EV270 Dedicated VFD for Fans and Pumps

User Manual



Nanjing Oulu Electric Corp.,Ltd.

Foreword

First of all, thank you for purchasing EV270 series fan pump dedicated inverter!

EV270 series is a special frequency converter for fan and water pump, which integrates the drive functions of permanent magnet synchronous motor and asynchronous motor. It adopts VF control mode and SVC vector control mode, and can be driven stably under various complex working conditions;

As a special frequency converter for fan and water pump, it is optimized for fan and water pump applications to make it easier to use. It can be applied to load-driven fan and water pump in sewage treatment, HVAC, chemical industry, metallurgy, electric power and other industries. Built-in a variety of fan and water pump application functions, such as PID control, constant pressure water supply control, timing control, multi-pump control, fire crossing, etc., and can use our company's upper computer tools for rapid debugging, effectively reducing the debugging difficulty of engineers; Can expand a variety of communication buses, such as BACnet, CANOPEN, EtherCAT, ModbusTCP, etc. have better industrial control system compatibility; At the same time, optimize the circuit design and appearance structure design, with excellent electromagnetic compatibility characteristics, to ensure the stable operation of equipment in complex electromagnetic environment, so that it can adapt to harsh environment applications, to ensure long-term reliable operation of equipment, reduce maintenance investment.

This manual introduces the functional characteristics and usage methods of EV270 series fan and water pump special frequency converter, including product selection, parameter setting, operation and debugging, maintenance and inspection, etc. Please read this manual carefully before use.

Precautions
◆The illustrations in this user manual are for illustration only and may differ from the product you ordered.
◆The company is committed to the continuous improvement of products, product features will continue to upgrade, the information provided is subject to change without notice.
◆If you have any problems in use, please contact our regional agents or contact our customer service center directly.

When you get the product, please confirm the following items:

Confirm Item	Confirmation method
Is it consistent with the type and model of the goods ordered?	Please confirm the nameplate on the side of the product
Are there any parts damaged or damaged	Check the overall appearance and check whether it is damaged during transportation
Whether the fastening parts such as screws are loose	If necessary, check with a screwdriver
Manual, warranty card and other accessories	Product manual and corresponding accessories

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Chapter 1 Safety Information and Precautions

Safety Definition: In this manual, safety precautions are divided into the following two categories:

Danger: situations that may result in serious injury or even death due to the danger caused by not operating as required;

CAUTION: Danger due to failure to operate as required may result in moderate or minor injuries and equipment damage.

Please read this chapter carefully when installing, debugging and repairing the system, and be sure to operate in accordance with the safety precautions required by this chapter. Any injury and loss caused by illegal operation has nothing to do with the company.

1.1 Safety Matters

Use phase	Security Grade	Precautions
Before Installation	Danger	● Do not install the control system when it is found that water enters, parts are missing or parts are damaged during unpacking! ● When the packing list does not match the physical name, please do not install!
	Attention	● When handling, it should be lifted gently, otherwise there is a risk of damage to the equipment! ● Please do not use the damaged drive or the inverter with missing parts. Danger of injury! ● Do not touch the components of the control system with your hands, otherwise there is a danger of electrostatic damage!
During installation	Danger	● Please install it on metal and other flame retardant objects; Keep away from combustibles. Otherwise, it may cause a fire alarm! ● Do not screw the fixing bolts of equipment elements, especially those marked in red!
	Attention	● Do not let the wire head or screw fall into the driver. Otherwise, the drive will be damaged! ● Please install the drive in a place with less vibration and avoid direct sunlight. ● When more than two inverters are placed in the same cabinet, please pay attention to the installation position to ensure the heat dissipation effect.
During wiring	Danger	● The instructions in this manual must be followed and construction by professional electrical engineering personnel, otherwise unexpected dangers will occur! ● There must be a circuit breaker between the frequency converter and the power supply, otherwise a fire may occur! ● Please confirm that the power supply is in a zero-energy state before wiring, otherwise there is a risk of electric shock! ● According to the standard for the correct specification of the inverter grounding, otherwise there is a risk of electric shock!
	Attention	● Never connect the input power supply to the output terminals (U, V, W) of the frequency converter. Pay attention to the marking of the terminal, do not connect the wrong wire! Otherwise, the drive will be damaged! ● Refer to manual recommendations for wire diameters used. Otherwise, an accident may occur! ● The braking resistor must not be directly connected between the DC bus (+) and (-) terminals. Otherwise, cause a fire! ● The encoder must use shielded wire, and the shielding layer must ensure reliable grounding of single end!

Use phase	Security Grade	Precautions
Before Power-on	Danger	● Please confirm whether the voltage level of the input power supply is consistent with the rated voltage level of the inverter. Whether the wiring positions on the power input terminals (R, S, T) and output terminals (U, V, W) are correct; And pay attention to check whether there is a short circuit in the peripheral circuit connected to the driver, and whether the connected lines are tight, otherwise the driver will be damaged! ● Any part of the inverter does not need to carry out voltage test, the product has been tested when leaving the factory. Or cause an accident!
	Attention	● The frequency converter can only be powered on after the cover plate is covered. Otherwise, it may cause electric shock! ● The wiring of all peripheral accessories must follow the instructions of this manual and be correctly wired according to the circuit connection method provided in this manual. Or cause an accident!
After power-on	Danger	● Do not open the cover after power up. Otherwise there is a risk of electric shock! ● Do not touch the driver and peripheral circuits with wet hands. Otherwise there is a risk of electric shock! ● Do not touch any input/output terminals of the inverter. Otherwise there is a risk of electric shock! ● When powering on, the frequency converter automatically carries out safety detection on the external strong current circuit. At this time, never touch the U, V, W terminal or motor terminal of the driver, otherwise there is a danger of electric shock!
	Attention	● If parameter identification is required, be aware of the risk of injury while the motor is rotating. Otherwise, it may cause an accident! ● Do not arbitrarily change the inverter manufacturer parameters. Otherwise, it may cause damage to the equipment!
During operation	Danger	● Do not touch the cooling fan and discharge resistor to test the temperature. Otherwise, it may cause burns! ● Non-professional technicians should not detect the signal in operation. Failure to do so may cause personal injury or equipment damage!
	Attention	● During the operation of the frequency converter, something should be avoided to fall into the equipment. Otherwise, the equipment will be damaged! ● Do not use the contactor on-off method to control the start and stop of the driver. Otherwise, the equipment will be damaged!
During maintenance	Danger	● Do not carry out repair and maintenance of the inverter without professional training. Otherwise, personal injury or equipment damage may occur! ● Do not electrify the equipment for repair and maintenance. Otherwise there is a risk of electric shock! ● Confirm that the input power of the inverter is powered off for 10 minutes before the drive can be maintained and repaired. Otherwise, the residual charge on the capacitor will cause harm to people! ● All pluggable plug-ins must be plugged in and out in the event of a power failure! ● After replacing the frequency converter, the parameters must be set and checked.

Safety Markers

安全标识	内容说明
	● Read the safety manual and operating instructions carefully before using the product; failure to do so may result in personal injury or death, or product damage! ● Do not touch terminals or remove the cover while power is applied and within 10 minutes after power-off, otherwise electric shock hazard exists!

Chapter 2 Product Information

2.1 Naming rules

EV270 - 0185 - T4 - **

① ② ③ ④

① Product Series

② Power code:

0185: 18. 5kW

③ Voltage class:

S2: single phase 220V
T2: three-phase 220V
T4: three-phase 380V
T5: three-phase 480V
T6: three-phase 690V

④ Model Description

Mark: Non-standard specification

Blank: Standard model

Figure 2-1 Naming Specifications

2.2 Nameplate

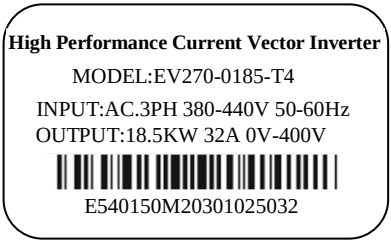


Figure 2-2 Nameplate

2.3 EV270 series parameters

Inverter model	Power supply capacity KVA	Input current A	Output current A	Matching motor kW
Three-phase power supply: 380V/480V,50/60Hz				
EV270-0015-T4(T5)	3.0	5.0	3.8	1.5
EV270-0022-T4(T5)	4.0	5.8	5.1	2.2
EV270-0037-T4(T5)	5.9	10.5	9.0	3.7
EV270-0055-T4(T5)	8.9	14.6	13.0	5.5
EV270-0075-T4(T5)	11.0	20.5	17.0	7.5
EV270-0110-T4(T5)	17.0	26.0	25.0	11
EV270-0150-T4(T5)	21.0	35.0	32.0	15
EV270-0185-T4(T5)	24.0	38.5	37.0	18.5
EV270-0220-T4(T5)	30.0	46.5	45.0	22
EV270-0300-T4(T5)	40.0	62.0	60.0	30

Inverter model	Power supply capacity KVA	Input current A	Output current A	Matching motor kW
EV270-0370-T4(T5)	57.0	76.0	75.0	37
EV270-0450-T4(T5)	69.0	92.0	91.0	45
EV270-0550-T4(T5)	85.0	113.0	112.0	55
EV270-0750-T4(T5)	114.0	157.0	150.0	75
EV270-0900-T4(T5)	134.0	180.0	176.0	90
EV270-1100-T4(T5)	160.0	214.0	210.0	110
EV270-1320-T4(T5)	192.0	256.0	253.0	132
EV270-1600-T4(T5)	231.0	307.0	304.0	160
EV270-1850-T4(T5)	240.0	330.0	340.0	185
EV270-2000-T4(T5)	250.0	385.0	377.0	200
EV270-2200-T4(T5)	280.0	430.0	426.0	220
EV270-2500-T4(T5)	355.0	468.0	465.0	250
EV270-2800-T4(T5)	396.0	525.0	520.0	280
EV270-3150-T4(T5)	445.0	590.0	585.0	315
EV270-3500-T4(T5)	500.0	665.0	650.0	350
EV270-4000-T4(T5)	565.0	785.0	725.0	400
EV270-4500-T4(T5)	630.0	800.0	820.0	450
EV270-5000-T4(T5)	700.0	890.0	870.0	500
EV270-5600-T4(T5)	783.0	980.0	950.0	560
EV270-6300-T4(T5)	882.0	1180.0	1100.0	630

2.4 Technical Specification

Project		Specifications
Basic Functions	Maximum frequency	Vector control: 0~500Hz;V/F control: 0~500Hz
	Carrier Frequency	0.8kHz ~ 12kHz. According to the temperature characteristics, automatically adjust the carrier frequency
	Input frequency resolution	Digital setting: 0.01Hz; Analog setting: Maximum frequency * 0.025%
	Control mode	Open loop vector control (SVC), V/F control
	Type of motor	Three-phase asynchronous motor, three-phase permanent magnet synchronous motor
	Starting torque	0.5Hz/100%
	Speed ratio	1:100(SVC)(synchronous/asynchronous motor)
	Overload capacity	110% rated current for 60s; overload is allowed every 5 minutes
	Torque boost	Automatic torque increase; manual torque increase by 0.1%~30.0%
	V/F curve	Three ways: linear type; multi-point type; N-square type V/F curve (x^1.2，x^1.4，x^1.6，x^1.8，x^2)
	V/F separation	2 ways: full separation, half separation
	acceleration and deceleration curve	Straight line or S curve acceleration and deceleration mode. Four kinds of acceleration and deceleration time, acceleration and deceleration time range of 0.0~6500.0s
	DC brake	DC braking frequency: 0.00Hz ~ maximum frequency; braking time: 0.0s ~ 36.0s; Braking action current value: 0.0%~ 100.0%
	jog control	Inching frequency range: 0.00Hz ~ 50.00Hz. jog acceleration and deceleration time 0.0s ~ 6500.0s
	Simple PLC, multi-speed operation	Up to 16-speed operation through built-in PLC or control terminals
	Built-in PID	Convenient for process control closed-loop control system
	Automatic Voltage Adjustment (AVR)	When the grid voltage changes, can automatically keep the output voltage constant
	Overvoltage and overcurrent stall control	Automatic limit of current and voltage during operation to prevent frequent over-current and over-voltage trips
	Fast current limiting function	Reduce the overcurrent fault and protect the normal operation of the frequency converter
	Torque Limiting and Control	"Excavator" feature, automatic torque limit during operation to prevent frequent overcurrent trips. Closed-loop vector mode can realize torque control
Personalized Functions	Excellent performance	Improving the Performance of Asynchronous Motor and Permanent Magnet Synchronous Motor with High Performance Current Vector Control Technology
	Instant stop	Instantaneous power failure through the load feedback energy compensation voltage reduction, to maintain the inverter in a short period of time to continue to run
	Virtual IO	Five groups of virtual DIDO, can realize simple logic control
	Timing control function	Timing control function: set time range of 0.0Min ~ 6500.0Min
	Multi-motor switching	Two sets of motor parameters, can realize two motor switching control
	Multi-threaded bus	Standard: ModbusRTU; optional: ModbusTCP, Profibus-DP,

Project		Specifications
	support	CANlink, CANopen, PROFINET, EtherCAT, BACnet, etc. (bus expansion card required)
	Powerful background software	Support inverter parameter operation and virtual oscilloscope function, can be parameter copy, parameter restore, online update procedures and other functions. Through the virtual oscilloscope can realize the internal state monitoring of the inverter
	Multi-encoder support	Support differential, open collector, resolver, UVW, etc. (requires closed loop expansion card)
	Motor overheat protection	Can support motor temperature sensor input (PT100, PT1000, KTY84, etc., need closed-loop expansion card or temperature acquisition card)
	Command Source	The operation panel is given, the control terminal is given, the serial communication port is given, and the extended communication is given, which can be switched in various ways.
	frequency source	10 kinds of frequency sources: digital given, analog voltage given, analog current given, pulse given, serial port given, extended communication given. Can be switched in many ways
	auxiliary frequency source	10 auxiliary frequency sources. Flexible auxiliary frequency fine-tuning, frequency synthesis
Special Functions	Timed start-stop	Start-stop control can be carried out according to the set time period
	Timing set pressure	Timing pressure can be set according to the set time period,
	Automatic sleep and wake-up	Automatic sleep and wake-up according to actual working conditions
	Energy-saving operation	According to the state of the detected load current, it can actively enter the energy saving mode
	Multi-pump control	Allows multi-pump control, with up to 4 auxiliary pumps
	Soft filling function of water pipe	Smoothly inject water into the water pipe to prevent water hammer effect
	Blocking function	Used to dredge the impeller of sewage pump, impurity pump, easy blocking fan and other loads to prevent blocking and burning caused by fiber, debris and sediment.
	Fire crossing function	Support two fire crossing modes
	Condensation protection	Avoid burning the motor due to condensation caused by high humidity
	Dedicated protection	Various protection functions matching with working conditions
External Interfaces	Input terminal	Standard: Five digital input terminals, one of which supports high-speed pulse input up to 100kHz (optional) 2 analog input terminals 2 supports 0~10V voltage input or 0 ~ 20mA current input More input functions can be expanded through the function expansion card
	Output terminal	Standard: 1 high-speed pulse output terminal (optional open collector type), support 0~100kHz square wave signal output (optional) 1 digital output terminal 2 relay output terminals 1 analog output terminal, supports 0 ~ 20mA current output or voltage output More output functions can be expanded through function expansion card

Project		Specifications
Display and Keyboard Operation	LED display	Standard dual-row digital tube display parameters, can display more status
	Encoder speed regulation	Support encoder stepless speed regulation, smooth speed regulation without jitter
	Button locking and function selection	Realize partial or full locking of the keys, define the scope of action of some keys to prevent misoperation, standard encoder speed regulation
	Protection function	Power-on motor short circuit detection, output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection, etc.
Operation Environment	Place of use	Indoor, free from direct sunlight, no dust, corrosive gas, flammable gas, oil mist, water vapor, dripping water or salt, etc.
	Altitude	No derating is required for use of 1000m and below, 1% for every 100m increase above 1000m, and the maximum use altitude is 3000m. Please contact the manufacturer if it exceeds 3000m.
	Ambient temperature	-10 ℃ ~ +50 ℃, when the ambient temperature is 40 ℃ ~ 50 ℃, derating is required, and the derating rate is 1.5 for every 1 ℃ increase in the ambient temperature.
	Humidity	Less than 95% RH, no bead condensation
Optional	LCD LCD keyboard	Large-size LCD LCD keyboard can support parameter copy, parameter restore, online update program, etc.; support Bluetooth connection to realize the Internet of Things. Support Chinese and English display, expandable multi-language
	Temperature acquisition card	Collect motor temperature and ambient temperature, support multiple temperature sensor types
	Function expansion card	Support the expansion of various digital input and output, analog input and output terminal functions, etc.
	Bus expansion card	ModbusTCP, Profibus-DP, CANlink, CANopen, PROFINET, EtherCAT, BACnet, etc.
	STO Expansion Card	Support extended STO function (matching STO expansion card, need to customize the motherboard, please contact our company in advance)

2.5 Product Dimensions

2.5.1 Wall Mounting Dimensions

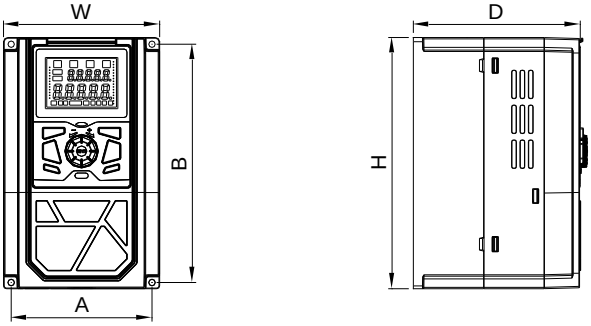


Figure 2-3 Schematic diagram of inverter wall-mounted installation

Models	Installation dimension (mm)		Outline dimension (mm)			Mounting hole diameter	Weight (KG)≈
	A	B	W	H	D		
Three-phase 380V/480V							
EV270-0015-T4(T5)	101	170.7	112	180	120	φ4.6	1.3
EV270-0022-T4(T5)							
EV270-0037-T4(T5)							
EV270-0055-T4(T5)	101	170.7	112	180	140	φ4.6	2.1
EV270-0075-T4(T5)							
EV270-0110-T4(T5)	135	245	150	260	162	φ6	3.9
EV270-0150-T4(T5)							
EV270-0185-T4(T5)							
EV270-0220-T4(T5)	186	306	212	330	187	φ9.5	7.5
EV270-0300-T4(T5)							
EV270-0370-T4(T5)							
EV270-0450-T4(T5)	238	396	260	420	194	φ8.5	12.5
EV270-0550-T4(T5)							
EV270-0750-T4(T5)	272	455	304	470	240	φ9	22.9
EV270-0900-T4(T5)	200	614	278	630	310	φ9	39
EV270-1100-T4(T5)							
EV270-1320-T4(T5)							
EV270-1600-T4(T5)	330	680	374	700	310	φ9	45.6
EV270-1850-T4(T5)							
EV270-2000-T4(T5)	400	810	520	835	382	φ13	107

Models	Installation dimension (mm)		Outline dimension (mm)			Mounting hole diameter	Weight (KG)≈
	A	B	W	H	D		
EV270-2200-T4(T5)							
EV270-2500-T4(T5)							
EV270-2800-T4(T5)							
EV270-3150-T4(T5)	460(230+230 total 3 holes)	895	720	920	382	φ13	155
EV270-3500-T4(T5)							
EV270-4000-T4(T5)							
EV270-4500-T4(T5)							

2.5.2 Floor Mounting Dimensions

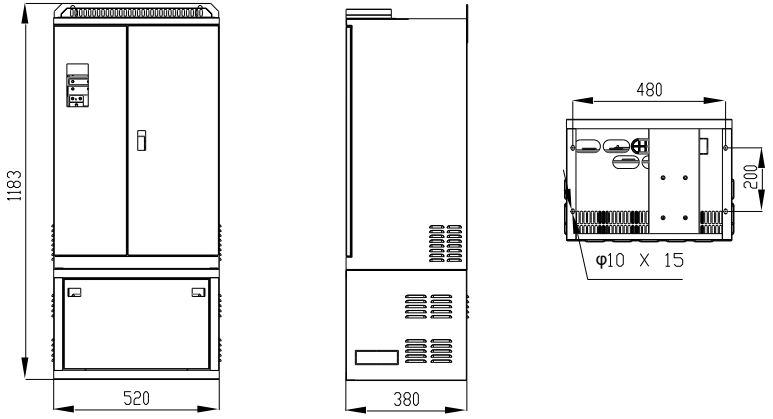


Fig. 2-4 Schematic Diagram of 200kW ~ 280kW (T4/T5 Voltage Level) Floor Installation

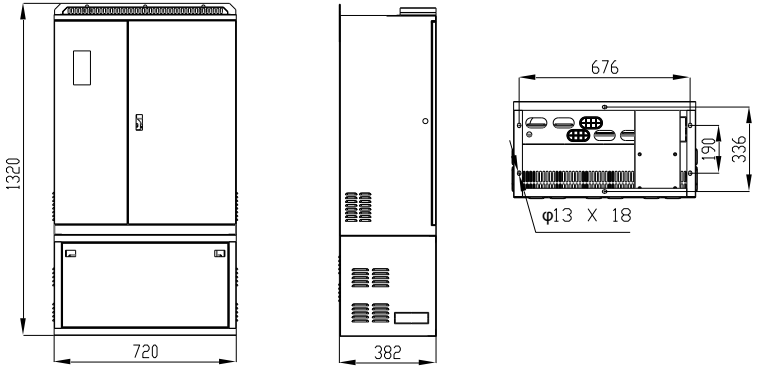


Figure 2-5 315kW ~ 500kW (T4/T5 voltage level) ground installation diagram

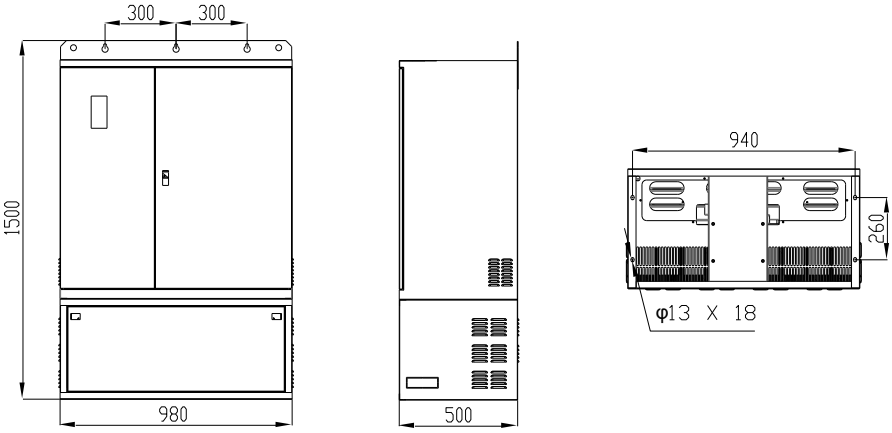
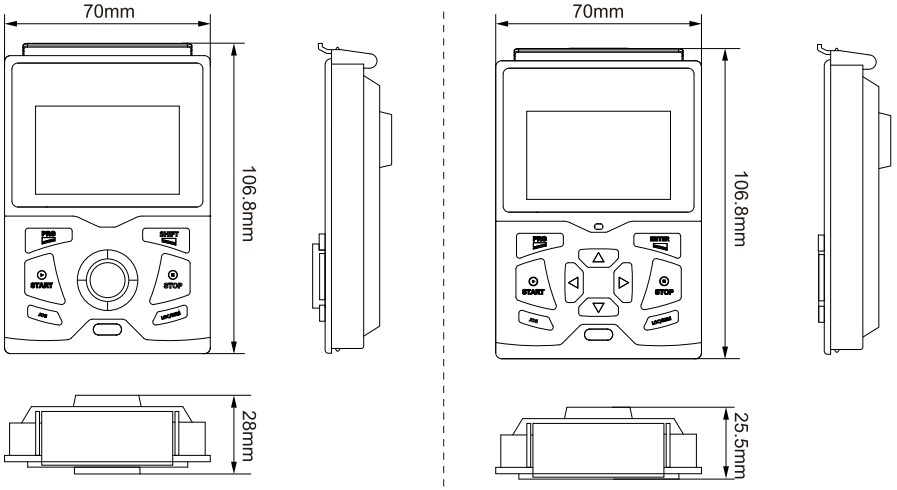


Fig. 2-6 560kW ~ 630kW (T4/T5 voltage level) landing installation diagram

2.5.3 Operation Panel Structure



Standard Configuration: LED Dual-Display Keypad

Optional Accessory: LCD Liquid Crystal Display Keypad

Fig. 2-7 Dimension of operation panel

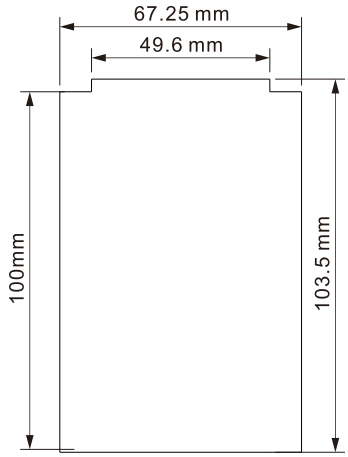


Figure 2-8 Operation Panel Cutout Dimension Drawing

2.6 Daily Maintenance and Maintenance of Inverter

2.6.1 Daily Maintenance

Due to the influence of environmental temperature, humidity, dust and vibration, it will lead to the aging of the internal components of the inverter, resulting in the potential failure of the inverter or reducing the service life of the inverter. Therefore, it is necessary to implement daily and regular maintenance and maintenance of the inverter.

Daily inspection items:

1) Whether the sound changes abnormally during the operation of the motor
2) Whether the motor produces vibration during operation
3) Whether the installation environment of the frequency converter changes
4) Whether the inverter cooling fan works normally
5) Whether the frequency converter is overheated

Daily cleaning:

1) The frequency converter should always be kept in a clean state
2) Effectively remove the dust on the surface of the inverter to prevent the dust from entering the inverter. Especially metal dust.
3) effectively remove the inverter cooling fan oil

2.6.2 Periodic Inspection

Please regularly check the places that are difficult to check during operation. Regular inspection items:

1) Check the air duct and clean it regularly
2) Check whether the screws are loose
3) Check the frequency converter for corrosion
4) Check whether there is arc trace in the terminal
5) Main circuit insulation test

Reminder: When measuring the insulation resistance of the motor with a megohmmeter (please use a DC 500V megohmmeter), disconnect the main circuit line from the frequency converter. Do not use an insulation resistance meter to test the insulation of the control circuit. There is no need to perform a high-voltage test (completed at the factory).

2.6.3 Replacement of Vulnerable Parts of Frequency Converter

The wearing parts of the inverter are mainly cooling fans and filtering electrolytic capacitors, and their life is closely related to the environment and maintenance conditions. The general life time is:

Device Name	Lifetime
Fan	2 to 3 years
Electrolytic Capacitor	4 to 5 years

The user can determine the replacement age according to the running time.

1) Cooling fan

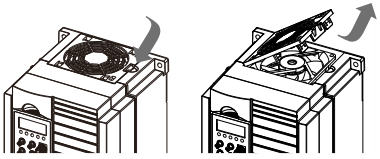
Possible causes of damage: bearing wear, blade aging.

Judgment criteria: whether there are cracks in the fan blades, etc., and whether there is abnormal vibration when the sound is turned on.

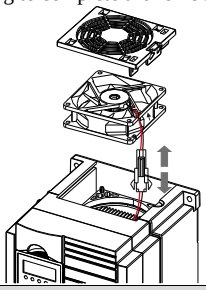
Fan replacement method: after pressing the plastic protective cover buckle of the fan, pull it out; after replacing the fan, ensure that the wind blows upward and pay attention to the wind direction.

Fan Removal (3075 Moulded Case, 3185 Moulded Case, 3370 Moulded Case)

1 Gently press the buckle on the fan cowl to remove the fan cowl.



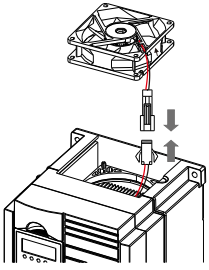
2. After lifting the fan upward, unplug the fan adapter plug to complete the removal.



Fan installation (3075 molded case, 3185 molded case, 3370 molded case)

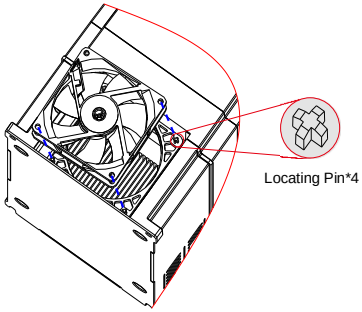
1. Please install the fan according to the reverse steps of removal. Please pay attention to distinguish the forward and reverse directions of the fan;

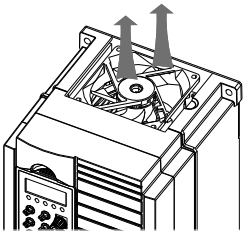
2. Insert the fan power cord plug into the machine's own adapter socket, as shown in the right figure:



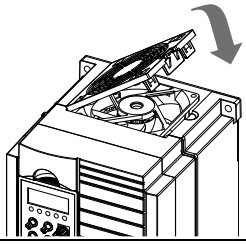
3. Put the fan into the installation part of the machine body, pay attention to align the four fixing holes at the bottom of the fan with the positioning column, place the fan line neatly on the side of the fan,

and do not block the inlet and outlet of the fan; Pay attention to the upward direction of the fan;





4. Insert the small buckle on the fan cover into the buckle groove of the body, and gently press the fixed buckle:



2) filter electrolytic capacitor

Possible causes of damage: poor quality of input power supply, high ambient temperature, frequent load jump, electrolyte aging. Discriminant criteria: whether there is liquid leakage, whether the safety valve has been protruding, the determination of electrostatic capacitance, the determination of insulation resistance.

2.6.4 Inverter Storage

After the user purchases the inverter, temporary storage and long-term storage must pay attention to the following points:

1) When storing, try to put it into the company's packing box according to the original packaging.

2) Long-term storage will lead to the deterioration of electrolytic capacitors. It must be ensured that the power is turned on once within 2 years, the power-on time is at least 5 hours, and the input voltage must be slowly increased to the rated value with a voltage regulator.

Chapter 3 Mechanical and Electrical Installation

3.1 Mechanical Installation

3.1.1 Installation Environment

1) Ambient temperature: The ambient temperature has a great influence on the life of the inverter, and the operating ambient temperature of the inverter is not allowed to exceed the allowable temperature range (-10 ℃ ~ 40 ℃).

2) Install the inverter on the surface of the flame retardant object and install it on the mounting support vertically with screws. When the inverter is working, it is easy to generate a lot of heat, and there should be enough space around to dissipate heat.

3) Please install it in a place that is not easy to vibrate. The vibration shall not be greater than 0.6G. Pay special attention to keep away from punch press and other equipment.

4) Avoid installing in direct sunlight, damp, and water drops.

5) Avoid being installed in places with corrosive, flammable and explosive gases in the air.

6) Avoid being installed in places with oil, dust and metal dust.

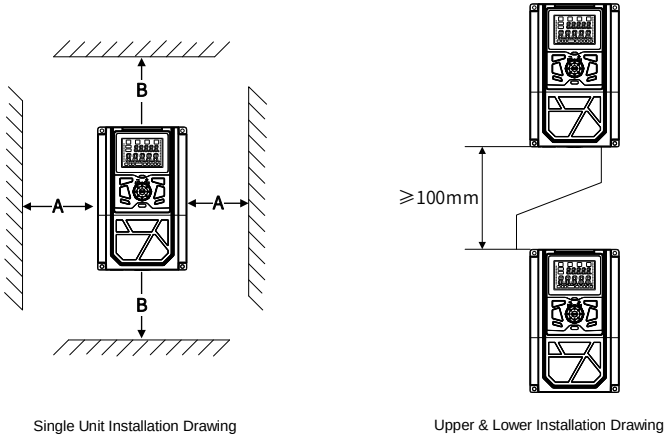


Figure 3-1 Schematic diagram of installation

When installing a single unit: when the inverter power is not more than 30kW, size a may not be considered. A should be greater than 50mm when greater than 30kW. When installing up and down: Please install the heat insulation deflector shown in the figure when installing up and down the inverter.

Power class	Mounting dimensions	
	B	A
≤ 18.5kW	≥ 100mm	May not be required
22kW ~ 55kW	≥ 200mm	≥ 50mm
≥ 75kW	≥ 300mm	≥ 50mm

3.1.2 Heat Dissipation

Mechanical installation needs to pay attention to the problem of heat dissipation. So please note the following:

1) Please install the inverter vertically to facilitate the upward heat dissipation. But not upside down. If there are more frequency converters in the cabinet, it is best to install side by side. Where upper and lower installation is required, please refer to the schematic diagram in Figure 3-1 to install the heat insulation deflector.

2) The installation space shall be as shown in Figure 3-1 to ensure the heat dissipation space of the inverter. However, please consider the heat dissipation of other devices in the cabinet when arranging.

3) The mounting bracket must be made of flame retardant material.

4) For metal dust applications, it is recommended to use the radiator cabinet outside the installation method. At this time, the space in the fully sealed cabinet should be as large as possible.

