JANSON CONTROLS

Professional manufacturer in electric drive
and industry control since 2012

FC300 Series Vector General Purpose AC Drive

User Manual Book

Contents

Contents

Preface

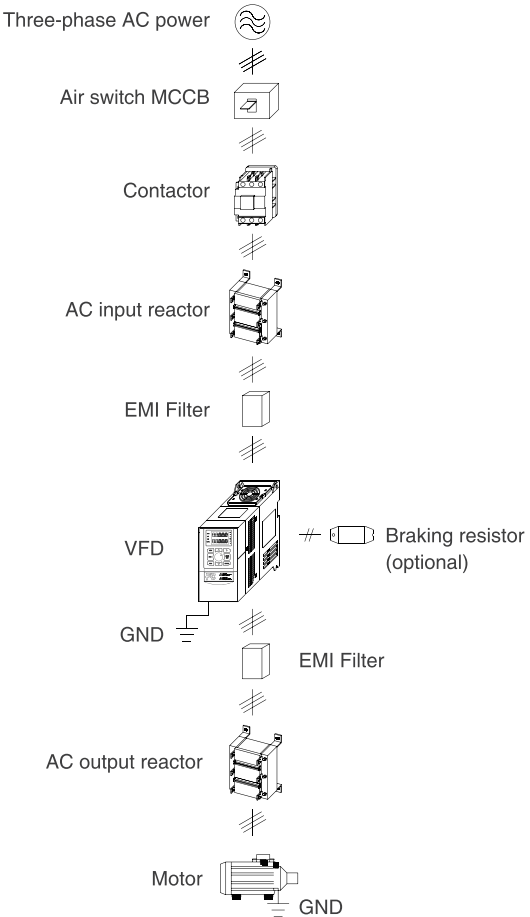
Thank you for purchasing the FC300 series vector general purpose AC drive for PMSM & induction motors developed by Our company.

This manual introduces how to use FC300 series frequency inverter correctly, and comprehensively introduces the functional characteristics and usage methods of FC300 frequency inverter, including product selection, parameter setting, operation debugging, maintenance inspection and other detailed information. Before use,please read this manual carefully. At the same time, please use the product after fully understanding the safety precautions of the product.

Precautions

- In order to illustrate the details of the product, the illustrations in this manual sometimes show the state where the cover or safety cover is removed. When using this product, please be sure to install the case or cover according to the regulations, and operate according to the contents of the manual.
- Illustrations in this manual are for illustration only and may differ from the product you ordered.
- The company is committed to the continuous improvement of products,and product functions will be continuously upgraded. The information provided is subject to change without prior notice.

Connections to Peripherals



Basic Application Quick Start

Note: Some parameters have been set before leaving the factory (factory value), and you don't need to set them for the first time.

1. Correctly set the rated parameters of the motor.

Power on, use the operation panel to set the parameters in the table below, and refer to the motor nameplate for the motor parameters.

Parameter number	Parameter name	Parameter number	Parameter name
P1-01	Motor rated power	P1-04	Motor rated frequency
P1-02	Motor rated voltage	P1-05	Motor rated speed
P1-03	Motor rated current		

2. Use the operation panel to control the start and stop and set the operating frequency.

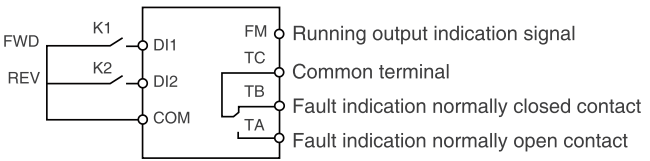
(1) Power-on. Use the operation panel to set motor parameters (P1-01 to P1-05) , running frequency (P1-08) and acceleration/deceleration time (P0-17, P0-18)

Parameter number	Parameter name	Parameter number	Parameter name
P0-02	Command Set Channel Selection	0 (factory default)	Run command channel as keyboard
P0-03	Frequency setting channel selection	0	The operating frequency is given by the keyboard number
P0-17	Acceleration time 1	-	Acceleration time, adjust according to actual needs
P0-18	Deceleration time 1	-	Deceleration time, adjust according to actual needs

(2) Press the key on the operation panel **RUN** to start the inverter, press ▲ / ▼ key to increase/decrease the set frequency, and press the key **STOP** to stop the inverter output.

3. Use the terminal to control the start and stop and the keyboard potentiometer to set the operating frequency.

(1) Terminal DI1 is for forward rotation signal input, DI2 is for reverse rotation signal input, the wiring is as shown in the figure below.



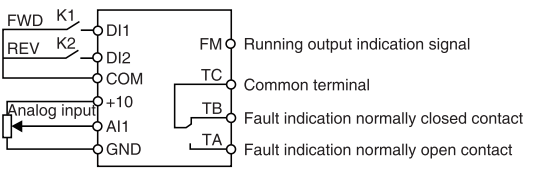
(2) Power on, and then set the function parameters according to the wiring diagram, see the table below.

Parameter number	Parameter name	Set value	Meaning
P0-02	Command Set Channel Selection	1	Run command channel as terminal
P0-03	Frequency setting channel selection	3 (factory value)	The operating frequency is given by the keyboard potentiometer
P0-17	Acceleration time 1	-	Acceleration time, adjust according to actual needs
P0-18	Deceleration time 1	-	Deceleration time, adjust according to actual needs
P4-00	DI1 terminal function	1 (factory default)	Forward rotation function (terminal forward rotation signal input)
P4-01	DI2 terminal function	1 (factory value)	Reverse function (terminal reverse signal input)

(3) When K1 in the wiring diagram is closed, the motor runs forward; when K1 is disconnected,the motor stops running. When K2 is closed, the motor runs in reverse; when K2 is disconnected, themotor stops running. When K1 and K2 are closed or disconnected at the same time, the motor willstop running. You can increase/decrease the set frequency by changing the size of the keyboard knob .

4. Use the terminal to control the start and stop and set the operating frequency by analog.

(1) Terminal DI1 is for forward rotation signal input, DI2 is for reverse rotation signal input, the wiring is as shown in the figure below.



(2) Power on, and then set the function parameters according to the wiring diagram, see the table below.

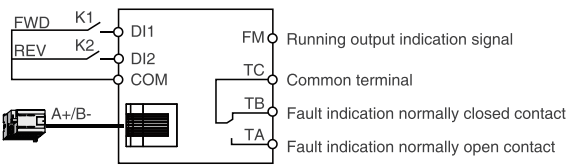
Parameter number	Parameter name	set value	Meaning
P0-02	Command set channel selection	1	Run command channel as terminal
P0-03	Frequency setting channel selection	2	The operating frequency is given by the AI1 external potentiometer
P0-17	Acceleration time 1	-	Acceleration time, adjust according to actual needs
P0-18	Deceleration time 1	-	Deceleration time, adjust according to actual needs
P4-00	DI1 terminal function	1 (factory default)	Forward rotation function (terminal forward rotation signal input)
P4-01	DI2 terminal function	2 (factory value)	Reverse function (terminal reverse signal input)

(3) Set the operating frequency by adjusting the AI1 analog input.

(4) When K1 in the wiring diagram is closed, the motor runs forward; when K1 is disconnected,the motor stops running. When K2 is closed, the motor runs in reverse; when K2 is disconnected, the motor stops running. When K1 and K2 are closed or disconnected at the same time, the motor will stop running.

5. Use the terminal to control the start and stop and communicate to set the operating frequency.

(1) Terminal DI1 is for forward rotation signal input, DI2 is for reverse rotation signal input, the wiring is as shown in the figure below.



(2) Power on, and then set the function parameters according to the wiring diagram, see the table below.

Parameter number	Parameter name	set value	Meaning
P0-02	Command Set Channel Selection	1	Run command channel as terminal
P0-03	Frequency setting channel selection	9	The operating frequency is given by communication
P0-17	Acceleration time 1	-	Acceleration time, adjust according to actual needs
P0-18	Deceleration time 1	-	Deceleration time, adjust according to actual needs
P4-00	DI1 terminal function	1 (factory default)	Forward rotation function (terminal forward rotation signal input)
P4-01	DI2 terminal function	2 (factory value)	Reverse function (terminal reverse signal input)

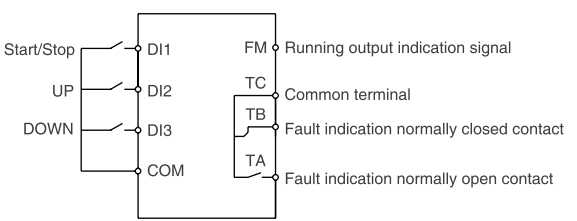
Parameter number	Parameter name	set value	Meaning
P5-00	FM terminal output mode	1	FMR switch output
P5-01	FM terminal function	1	Inverter running
Pd-00	Baud rate	5(factory value)	9600bps
Pd-01	Data Format	3(factory value)	8-N-1format,no parity, RTU
Pd-02	Local address	1 (factory default)	

(3) When K1 in the wiring diagram is closed, the motor runs forward; when K1 is disconnected,the motor stops running. When K2 is closed, the motor runs in reverse; when K2 is disconnected, the motor stops running. When K1 and K2 are closed or disconnected at the same time, the motor will stop running.

(4) Write register 0xF008H (P0-08) through SCI communication function code 0x06 to modify the running frequencycode 0x06 to modify the running frequency.

6. Use the terminal to control the start and stop and the terminal UP / DOWN to control the operating frequency.

(1) Terminal DI1 is the start/stop signal input, DI2 is the UP signal input, DI3 is the DOWN signal input, the wiring is as shown in the figure below.

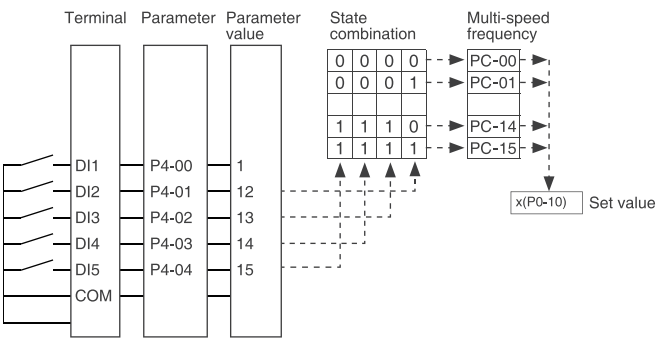


(2) Power on, and then set the function parameters according to the wiring diagram, see the table below.

Parameter number	Parameter name	set value	Meaning
P0-02	Command set channel selection	1	Run command channel as terminal
P0-03	Frequency setting channel selection	9	Given by terminals UP and DOWN
P0-17	Acceleration time 1	-	Acceleration time, adjust according to actual needs
P0-18	Deceleration time 1	-	Deceleration time, adjust according to actual needs
P5-00	FM terminal output mode	1	FMR switch output
P5-01	FM terminal function	1	Inverter running

7. Use the terminal to control the multi-stage speed of the inverter

(1) Terminal DI1 is start/stop signal input,DI2 is multi-stage speed signal 1 input, DI3 is multistage speed signal 2 input,DI4 is multi-stage speed signal 3, DI5 is multi-stage speed signal 4,the wiring is as shown in the figure below.



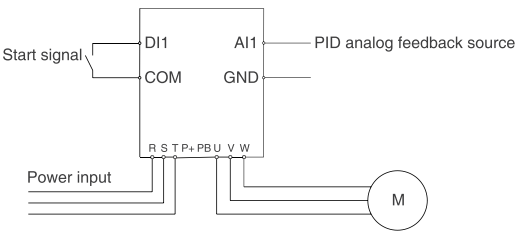
(2) Power on, and then set the function parameters according to the wiring diagram, see the table below.

Parameter number	Parameter name	set value	Meaning
P0-02	Command set channel selection	1	Run command channel as terminal
P0-03	Frequency setting channel selection	6	The operating frequency is given by the multi-stage speed
P0-17	Acceleration time 1	-	Acceleration time, adjust according to actual needs
P0-18	Deceleration time 1	-	Deceleration time, adjust according to actual needs
P4-00	DI1 terminal function	1 (factory default)	Forward rotation function (terminal forward rotation signal input)
P4-01	DI2 terminal function	12 (factory value)	Multi-stage speed command terminal signal 1 input
P4-02	DI3 terminal function	13 (factory value)	Multi-stage speed command terminal signal 2 input
P4-03	DI4 terminal function	14 (factory value)	Multi-stage speed command terminal signal 3 input
P4-04	DI5 terminal function	15 (factory value)	Multi-stage speed command terminal signal 4 input
PC-00	multi-segment instruction 0	-	Adjust according to actual needs
PC-01	multi-segment instruction 1	-	Adjust according to actual needs
PC-02	multi-segment instruction 2	-	Adjust according to actual needs
PC-03	multi-segment instruction 3	-	Adjust according to actual needs
PC-04	multi-segment instruction 4-	-	Adjust according to actual needs

PC-05	multi-segment instruction 5	-	Adjust according to actual needs
PC-06	multi-segment instruction 6	-	Adjust according to actual needs
PC-07	multi-segment instruction 7	-	Adjust according to actual needs

8. Process PID application function control

(1) Terminal DI1 is the start/stop signal input, AI1 is the PID analog feedback source input, the wiring is as shown in the figure below.



