83</td><td>RS trigger D reset input IN2</td><td><table><tr><th colspan="2">Input</th><th colspan="2">Output</th></tr><tr><td>IN1(S)</td><td>IN2(R)</td><td>OUT1</td><td>OUT2</td></tr><tr><td>0</td><td>0</td><td>Unchanged</td><td>Unchanged</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td></tr><tr><td>X</td><td>1</td><td>0</td><td>1</td></tr></table></td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.84</td><td>D trigger A set input IN1</td><td rowspan="16">0: 0
1: 1
2: Other-B connector
3: DI1
4: DI2
5: DI3
6: DI4
7: DI5
8: DI6
9: HDI1
10: HDI2
Truth table:<table><tr><th colspan="4">Input</th><th colspan="2">Output</th></tr><tr><td>IN1</td><td>IN2</td><td>IN3</td><td>IN4</td><td>OUT1</td><td>OUT2</td></tr><tr><td>0</td><td>IN2</td><td>↑</td><td>0</td><td>IN2</td><td>IN2</td></tr><tr><td>X</td><td>X</td><td>X</td><td>1</td><td>0</td><td>1</td></tr><tr><td>0</td><td>X</td><td>None ↑</td><td>0</td><td>Retain</td><td>Retain</td></tr><tr><td>1</td><td>X</td><td>X</td><td>0</td><td>1</td><td>0</td></tr></table></td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.85</td><td>D trigger A input IN2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.86</td><td>D trigger A clock input IN3</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.87</td><td>D trigger A reset input IN4</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.88</td><td>D trigger B set input IN1</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.89</td><td>D trigger B input IN2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.90</td><td>D trigger B clock input IN3</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.91</td><td>D trigger B reset input IN4</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.92</td><td>D trigger C set input IN1</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.93</td><td>D trigger C input IN2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.94</td><td>D trigger C clock input IN3</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.95</td><td>D trigger C reset input IN4</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.96</td><td>D trigger D set input IN1</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.97</td><td>D trigger D input IN2</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.98</td><td>D trigger D clock input IN3</td><td>0–10</td><td>0</td><td>○</td></tr>
<tr><td>P66.99</td><td>D trigger D reset input IN4</td><td>0–10</td><td>0</td><td>○</td></tr>
</table>

Group P67—PID function block configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P67.00	PID-A reference source	0: Invalid 1: Digital (-100.00–100.00%) 2: Other-C connector 3: AI1 4: AI2 5: High-speed pulse HDI1 6: High-speed pulse HDI2 7: Multi-step speed run 8: MOP 9: Process data 2 of bus adapter A	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
		10: Process data 2 of bus adapter B			
P67.01	PID-A feedback source	0: Invalid 1: Digital (-100.00–100.00%) 2: Other-C connector 3: AI1 4: AI2 5: High-speed pulse HDI1 6: High-speed pulse HDI2 7: Multi-step speed run (reserved) 8: MOP 9: Process data 2 of bus adapter A 10: Process data 2 of bus adapter B	0–10	0	○
P67.02	PID-A output characteristics	0: PID output is positive. 1: PID output is negative. 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P67.03	PID-A proportional gain (Kp)	0.00–100.00	0.00–100.00	1.00	○
P67.04	PID-A integral time (Ti)	0.00–10.00s	0.00–10.00	1.00s	○
P67.05	PID-A differential time (Td)	0.00–10.00s	0.00–10.00	0.00s	○
P67.06	PID-A sampling cycle (T)	0.001–1.000s	0.001–1.000	0.001s	○
P67.07	PID-A control deviation limit	0.1–100.0%	0.1–100.0	0.1%	○
P67.08	PID-A output upper limit	P67.09–100.0% (Max frequency or voltage)	P67.09-100.0	100.0%	○
P67.09	PID-A output lower limit	-100.0%–P67.08 (Max frequency or voltage)	-100.0–P67.08	0.0%	○
P67.10	PID-A feedback offline detection value	0.0–100.0%	0.0–100.0	0.0%	○
P67.11	PID-A feedback offline detection time	0.0–3600.0s	0.0–3600.0	1.0s	○
P67.12	PID-A regulation selection	Ones place: 0: Continue integral control after the frequency reaches upper/lower limit 1: Stop integral control after the frequency reaches upper/lower	0000–0x1111	0x0001	○

Function code	Name	Parameter description	Setting range	Default	Modify
		limit Tens place: 0: Same as the main given direction. When PID regulated output is inconsistent with the present running direction, the output is forced to 0. 1: Contrary to the main given direction. When PID regulated output is inconsistent with the present running direction, the closed-loop regulation output is executed at the direction opposite to the present running direction. Hundreds place–thousands place: Reserved			
P67.13	PID-A low frequency proportional gain (Kp)	0.00–100.00 Proportional gain at less than 5Hz; linearly increased to P67.03 at 5–10Hz.	0.00–100.00	1.00	○
P67.14	PID-A command ACC/DEC time	0.0–1000.0s Time for PID reference to increase from 0 to the given value.	0.0–1000.0s	0.0s	○
P67.15	PID-A output filter time	0.000–10.000s	0.000–10.000s	0.000s	○
P67.16	PID-A output pausing command source	0: 0 1: 1 (pausing is effective) 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P67.17	PID-A module reset source	0: 0 (ineffective) 1: 1 (reset is effective) 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P67.18–P67.19	Reserved	-	-	0	○
P67.20	PID-B reference source	0: Invalid 1: Digital (-100.00–100.00%) 2: Other-C connector 3: AI1 4: AI2 5: High-speed pulse HDI1 6: High-speed pulse HDI2 7: Multi-step speed run 8: MOP 9: Process data 2 of bus adapter A 10: Process data 2 of bus adapter B	0–10	0	○
P67.21	PID-B feedback source	0: Invalid 1: Digital (-100.00–100.00%) 2: Other-C connector 3: AI1 4: AI2 5: High-speed pulse HDI1 6: High-speed pulse HDI2 7: Multi-step speed run (reserved) 8: MOP 9: Process data 2 of bus adapter A 10: Process data 2 of bus adapter B	0–10	0	○
P67.22	PID-B output characteristics	0: PID output is positive. 1: PID output is negative. 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○
P67.23	PID-B Prop Gain(Kp)	0.00–100.00	0.00–100.00	1.00	○
P67.24	PID-B integral time (Ti)	0.00–10.00s	0.00–10.00	1.00s	○
P67.25	PID-B differential time (Td)	0.00–10.00s	0.00–10.00	0.00s	○
P67.26	PID-B sampling cycle(T)	0.001–1.000s	0.001–1.000	0.001s	○
P67.27	PID-B control deviation limit	0.1–100.0%	0.1–100.0	0.1%	○
P67.28	PID-B output upper limit	P64.29–100.0% (Max frequency or voltage)	P64.29-100.0	100.0%	○
P67.29	PID-B output lower limit	-100.0%–P64.28 (Max frequency or voltage)	-100.0–P64.28	0.0%	○

Function code	Name	Parameter description	Setting range	Default	Modify
P67.30	PID-B feedback offline detection value	0.0–100.0%	0.0–100.0	0.0%	○
P67.31	PID-B feedback offline detection time	0.0–3600.0s	0.0–3600.0	1.0s	○
P67.32	PID regulation selection	Ones place: 0: Continue integral control after the frequency reaches upper/lower limit 1: Stop integral control after the frequency reaches upper/lower limit Tens place: 0: Same as the main given direction. When PID regulated output is inconsistent with the present running direction, the output is forced to 0. 1: Contrary to the main given direction. When PID regulated output is inconsistent with the present running direction, the closed-loop regulation output is executed at the direction opposite to the present running direction. Hundreds place–thousands place: Reserved	0x0000–0x1111	0x0001	○
P67.33	PID-B low frequency proportional gain (Kp)	Proportional gain at less than 5Hz; linearly increased to P67.23 at 5–10Hz.	0.00–100.00	1.00	○
P67.34	PID-B command ACC/DEC time	0.0–1000.0s Time for PID reference to increase from 0 to the given value.	0.0–1000.0	0.0s	○
P67.35	PID-B output filter time	0.000–10.000s	0.000–10.000	0.000s	○
P67.36	PID-B output pausing command source	0: 0 1: 1 (pausing is effective) 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P67.37	PID-B module reset source	0: Invalid 1: Reset is valid 2: Other-B connector 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: HDI1 10: HDI2	0–10	0	○