3.2 Electrical Installation

3.2.1 Selection Guidance of Peripheral Electrical Components

Inverter model	Empty open (MCCB) A	Recommended Contactor A	Recommended input side main loop conductor mm ²	Recommended output side Main loop conductor mm ²	Recommended Control Loop conductor mm ²
Three-phase 380V/480V					
EV270-0015-T4(T5)	16	10	2.5	2.5	1.0
EV270-0022-T4(T5)	16	10	2.5	2.5	1.0
EV270-0037-T4(T5)	25	16	4.0	4.0	1.0
EV270-0055-T4(T5)	32	25	4.0	4.0	1.0
EV270-0075-T4(T5)	40	32	4.0	4.0	1.0
EV270-0110-T4(T5)	63	40	4.0	4.0	1.0
EV270-0150-T4(T5)	63	40	6.0	6.0	1.0
EV270-0185-T4(T5)	100	63	6	6	1.5
EV270-0220-T4(T5)	100	63	10	10	1.5
EV270-0300-T4(T5)	125	100	16	10	1.5
EV270-0370-T4(T5)	160	100	16	16	1.5
EV270-0450-T4(T5)	200	125	25	25	1.5
EV270-0550-T4(T5)	200	125	35	25	1.5
EV270-0750-T4(T5)	250	160	50	35	1.5
EV270-0900-T4(T5)	250	160	70	35	1.5
EV270-1100-T4(T5)	350	350	120	120	1.5
EV270-1320-T4(T5)	400	400	150	150	1.5
EV270-1600-T4(T5)	500	400	185	185	1.5
EV270-1850-T4(T5)	500	400	185	185	1.5

Inverter model	Empty open (MCCB) A	Recommended Contactor A	Recommended input side main loop conductor mm ²	Recommended output side Main loop conductor mm ²	Recommended Control Loop conductor mm ²
EV270-2000-T4(T5)	600	600	150*2	150*2	1.5
EV270-2200-T4(T5)	600	600	150*2	150*2	1.5
EV270-2500-T4(T5)	800	600	185*2	185*2	1.5
EV270-2800-T4(T5)	800	800	185*2	185*2	1.5
EV270-3150-T4(T5)	800	800	150*3	150*3	1.5
EV270-3500-T4(T5)	800	800	150*4	150*4	1.5
EV270-4000-T4(T5)	1000	1000	150*4	150*4	1.5
EV270-4500-T4(T5)	1200	1200	185*3	185*3	1.5
EV270-5000-T4(T5)	1400	1400	185*3	185*3	1.5
EV270-5600-T4(T5)	1400	1400	185*3	185*3	1.5
EV270-6300-T4(T5)	1600	1600	185*4	185*4	1.5

3.2.2 Schematic Diagram of Connection with Peripheral Devices

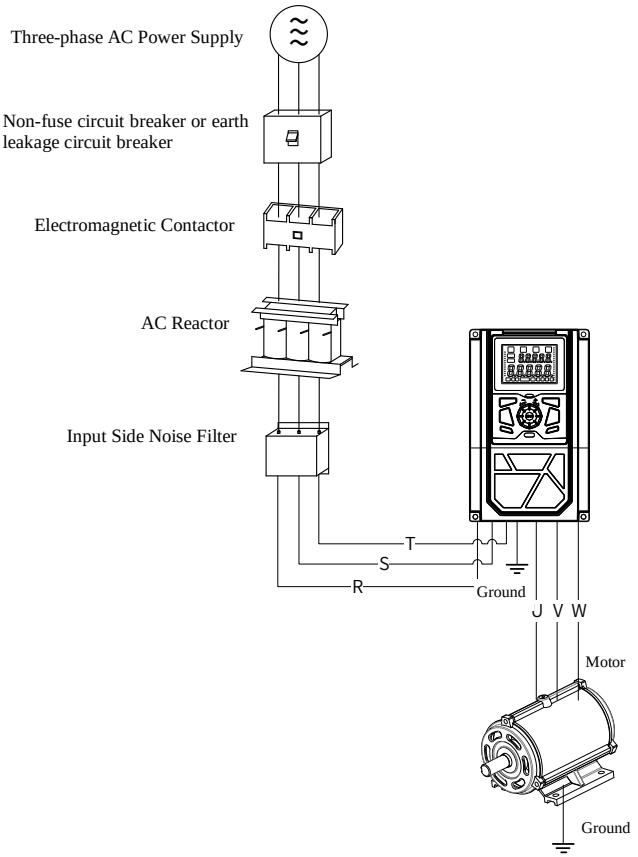


Figure 3-2 Schematic diagram of connection with peripheral devices

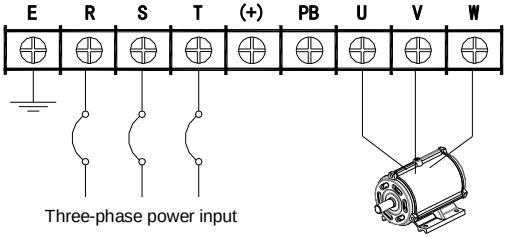
3.2.3 Instructions for Peripheral Electrical Components

Accessory Name	Function Description
Air switch	Downstream equipment over-current power off.
Contactor	On-off operation of frequency converter. Frequent power-on and power-off operation (less than twice per minute) or direct start-up operation of the frequency converter through the contactor shall be avoided.
AC input reactor	Improve the power factor on the input side; effectively eliminate the higher harmonics on the input side to prevent damage to other equipment due to voltage waveform distortion; eliminate the input current imbalance caused by the imbalance between power phases.
EMC input filter	Reduce the external conduction and radiation interference of the inverter; reduce the conduction interference from the power supply to the inverter, and improve the anti-interference ability of the inverter.
DC reactor	Improve the power factor of the input side; improve the efficiency and thermal stability of the inverter. Effectively eliminate the influence of high harmonics on the input side of the inverter, reduce the external conduction and radiation interference.

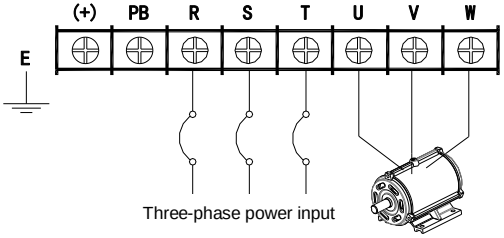
Accessory Name	Function Description
AC output reactor	The output side of the inverter generally contains more harmonics. When the motor is far away from the frequency converter, there is a large distributed capacitance in the circuit. One of the harmonics may resonate in the loop, bringing two effects: ◆ Damage the insulation performance of the motor, which will damage the motor for a long time. ◆ Generating large leakage current, causing frequent protection of the inverter. Generally, the distance between the frequency converter and the motor is more than 100m, and it is recommended to install an output AC reactor.

3.3 The Terminal Block Wiring of the Main Circuit

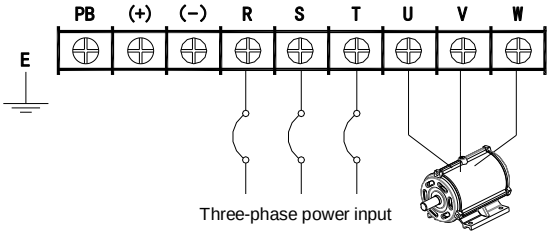
a) 1.5kW-22kW (T4/T5 voltage level) main circuit terminal strip wiring diagram



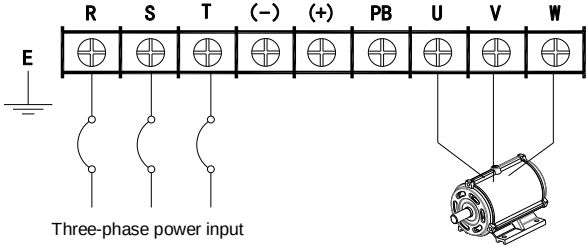
b) 30kW-37kW (T4/T5 voltage level) main circuit terminal strip wiring diagram



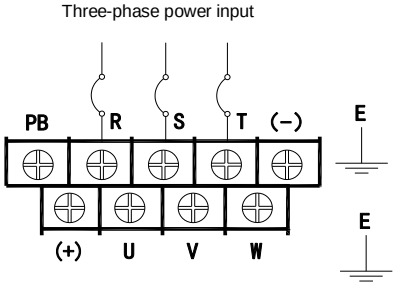
c)45kW-55kW (T4/T5 voltage level) main circuit terminal block wiring diagram



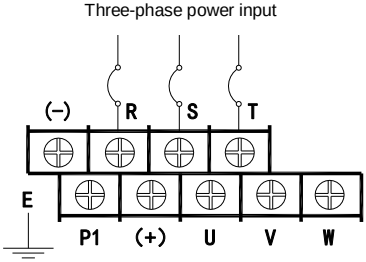
d) 75kW (T4/T5 voltage level) main circuit terminal strip wiring diagram



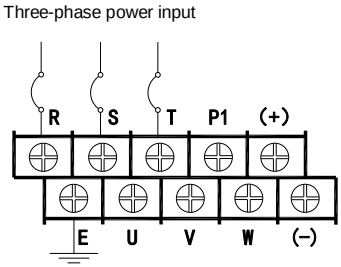
e) 90kW-132kW (T4/T5 voltage level) main circuit terminal block wiring diagram



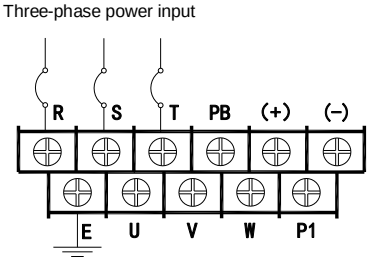
f) 160kW-185kW (T4/T5 voltage level) main circuit terminal strip wiring diagram



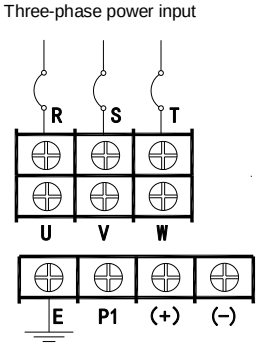
g) 200kW-280kW (T4/T5 voltage level) main circuit terminal strip wiring diagram



h) 315kW-500kW (T4/T5 voltage level) main circuit terminal strip wiring diagram



i) 560kW-630kW (T4/T5 voltage level) main circuit terminal strip wiring diagram



Terminal Symbol	Function Description
⏚	Ground terminal
R, S, T	Three-phase AC power connected to the grid
U, V, W	Three-phase AC motor
(+)	Filter capacitor DC side voltage positive terminal
(-)	Negative terminal of DC side voltage of filter capacitor

3.4 Standard Wiring Diagram

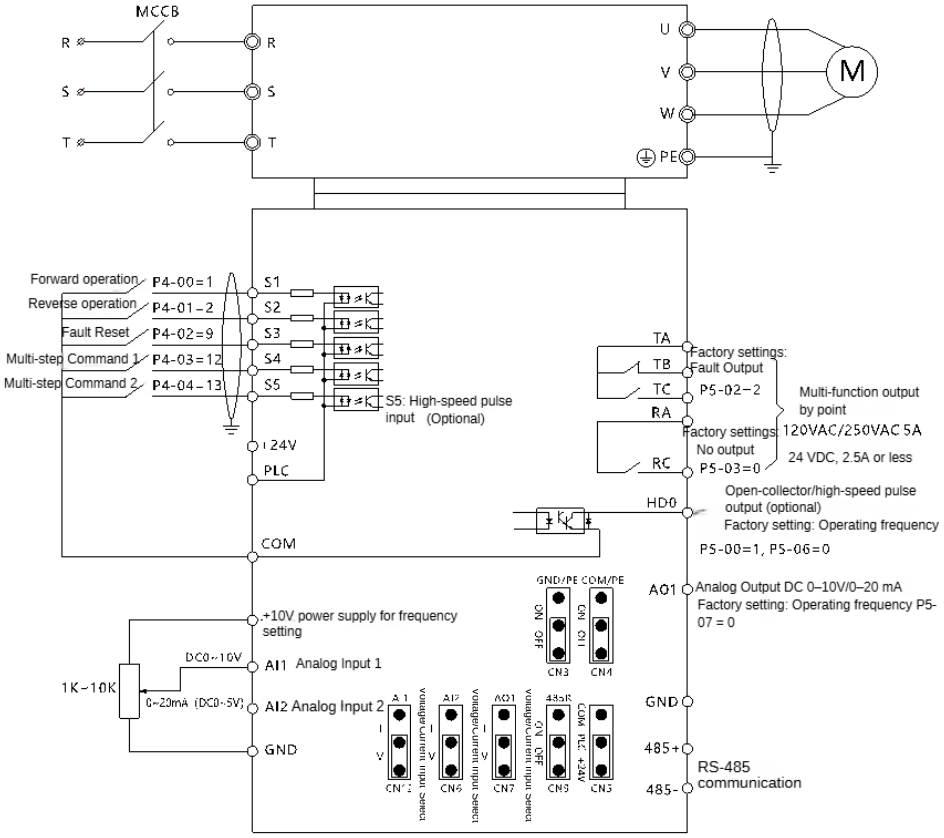


Figure 3-3 Standard Wiring Diagram

3.5 Control Board Terminal Distribution

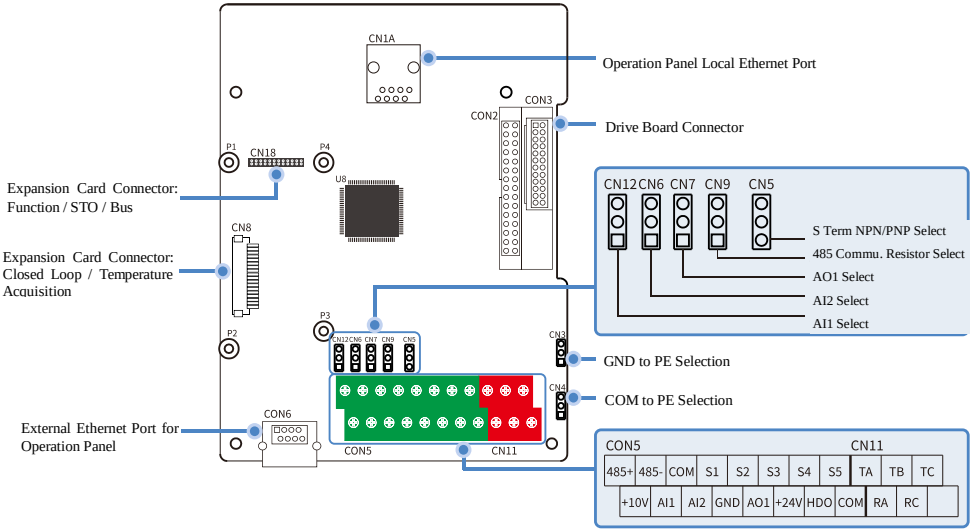
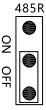
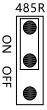
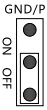
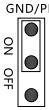
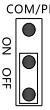
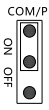


Fig. 3-4 Terminal Distribution of Control Board

3.5.1 Control Panel Jumper Description

Jumper position	Function Description	Jumper position	Function Description
	AI1 input voltage type 0~10V (factory default)		AI1 input current type 0 ~ 20mA
	AI2 input voltage type 0~10V (factory default)		AI2 input current type 0 ~ 20mA
	AO1 output voltage type selection 0~10V (factory default)		AO1 output current type selection 0 ~ 20mA
	485/CAN communication resistor is not short-circuited (factory default)		485/CAN communication resistor short circuit
	+24V and PLC short circuit (factory default)		COM and PLC short circuit

Jumper position	Function Description	Jumper position	Function Description
	GND Disconnect PE Select (Factory Default)		GND connection PE
	COM Off PE Select (factory default)		COM Connection PE

3.5.2 Terminal Description of Control Board

Terminal Name	Terminal Usage and Description
S1 ~ S5	Multi-function digital input 1. Optical coupling isolation, compatible with bipolar input 2. Input impedance: 5.1kΩ 3. Voltage range at level input: 9V ~ 30V
+ 24V-COM	+24V power supply for this machine (current: 150mA)
+ 10V-GND	+10V power supply for this unit (current: 10mA)
COM	Common for +24V
AI1-GND AI2-GND	Analog input, voltage (0~10V)/current (0 ~ 20mA) is optional through the motherboard jumper Input impedance: 10kΩ (voltage input)/250 Ω (current input)
GND	Reference zero potential of +10V (Note: GND is isolated from COM)
HDO	High-speed pulse or open-collector output terminal, whose corresponding common terminal is COM Output frequency range: 0~100kHz
AO1	Analog output terminal Output range: voltage (0~10V)/current (0 ~ 20mA)
TA-TB-TC	TA relay output, TA common terminal, TB normally closed, TC normally open Contact capacity: AC250V/3A,DC30V/1A
RA-RC	RA relay output, RA common, RC normally open Contact capacity: AC250V/3A,DC30V/1A
485 +, 485-	485 communication port, 485 differential signal positive and negative terminals, Please use twisted pair or shielded cable for standard 485 communication interface

3.5.3 Interface Description of Control Panel and Operation Panel

Connector Name	Purpose and description of connector
Connector CN1A	Low power 1.5 kW-18.5kW(T4/T5 voltage level) interface of this machine/external panel, suitable for digital panel/LCD panel; High-power 22kW and above (T4/T5 voltage level) local panel interface, suitable for digital panel/LCD panel.
Connector CON6	High-power 22kW and above (T4/T5 voltage level) external panel interface, suitable for digital panel/LCD panel.

3.5.4 Interface Description of Control Board Expansion Card

Connector Name	Purpose and description of connector
Connector CN8	Temperature acquisition card connector, used to expand the motor temperature, ambient temperature and other acquisition functions,
Connector CN18	The connectors of function expansion card, bus expansion card and STO expansion card are used to expand input and output functions, industrial bus and STO functions, which can be selected according to actual working conditions.

Note:

1、Low power section 1.5 kW-18.5kW(T4/T5 voltage level), only one expansion card can be installed.

2、For high-power segments of 22kW and above (T4/T5 voltage level), one expansion card can be installed on CN8 (closed loop/temperature acquisition expansion card) and CN18 (function/STO/bus expansion card). If the site conditions are not met, please contact our company.

3、 Since optional expansion cards vary for different power ratings, be sure to specify the compatible inverter power rating when placing an order to avoid incompatibility issues.

4、Refer to Appendix C-Expansion Card Function Description for expansion card selection and function details.

Chapter 4 Operation and Debugging

4.1 Digital Panel Operation and Application Example (Standard)

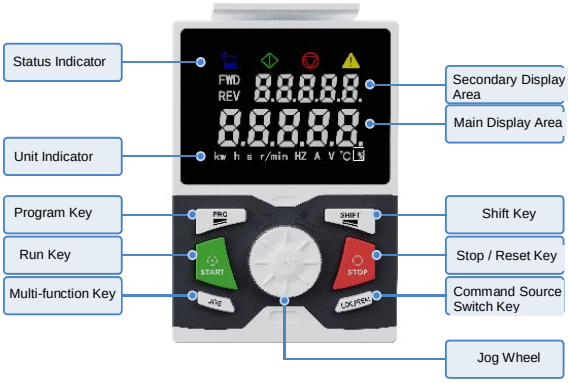


Fig. 4-1 Schematic Diagram of Digital Operation Panel

Shuttle Knob Description

Indicator Status		Status Description
	Shuttle	Rotate clockwise, data or function code increments
		Rotate counterclockwise, data or function code decrements
		Press the shuttle to enter the menu or confirm the data.

Digital panel application example:

■ To set the P0.08 preset specified frequency, for example, from 50.00Hz to 25.00Hz, set the steps as follows:

(1) In the monitoring parameter display interface, press "  " to enter the first-level menu P0;

(2) Press "  " to enter the secondary menu P0-00;

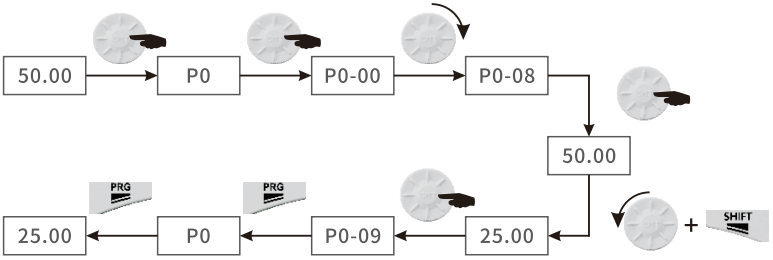
(3) Rotate "  " clockwise to enter the secondary menu P0-08;

(4) Press "  " to enter the three-level menu and display 50.00Hz;

(5) Rotate "  " counterclockwise to reduce the current value, press "  " key to move the cursor to select ten, 100 and 1000 digits respectively for quick modification;

(6) Press "  " to confirm the modification, and return to the secondary menu to display the P0-09, and the modification is successful;

(7) Press the " PRG " button twice to return to the monitoring display interface 25.00Hz;



■ Take the modification of the display bus voltage in the auxiliary display area as an example, and the setting steps are as follows:

(1) In the monitoring parameter display interface, press " " to enter the first-level menu P0;

(2) Turn " " clockwise to enter the secondary menu P7;

(3) Press " " to enter the secondary menu P7-00;

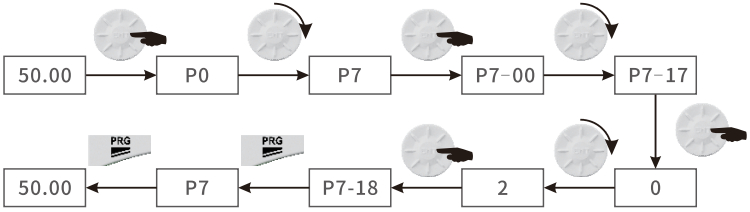
(4) Rotate " " clockwise to enter the secondary menu P7-17;

(5) Press " " to enter the three-level menu to display 0 or other values;

(6) Rotate " " counterclockwise to reduce or increase the current value, and change it to 2. The value set in the auxiliary display area corresponds to the serial number of D0 group monitoring parameters;

(7) Press " " to confirm the modification, and return to the secondary menu to display the P7-18, and the modification is successful;

(8) Press the " PRG " key twice to return to the monitoring display interface 25.00Hz.



4.2 LCD Panel Operation and Application Examples (optional)

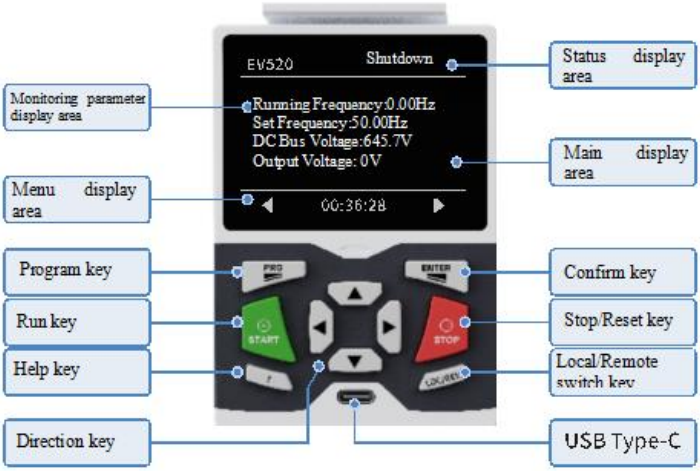
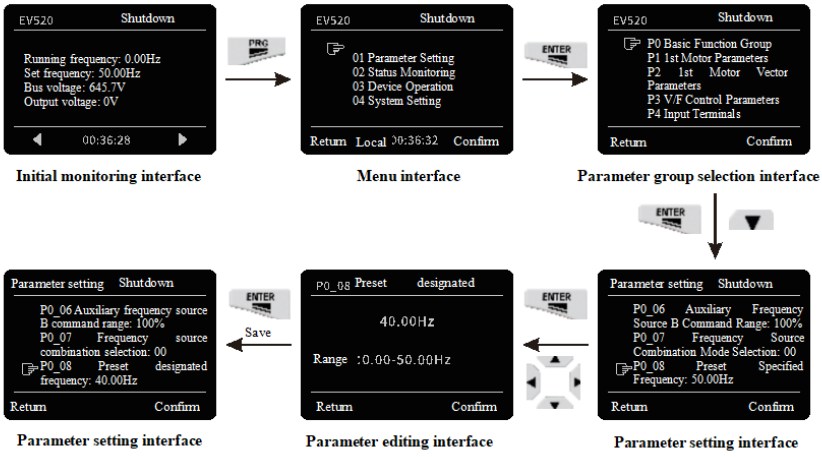


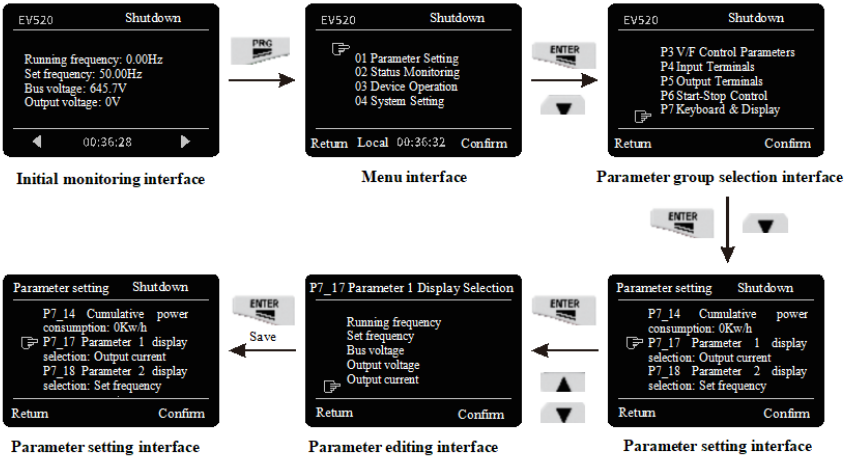
Figure 4-2 Schematic diagram of LCD operation panel

Examples of LCD panel applications:

■ Take setting the preset specified frequency of P0_08 as an example, the steps are as follows:



■ Take changing the display of parameter 1: operating frequency of the initial monitoring interface to the display of output current as an example, and the setting steps are as follows:



4.3 Debugging Process

4.3.1 Commissioning Guide

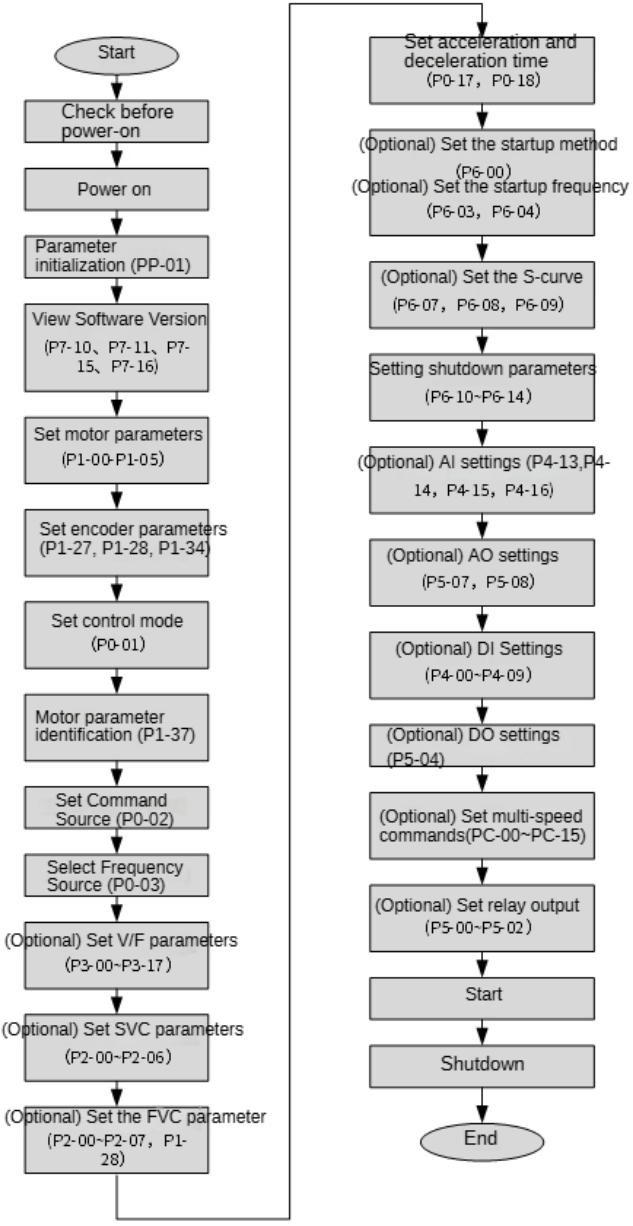


Figure 4-3 Basic Debugging Flow Chart

Table 4-1 Basic Commissioning Flow Chart

Serial Number	Steps	Related parameters
1	Check before power-on	None
2	Power on	None
3	Parameter initialization	PP-01
4	View Software Version	P7-10, P7-11, P7-15, P7-16
5	Set motor parameters	P1-00-P1-05 attention to set the corresponding motor type
6	Set control mode	P0-01
7	motor parameter identification	P1-37
8	Set Command Source	P0-02
9	Select Frequency Source	P0-03
10	Optional V/F parameters	P3-00 ~ P3-17
11	Optional Set SVC Parameters	P2-00 ~ P2-06
12	Set acceleration and deceleration time	P0-17, P0-18
13	Optional set start mode, start frequency	P6-00, P6-03, P6-04
14	Optional Set S-Curve	P6-07, P6-08, P6-09
15	Setting shutdown parameters	P6-10 ~ P6-14
16	Optional AI Settings	P4-13,P4-14, P4-15, P4-16
17	Optional AO Settings	P5-07, P5-08
18	Optional DI Settings	P4-00 ~ P4-09
19	Optional DO Settings	P5-04
20	Optional set multi-speed command	PC-00 ~ PC-15
21	Optional Set Relay Output	P5-00 ~ P5-02
22	Start	None
23	Shutdown	None

4.3.2 V/F Control Mode Debugging Process (asynchronous motor only)

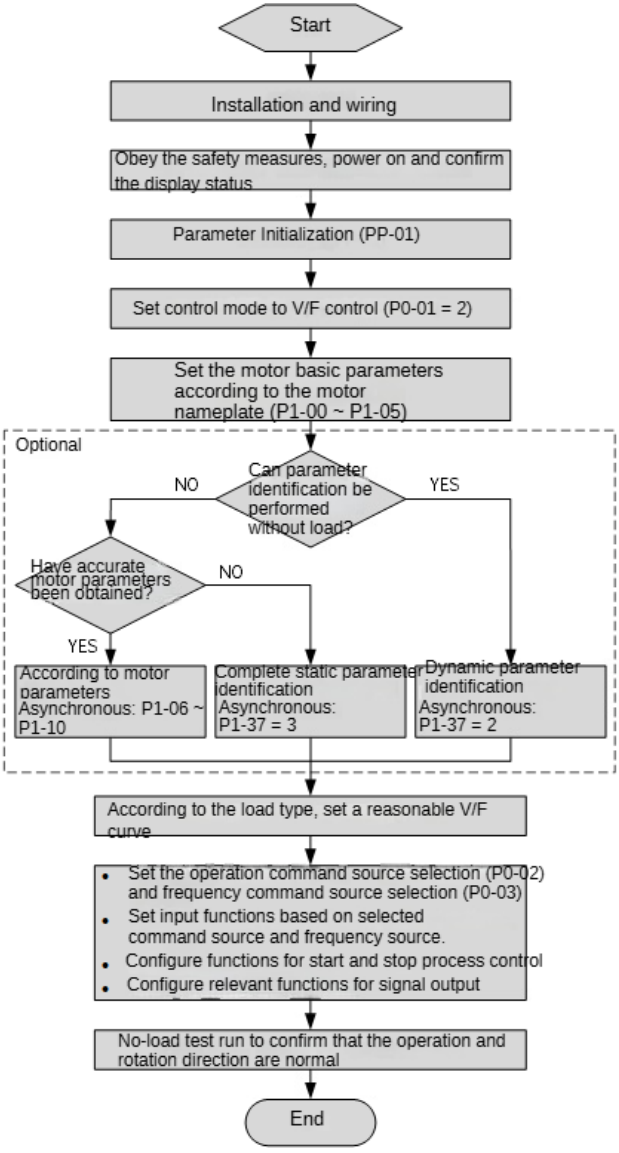


Figure 4-4 Frequency converter debugging flow chart (V/F control)

4.3.3 SVC Control Mode Debugging Process

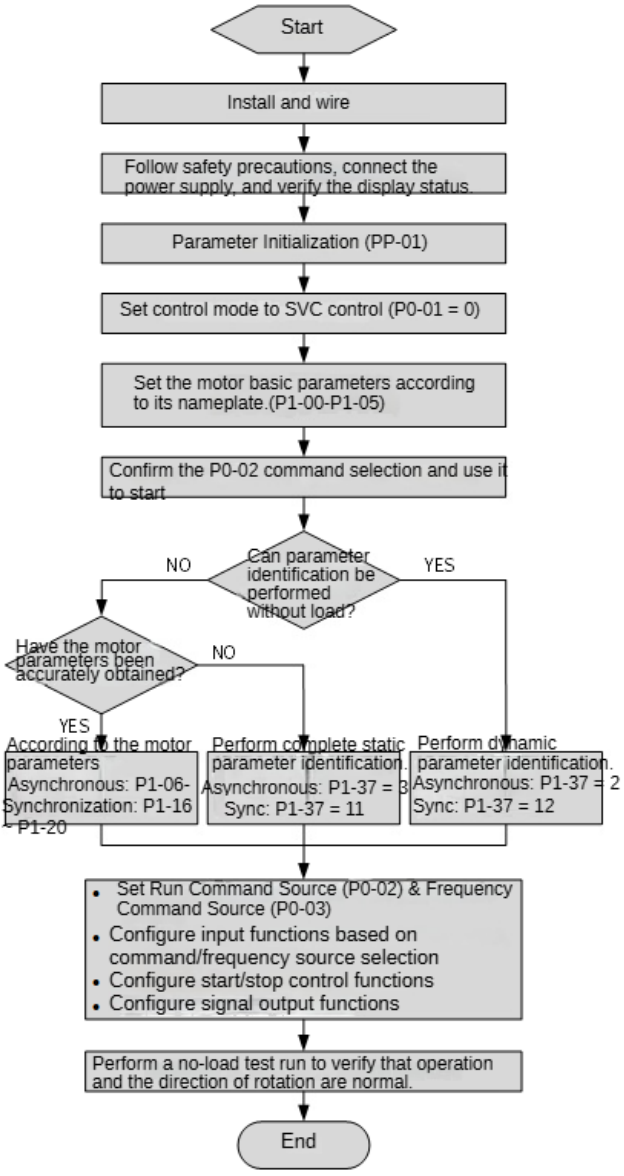


Fig. 4-5 Inverter Debugging Flow Chart (SVC)

Chapter 5 Function Parameter Table

The PP-00 is set to a value other than 0, that is, the parameter protection password is set. In the function parameter mode and the user change parameter mode, the parameter menu must be entered after the password is correctly entered. To cancel the password, set the PP-00 to 0.

The parameter menu in the custom parameter mode is not password protected.

Group P and group A are basic function parameters, and group D is monitoring function parameters. The symbols in the menu are described as follows:

"☆": indicates that the set value of this parameter can be changed when the inverter is in shutdown or running state;

"★": Indicates that the setting value of this parameter cannot be changed when the inverter is in operation;

"●": indicates that the value of this parameter is the actual test record value and cannot be changed;

"*": indicates that the parameter is "manufacturer parameter", which is only set by the manufacturer and is not allowed to be operated by the user.