(2) Power on,and then set the function parameters according to the wiring diagram,see the table below.

Parameter number	Parameter name	set value	Meaning
P0-02	Command Set Channel Selection	1	Run command channel as terminal
P0-03	Frequency setting channel selection	8	Given by the PID
P0-17	Acceleration time 1	-	Acceleration time, adjust according to actual needs
P0-18	Deceleration time 1	-	Deceleration time, adjust according to actual needs
PA-00	PID given source	0 (factory value)	PID given source is set for PA -01

Parameter number	Parameter name	set value	Meaning
PA-01	PID value given	50% (factory value)	Adjust according to actual needs
PA-02	PID Feedback Source	0 (factory value)	Analog AI1 feedback input

9. Motor parameter adjustment and setting

(1) Motor parameter tuning can only be performed in the operation panel control mode.

(2) Wiring correctly.

(3) Power on, set the motor parameters (P1-00~P1-05) with the operation panel.

(4) Parameter tuning, the tuning methods that can be used in different control modes are shown in the table below.

Control method	Self-tuning method (recommended)	
V/F control	Manual torque boost using static, rotating, stator resistance auto-tuning	Automatic torque boost using stationary, rotating autotune
Vector control	Use rotating autotune	

Static tuning of motor parameters:

P1-37 = 1 (static self-tuning) , press the button to **PRG** to the display state of the stop parameters, and press the button **RUN** to start the self-tuning.

After the auto-tuning is finished, P1-06~P1-08 will be refreshed automatically.

Parameter number	Parameter name	Parameter number	Parameter name
P1-06	Motor stator resistance	P1-08	Motor leakage inductance
P1-07	Electronic rotor resistance		

Motor parameters rotary tuning:

- Before performing rotary tuning, please disconnect the motor from the load.
- Then set P1-37 = 2 (rotary tuning) , press the key **PRG** to return to the stop parameter display state, and press the key **RUN** to start the auto-tuning.
- During the rotation of the motor, there may be vibration or even overcurrent. At this time, press the key **STOP** to stop the parameter setting, and adjust the acceleration and deceleration time properly to reduce the possible vibration.
- After parameter tuning is completed, P1-06~P1-10 will be refreshed automatically.

Parameter number	Parameter name	Parameter number	Parameter name
P1-05	Rated speed of motor 1	P1-08	Motor 1 leakage inductance
P1-06	Motor 1 Stator Resistance	P1-09	Motor 1 Mutual Inductance Reactance
P1-07	Motor 1 rotor resistance	P1-10	Motor 1 no-load excitation current

Chapter 1
Safety Information and Precautions

1.1 Security definition

⚠ **DANGER:** Information marked as Danger is critical to avoid safety incidents.
⚠ **WARNING:** Information marked as a WARNING is necessary to avoid damage to the product or other equipment
⚠ **CAUTION:** Information marked as a CAUTION assists in the proper use of the product.

1.2 Motor and mechanical load related

Compared with power frequency operation

FC300 is a voltage type inverter, the output voltage is PWM wave, which contains certain harmonics. Therefore, the temperature rise, noise and vibration of the motor during use are slightly increased compared with power frequency operation.

Constant torque low speed operation

When the Frequency Inverter drives the ordinary motor to run at low speed for a long time, the output torque will decrease due to the deterioration of the heat dissipation effect of the motor. If it is in the long-term low-speed constant torque operation condition, it is recommended to choose a frequency conversion motor.

Electronic thermal protection of the motor

When selecting a suitable motor, the inverter can effectively implement thermal protection for the motor. If the power of the controlled motor does not match the inverter, you must adjust the motor protection parameters or other protection measures to ensure the safe and reliable operation of the motor.

Above the rated frequency of the motor

If the motor is operated above its rated frequency, the noise will increase. It is necessary to pay attention to the vibration of the motor, and at the same time to ensure that the motor bearings and mechanical devices can meet the requirements of the operating speed range.

Lubrication of mechanical devices

For long-term low-speed operation, mechanical devices such as gearboxes and gears should be regularly lubricated and maintained to ensure that the transmission effect can meet the needs of the site.

Mechanical resonance point

Avoid the mechanical resonance point of the load device or the motor by setting the jump frequency of the inverter (P8-09-P8-10) .

Motor Insulation Inspection

When the motor is used for the first time or after long-term storage, the motor insulation should be inspected to avoid damage to the inverter due to deterioration of the motor insulation.

Notice: Please use a 500V voltage type megohmmeter for the test, and the insulation resistance is not less than 5 megohms.

Negative torque load

For occasions such as lifting loads, negative torque often occurs, and the inverter often trips due to over-current or over-voltage faults . Braking components with appropriate parameters should be considered.

Leakage current protector RCD requirements

When the equipment is in operation, a large leakage current will flow through the protective grounding conductor. Please install a B-type leakage protector RCD on one side of the power supply. When selecting the RCD of the leakage protector, the transient and steady-state leakage current to the ground that may occur during the start-up and operation of the equipment should be considered,and a special RCD with measures to suppress high-order harmonics, or a general-purpose RCD with a large residual current should be selected.

Earth leakage warning

The device will generate a large leakage current during operation. Before connecting to the input power supply, please be sure to ground it reliably. The grounding of the equipment must comply with the relevant IEC standards of local regulations.

1.3 Inverter related

It is forbidden to install capacitors or pressure-sensitive devices to improve power factor on the output side

Since the output of the inverter is a PWM wave, it is strictly forbidden to install a capacitor for improving the power factor or a piezoresistor for lightning protection on the output side to avoid possible tripping of the inverter or damage to the device.

The output end is externally connected with switching devices such as contactors

If there are switching devices such as contactors installed between the inverter and the motor,please make sure that the inverter has no output and perform on-off operations, otherwise the inverter will be damaged.

Operating voltage

It is strictly forbidden to use directly outside the voltage range specified by FC300. If the power supply voltage is not suitable, the corresponding voltage regulating device should be used to transform the voltage to obtain a voltage that meets the product's use.

Capacitor energy storage

In the event that the AC power supply is cut off, the capacitors in the Frequency Inverter will remain charged for a period of time, and the voltage is enough to kill. If the inverter has been powered on before, you must cut off the AC power supply for more than 10 minutes, and confirm that the internal charging indicator light is off, and the voltage between the power terminals (+) and (-) is lower than 36V before disassembling the machine.

Normally, internal circuitry discharges the capacitor. However, under some abnormal conditions,the capacitor may not be able to discharge. In this case, please consult our company or distributors.

Three-phase input changed to single-phase input

For three-phase input inverter, users are advised not to change to single-phase input.

If single-phase power must be used, the input phase loss protection function should be cancelled. The bus voltage and current ripple will increase, resulting in poor performance of the inverter and shortened capacitor life; in this application, derating is required, not exceeding 60% of the rated value of the inverter.

Lightning impact protection

The inverter is designed with a lightning strike overcurrent protection circuit, which has a certain self-protection ability against induced lightning.

Altitude and derating

In areas where the altitude exceeds 1000 meters,the heat dissipation effect of FC300 will be deteriorated due to the thin air. At this time, FC300 must be used with derating.

Every time the altitude rises by 100m, the output current rating will be reduced by 1%. That is, the altitude rises to 4000m, and the inverter current rating is derated by 30%.

Figure 1-1 is the derating relationship curve between the rated current of the inverter and the altitude above sea level.

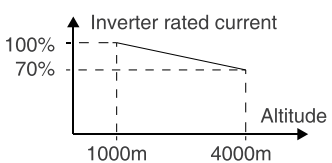
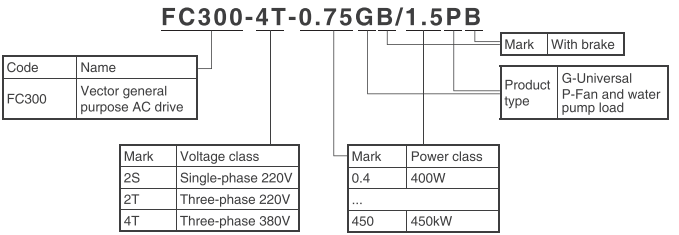


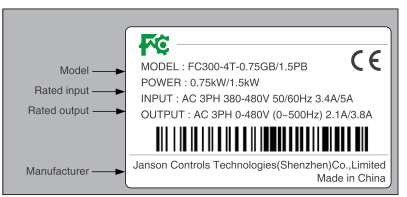
Figure 1-1 derating relationship curve

Chapter 2 Product Information

2.1 Model



2.2 Nameplate



2.3 Rated value

For structural specifications, please refer to Section Dimensions and Installation Dimensions,page 26.

Model	Adapted motor (kW)	Rated input current (A)	Rated output current (A)	Rated capacity (kVA)	Structural specification
1/3 Phase Input and 3 Phase Output 220V (-15%~+15% Tolerance)					
FC300-2S-0.4GB	0.4	6.5	2.1	0.7	S1
FC300-2S-0.75GB	0.75	8.2	4.0	1.5	S1

FC300-2S-1.5GB	1.5	14	7	3	S1
FC300-2S-2.2GB	2.2	23	9.6	4	S1
FC300-2S-4.0GB	4	35	17	11	S3
FC300-2S-5.5GB	5.5	45	25	17	S4
FC300-2S-7.5GB	7.5	75	32	21	S4
FC300-2S-11G(B)	11	100	45	30	S5
FC300-2S-15G(B)	15	130	60	39	S5
3 Phase Input and 3 Phase Output 220V (-15%~+15% Tolerance)					
FC300-2T-18.5G(B)	18.5	77	75	57	S5
FC300-2T-22G(B)	22	92	90	69	S6
FC300-2T-30G(B)	30	113	110	85	S6
3 Phase Input and 3 Phase Output 380V (-15%~+15% Tolerance)					
FC300-4T-0.75GB/1.5PB	0.75/1.5	3.4/5	2.1/3.8	1.5/3	S1
FC300-4T-1.5GB/2.2PB	1.5/2.2	5/5.8	3.8/5.1	3/4	S1
FC300-4T-2.2GB/4.0PB	2.2/4	5.8/10.5	5.1/9	4/5.9	S1
FC300-4T-4.0GB/5.5PB	4/5.5	10.5/14.6	9/13	5.9/8.9	S2
FC300-4T-5.5GB/7.5PB	5.5/7.5	14.6/19	13/17	8.9/11	S2
FC300-4T-7.5GB/11PB	7.5/11	19/28	17/25	11/16	S2
FC300-4T-11GB/15PB	11/15	28/35	25/32	16/21	S3
FC300-4T-15GB/18.5PB	15/18.5	35/39	32/37	21/24	S3
FC300-4T-18.5GB/22PB	18.5/22	39/47	37/45	24/30	S4
FC300-4T-22GB/30PB	22/30	47/62	45/60	30/39	S4
FC300-4T-30G(B)/37P(B)	30/37	62/77	60/75	39/49	S5
FC300-4T-37G(B)/45P(B)	37/45	77/92	75/90	49/59	S5
FC300-4T-45G(B)/55P(B)	45/55	92/113	90/110	59/72	S6
FC300-4T-55G(B)	55	113	110	72	S6
FC300-4T-55G(B)/75P(B)	55/75	113/156	110/152	72/114	S7
FC300-4T-75G(B)/90P(B)	75/90	156/180	152/173	114/134	S7
FC300-4T-90G/110P	90/110	180/214	176/210	134/160	S8
FC300-4T-110G/132P	110/132	214/256	210/253	160/192	S8