Group P80—Bit data set 1-Summary of data of BO type

Function code	Name	Parameter description	Setting range	Default	Modify
P80.00	Logic 0	0–1	0–1	0	●
P80.01	Logic 1	0–1	0–1	1	●
P80.02	DI1	0–1	0–1	0	●
P80.03	DI2	0–1	0–1	0	●
P80.04	DI3	0–1	0–1	0	●
P80.05	DI4	0–1	0–1	0	●
P80.06	DI5	0–1	0–1	0	●
P80.07	DI6	0–1	0–1	0	●
P80.08	HDI1	0–1	0–1	0	●
P80.09	HDI2	0–1	0–1	0	●
P80.10	RO1	0–1	0–1	0	●
P80.11	RO2	0–1	0–1	0	●
P80.12	RO3	0–1	0–1	0	●
P80.13	HDO1	0–1	0–1	0	●
P80.14	HDO2	0–1	0–1	0	●
P80.15	Input PZD1.0	Whether the bit information of PZD1 and PZD2 comes from bus adapter A or B is determined by the control channel. Displays the bit information of the input PZD.	0–1	0	●
P80.16	Input PZD1.1	Same as the description for input PZD1.0.	0–1	0	●
P80.17	Input PZD1.2	Same as the description for input PZD1.0.	0–1	0	●
P80.18	Input PZD1.3	Same as the description for input PZD1.0.	0–1	0	●
P80.19	Input PZD1.4	Same as the description for input PZD1.0.	0–1	0	●
P80.20	Input PZD1.5	Same as the description for input PZD1.0.	0–1	0	●
P80.21	Input PZD1.6	Same as the description for input PZD1.0.	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P80.22	Input PZD1.7	Same as the description for input PZD1.0.	0–1	0	●
P80.23	Input PZD1.8	Same as the description for input PZD1.0.	0–1	0	●
P80.24	Input PZD1.9	Same as the description for input PZD1.0.	0–1	0	●
P80.25	Input PZD1.10	Same as the description for input PZD1.0.	0–1	0	●
P80.26	Input PZD1.11	Same as the description for input PZD1.0.	0–1	0	●
P80.27	Input PZD1.12	Same as the description for input PZD1.0.	0–1	0	●
P80.28	Input PZD1.13	Same as the description for input PZD1.0.	0–1	0	●
P80.29	Input PZD1.14	Same as the description for input PZD1.0.	0–1	0	●
P80.30	Input PZD1.15	Same as the description for input PZD1.0.	0–1	0	●
P80.31	Input PZD2.0	Same as the description for input PZD1.0.	0–1	0	●
P80.32	Input PZD2.1	Same as the description for input PZD1.0.	0–1	0	●
P80.33	Input PZD2.2	Same as the description for input PZD1.0.	0–1	0	●
P80.34	Input PZD2.3	Same as the description for input PZD1.0.	0–1	0	●
P80.35	Input PZD2.4	Same as the description for input PZD1.0.	0–1	0	●
P80.36	Input PZD2.5	Same as the description for input PZD1.0.	0–1	0	●
P80.37	Input PZD2.6	Same as the description for input PZD1.0.	0–1	0	●
P80.38	Input PZD2.7	Same as the description for input PZD1.0.	0–1	0	●
P80.39	Input PZD2.8	Same as the description for input PZD1.0.	0–1	0	●
P80.40	Input PZD2.9	Same as the description for input PZD1.0.	0–1	0	●
P80.41	Input PZD2.10	Same as the description for input PZD1.0.	0–1	0	●
P80.42	Input PZD2.11	Same as the description for input PZD1.0.	0–1	0	●
P80.43	Input PZD2.12	Same as the description for input PZD1.0.	0–1	0	●
P80.44	Input PZD2.13	Same as the description for input PZD1.0.	0–1	0	●
P80.45	Input PZD2.14	Same as the description for input PZD1.0.	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P80.46	Input PZD2.15	Same as the description for input PZD1.0.	0–1	0	●
P80.47	IO expansion card 1-DI1	Same as the description for input PZD1.0.	0–1	0	●
P80.48	IO expansion card 1-DI2	Same as the description for input PZD1.0.	0–1	0	●
P80.49	IO expansion card 1-DI3	Same as the description for input PZD1.0.	0–1	0	●
P80.50	IO expansion card 2-DI1	Same as the description for input PZD1.0.	0–1	0	●
P80.51	IO expansion card 2-DI2	Same as the description for input PZD1.0.	0–1	0	●
P80.52	IO expansion card 2-DI3	Same as the description for input PZD1.0.	0–1	0	●
P80.53	SW 3.0	0: Non torque control 1: Torque control	0–1	0	●
P80.54	SW 3.1	0: Non V/F control 1: V/F control	0–1	0	●
P80.55	SW 3.2	0: Non SVC control 1: SVC control	0–1	0	●
P80.56	SW 3.3	0: Non FVC control 1: FVC control	0–1	0	●
P80.57	SW 3.4	0: Non speed control 1: Speed control	0–1	0	●
P80.58	SW 3.5	0: Do not remove integral component 1: Remove integral component	0–1	0	●
P80.59	SW 3.6	0: Do not pause integral component 1: Pause integral component	0–1	0	●
P80.60	SW 3.7	0: Output speed is not 0 0: Output speed is 0	0–1	0	●
P80.61	SW 3.8	0: Non brake close state 1: Brake close state	0–1	0	●
P80.62	SW 3.9	0: Non brake release state 1: Brake release state	0–1	0	●
P80.63	SW 3.10	0: Non forced brake close state 1: Forced brake close state	0–1	0	●
P80.64	SW 3.11	0: Non forced brake release state 1: Forced brake release state	0–1	0	●
P80.65	SW 3.12	0: Non encoder fault 1: Encoder fault	0–1	0	●
P80.66	SW 3.13	0: Non motor overtemperature alarm 1: Motor overtemperature alarm	0–1	0	●
P80.67	SW 3.14	0: Non motor overtemperature fault	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
		1: Motor overtemperature fault			
P80.68	SW 3.15	0: Non module overheating alarm 1: Module overheating alarm	0–1	0	●
P80.69	SW 4.0	0: VFD not in ACC running 1: VFD in ACC running	0–1	0	●
P80.70	SW 4.1	0: VFD not in DEC running 1: VFD in DEC running	0–1	0	●
P80.71	SW 4.2	0: VFD not in constant-speed running 1: VFD in constant-speed running	0–1	0	●
P80.72	SW 4.3	P80.72: Motor selection, bit0 P80.73: Motor selection, bit1 Bit1bit0: 00—Motor 1 Bit1bit0: 01—Motor 2 Bit1bit0: 10—Motor 3 Bit1bit0: 11—Motor 4	0–1	0	●
P80.73	SW 4.4		0–1	0	●
P80.74	Reserved	-	-	-	-