5.1 Basic Functional Parameters

Function code	Name	Setting range	Factory Value	Change
Basic function group P0 group				
P0-01	1st Motor Speed Control Mode	0: Speed sensorless vector control (SVC) 1: Vector control with speed sensor (FVC) 2:V/F control	2	★
P0-02	Run command channel	0: operation panel command channel 1: Terminal Command Channel 2: terminal communication command channel (terminal RS485) 3: extended communication command channel (bus expansion card) 4: timing control	0	☆
P0-03	Master Frequency Source A Command Selection	0: digital setting (preset frequency P0-08,UP/DOWN can be modified, power down without memory) 1: digital setting (preset frequency P0-08,UP/DOWN can be modified, power-down memory 2:AI1 3:AI2 4:AI3 (function expansion card) 5: High-speed pulse input setting (S5) 6: Multi-Segment Instruction 7: Simple PLC 8:PID 9: given terminal communication (terminal RS485) 10: communication expansion given (bus expansion card)	0	★
P0-04	Auxiliary Frequency Source B Command Input Selection	Same P0-03 (main frequency source A command input selection)	0	★

Function code	Name	Setting range	Factory Value	Change
P0-05	Auxiliary Frequency Source B Command Reference Object Selection	0: Relative to maximum frequency 1: Relative to frequency source A	0	☆
P0-06	Auxiliary Frequency Source B Command Range	0% to 150%	100 percent	☆
P0-07	Frequency source combination mode selection	Bits: Frequency Source Selection 0: Primary frequency source A 1: Main and Auxiliary Operation Results (The operation relationship is determined by ten bits) 2: Main frequency source A and auxiliary frequency source B switching 3: Main frequency source A and main and auxiliary operation results switch 4: switching between auxiliary frequency source B and main and auxiliary operation results Ten bits: frequency source primary and secondary operation relationship 0: Primary + Secondary 1: Main-Auxiliary 2: Maximum of both 3: the two minimum	00	☆
P0-08	Preset setting frequency	0.00Hz ~ maximum frequency (P0-10)	50.00Hz	☆
P0-09	Motor rotation direction	0: Consistent direction 1: in the opposite direction	0	☆
P0-10	Maximum output frequency	50.00Hz ~ 500.00Hz	50.00Hz	★
P0-11	Operating frequency upper limit source selection	0:P0-12 setting 1:AI1 2:AI2 3:AI3 (function expansion card) 4: High speed pulse setting (S5) 5: given terminal communication (terminal RS485) 6: communication expansion given (bus expansion card):	0	★
P0-12	Operating frequency upper limit	Lower limit frequency P0-14 ~ maximum frequency P0-10	50.00Hz	☆
P0-13	Operating frequency upper limit offset	0.00Hz ~ maximum frequency P0-10	0.00Hz	☆
P0-14	Lower limit of operating frequency	0.00Hz ~ upper limit frequency P0-12	0.00Hz	☆
P0-15	carrier frequency setting	0.8kHz to 12.0kHz	Model Determination	☆
P0-16	Carrier frequency adjusted with temperature	0: No 1: Yes	1	☆
P0-17	Acceleration time 1	(0~65000)* P0-19	Model Determination	☆
P0-18	Deceleration time 1	(0~65000)* P0-19	Model Determination	☆
P0-19	Acceleration and deceleration time unit	0:1 second 1:0.1 seconds	1	★

Function code	Name	Setting range	Factory Value	Change
		2:0.01 seconds		
P0-21	Auxiliary frequency source offset frequency when combined	0.00Hz ~ maximum frequency P0-10	0.00Hz	☆
P0-22	Frequency Command Resolution	1:0.1Hz 2:0.01Hz	2	★
P0-23	Digitally set frequency shutdown memory selection	0: No memory 1: Memories	1	☆
P0-24	Motor parameter group selection	0: 1st motor parameter 1: 2nd motor parameter	0	★
P0-25	Reference frequency of acceleration and deceleration time	0: Maximum frequency (P0-10) 1: Set the frequency 2:100Hz	0	★
P0-26	Runtime frequency command UP/DOWN reference	0: Operating frequency 1: Set the frequency	0	★
P0-27	Run Command Bundle Master Frequency Source A Command Selection	Bits: operation panel command binding frequency source selection 0: no binding 1: Digital setting frequency 2:AI1 3:AI2 4:AI3 (function expansion card) 5: High-speed pulse input setting (S5) 6: multi-speed 7: Simple PLC 8:PID 9: given communication (terminal RS485) A: given expansion communication (bus expansion card) Ten bits: terminal command binding frequency source selection Hundred bits: communication command binding frequency source selection (terminal RS485) Thousands: extended communication command binding frequency source selection (bus expansion card)	000	☆
P0-28	Serial port communication protocol selection	Bits: communication protocol selection (terminal RS485) 0:ModbusRTU communication protocol 1: Extended communication protocol Ten: Reserved Hundred: Extended Communication Protocol Selection (Bus Expansion Card) 0:ModbusRTU communication protocol 1: Extended communication protocol Thousands: CAN communication protocol selection 0:CANLINK communication protocol 1:CANOPEN communication protocol	0100	☆

Function code	Name	Setting range	Factory Value	Change
P1 group of first motor parameters				
P1-00	Motor 1 Type Selection	0: Ordinary asynchronous motor 1: variable frequency asynchronous motor 2: permanent magnet synchronous motor	0	★
P1-01	Motor 1 rated power	0.1kW ~ 1000.0kW	Model Determination	★
P1-02	Rated voltage of motor 1	1V ~ 2000V	Model Determination	★
P1-03	Rated current of motor 1	0.1A ~ 6553.5A	Model Determination	★
P1-04	Rated frequency of motor 1	0.01Hz ~ maximum frequency	Model Determination	★
P1-05	Rated speed of motor 1	1rpm ~ 65535rpm	Model Determination	★
P1-06	Stator resistance of asynchronous motor 1	0.001 Ω ~ 65.535 Ω	self-learning parameters	★
P1-07	Rotor resistance of asynchronous motor 1	0.001 Ω ~ 65.535 Ω	self-learning parameters	★
P1-08	Inductive leakage reactance of asynchronous motor 1	0.01mH ~ 655.35mH	self-learning parameters	★
P1-09	Mutual inductance of asynchronous motor 1	0.1mH ~ 6553.5mH	self-learning parameters	★
P1-10	No-load current of asynchronous motor 1	0.01A ~ P1-03	self-learning parameters	★
P1-11	SVC torque boost	0.0-50.0%	10.0 percent	☆
P1-12	SVC torque boost cut-off frequency	0.00 ~ P1.04	20.00Hz	☆
P1-13	Current Loop Filter Time	0.000~0.100s	0.000s	☆
P1-16	Stator resistance of synchronous motor 1	0.001 Ω ~ 65.535 Ω (Drive power ≤ 55kW) 0.0001 Ω ~ 6.5535 Ω (Drive power> 55kW)	self-learning parameters	★
P1-17	Synchronous motor 1D axis inductance	0.01mH ~ 655.35mH (Drive power ≤ 55kW) 0.001mH ~ 65.535mH (Drive power> 55kW)	self-learning parameters	★
P1-18	Synchronous motor 1Q axis inductance	0.01mH ~ 655.35mH (Drive power ≤ 55kW) 0.001mH ~ 65.535mH (Drive power> 55kW)	self-learning parameters	★

Function code	Name	Setting range	Factory Value	Change
P1-20	Back electromotive force coefficient of synchronous motor	0.1V ~ 6553.5V	self-learning parameters	★
P1-22	Synchronous motor learning compensation angle	0 °~ 360 °	0 °	★
P1-27	Number of encoder lines	1 to 65535	1024	★
P1-28	Encoder Type (Closed Loop Expansion Card)	0: ABZ incremental encoder 1: UVW encoder 2: Resolver 4: UVW Encoder (Wire-saving Type) 5: Single-turn absolute encoder (17-bit) 6: Single-turn absolute encoder (17-bit) (Auto-read motor parameters, for our company's motors) 7: Single-turn absolute encoder (23-bit) 8: Single-turn absolute encoder (23-bit) (Auto-read motor parameters, for our company's motors)	0	★
P1-30	ABZ incremental encoder AB phase sequence	0: Forward 1: Reverse	0	★
P1-31	Encoder zero position angle	0.0 to 359.9 °	0.0 °	★
P1-34	resolver pole number	1 to 65535	1	★
P1-36	Speed feedback PG disconnection detection time	0.0: no action 0.1s ~ 10.0s	0.0s	★
P1-37	Self-learning of motor parameters	0: No action 1: Asynchronous machine static part parameter self-learning 2: Asynchronous machine dynamic complete self-learning 3: Asynchronous machine static complete self-learning 11: Synchronous on-board self-learning 12: synchronous machine no-load self-learning	0	★
P2 group of first motor vector control parameters				
P2-00	Speed Loop Proportional Gain 1	1 to 100	30	☆
P2-01	Velocity loop integration time 1	10~1000 (0.01s ~ 10.00s)	0.50s	☆
P2-02	Toggle Low Point Frequency 1	0.00-P2-05	5.00Hz	☆
P2-03	Speed Loop Proportional Gain 2	1 to 100	10	☆
P2-04	Velocity Loop Integration Time 2	0.01s ~ 10.00s	1.00s	☆
P2-05	Toggle High Point Frequency 2	P2-02 ~ Maximum Frequency (P0-10)	10.00Hz	☆
P2-06	vector control slip gain	50% to 200%	100 percent	☆
P2-07	SVC speed feedback filter time constant	0.000s ~ 0.100s	0.005s	☆
P2-09	Selection of Torque Upper Limit Command Channel in Speed Control Mode	0: Function code P2-10 setting 1:AI1 2:AI2 3:AI3 (function expansion card) 4: High-speed pulse input setting (S5)	0	☆

Function code	Name	Setting range	Factory Value	Change
		5: communication given (terminal RS485) 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) 8: extended communication given (bus expansion card) Full-scale P2-10 for 1-8 options		
P2-10	Digital setting of torque upper limit in speed control mode	0.0-200.0%	150.0 percent	☆
P2-11	Torque upper limit command channel selection in speed control mode (power generation)	0: Function code P2-12 setting (Do not distinguish between electric and power generation) 1:AI1 2:AI2 3:AI3 (function expansion card) 4: High-speed pulse input setting 5: communication given (terminal RS485) 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) 8: extended communication given (bus expansion card) Full-scale P2-12 for 1-8 options	0	☆
P2-12	Digital setting of torque upper limit in speed control mode (power generation)	0.0-200.0%	150.0 percent	☆
P2-13	Proportional gain of excitation regulation	0 to 60000	2000	☆
P2-14	integral gain of excitation regulation	0 to 60000	1300	☆
P2-15	torque adjustment proportional gain	0 to 60000	2000	☆
P2-16	torque regulation integral gain	0 to 60000	1300	☆
P2-17	Velocity Loop Integral attribute	Bits: Integral Separation 0: invalid 1: Effective	0	☆
P2-18	Synchronous machine flux weakening mode	0: not weak magnetic 1: Automatic adjustment mode 2: calculation + automatic adjustment comprehensive mode	1	☆
P2-19	field weakening gain of synchronous machine	0 to 50	5	☆
P2-20	Synchronous machine maximum flux weakening current	0 to 300%	50%	☆
P2-21	Maximum torque coefficient in flux weakening region	50 to 200 percent	100 percent	☆
P2-22	Generation Power Limit enable	0: invalid 1: Effective	0	☆
P2-23	Power generation upper limit	0 to 200%	Model Determination	☆
P2-24	Synchronous machine initial position angle detection current	50% to 180%	80%	☆
P2-25	Synchronous machine initial position angle detection	0: Detecting Every Run 1: Do not detect	0	☆

Function code	Name	Setting range	Factory Value	Change
		2: Power-on first operation test		
P2-27	Synchronous machine saliency adjustment gain	50 to 500	100	☆
P2-28	Maximum torque to current ratio control	0: Not open 1: Open	0	☆
P2-32	Z signal correction	0: Not open 1: Open	1	☆
P2-36	low-speed excitation current	0-80%	30%	☆
P2-37	low speed carrier frequency	0.8K ~ P0-15	1.5KHz	☆
P2-38	SVC low-frequency braking mode	0: No low frequency braking 1: the use of low frequency braking	0	☆
P2-39	SVC Low Frequency Braking Effective Frequency	0 to 10.00Hz	2.00Hz	☆
P2-40	SVC low frequency braking frequency change step	0.0005~1.0000Hz	0.0010Hz	☆
P2-41	SVC low-frequency braking current	0-80%	50%	☆
P2-42	Synchronous machine SVC speed tracking	0: Not enabled 1: enable	0	☆
P2-43	Zero servo enable	0: Not enabled 1: enable	0	☆
P2-44	Switching frequency	0.00-P2-02	0.30Hz	☆
P2-45	Zero servo velocity loop proportional gain	1 to 100	10	☆
P2-46	Zero servo velocity loop integration time	0.01s ~ 10.00s	0.50s	☆
P2-47	Stop anti-reverse enable	0: Not enabled 1: enable	1: enable	☆
P2-48	Shutdown angle	0.0 °~ 10.0 °	0.8 °	☆
P3 group V/F control parameters				
P3-00	VF Curve Settings	0: Line V/F 1: Multi-point V/F 2: Square V/F 3:1.2V/F 4:1.4V/F 6:1.6V/F 8:1.8V/F 9: Reservations 10:VF complete separation mode 11:VF semi-separated mode	0	★
P3-01	torque boost	0.0%(no torque boost) 0.1-30.0%	Model Determination	☆
P3-02	Torque boost cut-off frequency	0.00Hz ~ maximum frequency	50.00Hz	★
P3-03	Multipoint V/F Frequency Point 1	0.00Hz to P3-05 Hz	5.00Hz	★
P3-04	Multi-point V/F voltage point 1	0.0-100.0%	10.0 percent	★
P3-05	Multi-Point V/F Frequency Point 2	P3-03 ~ P3-07	25.00Hz	★

Function code	Name	Setting range	Factory Value	Change
P3-06	Multi-point V/F voltage point 2	0.0-100.0%	50.0 percent	★
P3-07	Multi-Point V/F Frequency Point 3	P3-05 ~ motor rated frequency (P1-04)	50.00Hz	★
P3-08	Multi-Point V/F Voltage Point 3	0.0-100.0%	100.0 percent	★
P3-09	V/F slip compensation gain (reserved)	-	-	-
P3-10	V/F over-excitation gain	0 to 200	64	☆
P3-11	V/F oscillation suppression gain	0 to 100	40	☆
P3-13	V/F separated voltage source	0: Number setting (P3-14) 1:AI1 2:AI2 3:AI3 (function expansion card) 4: High-speed pulse input setting (S5) 5: Multi-segment instruction 6: Simple PLC 7:PID 8: communication given (terminal RS485) 9: extended communication given (bus expansion card) Note: 100.0% corresponds to the rated voltage of the motor	0	☆
P3-14	Digital setting of voltage for V/F separation	0V ~ Rated voltage of motor	0V	☆
P3-15	Voltage acceleration time of V/F separation	0.0s ~ 1000.0s Note: indicates the time from 0V to rated voltage	0.0s	☆
P3-16	Voltage deceleration time of V/F separation	0.0s ~ 1000.0s Note: indicates the time from 0V to the rated voltage of the motor	0.0s	☆
P3-17	V/F Separation Shutdown Mode Selection	0: Frequency/voltage independently reduced to 0 1: The voltage is reduced to 0 and then the frequency is reduced.	0	☆
P3-18	Overcurrent stall action current	50 to 200 percent	150 percent	★
P3-19	Overcurrent stall enable	0: invalid 1: Effective	1	★
P3-20	Overcurrent stall suppression gain	0 to 100	20	☆
P3-21	Double-speed overcurrent stall action current compensation coefficient	50 to 200 percent	50%	★
P3-22	Overvoltage stall action voltage	650V ~ 800.0V	760V	★
P3-23	Overvoltage stall enable	0: invalid 1: Effective	1	★
P3-24	Overvoltage stall suppression frequency gain	0 to 100	60	☆
P3-25	Overvoltage stall suppression voltage gain	0 to 100	30	☆
P3-26	Overvoltage stall maximum rise frequency limit	0 to 50Hz	5Hz	★

Function code	Name	Setting range	Factory Value	Change
P3-34	Power saving mode enabled (valid only in V/F control mode and VF curve is straight V/F)	0: Not enabled 1: enable	0	☆
P3-35	Energy saving mode operation detection current	0-60%	40%	☆
P3-36	Energy-saving mode operation voltage detection ratio	70-100%	80%	☆
P3-37	Acceleration and deceleration time of voltage switching in energy saving mode	0.0-10.0s	1.0S	☆
Group P4 input terminals				
P4-00	S1 terminal function selection	0: No function 1: Forward rotation operation (FWD) or operation instruction 2: Reverse running (REV) or positive and negative running direction (Note: Set 1 and 2 to be used in conjunction with the P4-11) 3: Three-wire operation control 4: forward rotation jog (FJOG) 5: Reverse jog (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Free Parking 9: fault reset (RESET) 10: Run pause 11: External fault normally open input 12: Multi-segment command terminal 1 13: Multi-segment command terminal 2 14: Multi-segment command terminal 3 15: Multi-segment command terminal 4 16: acceleration and deceleration time selection terminal 1 17: acceleration and deceleration time selection terminal 2 18: Frequency command switching 19:UP/DOWN setting clear (terminal, keyboard) 20: control command switching terminal 1 21: acceleration and deceleration prohibition 22:PID Pause 23: Simple PLC status reset 24: Pause of swing frequency 25: Counter input 26: Counter Reset 27: Length count input 28: Length reset 29: Torque control prohibition 30: High-speed pulse input (only valid for S5) 31: Reserved 32: Immediate DC braking 33: External fault normally closed input	1	★
P4-01	S2 terminal function selection		2	★
P4-02	S3 terminal function selection		9	★
P4-03	S4 terminal function selection		12	★
P4-04	S5 terminal function selection		13	★
P4-05	S6 terminal function selection (normal use when function expansion card, STO expansion card, this signal is STO1)		0	★
P4-06	S7 terminal function selection (function expansion card, STO expansion card, this signal is STO2)		0	★
P4-07	S8 terminal function selection (function expansion card)		0	★
P4-08	S9 terminal function selection (function expansion card)		0	★
P4-09	S10 terminal function selection (function expansion card)		0	★

Function code	Name	Setting range	Factory Value	Change
		34: Frequency Modification enable 35:PID action direction is reversed 36: External parking terminal 1 37: Control command switching terminal 2 38:PID integration pause 39: Frequency source A and preset frequency switching 40: Frequency source B and preset frequency switching 41: motor terminal selection function 42: Reserved 43:PID parameter switching 44: User-defined fault 1 45: User-defined fault 2 46: Speed control/torque control switching 47: Emergency stop 48: External parking terminal 2 49: DC brake deceleration 50: The running time is cleared 51: Two-wire/three-wire switching 52: Reverse frequency prohibited 53-61: Reserved 62: STO1 Detection (Valid for S6 only) 63: STO2 Detection (Valid for S7 only) 64: Fire signal 65: Sleep mode trigger 66: wake-up mode trigger 67: Manual control in multi-pump mode 68: Pump clean signal 69: Intake pool upper limit signal 70: lower limit signal of water inlet pool 71: water shortage signal into the pool 72: Motor 1 is invalid 73: Motor 2 is invalid 74: Motor 3 is invalid 75: Motor 4 is invalid 76: Blocking 77: Condensation protection		
P4-10	S1 ~ S10 terminal filtering time (S6 and S7 delay is invalid when STO expansion card is used)	0.000s ~ 1.000s	0.010s	☆
P4-11	Terminal control operation mode	0: Two-wire 1 1: Two-line 2 2: Three-line 1 3: Three-line type 2	0	★
P4-12	Terminal UP/DOWN Frequency Rate of Change	0.001Hz/s ~ 65.535Hz/s	1.00Hz/s	☆
P4-13	AI curve 1 minimum input	0.00V ~ P4-15 V	0.00V	☆
P4-14	AI Curve 1 Minimum Input Corresponding Setting	-100.0% to +100.0%	0.0 percent	☆
P4-15	AI curve 1 maximum input	P4-13 ~ +10.00V	10.00V	☆
P4-16	AI Curve 1 Maximum Input Corresponding Setting	-100.0% to +100.0%	100.0 percent	☆

Function code	Name	Setting range	Factory Value	Change
P4-17	AI1 input filter time	0.00s ~ 10.00s	0.10s	☆
P4-18	AI curve 2 minimum input	0.00V ~ P4-20 V	0.00V	☆
P4-19	AI curve 2 minimum input corresponding setting	-100.0% to +100.0%	0.0 percent	☆
P4-20	AI curve 2 maximum input	P4-18 ~ +10.00V	10.00V	☆
P4-21	AI curve 2 maximum input corresponding setting	-100.0% to +100.0%	100.0 percent	☆
P4-22	AI2 input filter time	0.00s ~ 10.00s	0.10s	☆
P4-23	AI curve 3 minimum input	0.00V ~ P4-25 V	0.00V	☆
P4-24	AI curve 3 minimum input corresponding setting	0.00% to +100.0%	0.0 percent	☆
P4-25	AI curve 3 maximum input	P4-23 ~ +10.00V	10.00V	☆
P4-26	AI curve 3 maximum input corresponding setting	0.00% to +100.0%	100.0 percent	☆
P4-27	AI3 input filter time	0.00s ~ 10.00s	0.10s	☆
P4-28	High-speed pulse input minimum frequency	0.00kHz to P4-30 kHz	0.00kHz	☆
P4-29	High-speed pulse minimum input frequency corresponding setting	-100.0% to 100.0%	0.0 percent	☆
P4-30	Maximum input frequency of high-speed pulse	P4-28 to 100.00kHz	50.00kHz	☆
P4-31	High-speed pulse maximum input frequency corresponding setting	-100.0% to 100.0%	100.0 percent	☆
P4-32	Pulse input filter time	0.00s ~ 10.00s	0.10s	☆
P4-33	AI Curve Selection	Bits: AI1 Curve Selection 1: Curve 1(2 points, see P4-13 ~ P4-16) 2: Curve 2(2 points, see P4-18 ~ P4-21) 3: Curve 3(2 points, see P4-23 ~ P4-26) 4: Curve 4(4 points, see A6-00 ~ A6-07) 5: Curve 5(4 points, see A6-08 ~ A6-15) Ten: AI2 curve selection, same as above Hundred bits: AI3 curve selection (function expansion card), same as above	321	☆
P4-34	AI Below Minimum Input Setting Selection	Bits: AI1 is lower than the minimum input setting selected 0: Corresponding minimum input setting 1:0.0 percent Ten position: AI2 is lower than the minimum input setting selection, as above Hundred bits: AI3 is lower than the minimum input setting selection (function expansion card), as above	000	☆
P4-35	S1 delay time	0.0s ~ 3600.0s	0.0s	★
P4-36	S2 delay time	0.0s ~ 3600.0s	0.0s	★
P4-37	S3 Delay Time	0.0s ~ 3600.0s	0.0s	★

Function code	Name	Setting range	Factory Value	Change
P4-38	S1 ~ S5 terminal valid mode selection 1	0: active high; 1: active low Bits: S1 Ten: S2 Hundred bits: S3 Thousands: S4 Ten thousand: S5	00000	★
P4-39	S6, S7 terminal valid mode selection 2 (This function is invalid on S6 and S7 with STO expansion card)	0: active high 1: active low level Bits: S6 (function expansion card) Ten: S7 (function expansion card) Hundred bits: S8 (function expansion card) Thousands: S9 (function expansion card) Ten thousand bits: S10 (function expansion card)	00000	★
P5 group output terminal				
P5-00	HDO terminal output mode selection	0: Pulse output (HDP) 1: switch output (HDY)	1	☆
P5-01	HDY output function selection	0: No output 1: inverter in operation 2: fault output (fault shutdown) 3: Frequency level detection FDT1 output 4: Frequency Arrival 5: zero speed operation (no output when shutdown) 6: motor overload pre-alarm 7: inverter overload pre-alarm 8: Set the recorded value to reach 9: Specify the value to reach 10: Length to reach 11:PLC cycle completed 12: Accumulated running time arrives 13: Frequency Limiting 14: Torque Limiting 15: Ready to run 16:AI1>AI2 17: Upper limit frequency reached 18: Lower limit frequency reached (operation related) 19: Undervoltage state output 20: Communication Settings (terminal RS485 or bus expansion card) 21: Positioning complete (reserved) 22: Positioning Approaching (Reserved) 23: 2 in zero speed operation (output when shutdown) 24: Accumulated power-on time arrives 25: Frequency level detection FDT2 output 26: Frequency 1 reaches output 27: Frequency 2 reaches output 28: Current 1 reaches output 29: Current 2 reaches output 30: Timed arrival output 31:AI1 input overrun 32: Under load	0	☆
P5-02	Relay 1 Output Function Selection (TA-TB-TC)		2	☆
P5-03	Relay 2 Output Function Selection (RA-RC)		0	☆
P5-04	DO1/T1A-T1C output function selection (function expansion card)		-	☆
P5-05	DO2/T2A-T2C output function selection (function expansion card)		-	☆

Function code	Name	Setting range	Factory Value	Change
		33: Reverse operation 34: Zero Current State 35: Module temperature reaches 36: Output current overrun 37: lower limit frequency reached (stop also output) 38: alarm output (continue to run) 39: Motor over-temperature pre-alarm 40: this run time to arrive 41: fault output (for free stop fault), and undervoltage does not output 42: Fire status 43:PID1 feedback too low warning 44:PID1 feedback high warning 45:PID1 feedback sleep state 46:PID2 startup status 47:PID2 stop state 48: standby pressure operation index 49: Lack of water 50: Warning output 51: Circulating motor 1 52: Cycle motor 2 53: Cycle motor 3 54: Cycle motor 4 55: low temperature warning 56: locked-rotor warning 57: Dry pumping warning 58:PTC overheating		
P5-06	HDP output function selection	0: Operating frequency 1: Set the frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: High-speed pulse input (100.% for 100.0kHz) 7:AI1 8:AI2 9:AI3 (function expansion card) 10: Length 11: Remember the value 12: Communication Settings (terminal RS485 or bus expansion card) 13: Motor speed 14: Output current: 100.0% to 1000.0A 15: output voltage: 100.0 corresponding to 1000.0V 16: Motor output torque (actual value, percentage relative to the motor)	0	☆
P5-07	AO1 Output Function Selection		0	☆
P5-08	AO2 output function selection (function expansion card)		1	☆
P5-09	HDO Output Maximum Frequency	0.01kHz to 100.00kHz	50.00kHz	☆
P5-10	AO1 zero bias coefficient	-100.0% to +100.0%	0.0 percent	☆
P5-11	AO1 gain	-10.00 ~ +10.00	1.00	☆
P5-12	AO2 zero bias coefficient	-100.0% to +100.0%	0.0 percent	☆

Function code	Name	Setting range	Factory Value	Change
P5-13	AO2 gain	-10.00 ~ +10.00	1.00	☆
P5-17	HDY output delay time	0.0s ~ 3600.0s	0.0s	☆
P5-18	Relay 1 output delay time (TA-TB-TC)	0.0s ~ 3600.0s	0.0s	☆
P5-19	Relay 2 output delay time (RA-TC)	0.0s ~ 3600.0s	0.0s	☆
P5-20	DO1/T1A-T1C output delay time (Function expansion card)	0.0s ~ 3600.0s	0.0s	☆
P5-21	DO2/T2A-T2C output delay time (Function expansion card)	0.0s ~ 3600.0s	0.0s	☆
P5-22	Output terminal valid state selection	0: Positive logic 1: Anti-Logic Bits: HDO(HDY) Ten: RO1A Hundred: RO2A Thousands: DO1/T1A-T1C (function expansion card) Ten thousand bits: DO2/T2A-T2C (function expansion card)	00000	☆
P5-24	D03/T3A-T3C output function selection (Function expansion card)	0: No output 1: inverter in operation 2: fault output (fault shutdown) 3: Frequency level detection FDT1 output 4: Frequency Arrival 5: zero speed operation (no output when shutdown) 6: motor overload pre-alarm 7: inverter overload pre-alarm 8: Set the recorded value to reach 9: Specify the value to reach 10: Length to reach 11:PLC cycle completed 12: Accumulated running time arrives 13: Frequency Limiting 14: Torque Limiting 15: Ready to run 16:AI1>AI2 17: Upper limit frequency reached 18: Lower limit frequency reached (operation related) 19: Undervoltage state output 20: Communication Settings (terminal RS485 or bus expansion card) 21: Positioning complete (reserved) 22: Positioning Approaching (Reserved) 23: 2 in zero speed operation (output when shutdown) 24: Accumulated power-on time arrives 25: Frequency level detection FDT2 output 26: Frequency 1 reaches output 27: Frequency 2 reaches output 28: Current 1 reaches output	0	☆
P5-25	D04/T4A-T4C output function selection (Function expansion card)		0	☆
P5-26	D05/T5A-T5C Output Function Selection (Function expansion card)		0	☆
P5-27	D06/T6A-T6C Output Function Selection (Function expansion card)		0	☆
P5-28	DO7/T7A-T7C output function selection (Function expansion card)		0	☆

Function code	Name	Setting range	Factory Value	Change
		29: Current 2 reaches output 30: Timed arrival output 31:AI1 input overrun 32: Under load 33: Reverse operation 34: Zero Current State 35: Module temperature reaches 36: Output current overrun 37: lower limit frequency reached (stop also output) 38: alarm output (continue to run) 39: Motor over-temperature pre-alarm 40: this run time to arrive 41: fault output (for free stop fault), and undervoltage does not output 42: Fire status 43:PID1 feedback too low warning 44:PID1 feedback high warning 45:PID1 feedback sleep state 46:PID2 startup status 47:PID2 stop state 48: standby pressure operation index 49: Lack of water 50: Warning output 51: Circulating motor 1 52: Cycle motor 2 53: Cycle motor 3 54: Cycle motor 4 55: low temperature warning 56: locked-rotor warning 57: Dry pumping warning 58:PTC overheating		
P5-29	DO3/T3A-T3C output delay time (Function expansion card)	0.0s ~ 3600.0s	0.0s	☆
P5-30	DO4/T4A-T4C output delay time (Function expansion card)	0.0s ~ 3600.0s	0.0s	☆
P5-31	DO5/T5A-T5C output delay time (Function expansion card)	0.0s ~ 3600.0s	0.0s	☆
P5-32	DO6/T6A-T6C output delay time (Function expansion card)	0.0s ~ 3600.0s	0.0s	☆
P5-33	DO7/T7A-T7C output delay time (Function expansion card)	0.0s ~ 3600.0s	0.0s	☆
P5-34	Output terminal valid state selection	0: Positive logic 1: Anti-Logic Bits: D03/T3A-T3C (function expansion card) Ten: D04/T4A-T4C (function expansion card) Hundred bits: D05/T5A-T5C (function expansion card) Thousands: D06/T6A-T6C (function	00000	☆

Function code	Name	Setting range	Factory Value	Change
		expansion card) Ten thousand bits: D07/T7A-T7C (function expansion card)		
P6 group start-stop control				
P6-00	Start-up operation mode	0: Direct Start 1: Speed tracking restart 2: Pre-excitation start (AC asynchronous machine) 3:SVC Quick Start	0	☆
P6-01	Speed tracking mode	0: Start from shutdown frequency 1: start from the frequency 2: Starting from the maximum frequency	0	★
P6-02	Speed tracking	20	20	☆
P6-03	Start frequency	0.00Hz to 10.00Hz	0.00Hz	☆
P6-04	Start frequency hold time	0.0s ~ 100.0s	0.0s	★
P6-05	DC braking current before startup/pre-excitation current	0% to 100%	0%	★
P6-06	DC braking time/pre-excitation time before starting	0.0s ~ 100.0s	0.0s	★
P6-07	Selection of acceleration and deceleration mode	0: straight line acceleration and deceleration 1:S curve acceleration and deceleration A (static) 2:S curve acceleration and deceleration B (dynamic)	0	★
P6-08	S-curve start time scale	0.0%~(100.0%-P6-09)	30.0 percent	★
P6-09	S curve end segment time scale	0.0%~(100.0%-P6-08)	30.0 percent	★
P6-10	Shutdown mode selection	0: Slow down and stop 1: Free Parking	0	☆
P6-11	Parking DC brake start frequency	0.00Hz ~ maximum frequency (P0-10)	0.00Hz	☆
P6-12	Shutdown DC brake waiting time	0.0s ~ 100.0s	0.0s	☆
P6-13	Shutdown DC brake current	0% to 100%	50%	☆
P6-14	Shutdown DC braking time	0.0s ~ 100.0s	0.0s	☆
P6-15	Brake usage rate	0% to 100%	100 percent	☆
P6-18	Speed tracking current size	30% to 200%	Model Determination	☆
P6-21	Degaussing time (SVC valid)	0.00~5.00s	Model Determination	☆
P7 group keyboard and display				
P7-00	Keyboard type selection	0: General Keyboard 1: new double-row keyboard	1	☆
P7-01	Multi-function key function selection	Bits: 0:JOG is invalid; 2: forward and reverse switching 3: forward rotation jog;	00	★

Function code	Name	Setting range	Factory Value	Change
		4: Reverse inching Ten: 0:LOC/REM invalid 1: Switch between the command channel of the operation panel and the remote command channel (terminal command channel or communication command channel)		
P7-02	STOP/RESET key function	0: Only in the keyboard operation mode, STOP/RES key stop function is effective 1: In any operation mode, the STOP/RES key stop function is effective	1	☆
P7-03	Main display LED operation status display parameter 1	0000~FFFF Bit00: Operating frequency 1(Hz) Bit01: Set frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07:S terminal input status Bit08:HDO Output Status Bit09:AI1 Voltage (V) Bit10:AI2 Voltage (V) Bit11:AI3 Voltage (V)(Function Expansion Card) Bit12: Count Value Bit13: Length value Bit14: Load Speed Display Bit15:PID Setting	1F	☆
P7-04	Main display LED operation status display parameter 2	0000~FFFF Bit00:PID feedback Bit01:PLC Phase Bit02: High Speed Pulse Input Frequency (kHz) Bit03: Operating frequency 2(Hz) Bit04: Remaining Running Time Bit05: Voltage before AI1 correction (V) Bit06: Voltage before AI2 correction (V) Bit07: Voltage before AI3 correction (V) (Function expansion card) Bit08: Line Speed Bit09: Current power-up time (Hour) Bit10: Current Running Time (Min) Bit11: High-speed pulse input frequency (Hz) Bit12: communication setting value Bit13: Encoder feedback speed (Hz) Bit14: Main frequency A display (Hz) Bit15: Secondary frequency B display (Hz)	0	☆
P7-05	Main display LED shutdown status display parameters	0000~FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02:S input status Bit03:HDO output status Bit04:AI1 Voltage (V) Bit05:AI2 Voltage (V)	33	☆

Function code	Name	Setting range	Factory Value	Change
		Bit06:AI3 Voltage (V) (Function expansion card) Bit07: Count value Bit08: Length value Bit09:PLC Phase Bit10: Load Speed Bit11:PID Setting Bit12: High Speed Pulse Input Frequency (kHz)		
P7-06	Load speed display factor	0.0001~6.5000	1.0000	☆
P7-07	IGBT module radiator temperature	-20.0 ℃ ~ 120.0 ℃	-	●
P7-09	Cumulative Running Time	0h ~ 65535h	-	●
P7-12	Load Speed Display Number of decimal places	Bits: d0-14 number of decimal points 0:0 decimal places 1:1 decimal place 2:2 decimal places Ten digits: number of decimal points of d0-19/d0-29 1:1 decimal place 2:2 decimal places	21	☆
P7-13	Cumulative power-on time	0h ~ 65535h	-	●
P7-14	Accumulated power consumption	0kW ~ 65535 degrees	-	●
P7-17	Show Selection 1	0~73, this value corresponds to the serial number of D0 group monitoring parameters. Example: When set to 0, the content of d0.00 is displayed. This parameter is not only the auxiliary display selection of dual display keyboard, but also the first row of display content of LCD keyboard custom display	0	☆
P7-18	Show Selection 2	0~73, this value corresponds to the serial number of d0 group monitoring parameters. Example: When set to 1, the content of d0.01 is displayed. This parameter is the second row of display content of LCD keyboard custom display	1	☆
P7-19	Show Selection 3	0~73, this value corresponds to the serial number of d0 group monitoring parameters. Example: When set to 2, the content of d0.02 is displayed. This parameter is the third row of display content of LCD keyboard custom display	2	☆
P7-20	Show Selection 4	0~73, this value corresponds to the serial number of d0 group monitoring parameters. Example: When set to 3, the display content is d0.03. This parameter is the fourth row of display content of the LCD keyboard custom display	3	☆

Function code	Name	Setting range	Factory Value	Change
P8 group auxiliary function				
P8-00	inching operation frequency	0.00Hz ~ maximum frequency (P0-10)	2.00Hz	☆
P8-01	jog acceleration time	0.0s ~ 6500.0s	20.0s	☆
P8-02	inching deceleration time	0.0s ~ 6500.0s	20.0s	☆
P8-03	Acceleration time 2	0.0s ~ 6500.0s	Model Determination	☆
P8-04	Deceleration time 2	0.0s ~ 6500.0s	Model Determination	☆
P8-05	Acceleration time 3	0.0s ~ 6500.0s	Model Determination	☆
P8-06	Deceleration time 3	0.0s ~ 6500.0s	Model Determination	☆
P8-07	Acceleration time 4	0.0s ~ 6500.0s	Model Determination	☆
P8-08	Deceleration time 4	0.0s ~ 6500.0s	Model Determination	☆
P8-09	Jump frequency 1	0.00Hz ~ maximum frequency (P0-10)	0.00Hz	☆
P8-10	Jump frequency 2	0.00Hz ~ maximum frequency (P0-10)	0.00Hz	☆
P8-11	Jump frequency amplitude	0.00Hz ~ maximum frequency (P0-10)	0.00Hz	☆
P8-12	forward and reverse dead time	0.0s ~ 3000.0s	0.0s	☆
P8-13	Reverse operation of motor is prohibited	0: invalid 1: Effective	0	☆
P8-14	Set the frequency below the lower limit frequency operation mode	0: Operation at the lower limit frequency 1: Shutdown 2: Zero speed operation	0	☆
P8-15	droop rate control	0.00-10.00%	0.00 percent	☆
P8-16	Set power-on arrival time	0h ~ 65000h	0h	☆
P8-17	Set Run Arrival Time	0h ~ 65000h	0h	☆
P8-18	Operation protection selection of power terminal	0: No protection 1: Protection	0	☆
P8-19	Frequency detection value (FDT1)	0.00Hz ~ maximum frequency (P0-10)	50.00Hz	☆
P8-20	Frequency detection hysteresis (FDT1)	0.0%~ 100.0%(FDT1 level)	5.0 percent	☆
P8-21	Frequency reach detection width	0.0 to 100.0%(maximum frequency P0-10)	0.0 percent	☆
P8-22	Whether the jump frequency is effective during acceleration and deceleration	0: invalid 1: Effective	0	☆
P8-25	Acceleration time 1 and acceleration time 2 switching frequency point	0.00Hz ~ maximum frequency (P0-10)	0.00Hz	☆