Model	Adapted motor (kW)	Rated input current (A)	Rated output current (A)	Rated capacity (kVA)	Structural specification
FC300-4T-132G/160P	132/160	256/307	253/304	192/231	S9
FC300-4T-160G/185P	160/185	307/345	304/340	231/236	S9
FC300-4T-185G	185	345	340	236	S9
FC300-4T-200G/220P	200/220	385/430	377/426	250/280	S10
FC300-4T-220G/250P	220/250	430/468	426/465	280/355	S10
FC300-4T-250G/280P	250/280	468/525	465/520	355/396	S11
FC300-4T-280G/315P	280/315	525/590	520/585	396/445	S11
FC300-4T-315G/355P	315/355	590/665	585/650	445/500	S12
FC300-4T-355G/400P	355/400	665/785	650/725	500/565	S12
FC300-4T-400G/450P	400/450	785/883	725/800	565/630	S12
FC300-4T-450G	450	883	820	630	S12

2.4 Technical specifications

Electrical specifications	
Input Voltage	AC 1PH 200(-15%)~240(+10%) AC 3PH 380(-15%)~440(+10%)
Input Frequency	50/60Hz ± 5%
Output Voltage	0V~Input Voltage
Output Frequency	Vector Control:0~500Hz V/F Control:0~3200Hz
Performance	
Drive motor type	Asynchronous motor, Permanent magnet synchronous motor
Overload Capacity	150% rated output current for 1 minute, 180% rated output current for 2 seconds
Control Method	Open-loop vector control (SVC), V/F control
Run Command Setting Method	Operation Panel Setting, External Terminal Setting,Communication Setting

Speed Setting Method	Digital setting, analog setting/pulse setting, communication setting
Speed Setting Resolution	Digital setting: 0.01Hz, Analog setting: 1% × maximum frequency
Speed Control Accuracy	SVC: ±0.5%
Speed Control Range	SVC: 1:100
Torque Control Response	SVC: <200ms
Starting Torque	SVC: 150% rated torque/0.5Hz
Special feature	
Programmable Input & Output Terminals	Input& Output terminal function can be edited
Process PID Adjustment Function	Built-in process PID module
Simple PLC Function	Built-in simple PLC module, which can realize timing and multi-segment frequency output
Textile Wobble Function	Built-in textile swing frequency function module
Water Supply Function	Built-in constant pressure water supply parameter macro
Fire Mode	Built-in European fire mode parameter set
Protective function	
Overvoltage Stall	Bus voltage automatic control to prevent overvoltage fault
Automatic Current Limiting Protection	Output current is automatically limited to prevent over-current faults
Overload Pre-Alarm & Alarm	Overload Pre-warning and protection
Output Phase Loss Protection	Output phase loss automatic detection and alarm function
Overvoltage & Overflow Stall Control	Automatically limit current and voltage during operation to prevent frequent over-current and over-voltage tripping
Output Short-to-Ground Protection	Effective protection function for output short circuit to ground
Output Phase-to-Phase Short Circuit Protection	Output interphase short circuit effective protection function
Input & output	
External analog power supply	+10V-GND

External digital power supply	24V-COM
Analog Input	AI1:Voltage 0~10V/0-20mA AI2:Voltage -10~+10V/0-20mA
Analog Output	AO1:0~10V/0~20mA(Voltage/Current Optional) AO2:0~10V/0~20mA(Voltage/Current Optional)
Digital Input	DI1~DI5(can be selected as a high-speed pulse signal)
Digital Output	FM,AO2,FM can be selected as high-frequency pulse signal output
Relay output	TA/TB/TC and RA/RB/RC:Contact rating 250VAC/3A or 30VDC/1A
MODBUS Communication	A+、B-
Operation display	
LED Display	Set frequency, output frequency, output voltage, output current, motor speed, Output torque, digital terminals, status parameters, programming menu parameters and fault codes etc
Indicator Light	3 unit indicators, 4 status indicators
Environmental characteristics	
Working Temperature	-10~+40℃ , Maximum temperature is 50°C, Air Temperature change is less than 0.5°C/min,40~50℃ Derating is required, output current derating 2% for each 1℃
Storage Environment Temperature	-40~+70℃
Application	Indoor, free from direct sunlight, dust, corrosive gas, flammable gas, oil mist, water vapor, dripping water or salt etc.
Altitude	Less than 1000 meters, derating is required for more than 1000 meters
Humidity	Less than 95%RH, no condensation
Vibration Resistance	3.5m/s² at 2-9Hz, 10m/s² at 9-200Hz (IEC60721-3-3)
Protection Degree	IP20
Pollution Level	Class 2 (dry, non-conductive dust pollution)
Certification	
CE	The whole series has passed CE certification

Chapter 3 Mechanical Installation

3.1 Installation precautions

⚠ Danger
· If the parts of the inverter are incomplete or damaged, please do not install it. · During transportation, please use appropriate tools according to the weight of the inverter to avoid being cut by sharp corners or being injured when the inverter rolls over or falls. · The inverter should be installed on flame-retardant objects such as metals, away from flammable and explosive objects. · After the inverter is reliably powered off for 10 minutes, make sure that the internal charging indicator light is off and the voltage between the power terminals (+) and (-) is lower than 36V before operating.

⚠ Warn
· When transporting, please hold the bottom of the inverter instead of just the operation panel and cover. · During installation work, do not drop wires, screws, and drilling residues into the inverter.

3.2 Installation site requirements

Confirm that the installation site meets the following conditions:

- Avoid installing in places exposed to direct sunlight, humidity, and drops of water;
- Avoid installing in places with flammable, explosive and corrosive gases and liquids;
- Avoid installing in places with oily dust, fibers and metal particles;
- Install vertically on an object that is flame retardant and can bear the weight of the fuselage;
- There is enough heat dissipation space around the inverter to ensure that the ambient temperature is within -10-+40℃ ;

- The installation foundation is solid, meeting the product vibration requirements, 3.5m/s 2 at 2-9Hz, 10m/s 2 at 9-200Hz (IEC60721-3-3);
- Installed in a place where the humidity is less than 95%RH and there is no condensation of water droplets;
- The protection level of the frequency inverter is IP20, and the pollution level is level 2 (dry,non-conductive dust pollution).

Notice:

1. If the operating environment of the inverter exceeds 40℃ , derating is required. For every increase of 1℃ , the inverter needs to be derated by 2%. The maximum working ambient temperature is 50°C .

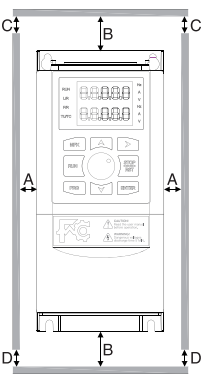
2. Keep the ambient temperature -10~+40℃ , install it in a well-ventilated place or add a cooling device, which can improve the reliability of the inverter operation.

3.3 Installation direction and space

In order to make the inverter have a good heat dissipation effect, the inverter must be installed vertically, and there must be enough space between the top, bottom, left, and right sides and adjacent objects or baffles (such as walls). The installation space dimensions are shown in Table 3-1 .

Table 3-1 Inverter Installation Space Dimensions table

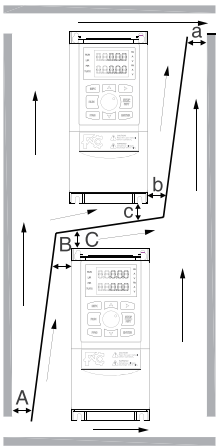
Inverter class	≤15 kW	≥18.5 kW ＜ 55kW	≥ 75kW
A (left and right)	≥10mm	≥ 30 mm	≥150mm
B (up and down)	≥100mm	≥100mm	≥350mm
C (upper vent)	≥50mm	≥50mm	≥100mm
D (lower vent)	≥50mm	≥50mm	≥100mm



When multiple frequency inverter are installed up and down, there should be a flow guide partition in the middle, and the installation space size is shown in Table 3-2 .

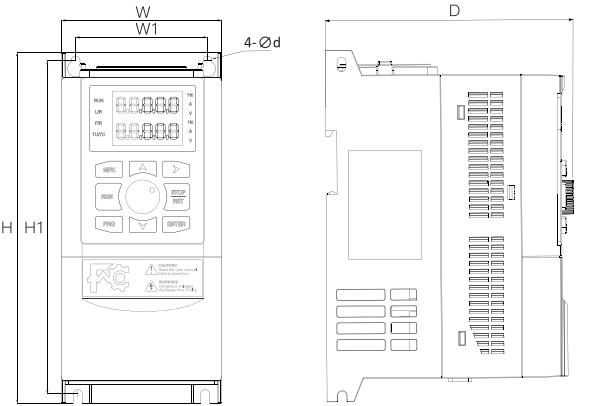
Table 3-2 Multiple frequency inverter installation space dimensions

Inverter class	≤15kW	≥18.5kW, < 55kW	≥75kW
A	≥10mm	≥50mm	≥100mm
B	≥30mm	≥50mm	≥100mm
C	≥30mm	≥50mm	≥100mm
a	≥10mm	≥50mm	≥100mm
b	≥30mm	≥50mm	≥100mm
c	≥ 30mm	≥50mm	≥100mm

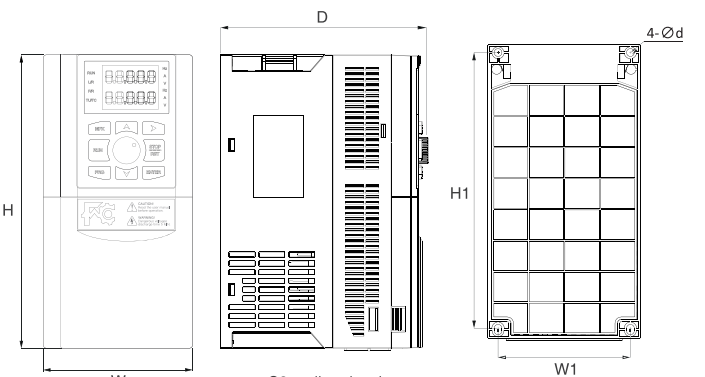


3.4 Outlook dimensions and Installation dimensions

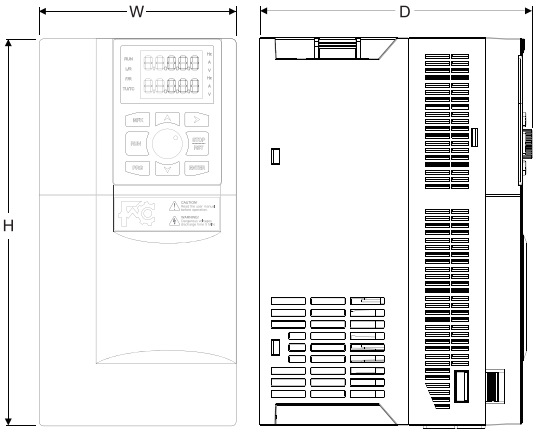
FC300 appearance and installation dimensions are shown in Table 3-3. For specific models corresponding to external dimensions, see Section Section 2.3 Rated value,page 17 .



S1 outline drawing



S2 outline drawing



S3 outline drawing

Structural specification	Power range	Dimensions (mm)			Installation size (mm)		
		W	H	D	W1	H1	d
S1	0.75~4.0kW	90	197	139	74	187	5
S2	5.5~7.5kW	102	202	162	90	189	5.6
S3	11~15kW	125	243	170	109	226	6.3
S4	18.5~22kW	165	297	206	147	279	7
S5	30~37kW	225	360	232	206	342	7
S6	45~55kW	260	440	240	220	420	8
S7	75kW	300	555	280	240	535	10
S8	90~110kW	338	580	325	270	560	10
S9	132~185kW	400	780	350	320	756	10
S10	200~220kW	520	780	355	380	756	12
S11	250~280kW	620	880	370	480	848	14
S12	315~450kW	780	1350	394	620	1320	14

Chapter 4 Electrical Installation

4.1 Wiring precautions

⚠ Danger

- Wiring must be performed by qualified electrical engineers.
- In order to provide over-current protection on the input side and facilitate power failure maintenance, the Frequency Inverter should be connected to the power supply through an air switch MCCB or a fuse.
- After the inverter is reliably powered off for 10 minutes, and after confirming that the internal charging indicator light is off and the voltage between the power terminals (+) and (-) is lower than 36V, then wiring or disassembly of the internal components of the inverter can be performed.
- After the emergency stop terminal of the external power supply is connected, it must be confirmed that its action is effective and reliable.
- The inverter has a leakage current greater than 3mA to the ground. The specific value is determined by the use conditions. To ensure safety, the inverter and the motor must use two independent grounding wires to ensure reliable grounding. It is recommended that the user install a Type B leakage protection device (ELCB/RCD).
- When the inverter is charged, the human body should not touch the inverter terminal. Do not connect the power terminals of the inverter to the product casing, and do not short-circuit between the power terminals.