Group P81—Bit data set 2-Summary of data of BO type

Function code	Name	Parameter description	Setting range	Default	Modify
P81.00	Word-to-bit A output bit 0	0–1	0–1	0	●
P81.01	Word-to-bit A output bit 1	0–1	0–1	0	●
P81.02	Word-to-bit A output bit 2	0–1	0–1	0	●
P81.03	Word-to-bit A output bit 3	0–1	0–1	0	●
P81.04	Word-to-bit A output bit 4	0–1	0–1	0	●
P81.05	Word-to-bit A output bit 5	0–1	0–1	0	●
P81.06	Word-to-bit A output bit 6	0–1	0–1	0	●
P81.07	Word-to-bit A output bit 7	0–1	0–1	0	●
P81.08	Word-to-bit A output bit 8	0–1	0–1	0	●
P81.09	Word-to-bit A output bit 9	0–1	0–1	0	●
P81.10	Word-to-bit A output bit 10	0–1	0–1	0	●
P81.11	Word-to-bit A output bit 11	0–1	0–1	0	●
P81.12	Word-to-bit A output bit 12	0–1	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P81.13	Word-to-bit A output bit 13	0–1	0–1	0	●
P81.14	Word-to-bit A output bit 14	0–1	0–1	0	●
P81.15	Word-to-bit A output bit 15	0–1	0–1	0	●
P81.16	Word-to-bit B output bit 0	0–1	0–1	0	●
P81.17	Word-to-bit B output bit 1	0–1	0–1	0	●
P81.18	Word-to-bit B output bit 2	0–1	0–1	0	●
P81.19	Word-to-bit B output bit 3	0–1	0–1	0	●
P81.20	Word-to-bit B output bit 4	0–1	0–1	0	●
P81.21	Word-to-bit B output bit 5	0–1	0–1	0	●
P81.22	Word-to-bit B output bit 6	0–1	0–1	0	●
P81.23	Word-to-bit B output bit 7	0–1	0–1	0	●
P81.24	Word-to-bit B output bit 8	0–1	0–1	0	●
P81.25	Word-to-bit B output bit 9	0–1	0–1	0	●
P81.26	Word-to-bit B output bit 10	0–1	0–1	0	●
P81.27	Word-to-bit B output bit 11	0–1	0–1	0	●
P81.28	Word-to-bit B output bit 12	0–1	0–1	0	●
P81.29	Word-to-bit B output bit 13	0–1	0–1	0	●
P81.30	Word-to-bit B output bit 14	0–1	0–1	0	●
P81.31	Word-to-bit B output bit 15	0–1	0–1	0	●
P81.32	Word-to-bit C output bit 0	0–1	0–1	0	●
P81.33	Word-to-bit C output bit 1	0–1	0–1	0	●
P81.34	Word-to-bit C output bit 2	0–1	0–1	0	●
P81.35	Word-to-bit C output bit 3	0–1	0–1	0	●
P81.36	Word-to-bit C	0–1	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
	output bit 4				
P81.37	Word-to-bit C output bit 5	0–1	0–1	0	●
P81.38	Word-to-bit C output bit 6	0–1	0–1	0	●
P81.39	Word-to-bit C output bit 7	0–1	0–1	0	●
P81.40	Word-to-bit C output bit 8	0–1	0–1	0	●
P81.41	Word-to-bit C output bit 9	0–1	0–1	0	●
P81.42	Word-to-bit C output bit 10	0–1	0–1	0	●
P81.43	Word-to-bit C output bit 11	0–1	0–1	0	●
P81.44	Word-to-bit C output bit 12	0–1	0–1	0	●
P81.45	Word-to-bit C output bit 13	0–1	0–1	0	●
P81.46	Word-to-bit C output bit 14	0–1	0–1	0	●
P81.47	Word-to-bit C output bit 15	0–1	0–1	0	●
P81.48	Word-to-bit D output bit 0	0–1	0–1	0	●
P81.49	Word-to-bit D output bit 1	0–1	0–1	0	●
P81.50	Word-to-bit D output bit 2	0–1	0–1	0	●
P81.51	Word-to-bit D output bit 3	0–1	0–1	0	●
P81.52	Word-to-bit D output bit 4	0–1	0–1	0	●
P81.53	Word-to-bit D output bit 5	0–1	0–1	0	●
P81.54	Word-to-bit D output bit 6	0–1	0–1	0	●
P81.55	Word-to-bit D output bit 7	0–1	0–1	0	●
P81.56	Word-to-bit D output bit 8	0–1	0–1	0	●
P81.57	Word-to-bit D output bit 9	0–1	0–1	0	●
P81.58	Word-to-bit D output bit 10	0–1	0–1	0	●
P81.59	Word-to-bit D output bit 11	0–1	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P81.60	Word-to-bit D output bit 12	0–1	0–1	0	●
P81.61	Word-to-bit D output bit 13	0–1	0–1	0	●
P81.62	Word-to-bit D output bit 14	0–1	0–1	0	●
P81.63	Word-to-bit D output bit 15	0–1	0–1	0	●
P81.64	Logical And A output	0–1	0–1	0	●
P81.65	Logical And B output	0–1	0–1	0	●
P81.66	Logical And C output	0–1	0–1	0	●
P81.67	Logical And D output	0–1	0–1	0	●
P81.68	Logical And E output	0–1	0–1	0	●
P81.69	Logical And F output	0–1	0–1	0	●
P81.70	Logical And G output	0–1	0–1	0	●
P81.71	Logical And H output	0–1	0–1	0	●
P81.72	Logical And I output	0–1	0–1	0	●
P81.73	Logical And J output	0–1	0–1	0	●
P81.74	Logical And K output	0–1	0–1	0	●
P81.75	Logical And L output	0–1	0–1	0	●
P81.76	Logical And M output	0–1	0–1	0	●
P81.77	Logical And N output	0–1	0–1	0	●
P81.78	Logical And O output	0–1	0–1	0	●
P81.79	Logical And P output	0–1	0–1	0	●
P81.80	Logical Or A output	0–1	0–1	0	●
P81.81	Logical Or B output	0–1	0–1	0	●
P81.82	Logical Or C output	0–1	0–1	0	●
P81.83	Logical Or D output	0–1	0–1	0	●
P81.84	Logical Or E output	0–1	0–1	0	●
P81.85	Logical Or F output	0–1	0–1	0	●
P81.86	Logical Or G output	0–1	0–1	0	●
P81.87	Logical Or H output	0–1	0–1	0	●
P81.88	Logical Or I output	0–1	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P81.89	Logical Or J output	0–1	0–1	0	●
P81.90	Logical Or K output	0–1	0–1	0	●
P81.91	Logical Or L output	0–1	0–1	0	●
P81.92	Logical Not A output	0–1	0–1	0	●
P81.93	Logical Not B output	0–1	0–1	0	●
P81.94	Logical Not C output	0–1	0–1	0	●
P81.95	Logical Not D output	0–1	0–1	0	●
P81.96	Logical Not E output	0–1	0–1	0	●
P81.97	Logical Not F output	0–1	0–1	0	●
P81.98	Logical Not G output	0–1	0–1	0	●
P81.99	Logical Not H output	0–1	0–1	0	●

Group P82—Bit data set 3-Summary of data of BO type

Function code	Name	Parameter description	Setting range	Default	Modify
P82.00	Logical XNOR A output	0–1	0–1	0	●
P82.01	Logical XNOR B output	0–1	0–1	0	●
P82.02	Logical XNOR C output	0–1	0–1	0	●
P82.03	Logical XNOR D output	0–1	0–1	0	●
P82.04	Logical XOR A output	0–1	0–1	0	●
P82.05	Logical XOR B output	0–1	0–1	0	●
P82.06	Logical XOR C output	0–1	0–1	0	●
P82.07	Logical XOR D output	0–1	0–1	0	●
P82.08	Binary selector A output	0–1	0–1	0	●
P82.09	Binary selector B output	0–1	0–1	0	●
P82.10	Binary selector C output	0–1	0–1	0	●
P82.11	Binary selector D output	0–1	0–1	0	●
P82.12	Binary selector E output	0–1	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P82.13	Binary selector F output	0–1	0–1	0	●
P82.14	Binary selector G output	0–1	0–1	0	●
P82.15	Binary selector H output	0–1	0–1	0	●
P82.16	Comparator A output	0–1	0–1	0	●
P82.17	Comparator B output	0–1	0–1	0	●
P82.18	Comparator C output	0–1	0–1	0	●
P82.19	Comparator D output	0–1	0–1	0	●
P82.20	LogicDelay A output	0–1	0–1	0	●
P82.21	LogicDelay B output	0–1	0–1	0	●
P82.22	LogicDelay C output	0–1	0–1	0	●
P82.23	LogicDelay D output	0–1	0–1	0	●
P82.24	Level-to-Pulse module A output	0–1	0–1	0	●
P82.25	Level-to-Pulse module B output	0–1	0–1	0	●
P82.26	Level-to-Pulse module C output	0–1	0–1	0	●
P82.27	Level-to-Pulse module D output	0–1	0–1	0	●
P82.28	Pulse-to-level module A output	0–1	0–1	0	●
P82.29	Pulse-to-level module B output	0–1	0–1	0	●
P82.30	Pulse-to-level module C output	0–1	0–1	0	●
P82.31	Pulse-to-level module D output	0–1	0–1	0	●
P82.32	AmplLimModule A Flag output	0–1	0–1	0	●
P82.33	AmplLimModule B Flag output	0–1	0–1	0	●
P82.34	AmplLimModule C Flag output	0–1	0–1	0	●
P82.35	AmplLimModule D Flag output	0–1	0–1	0	●
P82.36	RS trigger A set output	0–1	0–1	0	●
P82.37	RS trigger A reset output	0–1	0–1	0	●
P82.38	RS trigger B set output	0–1	0–1	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P82.39	RS trigger B reset output	0–1	0–1	0	●
P82.40	RS trigger C set output	0–1	0–1	0	●
P82.41	RS trigger C reset output	0–1	0–1	0	●
P82.42	RS trigger D set output	0–1	0–1	0	●
P82.43	RS trigger D reset output	0–1	0–1	0	●
P82.44	D trigger A set output	0–1	0–1	0	●
P82.45	D trigger A reset output	0–1	0–1	0	●
P82.46	D trigger B set output	0–1	0–1	0	●
P82.47	D trigger B reset output	0–1	0–1	0	●
P82.48	D trigger C set output	0–1	0–1	0	●
P82.49	D trigger C reset output	0–1	0–1	0	●
P82.50	D trigger D set output	0–1	0–1	0	●
P82.51	D trigger D reset output	0–1	0–1	0	●