Function code	Name	Setting range	Factory Value	Change
P8-26	Deceleration time 1 and deceleration time 2 switching frequency point	0.00Hz ~ maximum frequency (P0-10)	0.00Hz	☆
P8-27	Terminal jog priority	0: invalid 1: Effective	0	☆
P8-28	Frequency detection value (FDT2)	0.00Hz ~ maximum frequency	50.00Hz	☆
P8-29	Frequency detection hysteresis (FDT2)	0.0%~ 100.0%(FDT2 level)	5.0 percent	☆
P8-30	Any arrival frequency detection value 1	0.00Hz ~ maximum frequency (P0-10)	50.00Hz	☆
P8-31	Arbitrary arrival frequency detection amplitude 1	0.0 to 100.0%(maximum frequency P0-10)	0.0 percent	☆
P8-32	Any arrival frequency detection value 2	0.00Hz ~ maximum frequency (P0-10)	50.00Hz	☆
P8-33	Arbitrary arrival frequency detection amplitude 2	0.0 to 100.0%(maximum frequency P0-10)	0.0 percent	☆
P8-34	Zero current detection level	0.0-300.0% 100.0% corresponding to rated current of motor	5.0 percent	☆
P8-35	Zero current detection delay time	0.01s ~ 600.00s	0.10s	☆
P8-36	Output current overrun	0.0%(not detected) 0.1~300.0%(rated current of motor)	200.0 percent	☆
P8-37	Delay time of output current overrun detection	0.00s ~ 600.00s	0.00s	☆
P8-38	Arbitrary Arrival Current 1	0.0~300.0%(rated current of motor)	100.0 percent	☆
P8-39	Arbitrary Arrival Current 1 Amplitude	0.0~300.0%(rated current of motor)	0.0 percent	☆
P8-40	Arbitrary Arrival Current 2	0.0~300.0%(rated current of motor)	100.0 percent	☆
P8-41	Arbitrary Arrival Current 2 Amplitude	0.0~300.0%(rated current of motor)	0.0 percent	☆
P8-42	Timing function selection	0: invalid 1: Effective	0	☆
P8-43	Timing Run Time Selection	0:P8-44 setting 1:AI1 2:AI2 3:AI3 (function expansion card) Analog input range P8-44	0	☆
P8-44	Timed Running Time	0.0Min ~ 6500.0Min	0.0Min	☆
P8-45	AI1 input voltage protection value lower limit	0.00V ~ P8-46 V	3.10V	☆
P8-46	AI1 input voltage protection value upper limit	P8-45 ~ 11.00V	6.80V	☆
P8-47	Module temperature reached	0 ℃ ~ 100 ℃	75 ℃	☆
P8-48	Cooling fan control mode	0: Running fan 1: The fan has been running	0	☆
P8-53	Arrival time setting of this operation	0.0Min ~ 6500.0Min	0.0Min	☆
P8-54	output power correction factor	0.00-200.0%	100.0 percent	☆

Function code	Name	Setting range	Factory Value	Change
P9 group fault and protection				
P9-00	Motor overload protection selection	0: prohibited 1: Permitted	1	☆
P9-01	Motor overload protection gain	0.20~10.00	1.00	☆
P9-02	Motor overload warning coefficient	50% to 100%	80%	☆
P9-03	Overvoltage stall gain	0 to 100	30	☆
P9-04	Overvoltage stall protection voltage	650V ~ 800V	760V	☆
P9-07	Short circuit to ground protection selection	Bits: Power-on short-to-ground protection selection 0: invalid 1: Effective Ten position: selection of short circuit protection to ground before operation 0: invalid 1: Effective	01	☆
P9-08	Brake unit action starting voltage	650V ~ 800V	690V	☆
P9-09	Fault automatic reset times	0 to 20	0	☆
P9-10	Fault HDO action selection during fault auto reset	0: No action 1: Action	0	☆
P9-11	Fault automatic reset waiting time	0.1s ~ 100.0s	5.0s	☆
P9-12	Input phase loss and contactor protection selection (Reserved)	Bit: input phase loss protection selection 0: prohibited 1: Permitted Ten position: selection of contactor pull-in protection 0: prohibited 1: Permitted	11	★
P9-13	Output phase loss protection selection	Bit: Output phase loss protection selection 0: prohibited 1: Permitted Ten bits: output phase loss protection selection before operation 0: prohibited 1: Permitted	01	☆
P9-14	First Fault Type	0: No fault 1: Reserved 2: Accelerated overcurrent 3: deceleration overcurrent 4: Constant speed overcurrent 5: Accelerating overvoltage 6: deceleration overvoltage 7: constant speed overvoltage 8: buffer resistance overload 9: Undervoltage 10: inverter overload 11: motor overload 12: Input phase loss 13: Output phase loss	-	●
P9-15	Type of second fault		-	●
P9-16	Third (most recent) failure type		-	●

Function code	Name	Setting range	Factory Value	Change
		14: Module overheating 15: External fault 16: abnormal communication (terminal RS485) 17: Contactor abnormal 18: Abnormal current detection 19: motor self-learning abnormal 20: Encoder/PG Card Abnormal 21: parameter read/write exception 22: The inverter hardware is abnormal 23: motor short circuit to ground 24: Reserved 25: Reserved 26: RUN TIME to arrive 27: User-defined fault 1 28: User-defined fault 2 29: Power-on Time Arrived 30: Underload 31: Runtime PID feedback lost 32: STO Trigger 33: STO1 Trigger 34: STO2 Trigger 40: Fast Limit Timeout 41: Switching motor during operation 42: Speed deviation is too large 43: Motor overspeed (reserved) 45: Motor over-temperature 51: Initial position error 55: Master-slave control slave failure 56:CAN communication failure 57: LCD keyboard communication failure 58: expansion card communication failure		
P9-17	Frequency at third (last) fault	-	-	●
P9-18	Current at third (last) fault	-	-	●
P9-19	Bus voltage at third (latest) fault	-	-	●
P9-20	Input terminal status at third (most recent) fault	-	-	●
P9-21	Output terminal status at third (most recent) fault	-	-	●
P9-22	Converter status at third (most recent) fault	-	-	●
P9-23	Power-on time at third (latest) fault	-	-	●
P9-24	Time of operation at third (most recent) failure	-	-	●
P9-27	Frequency at second fault	-	-	●
P9-28	Current at second fault	-	-	●
P9-29	Bus voltage at second fault	-	-	●
P9-30	Input terminal status at second fault	-	-	●

Function code	Name	Setting range	Factory Value	Change
P9-31	Output terminal status at second fault	-	-	●
P9-32	Converter status at second fault	-	-	●
P9-33	Power-on time at second fault	-	-	●
P9-34	Time of operation at second fault	-	-	●
P9-37	Frequency at first fault	-	-	●
P9-38	Current at first fault	-	-	●
P9-39	Bus voltage at first fault	-	-	●
P9-40	Input terminal status at first fault	-	-	●
P9-41	Output terminal status at first fault	-	-	●
P9-42	Converter status at first fault	-	-	●
P9-43	Power-on time at first fault	-	-	●
P9-44	Time to run on first fault	-	-	●
P9-47	Failsafe action selection 1	Bits: motor overload (FU11) 0: free parking 1: shut down according to the shutdown mode 2: Continue to run Ten digits: input phase missing (FU12)(reserved) Hundred: Output phase missing (FU13) Thousands: external fault (FU15) Ten thousand: abnormal communication (FU16)	00000	☆
P9-48	Fault protection action selection 2	Bits: Encoder/PG card exception (FU20) 0: free parking Ten: function code read and write exception (FU21) 0: free parking 1: shut down according to the shutdown mode Hundred bits: inverter overload fault action selection (FU10) 0: Free Stop 1: derating operation Thousands: motor overheating (FU45) Ten Thousand Bits: Running Time Arrived (FU26)	00000	☆
P9-49	Fail-safe action selection 3	Bits: User-defined fault 1(FU27) 0: free parking 1: shut down according to the shutdown mode 2: Continue to run Ten: User-defined fault 2(FU28) 0: free parking 1: shut down according to the shutdown mode 2: Continue to run Hundred: Power-on Time Arrived (FU29)	00000	☆

Function code	Name	Setting range	Factory Value	Change
		0: free parking 1: shut down according to the shutdown mode 2: Continue to run Thousands: Underload (FU30) 0: free parking 1: Slow down and stop 2: Decelerate to 7% of the rated frequency of the motor and continue to run, and automatically return to the set frequency when not under load Ten thousand bits: PID feedback lost at runtime (FU31) 0: free parking 1: shut down according to the shutdown mode 2: Continue to run		
P9-50	Fault protection action selection 4	Bit: excessive speed deviation (FU42) 0: free parking 1: shut down according to the shutdown mode 2: Continue to run Ten: motor speed (FU43) Hundred: Initial position error (FU51)	00000	☆
P9-54	Continue operation frequency selection in case of fault	0: Run at the current operating frequency 1: Run at set frequency 2: Operation at upper limit frequency 3: the following limit frequency operation 4: Run at abnormal standby frequency	0	☆
P9-55	Abnormal standby frequency	0.0-100.0% (100.0% corresponds to maximum frequency P0-10)	100.0 percent	☆
P9-56	Motor temperature sensor type (closed loop expansion card/temperature acquisition card)	0: No sensor 1:PT100 2:PT1000 3:KTY84	0	☆
P9-57	Motor overheat protection threshold (closed loop expansion card/temperature acquisition card)	0 ℃-200 ℃	110 ℃	☆
P9-58	Motor overheating pre-alarm threshold (closed-loop expansion card/temperature acquisition card).	0 ℃-200 ℃	90 ℃	☆
P9-59	Instantaneous stop function selection	0: invalid 1: bus voltage constant control 2: Deceleration and shutdown	0	☆
P9-60	Instantaneous stop non-stop recovery voltage	80% to 100.0%	85.0 percent	☆
P9-61	Instantaneous stop non-stop voltage recovery judgment time	0.00s ~ 100.00s	0.50s	☆
P9-62	Instant stop non-stop action voltage	60.0~100.0 (standard bus voltage)	80.0 percent	☆
P9-63	Underload Protection Selection	0: invalid 1: Effective	0	☆
P9-64	Underload detection level	0.0-100.0%	10.0	☆

Function code	Name	Setting range	Factory Value	Change
			percent	
P9-65	Underload detection time	0.0~60.0s	1.0s	☆
P9-67	over-speed detection value	0.0 to 50.0%(maximum frequency)	20.0 percent	☆
P9-68	over-speed detection time	0.0s: do not detect 0.1~60.0s	1.0s	☆
P9-69	Detection value of excessive speed deviation	0.0 to 50.0%(maximum frequency)	20.0 percent	☆
P9-70	Excessive speed deviation detection time	0.0s: do not detect 0.1~60.0s	5.0s	☆
P9-71	Transient stop gain Kp	0 to 100	80	☆
P9-72	Instantaneous non-stop integral coefficient Ki	0 to 100	20	☆
P9-73	Instant stop non-stop action deceleration time	0~300.0s	0.1s	★
PA group PID function				
PA-00	PID given source selection	0:PA-01 setting 1:AI1 2:AI2 3:AI3 (function expansion card) 4: High-speed pulse input setting (S5) 5: communication given (terminal RS485) 6: Multi-segment instruction given 7: extended communication given (bus expansion card) 8: Timing given	0	☆
PA-01	PID value given	0.0-100.0%	50.0 percent	☆
PA-02	PID Feedback Source Selection	0:AI1 1:AI2 2:AI3 (function expansion card) 3:AI1-AI2 4: High-speed pulse input setting (S5) 5: communication given (terminal RS485) 6:AI1 + AI2 7:MAX(|AI1|,|AI2|) 8:MIN(|AI1|,|AI2|) 9: extended communication given (bus expansion card)	0	☆
PA-03	PID action direction	0: positive effect 1: The reaction	0	☆
PA-04	PID given feedback range	0 to 65535	1000	☆
PA-05	Proportional gain KP1	0.0~100.0	20.0	☆
PA-06	Integration time Ti1	0.01s ~ 10.00s	2.00s	☆
PA-07	Differential time Td1	0.000s ~ 10.000s	0.000s	☆
PA-08	PID Inverted Cut-off Frequency	0.00 ~ maximum frequency (P0-10)	0.00Hz	☆
PA-09	PID deviation limit	0.0-100.0%	0.0 percent	☆

Function code	Name	Setting range	Factory Value	Change
PA-10	PID Differential Limiting	0.00-100.00%	0.10 percent	☆
PA-11	PID given change time	0.00~650.00s	0.00s	☆
PA-12	PID feedback filtering time	0.00~60.00s	0.00s	☆
PA-13	PID output filter time	0.00~60.00s	0.00s	☆
PA-14	Retention	-	-	☆
PA-15	Proportional gain KP2	0.0~1000.0	20.0	☆
PA-16	Integration time Ti2	0.01s ~ 10.00s	2.00s	☆
PA-17	Differential time Td2	0.000s ~ 10.000s	0.000s	☆
PA-18	PID parameter switching condition	0: Do not switch 1: Switch via S terminal 2: Automatic switching according to deviation 3: Automatic switching according to the operating frequency	0	☆
PA-19	PID parameter switching deviation 1	0.0%~ PA-20	20.0 percent	☆
PA-20	PID parameter switching deviation 2	PA-19 ~ 100.0%	80.0 percent	☆
PA-21	PID initial value	0.0-100.0%	0.0 percent	☆
PA-22	PID initial value holding time	0.00~650.00s	0.00s	☆
PA-23	Maximum positive value of two output deviations	0.00-100.00%	1.00 percent	☆
PA-24	Maximum value of two reverse output deviations	0.00-100.00%	1.00 percent	☆
PA-25	PID Integral Properties	Bits: Integral Separation 0: invalid 1: Effective Ten bits: whether to stop integration after output to limit 0: Continue integration 1: Stop Integral	00	☆
PA-26	PID feedback loss detection value	0.0%: Do not judge that feedback is lost 0.1-100.0%	0.0 percent	☆
PA-27	PID feedback loss detection time	0.0s ~ 20.0s	0.0s	☆
PA-28	PID shutdown operation	0: stop without operation 1: Calculation during shutdown	0	☆
PB group pendulum frequency, fixed length and counting				
Pb-00	Pendulum frequency setting mode	0: Relative to center frequency 1: Relative to the maximum frequency	0	☆
Pb-01	swing frequency amplitude	0.0-100.0%	0.0 percent	☆
Pb-02	Sudden jump frequency amplitude	0.0-50.0%	0.0 percent	☆
Pb-03	Pendulum period	0.1s ~ 3000.0s	10.0s	☆
Pb-04	swing frequency triangle wave rise time	0.1-100.0%	50.0 percent	☆
Pb-05	Set Length	0m ~ 65535m	1000m	☆

Function code	Name	Setting range	Factory Value	Change
Pb-06	Actual length	0m ~ 65535m	0m	☆
Pb-07	Number of pulses per meter	0.1~6553.5	100.0	☆
Pb-08	Set count value	1 to 65535	1000	☆
Pb-09	Specify Count Value	1 to 65535	1000	☆
PC group multi-segment instructions, simple PLC				
PC-00	Multi-Segment Instruction 0	-100.0% to 100.0%	0.0 percent	☆
PC-01	Multi-Segment Command 1	-100.0% to 100.0%	0.0 percent	☆
PC-02	Multi-Segment Command 2	-100.0% to 100.0%	0.0 percent	☆
PC-03	Multi-Segment Command 3	-100.0% to 100.0%	0.0 percent	☆
PC-04	Multi-Segment Command 4	-100.0% to 100.0%	0.0 percent	☆
PC-05	Multi-Segment Command 5	-100.0% to 100.0%	0.0 percent	☆
PC-06	Multi-Segment Instruction 6	-100.0% to 100.0%	0.0 percent	☆
PC-07	Multi-Segment Instruction 7	-100.0% to 100.0%	0.0 percent	☆
PC-08	Multi-Segment Command 8	-100.0% to 100.0%	0.0 percent	☆
PC-09	Multi-Segment Instruction 9	-100.0% to 100.0%	0.0 percent	☆
PC-10	Multi-Segment Command 10	-100.0% to 100.0%	0.0 percent	☆
PC-11	Multi-Segment Command 11	-100.0% to 100.0%	0.0 percent	☆
PC-12	Multi-Segment Instruction 12	-100.0% to 100.0%	0.0 percent	☆
PC-13	Multi-Segment Directive 13	-100.0% to 100.0%	0.0 percent	☆
PC-14	Multi-Segment Instruction 14	-100.0% to 100.0%	0.0 percent	☆
PC-15	Multi-Segment Instruction 15	-100.0% to 100.0%	0.0 percent	☆
PC-16	Simple PLC operation mode	0: End of single operation and shutdown 1: Maintain final value at the end of a single run 2: Always cycle	0	☆
PC-17	Simple PLC power-down memory selection	Bit: power-down memory selection 0: power failure does not remember 1: Power-down memory Ten: stop memory selection 0: shutdown without memory 1: Shutdown memory	00	☆
PC-18	Simple PLC segment 0 operation time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-19	Simple PLC Section 0 Acceleration and Deceleration Time Selection	0 to 3	0	☆
PC-20	Simple PLC Section 1 Operation Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-21	Simple PLC first acceleration and deceleration time selection	0 to 3	0	☆
PC-22	Simple PLC Section 2 Operation Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆

Function code	Name	Setting range	Factory Value	Change
PC-23	Simple PLC Section 2 Acceleration and Deceleration Time Selection	0 to 3	0	☆
PC-24	Simple PLC Section 3 Operation Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-25	Simple PLC 3rd Acceleration and Deceleration Time Selection	0 to 3	0	☆
PC-26	Simple PLC Section 4 Operation Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-27	Simple PLC Section 4 Acceleration and Deceleration Time Selection	0 to 3	0	☆
PC-28	Simple PLC Section 5 Operation Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-29	Simple PLC Section 5 Acceleration and Deceleration Time Selection	0 to 3	0	☆
PC-30	Simple PLC Section 6 Running Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-31	Simple PLC Section 6 Acceleration and Deceleration Time Selection	0 to 3	0	☆
PC-32	Simple PLC Section 7 Operating Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-33	Simple PLC Section 7 Acceleration and Deceleration Time Selection	0 to 3	0	☆
PC-34	Simple PLC Section 8 Operation Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-35	Simple PLC Section 8 Acceleration and Deceleration Time Selection	0 to 3	0	☆
PC-36	Simple PLC Section 9 Running Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-37	Simple PLC 9th Acceleration and Deceleration Time Selection	0 to 3	0	☆
PC-38	Simple PLC Section 10 Operating Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-39	Simple PLC 10th acceleration and deceleration time selection	0 to 3	0	☆
PC-40	Simple PLC Section 11 Operation Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-41	Simple PLC 11th Acceleration and Deceleration Time Selection	0 to 3	0	☆
PC-42	Simple PLC Section 12 Operation Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-43	Simple PLC 12 acceleration and deceleration time selection	0 to 3	0	☆
PC-44	Simple PLC Section 13 Operation Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-45	Simple PLC 13th acceleration and deceleration time selection	0 to 3	0	☆
PC-46	Simple PLC Section 14 Operating Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-47	Simple PLC 14th acceleration and deceleration time selection	0 to 3	0	☆

Function code	Name	Setting range	Factory Value	Change
PC-48	Simple PLC Section 15 Operating Time	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC-49	Simple PLC 15th segment acceleration and deceleration time selection	0 to 3	0	☆
PC-50	Simple PLC operation time unit	0:s (seconds) 1:h (hours)	0	☆
PC-51	Multi-segment instruction 0 given method	0: function code PC-00 given 1:AI1 2:AI2 3:AI3 (function expansion card) 4: High-speed pulse input 5:PID 6: preset frequency (P0-08) given, UP/DOWN can be modified	0	☆
PD group communication parameters				
Pd-00	Universal Baud Rate Setting	Bits: MODBUS (terminal RS485) 0:300BPS 1:600BPS 2:1200BPS 3:2400BPS 4:4800BPS 5:9600BPS 6:19200BPS 7:38400BPS 8:57600BPS 9:115200BPS Ten: Reserved Hundred: Reserved Thousands: Reserved	5005	☆
Pd-01	MODBUS data format (terminal RS485)	0: No verification (8-N-2) 1: Even check (8-E-1) 2: odd check (8-O-1) 3: No verification (8-N-1)	3	☆
Pd-02	Local address (terminal RS485)	0: broadcast address 1~247	1	☆
Pd-03	MODBUS response delay (terminal RS485)	0ms -20ms	2	☆
Pd-04	Serial communication timeout (terminal RS485)	0.0: Invalid 0.1s ~ 60.0s	0.0	☆
Pd-05	Data transfer format selection (terminal RS485)	Bits: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol Ten: Reserved	31	☆
Pd-06	Communication read current resolution (terminal RS485)	0:0.01A (valid when ≤ 55kW) 1:0.1A	0	☆
Pd-08	Bus extension card interrupt detection time	0.0: Invalid 0.1s ~ 60.0s	0.0	☆
Pd-10	Debug Communication Baud Rate Settings	5:9600BPS 6:19200BPS 7:38400BPS 8:57600BPS 9:115200BPS	6	☆
Pd-11	Data format of debugging communication	0: No verification (8-N-2) 1: Even check (8-E-1) 2: odd check (8-O-1) 3: No verification (8-N-1)	3	☆
Pd-12	Local address of debugging communication	1 to 247	1	☆

Function code	Name	Setting range	Factory Value	Change
Pd-13	Debugging Communication Response Delay	0ms -20ms	2	☆
Pd-14	Debug Communication Timeout	0.0: Invalid 0.1s ~ 60.0s	0.0	☆
Pd-15	Baud Rate Setting for Internal Communication of Bus Expansion Card	5:9600BPS 8:57600BPS 6:19200BPS 9:115200BPS 7:38400BPS	9	☆
Pd-16	Data format for intra-pair communication of bus expansion card	0: No verification (8-N-2) 1: Even check (8-E-1) 2: odd check (8-O-1) 3: No verification (8-N-1)	3	☆
Pd-17	Bus expansion card internal communication local address	1 to 247	1	☆
Pd-18	Bus Expansion Card Intercommunication Response Delay	0ms -20ms	2	☆
Pd-19	Bus Expansion Card Intercommunication Timeout	0.0: Invalid 0.1s ~ 60.0s	0.0	☆
PE group user customized function code, bus expansion PZD				
PE-00	User function code 0 (PZD1 receive)	P0-00 ~ PP-xx A0-00 ~ Ax-xx d0-00 ~ d0-xx d3-00 ~ d3-xx	d3-17	☆
PE-01	User function code 1 (PZD2 receive)		d3-18	☆
PE-02	User function code 2 (PZD3 receive)		P0.00	☆
PE-03	User function code 3 (PZD4 receive)		P0.00	☆
PE-04	User function code 4 (PZD5 receive)		P0.00	☆
PE-05	User function code 5 (PZD6 receive)		P0.00	☆
PE-06	User function code 6 (PZD7 receive)		P0.00	☆
PE-07	User function code 7 (PZD8 receive)		P0.00	☆
PE-08	User function code 8 (PZD9 receive)		P0.00	☆
PE-09	User function code 9 (PZD10 receive)		P0.00	☆
PE-10	User function code 10 (PZD11 receive)		P0.00	☆
PE-11	User function code 11 (PZD12 receive)		P0.00	☆
PE-12	User function code 12		P0.00	☆
PE-13	User function code 13		P0.00	☆
PE-14	User function code 14		P0.00	☆
PE-15	User function code 15		P0.00	☆
PE-16	User function code 16		P0.00	☆
PE-17	User function code 17		P0.00	☆

Function code	Name	Setting range	Factory Value	Change
PE-18	User function code 18		P0.00	☆
PE-19	User function code 19		P0.00	☆
PE-20	User function code 20 (PZD1 send)		d0-68	☆
PE-21	User function code 21 (PZD2 send)		d0-69	☆
PE-22	User function code 22 (PZD3 send)		P0.00	☆
PE-23	User function code 23 (PZD4 send)		P0.00	☆
PE-24	User function code 24 (PZD5 send)		P0.00	☆
PE-25	User function code 25 (PZD6 send)		P0.00	☆
PE-26	User function code 26 (PZD7 send)		P0.00	☆
PE-27	User function code 27 (PZD8 send)		P0.00	☆
PE-28	User function code 28 (PZD9 send)		P0.00	☆
PE-29	User function code 29 (PZD10 send)		P0.00	☆
PE-30	User function code 30 (PZD11 send)		P0.00	☆
PE-31	User function code 31 (PZD12 send)		P0.00	☆
PP group function code management				
PP-00	User Password	0 to 65535	0	☆
PP-01	Parameter initialization	0: No action 01: Restore factory parameters, excluding motor parameters 02: Clear Record Information 04: Backup User's Current Parameters 501: Restore current user parameters	0	☆
PP-02	Function parameter group display selection	Bit: d group display selection 0: do not display; 1: display Ten: Group A Display Selection 0: do not display; 1: display	11	★
PP-04	Function code modification attribute	0: modifiable 1: Not modifiable	0	☆
A0 group torque control parameters				
A0-00	Speed/torque control mode selection	0: Speed control 1: Torque control	0	★
A0-01	Torque setting selection in torque control mode	0: Number set 1(A0-03) 1:AI1 2:AI2 3:AI3 (function expansion card) 4: High-speed pulse input (S5) 5: communication given (terminal RS485) 6:MIN(AI1,AI2)	0	★

Function code	Name	Setting range	Factory Value	Change
		7:MAX(AI1,AI2) 8: extended communication given (bus expansion card) Full scale of 1-8 options, corresponding to A0-03 digital setting		
A0-03	Torque digital setting in torque control mode	-200.0% to 200.0%	150.0 percent	☆
A0-05	Torque control forward maximum frequency	0.00Hz ~ maximum frequency (P0-10)	50.00Hz	☆
A0-06	Torque control reverse maximum frequency	0.00Hz ~ maximum frequency (P0-10)	50.00Hz	☆
A0-07	Torque rise filter time	0.00s ~ 65000s	0.00s	☆
A0-08	Torque drop filter time	0.00s ~ 65000s	0.00s	☆
A1 group virtual DI, virtual DO group				
A1-00	VDI1 terminal function selection	0: No function 1: Forward rotation operation (FWD) or operation instruction 2: Reverse running (REV) or positive and negative running direction (Note: Set 1 and 2 to be used in conjunction with the P4-11) 3: Three-wire operation control 4: forward rotation jog (FJOG) 5: Reverse jog (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Free Parking 9: fault reset (RESET) 10: Run pause 11: External fault normally open input 12: Multi-segment command terminal 1 13: Multi-segment command terminal 2 14: Multi-segment command terminal 3 15: Multi-segment command terminal 4 16: acceleration and deceleration time selection terminal 1 17: acceleration and deceleration time selection terminal 2 18: Frequency command switching 19:UP/DOWN setting clear (terminal, keyboard) 20: control command switching terminal 1 21: acceleration and deceleration prohibition 22:PID Pause 23: Simple PLC status reset 24: Pause of swing frequency 25: Counter input 26: Counter Reset 27: Length count input 28: Length reset 29: Torque control prohibition 30: High-speed pulse input (only valid for S5)	0	★
A1-01	VDI2 terminal function selection		0	★
A1-02	VDI3 terminal function selection		0	★
A1-03	VDI4 terminal function selection		0	★
A1-04	VDI5 terminal function selection		0	★

Function code	Name	Setting range	Factory Value	Change
		31: Reserved 32: Immediate DC braking 33: External fault normally closed input 34: Frequency Modification enable 35:PID action direction is reversed 36: External parking terminal 1 37: Control command switching terminal 2 38:PID integration pause 39: Frequency source A and preset frequency switching 40: Frequency source B and preset frequency switching 41: motor terminal selection function 42: Reserved 43:PID parameter switching 44: User-defined fault 1 45: User-defined fault 2 46: Speed control/torque control switching 47: Emergency stop 48: External parking terminal 2 49: DC brake deceleration 50: The running time is cleared 51: Two-wire/three-wire switching 52: Reverse frequency prohibited 53-61: Reserved 62: STO1 63: STO2 64: Fire signal 65: Sleep mode trigger 66: wake-up mode trigger 67: Manual control 68: Pump clean signal 69: Intake pool upper limit signal 70: lower limit signal of water inlet pool 71: water shortage signal into the pool 72: Motor 1 is invalid 73: Motor 2 is invalid 74: Motor 3 is invalid 75: Motor 4 is invalid 76: Blocking 77: Condensation protection		
A1-05	VDI terminal status setting mode	Bits: VDI1 0: Function code setting (A1.06, and binding with VDO1) 1:DO Status 2:DI Status Ten: VDI2 0: Function code setting (A1.06, and binding with VDO2) 1:DO Status 2:DI Status Hundred bits: VDI3 0: Function code setting (A1.06, and binding with VDO3) 1:DO Status	00000	★

Function code	Name	Setting range	Factory Value	Change
		2:DI Status Thousands: VDI4 0: Function code setting (A1.06 and binding with VDO4) 1:DO Status 2:DI Status Ten thousand: VDI5 0: Function code setting (A1.06 and binding with VDO5) 1:DO Status 2:DI Status		
A1-06	Virtual VDI terminal status settings	00000~11111	0	★
A1-07	AI1 terminal function selection (as DI)	Same A1-00	0	★
A1-08	AI2 terminal function selection (as DI)	Same A1-00	0	★
A1-09	AI3 terminal function selection (as DI)	Same A1-00	0	★
A1-10	AI as DI Valid State Selection	Bits: AI1 0: active high 1: active low level Ten: AI2; 0: active high 1: active low level Hundred: AI3 0: active high 1: active low level	0	★
A1-11	VDO1 Output Function Selection	0: No output 1: inverter in operation 2: fault output (fault shutdown) 3: Frequency level detection FDT1 output 4: Frequency Arrival 5: zero speed operation (no output when shutdown) 6: motor overload pre-alarm 7: inverter overload pre-alarm 8: Set the recorded value to reach 9: Specify the value to reach 10: Length to reach 11:PLC cycle completed 12: Accumulated running time arrives 13: Frequency Limiting 14: Torque Limiting 15: Ready to run 16:AI1>AI2 17: Upper limit frequency reached 18: Lower limit frequency reached (operation related) 19: Undervoltage state output 20: Communication Settings (terminal RS485 or bus expansion card) 21: Positioning complete (reserved) 22: Positioning Approaching (Reserved) 23: 2 in zero speed operation (output when shutdown)	0	☆
A1-12	VDO2 output function selection		0	☆
A1-13	VDO3 Output Function Selection		0	☆
A1-14	VDO4 Output Function Selection		-	☆
A1-15	VDO5 Output Function Selection		-	☆

Function code	Name	Setting range	Factory Value	Change
		24: Accumulated power-on time arrives 25: Frequency level detection FDT2 output 26: Frequency 1 reaches output 27: Frequency 2 reaches output 28: Current 1 reaches output 29: Current 2 reaches output 30: Timed arrival output 31:AI1 input overrun 32: Under load 33: Reverse operation 34: Zero Current State 35: Module temperature reaches 36: Output current overrun 37: lower limit frequency reached (stop also output) 38: alarm output (continue to run) 39: Motor over-temperature pre-alarm 40: this run time to arrive 41: fault output (for free stop fault), and undervoltage does not output 42: Fire status 43:PID1 feedback too low warning 44:PID1 feedback high warning 45:PID1 feedback sleep state 46:PID2 startup status 47:PID2 stop state 48: standby pressure operation index 49: Lack of water 50: Warning output 51: Circulating motor 1 52: Cycle motor 2 53: Cycle motor 3 54: Cycle motor 4 55: low temperature warning 56: locked-rotor warning 57: Dry pumping warning 58:PTC overheating		
A1-16	VDO1 output delay time	0.0s ~ 3600.0s	0.0s	☆
A1-17	VDO2 output delay time	0.0s ~ 3600.0s	0.0s	☆
A1-18	VDO3 output delay time	0.0s ~ 3600.0s	0.0s	☆
A1-19	VDO4 output delay time	0.0s ~ 3600.0s	0.0s	☆
A1-20	VDO5 output delay time	0.0s ~ 3600.0s	0.0s	☆
A1-21	VDO output terminal valid state selection	0: Positive logic 1: Anti-Logic Bits: VDO1 Ten: VDO2 Hundred: VDO3 Thousands: VDO4 million: VDO5	00000	☆
A2 group second motor control				
A2-00	Motor 2 Type Selection	0: Ordinary asynchronous motor 1: variable frequency asynchronous motor 2: permanent magnet synchronous motor	0	★

Function code	Name	Setting range	Factory Value	Change
A2-01	Motor 2 rated power	0.1kW ~ 1000.0kW	Model Determination	★
A2-02	Rated voltage of motor 2	1V ~ 2000V	Model Determination	★
A2-03	Rated current of motor 2	0.1A ~ 6553.5A	Model Determination	★
A2-04	Rated frequency of motor 2	0.01Hz ~ maximum frequency (P0-10)	Model Determination	★
A2-05	Motor 2 rated speed	1rpm ~ 65535rpm	Model Determination	★
A2-06	Stator resistance of asynchronous motor 2	0.0001Ω ~ 65.5350Ω	Model Determination	★
A2-07	Rotor resistance of asynchronous motor 2	0.0001Ω ~ 65.5350Ω	Model Determination	★
A2-08	Inductive leakage reactance of asynchronous motor 2	0.001mH ~ 655.350mH	Model Determination	★
A2-09	Asynchronous motor 2 mutual inductance	0.01mH ~ 6553.50mH	Model Determination	★
A2-10	No-load current of asynchronous motor 2	0.1A ~ A2-03	Model Determination	★
A2-16	Stator resistance of synchronous motor 2	0.001 Ω ~ 65.535 Ω (Drive power ≤ 55kW) 0.0001 Ω ~ 6.5535 Ω (Drive power> 55kW)	self-learning parameters	★
A2-17	Synchronous motor 2D axis inductance	0.01mH ~ 655.35mH (Drive power ≤ 55kW) 0.001mH ~ 65.535mH (Drive power> 55kW)	self-learning parameters	★
A2-18	Synchronous motor 2Q axis inductance	0.01mH ~ 655.35mH (Drive power ≤ 55kW) 0.001mH ~ 65.535mH (Drive power> 55kW)	self-learning parameters	★
A2-20	Back electromotive force coefficient of synchronous motor	0.1V ~ 6553.5V	self-learning parameters	★
A2-27	Number of encoder lines	1 to 65535	1024	★
A2-28	Encoder Type	0: ABZ incremental encoder 1: UVW encoder 2: Resolver 4: UVW Encoder (Wire-saving Type) 5: Single-turn absolute encoder (17-bit) 6: Single-turn absolute encoder (17 bit) (Auto read motor parameters, for our company's motors)	0	★