⚠ Warn

- The inverter has passed the withstand voltage test before leaving the factory, and the user can no longer conduct the withstand voltage test on the inverter.
- For inverter that have been stored for more than 2 years, when powered on, the voltage regulator should be slowly boosted to supply power.
- When an external braking resistor is required, please connect the braking resistor or braking unit according to the wiring diagram.
- Please securely fasten the terminals.
- It is forbidden to connect the input power line to the output U/V/W terminal.
- It is forbidden to connect the phase-shifting capacitor to the output circuit.
- The motor can be switched or frequency conversion/power frequency switching can only be performed when the Frequency Inverter stops outputting.
- It is forbidden to short-circuit the DC bus terminals of the inverter.

4.2 Peripheral device selection

4.2.1 Input and output wiring specifications

- Between the power supply and the frequency inverter, a breaking device such as an air switch (MCCB) or a fuse with overcurrent protection must be installed to avoid the expansion of the impact range caused by the failure of the subsequent equipment to ensure equipment and personal safety.
- The recommended values of the recommended air switch MCCB, contactor capacity and cross-sectional area of copper core insulated conductors are shown in Table 4-2 .
- Sectional area of the grounding protective conductor (grounding wire) should meet the requirements of 4.3.5.4 of IEC61800-5-1,as shown in Table 4-1.

Table 4-1 Cross-sectional area of grounding protective conducto

The cross-sectional area S (mm^2) of the phase conductor (power line) during installation	$S \leq 2.5$	$2.5 < S \leq 16$	$16 < S \leq 35$	$S > 35$
The minimum cross-sectional area Sp (mm^2) of the corresponding protective conductor (grounding wire)	2.5	S	16	S/2

Table 4-2 Input and output wiring selection

Model	MCCB (A)	Contactor (A)	Power cord (mm^2)	Motor wire (mm^2)	Ground wire (mm^2)	Structural specification
1/3 Phase Input and 3 Phase Output 220V (-15%~+15% Tolerance)						
FC300-2S-0.4GB	16	10	0.5	0.5	2.5	S1
FC300-2S-0.75GB	16	10	0.75	0.5	2.5	S1
FC300-2S-1.5GB	20	16	4	0.8	4	S1
FC300-2S-2.2GB	32	20	6	1.5	6	S1
FC300-2S-4.0GB	100/40(1)	63/32(1)	10/4(1)	4	10/4(1)	S3
FC300-2S-5.5GB	125/63(1)	100/40(1)	25/6(1)	6	16/6(1)	S4

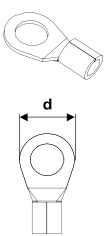
Model	MCCB (A)	Contactor (A)	Power cord (mm²)	Motor wire (mm²)	Ground wire (mm²)	Structural specification
FC300-2S-7.5GB	160/63(1)	100/40(1)	25/10(1)	10	16/10(1)	S4
FC300-2S-11G(B)	200/100(1)	125/63(1)	25/16(1)	16	16	S5
FC300-2S-15G(B)	200/125(1)	160/100(1)	50/25(1)	16	25/16(1)	S6
3 Phase Input and 3 Phase Output 220V (-15%~+15% Tolerance)						
FC300-2T-18.5G(B)	160	100	25	25	16	S5
FC300-2T-22G(B)	200	125	35	35	16	S5
FC300-2T-30G(B)	200	125	35	35	16	S6
3 Phase Input and 3 Phase Output 380V (-15%~+15% Tolerance)						
FC300-4T-0.75GB/1.5PB	10	10	0.5	0.5	2.5	S1
FC300-4T-1.5GB/2.2PB	16	10	0.75	0.5	2.5	S1
FC300-4T-2.2GB/4.0PB	16	10	1.5	0.75	2.5	S1
FC300-4T-4.0GB/5.5PB	25	16	2.5	2.5	2.5	S2
FC300-4T-5.5GB/7.5PB	32	25	4	4	4	S2
FC300-4T-7.5GB/11PB	40	32	6	6	6	S2
FC300-4T-11GB/15PB	63	40	10	10	10	S3
FC300-4T-15GB/18.5PB	63	40	10	10	10	S3
FC300-4T-18.5GB/22PB	100	63	16	16	16	S4
FC300-4T-22GB/30PB	100	63	25	25	16	S4
FC300-4T-30G(B)/37P(B)	125	100	25	25	16	S5
FC300-4T-37G(B)45P(B)	160	100	35	35	16	S5
FC300-4T-45G(B)/55P(B)	200	125	35	35	16	S6
FC300-4T-55G(B)	200	125	50	50	25	S6
FC300-4T-55G(B)/75P(B)	200	125	50	50	25	S7
FC300-4T-75G(B)/90P(B)	250	160	50	50	25	S7
FC300-4T-90G/110P	250	160	95	70	50	S8
FC300-4T-110G/132P	350	350	120	120	60	S8
FC300-4T-132G/160P	400	400	120	120	60	S9
FC300-4T-160G/185P	500	400	185	185	95	S9
FC300-4T-185G	500	410	185	185	95	S9

FC300-4T-200G/220P	600	600	240	240	120	S10
FC300-4T-220G/250P	600	600	120*2(1)	120*2(1)	120	S10
FC300-4T-250G/280P	800	600	150*2(1)	120*2(1)	120	S11
FC300-4T-280G/315P	800	800	185*2(1)	185*2(1)	150	S11
FC300-4T-315G/355P	800	800	240*2(1)	240*2(1)	185	S12
FC300-4T-355G/400P	800	800	240*2(1)	240*2(1)	240	S12
FC300-4T-400G/450P	1000	1000	240*2(1)	240*2(1)	240	S12
FC300-4T-450G	1000	1000	240*2(1)	240*2(1)	240	S12

4.2.2 Power terminal lugs

- Wire lug of the power terminal can be selected according to the terminal wiring specification,screw specification, and the maximum outer diameter of the wire lug, see Table 4-3 .
- Round bare terminal as an example for wire lugs .

Table 4-3 Selection of wire lugs for power terminals

Inverter structure specification	Power range	Screw specification	Tightening torque (N.M)	The maximum outer diameter of thewire lug is allowed (mm)	
S1	0.75~4.0kW	M3.5	0.8~1.2	7	
S2	5.5~7.5kW	M4	1.2~1.5	9.9	
S3-S4	11~22kW	M5	2.5-3.0	12	
S5-S6	30~55kW	M6	4.0~5.0	15.5	
S7	75kW	M8	9.0~10.0	24	
S8	90~110kW	M10	17.6~22.5	30	
S9	132~185kW	M12	31.4~39.2	37	
S10	200~220kW	M12	31.4~39.2	40	
S11	250~280kW	M12	31.4~39.2	40	
S12	315~450kW	M16	48.6~59.4	40	

4.3 Control panel description

⚠ Danger

The control circuit and the power circuit are basically insulated, and the inverter cannot be touched after it is powered on.

⚠ Warn

- If the control circuit is connected to an external device with an accessible port during power-on, it should be noted that an additional insulation protection isolation device should be added to ensure that the original voltage level of the external device will not be changed.
- If the communication terminal of the control circuit is used in connection with a PC, an RS485 isolation converter that meets the requirements of safety regulations should be selected.
- It is strictly forbidden to connect control terminals other than relay terminals to AC 220V voltage.

4.3.1 Jumper

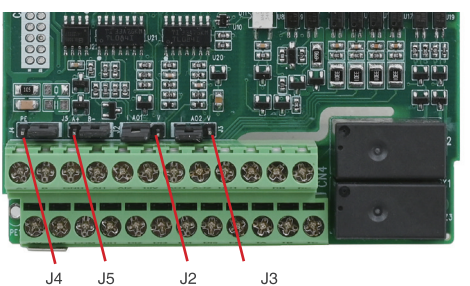


Figure 4-1 Jumper position (0.4~37kW)

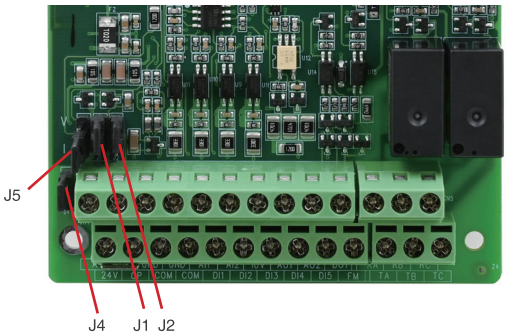


Figure 4-2 Jumper position (45~400kW)

4.3.2 Jumper description

Table 4-4 Jumper description(0.4~37kW)

Jumper	Jumper description
J5  1 3	**485 communication matching resistor selection:** 1,2 pins shorted, do not use matching resistor (factory setting); 2,3 pins shorted, use matching resistor.
J2  1 3	**AO1 simulated voltage output and simulated current output selection:** When pins 1 and 2 are short-circuited, AO1 is a simulated voltage output(factory setting); when pins 2 and 3 are short-circuited, AO1 is a simulated current output.
J3  1 3	**AO2 simulated voltage output and simulated current output selection:** When pins 1 and 2 are short-circuited, AO2 is a simulated voltage output(factory setting); when pins 2 and 3 are short-circuited, AO2 is a simulated current output.

Table 4-5 Jumper description (45~400kW)

Jumper	Jumper description
J3 1 3	**485 communication matching resistor selection:** 1,2 pins shorted, do not use matching resistor (factory setting); 2,3 pins shorted, use matching resistor.
J1 1 3	**AO1 simulated voltage output and simulated current output selection:** When pins 1 and 2 are short-circuited, AO1 is a simulated voltage output(factory setting); when pins 2 and 3 are short-circuited, AO1 is a simulated current output.
J2 1 3	**AO2 simulated voltage output and simulated current output selection:** When pins 1 and 2 are short-circuited, AO2 is a simulated voltage output(factory setting); when pins 2 and 3 are short-circuited, AO2 is a simulated current output.
Notices	
To minimize interference with control signals and signal attenuation, the length of the control cable should be limited to within 50 meters, and the spacing from motor cables should be greater than 0.3 meters. The control cable must be a shielded cable, and twisted-pair shielded cables should be used for analog signal cables.	

4.3.3 Control terminal

Figure 4-3 Control Terminals(0.4~37kW)

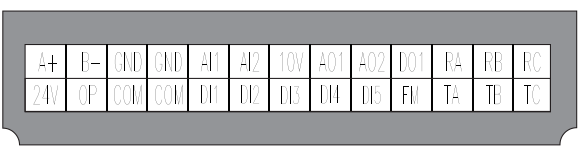


Figure 4-4 Control Terminals(45~400kW)

Table 4-6 Control Terminal Description

Category	Terminal symbol	Terminal name	Function Description
Power supply	**10V , GND**	External + 10V power supply	+10V reference power supply for analog input, the maximum allowable output current is 100mA GND and COM isolation
	24V , COM	External + 24V power supply	+24V power supply for digital input, the maximum allowable output current is 200mA
Analog input	**AI1 - GND**	Analog input terminal 1	AI1 input voltage range : 0-10V , input impedance 22 KΩ AI1 input current range : 0-20mA , input impedance 500Ω AI1 input voltage/current is optional: P4-40
	AI2 -GND	Analog input terminal 2	AI2 input voltage range : -10-10V , input impedance 22 KΩ AI2 input current range : 0-20mA , input impedance 500Ω AI2 input voltage/current is optional: P4-40
Analog output	**AO1-GND**	Analog output 1	Output voltage/current signal: 0~10V/0~20mA Output current range: 0mA~20mA, 4~20mA The selection of voltage or current output is determined by the J2 jumper on the control board (0.4~37kW) The selection of voltage or current output is determined by the J1 jumper on the control board (45~400kW)
	AO2- GND	Analog output 2	Output voltage/current signal: 0~10V/0~20mA Decided by the J3 jumper on the control board whether it is voltage or current output (0.4~37kW) Decided by the J2 jumper on the control board whether it is voltage or current output (45~400kW)
Digital input	**DI1-COM**	Digital input 1	Optocoupler isolation, programmable bipolar selectable input signal Input voltage range : 5-30V DC DI1-DI4 input impedance 1kΩ
	DI2-COM	Digital input 2	
	DI3-COM	Digital input 3	
	DI4-COM	Digital input 4	

Digital input	**DI5-COM**	High-speed pulse input terminal	In addition to the characteristics of DI1-DI4,it Can also be used as a high-speed pulse input channel. Maximum input frequency : 100kHz
Digital Output	**DO1 - COM**	Digital output	Optocoupler isolation, unipolar open collector output Output voltage range : 0-30 VDC Output current range : 0-50mA
	FM - COM	High speed pulse output	Constrained by function code P5-00 "FM terminal output mode selection" When used as a high-speed pulse output, the highest frequency is 100kHz;
Relay output	**TA-TB**	Normally closed terminal	Programmable output, contact capacity: 250VAC/3A or 30VDC/1A
	TA-TC	Normally open terminal	
	RA-RB	Normally closed terminal	Programmable output, contact capacity: 250VAC/3A or 30VDC/1A
	RA-RC	Normally open terminal	

Note: If the relay terminal is connected to an AC 220V voltage signal, the current must be limited within 3A.