Group P83—Word data set 1-Summary of data of CO type

Function code	Name	Parameter description	Setting range	Default	Modify
P83.00	Bit-to-word A output	0–65535	0–65535	0	●
P83.01	Bit-to-word B output	0–65535	0–65535	0	●
P83.02	Bit-to-word C output	0–65535	0–65535	0	●
P83.03	Bit-to-word D output	0–65535	0–65535	0	●
P83.04	Word-to-Dword A output	0–65535	0–65535	0	●
P83.05	Word-to-Dword B output	0–65535	0–65535	0	●
P83.06	Word-to-Dword C output	0–65535	0–65535	0	●
P83.07	Word-to-Dword D output	0–65535	0–65535	0	●
P83.08	Dword-to-word A output high bit	0–65535	0–65535	0	●
P83.09	Dword-to-word A output low bit	0–65535	0–65535	0	●
P83.10	Dword-to-word B output high bit	0–65535	0–65535	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P83.11	Dword-to-word B output low bit	0–65535	0–65535	0	●
P83.12	Dword-to-word C output high bit	0–65535	0–65535	0	●
P83.13	Dword-to-word C output low bit	0–65535	0–65535	0	●
P83.14	Dword-to-word D output high bit	0–65535	0–65535	0	●
P83.15	Dword-to-word D output low bit	0–65535	0–65535	0	●
P83.16	PlusMinus module A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.17	PlusMinus module B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.18	PlusMinus module C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.19	PlusMinus module D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.20	PlusMinus module E output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.21	PlusMinus module F output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.22	PlusMinus module G output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.23	PlusMinus module H output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.24	MultiplyDivide module A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.25	MultiplyDivide module B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.26	MultiplyDivide module C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.27	MultiplyDivide module D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.28	MultiplyDivide module E output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.29	MultiplyDivide module F output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.30	MultiplyDivide module G output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.31	MultiplyDivide module H output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.32	AbsoluteValModule A output	0–65535	0–65535	0	●
P83.33	AbsoluteValModule B output	0–65535	0–65535	0	●
P83.34	AbsoluteValModule C output	0–65535	0–65535	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P83.35	AbsoluteValModule D output	0–65535	0–65535	0	●
P83.36	DigitSelector A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.37	DigitSelector B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.38	DigitSelector C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.39	DigitSelector D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.40	DigitSelector E output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.41	DigitSelector F output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.42	DigitSelector G output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.43	DigitSelector H output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.44	DigitSelector I output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.45	DigitSelector J output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.46	DigitSelector K output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.47	DigitSelector L output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.48	FiltModule A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.49	FiltModule B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.50	FiltModule C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.51	FiltModule D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.52	FiltModule E output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.53	FiltModule F output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.54	FiltModule G output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.55	FiltModule H output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.56	AmplLimModule A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.57	AmplLimModule B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.58	AmplLimModule C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.59	AmplLimModule D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.60	InvModule A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.61	InvModule B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.62	InvModule C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.63	InvModule D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.64	InvModule E output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●

Function code	Name	Parameter description	Setting range	Default	Modify
P83.65	InvModule F output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.66	InvModule G output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.67	InvModule H output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.68	IntegModule A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.69	IntegModule B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.70	IntegModule C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.71	IntegModule D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.72	DiffModule A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.73	DiffModule B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.74	DiffModule C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.75	DiffModule D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.76	MultidotCurveModule A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.77	MultidotCurveModule B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.78	MultidotCurveModule C output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.79	MultidotCurveModule D output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.80	CountModule A output	0–65535	0–65535	0	●
P83.81	CountModule B output	0–65535	0–65535	0	●
P83.82	CountModule C output	0–65535	0–65535	0	●
P83.83	CountModule D output	0–65535	0–65535	0	●
P83.84	PID-A output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●
P83.85	PID-B output	-0x7FFF–0x7FFF	-0x7FFF–0x7FFF	0x0000	●

Group P84—Word data set 2-Summary of data of CO type

Function code	Name	Parameter description	Setting range	Default	Modify
P84.00	PC reference frequency	Communication frequency: InvtWorkshop given frequency	0–65535	0	●
P84.01	Modbus reference frequency	0–65535	0–65535	0	●
P84.02–P84.29	Reserved	-	-	-	-
P84.30	Frequency set through communication	InvtWorkshop/Modbus	0–65535	0	●

Function code	Name	Parameter description	Setting range	Default	Modify
P84.31	PID reference	InvtWorkshop/Modbus	0–65535	0	●
P84.32	PID feedback	InvtWorkshop/Modbus	0–65535	0	●
P84.33	Torque setting	InvtWorkshop/Modbus	0–65535	0	●
P84.34	FWD rotation upper-limit frequency setting	InvtWorkshop/Modbus	0–65535	0	●
P84.35	REV rotation upper-limit frequency setting	InvtWorkshop/Modbus	0–65535	0	●
P84.36	Electromotive torque upper limit	InvtWorkshop/Modbus	0–65535	0	●
P84.37	Braking torque upper limit	InvtWorkshop/Modbus	0–65535	0	●
P84.38	Special CW	InvtWorkshop/Modbus	0–65535	0	●
P84.39	Virtual input terminal command	InvtWorkshop/Modbus	0–65535	0	●
P84.40	VF separation voltage setting	InvtWorkshop/Modbus	0–65535	0	●

Group P85—Free programming configuration

Function code	Name	Parameter description	Setting range	Default	Modify
P85.00	Programming system A execution cycle	0: Invalid Anther value indicates the execution cycle 1–65535ms. **Note:** The selection of a free programming module (for example, selecting module 1 in the execution order of programming system A) can only be modified when the system cycle is 0.	0–65535	0ms	◎
P85.01	Programming system A-Module 1 selection	0: Invalid 1: Word-to-bit module A 2: Word-to-bit module B 3: Word-to-bit module C 4: Word-to-bit module D 5: Bit-to-word module A 6: Bit-to-word module B 7: Bit-to-word module C 8: Bit-to-word module D 9: Word-to-Dword module A 10: Word-to-Dword module B 11: Word-to-Dword module C 12: Word-to-Dword module D 13: Dword-to-word module A 14: Dword-to-word module B	0–162	0	◎
P85.02	Programming system A-Module 2 selection			0	◎
P85.03	Programming system A-Module 3 selection			0	◎
P85.04	Programming system A-Module 4 selection			0	◎
P85.05	Programming system A-Module 5 selection			0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P85.06	Programming system A-Module 6 selection	15: Dword-to-word module C 16: Dword-to-word module D 17: Logical And A 18: Logical And B 19: Logical And C 20: Logical And D 21: Logical And E 22: Logical And F 23: Logical And G 24: Logical And H 25: Logical And I 26: Logical And J 27: Logical And K 28: Logical And L 29: Logical And M 30: Logical And N 31: Logical And O 32: Logical And P 33: Logical Or A 34: Logical Or B 35: Logical Or C 36: Logical Or D 37: Logical Or E 38: Logical Or F 39: Logical Or G 40: Logical Or H 41: Logical Or I 42: Logical Or J 43: Logical Or K 44: Logical Or L 45: Logical Not A 46: Logical Not B 47: Logical Not C 48: Logical Not D 49: Logical Not E 50: Logical Not F 51: Logical Not G 52: Logical Not H 53: Logical XNOR A 54: Logical XNOR B 55: Logical XNOR C 56: Logical XNOR D 57: Logical XOR A 58: Logical XOR B 59: Logical XOR C 60: Logical XOR D 61: PlusMinus module A 62: PlusMinus module B 63: PlusMinus module C 64: PlusMinus module D 65: PlusMinus module E 66: PlusMinus module F		0	◎
P85.07	Programming system A-Module 7 selection			0	◎
P85.08	Programming system A-Module 8 selection			0	◎
P85.09	Programming system A-Module 9 selection			0	◎
P85.10	Programming system A-Module 10 selection			0	◎
P85.11	Programming system A-Module 11 selection			0	◎
P85.12	Programming system A-Module 12 selection			0	◎
P85.13	Programming system A-Module 13 selection			0	◎
P85.14	Programming system A-Module 14 selection			0	◎
P85.15	Programming system A-Module 15 selection			0	◎
P85.16	Programming system A-Module 16 selection			0	◎
P85.17	Programming system A-Module 17 selection			0	◎
P85.18	Programming system A-Module 18 selection			0	◎
P85.19	Programming system A-Module 19 selection			0	◎
P85.20	Programming system A-Module 20 selection			0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		67: PlusMinus module G 68: PlusMinus module H 69: MultiplyDivide module A 70: MultiplyDivide module B 71: MultiplyDivide module C 72: MultiplyDivide module D 73: MultiplyDivide module E 74: MultiplyDivide module F 75: MultiplyDivide module G 76: MultiplyDivide module H 77: AbsoluteValModule A 78: AbsoluteValModule B 79: AbsoluteValModule C 80: AbsoluteValModule D 81: AmplLimModule A 82: AmplLimModule B 83: AmplLimModule C 84: AmplLimModule D 85: InvModule A 86: InvModule B 87: InvModule C 88: InvModule D 89: InvModule E 90: InvModule F 91: InvModule H 92: InvModule H 93: IntegModule A 94: IntegModule B 95: IntegModule C 96: IntegModule D 97: DiffModule A 98: DiffModule B 99: DiffModule C 100: DiffModule D 101: FiltModule A 102: FiltModule B 103: FiltModule C 104: FiltModule D 105: FiltModule E 106: FiltModule F 107: FiltModule G 108: FiltModule H 109: Level-to-pulse module A 110: Level-to-Pulse module B 111: Level-to-Pulse module C 112: Level-to-Pulse module D 113: Pulse-to-level module A 114: Pulse-to-level module B 115: Pulse-to-level module C 116: Pulse-to-level module D 117: Logic delay A 118: Logic delay B			