Function code	Name	Setting range	Factory Value	Change
		7: Single turn absolute encoder (23 bit) 8: Single turn absolute encoder (23 bit) (Auto read motor parameters, for our company's motors)		
A2-29	Speed Feedback PG Select	0: Local PG 1: Extended PG (Reserved) 2: High-speed pulse input (S5)	0	★
A2-30	ABZ incremental encoder AB phase sequence	0: Forward 1: Reverse	0	★
A2-31	Encoder mounting angle	0.0 to 359.9 °	0.0 °	★
A2-32	UVW encoder UVW phase sequence	0: Forward 1: Reverse	0	★
A2-34	resolver pole number	1 to 65535	1	★
A2-36	Speed feedback PG disconnection detection time	0.0: no action 0.1s ~ 10.0s	0.0	★
A2-37	Self-learning selection	0: No action 1: Asynchronous machine static part parameter self-learning 2: Asynchronous machine dynamic complete self-learning 3: Asynchronous machine static complete self-learning 11: Synchronous on-board self-learning 12: synchronous machine no-load self-learning	0	★
A2-38	Speed Loop Proportional Gain 1	1 to 100	30	☆
A2-39	Velocity loop integration time 1	0.01s ~ 10.00s	0.50s	☆
A2-40	Toggle Low Point Frequency 1	0.00-A2-43	5.00Hz	☆
A2-41	Speed Loop Proportional Gain 2	1 to 100	10	☆
A2-42	Velocity Loop Integration Time 2	0.01s ~ 10.00s	1.00s	☆
A2-43	Toggle High Point Frequency 2	A2-40 ~ Maximum Frequency (P0-10)	10.00Hz	☆
A2-44	vector control slip gain	50% to 200%	100 percent	☆
A2-45	SVC torque filter constant	0.000s ~ 0.100s	0.015s	☆
A2-47	Upper Torque Limit Source in Speed Control Mode	0:A2-48 setting 1:AI1 2:AI2 3:AI3 (function expansion card) 4: High-speed pulse input (S5) 5: communication given (terminal RS485) 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) 8: extended communication given (bus expansion card) Full scale of 1-8 options, corresponding to A2-48 digital setting	0	☆

Function code	Name	Setting range	Factory Value	Change
A2-48	Digital setting of torque upper limit in speed control mode	0.0-200.0%	150.0 percent	☆
A2-49	Torque upper limit command in speed control mode Select (Generation)	0: Function code A2-50 setting 1:AI1 2:AI2 3:AI3 (function expansion card) 4: High-speed pulse input setting (S5) 5: communication given (terminal RS485) 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) 8: extended communication given (bus expansion card) Full scale of 1-8 options, corresponding to P2-12 digital setting	0	☆
A2-50	Upper Torque Limit Figures in Speed Control Mode Setting (Generation)	0.0-200.0%	150.0 percent	☆
A2-51	Proportional gain of excitation regulation	0 to 60000	2000	☆
A2-52	integral gain of excitation regulation	0 to 60000	1300	☆
A2-53	torque adjustment proportional gain	0 to 60000	2000	☆
A2-54	torque regulation integral gain	0 to 60000	1300	☆
A2-55	Velocity Loop Integral attribute	Bits: Integral Separation 0: invalid 1: Effective	0	☆
A2-56	Synchronous machine flux weakening mode	0: not weak magnetic 1: Automatic adjustment mode 2: calculation + automatic adjustment comprehensive mode	1	☆
A2-57	field weakening gain of synchronous machine	0 to 50	5	☆
A2-58	Synchronous machine maximum flux weakening current	0 to 300%	50%	☆
A2-59	Maximum torque coefficient in flux weakening region	50% to 200%	100 percent	☆
A2-60	Generation Power Limit enable	0: invalid 1: Effective	0	☆
A2-61	2nd Motor Speed Control Mode	0: Speed sensorless vector control (SVC) 1: Vector control with speed sensor (FVC) 2:V/F control	2	★
A2-62	Second motor acceleration and deceleration time selection	0: Same as motor 1 2: acceleration and deceleration time 2 3: acceleration and deceleration time 3 4: acceleration and deceleration time 4	0	☆
A2-63	2nd motor torque boost	0.0%: automatic torque boost 0.1-30.0%	Model Determination	☆
A2-65	2nd motor oscillation suppression gain	0 to 100	40	☆

Function code	Name	Setting range	Factory Value	Change
A2-66	Synchronous machine output voltage upper limit margin	0% to 50%	5%	☆
A2-67	Synchronous machine initial position angle detection current	50% to 180%	80%	☆
A2-68	Synchronous machine initial position angle detection	0: Detecting Every Run 1: Do not detect 2: Power-on first operation test	0	☆
A2-70	Synchronous machine saliency adjustment gain	50 to 500	100	☆
A2-71	Maximum torque to current ratio control	0: Open 1: Not open.	0	☆
A2-75	Z signal correction	0: Not open 1: Open	1	☆
A2-79	low-speed excitation current	0-80%	30%	☆
A2-80	low speed carrier frequency	0.8K ~ P0-15	1.5KHz	☆
A2-81	SVC low-frequency braking mode	0: No low frequency braking 1: the use of low frequency braking	0	☆
A2-82	SVC Low Frequency Braking Effective Mode	0 to 10.00Hz	2.00Hz	☆
A2-83	SVC low frequency braking frequency change step	0.0005~1.0000Hz	0.0010Hz	☆
A2-84	SVC low-frequency braking current	0-80%	50%	☆
A2-85	Synchronous machine SVC speed tracking	0: Not enabled 1: enable	0	☆
A2-86	Zero servo enable	0: Not enabled 1: enable	0	☆
A2-87	Switching frequency	0.00-F2-02	0.00Hz	☆
A2-88	Zero servo velocity loop proportional gain	1 to 100	10	☆
A2-89	Zero servo velocity loop integration time	0.01s ~ 10.00s	0.50s	☆
A2-90	Stop anti-reverse enable	0: Not enabled 1: enable	0	☆
A2-91	Shutdown angle	0.0 °~ 10.0 °	0.8 °	☆
A4 group bus expansion card configuration parameters				
A4-00	BACnet MSTP Native Device Address	1-247	1	☆
A4-01	BACnet MSTP Communication Mode Selection	1: Select the A4-02 (set the baud rate of BACnet MSTP) is valid	1	☆
A4-02	Baud rate of BACnet MSTP	0:9600BPS 1:19200BPS 2:38400BPS 3:57600BPS 4:76800BPS 5:115200BPS	2	☆
A4-03	BACnet MSTP Communication Timeout	0.0: Invalid 0.1s ~ 60.0s	0.0	☆
A4-05	CAN Communication Slave Address	1～247	1	☆
A4-06	CAN Communication Baud Rate	0：20K 4：250K 1：50K 5：500K 2：100K 6：1M	5	☆

Function code	Name	Setting range	Factory Value	Change
		3：125K		
A4-07	CAN Communication Time-out Time	0.0：Disable 0.1s～60.0s	0.0s	☆
A4-20	Bus expansion card Ethernet IP address 1	0~255 (modification takes effect after restart)	192	☆
A4-21	Bus expansion card Ethernet IP address 2	0~255 (modification takes effect after restart)	168	☆
A4-22	Bus expansion card Ethernet IP address 3	0~255 (modification takes effect after restart)	0	☆
A4-23	Bus expansion card Ethernet IP address 4	0~255 (modification takes effect after restart)	20	☆
A4-24	Bus Expansion Card Ethernet Subnet Mask 1	0~255 (modification takes effect after restart)	255	☆
A4-25	Bus Expansion Card Ethernet Subnet Mask 2	0~255 (modification takes effect after restart)	255	☆
A4-26	Bus Expansion Card Ethernet Subnet Mask 3	0~255 (modification takes effect after restart)	255	☆
A4-27	Bus Expansion Card Ethernet Subnet Mask 4	0~255 (modification takes effect after restart)	0	☆
A4-28	Bus Expansion Card Ethernet Gateway 1	0~255 (modification takes effect after restart)	192	☆
A4-29	Bus Expansion Card Ethernet Gateway 2	0~255 (modification takes effect after restart)	168	☆
A4-30	Bus Expansion Card Ethernet Gateway 3	0~255 (modification takes effect after restart)	0	☆
A4-31	Bus Expansion Card Ethernet Gateway 4	0~255 (modification takes effect after restart)	1	☆
A4-32	Bus Expansion Card Ethernet MAC Address High Byte	0~0xFFFF (changes take effect after restart)	0	☆
A4-33	Bus Expansion Card Ethernet MAC Address Middle Byte	0~0xFFFF (changes take effect after restart)	0	☆
A4-34	Bus Expansion Card Ethernet MAC Address Low Byte	0~0xFFFF (changes take effect after restart)	0	☆
A4-35	Bus expansion card Ethernet communication timeout	0.0: Invalid 0.1s ~ 60.0s	0.0s	☆
A5 group control optimization parameters				
A5-00	DPWM switching upper limit frequency	5.00Hz ~ Maximum Frequency (P0-10)	8.00Hz	☆
A5-01	PWM modulation mode	0: Asynchronous 1: synchronous modulation	0	☆
A5-02	Deadband Compensation Mode Selection	0: No compensation 1: Compensation Mode 1	1	☆
A5-03	Random PWM Depth	0: Random PWM is invalid 1~10:PWM carrier frequency random depth	0	☆
A5-04	Fast Current Limit enable	0: Not enabled 1: enable	1	☆
A5-05	Maximum output voltage coefficient	100-120%	110 percent	★
A5-06	Undervoltage point setting	200.0~200.0V	Model Determination	☆

Function code	Name	Setting range	Factory Value	Change
A5-08	Dead Time Adjustment	100-200%	150 percent	★
A5-09	Overpressure point setting	650-820V	Model Determination	★
A6 group AI curve setting				
A6-00	AI curve 4 minimum input	-10.00V ~ A6-02	0.00V	☆
A6-01	AI curve 4 minimum input corresponding setting	-100.0% to +100.0%	0.0 percent	☆
A6-02	AI curve 4 inflection point 1 input	A6-00 ~ A6-04	3.00V	☆
A6-03	AI curve 4 inflection point 1 input corresponding setting	-100.0% to +100.0%	30.0 percent	☆
A6-04	AI curve 4 inflection point 2 input	A6-02 ~ A6-06	6.00V	☆
A6-05	AI curve 4 inflection point 2 input corresponding setting	-100.0% to +100.0%	60.0 percent	☆
A6-06	AI curve 4 maximum input	A6-04 ~ +10.00V	10.00V	☆
A6-07	AI curve 4 maximum input corresponding setting	-100.0% to +100.0%	100.0 percent	☆
A6-08	AI curve 5 minimum input	-10.00V ~ A6-10	-10.00V	☆
A6-09	AI Curve 5 Minimum Input Corresponding Setting	-100.0% to +100.0%	-100.0 percent	☆
A6-10	AI curve 5 inflection point 1 input	A6-08 ~ A6-12	-3.00V	☆
A6-11	AI curve 5 inflection point 1 input corresponding setting	-100.0% to +100.0%	-30.0 percent	☆
A6-12	AI curve 5 inflection point 2 input	A6-10 ~ A6-14	3.00V	☆
A6-13	AI curve 5 inflection point 2 input corresponding setting	-100.0% to +100.0%	30.0 percent	☆
A6-14	AI curve 5 maximum input	A6-12 ~ +10.00V	10.00V	☆
A6-15	AI Curve 5 Maximum Input Corresponding Setting	-100.0% to +100.0%	100.0 percent	☆
A6-24	AI1 Set Jump Point	-100.0% to +100.0%	0.0 percent	☆
A6-25	AI1 Set Jump Amplitude	0.0-100.0%	0.5 percent	☆
A6-26	AI2 Set jump point	-100.0% to +100.0%	0.0 percent	☆
A6-27	AI2 Set Jump Amplitude	0.0-100.0%	0.5 percent	☆
A6-28	AI3 Set Jump Point (Function Expansion Card)	-100.0% to +100.0%	0.0 percent	☆
A6-29	AI3 Set Jump Amplitude (Function expansion card)	0.0-100.0%	0.5 percent	☆
A8 group point-to-point communication				
A8-00	Point-to-point communication function selection	0: invalid 1: Effective	0	☆
A8-01	Master-slave selection	0: host 1: from the machine	0	☆
A8-02	The slave command follows the master-slave information	Bits: slave commands follow 0: The slave does not follow the host to	011	★

Function code	Name	Setting range	Factory Value	Change
	interaction	run the command. 1: The slave follows the host to run the command. Ten bits: slave fault information transmission 0: slave fault information is not transmitted 1: slave fault information transmission 100: the host shows that the slave is disconnected. 0: slave dropped host does not report fault 1: slave dropped host reported fault		
A8-03	Slight Receive Data Role Selection	0: given torque 1: frequency given	0	☆
A8-04	Receive data zero bias	-100.00% to 100.00%	0.00 percent	★
A8-05	Receive data gain	-10.00~10.00	1.00	★
A8-06	Point-to-point communication interruption detection time	0.0~10.0s	1.0s	☆
A8-07	Point-to-point communication host data transmission cycle	0.001~10.000s	0.001s	☆
A8-11	Main Frequency Control Inspection Frequency	0.2.~ 10.00Hz	0.5Hz	☆
A9 Group Parameter Group Dedicated for Fans & Pumps				
A9-00	Multi-pump mode operation selection	0: Multi-pump control is invalid 1: Plus and minus pump control in frequency mode 2: Plus and minus pump control in pressure mode	0	☆
A9-01	Sleep Mode Selection	0: Control sleep and wake-up according to terminal function 1: According to the frequency of sleep and wake-up 2: Control sleep and wake up according to pressure	0	☆
A9-02	Sleep Start Frequency	0.00 ~ maximum frequency	30.00Hz	☆
A9-03	Sleep Start Deviation	0.0-30.0%	10.0 percent	☆
A9-04	Sleep entry delay time	0.0~3600.0S	10.S	☆
A9-05	PID boost value	0.0-100.0%	0	☆
A9-06	PID maximum lifting time	0.0~60000.0S	0	☆
A9-07	Wake-up frequency	0.00 ~ maximum frequency	35.00Hz	☆
A9-08	Sleep wake deviation	0.0-30.0%	10.0 percent	☆
A9-09	Wake-up delay time	0.0~3600.0S	2.0S	☆
A9-10	Variable frequency motor operation selection	0: Fixed variable frequency motor 1: Cycle variable frequency motor	0	☆
A9-11	Number of auxiliary pumps	0 to 8	0	☆
A9-19	Pressure deviation of pump	0 to 30.0%	10.0 percent	☆

Function code	Name	Setting range	Factory Value	Change
A9-20	Pump operation judgment frequency	0 ~ maximum frequency	48.00Hz	☆
A9-21	Pump addition judgment delay time	0~500.0S	20.0s	☆
A9-22	Pump variable frequency operation frequency	0 ~ maximum frequency	25.00Hz	☆
A9-23	Operation time of pump switching frequency	0.0s ~ 500.0S	5.0s	☆
A9-24	Reduce pump pressure deviation	0 to 30.0%	10.0 percent	☆
A9-25	Reduce pump judgment frequency	0 ~ maximum frequency	30.00Hz	☆
A9-26	Pump reduction judgment time	0~500.0S	10.0S	☆
A9-27	Variable frequency action selection for pump reduction	0: Normal operation 1: Run at reduced pump set frequency and time	0	☆
A9-28	Reduce pump operating frequency	0 ~ max	40.00Hz	☆
A9-29	Reduce pump frequency running time	0~500.0S	5.0S	☆
A9-34	motor wheel seek cycle	0.0~60000.0s	0	☆
A9-35	Round-Wheel Run Frequency Threshold	0.00-P0-10	45.00Hz	☆
A9-36	Closing delay time of contactor	0.0~100.0s	0. 5S	☆
A9-37	Delay time of contactor disconnection-connection of power frequency motor	0.0~100.0s	0. 5S	☆
A9-38	Manual soft start switching frequency	0.00-P0-10	50.00Hz	☆
A9-39	Enter pool signal input selection	0: No input signal 1:S terminal given 2:AI1 given 3:AI2 given 4:AI3 given 6: communication given (terminal RS485)	0	☆
A9-40	Upper limit of water inlet pool	0.0-100.0%	60%	☆
A9-41	Lower limit of water inlet	0.0-A9-40	40%	☆
A9-42	Water shortage value of intake pool	0.0-A9-41	20%	☆
A9-43	Non-normal standby pressure	0.0-100.0%	0%	☆
A9-44	PID feedback low protection value	0.0-100.0%	0%	☆
A9-45	PID feedback low detection time	0.0~36000.0s	500.0s	☆
A9-46	PID feedback over protection value	0.0-100.0%	0%	☆
A9-47	PID feedback high detection time	0.0~36000.0s	500.0s	☆
AA group timing control and multi-stage water pressure function group				
AA-00	Update Display Year	2026~2099	2026	☆

Function code	Name	Setting range	Factory Value	Change
AA-01	Update Display Month Day	01.01~12.31 MM.DD	7.01	☆
AA-02	Update display time	00.00~23.59 HH.MM	8.00	☆
AA-03	Update Display Seconds	0~59 S	0s	☆
AA-04	Week display (automatically calculated)	1 to 7	-	●
AA-05	Whether clock control is allowed	0: not allowed 1: Permitted	0	☆
AA-06	Operating days	Bit0 ~ bit6 represent Monday to Sunday respectively Monday: 0x01 Tuesday: 0x02 Wednesday: 0x04 Monday to Wednesday: 0x07 Tuesday Wednesday Saturday: 0x16	0x3f	☆
AA-07	Run Time Setpoint	00.00~23.99	8.00	☆
AA-08	Operating Seconds Setpoint	0 to 59s	0s	☆
AA-09	Shutdown time set value	00.00~23.99	18.00	☆
AA-10	Shutdown seconds setpoint	0 to 59s	0s	☆
AA-11	Clock failure allows operation	0: not allowed 1: Allow to continue running	0	☆
AA-15	Time display	00.00~23.59 HH.MM	-	●
AA-16	Pressure segment setting selection	Paragraph 1-8	8	☆
AA-17	First period of time set	00.00~23.59 HH.MM	0.00	☆
AA-18	First pressure setting	0 to 100.0%	50.0 percent	☆
AA-19	SECOND SECOND TIME SETTING	00.00~23.59 HH.MM	0.00	☆
AA-20	SECOND SECOND SECOND PRESSURE SETTING	0 to 100.0%	50.0 percent	☆
AA-21	Third time setting	00.00~23.59 HH.MM	0.00	☆
AA-22	Third pressure setting	0 to 100.0%	50.0 percent	☆
AA-23	Fourth time setting	00.00~23.59 HH.MM	0.00	☆
AA-24	Fourth pressure setting	0 to 100.0%	50.0 percent	☆
AA-25	Fifth period of time set	00.00~23.59 HH.MM	0.00	☆
AA-26	Fifth pressure setting	0 to 100.0%	50.0 percent	☆
AA-27	Sixth period of time setting	00.00~23.59 HH.MM	0.00	☆
AA-28	SECURE 6 PRESSURE SETTING	0 to 100.0%	50.0 percent	☆
AA-29	Seventh period of time setting	00.00~23.59 HH.MM	0.00	☆
AA-30	SECURE 7 PRESSURE SETTING	0 to 100.0%	50.0 percent	☆
AA-31	Eighth period of time setting	00.00~23.59 HH.MM	0.00	☆

Function code	Name	Setting range	Factory Value	Change
AA-32	SECURE 8 PRESSURE SETTING	0 to 100.0%	50.0 percent	☆
Group AB Protection Function Group				
AB-00	Water pipe rupture detection	0: Do not detect 1: Detection enable	0	☆
AB-01	Water pipe rupture detection pressure	0.0-100.0%	10.0 percent	☆
AB-02	Water pipe rupture detection time	0~60000S	120.0S	☆
AB-03	Selection of soft filling function of water pipe	0: Not enabled 1: enable	0	☆
AB-04	Water pipe soft filling given frequency	0.00Hz ~ maximum frequency	30.00Hz	☆
AB-05	Duration of soft filling of water pipe	0.0S ~ 6000.0S	20.0s	☆
AB-06	Water pipe soft filling cut-off pressure	0.0-80.0%	20.0 percent	☆
AB-09	Sampling AI Port Selection	0:AI1 1:AI2 2:AI3	0	☆
AB-10	Frost protection enable	0: Not enabled 1: enable frost protection	0	☆
AB-11	Temperature Sensor Selection	0: None 1:PT100 2:PT1000 3:KTY84	0	☆
AB-12	frost protection value	-50~10 ℃	0	☆
AB-13	Low temperature protection value	-50~10 ℃	-10 ℃	☆
AB-14	Frost protection operating frequency	0 to 40.00Hz	10.00Hz	☆
AB-16	Condensation protection current	0 to 100%	30%	☆
AB-17	Condensing DC operating time	0~100.0S	40.0S	☆
AB-18	Condensation downtime	0~100.0S	10.0S	☆
AB-19	Deblocking keyboard control	0: Not enabled 1: enable	0	☆
AB-20	Plugging positive rotation operation frequency	0.00Hz ~ maximum frequency	35.00Hz	☆
AB-21	Plugging reversal operation frequency	0.00Hz ~ maximum frequency	35.0Hz	☆
AB-22	Acceleration time	0.0~3600.0S	10.0S	☆
AB-23	Plugging reversal acceleration time	0.0~3600.0S	10.0S	☆
AB-24	Block clearing and forward rotation time	0.0~3600.0S	15.0s	☆
AB-25	Plugging reversal time	0.0~3600.0S	15.0s	☆
AB-26	Plugging positive and negative stop time interval	0.0~3600.0S	3.0S	☆
AB-27	Number of Plugging Cycles	1000	1	☆
AB-28	Stall function selection	0: Do not detect 1: locked-rotor warning	0	☆

Function code	Name	Setting range	Factory Value	Change
		2: Stall-rotor protection		
AB-29	Stall detection current	0.0-300.0%	200.0 percent	☆
AB-30	Stall detection frequency upper limit	0.00 ~ maximum frequency	15.00Hz	☆
AB-31	Stall detection time	0~36000S	2.0S	☆
AB-32	Dry pumping function selection	0: Do not detect 1: Dry pumping warning 2: Dry pumping protection	0	☆
AB-33	Dry pumping operation detection current	0.0-50.0%	50.0 percent	☆
AB-34	Dry pumping protection delay time	0.0~3600.0S	200.0S	☆
AB-35	Dry pumping reset delay	10~60000s	600S	☆
AC group AIAO correction				
AC-00	AI1 Measured voltage 1	-10.00V ~ 10.000V	Factory Calibration	☆
AC-01	AI1 shows voltage 1	-10.00V ~ 10.000V	Factory Calibration	☆
AC-02	AI1 Measured Voltage 2	-10.00V ~ 10.000V	Factory Calibration	☆
AC-03	AI1 shows voltage 2	-10.00V ~ 10.000V	Factory Calibration	☆
AC-04	AI2 Measured voltage 1	-10.00V ~ 10.000V	Factory Calibration	☆
AC-05	AI2 Display Voltage 1	-10.00V ~ 10.000V	Factory Calibration	☆
AC-06	AI2 Measured voltage 2	-10.00V ~ 10.000V	Factory Calibration	☆
AC-07	AI2 Display Voltage 2	-10.00V ~ 10.000V	Factory Calibration	☆
AC-08	AI3 Measured Voltage 1 (Function Expansion Card)	-10.00V ~ 10.000V	Factory Calibration	☆
AC-09	AI3 Display Voltage 1 (Function Expansion Card)	-10.00V ~ 10.000V	Factory Calibration	☆
AC-10	AI3 Measured Voltage 2 (Function Expansion Card)	-10.00V ~ 10.000V	Factory Calibration	☆
AC-11	AI3 Display Voltage 2 (Function Expansion Card)	-10.00V ~ 10.000V	Factory Calibration	☆
AC-12	AO1 Target Voltage 1	-10.00V ~ 10.000V	Factory Calibration	☆
AC-13	AO1 Measured voltage 1	-10.00V ~ 10.000V	Factory Calibration	☆
AC-14	AO1 Target Voltage 2	-10.00V ~ 10.000V	Factory Calibration	☆
AC-15	AO1 measured voltage 2	-10.00V ~ 10.000V	Factory Calibration	☆
AC-16	AO2 Target Voltage 1 (Function Expansion Card)	-10.00V ~ 10.000V	Factory Calibration	☆
AC-17	AO2 measured voltage 1 (function expansion card)	-10.00V ~ 10.000V	Factory Calibration	☆
AC-18	AO2 Target Voltage 2	-10.00V ~ 10.000V	Factory Calibration	☆

Function code	Name	Setting range	Factory Value	Change
	(Function Expansion Card)			
AC-19	AO2 measured voltage 2 (function expansion card)	-10.00V ~ 10.000V	Factory Calibration	☆
Fire crossing function group of AD group				
AD-00	Fire mode function	0: Not enabled 1: Crossing fire mode 1 2: Fire crossing mode 2	0	☆
AD-01	Fire mode operating frequency	0.00-P0-10	50.00Hz	☆
AD-02	Operating direction in fire mode	0: forward 1: Reverse	0	☆
AD-03	Fire mode operation sign	0: Fire mode not triggered 1: Trigger fire mode	-	●
AD-04	Year of Fire Mode Triggered	0 to 2099	-	●
AD-05	Day of the month on which fire mode is triggered	0.00~12.31 MM.DD	-	●
AD-06	Time division when fire mode is triggered	00.00~23.59 HH.MM	-	●
AD-07	Seconds the fire mode is triggered	0~59 S	-	●
AD-08	Week of fire mode triggered	0 to 7	-	●

5.2 Monitoring Parameters

Function code	Name	Minimum Unit	Correspondence Address
D0 group of basic monitoring parameters			
d0-00	Operating frequency (Hz)	0.01Hz	7000H
d0-01	Set frequency (Hz)	0.01Hz	7001H
d0-02	Bus voltage (V)	0.1V	7002H
d0-03	Output voltage (V)	1V	7003H
d0-04	Output current (A)	0.01A	7004H
d0-05	Output power (kW)	0.1kW	7005H
d0-06	Output torque (%)	0.1 percent	7006H
d0-07	S terminal input status	1	7007H
d0-08	HDO Output Status	1	7008H
d0-09	AI1 voltage (V)	0.01V	7009H
d0-10	AI2 Voltage (V)/Current (mA)	0.01V/0.01mA	700AH
d0-11	AI3 Voltage (V)(Function Expansion Card)	0.01V	700BH
d0-12	Count value	1	700CH
d0-13	Length value	1	700DH
d0-14	Load speed display	1	700EH

Function code	Name	Minimum Unit	Correspondence Address
d0-15	PID setting	1	700FH
d0-16	PID feedback	1	7010H
d0-17	PLC Phase	1	7011H
d0-18	Input pulse frequency (Hz)	0.01kHz	7012H
d0-19	Feedback speed (Hz)	0.01Hz	7013H
d0-20	Remaining Running Time	0.1Min	7014H
d0-21	Voltage before AI1 correction	0.001V	7015H
d0-22	Voltage (V)/Current (mA) before AI2 correction	0.001V/0.01mA	7016H
d0-23	AI3 Pre-Calibration Voltage (Function Expansion Card)	0.001V	7017H
d0-24	Line speed	1m/Min	7018H
d0-25	Current power-on time	1Min	7019H
d0-26	Current Running Time	0.1Min	701AH
d0-27	High-speed pulse input frequency	1Hz	701BH
d0-28	Communication setting value	0.01 percent	701CH
d0-29	Encoder feedback speed	0.01Hz	701DH
d0-30	Main frequency A display	0.01Hz	701EH
d0-31	Secondary frequency B display	0.01Hz	701FH
d0-32	View arbitrary memory address values	1	7020H
d0-34	Motor temperature value	1 ℃	7022H
d0-35	Target torque (%)	0.1 percent	7023h
d0-36	Rotary position	1	7024H
d0-37	Power Factor Angle	0.1 °	7025H
d0-38	ABZ position	1	7026H
d0-39	V/F separation target voltage	1V	7027H
d0-40	V/F Split Output Voltage	1V	7028H
d0-41	Visual display of S input status	1	7029H
d0-42	Visual display of HDO input status	1	702AH
d0-43	Visual display of S function status 1 (function 01-40)	1	702BH
d0-44	S Function Status Visual Display 2 (Functions 41-80)	1	702CH
d0-45	Fault message	1	702DH
d0-58	Z signal counter	1	703AH
d0-59	Set frequency (%)	0.01 percent	703BH
d0-60	Operating frequency (%)	0.01 percent	703CH

Function code	Name	Minimum Unit	Correspondence Address
d0-61	Converter status	1	703DH
d0-62	Current fault coding	1	703EH
d0-63	Point-to-point communication sending value	0.01 percent	703FH
d0-64	Point-to-Point Communication Received Value	1	7040H
d0-65	Torque upper limit	0.1 percent	7041H
d0-66	Bus Expansion Card Type	1	7042H
d0-67	Bus expansion card software version	0.01	7043H
d0-68	Converter composite status (for bus expansion card)	1	7044H
d0-69	Frequency converter operating frequency (for bus expansion card)	0.01Hz	7045H
d0-70	Frequency converter operating speed (for bus expansion card)	1RPM	7046H
d0-71	Inverter output current (for bus expansion card)	0.1A	7047H
d0-73	Motor serial number	0: Motor 1 1: Motor 2	7049H
d0-74	Actual output torque of motor	-100~100%	704AH
Group D3 communication monitoring parameters			
d3-16	Communication given frequency value	0.01 percent	7310H
d3-17	Communication given run command value	1	7311H
d3-18	Communication control DO output value	1	7312H
d3-19	Communication control AO1 output value	1	7313H
d3-20	Communication control AO2 output (function expansion card)	1	7314H
d3-21	Communication control high-speed pulse output value	1	7315H
d3-22	COMMUNICATION CONTROL COMPOSITE COMMAND VALUE	1	7316H
d3-23	Communication given speed value	1	7317H

Chapter 6 Fan Pump Special Function Description

6.1 Timing function

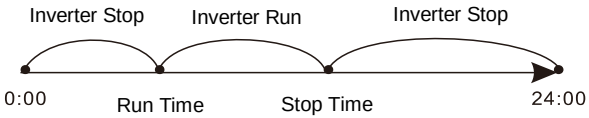
6.1.1 Timing Start and Stop

When the system uses timing start-stop or timing set pressure, the time of the underlying motherboard needs to be updated through the upper computer or LCD operation panel. The parameter table shown in the figure below is the frequency converter parameters required to control the start and stop of the frequency converter regularly.

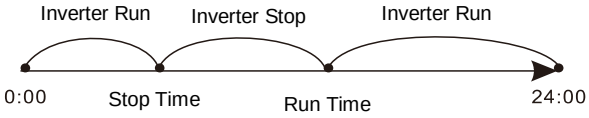
Function code	Name	Detailed Description of Parameters	Default Value	Change
P0-02	Run command channel	0: operation panel command channel 1: Terminal Command Channel 2: communication command channel 3: external communication expansion card 4: Timing start control	0	☆
AA-00	Update Display Year	2026~2099	2026	☆
AA-01	Update Display Month Day	01.01~12.31 MM.DD	7.01	☆
AA-02	Update display time	00.00~23.59 HH.MM	8.00	☆
AA-03	Update Display Seconds	0~59 S	0s	☆
AA-04	Week Display	1 to 7	-	●
AA-05	Whether clock control is allowed	0: not allowed 1: Permitted	0	☆
AA-06	Operating days	Bit0 ~ bit6 represent Monday to Sunday respectively Monday: 0x01 Tuesday: 0x02 Wednesday: 0x04 Monday to Wednesday: 0x07 Tuesday Wednesday Saturday: 0x16	0x3f	☆
AA-07	Run Time Setpoint	00.00~23.99	8.00	☆
AA-08	Operating Seconds Setpoint	0 to 59s	0s	☆
AA-09	Shutdown time set value	00.00~23.99	18.00	☆
AA-10	Shutdown seconds setpoint	0 to 59s	0s	☆
AA-11	Clock failure allows operation	0: not allowed 1: Allow to continue running	0	☆

When using timing to control the start and stop of the frequency converter, the AA-05 should be set to 1 to allow clock control. The running command channel parameter P0-02 should be set to 4. AA-00 to AA-03 are calibrated and updated values for the motherboard clock. When the inverter is powered on, if the operation panel used is not the LCD panel, the time parameter value needs to be changed manually or through the upper computer. Otherwise, the default is time not calibrated, time fault. When the AA-11 is set to 0, the time fault does not allow the converter to start.

When the running time of the value setting is less than the stop time, the state control chart of the inverter is as follows:



When the running time of the value setting is greater than the stop time, the state control chart of the inverter is as follows:



6.1.2 Regularly Set Variable Frequency Pressure Function

Function code	Name	Detailed Description of Parameters	Default Value	Change
P0-03	Frequency Source Selection	0: digital setting (preset frequency P0-08,UP/DOWN can be modified, power down without memory) 1: digital setting (preset frequency P0-08,UP/DOWN can be modified, power-down memory 2:AI1 3:AI2 4:AI3 (function expansion card) 5: High-speed pulse input setting (S5) 6: Multi-Segment Instruction 7: Simple PLC 8:PID 9: terminal communication given (terminal RS485) 10: extended communication given (bus expansion card)	0	☆
PA-00	PID given source selection	0:PA-01 setting 1:AI1 2:AI2 3:AI3 4: High-speed pulse input 5: Communication given 6: multiple segment number given 7: External expansion card communication 8: Timing given		
PA-02	PID Feedback Source Selection	0:AI1 1:AI2 3:AI3 3:AI1-AI2 4:HDI 5: Communication given 6:AI1 + AI2 7:Max(AI1,AI2) 8:Min(AI1,AI2)	0	☆
AA-15	Time display	00.00 ~ 23.59HH.MM	-	●
AA-16	Pressure segment setting selection	Paragraph 1-8	8	☆
AA-17	First period of time set	First period of time set	0.00	☆
AA-18	First pressure setting	0 to 100.0%	50.0 percent	☆
AA-19	SECOND SECOND TIME SETTING	First period of time set	0.00	☆
AA-20	SECOND SECOND SECOND PRESSURE	0 to 100.0%	50.0 percent	☆

Function code	Name	Detailed Description of Parameters	Default Value	Change
	SETTING			
AA-21	Third time setting	First period of time set	0.00	☆
AA-22	Third pressure setting	0 to 100.0%	50.0 percent	☆
AA-23	Fourth time setting	First period of time set	0.00	☆
AA-24	Fourth pressure setting	0 to 100.0%	50.0 percent	☆
AA-25	Fifth period of time set	First period of time set	0.00	☆
AA-26	Fifth pressure setting	0 to 100.0%	50.0 percent	☆
AA-27	Sixth period of time setting	First period of time set	0.00	☆
AA-28	SECURE 6 PRESSURE SETTING	0 to 100.0%	50.0 percent	☆
AA-29	Seventh period of time setting	First period of time set	0.00	☆
AA-30	SECURE 7 PRESSURE SETTING	0 to 100.0%	50.0 percent	☆
AA-31	Eighth period of time setting	First period of time set	0.00	☆
AA-32	SECURE 8 PRESSURE SETTING	0 to 100.0%	50.0 percent	☆

After the optional LCD keyboard, you can enable the clock function of the LCD keyboard; or through the upper computer calibration AA-00 to the AA-03 time parameters, you can use the timing to set the function of variable frequency pressure. When the time is calibrated by the upper computer, the communication address from the AA-00 to the AA-03 is 0xAA00 to 0xAA03.