4.3.4 Inverter application wiring mode

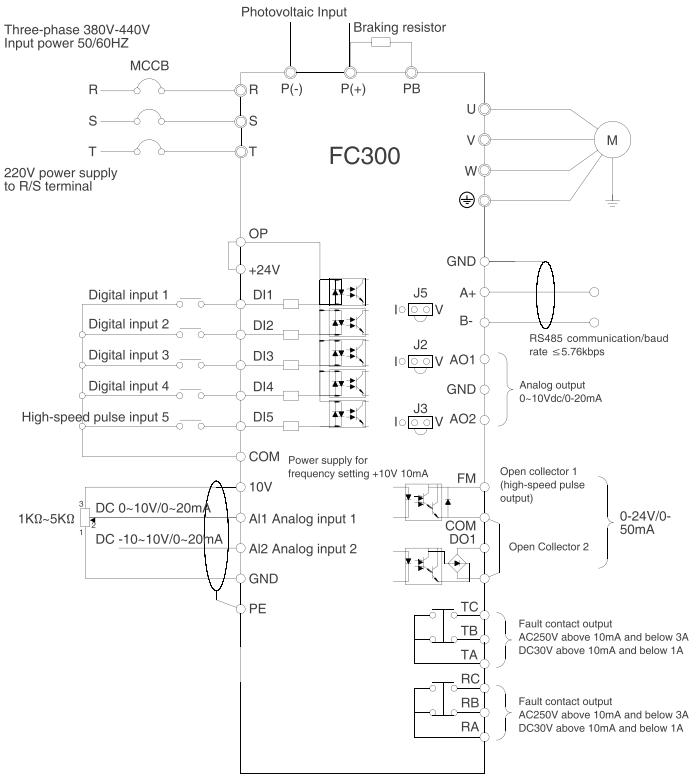


Figure 4-5 FC300 control terminal wiring diagram

Source (drain) method

When using the internal 24V power supply of the inverter, the external controller is NPN type,PNP type common emitter output wiring mode, as shown in Figure 4-6.

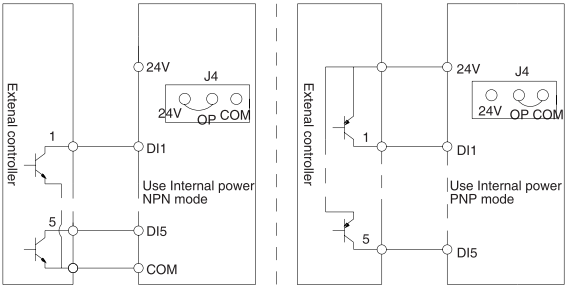


Figure 4-6 DI terminal input wiring when using internal 24V power supply

Analog input terminal (AI) wiring

AI1/AI2 can be selected as voltage input, the input range is 0-10V , the wiring is shown in Figure4-7.

AI1/AI2 can be selected as current input, the input range is 0-20mA, the wiring is shown in Figure 4-7.

The wiring diagram of AI2 is the same as that of AI1 .

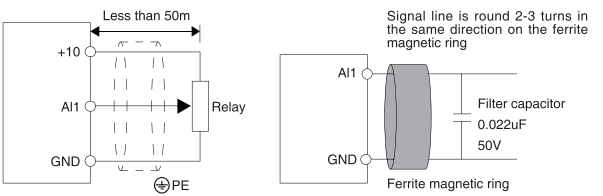


Figure 4-7 AI1 terminal wiring

Note:

In order to reduce the interference and attenuation of the control signal, the length of the control cable should be limited within 50m, and the shielding layer should be reliably grounded.

In the case of serious interference, the analog input signal needs to add filter capacitors or ferrite magnetic rings, as shown in Figure 4-7 .

Digital output terminal (FM) wiring

FM is an open-circuit collector output, which can use the internal 24V power supply of the inverter or use an external power supply. The wiring is shown in Figure 4-8 .

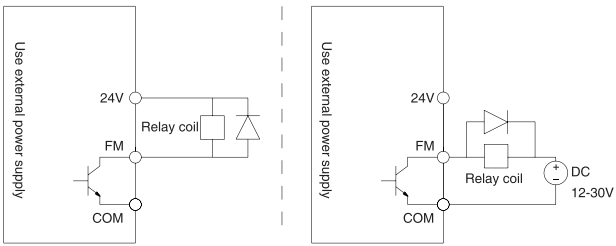


Figure 4-8 FM terminal wiring

The wiring of DO1 is the same as FM, as shown in Figure 4-9 .
FM is selected as the pulse frequency output, and the internal 24V power supply or external power supply of the inverter can be used. The wiring is shown in Figure 4-9.

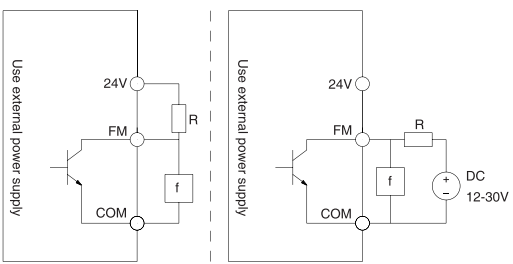
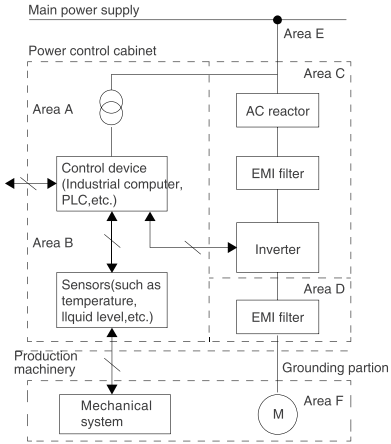


Figure 4-9 FM terminal wiring

4.4 Installation instructions for compliance with EMC requirements

4.4.1 Correct EMC installation

- The national standard GB/T12668.3 stipulates that the inverter needs to meet the requirements of electromagnetic interference and anti-electromagnetic interference. The international standard IEC/61800-3 (the third part of variable frequency speed regulation drive system: EMC specification requirements and test methods) is equivalent to the national standard GB/T12668.3.
- The FC300 produced by Janson Controls Technologies (Shenzhen) Co.,Limited has been designed and tested according to the requirements of IEC/61800-3. Please follow the instructions in this section for correct EMC installation to make it have good electromagnetic compatibility.
  In the transmission system composed of the inverter and the motor, the inverter, the control device, and the sensor are installed in a cabinet, and the noise emitted to the outside must be limited at the main connection point, so EMI filters and AC reactors must be installed in the cabinet to meet the electromagnetic compatibility requirements.
- Considering the spatial separation of noise sources and noise receivers during the mechanical / system design phase is the most effective measure to reduce interference, but it is also the most expensive. In the transmission system composed of the inverter and the motor, the inverter, braking unit, contactor, etc. can all be noise sources, and the noise receivers can be automation devices, encoders, sensors, etc.
- Machinery / system is divided into different EMC areas according to the electrical characteristics,and it is recommended to place the device in the areas divided as shown in Figure 4-10.



Area A: Control power transformer,control device,sensor,etc.

Area B: The signal and control cable interface part requires a certain degree of immunity.

Area C: Noise sources such as AC reactors. frequency Inverter,braking units,contactors,etc.

Area D: Output EMI filter and its wiring part.

Area E: Power

Area F: Motors and its cables.

Figure 4-10 system-wiring area division diagram

Description:

- The zones should be spatially separated to allow electromagnetic decoupling .
- Minimum distance between each area is 20cm , and it is better to decouple with grounding partitions . The cables in different areas should be placed in different cable ducts.
- EMI filters should be installed at the interface between areas.
- All communication cables and signal cables leading out of the cabinet must be shielded.

4.4.2 Wiring requirements

- In order to avoid mutual coupling of interference, the power cable, motor cable and control cable must be installed separately, and a sufficient distance must be ensured, especially when the cables are installed in parallel and extend for a long distance.
- If the signal cable must pass through the power cable or motor cable, it must pass through vertically (the included angle is 90°), as shown in Figure 4-11.

Power cables, motor cables and control cables should be distributed in different conduits.

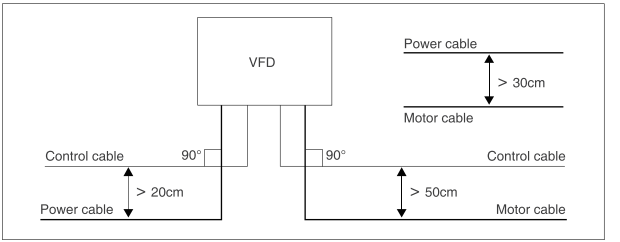


Figure 4-11 system-wiring area division diagram

- Shielded / armored cables should be high-frequency low-impedance shielded cables. Such as braided copper wire mesh, aluminum wire mesh or barbed wire mesh, etc.
- Generally, the control cable must be a shielded cable, and the shielded wire mesh must be connected to the metal casing of the inverter through the cable clips at both ends, as shown in Figure 4-12 .

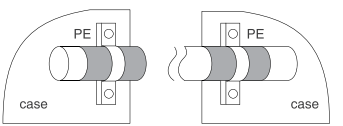


Figure 4 -12 shielded cable connection diagram

4.4.3 Motor wiring

The longer the motor cable and the higher the carrier frequency, the greater the high-order harmonic leakage current on the cable. Leakage current will have adverse effects on the equipment near the inverter. When the motor cable exceeds 100 meters, it is recommended to install an AC output reactor,and refer to Table 4-7 to set the carrier frequency.

Table 4-7 Wiring Distance and Carrier Frequency Between Variable Frequency Motors

Wiring distance between inverter and motor	<30m	30-50m	50-100m	≥100m
Set carrier frequency	Below 15kHz	Below 10kHz	Below 5kHz	Below 2kHz

- The motor cable should use the cable with the specified area, see Section Selection of Peripheral Components, page 28.
- When the motor cable is too long or the cross-sectional area is too large, it must be used with derating. According to the recommended cross-sectional area, the current will be reduced by about 5% for each increase of one gear.
- Because the larger the cross-sectional area of the cable, the greater the capacitance to ground,and the greater the leakage current to ground.

4.4.4 Grounding

- The inverter has leakage current to the ground. The grounding terminal PE must be grounded as close as possible to the grounding point, the grounding area should be as large as possible, and the grounding resistance should be less than 10Ω .
- Do not share the grounding wire (A) with other power equipment, you can share the grounding electrode (C), but each has a dedicated grounding electrode (B) for the best effect, as shown in Figure 4-13.

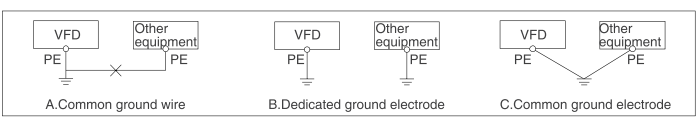


Figure 4-13 recommended grounding method

At the same time, when two or more inverter are used, please do not form a loop with the ground wire, as shown in Figure 4-14.

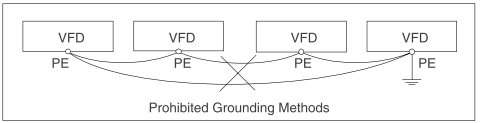


Figure 4-14 Prohibited grounding methods

4.4.5 EMI filter

Equipment that can generate strong interference and equipment that is sensitive to external interference should use EMI filters. EMI filters are bidirectional low-pass filters that allow lowfrequency currents to pass through, but high-frequency electromagnetic interference currents are not easy to pass through.

The function of EMI filters

It enables the equipment to meet the requirements of the electromagnetic compatibility standard for conducted emission and conduction sensitivity, and can suppress the radiated emission of the equipment.
Prevent the electromagnetic interference generated by the device itself from entering the power line, and prevent the interference on the power line from entering the device.