Function code	Name	Parameter description	Setting range	Default	Modify
		119: Logic delay C 120: Logic delay D 121: MultidotCurveModule A 122: MultidotCurveModule B 123: MultidotCurveModule C 124: MultidotCurveModule D 125: PID module A 126: PID module B 127: Binary selector A 128: Binary selector B 129: Binary selector C 130: Binary selector D 131: Binary selector E 132: Binary selector F 133: Binary selector G 134: Binary selector H 135: DigitSelector A 136: DigitSelector B 137: DigitSelector C 138: DigitSelector D 139: DigitSelector E 140: DigitSelector F 141: DigitSelector G 142: DigitSelector H 143: DigitSelector I 144: DigitSelector J 145: DigitSelector K 146: DigitSelector L 147: Comparator A 148: Comparator B 149: Comparator C 150: Comparator D 151: RS trigger A 152: RS trigger B 153: RS trigger C 154: RS trigger D 155: D trigger A 156: D trigger B 157: D trigger C 158: D trigger D 159: Counter A 160: Counter B 161: Counter C 162: Counter D			
P85.21	Programming system B execution cycle	0: Invalid. Another value indicates an execution cycle value.	0–65535	0ms	◎
P85.22	Programming system B-Module 1 selection	Same as that for programming system A.	0–162	0	◎
P85.23	Programming system B-Module 2 selection			0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P85.24	Programming system B-Module 3 selection			0	◎
P85.25	Programming system B-Module 4 selection			0	◎
P85.26	Programming system B-Module 5 selection			0	◎
P85.27	Programming system B-Module 6 selection			0	◎
P85.28	Programming system B-Module 7 selection			0	◎
P85.29	Programming system B-Module 8 selection			0	◎
P85.30	Programming system B-Module 9 selection			0	◎
P85.31	Programming system B-Module 10 selection			0	◎
P85.32	Programming system B-Module 11 selection			0	◎
P85.33	Programming system B-Module 12 selection			0	◎
P85.34	Programming system B-Module 13 selection			0	◎
P85.35	Programming system B-Module 14 selection			0	◎
P85.36	Programming system B-Module 15 selection			0	◎
P85.37	Programming system B-Module 16 selection			0	◎
P85.38	Programming system B-Module 17 selection			0	◎
P85.39	Programming system B-Module 18 selection			0	◎
P85.40	Programming system B-Module 19 selection			0	◎
P85.41	Programming system B-Module 20 selection			0	◎

Group P94—Deadzone identification

Function code	Name	Parameter description	Setting range	Default	Modify
P94.00	Max current	0–4096	0–4096	0	○
P94.01	Deadzone compensation current step number	0–64	0–64	0	○
P94.02	Deadzone identification value 1	0–1500	0–1500	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P94.03	Deadzone identification value 2	0–1500	0–1500	0	◎
P94.04	Deadzone identification value 3	0–1500	0–1500	0	◎
P94.05	Deadzone identification value 4	0–1500	0–1500	0	◎
P94.06	Deadzone identification value 5	0–1500	0–1500	0	◎
P94.07	Deadzone identification value 6	0–1500	0–1500	0	◎
P94.08	Deadzone identification value 7	0–1500	0–1500	0	◎
P94.09	Deadzone identification value 8	0–1500	0–1500	0	◎
P94.10	Deadzone identification value 9	0–1500	0–1500	0	◎
P94.11	Deadzone identification value 10	0–1500	0–1500	0	◎
P94.12	Deadzone identification value 11	0–1500	0–1500	0	◎
P94.13	Deadzone identification value 12	0–1500	0–1500	0	◎
P94.14	Deadzone identification value 13	0–1500	0–1500	0	◎
P94.15	Deadzone identification value 14	0–1500	0–1500	0	◎
P94.16	Deadzone identification value 15	0–1500	0–1500	0	◎
P94.17	Deadzone identification value 16	0–1500	0–1500	0	◎
P94.18	Deadzone identification value 17	0–1500	0–1500	0	◎
P94.19	Deadzone identification value 18	0–1500	0–1500	0	◎
P94.20	Deadzone identification value 19	0–1500	0–1500	0	◎
P94.21	Deadzone identification value 20	0–1500	0–1500	0	◎
P94.22	Deadzone identification value 21	0–1500	0–1500	0	◎
P94.23	Deadzone identification value 22	0–1500	0–1500	0	◎
P94.24	Deadzone identification value 23	0–1500	0–1500	0	◎
P94.25	Deadzone identification value 24	0–1500	0–1500	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P94.26	Deadzone identification value 25	0–1500	0–1500	0	◎
P94.27	Deadzone identification value 26	0–1500	0–1500	0	◎
P94.28	Deadzone identification value 27	0–1500	0–1500	0	◎
P94.29	Deadzone identification value 28	0–1500	0–1500	0	◎
P94.30	Deadzone identification value 29	0–1500	0–1500	0	◎
P94.31	Deadzone identification value 30	0–1500	0–1500	0	◎
P94.32	Deadzone identification value 31	0–1500	0–1500	0	◎
P94.33	Deadzone identification value 32	0–1500	0–1500	0	◎
P94.34	Deadzone identification value 33	0–1500	0–1500	0	◎
P94.35	Deadzone identification value 34	0–1500	0–1500	0	◎
P94.36	Deadzone identification value 35	0–1500	0–1500	0	◎
P94.37	Deadzone identification value 36	0–1500	0–1500	0	◎
P94.38	Deadzone identification value 37	0–1500	0–1500	0	◎
P94.39	Deadzone identification value 38	0–1500	0–1500	0	◎
P94.40	Deadzone identification value 39	0–1500	0–1500	0	◎
P94.41	Deadzone identification value 40	0–1500	0–1500	0	◎
P94.42	Deadzone identification value 41	0–1500	0–1500	0	◎
P94.43	Deadzone identification value 42	0–1500	0–1500	0	◎
P94.44	Deadzone identification value 43	0–1500	0–1500	0	◎
P94.45	Deadzone identification value 44	0–1500	0–1500	0	◎
P94.46	Deadzone identification value 45	0–1500	0–1500	0	◎
P94.47	Deadzone identification value 46	0–1500	0–1500	0	◎
P94.48	Deadzone identification value 47	0–1500	0–1500	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P94.49	Deadzone identification value 48	0–1500	0–1500	0	◎
P94.50	Deadzone identification value 49	0–1500	0–1500	0	◎
P94.51	Deadzone identification value 50	0–1500	0–1500	0	◎
P94.52	Deadzone identification value 51	0–1500	0–1500	0	◎
P94.53	Deadzone identification value 52	0–1500	0–1500	0	◎
P94.54	Deadzone identification value 53	0–1500	0–1500	0	◎
P94.55	Deadzone identification value 54	0–1500	0–1500	0	◎
P94.56	Deadzone identification value 55	0–1500	0–1500	0	◎
P94.57	Deadzone identification value 56	0–1500	0–1500	0	◎
P94.58	Deadzone identification value 57	0–1500	0–1500	0	◎
P94.59	Deadzone identification value 58	0–1500	0–1500	0	◎
P94.60	Deadzone identification value 59	0–1500	0–1500	0	◎
P94.61	Deadzone identification value 60	0–1500	0–1500	0	◎
P94.62	Deadzone identification value 61	0–1500	0–1500	0	◎
P94.63	Deadzone identification value 62	0–1500	0–1500	0	◎
P94.64	Deadzone identification value 63	0–1500	0–1500	0	◎
P94.65	Deadzone identification value 64	0–1500	0–1500	0	◎
P94.66–P94.69	Reserved	-	-	-	-