6.2 Automatic Sleep Function

According to the parameter A9-01, the sleep mode of frequency conversion is selected.

Function code	Name	Detailed Description of Parameters	Default Value	Change
A9-01	Sleep Mode Selection	0: Control sleep and wake-up according to terminal function 1: According to the frequency of sleep and wake-up 2: Control sleep and wake up according to pressure	0	☆

6.2.1 Control the sleep and wake-up of the inverter according to the terminal

Function code	Name	Detailed Description of Parameters	Setpoint	Change
A9-01	Sleep Mode Selection	0: Control sleep and wake-up according to terminal function	0	☆
P4-00 ~ P4-07	S1 ~ S8 multi-function terminal	65: Sleep trigger signal 66: wake-up mode trigger	On-demand setting	☆

When the terminal is used as the sleep wake-up control, the A9-01 is set to 0, and the sleep and wake-up modes of the inverter are terminal control. After the inverter running signal is given, when the sleep trigger signal is detected, the inverter stops sleeping, and when the wake-up signal is detected, the

inverter starts again. When a simultaneous action is detected, the last control state is maintained.

6.2.2 Control the sleep and wake-up of the inverter according to the frequency

Function code	Name	Detailed Description of Parameters	Setpoint	Change
P0-03	Frequency Source Selection	0: digital setting (preset frequency P0-08,UP/DOWN can be modified, power down without memory) 1: digital setting (preset frequency P0-08,UP/DOWN can be modified, power-down memory 2:AI1 3:AI2 4:AI3 (function expansion card) 5: High-speed pulse input setting (S5) 6: Multi-Segment Instruction 7: Simple PLC 8:PID 9: terminal communication given (terminal RS485) 10: extended communication given (bus expansion card)	8	☆
PA-00	PID given source selection	0:PA-01 setting 1:AI1 2:AI2 3:AI3 4: High-speed pulse input 5: Communication given 6: multiple segment number given 7: External expansion card communication 8: Timing given	On-demand setting	☆
PA-01	PID value setting	0.0-100.0%	0	☆
PA-02	PID Feedback Source Selection	0:AI1 1:AI2 3:AI3 3:AI1-AI2 4:HDI 5: Communication given 6:AI1 + AI2 7:Max(AI1,AI2) 8:Min(AI1,AI2)	0	☆
A9-01	Sleep Mode Selection	1: according to the frequency control inverter sleep	1	☆
A9-02	Sleep Start Frequency	0.00 ~ maximum frequency	30.00Hz	☆
A9-04	Sleep entry delay time	0.0~3600.0S	10.S	☆
A9-07	Wake-up frequency	0.00 ~ maximum frequency	35.00Hz	☆
A9-09	Wake-up delay time	0.0~3600.0S	2.0S	☆

When the target frequency is used as the sleep wake-up control, the A9-01 is set to 1, and the sleep and wake-up modes of the inverter are frequency control. After the inverter operation signal is given, when it is detected that the target frequency is lower than the A9-02 frequency, the inverter will sleep and stop after the A9-06 set time. When it is detected that the target frequency is greater than the A9-07 set value, after a A9-09 set time, the inverter will run again.

Note: When using frequency as sleep and pump frequency control, the default PID is shutdown.

6.2.3 Control the sleep and wake-up of the inverter according to the pressure

Function code	Name	Detailed Description of Parameters	Setpoint	Change
P0-03	Frequency Source Selection	0: digital setting (preset frequency P0-08,UP/DOWN can be modified, power down without memory) 1: digital setting (preset frequency P0-08,UP/DOWN can be modified, power-down memory 2:AI1 3:AI2 4:AI3 (function expansion card) 5: High-speed pulse input setting (S5) 6: Multi-Segment Instruction 7: Simple PLC 8:PID 9: terminal communication given (terminal RS485) 10: extended communication given (bus expansion card)	8	☆
PA-00	PID given source selection	0:PA-01 setting 1:AI1 2:AI2 3:AI3 4: High-speed pulse input 5: Communication given 6: multiple segment number given 7: External expansion card communication 8: Timing given	0	☆
PA-02	PID Feedback Source Selection	0:AI1 1:AI2 3:AI3 3:AI1-AI2 4:HDI 5: Communication given 6:AI1 + AI2 7:Max(AI1,AI2) 8:Min(AI1,AI2)	0	☆
A9-01	Sleep Mode Selection	2: according to the pressure control inverter sleep	2	☆
A9-03	Sleep Start Deviation	0.0-30.0%	10.0 percent	☆
A9-04	Sleep entry delay time	0.0~3600.0S	10.S	☆
A9-08	Sleep wake deviation	0.0-30.0%	10.0 percent	☆
A9-09	Wake-up delay time	0.0~3600.0S	2.0S	☆

Sleep pressure = set pressure + sleep start deviation

Wake-up pressure = set pressure-sleep wake-up deviation

When the feedback pressure is used as the sleep wake-up control, the A9-01 is set to 2, and the sleep and wake-up modes of the inverter are pressure control. After the inverter operation signal is given, when it is detected that the feedback pressure is greater than the sleep pressure, the inverter will sleep and stop after the A9-04 set time. When it is detected that the feedback pressure is less than the wake-up pressure, the frequency converter will run again after the A9-09 set time.

6.3 Multi-Pump Control Function

EV270 fan water pump inverter can control multiple water pumps with one inverter. When you need to control multiple pumps, you need to add an expansion card.

The multi-pump control mode is selected according to the parameter A9-10 setting.

Function code	Name	Detailed Description of Parameters	Default Value	Change
A9-00	Multi-pump mode operation selection	0: Multi-pump control is invalid 1: Plus and minus pump control in frequency mode 2: Plus and minus pump control in pressure mode	0	☆
A9-10	Variable frequency motor operation selection	0: Fixed variable frequency motor 1: Cycle variable frequency motor	0	☆
A9-11	Number of auxiliary pumps	0 to 8	0	☆

6.3.1 Operation Control in Manual Mode

Function code	Name	Detailed Description of Parameters	Setpoint	Change
A9-00	Multi-pump mode operation selection	0: Multi-pump control is invalid 1: Plus and minus pump control in frequency mode 2: Plus and minus pump control in pressure mode	1/2	☆
P4-00 ~ P4-07	S1 ~ S8 multi-function terminal	67: Manual control mode 72: Motor 1 control is invalid 73: Motor 2 control is invalid 74: Motor 3 control is invalid 75: Motor 4 control is invalid	On-demand setting	☆
P5-01	HDY output function selection	terminal selection of multi function output terminal: 51: Circulating motor 1 52: Cycle motor 2 53: Cycle motor 3 54: Cycle motor 4	On-demand setting	☆
P5-02	Relay 1 Output Function Selection (TA-TB-TC)		On-demand setting	☆
P5-03	Relay 2 Output Function Selection (RA-RC)		On-demand setting	☆
P5-04	DO1/T1A-T1C output function selection (function expansion card)		On-demand setting	☆
P5-05	DO2/T2A-T2C output function selection (function expansion card)		On-demand setting	☆
P5-24	DO3/T3A-T3C output function selection (function expansion card)	External expansion multi-function terminal selection: 51: Circulating motor 1 52: Cycle motor 2 53: Cycle motor 3 54: Cycle motor 4	On-demand setting	☆
P5-25	DO4/T4A-T4C output function selection (function expansion card)		On-demand setting	☆
P5-26	DO5/T5A-T5C output function selection (function expansion card)		On-demand setting	☆

Function code	Name	Detailed Description of Parameters	Setpoint	Change
P5-27	DO6/T6A-T6C output function selection (function expansion card)		On-demand setting	☆
P5-28	DO7/T7A-T7C output function selection (function expansion card)		On-demand setting	☆

In the manual control mode, a multi-function terminal SI needs to be set to the 67 function. When the terminal function is triggered, the manual operation mode is triggered. In this mode, the control signal of the auxiliary circulating pump can be set by setting the remaining SI function of the frequency converter to the function of 51 to 54. When the signal is triggered, the auxiliary pump is disabled.

6.3.2 Fixed variable Frequency Motor Mode of Automatic Control Mode

The state when the manual mode operation is not triggered is the automatic operation mode, and the automatic mode is divided into the pressure control mode and the frequency control mode.

6.3.2.1 Frequency control mode

Function code	Name	Detailed Description of Parameters	Default Value	Change
P0-03	Frequency Source Selection	0: digital setting (preset frequency P0-08,UP/DOWN can be modified, power down without memory) 1: digital setting (preset frequency P0-08,UP/DOWN can be modified, power-down memory 2:AI1 3:AI2 4:AI3 (function expansion card) 5: High-speed pulse input setting (S5) 6: Multi-Segment Instruction 7: Simple PLC 8:PID 9: terminal communication given (terminal RS485) 10: extended communication given (bus expansion card)	8	☆
A9-00	Multi-pump mode operation selection	0: Multi-pump control is invalid 1: Plus and minus pump control in frequency mode 2: Plus and minus pump control in pressure mode	1	☆
A9-20	Pump operation judgment frequency	0 ~ maximum frequency	48.00Hz	☆
A9-21	Pump addition judgment delay time	0~500.0S	20.0s	☆
A9-22	Pump variable frequency operation frequency	0 ~ maximum frequency	25.00Hz	☆
A9-25	Reduce pump judgment frequency	0 ~ maximum frequency	30.00Hz	☆
A9-26	Pump reduction judgment time	0~500.0S	10.0S	☆
A9-27	Variable frequency action selection for pump reduction	0: Normal operation 1: Run at reduced pump set frequency and time	0	☆

Function code	Name	Detailed Description of Parameters	Default Value	Change
A9-28	Reduce pump operating frequency	0 ~ max	40.00Hz	☆

6.3.2.2 Pressure control mode

Function code	Name	Detailed Description of Parameters	Default Value	Change
P0-03	Frequency Source Selection	0: digital setting (preset frequency P0-08,UP/DOWN can be modified, power down without memory) 1: digital setting (preset frequency P0-08,UP/DOWN can be modified, power-down memory 2:AI1 3:AI2 4:AI3 (function expansion card) 5: High-speed pulse input setting (S5) 6: Multi-Segment Instruction 7: Simple PLC 8:PID 9: terminal communication given (terminal RS485) 10: extended communication given (bus expansion card)	8	☆
A9-00	Variable frequency motor operation selection	0: Multi-pump control is invalid 1: Plus and minus pump control in frequency mode 2: Plus and minus pump control in pressure mode	2	☆
A9-19	Pressure deviation of pump	0 to 30.0%	10.0 percent	☆
A9-21	Pump addition judgment delay time	0~500.0S	20.0s	☆
A9-22	Pump variable frequency operation frequency	0 ~ maximum frequency	25.00Hz	☆
A9-24	Reduce pump pressure deviation	0 to 30.0%	10.0 percent	☆
A9-26	Pump reduction judgment time	0~500.0S	10.0S	☆
A9-27	Variable frequency action selection for pump reduction	0: Normal operation 1: Run at reduced pump set frequency and time	0	☆
A9-28	Reduce pump operating frequency	0 ~ max	40.00Hz	☆
A9-29	Reduce pump frequency running time	0~500.0S	5.0S	☆

Pump pressure = set pressure-pump pressure deviation

Reductive pump pressure = set pressure + reduced pump pressure deviation

When the detected pressure is less than the pump pressure, start pump addition judgment; when the detected pressure is greater than the pump pressure, start pump reduction judgment.

6.4 Water Pipe Soft Filling Function

After the system is supplied with water for the first time or shut down for a long time, the pipeline is empty, and direct full-pressure startup will produce huge water hammer impact, resulting in severe vibration of the pipeline, leakage of joints and even bursting. At the same time, it is also possible to impact and damage the impeller or seal of the water pump. The pressure of the pipe network is overpressured instantly, causing damage to the water pipe or valve. After the soft filling function of the water pipe is enabled, the inverter will slowly and smoothly inject water into the water pipe after each power-on to prevent the water hammer effect. The soft filling function of the water pipe is realized as follows:

Function code	Name	Detailed Description of Parameters	Default Value	Change
AB-03	Selection of soft filling function of water pipe	0: Not enabled 1: enable	0	☆
AB-04	Water pipe soft filling given frequency	0.00Hz ~ maximum frequency	30.00Hz	☆
AB-05	Duration of soft filling of water pipe	0.0S ~ 6000.0S	20.0s	☆
AB-06	Water pipe soft filling cut-off pressure	0.0-80.0%	20.0 percent	☆

After the soft filling function of water pipe is enabled (AB-03=1), when the frequency converter receives the operation command. First fill the water pipe to run at the given frequency (AB-04). When it is detected that the running time is greater than the water pipe filling duration (AB-05), or the feedback pressure is greater than the water pipe soft filling cut-off pressure (AB-06), the frequency converter operates with the normal given frequency source.

6.5 Clearing Function

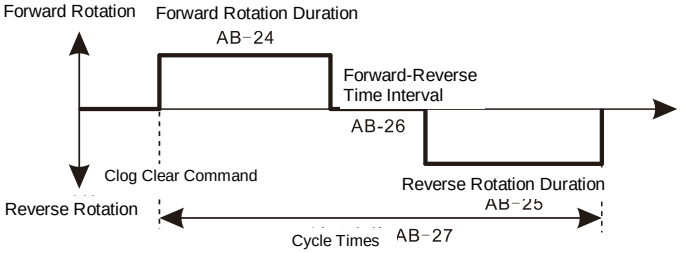
EV270 series frequency converter supports the function of blocking and cleaning of water pump/fan. It is used to dredge the impellers of sewage pump, impurity pump, easy blocking fan and other loads to prevent blocking and burning caused by fibers, sundries and sediment. The blocking removal function can only be triggered when the frequency converter is in the shutdown state. After the blocking removal is started, the frequency converter will automatically execute the cycle action of "forward rotation → intermittent shutdown → reverse rotation → intermittent shutdown" according to the set parameters, and will automatically stop after completing the preset number of dredging actions. In the process, the blocking can also be interrupted at any time by the shutdown instruction. If it is necessary to perform unblocking again, a shutdown command must be given to reset the state.

Trigger conditions for the unblocking function:

Trigger conditions for blockage removal function	Trigger Condition Description
Terminal Trigger	When the S multi-function terminal is set to 76, the plug removal function is triggered when the terminal is detected to be triggered.
keyboard trigger	In shutdown mode, when parameter AB-19 is set to 1, the blockage removal function is triggered
communication trigger	In shutdown mode, when 1 is written to address 0x4B13, the block removal function is triggered.

Note: It is not recommended to use the block removal function in the timing mode, although the function can also operate normally. However, the shutdown in the timed mode is automatically controlled by time triggering. Therefore, in the operation of the blockage, the middle can not control the shutdown.

Function code	Name	Detailed Description of Parameters	Default Value	Change
AB-19	Deblocking keyboard control	0: Not enabled 1: enable	0	☆
AB-20	Positive running frequency of blockage removal	0.00Hz ~ maximum frequency	35.00Hz	☆
AB-21	Plugging reversal operation frequency	0.00Hz ~ maximum frequency	35.0Hz	☆
AB-22	Acceleration time	0.0~3600.0S	10.0S	☆
AB-23	Plugging reversal acceleration time	0.0~3600.0S	10.0S	☆
AB-24	Clear the positive pass time	0.0~3600.0S	15.0s	☆
AB-25	Plugging reversal time	0.0~3600.0S	15.0s	☆
AB-26	Plugging positive and negative stop time interval	0.0~3600.0S	3.0S	☆
AB-27	Number of Plugging Cycles	1000	1	☆



Pump cleaning logic diagram

6.6 Fire Crossing Function

The function of fire crossing mode can make the inverter products run normally in the case of fire. Therefore, the fire crossing mode of the EV270 inverter allows the motor to be controlled in a preset manner when the fire crossing mode is triggered, so as to maintain the normal operation of the control motor during evacuation and fire extinguishing after the fire is sent.

When the S terminal function is set to 64, when the terminal is triggered by the fire signal, the inverter enters the fire ride-through mode. In the fire crossing mode, the operating frequency in the fire crossing mode can be set by parameter AD-01, and the motor operating direction in the fire crossing mode can be set by parameter AD-02.

Function code	Name	Detailed Description of Parameters	Default Value	Change
AD-00	Fire mode function	0: Not enabled 1: Crossing fire mode 1 2: Fire crossing mode 2	0	☆
AD-01	Fire mode operating frequency	0.00Hz ~ maximum frequency	50.00Hz	☆
AD-02	Operating direction in fire mode	0: forward 1: Reverse	0	☆
AD-03	Fire mode operation sign	0: No fire crossing mode is triggered 1: trigger fire crossing mode	-	•

Fire Ride Through Mode 1: The frequency converter is forced to operate, and the frequency operation is operated according to the fire mode operation frequency set by AD-01, and the operation

direction is operated according to the direction set by AD-02. In fire mode 1, all faults of hardware overcurrent and hardware overvoltage are shielded. When other faults are triggered, FIrxx is displayed normally. xx represents the triggered fault code, but it does not respond to shutdown. The operation normally follows the frequency and direction of the fire ride-through mode.

Fire ride-through mode 2: The frequency converter is forced to operate, and the frequency operation is operated according to the fire mode operation frequency set by AD-01, and the operation direction is operated according to the direction set by AD-02. In fire mode 2, faults other than overcurrent, overvoltage and output phase loss are shielded. When other faults are triggered, FIrxx is displayed normally. xx represents the triggered fault code, but it does not respond to shutdown. The operation normally follows the frequency and direction of the fire ride-through mode.

Function code	Name	Detailed Description of Parameters	Default Value	Change
AD-04	Year of Fire Mode Triggered	0 to 2100	-	●
AD-05	Day of the month on which fire mode is triggered	0 to 1231	-	●
AD-06	Time division when fire mode is triggered	0 to 2459	-	●
AD-07	Seconds the fire mode is triggered	0 to 59	-	●
AD-08	Week of fire mode triggered	0 to 7	-	●

AD-04 ~ AD-08 Record the last time the fire mode is triggered, and the AA-00 ~ AA-03 needs to be set accurately.

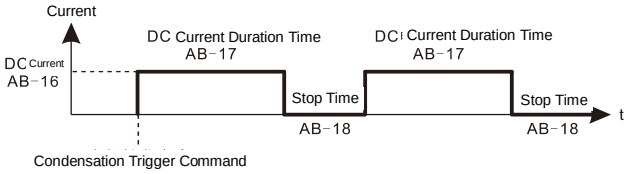
6.7 Condensation Protection Function

When the humidity of the environment is high and the surface temperature of the motor is lower than the dew point, condensation will occur, water droplets will adhere to the motor windings, insulation reduction, leakage, creepage, short circuit, corrosion of the motor, resulting in motor failure. When it is detected that the motor is stopped, this problem can be avoided by outputting DC current to make the windings of the motor heat up and slightly increase the temperature of the motor surface.

Function code	Name	Detailed Description of Parameters	Setpoint	Change
P4-00 ~ P4-07	S1 ~ S8 multi-function terminal	77: Condensation protection	-	☆
AB-16	Condensation protection current	0 to 100%	30%	☆
AB-17	Condensing DC operating time	0~100.0S	40.0S	☆
AB-18	Condensation downtime	0~100.0S	10.0S	☆

Function realization: configure S digital input terminal to 77, start the condensation protection function. When the external signal enables this terminal, the frequency converter sends DC current, which will automatically stop after the set time of AB-17, and start again after the stop time exceeds AB-17. When a run command or a stop command is detected, the condensation protection function is stopped. If you need to trigger this function again, you need to enable this function terminal again. The parameter AB-16 adjusts the ratio of the DC current, which is relative to the motor value. (Because it is a DC drive, in order to protect the drive, the maximum value is 1/2 of the rated current of the inverter)

Run logic:



6.8 Special Protection Function

Compared with the general frequency converter, the EV270 water pump special frequency converter not only has basic protection such as overcurrent, overvoltage, undervoltage, overtemperature, phase loss, overload, etc., but also adds the following pump exclusive protection functions:

- Water level protection: to prevent dry pumping, or excessive pumping overflow reservoir according to waste.
- PID feedback abnormal protection: feedback is too low and feedback is too high to help judge abnormal pressure.
- Dry pumping protection: detect idling or no water operation to prevent pump body wear and burn.
- Anti-stalling protection: fast protection when stuck in operation to avoid motor overload damage.
- Water pipe rupture detection and protection: alarm and shutdown when flow/pressure is abnormal, reducing water leakage loss.
- Frost protection: automatic intermittent operation at low temperature to prevent the pipeline from freezing and cracking.

Protection function code	Protection Function Name	Protection function code	Fault Name
Prt01	High Water Level Protection	Prt02	Low Water Level Protection
Prt03	Water shortage protection	Prt04	PID feedback low protection
Prt05	PID feedback over protection	Prt06	Water pipe break protection
Prt07	Stall-rotor protection	Prt08	Dry pumping protection
Prt09	Frost protection		

6.8.1 Water Level Signal Protection

Water level alarm detection is the core protection function of EV270 inverter to ensure the safe operation of the system, prevent waste of water resources and equipment damage, mainly for the reservoir, water source pool (well water, river water, etc.) water level real-time monitoring, divided into high water level signal, low water level signal and water shortage signal. The high water level and low water level are the water level detection signals in the reservoir; the water shortage signal is the water source detection signal for pumping water. The system collects the water level signal through the water level sensor (floating ball type, static pressure type, etc.), and the water level signal detection method can be set by parameter A9-39 (water level signal selection). The real-time water level data is compared with the preset high and low water level thresholds to achieve accurate alarm and linkage control.

When the water level signal is detected, it will stop immediately.

6.8.1.1 S terminal function detection water level

Function code	Name	Detailed Description of Parameters	Setpoint	Change
A9-39	Water level sensor selection	1:S multi-function terminal detection	1	☆

P4-00 ~ P4-07	S1 ~ S8 multi-function terminal	69: Intake pool upper limit signal 70: lower limit signal of water inlet pool 71: water shortage signal into the pool	-	☆

6.8.1.2 Analog water level

Function code	Name	Detailed Description of Parameters	Setpoint	Change
A9-39	Water level sensor selection	2: AI1 3:AI2 4:AI3	2/3/4	☆
A9-40	Upper limit of reservoir water level	0.0-100.0%	60.0 percent	☆
A9-41	Lower limit value of reservoir water level	0.0-100.0%	40.0 percent	☆
A9-42	Water shortage value of water source	0.0-100.0%	20.0 percent	☆

6.8.1.3 Communication detection water level

Function code	Name	Detailed Description of Parameters	Setpoint	Change
A9-39	Water level sensor selection	6: Communication given	2/3/4	☆
A9-40	Upper limit of reservoir water level	0.0-100.0%	60.0 percent	☆
A9-41	Lower limit value of reservoir water level	0.0-100.0%	40.0 percent	☆
A9-42	Water shortage value of water source	0.0-100.0%	20.0 percent	☆
Water level detection communication address: 0x1000				

6.8.2 PID Feedback Abnormality and Protection

1. Constant pressure water supply

Feedback: pressure transmitter 4-20mA

Feedback is too low: the pressure of the pipe network cannot go up, the water pump does not pump water, the pipeline leaks, and the transmitter is broken/the wiring is broken.

High feedback: ultra-high pressure, pressure in pipe network, zero drift of transmitter, short circuit of signal line

2. Constant level control of water tank

Feedback: Level transmitter/float analog

Too low: there is no water in the water tank, the water inlet valve is blocked, and the liquid level probe fails.

Too high: overflowing liquid level, stuck probe, disordered signal

3. Constant temperature control (workshop, oven, central air conditioning)

Feedback: PT100, thermocouple, temperature analog

Too low: the heating does not work, the sensor is disconnected, and the probe falls off.

Too high: false high temperature, short circuit of probe, floating value of environmental interference

4. Constant air volume and constant air pressure (dust removal fan and centrifugal fan)

Feedback: wind pressure sensor

Too low: the air duct is blocked, the fan reverses, and the sensor falls off.

Too high: pressure of air duct and excessive negative pressure

EV270 series inverter in order to avoid the above due to abnormal feedback equipment damage, PID to do the upper and lower limit protection.

Function code	Name	Detailed Description of Parameters	Default Value	Change
A9-44	PID feedback low detection value	0.0-100.0%	0.0 percent	☆
A9-45	PID feedback low detection time	0.0~3600.0S	500.0S	☆
A9-46	PID feedback high and low detection value	0.0-100.0%	100.0 percent	☆
A9-47	PID feedback high detection time	0.0~3600.0S	500.0S	☆

6.8.3 Dry Pumping Protection

Dry pumping operation judgment is the special protection function of EV270 series frequency converter for water shortage operation of water pump. The core purpose is to prevent the water pump from idling under the condition of no water source and insufficient water source, resulting in serious faults such as wear of water pump impeller, damage of seal, overheating and burning of motor, and prolong the service life of water pump. The system uses the current detection value to judge, combined with the corresponding parameter settings, to ensure the accuracy of dry pumping judgment, to avoid misjudgment, where the parameter AB-33 (dry pumping operation detection value) is used to set the current threshold reference for dry pumping judgment, when the set value is 0, dry pumping operation is not judged. The parameter A3-24 (dry pumping protection delay time) is used to set the delay time of dry pumping judgment to prevent false triggering of protection due to instantaneous water shortage.

Function code	Name	Detailed Description of Parameters	Default Value	Change
AB-32	Dry pumping function selection	0: Do not detect 1: Dry pumping warning 2: Dry pumping protection	0	☆
AB-33	Dry pumping operation detection current	0.0-50.0%	50.0 percent	☆
AB-34	Dry pumping protection delay time	0.0~3600.0S	200.0S	☆
AB-35	Dry pumping reset delay	10~60000s	600S	☆

6.8.4 Anti-stall Protection

The anti-stall function can effectively prevent the motor from being damaged by heat due to stall. When the operating frequency of the detected frequency converter is lower than the upper limit of the locked-rotor frequency and the duration is greater than the locked-rotor detection time, it is judged that the motor is locked-rotor fault.

Function code	Name	Detailed Description of Parameters	Default Value	Change
AB-28	Stall function selection	0: Do not detect 1: locked-rotor warning 2: Stall-rotor protection	0	☆
AB-29	Stall detection current	0.0-300.0%	200.0 percent	☆
AB-30	Stall detection frequency upper limit	0.00 ~ maximum frequency	15.00Hz	☆
AB-31	Stall detection time	0~36000S	2.0S	☆

6.8.5 Water Pipe Rupture Detection and Protection

The rupture of the water pipe can detect the rupture of the water outlet pipe, stop the machine in time, and reduce the loss.

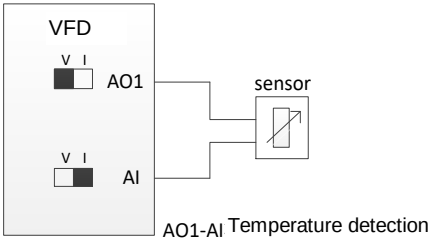
When reference AB-00 is set to 1, water tube rupture detection is enabled. When the inverter runs to the maximum frequency, the feedback pressure is always less than the set pressure value of parameter AB-01, and the duration exceeds the set value of AB-02, the water pipe is determined to be broken.

Function code	Name	Detailed Description of Parameters	Default Value	Change
AB-00	Water pipe rupture detection	0: Do not detect 1: Detection enable	0	☆
AB-01	Water pipe rupture detection pressure	0.0-100.0%	10.0 percent	☆
AB-02	Water pipe rupture detection time	0~60000S	120.0S	☆

6.8.6 Frost Protection Function

When the ambient temperature is too low, in order to protect the water pipe from damage due to ice, when it is detected that the frequency converter stops, when the ambient temperature is lower than the frost protection value set by AB-12, the frost protection is started, and the motor will automatically run in the frost protection mode to prevent the water pipe from freezing. When the ambient temperature continues to decrease and the ambient temperature is lower than the frost fault detection value set by AB-15, the motor will stop to prevent the water pump from freezing and blocking due to low ambient temperature, and the motor will continue to run, causing the motor to block and burn.

Wiring of temperature sensor: jumper of AO1 is connected to voltage gear "V", jumper of AI is connected to current gear "I"



Related function parameters:

Function code	Name	Detailed Description of Parameters	Default Value	Change
AB-09	Sampling AI Port Selection	0:AI1 1:AI2 2:AI3	0	☆
AB-10	Frost protection enable	0: Not enabled 1: enable frost protection	0	☆
AB-11	Temperature Sensor Selection	0: None 2:PT1000 1:PT100 3:KTY84	0	☆
AB-12	frost protection value	-50~10 ℃	0	☆
AB-13	Low temperature warning protection value	-50~10 ℃	0 ℃	☆

AB-14	Frost protection operating frequency	0 to 40.00Hz	10.00Hz	☆
AB-15	Frost fault detection value	-50~10 ℃	-10 ℃	☆

6.9 Energy-Saving Operation

The EV270 inverter has a sleep wake-up function to reduce energy consumption, as well as active energy-saving control in light-load mode. When the motor is lightly loaded, the load torque is very small, the rotor current is very small, and the excitation current (reactive component) accounts for a high proportion of the total current. At this time, if the rated voltage is maintained, the iron loss of the motor will be very high, and the excitation current itself will cause additional copper loss. By reducing the output voltage, the frequency converter can reduce the main magnetic flux of the motor, thereby reducing the iron loss. At this time, the excitation current is reduced, the total current of the stator is reduced, and the copper loss is also reduced. As long as the voltage is reduced, the torque output by the motor can still meet the load demand, which will not affect the normal operation

Control parameters in EV270 power-saving mode:

Function code	Name	Detailed Description of Parameters	Default Value	Change
P3-00	VF Curve Settings	0: Line V/F	0	☆
P3- 34	Energy-saving operation mode	0: Not enabled 1: enable energy saving mode	0	☆
P3-35	Energy-saving operation detection current	0 to 60.0%	40.0 percent	☆
P3-36	Energy-saving mode voltage operation ratio	70.0-100.0%	80.0 percent	☆
P3-37	Acceleration and deceleration time of voltage switching in energy saving mode	0 to 10.0S	1.0S	☆

Note: The power saving mode is only effective if the P3-00 is set to 0.

Chapter 7 Fault Diagnosis and Countermeasures

7.1 Adjustment Guide Before VFD Commissioning

1) Open loop vector control mode (P0-01 = 0)

The control mode is to control the speed and torque of the motor in the application of the motor without encoder speed feedback. In this control mode, the motor parameters need to be self-learned to complete the automatic tuning of the motor parameters.

Problems and failures	treatment countermeasures
Overload or overcurrent fault is reported during motor start-up	■ The motor parameters (P1-01 ~ P1-05) are set according to the motor nameplate; ■ Self-learning (P1-37) of motor parameters is carried out. If conditions permit, it is better to carry out complete self-learning of motor dynamics.
Slow response of torque or speed below 5Hz, motor vibration	■ To improve the response of torque and speed, it is necessary to strengthen the proportional adjustment of the speed ring (P2-00 increase the set value by 10) or reduce the integration time of the speed ring (P2-01 decrease by 0.05); ■ If vibration occurs, you need to weaken the P2-00 and P2-01 the parameter value.
More than 5Hz torque or speed response is slow, motor vibration.	■ To improve the response of torque and speed, it is necessary to strengthen the proportional adjustment of the speed ring (P2-03 increase the set value by 10) or reduce the integration time of the speed ring (P2-04 decrease by 0.05); ■ If vibration occurs, you need to weaken the P2-03 and P2-04 the parameter value.
Low speed accuracy	■ When the load speed deviation of the motor is too large, the vector slip compensation gain (P2-06) shall be increased by 10%.
Large speed fluctuation	■ When the motor speed has abnormal fluctuations, the speed filtering time (P2-07) can be appropriately increased by 0.001s.
The motor is noisy	■ Appropriately increase the carrier frequency value (P0-15) in 1.0KHz (note: increase the carrier frequency motor leakage current will increase).
Insufficient motor torque or output	■ Whether the torque upper limit is limited, increase the torque upper limit (P2-10) in speed mode; increase the torque command in torque mode.

2) Closed loop vector control mode (P0-01 = 1)

This mode is used in applications where the motor has encoder speed feedback. It is necessary to correctly set the number of encoder lines, encoder type and signal direction to complete the automatic tuning of motor parameters.

Problems and failures	treatment countermeasures
Start-up overcurrent or overload fault	■ Set the number of encoder lines, type, encoder direction correctly.
Overload is reported during motor rotation or overcurrent fault	■ The motor parameters (P1-01 ~ P1-05) are set according to the motor nameplate; ■ Self-learning (P1-37) of motor parameters is carried out. If conditions

Problems and failures	treatment countermeasures
	permit, it is better to carry out complete self-learning of motor dynamics.
Slow response of torque or speed below 5Hz, motor vibration	■ To improve the response of torque and speed, it is necessary to strengthen the proportional adjustment of the speed ring (P2-00 increase the set value by 10) or reduce the integration time of the speed ring (P2-01 decrease by 0.05); ■ If vibration occurs, you need to weaken the P2-00 and P2-01 the parameter value.
More than 5Hz torque or speed response is slow, motor vibration.	■ To improve the response of torque and speed, it is necessary to strengthen the proportional adjustment of the speed ring (P2-03 increase the set value by 10) or reduce the integration time of the speed ring (P2-04 decrease by 0.05); ■ If vibration occurs, you need to weaken the P2-03 and P2-04 the parameter value.
Large speed fluctuation	■ When the motor speed has abnormal fluctuations, the speed filtering time (P2-07) can be appropriately increased by 0.001s.
The motor is noisy	■ Appropriately increase the carrier frequency value (P0-15) in units of 1.0kHz (note: increase the carrier frequency motor leakage current will increase).
Insufficient motor torque or output	■ Whether the torque upper limit is limited, increase the torque upper limit (P2-10) in speed mode; increase the torque command in torque mode.

3)V/F control mode (P0-01 = 2 factory default)

This mode is used in applications where the motor has no encoder speed feedback. It is not sensitive to the motor parameters and only needs to correctly set the rated voltage and rated frequency of the motor.

Problems and failures	treatment countermeasures
Motor oscillation during operation	■ Increase the shock suppression parameter (P3-11) by 10 (maximum adjustment to 100).
Overcurrent for high-power starting	■ Reduce the torque boost (P3-01), adjusted in units of 0.5%.
The motor is noisy	■ Appropriately increase the carrier frequency value (P0-15) in 1.0kHz (note: increase the carrier frequency motor leakage current will increase).
Large current in operation	■ Correctly set the rated voltage (P1-02) and rated frequency (P1-04) of the motor; ■ Reduce the torque boost (P3-01), adjusted in units of 0.5%.
Overvoltage for sudden unloading and overvoltage for deceleration	■ Make sure that the overvoltage stall enable (P3-23) is set to enable. Increase the overvoltage stall gain (P3-24/P3-25, ex-factory 30) by 10 (the maximum is 100); ■ Decrease the overvoltage stall action voltage (P3-22 factory 770V) by 10V (minimum adjustment to 700V).
Sudden overload report overcurrent, accelerated report overcurrent	■ Increase the overcurrent stall gain (P3-20 factory 20) by 10 (maximum adjusted to 100); ■ Reduce the overcurrent stall action current (P3-18 factory 150%) by 10% (minimum adjustment to 50%).