Common mistakes in EMI filter installation

The wiring between the EMI filter and the inverter is too long.
The installation position of the filter in the cabinet should be close to the entrance of the power cable, and the power input cable of the filter should be as short as possible in the cabinet.

The input and output lines of the EMI filter are too close together.
The input and output lines of the filter are too close, and the high-frequency interference signal is directly coupled through the input and output lines of the filter, bypassing the filter, thus making the power line filter useless.

The EMI filter is poorly grounded.
The shell of the EMI filter must be reliably connected to the metal box. The shell of the filter usually has a dedicated ground terminal,but connecting the filter to the shell with a wire is useless for high-frequency

interference signals, because the impedance (non-resistance) of the long wire is very large at high frequencies , there is no effective bypass effect at all.

Correct installation method: paste the EMI filter shell directly on the conductive plane of the metal casing of the equipment, and pay attention to remove the insulating paint.

4.4.6 Conducted, radiated, radio frequency interference countermeasures

Frequency Inverter Radiated Emissions

- The working principle of the Frequency Inverter determines that the radiation emission of the Frequency Inverter is inevitable. The Frequency Inverter is generally installed in a metal cabinet,and the equipment outside the metal cabinet is less affected by the radiation emission of the Frequency Inverter itself. The external connection cable is the main source of radiation emission.Wiring according to the cable requirements described in this section can effectively suppress the radiation emission of the cable.
- If the Frequency Inverter and other control devices are in the same metal cabinet, careful consideration should be made when designing the cabinet according to the aforementioned partition principles, and attention should be paid to the isolation of each section, cable wiring, shielding and lapping.

Conducted disturbance countermeasures

To suppress the conduction interference that occurs on the output side, in addition to installing a noise filter, you can also use the method of leading the output wiring into a grounded metal pipe. The distance between the output wiring and the signal line is greater than 0.3 m , and the influence of conducted interference is also significantly reduced.

Radio Frequency Interference Countermeasures

The input connection, output connection and the Frequency Inverter itself will generate radio frequency interference. EMI filters are installed on both sides of the input and output, and shielded with iron vessels, which can reduce radio frequency interference. The connection between the inverter and the motor should be as short as possible. Measures to mitigate radio frequency interference are shown in Figure 4-15

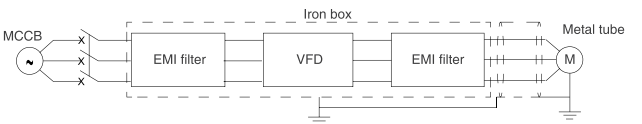


Figure 4-15 Radio Frequency Interference Measures

4.4.7 Reactor

AC input reactor

The purpose of configuring the AC line reactor is to: improve the power factor of the input side;effectively eliminate the high-order harmonics on the input side, prevent other equipment from being damaged due to voltage waveform distortion; eliminate the input current imbalance caused by the imbalance between phases of the power supply.

DC reactor

If the inverter is equipped with a DC reactor, it can improve the power factor of the input side,improve the efficiency and thermal stability of the inverter, effectively eliminate the impact of highorder harmonics on the input side on the inverter, and reduce external conduction and radiationinterference.

AC output reactor

distance between the motor and the inverter exceeds 100 meters, a large leakage current will be generated, causing the inverter to be protected. At this time, it is recommended to install an output AC reactor.

Chapter 5 Operation

⚠ Danger
· The inverter can only be powered on after the chassis shell is installed. It is strictly forbidden to disassemble the case shell after power on. · Before the inverter starts the motor and mechanical equipment, please make sure that the motor and mechanical equipment are working within the allowable range of use. · If the Frequency Inverter has been set with an undervoltage restart function, please do not approach the mechanical transmission equipment. · If the main control board is replaced, the parameters must be set correctly after replacement before it can run.

⚠ Warn
· It is forbidden to check and measure the signal while the inverter is running. · Do not change the parameter settings of the inverter at will. · Before switching the inverter running command channel, be sure to perform switching debugging. · The energy consumption braking resistor is very hot, please do not touch it.

5.1 Explain

5.1.1 Run command channel

The physical channel for FC300 to receive running commands (start, run, stop, jog, etc.) can be selected through P0-02 and DI terminals:

FC300 running command channel	Illustrate
Operation panel	The keys on the operation panel to control the start and stop of the inverter.
Control terminal	Use the control terminals to control the start and stop of the inverter.
MUDBUS communication	Through 485 communication.

5.1.2 Frequency setting channel

The final frequency set by FC300 is obtained from the main setting channel (P0-03) and the auxiliary setting channel (P0-04) after calculation (P0-07) . When the auxiliary setting channel is the same as the main setting channel (except analog), the frequency is set by the main setting channel.

Main setting frequency channel (parameter P0-03)	Auxiliary setting frequency channel (parameter P0-04)	Remark
0: Digital setting, P0-08 sets the initial value, no memory when power off	0: Digital setting, P0-08 sets the initial value, no memory when power off	Operation panel ▲, ▼ adjustment
1: Digital setting, P0-08 setting initial value, power-off memory	1: Digital setting, P0-08 setting initial value, power-off memory	Terminal UP/DN adjustment
2: AI1	2: AI1	
3: AI2	3: AI2	
4: AI3 keyboard potentiometer	4: AI3 keyboard potentiometer	
5: PLUSE pulse setting (DI5)	5: PLUSE pulse setting (DI5)	DI5 terminal P4-04 is set to 30
6: Multi-segment instructions	6: Multi-segment instructions	
7: Simple PLC	7: Simple PLC	
8: PID	8: PID	
9: Communication setting	9: Communication setting	

5.1.3 Working status

FC300 working status	Illustrate
Downtime	After the inverter is powered on and initialized, if there is no running command input, or after the stop command is executed during running, the U/V/W terminals of the inverter will have no output, and the running status indicator on the operation panel will flash.

FC300 working status	Illustrate
Operating status	After the inverter receives the running command, the U/V/W terminals of the inverter start to output, and the running status indicator on the operation panel is always on.
Motor parameter self-tuning status	P1-37 is set to 1 or 2 or 3, the inverter receives the running command and enters the motor parameter self-tuning state. After the self-tuning is completed, it will automatically enter the shutdown state.
System running status	Refers to the state where the U/V/W terminals of the inverter have output or zero-frequency blocked output or sleep and wait for restart. In this state, the running status indicator on the operation panel is always on, and the LED flashes to display the parameters in the stop state, and the parameters that cannot be modified during the operation of the inverter cannot be modified.

5.1.4 Operating mode

FC300 operating mode	Illustrate
Process PID adjustment operation	Process PID adjustment operation function is valid (P0-03=8), the inverter will select the process PID adjustment operation mode, that is, perform PID adjustment according to the setting and feedback amount (PA group needs to be set).
Multi-stage speed operation	The logical combination of DI terminals (12-1 No. 5 function), select the multi-stage frequency 1-16 (PC-00~PC-15) for multi-stage speed operation.
Simple PLC operation	Simple PLC function selection is valid (P0-03 = 7), the inverter will run in the simple PLC mode, and the inverter will run according to the preset operating parameters (see the parameters of the PC group) .

5.1.5 Operation Panel Description

The operation panel can be used to modify the function parameters of the inverter, monitor the working status of the inverter and control the operation (start, stop) of the inverter, etc. Its appearance and function area are shown in the following figure:

FC300 is equipped with a double-digit LED operation panel as standard, and the keys and functions of the operation panel are shown in Figure 5-1 Schematic diagram of the operation panel Shows as Figure 5-1

Figure 5-1 Schematic diagram of the operation panel

Table 5-2 Operation panel key description

Button	Function	
PRG	Programming key	First-level menu entry or exit
ENTER	Enter	Enter the menu screen step by step, confirm the setting parameters
RUN	Run key	When the operation panel is controlled, start the inverter
STOP / RST	Stop/RST	a. When the operation panel is controlled, stop the inverter b. When a fault is detected, it is a fault reset button
MFK	Multi-function selection key	Multi-function selection key: switch function according to P7-01
▲	Increment key	Increment of function parameter or parameter setting value
▼	Down key	Function parameter and parameter setting value decrement
▶	Shift key	a. Select the modification bit of the setting data b. Cyclic switching stop/run display status parameters

4 status indicator lights and 3 unit indicator lights on the FC300 operation panel , and the meanings of the indicator lights and display states are shown in Table 5-3 .

Table 5-3 Description of the indicator lights on the operation panel

Logo	Indicator name	(Always on) Description	(Flashing) Description	(Not lit) Description
RUN	Operating status	When the light is on, it means the inverter is running		When the light is on, it means the inverter is in the stop state
L/R	Keypad, terminal and remote operation (communication control) status	The current terminal start-stop control mode	The current communication start-stop control mode	The current keyboard start-stop control mode
F/R	Forward and reverse running status	The current inverter is forward and reverse		The current inverter is reverse reverse
TU/TC	Tuning / Torque Control / Fault Status	Lights on to indicate torque control mode	The light flashes slowly to indicate that it is in tuning state The light flashes quickly to indicate that it is in a fault state	The current Frequency Inverter is not faulty
Hz	Frequency unit	The unit of the current parameter is Hz	The current parameter is the output frequency	
A	Current unit	The unit of the current parameter is A		
V	Voltage unit	The unit of the current parameter is V		

FC300 has a 5-digit LED digital tube, and the display meanings are shown in Table 5-4 .

Table 5-4 Nixietube displayinstructions

LED display	Meaning	LED display	Meaning	LED display	Meaning	LED display	Meaning
	0		A		J		U
	1		b		L		u
	2		C		no		The y
	3		c		o		-
	4		d		P		Point
	5		E.		q		Show all
	6		f		r		No display
	7		h		S		Flashing Can be modified
	8		h		T		
	9		i		t		

Table 5-4 key switching four-level menu description

Button	First level menu	Second level menu	Third level menu	Fourth level menu
RRG	When there is a fault, return to the fault display. When there is no fault, return to the display of running or stopping state	Return to first level menu	Return to second level menu	Do not save the current value and return to the third-level menu
↵	Enter the second level menu	Enter the third level menu	Enter the fourth level menu	Save the current value and return to the third level menu
▲	Select a functional group. Loop according to P0 - PP - A0 - U0	Modify the function number. Press 1 time to add 1 to the value of the current modified bit	Modify the internal number of the function group. Press 1 time to add 1 to the value of the current modified bit	Modify the function code value. Press 1 time to add 1 to the value of the current modified bit
▼	Select a functional group. Loop according to P0 - PP - A0 - U0	Modify the function number. Press 1 time to subtract 1 from the value of the current modification bit	Modify the internal number of the function group. Press 1 time to subtract 1 from the value of the current modified bit	Modify the function code value. Press 1 time to subtract 1 from the value of the current modified bit
▶▶	Invalid	Invalid	Switch between ones and tens	Ones, Ten Thousands, Thousands, Hundreds, Tens cycle switching

Chapter 6 Brief Introduction of Function Parameters

6.1 Brief table of basic function parameters

" ☆ " : Indicates that the setting value of this parameter can be changed when the inverter is in stop or running state;

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

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

Function code	Name	Setting range	Factory default	Attributes	DEC address
P0 group Basic parameters					
P0-00	**G/P model**	1: G type 2: P type	1	●	0xF000
P0-01	**Selection of Motor Control Method**	0: SVC- No PG vector control 1: Reserved 2: V/F- Open-loop speed control	2	★	0xF001
P0-02	**Command source selection**	0: Panel command channel (L/R LED off) 1: Terminal command channel (L/R LED on) 2: Communication command channel (L/R LED flashing)	0	★	0xF002
P0-03	**Main frequency source X selection**	0: Digital setting (preset frequency P0-08,UP/DOWN can be modified,no memory when power off) 1: Digital setting (preset frequency P0-08,UP/DOWN can be modified,memory when power off)	4	★	0xF003

Function code	Name	Setting range	Factory default	Attributes	DEC address
		2: AI1 3: AI2 4: Keyboard potentiometer 5: PLUSE pulse setting(DI5) 6: Multi-segment command 7: Simple PLC 8: PID 9: Communication given			
P0-04	**Auxiliary frequency source Y selection**	Same as P0-03 (main frequency source X selection)	0	★	0xF004
P0-05	**Frequency source Y during superposition range selection**	0: relative to the maximum frequency 1 : relative to the frequency source X	0	☆	0xF005
P0-06	**Frequency source Y range when superimposed**	0% ~ 150%	100%	☆	0xF006
P0-07	**Frequency source superposition mode selection**	Units place: Frequency source selection 0: Main frequency source X 1: Main and auxiliary operation (the operation method is determined by the tens place) 2: Main frequency source X and auxiliary frequency source Y switching 3: Main frequency source X and main and auxiliary operation results Switching	00	☆	0xF007