Group P95—IGBT-On voltage falling identification

Function code	Name	Parameter description	Setting range	Default	Modify
P95.00	IGBT-On voltage falling identification value 1	0–500	0–500	0	◎
P95.01	IGBT-On voltage falling identification value 2	0–500	0–500	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P95.02	IGBT-On voltage falling identification value 3	0–500	0–500	0	◎
P95.03	IGBT-On voltage falling identification value 4	0–500	0–500	0	◎
P95.04	IGBT-On voltage falling identification value 5	0–500	0–500	0	◎
P95.05	IGBT-On voltage falling identification value 6	0–500	0–500	0	◎
P95.06	IGBT-On voltage falling identification value 7	0–500	0–500	0	◎
P95.07	IGBT-On voltage falling identification value 8	0–500	0–500	0	◎
P95.08	IGBT-On voltage falling identification value 9	0–500	0–500	0	◎
P95.09	IGBT-On voltage falling identification value 10	0–500	0–500	0	◎
P95.10	IGBT-On voltage falling identification value 11	0–500	0–500	0	◎
P95.11	IGBT-On voltage falling identification value 12	0–500	0–500	0	◎
P95.12	IGBT-On voltage falling identification value 13	0–500	0–500	0	◎
P95.13	IGBT-On voltage falling identification value 14	0–500	0–500	0	◎
P95.14	IGBT-On voltage falling identification value 15	0–500	0–500	0	◎
P95.15	IGBT-On voltage falling identification value 16	0–500	0–500	0	◎
P95.16	IGBT-On voltage falling identification value 17	0–500	0–500	0	◎
P95.17	IGBT-On voltage falling identification value 18	0–500	0–500	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P95.18	IGBT-On voltage falling identification value 19	0–500	0–500	0	◎
P95.19	IGBT-On voltage falling identification value 20	0–500	0–500	0	◎
P95.20	IGBT-On voltage falling identification value 21	0–500	0–500	0	◎
P95.21	IGBT-On voltage falling identification value 22	0–500	0–500	0	◎
P95.22	IGBT-On voltage falling identification value 23	0–500	0–500	0	◎
P95.23	IGBT-On voltage falling identification value 24	0–500	0–500	0	◎
P95.24	IGBT-On voltage falling identification value 25	0–500	0–500	0	◎
P95.25	IGBT-On voltage falling identification value 26	0–500	0–500	0	◎
P95.26	IGBT-On voltage falling identification value 27	0–500	0–500	0	◎
P95.27	IGBT-On voltage falling identification value 28	0–500	0–500	0	◎
P95.28	IGBT-On voltage falling identification value 29	0–500	0–500	0	◎
P95.29	IGBT-On voltage falling identification value 30	0–500	0–500	0	◎
P95.30	IGBT-On voltage falling identification value 31	0–500	0–500	0	◎
P95.31	IGBT-On voltage falling identification value 32	0–500	0–500	0	◎
P95.32	IGBT-On voltage falling identification value 33	0–500	0–500	0	◎
P95.33	IGBT-On voltage falling identification value 34	0–500	0–500	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P95.34	IGBT-On voltage falling identification value 35	0–500	0–500	0	◎
P95.35	IGBT-On voltage falling identification value 36	0–500	0–500	0	◎
P95.36	IGBT-On voltage falling identification value 37	0–500	0–500	0	◎
P95.37	IGBT-On voltage falling identification value 38	0–500	0–500	0	◎
P95.38	IGBT-On voltage falling identification value 39	0–500	0–500	0	◎
P95.39	IGBT-On voltage falling identification value 40	0–500	0–500	0	◎
P95.40	IGBT-On voltage falling identification value 41	0–500	0–500	0	◎
P95.41	IGBT-On voltage falling identification value 42	0–500	0–500	0	◎
P95.42	IGBT-On voltage falling identification value 43	0–500	0–500	0	◎
P95.43	IGBT-On voltage falling identification value 44	0–500	0–500	0	◎
P95.44	IGBT-On voltage falling identification value 45	0–500	0–500	0	◎
P95.45	IGBT-On voltage falling identification value 46	0–500	0–500	0	◎
P95.46	IGBT-On voltage falling identification value 47	0–500	0–500	0	◎
P95.47	IGBT-On voltage falling identification value 48	0–500	0–500	0	◎
P95.48	IGBT-On voltage falling identification value 49	0–500	0–500	0	◎
P95.49	IGBT-On voltage falling identification value 50	0–500	0–500	0	◎

Function code	Name	Parameter description	Setting range	Default	Modify
P95.50	IGBT-On voltage falling identification value 51	0–500	0–500	0	◎
P95.51	IGBT-On voltage falling identification value 52	0–500	0–500	0	◎
P95.52	IGBT-On voltage falling identification value 53	0–500	0–500	0	◎
P95.53	IGBT-On voltage falling identification value 54	0–500	0–500	0	◎
P95.54	IGBT-On voltage falling identification value 55	0–500	0–500	0	◎
P95.55	IGBT-On voltage falling identification value 56	0–500	0–500	0	◎
P95.56	IGBT-On voltage falling identification value 57	0–500	0–500	0	◎
P95.57	IGBT-On voltage falling identification value 58	0–500	0–500	0	◎
P95.58	IGBT-On voltage falling identification value 59	0–500	0–500	0	◎
P95.59	IGBT-On voltage falling identification value 60	0–500	0–500	0	◎
P95.60	IGBT-On voltage falling identification value 61	0–500	0–500	0	◎
P95.61	IGBT-On voltage falling identification value 62	0–500	0–500	0	◎
P95.62	IGBT-On voltage falling identification value 63	0–500	0–500	0	◎
P95.63	IGBT-On voltage falling identification value 64	0–500	0–500	0	◎
P94.64–P94.69	Reserved	-	-	-	-

Group P96—Motor1/Motor2 saturation parameter calibration

Function code	Name	Parameter description	Setting range	Default	Modify
P96.00	AM1 iron core saturation coefficient 1	0.0–200.0	0.0–200.0	125.0	○
P96.01	AM1 iron core saturation coefficient 2	0.0–200.0	0.0–200.0	125.0	○
P96.02	AM1 mutual inductance saturation coefficient 1	0.0–200.0	0.0–200.0	88.0	○
P96.03	AM1 mutual inductance saturation coefficient 2	0.0–200.0	0.0–200.0	88.0	○
P96.04	AM1 mutual inductance flux weakening coefficient 1	0.0–200.0	0.0–200.0	112.5	○
P96.05	AM1 mutual inductance flux weakening coefficient 2	0.0–200.0	0.0–200.0	117.6	○
P96.06	AM1 mutual inductance flux weakening coefficient 3	0.0–200.0	0.0–200.0	122.8	○
P96.07	AM1 mutual inductance flux weakening coefficient 4	0.0–200.0	0.0–200.0	125.0	○
P96.08	AM1 leakage inductance calibration coefficient 0	0.0–200.0	0.0–200.0	100.0	○
P96.09	AM1 leakage inductance calibration coefficient 1	0.0–200.0	0.0–200.0	100.0	○
P96.10	AM1 leakage inductance calibration coefficient 2	0.0–200.0	0.0–200.0	125.0	○
P96.11	AM1 leakage inductance calibration coefficient 3	0.0–200.0	0.0–200.0	88.0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P96.12	AM1 leakage inductance calibration coefficient 4	0.0–200.0	0.0–200.0	112.5	○
P96.13	SM1 D-axis inductance saturation coefficient 0	100–10000	100–10000	4096	○
P96.14	SM1 D-axis inductance saturation coefficient 1	100–10000	100–10000	4096	○
P96.15	SM1 D-axis inductance saturation coefficient 2	100–10000	100–10000	4096	○
P96.16	SM1 D-axis inductance saturation coefficient 3	100–10000	100–10000	3686	○
P96.17	SM1 D-axis inductance saturation coefficient 4	100–10000	100–10000	3677	○
P96.18	SM1 D-axis inductance saturation coefficient 5	100–10000	100–10000	2867	○
P96.19	SM1 D-axis inductance saturation coefficient 6	100–10000	100–10000	2458	○
P96.20	SM1 D-axis inductance saturation coefficient 7	100–10000	100–10000	2048	○
P96.21	SM1 Q-axis inductance saturation coefficient 0	100–10000	100–10000	4096	○
P96.22	SM1 Q-axis inductance saturation coefficient 1	100–10000	100–10000	4096	○
P96.23	SM1 Q-axis inductance saturation coefficient 2	100–10000	100–10000	4096	○