7.2 Fault Alarm and Countermeasures

The following fault types may be encountered during the use of the inverter. Please refer to the following methods for simple fault analysis:

Fault Name	Operating surface Panel Display	Troubleshooting	fault handling countermeasures
Accelerated overcurrent	FU02	Inverter output circuit is grounded or short-circuited	■ Eliminate peripheral faults and detect whether the motor or interrupt contactor is short-circuited.
		Control mode is FVC or SVC without parameter identification	■ Set the motor parameters according to the motor nameplate and identify the motor parameters.
		Under the condition of rapid acceleration, the acceleration time is set too short.	■ Increase the acceleration time.
		Overcurrent stall suppression setting not appropriate	■ Make sure that the overcurrent stall suppression function (P3-19 = 1) is enabled; ■ The set value of overcurrent stall action current (P3-18) is too large, and it is recommended to be adjusted within 120 to 150; ■ The overcurrent stall suppression gain (P3-20) setting is too small, it is recommended to adjust within 20 to 40.
		Manual torque boost or V/F curve not appropriate	■ Adjust manual lift torque or V/F curve.
		Start the rotating motor	■ Select speed tracking start or wait for the motor to stop and then start.
		by external interference	■ Check the historical fault record. If the current value is far from reaching the overcurrent point value at the time of the fault, find the interference source. If there are no other sources of interference, the driver board or current sensor may be a problem.
deceleration overcurrent	FU03	Inverter output circuit is grounded or short-circuited	■ Eliminate peripheral faults and detect whether the motor is short-circuited or open-circuited.
		Control mode is FVC or SVC without parameter identification	■ Set the motor parameters according to the motor nameplate and identify the motor parameters.
		Under the condition of rapid deceleration, the deceleration time is set too short.	■ Increase the deceleration time.
		Overcurrent stall suppression setting not appropriate	■ Make sure that the overcurrent stall suppression function (P3-19) is enabled; ■ The set value of overcurrent stall action current (P3-18) is too large, and it is recommended to be adjusted within 120 to 150;

Fault Name	Operating surface Panel Display	Troubleshooting	fault handling countermeasures
			■ The overcurrent stall suppression gain (P3-20) setting is too small, it is recommended to adjust within 20 to 40.
		No additional braking unit and braking resistor	■ Add brake unit and resistor.
		by external interference	■ Check the historical fault record. If the current value is far from reaching the overcurrent point value at the time of the fault, find the interference source. If there are no other sources of interference, the driver board or current sensor may be a problem.
Constant speed overcurrent	FU04	Inverter output circuit is grounded or short-circuited	■ Eliminate peripheral faults and detect whether the motor is short-circuited or open-circuited.
		Control mode is FVC or SVC without parameter identification	■ Set the motor parameters according to the motor nameplate and identify the motor parameters.
		Overcurrent stall suppression setting not appropriate	■ Confirm the overcurrent stall. The inhibition function (P3-19) has been enabled; ■ The set value of overcurrent stall action current (P3-18) is too large, and it is recommended to be adjusted within 120 to 150; ■ The overcurrent stall suppression gain (P3-20) setting is too small, it is recommended to adjust within 20 to 40.
		Frequency converter selection is small	■ In the stable operation state, if the running current has exceeded the rated current of the motor or the rated output current value of the inverter, please select the inverter with higher power level.
		by external interference	■ Check the historical fault record. If the current value is far from reaching the overcurrent point value at the time of the fault, find the interference source. If there are no other sources of interference, the driver board or current sensor may be a problem.
accelerating overvoltage	FU05	High input voltage	■ The voltage is adjusted to the normal range.
		There is an external force in the acceleration process to drag the motor to run.	■ Cancel the additional power or add a braking resistor.
		Inappropriate overvoltage suppression setting	■ Make sure that the overvoltage suppression function (P3-23) is enabled;

Fault Name	Operating surface Panel Display	Troubleshooting	fault handling countermeasures
			■ Overvoltage suppression action voltage (P3-22) setting value is too large, recommended in 770V ~ 700V adjustment; ■ Overvoltage suppression gain (P3-24) setting is too small, it is recommended to adjust within 30 to 50.
		No additional braking unit and braking resistor	■ Add brake unit and resistor.
		Acceleration time is too short	■ Increase the acceleration time.
deceleration overvoltage	FU06	Inappropriate overvoltage suppression setting	■ Make sure that the overvoltage suppression function (P3-23) is enabled; ■ Overvoltage suppression action voltage (P3-22) setting value is too large, recommended in 770V ~ 700V adjustment; ■ Overvoltage suppression gain (P3-24) setting is too small, it is recommended to adjust within 30 to 50.
		There is an external force in the deceleration process to drag the motor to run.	■ Cancel the additional power or add a braking resistor.
		Deceleration time is too short	■ Increase the deceleration time.
		No additional braking unit and braking resistor	■ Add brake unit and resistor.
constant speed overvoltage	FU07	Verify that the overvoltage suppression function (P3-23) is enabled	■ Make sure that the overvoltage suppression function (P3-23) is enabled; ■ Overvoltage suppression action voltage (P3-22) setting value is too large, recommended in 770V ~ 700V adjustment; ■ Overvoltage suppression frequency gain (P3-24) setting is too small, it is recommended to adjust within 30 to 50; ■ Overvoltage suppression maximum rise frequency (P3-26) setting is too small, it is recommended to adjust within 5~20Hz.
		There is an external force during operation to drag the motor to run	■ Cancel the additional power or add a braking resistor.
Control power failure	FU08	Input voltage not within specification	■ The voltage shall be adjusted to the range required by the specification.
Undervoltage fault	FU09	Instantaneous power failure	■ The instantaneous stop function (P9-59) is enabled to prevent instantaneous power failure and undervoltage fault.
		The voltage at the input end of	■ Adjust the voltage to the normal range.

Fault Name	Operating surface Panel Display	Troubleshooting	fault handling countermeasures
		the frequency converter is not within the range required by the specification.	
		Busbar voltage not normal	■ Seek technical support.
		Rectifier bridge, buffer resistor, drive board and control board are abnormal	■ Seek technical support.
Inverter overload	FU10	Whether the load is too large or the motor is locked	■ Reduce the load and check the motor and mechanical condition.
		Frequency converter selection is small	■ Choose a frequency converter with a larger power level.
Motor overload	FU11	Whether the motor protection parameter P9-01 setting is appropriate	■ Set this parameter correctly.
		Whether the load is too large or the motor is locked	■ Reduce the load and check the motor and mechanical condition.
Input phase loss	FU12	Three-phase power input abnormal	■ Check and eliminate problems in peripheral circuits.
		Driver, lightning protection board, main control board and rectifier bridge are abnormal	■ Seek technical support.
Output phase loss	FU13	Motor fault	■ Check whether the motor is open.
		The lead wire from the converter to the motor is not normal.	■ Troubleshoot peripheral faults.
		Unbalanced three-phase output of inverter when motor is running	■ Check whether the three-phase winding of the motor is normal and eliminate the fault.
		Driver board, IGBT module abnormal	■ Seek technical support.
Module overheating	FU14	The ambient temperature is too high	■ Reduce the ambient temperature.
		Air duct blockage	■ Clean the air duct.
		Fan damage	■ Replace the fan.
		Damaged module thermistor	■ Replace the thermistor.
		Inverter module damaged	■ Replace the inverter module.
External device failure	FU15	The signal of the external fault is input through the multi-function terminal S.	■ Troubleshoot peripheral faults, confirm that the machine is allowed to restart (P8-18) and reset the operation.
Communication failure (terminal RS485)	FU16	The upper computer is not working properly	■ Check the upper computer wiring.
		Communication line is not normal	■ Check the communication cable.
		Communication expansion card P0-28 set incorrectly	■ Set the communication expansion card type correctly.
		Communication parameter Pd group setting is incorrect	■ Set the communication parameters correctly.
		After the above tests, you can try to restore the factory settings.	

Fault Name	Operating surface Panel Display	Troubleshooting	fault handling countermeasures
Contactor fault	FU17	Abnormal drive board and power supply	■ Replace the driver board or power board.
		Contactor abnormal	■ Replace the contactor.
		Lightning protection plate abnormal	■ Replace the lightning protection plate.
Current detection fault	FU18	Check current sensor for abnormality	■ Replace the current sensor.
		Abnormal drive board	■ Replace the drive plate.
Motor self-learning fault	FU19	Motor parameters not set according to nameplate	■ Set the motor parameters correctly according to the nameplate.
		Parameter identification process timeout	■ Check the inverter to motor lead.
		Abnormal encoder	■ Check whether the number of encoder lines is set correctly and P1-27, and check whether the signal lines of the encoder are connected correctly and firmly.
Encoder failure	FU20	Encoder model mismatch	■ Set the encoder type correctly according to the actual situation.
		Encoder wiring error	■ Detection of PG card power and phase sequence.
		Broken encoder	■ Replace the encoder.
		PG card abnormal	■ Replace the PG card.
EEPROM read/write fault	FU21	EEPROM chip damage	■ Replace the main control board.
Short circuit to ground fault	FU23	Motor short circuit to ground	■ Replace the cable or motor.
Cumulative Run Time Reach Fault	FU26	Cumulative running time reaches set value	■ Use the parameter initialization function to clear the record information.
User-defined fault 1	FU27	Input signal of user-defined fault 1 via multi-function terminal S	■ Reset run.
User-defined fault 2	FU28	Input signal of user-defined fault 2 via multi-function terminal S	■ Reset run.
Accumulated power-on time reaches fault	FU29	Accumulated power-on time reaches the set value	■ Use the parameter initialization function to clear the record information.
Underload fault	FU30	Inverter running current is less than P9-64	■ Confirm whether the load is separated or P9-64, and whether the P9-65 parameter setting conforms to the actual operating conditions.
Runtime PID feedback loss fault	FU31	PID feedback less than PA-26 setpoint	■ Check the PID feedback signal or set PA-26 to a suitable value.
Safe Torque Off (STO)	STO	Simultaneous failure of STO1 and STO2	■ Check the wiring of STO1 and STO2. ■ Check whether CN4 on the expansion card is jumpered to COM and PLC.

Fault Name	Operating surface Panel Display	Troubleshooting	fault handling countermeasures
			■ Check parameter P4-39; both the units and tens digits shall be set to 1.
Safe Torque Off (STO1)	STO1	STO1 failure	■ Check the wiring of STO1.
			■ Check whether CN4 on the expansion card is jumpered to COM and PLC.
			■ Check parameter P4-39; the units digit shall be set to 1.
Safe Torque Off (STO2)	STO2	STO2 failure	■ Check the wiring of STO2.
			■ Check whether CN4 on the expansion card is jumpered to COM and PLC.
			■ Check parameter P4-39; the tens digit shall be set to 1.
Wave-by-wave current limiting fault	FU40	Whether the load is too large or the motor is locked	■ Reduce the load and check the motor and mechanical condition.
		Frequency converter selection is small	■ Choose a frequency converter with a larger power level.
Runtime switching Motor fault	FU41	Change current motor selection via terminals during converter operation	■ The motor switching operation shall be carried out after the frequency converter is shut down.
Excessive speed deviation fault	FU42	Incorrect encoder parameter setting	■ Set the encoder parameters correctly.
		No parameter identification	■ Motor parameter identification.
		Excessive speed deviation P9-69 detection parameters and unreasonable P9-70 setting	■ According to the actual situation, set the detection parameters reasonably.
Motor over-speed fault	FU43	Incorrect encoder parameter setting	■ Set the encoder parameters correctly.
		No parameter identification	■ Motor parameter identification.
		Motor over-speed detection parameter P9-67 and P9-68 setting unreasonable	■ According to the actual situation, set the detection parameters reasonably.
Motor over-temperature	FU45	Temperature sensor access error	■ Connect the temperature sensor correctly.
		Temperature sensor type selection error	■ Selecting the correct temperature sensor type (P9-56)
		P9-57 temperature protection threshold and unreasonable P9-58 setting	■ According to the actual situation, set the detection parameters reasonably.
Initial position error	FU51	Unconnected motor in vector mode	■ Please connect the motor
		Control mode setting error	■ Please set the correct control mode
Point-to-point slave failure	FU55	Point-to-point communication slave dropped	■ Check the slave
CAN communication failure	FU56	The upper computer is not working properly	■ Check the upper computer wiring.
		Communication line is not normal	■ Check the communication cable.

Fault Name	Operating surface Panel Display	Troubleshooting	fault handling countermeasures
		Communication expansion card P0-28 set incorrectly	■ Set the communication expansion card type correctly.
		Communication parameter Pd group setting is incorrect	■ Set the communication parameters correctly.
LCD keyboard or PC debugging tool communication failure	FU57	PD-14 setting error	■ PD-14 set to 0
		Communication parameter Pd-10 ~ Pd-13 group setting is incorrect	■ Set the communication parameters correctly.
Extended communication failure	FU58	PD-19 setting error	■ PD-14 set to 0
		Communication parameter Pd-15 ~ Pd-18 group setting is incorrect	■ Set the communication parameters correctly.

7.3 Fan & Water Pump Dedicated Protection Alarms and Solutions

The following fault types may be encountered when using the dedicated functions of the fan and water pump. Please refer to the following methods for simple fault analysis:

Fault Name	Operating surface Panel Display	Troubleshooting	fault handling countermeasures
High water level protection	Prt01	Current water level reaches high water level	■ Confirm whether the high water level setting is reasonable.
		High water level sensor abnormal	■ Check high water level sensor
Low water level protection	Prt02	The current water level is lower than the low water level	■ Confirm whether the low water level setting is reasonable.
		Abnormal low water level sensor	■ Check low water level sensor
Water shortage protection	Prt03	The current water level is below the water shortage level	■ Confirm whether the water shortage level setting is reasonable.
		Water shortage level sensor abnormal	■ Check water shortage level sensor
PID feedback too low	Prt04	Unreasonable pressure feedback setting	■ Confirm whether the pressure feedback setting is reasonable
		Abnormal pressure sensor	■ Check pressure sensor
PID feedback too high	Prt05	Unreasonable pressure feedback setting	■ Confirm whether the pressure feedback setting is reasonable
		Abnormal pressure sensor	■ Check pressure sensor
Water pipe rupture	Prt06	Water pipe rupture	■ Check whether the water pipe is broken
		Unreasonable pressure feedback setting	■ Confirm whether the pressure feedback setting is reasonable
		Communication parameter Pd-15 ~ Pd-18 group setting is incorrect	■ Set the communication parameters correctly.
Stall-rotor alarm	Prt07	Motor stalling	■ Confirm whether the motor is locked or stuck.
		Unreasonable selection of motor	■ Confirm whether the motor selection is small
Dry pumping alarm	Prt08	Motor running at idle	■ Confirm whether the motor is idling
		AB-33 setting unreasonable	■ Make AB-33 smaller to meet the current working conditions.
Frost Alarm	Prt09	Temperature sensor selection error	■ Choosing the Right Temperature Sensor
		Unreasonable setting of protection threshold	■ Modify AB-15 to make it conform to the current working condition.

7.4 Common Faults and Treatment Methods

The following faults may be encountered during the use of the inverter. Please refer to the following methods for simple fault analysis:

Serial Number	Fault phenomenon	Possible causes	Solution
1	No display on power-on	No or too low grid voltage	■ Check input power.
		Switching power supply fault on the converter drive board	■ Check the bus voltage.
		The connection between the control board and the drive board and the keyboard is broken.	■ Reseat the 30-core cable.
		Inverter buffer resistance damage	■ Seek services from manufacturers.
		Control board and keyboard fault	
		Damaged rectifier bridge	
2	Power-on always shows 510-A	Poor connection between driver board and control board	■ Reseat the 30-core cable.
		Related devices on the control board are damaged	■ Seek services from manufacturers.
		The motor or motor line has a short circuit to ground	
		Current sensor fault	
		Grid voltage too low	
3	Power-on display "FU23" alarm	Motor or output line short to ground	■ Measure the insulation of the motor and output lines with a shaking table.
		Inverter damage	■ Seek services from manufacturers.
4	The power-on inverter shows normal, and "510-A" is displayed after operation and the inverter is shut down immediately.	The fan is damaged or stalling.	■ Replace the fan.
		Peripheral control terminal wiring is short-circuited	■ Troubleshoot external short circuit.
5	Frequent FU14 (module overheat) fault	Carrier frequency setting too high	■ Reduce the carrier frequency (P0-15).
		The fan is damaged or the air duct is blocked.	■ Replace the fan and clean the air duct.
		Damage to internal components of the converter (thermocouple or others)	■ Seek services from manufacturers.
6	The motor does not rotate after the frequency converter is	Motor and motor line	■ Reconfirm the correct connection between the frequency converter and the motor.
		Inverter parameter setting error	■ Restore the factory parameters and reset

Serial Number	Fault phenomenon	Possible causes	Solution
	running	(motor parameter)	the use parameter group; ■ Check whether the encoder parameters are set correctly and the rated parameters of the motor are set correctly, such as the rated frequency and rated speed of the motor; ■ Check that the P0-01 (control mode), P0-02 (operation mode) and settings are correct; ■ V/F mode, heavy load start, adjust the P3-01 (torque boost) parameters.
		Poor connection between driver board and control board	■ Do you reseat the connection line and make sure the connection is firm.
		Drive board failure	■ Seek services from manufacturers.
7	S terminal failure	Parameter setting error	■ Check and reset the parameters associated with group P4.
		External signal error	■ Reconnect the external signal line.
		PLC and +24V jumper loose	■ Reconfirm the PLC with the +24V jumper and make sure it is tight.
		Control board fault	■ Seek services from manufacturers.
8	When closed-loop vector control, the motor speed cannot be increased	Encoder failure	■ Replace the code wheel and reconfirm the wiring.
		Wrong wire connection or poor contact of encoder	■ Replace the PG card.
		PG card fault	■ Seek services from manufacturers.
		Drive board failure	
9	Frequency converter frequently reports overcurrent and overvoltage faults	Motor parameter setting is incorrect	■ Re-set the motor parameters or motor self-learning.
		Acceleration and deceleration time is not appropriate	■ Set the appropriate acceleration and deceleration time.
		load fluctuation	■ Seek services from manufacturers.
10	Power-on (or running) report FU17	Soft start contactor is not closed	■ Check whether the contactor cable is loose; ■ Check whether the contactor is faulty; ■ Check whether the 24V power supply of the contactor is faulty; ■ Seek services from manufacturers.
11	The motor stops freely or has no braking capacity when decelerating or decelerating to a	Encoder disconnection or over-voltage stall protection in effect	■ When there is a speed sensor in vector control mode (P0-01 = 1), please check the encoder wiring; ■ If the braking resistors are configured, select Overvoltage Stall

Serial Number	Fault phenomenon	Possible causes	Solution
	stop		enable as Inactive (set P3-23 = 0) to ■ turn off the overvoltage stall.
12	Inverter runs but has no output.	Motor not wired.	■ Check motor wiring.
		Control board fault (STO-type control board incorrectly selected).	■ Replace the control board.

Appendix A Communication Data Address Definitions

The EV270 series inverter supports Modbus communication protocol. The upper computer can control, monitor and modify the functional parameters of the inverter through Modbus communication protocol.

EV270 communication data can be divided into functional code data, non-functional code data, the latter includes operating commands, operating status, operating parameters, alarm information.

A.1 EV270 Function Code Data

The function code data is an important setting parameter of the inverter. EV270 has P group and A group function parameters, and the parameter groups are as follows:

EV270 Function code data	Group P (Read and Write)	P0, P1, P2, P3, P4, P5, P6, P7, P8, P9, PA, PB, PC, PD, PE, PF
	Group A (Read and Write)	A0, A1, A2, A3, A4, A5, A6, A7, A8, A9, AA, AB, AC, AD, AE, AF

The function code data communication address is defined as follows:

1、When reading function code data for communication

For P0-PF and A0-AF group function code data, the upper eight bits of the communication address are directly the function group number, and the lower eight bits are directly the serial number of the function code in the function group, for example, as follows:

P0-16 function parameter, its communication address is F010H, where F0H represents P0 group function parameter, 10H represents the hexadecimal data format of serial number 16 in the function group. AC-08 function parameter, its communication address is AC08H, where ACH represents the AC group function parameter, and 08H represents the hexadecimal data format of serial number 8 in the function group.

2、When writing function code data for communication

For the P0-PF group function code data, its communication address is eight bits higher, according to whether to write EEPROM, divided into 00-0F or P0-PF, the lower eight bits directly for the function code in the function group serial number, for example, as follows:

Write function in parameter P0-16:

When it is not necessary to write into EEPROM, its communication address is 0010H;

When it is necessary to write to EEPROM, its communication address is F010H.

For the A0-AF group function code data, its communication address is eight bits higher, according to whether it needs to be written into EEPROM, it is distinguished as 40-4F or A0-AF, and the lower eight bits are directly the serial number of the function code in the function group, for example, as follows:

Write function parameter AC-08:

When it is not necessary to write into EEPROM, its communication address is 4C08H;

When it is necessary to write to EEPROM, its communication address is AC08H.

A.2 EV270 Non-Function Code Data

EV270 Non-function code data	Status data (readable)	d group monitoring parameters, inverter fault description, inverter running state
	Control parameters (writable)	Control command, communication setting value, digital output terminal control, analog output AO1 control, analog output AO2 control, high-speed pulse (FMP) output control, parameter initialization

1、Status Data

The status data is divided into d groups of monitoring parameters, inverter fault description, inverter operation status.

d group parameters monitoring parameters

For the description of group d monitoring data, see the relevant description in Chapter 5 and Chapter 6, and its address is defined as follows:

d0-dF, the high eight bits of the communication address are 70 ~ 7F, and the low eight bits are the serial number of the monitoring parameter in the group, for example, as follows:

d0-11, its mailing address is 700BH

Inverter Fault Description

When the communication reads the inverter fault, the communication address is fixed at 8000H, and the upper computer can obtain the current inverter fault code by reading the address data. The description of the fault code is defined in the P9-14 function code in Chapter 5.

Operation status of frequency converter

When the communication reads the running status of the inverter, the communication address is set to 3000H, and the upper computer can obtain the current running status information of the inverter by reading the data, which is defined as follows:

Communication address of frequency converter running status	Read Status Word Definition		
3000h	1: forward rotation operation	2: Reverse Run	3: Shutdown

2、Control parameters

The control parameters are divided into control commands, digital output terminal control, analog output AO1 control, analog output AO2 control, and high-speed pulse (FMP) output control.

3、Control command

When the P0-02 (command source) is selected as 2: communication control, the upper computer can control the start and stop of the inverter through the communication address, and the control command is defined as follows:

Control Command Address	Command Function		
2000h	1: forward rotation operation 2: Reverse Run 3: forward rotation jog	4: Reverse inching 5: Free Shutdown	6: Slow down and stop 7: fault reset

4、Communication setting value

Communication setting value The frequency source, torque upper limit source, VF separate

voltage source, PID given source, PID feedback source, etc. in EV270 are selected as the given data at the given communication time, and its communication address is 1000H. When the upper computer sets the communication address value, its data range is -10000~10000, corresponding to -100.00-100.00 relative to the given value.

Digital output terminal control

When the digital output terminal function is selected as 20: communication control, the upper computer can control the digital output terminal of the inverter through the communication address, which is defined as follows:

Digital output terminal control communication address	command content	
2001H	BiT0: None BiT1: None BiT2:RELAY1 output control	BiT3:RELAY2 output control BiT4:HD0 output control

5、Analog output AO1, AO2, high-speed pulse output FMP control

When the analog output AO1 and AO2 and the high-speed pulse output FMP output function are selected as 12: communication setting, the upper computer can control the analog output and high-speed pulse output of the frequency converter through the communication address, which is defined as follows

Output control communication address		command content
AO1	2002H	0 ~ 7FFF means 0% ~ 100
AO2	2003H	

6、Parameter initialization

When it is necessary to initialize the parameters of the frequency converter through the upper computer, this function needs to be used.

If the PP-00 (user password) is not 0, it is necessary to verify the password first. After the verification is passed, the upper computer performs parameter initialization within 30 seconds.

The communication address for user password verification in communication is 1F00H. If the correct user password is directly written into the address, the password verification can be completed.

The address for parameter initialization for communication is 1F01H, and its data content is defined as follows:

Parameter initialization communication address	Command Function
1F01H	1: Restore factory parameters 2: Clear record information 4: Restore user backup parameters 501: Backup User's Current Parameters

Appendix B Modbus Communication Protocol

The EV270 series inverter provides RS485 communication interface and supports Modbus-RTU communication protocols. Users can achieve centralized control through the computer or PLC, through the communication protocol to set the inverter operation command, modify or read the function code parameters, read the inverter working status and fault information.

B .1 Content of Agreement

The serial communication protocol defines the content and format of information transmitted in serial communication. These include: host polling (or broadcast) format; host encoding method, including: the function code of the required action, transmission data and error checking. The response of the slave also adopts the same structure, including: action confirmation, return data and error check. If the slave makes an error when receiving the information, or cannot complete the action required by the master, it will organize a fault message as a response to the host.

Application mode

The frequency converter is connected to the "single master and multiple slave" PC/PLC control network with RS485 bus as a communication slave.

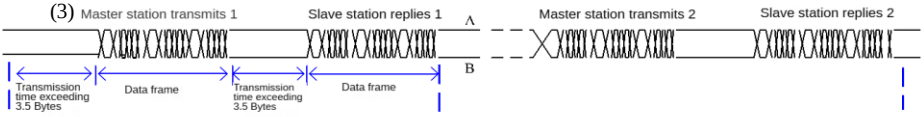
bus structure

(1) Single-host multi-slave **topology** system. Each communication device in the network has a unique slave address, one of which is used as a communication host (usually a flat PC upper computer, PLC, HMI, etc.). The host starts communication and reads or writes parameters to the slave. Other devices are communication slave machines and respond to the host's inquiry or communication operation to the machine. Only one device can send data at a time, while the other devices are in the receiving state.

The setting range of the slave address is 1 to 247, and 0 is the broadcast communication address. The slave addresses in the network must be unique.

(2) Asynchronous serial **communication transmission mode**, half duplex transmission mode. In the process of serial asynchronous communication, data is sent one frame of data at a time in the form of a message. It is agreed in the Modbus-RTU protocol that when the idle time of no data on the communication data line is greater than the transmission time of 3.5Byte, it indicates the start of a new communication frame.

(3)

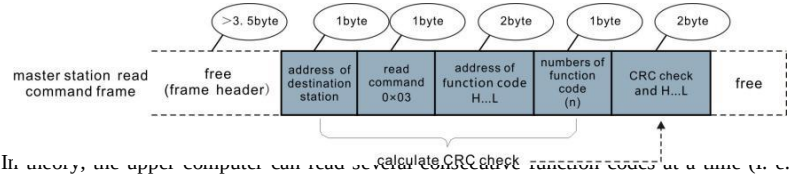


The built-in communication protocol of EV270 series inverter is Modbus-RTU slave communication protocol, which can respond to the "query/command" of the host, or make corresponding actions according to the "query/command" of the host, and communicate data response.

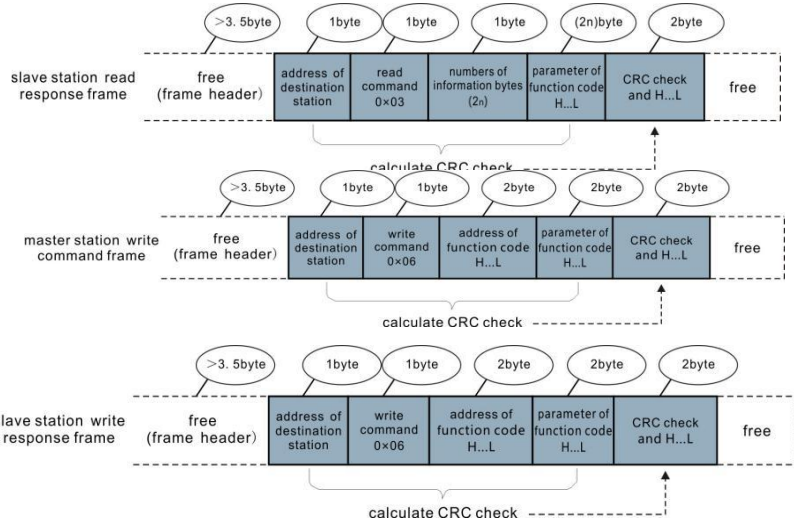
The host can refer to a personal computer (PC), industrial control equipment or programmable logic controller (PLC), etc. The host can not only communicate with a slave alone, but also release broadcast information to all lower slave machines. For the individual access "query/command" of the host, the accessed slave returns a response frame rate; for the broadcast information sent by the host, the slave does not need to feedback the response to the host.

(3) Communication data structure The Modbus protocol communication data format of EV270 series inverter is as follows. The inverter only supports reading or writing Word parameters. The

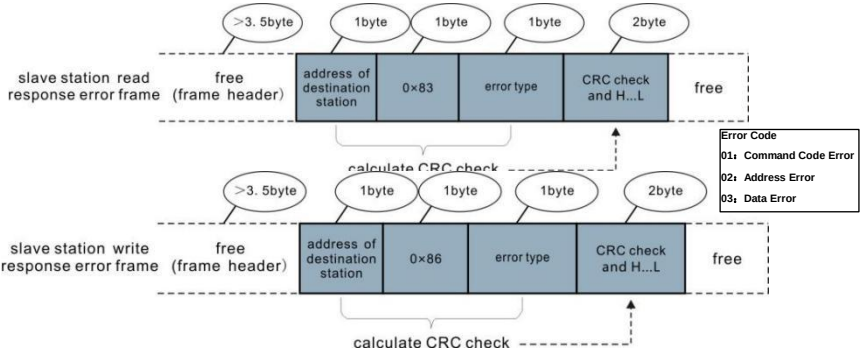
corresponding communication read operation command is Ox03; The write operation command is Ox06, and byte or bit read and write operations are not supported:



In theory, the upper computer can read several consecutive function codes at a time (i. e. n can reach 12 at most), but it should be noted that the last function code of the function code group cannot be crossed, otherwise the reply will be wrong.



If the slave detects a communication frame error, or if the read and write are unsuccessful due to other reasons, it will reply to the error frame.



Data Frame Field Description

Frame header START	Idle with a transfer time greater than 3.5 characters.
slave address ADR	Communication address range: 1~247;0 = broadcast address.
Command Code CMD	03: Read slave machine parameters; 06: Write slave machine parameters.
Function code address H	The internal parameter address of the frequency converter is expressed in hexadecimal. It is divided into functional code type and non-functional code type (such as running state parameters, running commands, etc.) parameters, etc., see the address definition for details. When transmitting, the high byte is preceded by the low byte.
Function code address L	
Number of function codes H	The number of function codes read in this frame. If it is 1, it means 1 function code is read. When transmitting, the high byte is preceded by the low byte. This protocol can only rewrite one function code at a time, without this field.
Number of function codes L	
Data H	Reply data, or close-up data, is transmitted with the high byte first and the low byte second.
Data L	
CRCCHK Low	Detection value: CRC16 check value. When transmitting, the low byte comes first and the high byte comes after. The calculation method is detailed in the description of CRC check in this section.
CRCCHK High	
END	3.5 character time.

CMD calibration method

Verification method-CRC verification method:

The CRC(Cyclical Redundancy Check) uses the RTd frame format, and the message includes an error detection field based on the CRC method.

The CRC field detects the contents of the entire message.

The CRC field is two bytes and contains a 16-bit binary value.

It is calculated by the transmission device and added to the message.

The receiving device recalculates the CRC of the received message and compares it with the value in the received CRC field. If the two CRC values are not equal, then there is an error in the transmission.

The CRC is stored in 0xFFFF first, and then a procedure is called to process the consecutive 8-bit bytes in the message with the value in the current register.

Only the 8Bit data in each character is valid for CRC, and the start and stop bits and parity bits are invalid.

In the CRC generation process, each 8-bit character is individually or (XOR) with the contents of the register, and the result is moved in the direction of the least significant bit, and the most significant bit is filled with 0.

The LSB is extracted and detected. If the LSB is 1, the register alone is the exclusive OR of the preset value, and if the LSB is 0, it is not performed. The whole process is repeated 8 times. After the last bit (bit 8) is completed, the next 8-bit byte is independently XOR-ed with the current value of the register.

The value in the final register is the CRC value after all the bytes in the message have been executed.

When a CRC is added to a message, the low byte is added first, then the high byte.

The simple CRC function is as follows:

```
unsigned int crc_chk_value(unsigned char *data_value,unsigned char length)
{
```

```
unsigned int crc_value=0xFFFF;
   int I;
while(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);
}
```

Address definitions for communication parameters

Read and write function code parameters (some function codes cannot be changed, only for manufacturers to use or monitor)

Function code parameter address marking rules:

The rule is represented by the function code group number and label number as the parameter address:

High byte: P0 ~ PF (group P), A0 ~ AF (group A), 70 ~ 7F (group d); Low byte: 00 ~ FF

For example, if the range function code is P3-12, the access address of the function code is expressed as 0 × F30C.

Note: PF group: parameters can neither be read nor changed; d group: only read, parameters can not be changed.

Some parameters cannot be changed when the inverter is in operation. Some parameters cannot be changed regardless of the state of the inverter. When changing the function code parameters, pay attention to the range, unit and related instructions of the parameters.

Function code group number	Communication Access Address	Communication modifies the address of the function code in RAM
P0 ~ PE group	0 ×F000~0 ×FEFF	0 × 0000~0 × 0EFF
A0 ~ AC group	0 ×A000~0 ×ACFF	0 x 4000~0 x 4CFF
group d0	0 x 7000~0 x 70FF	

Note that because EEPROM is frequently stored, it will reduce the service life of EEPROM, so some function codes do not need to be stored in communication mode, just change the value in RAM.

If it is a P group parameter, to realize this function, it can be realized by changing the high order F of the function code address to 0.

If it is a group A parameter, to realize this function, it can be realized by changing the high bit A of the function code address to 4.

The corresponding function code address is indicated as follows:

High byte: 00 ~ 0F (group P), 40 ~ 4F (group A); Low byte: 00 ~ FF.

For example, the function code P3-12 is not stored in EEPROM, and the address is 030C; The function code A0-05 is not stored in EEPROM, and the address is 4005;

This address indicates that only RAM can be written and cannot be read. When reading, it is an invalid address. For all parameters, the command code 07H can also be used to implement this function.

Shutdown/Operation Parameters Section

Parameter Address	Parameter Description	Parameter Address	Parameter Description
1000	* Communication setting value (decimal) -10000~10000	1010	PID Settings
1001	Operating frequency	1011	PID feedback
1002	Bus voltage	1012	PLC Steps
1003	Output voltage	1013	High-speed pulse input frequency, 0.01kHz
1004	Output current	1014	Feedback speed in 0.1Hz
1005	Output power	1015	Remaining Running Time
1006	Output torque	1016	Voltage before AI1 correction
1007	Running speed	1017	Voltage before AI2 correction
1008	S input flag	1018	AI3 Pre-Calibration Voltage (Function Expansion Card)
1009	HDO Output Flag	1019	Line speed
100A	AI1 voltage	101A	Current power-on time
100B	AI2 voltage	101B	Current Running Time
100c	AI3 Voltage (Function Expansion Card)	101C	High-speed pulse frequency input, unit 1Hz
100D	Count value input	101D	Communication setting value
100E	Length value input	101E	Actual feedback speed
100F	Load speed	101F	Main frequency A display
		1020	Secondary frequency B display

Note: The communication setpoint is a percentage of the relative value, 10000 corresponds to 100.00%, and -10000 corresponds to -100.00%.

For the data of frequency dimension, the percentage is the percentage relative to the maximum frequency (P0-10); for the data of torque dimension, the percentage is P2-10 and A2-48 (the upper limit of torque is set, corresponding to the first and second motors respectively).