Function code	Name	Setting range	Factory default	Attributes	DEC address
		4: Auxiliary frequency source Y and main-auxiliary operation result switching Tens digit: frequency source main-auxiliary operation relationship 0: main + auxiliary 1: main - auxiliary 2: maximum value of both 3: minimum value of both			
P0-08	**Preset frequency**	0.00Hz~maximum frequency (P0-10)	50.00Hz	☆	0xF008
P0-09	**Running direction**	0: Same direction 1: Opposite direction	0	☆	0xF009
P0-10	**Maximum frequency**	50.00Hz~500.00Hz	50.00Hz	★	0xF00A
P0-11	**Upper limit frequency source**	0: P0-12 setting 1: AI1 2: AI2 3: AI3 external keyboard potentiometer 4: PLUSE Pulse Setting (DI5) 5: Communication setting	0	★	0xF00B
P0-12	**Upper limit frequency**	Lower limit frequency P0-14 ~ maximum frequency P0-10	50.00Hz	☆	0xF00C
P0-13	**Upper limit frequency offset**	0.00Hz~maximum frequency P0-10	0.00Hz	☆	0xF00D
P0-14	**Lower limit frequency**	0.00Hz~upper limit frequency P0-12	0.00Hz	☆	0xF00E
P0-15	**Carrier frequency**	0.5kHz~16.0kHz	Model confirmed	☆	0xF00F

Function code	Name	Setting range	Factory default	Attributes	DEC address
P0-16	Carrier frequency adjusted with temperature	0: No 1: Yes	1	☆	0xF010
P0-17	Acceleration time 1	0s~65000s (P0-19 =0) 0.0s~ 6500.0s (P0-19 = 1) 0.0 0s~650.00s (P0-19 =2)	Model confirmed	☆	0xF011
P0-18	Deceleration time 1				0xF012
P0-19	Acceleration and deceleration time unit	0: 1 second 1: 0.1 second 2: 0.01 second	1	★	0xF013
P0-21	Auxiliary frequency source during superposition Bias frequency	0.00Hz~maximum frequency P0-10	0.00Hz	☆	0xF015
P0-22	Reserve	-	-	-	-
P0-23	Digital setting frequency stop memory	0: No memory 1: Memory	1	☆	0xF017
P0-24	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2	0	★	0xF018
P0-25	Acceleration and deceleration time base frequency	0: Maximum frequency (P0-10) 1: Set frequency 2: 100Hz	0	★	0xF019
P0-26	Frequency command UP/DOWN reference during operation	0: Running frequency 1: Setting frequency	0	★	0xF01A

Function code	Name	Setting range	Factory default	Attributes	DEC address
P0-27	**Command source bundled frequency source**	Units: Operation panel command binding frequency source selection 0: No binding 1: Digital setting frequency 2: AI1 3: AI2 4: Keyboard potentiometer 5: PLUSE pulse setting (DI5) 6: Multi-stage speed 7: Simple PLC 8: PID 9: Communication given Tenth place: terminal command binding frequency source selection Hundreds place: communication command binding frequency source selection	0000	☆	0xF01B
P0-28	**Communication protocol selection**	0: Modbus RTU 1: Reserved	0	★	0xF01C
Group P1 Motor Parameters					
P1-00	**Motor Type Selection**	0: Ordinary asynchronous motor 2: Permanent magnet synchronous motor	0	●	0xF100
P1-01	**Motor rated power**	0.1~1000kW	Model confirmed	★	0xF101
P1-02	**Motor rated voltage**	1~2000V	Model confirmed	★	0xF102

Function code	Name	Setting range	Factory default	Attributes	DEC address
P1-03	Motor rated current	0.01~655.35A (inverter power≤55 kW) 0.1~6553.5A (inverter power>55 kW)	Model confirmed	★	0xF103
P1-04	Motor rated frequency	0.01Hz~maximum frequency	Model confirmed	★	0xF104
P1-05	Motor rated speed	1~65535rpm	Model confirmed	★	0xF105
P1-06	Asynchronous motor stator resistance	0.001Ω ~ 65.535Ω (inverter power ≤55 kW) 0.0001Ω ~ 6.5535Ω (inverter power > 55 kW)	Model confirmed	★	0xF106
P1-07	Asynchronous motor rotor resistance	0.001Ω ~ 65.535Ω (inverter power ≤55 kW) 0.0001Ω ~ 6.5535Ω (inverter power > 55 kW)	Model confirmed	★	0xF107
P1-08	Asynchronous motor leakage inductance	0.01mH ~ 655.35mH (inverter power ≤55 kW) 0.001mH ~ 65.535mH (inverter power> 55 kW)	Model confirmed	★	0xF108
P1-09	Mutual inductance reactance of asynchronous motor	0.1mH ~ 6553.5mH (inverter power ≤55 kW) 0.01mH ~ 655.35mH (inverter power> 55 kW)	Model confirmed	★	0xF109
P1-10	Asynchronous motor no-load current	0.01~P1-03	Tuning parameters	★	0xF10A
P1-16	Synchronous motor stator resistance	0.001Ω to 65.535Ω (Inverter power ≤ 55kW) 0.0001Ω to 6.5535Ω (Inverter power > 55kW)	Tuning parameters	★	0xF110
P1-17	Synchronous motor D-axis inductance	0.01mH to 655.35mH (Inverter power ≤ 55kW) 0.001mH to 65.535mH (Inverter power > 55kW)	Tuning parameters	★	0xF111

Function code	Name	Setting range	Factory default	Attributes	DEC address
P1-18	Synchronous motor Q-axis inductance	0.01mH to 655.35mH (Inverter power ≤ 55kW) 0.001mH to 65.535mH (Inverter power > 55kW)	Tuning parameters	★	0xF112
P1-20	Synchronous motor back electromotive force	0.0V~6553.5V	Tuning parameters	★	0xF114
P1-37	Tuning selection	00: No operation 01: Partial tuning of asynchronous motor parameters at standstill 02: Complete dynamic tuning of asynchronous motor parameters 11: On-load tuning of synchronous motor parameters 12: No-load tuning of synchronous motor parameters	0	★	0xF125
P2 Group vector parameters					
P2-00	Speed loop proportional gain 1	1~100	30	☆	0xF200
P2-01	Speed loop integration time 1	0.01~10.00s	0.50s	☆	0xF201
P2-02	Switching frequency 1	0.00~P2-05	5.00Hz	☆	0xF202
P2-03	Speed loop proportional gain 2	1~100	10	☆	0xF203
P2-04	Speed loop integration time 2	0.01s~10.00s	1.00s	☆	0xF204

Function code	Name	Setting range	Factory default	Attributes	DEC address
P2-05	Switching frequency 2	P2-02~maximum frequency	10.00Hz	☆	0xF205
P2-06	Asynchronous motor vector control slip gain	50~200%	100%	☆	0xF206
P2-07	Asynchronous motor speed loop filter time constant	0.000~0.100s	0.015s	☆	0xF207
P2-08	Overexcitation gain of asynchronous motor vector control	0~200	64	☆	0xF208
P2-09	Torque upper limit source in speed control mode	0: Function code P2-10 setting 1: AI1 2: AI2 3: Keyboard potentiometer 4: PULSE setting (DI5) 5: Communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) The full range of options 1-7 corresponds to P2-10	0	☆	0xF209
P2-10	In speed control mode Torque upper limit digital setting	0.0% ~ 200.0%	150.0%	☆	0xF20A
P2-11	Torque command selection in speed control mode (power generation)	0: Function code P2-10 setting (does not distinguish between motoring and generating) 1: AI1 2: AI2	0	☆	0xF20B

Function code	Name	Setting range	Factory default	Attributes	DEC address
		3: Keypad potentiometer 4: PULSE setting (DI5) 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 8: Function code F2-12 setting The full scale of options 1-7 is affected by the operating range of P2-10.			
P2-12	**Digital setting of torque upper limit in speed control mode (power generation)**	0.0%~200.0%	150.0%	☆	0xF20C
P2-13	**M-axis current loop KP**	0~60000	2000	☆	0xF20D
P2-14	**M-axis current loop KI**	0~60000	1300	☆	0xF20E
P2-15	**T-axis current loop KP**	0~60000	2000	☆	0xF20F
P2-16	**T-axis current loop KI**	0~60000	1300	☆	0xF210
P2-17	**Asynchronous motor speed loop integral properties**	Units digit: Integral separation 0: Invalid 1: Valid	0	☆	0xF211
P2-18	**Reserve**	-	-	–	0xF212
P2-19	**Reserve**	-	-	–	0xF213
P2-22	**Power generation limit enable**	0: No limit 1: Limit	1	☆	0xF216
P2-23	**Generating power upper limit**	0%-200.0%	Model confirmed	☆	0xF217

Function code	Name	Setting range	Factory default	Attributes	DEC address
P2-24	**Asynchronous motor vector control slip gain**	0: No field weakening. When the output voltage reaches the upper limit, the frequency will automatically be reduced to prevent the system from entering the field weakening zone. 1: Automatic field weakening mode 2: Calculated field weakening mode	1	★	0xF218
P2-25	**Synchronous motor field weakening gain**	1~50	5	☆	0xF219
P2-26	**Reserve**	-	-	☆	0xF21A
P2-27	**Reserve**	-	-	☆	0xF21B
P2-28	**Reserve**	-	-	☆	0xF21C
P2-29	**Synchronous motor output voltage upper limit margin**	0%~50%	5%	☆	0xF21D
P2-30	**Synchronous motor initial position angle detection current**	50%~180%	80%	☆	0xF21E
P2-31	**Synchronous motor initial position angle detection**	0: Test at every startup; 1: Do not test; 2: Test at the first startup after power-up;	0	☆	0xF21F
P2-32	**Synchronous motor speed loop mode selection**	0,1	0	☆	0xF220

Function code	Name	Setting range	Factory default	Attributes	DEC address
P2-33	Synchronous motor saliency ratio adjustment gain	50-500	100	☆	0xF221
P2-34	Maximum torque current ratio control	0,1	0	☆	0xF222
P2-36	Current loop KP during tuning	1-100	6	☆	0xF224
P2-37	Current loop KI during tuning	1-100	6	☆	0xF225
P2-38	Z signal correction	0,1	1	☆	0xF226
P2-39	Synchronous motor SVC speed filter level	10-1000	100	☆	0xF227
P2-40	Synchronous motor SVC speed estimation proportional gain	5-200	40	☆	0xF228
P2-41	Synchronous motor SVC speed estimation integral gain	5-200	30	☆	0xF229
P2-42	Synchronous motor SVC initial excitation current limit	30%~80%	30%	☆	0xF22A

Function code	Name	Setting range	Factory default	Attributes	DEC address
P2-43	Low-speed carrier frequency	0.8K~F0-15	1.5k	☆	0xF22B
P2-47	Synchronous motor inductance detection current	0%~80%	50%	☆	0xF22F
P2-49	Zero servo enable	0: Off 1: On	0	☆	0xF231
P2-50	Switching frequency	0.00~F2-02	0.30Hz	☆	0xF232
P2-51	Zero servo speed loop proportional gain	1~100	10	☆	0xF233
P2-52	Zero servo speed loop integral time	0.01s~10.00s	0.50s	☆	0xF234
P2-55	Online parameter identification	0: Off 1: Tune before power-on first run 2: Tune before run	0	☆	0xF237
P2-56	Online back EMF calculation	0: Off 1: On	0	☆	0xF238
P2-57	SVC initial position compensation angle	0.0°~359.9°	0.0	☆	0xF239
P3 group V/F control parameters					
P3-00	VF curve setting	0: Straight line V/F 1: Multi-point V/F 2: Square V/F 3: 1.2 power V/F 4: 1.4 power V/F	0	★	0xF300