Function code	Name	Parameter description	Setting range	Default	Modify
P96.24	SM1 Q-axis inductance saturation coefficient 3	100–10000	100–10000	3686	○
P96.25	SM1 Q-axis inductance saturation coefficient 4	100–10000	100–10000	3277	○
P96.26	SM1 Q-axis inductance saturation coefficient 5	100–10000	100–10000	2867	○
P96.27	SM1 Q-axis inductance saturation coefficient 6	100–10000	100–10000	2458	○
P96.28	SM1 Q-axis inductance saturation coefficient 7	100–10000	100–10000	2048	○
P96.29–P96.49	Reserved	-	-	-	-
P96.50	AM2 iron core saturation coefficient 1	0.0–200.0	0.0–200.0	125.0	○
P96.51	AM2 iron core saturation coefficient 2	0.0–200.0	0.0–200.0	125.0	○
P96.52	AM2 mutual inductance saturation coefficient 1	0.0–200.0	0.0–200.0	88.0	○
P96.53	AM2 mutual inductance saturation coefficient 2	0.0–200.0	0.0–200.0	88.0	○
P96.54	AM2 mutual inductance flux weakening coefficient 1	0.0–200.0	0.0–200.0	112.5	○
P96.55	AM2 mutual inductance flux weakening coefficient 2	0.0–200.0	0.0–200.0	117.6	○
P96.56	AM2 mutual inductance flux weakening coefficient 3	0.0–200.0	0.0–200.0	122.8	○

Function code	Name	Parameter description	Setting range	Default	Modify
P96.57	AM2 mutual inductance flux weakening coefficient 4	0.0–200.0	0.0–200.0	125.0	○
P96.58	AM2 leakage inductance calibration coefficient 0	0.0–200.0	0.0–200.0	100.0	○
P96.59	AM2 leakage inductance calibration coefficient 1	0.0–200.0	0.0–200.0	100.0	○
P96.60	AM2 leakage inductance calibration coefficient 2	0.0–200.0	0.0–200.0	125.0	○
P96.61	AM2 leakage inductance calibration coefficient 3	0.0–200.0	0.0–200.0	88.0	○
P96.62	AM2 leakage inductance calibration coefficient 4	0.0–200.0	0.0–200.0	112.5	○
P96.63	SM2 D-axis inductance saturation coefficient 0	100–10000	100–10000	4096	○
P96.64	SM2 D-axis inductance saturation coefficient 1	100–10000	100–10000	4096	○
P96.65	SM2 D-axis inductance saturation coefficient 2	100–10000	100–10000	4096	○
P96.66	SM2 D-axis inductance saturation coefficient 3	100–10000	100–10000	3686	○
P96.67	SM2 D-axis inductance saturation coefficient 4	100–10000	100–10000	3677	○
P96.68	SM2 D-axis inductance saturation coefficient 5	100–10000	100–10000	2867	○

Function code	Name	Parameter description	Setting range	Default	Modify
P96.69	SM2 D-axis inductance saturation coefficient 6	100–10000	100–10000	2458	○
P96.70	SM2 D-axis inductance saturation coefficient 7	100–10000	100–10000	2048	○
P96.71	SM2 Q-axis inductance saturation coefficient 0	100–10000	100–10000	4096	○
P96.72	SM2 Q-axis inductance saturation coefficient 1	100–10000	100–10000	4096	○
P96.73	SM2 Q-axis inductance saturation coefficient 2	100–10000	100–10000	4096	○
P96.74	SM2 Q-axis inductance saturation coefficient 3	100–10000	100–10000	3686	○
P96.75	SM2 Q-axis inductance saturation coefficient 4	100–10000	100–10000	3277	○
P96.76	SM2 Q-axis inductance saturation coefficient 5	100–10000	100–10000	2867	○
P96.77	SM2 Q-axis inductance saturation coefficient 6	100–10000	100–10000	2458	○
P96.78	SM2 Q-axis inductance saturation coefficient 7	100–10000	100–10000	2048	○
P96.79–P96.90	Reserved	-	-	-	-

Group P98—AIAO calibration function

Function code	Name	Parameter description	Setting range	Default	Modify
P98.00	Calibration parameter group password	0–65535	0–65535	0	○
P98.01	AI1 voltage input AD value	AD sampling value of AI1 at voltage input	0–4095	0	●
P98.02	AI1 reference voltage 1	AI1 terminal given voltage value (0V)	-0.50–4.00	0.00V	○
P98.03	AI1 reference voltage 1 AD value	AD sampling value of AI1 at 0V input	0–4095	0	○
P98.04	AI1 reference voltage 2	AI1 terminal given voltage value (10V)	6.00–10.50	10.00V	○
P98.05	AI1 reference voltage 2 AD value	AD sampling value of AI1 at 10V input	0–4095	4095	○
P98.06	AI1 current input AD value	AD sampling value of AI1 at current input	0–4095	0	●
P98.07	AI1 reference current 1	AI1 terminal given current value (0.00mA)	-1.00–8.00	0.00mA	○
P98.08	AI1 reference current 1 AD value	AD sampling value of AI1 at 0.00mA input	0–4095	0	○
P98.09	AI1 reference current 2	AI1 terminal given current value (20.00mA)	12.00–21.00	20.00mA	○
P98.10	AI1 reference current 2 AD value	AD sampling value of AI1 at 20.00mA input	0–4095	4095	○
P98.11	AI2 voltage input AD value	AD sampling value of AI2 at voltage input	0–4095	0	●
P98.12	AI2 reference voltage 1	AI2 terminal given voltage value (0V)	-0.50–4.00	0.00V	○
P98.13	AI2 reference voltage 1 AD value	AD sampling value of AI2 at 0V input	0–4095	0	○
P98.14	AI2 reference voltage 2	AI2 terminal given voltage value (10V)	6.00–10.50	10.00V	○
P98.15	AI2 reference voltage 2 AD value	AD sampling value of AI2 at 10V input	0–4095	4095	○
P98.16	AI2 current input AD value	AD sampling value of AI2 current input	0–4095	0	●
P98.17	AI2 reference current 1	AI2 terminal given current value (0.00mA)	-1.00–8.00	0.00mA	○
P98.18	AI2 reference current 1 AD value	AD sampling value of AI2 at 0.00mA input	0–4095	0	○
P98.19	AI2 reference current 2	AI2 terminal given current value (20.00mA)	12.00–21.00	20.00mA	○
P98.20	AI2 reference current 2 AD value	AD sampling value of AI2 at 20.00mA input	0–4095	4095	○
P98.21	AO1 voltage at 0V output	Actual voltage value of AO1 for 0V output	-1.000–12.500	-0.000V	○

Function code	Name	Parameter description	Setting range	Default	Modify
P98.22	AO1 voltage at 10V output	Actual voltage value of AO1 for 10V output	-1.000–12.500	10.000V	○
P98.23	AO1 current at 0mA output	Actual current value of AO1 for 0mA output	-2.000–25.000	-0.000mA	○
P98.24	AO1 current at 20mA output	Actual current value of AO1 for 20mA output	-2.000–25.000	20.000mA	○
P98.25	AO2 voltage at 0V output	Actual voltage value of AO2 for 0V output	-1.000–12.500	-0.000V	○
P98.26	AO2 voltage at 10V output	Actual voltage value of AO2 for 10V output	-1.000–12.500	10.000V	○
P98.27	AO2 current at 0mA output	Actual current value of AO2 for 0mA output	-2.000–25.000	-0.000mA	○
P98.28	AO2 current at 20mA output	Actual current value of AO2 for 20mA output	-2.000–25.000	20.000mA	○
P98.29	Card1: AI1 voltage input AD value	0–4095	0–4095	0	●
P98.30	Card1: AI1 reference voltage 1	0V input	-0.50–4.00	0.00V	○
P98.31	Card1: AI1 reference voltage1 AD value	AD sampling value of AI1 at 0V input	0–4095	0	○
P98.32	Card1: AI1 reference voltage 2	10V input	6.00–10.50	10.00V	○
P98.33	Card1: AI1 reference voltage1 AD value	AD sampling value of AI1 at 10V input	0–4095	4095	○
P98.34	Card1: AI1 current input AD value	0–4095	0–4095	0	●
P98.35	Card1: AI1 reference current 1	-1.00–8.00mA	-1.00–8.00	0.00mA	○
P98.36	Card1: AI1 reference current1 AD value	0–4095	0–4095	0	○
P98.37	Card1: AI1 reference current 2	12.00–21.00mA	12.00–21.00	20.00mA	○
P98.38	Card1: AI1 reference current2 AD value	0–4095	0–4095	4095	○
P98.39	Card1: AI2 voltage input AD value	0–4095	0–4095	0	●
P98.40	Card1: AI2 reference voltage 1	0V input	-0.50–4.00	0.00V	○
P98.41	Card1: AI2 reference voltage1 AD value	AD sampling value of AI1 at 0V input	0–4095	0	○
P98.42	Card1: AI2 reference voltage 2	10V input	6.00–10.50	10.00V	○
P98.43	Card1: AI2 reference voltage2 AD value	AD sampling value of AI1 at 10V input	0–4095	4095	○
P98.44	Card1: AI2 current input AD value	0–4095	0–4095	0	●
P98.45	Card1: AI2 reference current 1	-1.00–8.00mA	-1.00–8.00	0.00mA	○