Control command input to converter (write only)

Command Word Address	Command Function		
2000	0001: running forward 0002: Reverse Run 0003: forward jog	0004: reverse inching 0005: free stop	0006: Slow down and stop 0007: fault reset

Read converter status (read only)

Status Word Address	Status word function		
3000	0001: running forward	0002: Reverse Run	0003: Shutdown

Parameter lock password verification (if the return is 8888H, the password verification passes)

Password Address	Enter the contents of the password
1F00	*****

Digital output terminal control (write only)

Command Address	command content		
2001	BIT2:RELAY1 Output Control	BIT3:RELAY2 Output Control	BIT4:HDO Output Control

Analog Output AO1 Control (Write Only)

Command Address	command content
2002	0 ~ 7FFF means 0% ~ 100

Analog Output AO2 Control (Write Only)

Command Address	command content
2003	0 ~ 7FFF means 0% ~ 100

High Speed Pulse Output Control (Write Only)

Command Address	command content
2004	0 ~ 7FFF means 0% ~ 100

Inverter Fault Description

Frequency converter fault address	Inverter fault information		
8000	0000: No fault 0001: Reserved 0002: Accelerated overcurrent 0003: deceleration overcurrent 0004: Constant speed over current 0005: acceleration overvoltage 0006: deceleration overvoltage 0007: constant speed overvoltage 0008: buffer resistor overload fault 0009: undervoltage	000D: Output phase loss 000E: Module overheating 000F: External fault 0010: abnormal communication 0011: Contactor abnormal 0012: current detection fault 0013: motor self-learning fault 0014: encoder/PG card fault 0015: parameter read/write exception 0016: inverter hardware	001B: User-defined fault 1 001C: User-defined fault 2 001D: Power-on Time Arrived 001E: Underload 001F: Runtime PID Feedback Missing 0020: STO Trigger 0021: STO1 Trigger 0022: STO2 Trigger 0028: Fast current limit timeout fault 0029: Switching motor fault during operation 002A: excessive speed deviation 002B: Motor overspeed

8001	BIT0: high water status alarm BIT1: low water status alarm BIT2: Water shortage alarm BIT3:PID feedback too low BIT4:PID feedback too high

Pd group communication parameter description

Pd-00	Baud rate (terminal RS485)	Factory Value	5005
	Setting range	Bits: Modbus baud rate	
		Bits: MODBUS (terminal RS485) 0:300BPS 1:600BPS 2:1200BPS 3:2400BPS 4:4800BPS 5:9600BPS 6:19200BPS 7:38400BPS 8:57600BPS 9:115200BPS	Ten: Reserved Hundred: Reserved Thousands: CAN (Bus Expansion Card) 0:20k 1:50K 2:100K 3:125K 4:250K 5:500K 6:1M

This parameter is used to set the data transmission rate between the upper computer and the frequency converter. Note that the baud rate set by the upper computer and the frequency converter must be consistent, otherwise, communication cannot be carried out. The greater the baud rate, the faster the communication speed.

Pd-01	MODBUS data format (terminal RS485)	Factory Value	3
	Setting range	0: no verification: data format <8-N-2> 1: even test: data format <8-E-1> 2: odd check: data format <8-O-1> 3: no verification: data format <8-N-1>	

The data format set by the upper computer and the frequency converter must be consistent, otherwise, the communication cannot be carried out.

Pd-02	Local address (terminal RS485)	Factory Value	1
	Setting range	1~247,0 is the broadcast address	

When the local address is set to 0, it is the broadcast address, and the broadcast function of the upper computer is realized.

The local address is unique (except for the broadcast address), which is the basis for point-to-point communication between the upper computer and the inverter.

Pd-03	MODBUS Response	Factory Value	2ms

	Delay (terminal RS485)		
	Setting range	0 to 20ms	

Response delay: refers to the intermediate time between the end of the inverter data acceptance and the data sent to the upper computer. If the response delay is less than the system processing time, the response delay is subject to the system processing time, if the response delay is longer than the system processing time, the system will wait until the response delay time to send data to the upper computer.

Pd-04	Serial communication timeout (terminal RS485)	Factory Value	0.0s
	Setting range	0.0s (invalid);0.1~60.0s	

When the function code is set to 0.0s, the communication timeout parameter is invalid.

When the function code is set to a valid value, if the interval between one communication and the next communication exceeds the communication timeout time, the system will report a communication fault error (FU16). Usually, it is set to invalid. If the secondary parameter is set in a continuous communication system, the communication condition can be monitored.

Pd-05	Communication protocol selection (terminal RS485)	Factory Value	31
	Setting range	Bits: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol	
		Ten: Reserved	

Pd-05 = 1: Select the standard Modbus protocol.

Pd-05 = 0: When reading the command, the number of bytes returned from the slave is one byte more than that of the standard Modbus protocol. For details, please refer to the "Communication Data Structure" section of this protocol.

Pd-06	Communication Read Current Resolution (terminal RS485)	Factory Value	0
	Setting range	0:0.01A (valid when ≤ 55kW); 1:0.1A	

The output unit used to determine the current value when the communication reads the output current.

Appendix C Expansion Card Function Description

Expansion Card Selection Table

Expansion Card Type	Expansion Card Name	Expansion Card Model	Expansion Card Description
Function Expansion Card	I-O Expansion Card 1	EV515IO1	Supports expansion of 4-channel digital input, 1-channel analog input, 1-channel analog output, 1-channel collector output and 1-channel relay output
	Relay Output Expansion Card 1	EV520IO2-K3	Supports expansion of 3-channel relay output
Closed-loop Expansion Card	Absolute Encoder PG Expansion Card-DB9	EV520PG-CT1	Absolute encoder closed-loop expansion card with DB9 external interface
	Absolute Encoder PG Expansion Card-TB	EV520PG-CT2	Absolute encoder closed-loop expansion card with European-style terminal block for external interface
	ABZ Encoder PG Card	EV520PG-ABZ	ABZ encoder closed-loop expansion card, compatible with differential input and open-collector input
	Resolver PG Card	EV515PG-RT1	Resolver closed-loop expansion card
	Motor Temperature Acquisition Card	EV520TM1	Motor temperature acquisition card. Via jumper selection, it supports 1-channel analog acquisition, or 1-channel PT100 / PT1000 / KTY84 temperature acquisition
	Positioning PG Card (For Straightening Machine)	EV520IO1	Supports 1-channel AB encoder detection, 4-channel digital input and 3-channel high-power collector output
Fieldbus Expansion Card	CANlink/CANopen Fieldbus Expansion Card	EV515CAN1	Supports CANlink / CANopen fieldbus expansion
	ModbusTCP/BACnet Fieldbus Expansion Card	EV515BACnet1	Supports ModbusTCP / BACnet fieldbus expansion
	EtherCAT Fieldbus Expansion Card	EV520EtherCAT1	Supports EtherCAT fieldbus expansion

C.1 I-O Expansion Card 1 (EV515IO1)

C.1.1 Introduction

EV515IO1 is a multi-functional I-O expansion card, adding 4-channel digital input, 1-channel analog input, 1-channel open-collector output, 1-channel relay output and 1-channel analog output.

This expansion card has two variants:

EV515IO1(PA6.0): Applicable to our low-power inverters: 0.4kW-2.2kW (S2 voltage class), 3.7kW-7.5kW (T2 voltage class), 0.75kW-15kW (T4/T5 voltage class).

EV515IO1(PA12.0): Applicable to our high-power inverters of 18.5kW and above (T4/T5 voltage class).



C.1.2 Interface Definition

AI3	GND	COM	+24V	NC	TA2	TB2	TC2
AO2	+15V	S6	S7	S8	S9	DO2	COM

Terminal Name	Terminal Purpose & Description
S6～S9	Multi-function digital input 1. Opto-coupler isolated, supports bipolar input 2. Input impedance: 5.1kΩ 3. Voltage range for level input: 9V～30V
+24V-COM	On-board +24V power supply (Current: 150mA)
+15V-GND	On-board +15V power supply (Current: 10mA)
COM	Common terminal for +24V
AI3-GND	Analog input. Voltage (0 ～ 10V) / Current (0 ～ 20mA) selectable via main-board jumperInput impedance: 10kΩ (voltage input) / 250Ω (current input)
GND	Reference zero potential for +10V (Note: GND is isolated from COM)
DO2	Open-collector output terminal, its corresponding common terminal is COM
AO2	Analog output terminal Output range: Voltage (0～10V) / Current (0～20mA)
TA2-TB2-TC2	TA2 relay output: TA2-common, TB2-normally-closed, TC2-normally-openContact rating: AC250V/3A, DC30V/1A

C.1.3 Relevant Parameter Settings

Configure the following basic parameters when using this card on the inverter. Perform parameter setting while the inverter is stopped.

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P4-05	S6 Terminal Function Selection(Normal for function expansion card; STO1 signal for STO expansion card)	0～63	0	Same as S1-S5, refer to Group P4 parameters
P4-06	S7 Terminal Function Selection(Normal for function expansion card; STO2 signal for STO expansion card)	0～63	0	Same as S1-S5, refer to Group P4 parameters
P4-07	S8 Terminal Function Selection(For function expansion card)	0～63	0	Same as S1-S5, refer to Group P4 parameters
P4-08	S9 Terminal Function Selection(For function expansion card)	0～63	0	Same as S1-S5, refer to Group P4 parameters
P4-23	AI Curve 3 Minimum Input	0.00V～P4-25	0.00V	Same as AI1, refer to Group P4 parameters
P4-24	Setting Corresponding to AI Curve 3 Minimum Input	0.00%～+100.0%	0.0%	Same as AI1, refer to Group P4 parameters
P4-25	AI Curve 3 Maximum Input	P4-23～+10.00V	10.00V	Same as AI1, refer to Group P4 parameters
P4-26	Setting Corresponding to AI Curve 3 Maximum Input	0.00%～+100.0%	100.0%	Same as AI1, refer to Group P4 parameters
P4-27	AI3 Input Filter Time	0.00s～10.00s	0.10s	Same as AI1, refer to Group P4 parameters
P5-04	DO1/T1A-T1C Output Function Selection(For function expansion card)	0～41	0	Same as HDO, refer to Group P5 parameters
P5-05	DO2/T2A-T2C Output Function Selection(For function expansion card)	0～41	0	Same as Relay 1 output function (TA-TB-TC), refer to Group P5 parameters
P5-12	AO2 Offset Coefficient	-100.0%～+100.0%	0.0%	Same as AO1 output function, refer to Group P5 parameters
P5-13	AO2 Gain	-10.00～+10.00	1.00	Same as AO1 output function, refer to Group P5 parameters

C.2 Relay Output Expansion Card 1(EV520IO2-K3)

C.2.1 Introduction

EV520IO2-K3 is a multi-function relay expansion card providing 3-channel relay output.

This expansion card has two variants:

EV520IO2-K3(PA6.0): Applicable to our low-power inverters: 0.4kW-2.2kW (S2 voltage class), 3.7kW-7.5kW (T2 voltage class), 0.75kW-15kW (T4/T5 voltage class).

EV520IO2-K3(PA12.0): Applicable to our high-power inverters of 18.5kW and above (T4/T5 voltage class).



C.2.2 Interface Definition

T1A	T1C	T2A	T2C	T3A	T3C

Terminal Name	Terminal Purpose & Description
TIA-T1C	T1A relay output, normally-open relay Contact rating: AC250V/3A, DC30V/1A
T2A-T2C	T2A relay output, normally-open relay Contact rating: AC250V/3A, DC30V/1A
T3A-T3C	T3A relay output, normally-open relay Contact rating: AC250V/3A, DC30V/1A

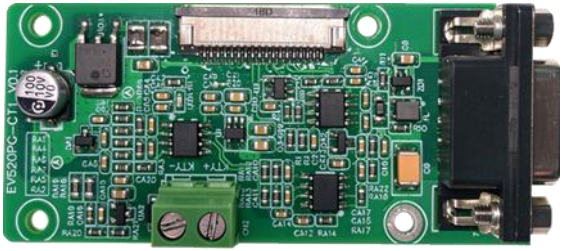
C.2.3 Relevant Parameter Settings

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P5-04	DO1/T1A-T1C Output Function Selection(For function expansion card)	0～41	0	Same as HDO, refer to Group P5 parameters
P5-05	DO2/T2A-T2C Output Function Selection(For function expansion card)	0～41	0	Same as Relay 1 output function (TA-TB-TC), refer to Group P5 parameters
P5-24	DO3/T3A-T3C Output Function Selection(For function expansion card)	0～41	0	Same as Relay 1 output function (TA-TB-TC), refer to Group P5 parameters

C.3 Absolute Encoder PG Expansion Card-DB9 (EV520PG-CT1)

C.3.1 Introduction

EV520PG-CT1 is an absolute encoder expansion card with DB9 interface. It works with our servo motors (17-bit / 23-bit encoder) and permanent-magnet synchronous motors.



C.3.2 Interface Definition

EV520PG-CT1 adopts DB9 (9-pin) connector for connection to inverter encoder module. Pin definitions are as follows:

Pin No.	Signal Name	Description
1	PS+	Absolute encoder communication positive
2	PS-	Absolute encoder communication negative
3	/	Reserved pin (Not connected)
4	/	Reserved pin (Not connected)
5	KTY-	Second terminal of KTY84-130
6	/	Reserved pin (Not connected)
7	+5V	5V power positive
8	GND	5V power ground
9	KTY+	One terminal of KTY84-130

Pin definition of European-style terminal block CN2:

KTY+	KTY-

Terminal Name	Terminal Purpose & Description
KTY+	One terminal of KTY84-130
KTY-	Second terminal of KTY84-130

C.3.3 Relevant Parameter Settings

■ Set the following basic parameters for resolver configuration on the inverter. Perform parameter setting while the inverter is stopped.

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P0-01	Control Mode Selection	0/1/2	0	Set to 1: Speed-sensor vector control mode
P1-00	Motor Type Selection	0～2	0	0: General asynchronous motor 1: Variable-frequency asynchronous motor 2: Permanent-magnet synchronous motor
P1-28	Encoder Type Selection	0～8	0	5: Single-turn Absolute Encoder (17-bit) 6: Single-turn Absolute Encoder (17-bit) (Auto-read motor parameters, for our company's motors) 7: Single-turn Absolute Encoder (23-bit) 8: Single-turn Absolute Encoder (23-bit) (Auto-read motor parameters, for our company's motors)
P1-01	Motor Rated Power	0.1～1000.0	/	Unit: kW, set according to motor nameplate
P1-02	Motor Rated Voltage	60～660	/	Unit: V, set according to motor nameplate
P1-03	Motor Rated Current	0.1～1500.0	/	Unit: A, set according to motor nameplate
P1-04	Motor Rated Frequency	20.00～Fmax	/	Unit: Hz, set according to motor nameplate
P1-05	Motor Rated Speed	1～30000	/	Unit: r/min, set according to motor nameplate
P1-30	Encoder Phase Sequence	0/1	0	
P1-37	Motor Auto-tuning	0～12	0	0: No operation 1: Static partial-parameter auto-tuning for asynchronous motor 2: Dynamic full auto-tuning for asynchronous motor 3: Static full auto-tuning for asynchronous motor 11: Loaded auto-tuning for synchronous motor 12: No-load auto-tuning for synchronous motor

■ If KTY84-130 temperature sensor is equipped, configure parameters below:

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P9-56	Motor Temperature Sensor Type	0/1/2/3	0	Set to 3: KTY84
P9-57	Motor Overheat Protection Threshold	0～200℃	110℃	Set as required
P9-58	Motor Overheat Pre-alarm Threshold	0～200℃	90℃	Set as required
P9-78	Motor Temperature Sampling Adjustment Coefficient	90.0～110%	100.0℃	Set as required
D0-34	Current Temperature Monitoring	/	/	View real-time sampled temperature value

C.4 Absolute Encoder PG Expansion Card-TB (EV520PG-CT2)

C.4.1 Introduction

EV520PG-CT2 is an absolute encoder expansion card with European-style terminal block. It works with our servo motors (17-bit / 23-bit encoder) and permanent-magnet synchronous motors.



C.4.2 Interface Definition

Pin definitions for European-style terminal block J1:

PG	PS-	PS+	GND	+5V

Terminal Name	Terminal Purpose & Description
PG	Protective ground terminal
PS-	Absolute encoder communication negative
PS+	Absolute encoder communication positive
GND	5V power ground
+5V	5V power positive

Pin definition of European-style terminal block CN2:

KTY+	KTY-

Terminal Name	Terminal Purpose & Description
KTY+	One terminal of KTY84-130
KTY-	Second terminal of KTY84-130

C.4.3 Relevant Parameter Settings

■ Set the following basic parameters for resolver configuration on the inverter. Perform parameter setting while the inverter is stopped.

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P0-01	Control Mode Selection	0/1/2	0	Set to 1: Speed-sensor vector control mode
P1-00	Motor Type Selection	0～2	0	0: General asynchronous motor 1: Variable-frequency asynchronous motor 2: Permanent-magnet synchronous motor
P1-28	Encoder Type Selection	0～8	0	5: Single-turn Absolute Encoder (17-bit) 6: Single-turn Absolute Encoder (17-bit) (Auto-read motor parameters, for our company's motors) 7: Single-turn Absolute Encoder (23-bit) 8: Single-turn Absolute Encoder (23-bit) (Auto-read motor parameters, for our company's motors)
P1-01	Motor Rated Power	0.1～1000.0	/	Unit: kW, set according to motor nameplate
P1-02	Motor Rated Voltage	60～660	/	Unit: V, set according to motor nameplate
P1-03	Motor Rated Current	0.1～1500.0	/	Unit: A, set according to motor nameplate
P1-04	Motor Rated Frequency	20.00～Fmax	/	Unit: Hz, set according to motor nameplate
P1-05	Motor Rated Speed	1～30000	/	Unit: r/min, set according to motor nameplate
P1-30	Encoder Phase Sequence	0/1	0	
P1-37	Motor Auto-tuning	0～12	0	0: No operation 1: Static partial-parameter auto-tuning for asynchronous motor 2: Dynamic full auto-tuning for asynchronous motor 3: Static full auto-tuning for asynchronous motor 11: Loaded auto-tuning for synchronous

Parameter Code	Parameter Name	Setting Range	Default Value	Description
				motor 12: No-load auto-tuning for synchronous motor

■ If KTY84-130 temperature sensor is equipped, configure parameters below:

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P9-56	Motor Temperature Sensor Type	0/1/2/3	0	Set to 3：KTY84
P9-57	Motor Overheat Protection Threshold	0～200℃	110℃	Set as required
P9-58	Motor Overheat Pre-alarm Threshold	0～200℃	90℃	Set as required
P9-78	Motor Temperature Sampling Adjustment Coefficient	90.0～110%	100.0℃	Set as required
D0-34	Current Temperature Monitoring	/	/	View real-time sampled temperature value

C.5 ABZ Encoder PG Expansion Card (EV520PG-ABZ)

C.5.1 Introduction

EV520PG-ABZ is an ABZ encoder expansion card with European-style terminal block. It supports differential input and open-collector input and shall be used with line-saving encoders.



C.5.2 Interface Definition

Pin definitions for European-style terminal block J1:

PE	COM	5/15V	Z-	Z+	B-	B+	A-	A+

Terminal Name	Terminal Purpose & Description
PE	Protective ground terminal

COM	5V/15V power ground
5/15V	5V/15V power positive
Z-	Encoder Z-phase input negative
Z+	Encoder Z-phase input positive
B-	Encoder B-phase input negative
B+	Encoder B-phase input positive
A-	Encoder A-phase input negative
A+	Encoder A-phase input positive

Pin definition of European-style terminal block CN2:

KTY+	KTY-

Terminal Name	Terminal Purpose & Description
KTY+	One terminal of KTY84-130
KTY-	Second terminal of KTY84-130

C.5.3 Relevant Parameter Settings

■ Set the following basic parameters for resolver configuration on the inverter. Perform parameter setting while the inverter is stopped.

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P0-01	Control Mode Selection	0/1/2	0	Set to 1: Speed-sensor vector control mode
P1-00	Motor Type Selection	0～2	0	0: General asynchronous motor 1: Variable-frequency asynchronous motor 2: Permanent-magnet synchronous motor
P1-28	Encoder Type Selection	0～8	0	0：ABZ encoder 4：UVW Encoder (Wire-saving Type)
P1-01	Motor Rated Power	0.1～1000.0	/	Unit: kW, set according to motor nameplate
P1-02	Motor Rated Voltage	60～660	/	Unit: V, set according to motor nameplate
P1-03	Motor Rated Current	0.1～1500.0	/	Unit: A, set according to motor nameplate
P1-04	Motor Rated Frequency	20.00～Fmax	/	Unit: Hz, set according to motor nameplate
P1-05	Motor Rated Speed	1～30000	/	Unit: r/min, set according to motor nameplate
P1-30	Encoder Phase Sequence	0/1	0	

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P1-37	Motor Auto-tuning	0～12	0	0: No operation 1: Static partial-parameter auto-tuning for asynchronous motor 2: Dynamic full auto-tuning for asynchronous motor 3: Static full auto-tuning for asynchronous motor 11: Loaded auto-tuning for synchronous motor 12: No-load auto-tuning for synchronous motor

■ If KTY84-130 temperature sensor is equipped, configure parameters below:

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P9-56	Motor Temperature Sensor Type	0/1/2/3	0	Set to 3：KTY84
P9-57	Motor Overheat Protection Threshold	0～200℃	110℃	Set as required
P9-58	Motor Overheat Pre-alarm Threshold	0～200℃	90℃	Set as required
P9-78	Motor Temperature Sampling Adjustment Coefficient	90.0～110%	100.0℃	Set as required
D0-34	Current Temperature Monitoring	/	/	View real-time sampled temperature value

C.6 Resolver PG Expansion Card (EV515PG-RT1)

C.6.1 Introduction

EV515PG-RT1 is resolver expansion card with excitation frequency of 10kHz and DB9 interface, compatible with resolver.



C.6.2 Interface Definition（PB9）

Resolver PG card uses DB9 (9-pin) connector for connection to inverter encoder module. Pin definitions are as follows:

Pin No.	Signal Name	Signal Type	Description
1	EXC-	Excitation Return-	Negative return terminal for excitation signal
2	EXC+	Excitation Input+	Positive input terminal for excitation signal
3	COS+	Cosine Signal+	Positive output of cosine signal
4	COS-	Cosine Signal-	Negative differential output of cosine signal
5	SIN+	Sine Signal+	Positive output of sine signal
6	/	Reserved	Reserved pin (Not connected)
7	KTY+	KTY+	Connect to one terminal of KTY84-130; leave unconnected if no KTY sensor
8	KTY-	KTY-	Connect to second terminal of KTY84-130; leave unconnected if no KTY sensor
9	SIN-	Sine Signal-	Negative differential output of sine signal

Wiring Notes

①Resolver signal cable shall be twisted-pair shielded cable, with single-point grounding for shield at inverter side.

②Signal cables shall be routed away from power cables; avoid parallel routing. Minimum spacing ≥200 mm is recommended.

③ Excitation drive circuit and signal conditioning circuit shall be powered by DC-DC isolation module.

④ Analog ground and digital ground shall adopt single-point connection.

⑤ For wiring, route SIN / COS signals as differential pairs and keep away from power circuits.

⑥ Perform insulation test after wiring completion to ensure no short-circuit or electric leakage.

C.6.3 Relevant Parameter Settings

■ Set the following basic parameters for resolver configuration on the inverter. Perform parameter setting while the inverter is stopped.

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P0-01	Control Mode Selection	0/1/2	0	Set to 1: Speed-sensor vector control mode
P1-00	Motor Type Selection	0～2	0	0: General asynchronous motor 1: Variable-frequency asynchronous motor 2: Permanent-magnet synchronous motor
P1-28	Encoder Type Selection	0～8	0	Set to 2：resolver
P1-01	Motor Rated Power	0.1～1000.0	/	Unit: kW, set according to motor nameplate
P1-02	Motor Rated Voltage	60～660	/	Unit: V, set according to motor nameplate
P1-03	Motor Rated Current	0.1～1500.0	/	Unit: A, set according to motor nameplate
P1-04	Motor Rated Frequency	20.00～Fmax	/	Unit: Hz, set according to motor nameplate
P1-05	Motor Rated Speed	1～30000	/	Unit: r/min, set according to motor nameplate
P1-30	Encoder Phase Sequence	0/1	0	
P1-34	Resolver Pole-pair Number	1～65535	1	Must match pole-pair number of resolver
P1-37	Motor Auto-tuning	0～12	0	0: No operation 1: Static partial-parameter auto-tuning for asynchronous motor 2: Dynamic full auto-tuning for asynchronous motor 3: Static full auto-tuning for asynchronous motor 11: Loaded auto-tuning for synchronous motor 12: No-load auto-tuning for synchronous motor

■ If KTY84-130 temperature sensor is equipped, configure parameters below:

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P9-56	Motor Temperature Sensor Type	0/1/2/3	0	Set to 3：KTY84
P9-57	Motor Overheat Protection Threshold	0～200℃	110℃	Set as required
P9-58	Motor Overheat Pre-alarm Threshold	0～200℃	90℃	Set as required
P9-78	Motor Temperature Sampling Adjustment Coefficient	90.0～110%	100.0℃	Set as required
D0-34	Current Temperature Monitoring	/	/	View real-time sampled temperature value

C.7 Motor Temperature Acquisition Card (EV520TM1)

C.7.1 Introduction

EV520TM1 is motor temperature acquisition card. By DIP-switch selection, it can acquire resistance value from PT100, PT1000, KTY84-130 and convert to real-time temperature.



C.7.2 Interface Definition

Pin definitions of EV520TM1 are as follows:

AI3	/	/	GND

Terminal Name	Terminal Purpose & Description
AI3	One terminal of temperature sensor
GND	Second terminal of temperature sensor

Detection circuit can be switched for different sensors via DIP-switch configuration.

C.7.3 Relevant Parameter Settings

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P9-56	Motor Temperature Sensor Type	0/1/2/3	0	0：No temperature detection 1：PT100 2：PT1000 3：KTY84
P9-57	Motor Overheat Protection Threshold	0～200℃	110℃	Set as required
P9-58	Motor Overheat Pre-alarm Threshold	0～200℃	90℃	Set as required
P9-78	Motor Temperature Sampling Adjustment Coefficient	90.0～110%	100.0℃	Set as required
D0-34	Current Temperature Monitoring	/	/	View real-time sampled temperature value

C.8 Positioning PG Card (For Straightening Machine) (EV520IO1)

C.8.1 Introduction

EV520IO1 is special-purpose positioning expansion card for steel bar straightening machine. It provides 4-channel digital input and 3-channel open-collector output. Collector outputs adopt high-power MOSFET, which can directly drive 24V high-power loads such as cutting knives. It also provides 1-channel AB encoder detection for length calculation.

This expansion card requires customized firmware. Please contact our company in advance if this card shall be applied for working conditions.



C.8.2 Interface Definition

Pin definitions of CN4:

SGND	24V	S6	S7	S8	S9	DO3	DO2	DO1

Terminal Name	Terminal Purpose & Description
S6～S9	Multi-function digital input 1. Opto-coupler isolated, supports bipolar input 2. Input impedance: 5.1kΩ 3. Voltage range for level input: 9V～30V
24V	External +24V power supply output
SGND	Common terminal for +24V
DO1～DO3	Open-collector output terminals, corresponding common terminal is SGND Capable of driving high-power equipment

Pin definitions of CN3:

VCC	GND	A	B

Terminal Name	Terminal Purpose & Description
VCC	On-board +24V power supply for encoder powering
GND	Common terminal for +24V
A-B	AB encoder signals

C.8.3 Relevant Parameter Settings

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P4-05	S6 Terminal Function Selection(Normal for function expansion card; STO1 signal for STO expansion card)	0～63	0	Same as S1-S5, refer to Group P4 parameters
P4-06	S7 Terminal Function Selection(Normal for function expansion card; STO2 signal for STO expansion card)	0～63	0	Same as S1-S5, refer to Group P4 parameters
P4-07	S8 Terminal Function Selection(For function expansion card)	0～63	0	Same as S1-S5, refer to Group P4 parameters
P4-08	S9 Terminal Function Selection(For function expansion card)	0～63	0	Same as S1-S5, refer to Group P4 parameters
P5-04	DO1/T1A-T1C Output Function Selection(For function expansion card)	0～41	0	Same as HDO, refer to Group P5 parameters
P5-05	DO2/T2A-T2C Output Function Selection(For function expansion card)	0～41	0	Same as Relay 1 output function (TA-TB-TC), refer to Group P5 parameters
P5-24	DO3/T3A-T3C Output Function Selection(For function expansion card)	0～41	0	Same as Relay 1 output function (TA-TB-TC), refer to Group P5 parameters

C.9 CANlink/CANopen Fieldbus Expansion Card (EV515CAN1)

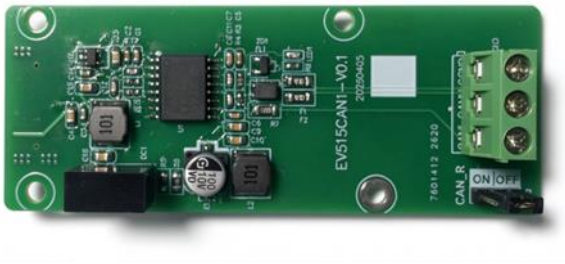
C.9.1 Introduction

EV515CAN1 is CAN communication expansion card, which connects inverter to high-speed CANLink / CANopen communication network for fieldbus control.

This expansion card has two variants:

EV515CAN1 (PA6.0): Applicable to our low-power inverters: 0.4kW-2.2kW (S2 voltage class), 3.7kW-7.5kW (T2 voltage class), 0.75kW-15kW (T4/T5 voltage class).

EV515CAN1 (PA12.0): Applicable to our high-power inverters of 18.5kW and above (T4/T5 voltage class).



C.9.2 Interface Definition

Pin definitions of EV515CAN1:

CANL	CANH	CGND

Terminal Name	Terminal Purpose & Description
CANL	CAN communication L
CANH	CAN communication H
CGND	CAN communication ground

C.9.3 Relevant Parameter Settings

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P0-02	Run Command Channel	0/1/2/3	0	Set to 3: Extended communication command channel (fieldbus expansion card) for bus control
P0-03	Main Frequency Source A Command Selection	0～10	0	Set to 10: Extended communication reference (fieldbus expansion card) for frequency reference
A4-05	CAN Communication Slave Address	1～247	1	CAN communication slave address
A4-06	CAN Communication Baud Rate	0～6	5	CAN communication slave baud rate
A4-07	CAN Communication Time-out Time	0.0: Disabled 0.1s～60.0s	0.0	Disabled by default

C.10 ModbusTCP / BACnet Fieldbus Expansion Card (EV515BACnet1)

C.10.1 Introduction

EV515BACnet1 is fieldbus adapter card supporting ModbusTCP, BACnet-MSTP, BACnet/IP. It enables inverter to act as fieldbus slave and accept control from fieldbus master.

This expansion card has two variants:

EV515BACnet1 (PA6.0): Applicable to our low-power inverters: 0.4kW-2.2kW (S2 voltage class), 3.7kW-7.5kW (T2 voltage class), 0.75kW-15kW (T4/T5 voltage class).

EV515BACnet1 (PA12.0): Applicable to our high-power inverters of 18.5kW and above (T4/T5 voltage class).



C.10.2 Interface Definition

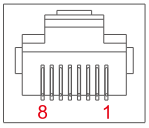
Pin definitions of CN3:

485A	485B	CGND

Terminal Name	Terminal Purpose & Description
485A	RS485+ for MSTP protocol
485B	RS485- for MSTP protocol
GND	Communication ground

Standard Ethernet port: BACnet/IP pin assignment:

Pin No.	Signal Name	Description
1	TX+	Transmit Data+
2	TX-	Transmit Data-
3	RX+	Receive Data+
4	N/C	Not connected
5	N/C	Not connected
6	RX-	Receive Data-
7	N/C	Not connected
8	N/C	Not connected



C.10.3 Relevant Parameter Settings

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P0-02	Run Command Channel	0/1/2/3	0	Set to 3: Extended communication command channel (fieldbus expansion card) for bus control
P0-03	Main Frequency Source A Command Selection	0～10	0	Set to 10: Extended communication reference (fieldbus expansion card) for frequency reference
A4-00	BACnet MSTP Local Device Address	1～247	1	BACnet MSTP local device address
A4-01	BACnet MSTP Communication Mode Selection	1	1	1: A4-02 (BACnet MSTP baud rate setting) takes effect
A4-02	BACnet MSTP Baud Rate	0～5	2	Default baud rate:19200
A4-03	BACnet MSTP Communication Time-out Time	0.0:Disabled 0.1s-60.0s	0.0	Disabled by default
A4-20	Bus expansion card Ethernet IP address 1	0～255	192	Takes effect after modification and restart
A4-21	Bus expansion card Ethernet IP address 2	0～255	168	Takes effect after modification and restart
A4-22	Bus expansion card Ethernet IP address 3	0～255	0	Takes effect after modification and restart
A4-23	Bus expansion card Ethernet IP address 4	0～255	20	Takes effect after modification and restart
A4-24	Bus expansion card Ethernet subnet mask 1	0～255	255	Takes effect after modification and restart
A4-25	Bus expansion card Ethernet subnet mask 2	0～255	255	Takes effect after modification and restart
A4-26	Bus expansion card Ethernet subnet mask 3	0～255	255	Takes effect after modification and restart
A4-27	Bus expansion card Ethernet subnet mask 4	0～255	0	Takes effect after modification and restart
A4-28	Bus expansion card Ethernet gateway 1	0～255	192	Takes effect after modification and restart
A4-29	Bus expansion card Ethernet gateway 2	0～255	168	Takes effect after modification and restart
A4-30	Bus expansion card Ethernet gateway 3	0～255	0	Takes effect after modification and restart
A4-31	Bus expansion card Ethernet gateway 4	0～255	1	Takes effect after modification and restart

C.11 EtherCAT Fieldbus Expansion Card (EV520EtherCAT1)

C.11.1 Introduction

EV520EtherCAT1 is EtherCAT fieldbus adapter card for ultra-high-speed industrial I/O network. Protocol processing is implemented at I/O layer with advantages of high efficiency, flexible topology and easy operation.

This expansion card has two variants:

EV520EtherCAT1 (PA6.0): Applicable to our low-power inverters: 0.4kW-2.2kW (S2 voltage class), 3.7kW-7.5kW (T2 voltage class), 0.75kW-15kW (T4/T5 voltage class).

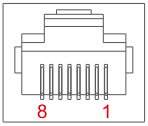
EV520EtherCAT1 (PA12.0): Applicable to our high-power inverters of 18.5kW and above (T4/T5 voltage class).



C.11.2 Interface Definition

EV520EtherCAT1 uses standard RJ45 connectors. This communication option has two RJ45 ports: IN for input and OUT for output. Pin assignment is shown below:

Pin No.	Signal Name	Description
1	TX+	Transmit Data+
2	TX-	Transmit Data-
3	RX+	Receive Data+
4	N/C	Not connected
5	N/C	Not connected
6	RX-	Receive Data-
7	N/C	Not connected
8	N/C	Not connected



C.11.3 Relevant Parameter Settings

Parameter Code	Parameter Name	Setting Range	Default Value	Description
P0-02	Run Command Channel	0/1/2/3	0	Set to 3: Extended communication command channel (fieldbus expansion card) for bus control
P0-03	Main Frequency Source A Command Selection	0～10	0	Set to 10: Extended communication reference (fieldbus expansion card) for frequency reference





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