Function code	Name	Parameter description	Setting range	Default	Modify
P98.46	Card1: AI2 reference current1 AD value	0–4095	0–4095	0	○
P98.47	Card1: AI2 reference current 2	12.00–21.00mA	12.00–21.00	20.00mA	○
P98.48	Card1: AI2 reference current2 AD value	0–4095	0–4095	4095	○
P98.49	Card1: 0V output AO1 voltage	Actual voltage value of AO1 for 0V output	-1.000–12.500	-0.000V	○
P98.50	Card1: 10V output AO1 voltage	Actual voltage value of AO1 for 10V output	-1.000–12.500	10.000V	○
P98.51	Card1: 0mA output AO1 current	Actual current value of AO1 for 0mA output	-2.000–25.000	-0.000mA	○
P98.52	Card1: 20mA output AO1 current	Actual current value of AO1 for 20mA output	-2.000–25.000	20.000mA	○
P98.53	Card1: 0V output AO2 voltage	Actual voltage value of AO2 for 0V output	-1.000–12.500	-0.000V	○
P98.54	Card1: 10V output AO2 voltage	Actual voltage value of AO2 for 10V output	-1.000–12.500	10.000V	○
P98.55	Card1: 0mA output AO2 current	Actual current value of AO2 for 0mA output	-2.000–25.000	-0.000mA	○
P98.56	Card1: 20mA output AO2 current	Actual current value of AO2 for 20mA output	-2.000–25.000	20.000mA	○
P98.57	Card2: AI1 voltage input AD value	AD sampling value of AI1 at voltage input	0–4095	0	●
P98.58	Card2: AI1 reference voltage 1	0V input	-0.50–4.00	0.00V	○
P98.59	Card2: AI1 reference voltage1 AD value	AD sampling value corresponding to AI1 reference voltage 1 AD sampling value of AI1 at 0V input	0–4095	0	○
P98.60	Card2: AI1 reference voltage 2	10V input	6.00–10.50	10.00V	○
P98.61	Card2: AI1 reference voltage2 AD value	AD sampling value corresponding to AI1 reference voltage 2 AD sampling value of AI1 at 10V input	0–4095	4095	○
P98.62	Card2: AI1 current input AD value	AD sampling value of AI1 at current input	0–4095	0	●
P98.63	Card2: AI1 reference current 1	-1.00–8.00mA	-1.00–8.00	0.00mA	○
P98.64	Card2: AI1 reference current1 AD value	AD sampling value corresponding to AI1 reference current 1	0–4095	0	○

Function code	Name	Parameter description	Setting range	Default	Modify
P98.65	Card2: AI1 reference current 2	12.00–21.00mA	12.00–21.00	20.00mA	○
P98.66	Card2: AI1 reference current2 AD value	AD sampling value corresponding to AI1 reference current 2	0–4095	4095	○
P98.67	Card2: AI2 voltage input AD value	AD sampling value of AI2 at voltage input	0–4095	0	●
P98.68	Card2: AI2 reference voltage 1	0V input	-0.50–4.00	0.00V	○
P98.69	Card2: AI2 reference voltage1 AD value	AD sampling value of AI1 at 0V input	0–4095	0	○
P98.70	Card2: AI2 reference voltage 2	10V input	6.00–10.50	10.00V	○
P98.71	Card2: AI2 reference voltage2 AD value	AD sampling value corresponding to AI2 reference voltage 2 AD sampling value of AI1 at 10V input	0–4095	4095	○
P98.72	Card2: AI2 current input AD value	AD sampling value of AI2 current input	0–4095	0	●
P98.73	Card2: AI2 reference current 1	-1.00–8.00mA	-1.00–8.00	0.00mA	○
P98.74	Card2: AI2 reference current1 AD value	AD sampling value of AI2 current input	0–4095	0	○
P98.75	Card2: AI2 reference current 2	12.00–21.00mA	12.00–21.00	20.00mA	○
P98.76	Card2: AI2 reference current2 AD value	AD sampling value corresponding to AI2 reference current 2	0–4095	4095	○
P98.77	Card2: 0V output AO1 voltage	-1.000–12.500V	-1.000–12.500	-0.000V	○
P98.78	Card2: 10V output AO1 voltage	Actual voltage value of AO1 for 10V output	-1.000–12.500	10.000V	○
P98.79	Card2: 0mA output AO1 current	Actual current value of AO1 for 0mA output	-2.000–25.000	-0.000mA	○
P98.80	Card2: 20mA output AO1 current	Actual current value of AO1 for 20mA output	-2.000–25.000	20.000mA	○
P98.81	Card2: 0V output AO2 voltage	Actual voltage value of AO2 for 0V output	-1.000–12.500	-0.000V	○
P98.82	Card2: 10V output AO2 voltage	Actual voltage value of AO2 for 10V output	-1.000–12.500	10.000V	○
P98.83	Card2: 0mA output AO2 current	Actual current value of AO2 for 0mA output	-2.000–25.000	-0.000mA	○
P98.84	Card2: 20mA output AO2 current	Actual current value of AO2 for 20mA output	-2.000–25.000	20.000mA	○

Function code	Name	Parameter description	Setting range	Default	Modify
P98.85	Deadzone compensation calibration coefficient	0.0–200.0	0.0–200.0	100.0	◎

Group P99—Factory parameters

Function code	Name	Parameter description	Setting range	Default	Modify
P99.00	Factory password	Factory password	0–65535	0	●
P99.01	Complete machine model	Each number represents a unit current class and relates to the data calibration for the VFD, affecting the unit rated power and rated current. The following table lists the complete machine models of the 380V and 660V voltage classes. 0: 0009-4/0062-6 1: 0013-4/0082-6 2: 0017-4/0099-6 3: 0023-4/0125-6 4: 0033-4/0144-6 5: 0038-4/0192-6 6: 0048-4/0217-6 7: 0060-4/0270-6 8: 0078-4/0340-6 9: 0094-4/0410-6 10: 0116-4/0530-6 11: 0149-4/0600-6 12: 0183-4/0650-6 13: 0245-4/0720-6 14: 0299-4/0779-6 (410*2) 15: 0349-4/1007-6 (530*2) 16: 0395-4/1140-6 (600*2) 17: 0516-4/1235-6 (650*2) 18: 0639-4/1368-6 (720*2) 19: 0757-4/1510-6 (530*3) 20: 0900-4/1710-6 (600*3) 21: 0975-4/1853-6 (650*3) 22: 1213-4 (639*2)/2052-6 (720*3) 23: 1439-4 (757*2)/2280-6 (600*4) 24: 1710-4 (900*2)/2470-6 (650*4) 25: 1852-4 (975*2)/2736-6 (720*4) 26: 2158-4 (757*3)/3088-6 (650*5) 27: 2565-4 (900*3)/3420-6 (720*5) 28: 2778-4 (975*3)/3705-6 (650*6) 29: 3420-4 (900*4)/4104-6 (720*6)	0–34	Model depended	◎

Function code	Name	Parameter description	Setting range	Default	Modify
		30: 3704-4 (975*4)/4940-6 (650*8) 31: 4275-4 (900*5)/5472-6 (720*8) 32: 4630-4 (975*5)/6175-6 (650*10) 33: 5130-4 (900*6)/6840-6 (720*10) 34: 5556-4 (975*6)/None			
P99.02	Unit rated power	2.2–500.0kW	2.2–500.0	Model depended	●
P99.03	Unit rated voltage	10–2000V	10–2000	Model depended	◎
P99.04	Unit rated current	0.0–1000.0A	0.0–1000.0	Model depended	●

10 Derated application

10.1 Capacity

Choose a VFD model based on the rated current and power of the motor. To endure the rated power of the motor, the rated output current of the VFD must be larger or equal to the rated current of the motor. The rated power of the VFD must be higher or equal to that of the motor.

Note:

- The maximum allowable shaft power of the motor is limited to 1.5 times the rated power of the motor. If the limit is exceeded, the VFD automatically restricts the torque and current of the motor. This function effectively protects the input shaft against overload.
- The rated capacity is the capacity at the ambient temperature of 40°C.
- You need to check and ensure that the power flowing through the common DC connection in the common DC system does not exceed the rated power of the motor.

10.2 Derating

If the ambient temperature at the VFD installation site exceeds 40°C, the VFD installation site altitude exceeds 1000m, a cover with heat dissipation vents is used, or the carrier frequency is higher than the recommended (for the recommended frequency, see P04.05), the VFD needs to be derated.

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