Function code	Name	Setting range	Factory default	Attributes	DEC address
		6: 1.6 power V/F 8: 1.8 power V/F 9: Reserved 10: V/F completely separated 11: V/F half separation			
P3-01	Torque boost	0.0%: (automatic torque boost) 0.1 ~ 30.0%	Model confirmed	☆	0xF301
P3-02	Torque boost cut-off frequency	0.00Hz~maximum frequency	50.00Hz	★	0xF302
P3-03	Multi-point V/F frequency point 1	0.00Hz~P3-05	0.00Hz	★	0xF303
P3-04	Multi-point V/F voltage point 1	0.0%~100.0%	0.0%	★	0xF304
P3-05	Multi-point V/F frequency point 2	P3-03~P3-07	0.00Hz	★	0xF305
P3-06	Multi-point V/F voltage point 2	0.0%~100.0%	0.0%	★	0xF306
P3-07	Multi-point V/F frequency point 3	P3-05~motor rated frequency (P1-04)	0.00Hz	★	0xF307
P3-08	Multi-point VF voltage point 3	0.0%~100.0%	0.0%	★	0xF308
P3-09	V/F slip compensation gain	0.0%~200.0%	0.0%	☆	0xF309
P3-10	V/F overexcitation gain	0~200	64	☆	0xF30A

Function code	Name	Setting range	Factory default	Attributes	DEC address
P3-11	V/F oscillation suppression gain	0~100	Model confirmed	☆	0xF30B
P3-12	Oscillation suppression mode selection	0~4	3	★	0xF30C
P3-13	V/F separated voltage source	0: Digital setting (P3-14) 1: AI1 2: AI2 3: AI3 4: PULSE setting (DI5) 5: Multi-step command 5 6: Simple PLC 7: PID 8: Communication setting Note: 100.0% corresponds to the rated motor voltage	0	☆	0xF30D
P3-14	V/F separation voltage digital setting	0V ~ motor rated voltage	0V	☆	0xF30E
P3-15	Voltage acceleration time for V/F separation	0.0s~1000.0s (Note: It indicates the time from 0V to the rated voltage of the motor)	0.0s	☆	0xF30F
P3-16	Voltage deceleration time for V/F separation	0.0s~1000.0s (Note: It indicates the time from 0V to the rated voltage of the motor)	0.0s	☆	0xF310
P3-17	V/F separation stop mode selection	0: Frequency and voltage are reduced to 0 independently 1: Frequency is reduced after voltage is reduced to 0	0	☆	0xF311
P3-18	Over-current stall current	50~200%	150%	★	0xF312

Function code	Name	Setting range	Factory default	Attributes	DEC address
P3-19	Overcurrent stall enable	0: Invalid 1: Valid	1	★	0xF313
P3-20	Overcurrent stall suppression gain	0~100	20	☆	0xF314
P3-21	Current compensation coefficient of double-speed over-current stall action	50~200%	50	★	0xF315
P3-22	Overvoltage stall action voltage	Three-phase 380-480V models: 330.0V-800.0V Three-phase 200-240V models: 330.0V-800.0V	760	★	0xF316
P3-23	Overvoltage stall enable	0: Invalid 1: Valid	1	★	0xF317
P3-24	Overvoltage stall suppression frequency gain	0~100	30	☆	0xF318
P3-25	Overvoltage stall suppression voltage gain	0~100	30	☆	0xF319
P3-26	Overvoltage stall maximum rising frequency limit	0~50Hz	5Hz	★	0xF31A
P4 Group input termina					
P4-00	DI1 terminal function selection	0: No function 1: Forward running (FWD) 2: Reverse running (REV)	01	★	0xF400

Function code	Name	Setting range	Factory default	Attributes	DEC address
P4-01	DI2 terminal function selection	3: Three-wire running control 4: Forward jogging (FJOG) 5: Reverse jogging (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Free stop 9: Fault reset (RESET) 10: Running 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 source switching 19: UP/DOWN setting reset (terminal/keyboard) 20: Running command switching terminal 1 21: Acceleration and deceleration prohibited 22: PID pause 23: PLC status reset 24: Wobble frequency pause 25: Counter input 26: Counter reset	04	★	0xF401
P4-02	DI3 terminal function selection		09	★	0xF402
P4-03	DI4 terminal function selection		12	★	0xF403
P4-04	DI5 terminal function selection		13	★	0xF404
P4-05	Reserve		00	★	0xF405

Function code	Name	Setting range	Factory default	Attributes	DEC address
P4-06	Reserve	27: Length count input 28: Length reset 29: Torque control prohibited 30: PLUSE pulse frequency input (DI5) 31: Reserve 32: Immediate DC braking 33: External fault normally closed input 34: Frequency modification enabled 35: PID action direction reversed 36: External stop terminal 1 37: Switching of running command Terminal 2 38: PID integral pause 39: Switching between frequency source X and preset frequency 40: Switching between frequency source Y and preset frequency 43: Switching between PID parameters 44: User-defined fault 1 45: User-defined fault 2 46: Speed control/torque control switch 47: Emergency stop 48: External stop terminal 2 49: Deceleration DC braking 50: Reset current running time 51: Two-wire and three-wire switching 52: No reversing	00	★	0xF406

Function code	Name	Setting range	Factory default	Attributes	DEC address
		53: Single-ended terminal UP/DOWN enable, frequency source switching (same function as 18) 54: Terminal activation UP, not activated is DOWN 55: Fire alarm mode trigger terminal			
P4-10	**DI terminal filter time**	0.000s~1.000s	0.010s	☆	0xF40A
P4-11	**Terminal command mode**	0: Two-line type 1 1 : Two-line type 2 2: Three-wire type 1 3: Three-wire type 2	0	★	0xF40B
P4-12	**Terminal UP/ DOWN change rate**	0.001Hz/s~65.535Hz/s	1.00 Hz/s	☆	0xF40C
P4-13	**AI curve 1 minimum input**	0.00V~P4-15	0.00V	☆	0xF40D
P4-14	**AI curve 1 minimum input corresponding setting**	-100.0%~+100.0%	0.0%	☆	0xF40E
P4-15	**AI curve 1 maximum input**	P4-13~+10.00V	10.00V	☆	0xF40E
P4-16	**AI curve 1 maximum input corresponding setting**	-100.0%~+100.0%	100.0%	☆	0xF410
P4-17	**AI1 filter time**	0.00s~10.00s	0.10s	☆	0xF411

Function code	Name	Setting range	Factory default	Attributes	DEC address
P4-18	AI curve 2 minimum input	-10.00V~P4-20	0.00V	☆	0xF412
P4-19	AI curve 2 minimum input corresponding setting	-100.0%~+100.0%	0.0%	☆	0xF413
P4-20	AI curve 2 maximum input	P4-18~+10.00V	10.00V	☆	0xF414
P4-21	AI curve 2 maximum input corresponding setting	-100.0%~+100.0%	100.0%	☆	0xF415
P4-22	AI2 filter time	0.00s~10.00s	0.10s	☆	0xF416
P4-23	AI curve 3 minimum input	0.00V~P4-25	0.00V	☆	0xF417
P4-24	AI curve 3 minimum input corresponding setting	-100.0%~+100.0%	0.0%	☆	0xF418
P4-25	AI Curve 3 maximum Input	P4-23~+10.00V	10.00V	☆	0xF419
P4-26	AI curve 3 maximum input corresponding setting	-100.0%~+100.0%	100.0%	☆	0xF41A
P4-27	Keyboard potentiometer filter time	0.00s~10.00s	0.10s	☆	0xF41B
P4-28	DI5 pulse minimum input	0.00kHz~P4-30	0.00kHz	☆	0xF41C

Function code	Name	Setting range	Factory default	Attributes	DEC address
P4-29	DI5 pulse minimum input corresponding setting	-100.0%~100.0%	0.0%	☆	0xF41D
P4-30	DI5 pulse maximum input	P4-28~50.00kHz	50.00kHz	☆	0xF41E
P4-31	DI5 pulse maximum input setting	-100.0%~100.0%	100.0%	☆	0xF41F
P4-32	DI5 pulse filter time	0.00s~10.00s	0.10s	☆	0xF420
P4-33	AI curve selection	Bit: AI1 curve selection 1: Curve 1 (2 points, P4-13~ P4-16) 2: Curve 2 (2 points, P4-18~P4-21) 3: Curve 3 (2 points, P4-23~ P4- 26) Tens digit: AI2 curve selection, same as above Hundreds digit: reserve	321	☆	0xF421
P4-34	AI below minimum input setting selection	Units: AI1 is lower than the minimum input setting selection 0: corresponding to the minimum input setting 1: 0.0% Tens digit: AI2 is lower than the minimum input setting selection, the same as above Hundreds digit: reserve	000	☆	0xF422
P4-35	DI1 delay time	0.0s~3600.0s	0.0s	★	0xF423
P4-36	DI2 delay time	0.0s~3600.0s	0.0s	★	0xF424
P4-37	DI3 delay time	0.0s~3600.0s	0.0s	★	0xF425

Function code	Name	Setting range	Factory default	Attributes	DEC address
P4-38	DI terminal valid mode selection 1	0: High level active 1: Low level active Units: DI1 Tens: DI2 Hundreds: DI3 Thousands: DI4 Ten thousand's: DI5	00000	★	0xF426
P4-39	Reserve	-	-	★	0xF427
P4-40	AI input voltage/ current mode selection	Units digit: AI1 Tens digit: AI2 0: Voltage input 1: Current input	00	★	0xF428
P4-41	Terminal detection at power-on moment	0: Level effective 1: Rising edge is valid	0	★	0xF429
		P5 Group output terminal			
P5-00	FM terminal output mode selection	0: High-speed pulse output (FMP) 1: Terminal switch output (FMR)	0	☆	0xF500
P5-01	FMR terminal switching value Output function selection	0: No output 1: Inverter running 2: Fault output (failure shutdown) 3: Frequency level detection FDT1 output 4: Frequency reached 5: Running at zero speed (no output when stopped) 6: Motor overload pre-alarm 7: Frequency conversion Overload pre-alarm 8: Set count value reached 9: Specified count value reached	0	☆	0xF501
P5-02	Relay RY1 function selection (RA-RB-RC)		2	☆	0xF502
P5-03	Relay RY2 function selection (TA-TB-TC)		0	☆	0xF503

Function code	Name	Setting range	Factory default	Attributes	DEC address
		11: PLC cycle completed 12: Accumulated running time reached 13: Frequency limited 14: Torque limited 15: Ready to run 16: AI1>AI2 17: The upper limit frequency is reached 18: The lower limit frequency is reached (No output during shutdown) 19: Undervoltage state output 20: Communication setting 23: Zero speed running 2 (output even when stopped) 24: Accumulated power-on time is reached 25: Frequency level detection FDT2 Output 26: Frequency 1 reaches the output 27: Frequency 2 reaches the output 28: Current 1 reaches output 29: Current 2 reaches output 30: Timing reaches output 31: AI1 input overrun 32: Load shedding 33: Reverse running 34: Zero Current state 35: Module temperature reaches 36: Putput current exceeds limit 37: Lower limit frequency reaches (stops and outputs also)			

Function code	Name	Setting range	Factory default	Attributes	DEC address
P5-04	DO1 output function selection	38: Alarm output (continues to run) 40: Current running time reaches 41: Fault output (for free stop fault and under Pressure does not output	1	☆	0xF504
P5-05	Reserve		-	☆	0xF505
P5-06	FMP high speed pulse Output function selection	0: Running frequency 1: Set frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: PULSE pulse setting (DI5) (100.% corresponds to 100.0kHz) 7: AI1 8: AI2 9: Keyboard potentiometer 11: Counter value 12: Communication setting 13: Motor speed 14: Output current (100.0% corresponds to 1000.0A) 15: Output voltage (100.0% corresponds to 1000.0V) 16: Motor output torque (actual value: relative to the percentage of the motor)	0	☆	0xF506
P5-07	AO1 output function selection		0	☆	0xF507
P5-08	AO2 output function selection		1	☆	0xF508
P5-09	Reserve	-	-	-	0xF509
P5-10	FMP output maximum frequency	0.01kHz~100.00kHz	50.00kHz	☆	0xF50A
P5-11	AO1 zero bias coefficient	-100.0%~+100.0%	0.0%	☆	0xF50B
P5-12	AO1 gain	-10.00~+10.00	1.00	☆	0xF50C

Function code	Name	Setting range	Factory default	Attributes	DEC address
P5-13	AO2 bias coefficient	-100.0%~+100.0%	0.0%	☆	0xF50D
P5-14	AO2 gain	-10.00~+10.00	1.00	☆	0xF50E
P5-15	Reserve	-	-	–	0xF50F
P5-16	Reserve	-	-	–	0xF510
P5-17	FMR output filter time	0.0s~655.35s	0.0s	☆	0xF511
P5-18	AO1 output filter time	0.0s~655.35s	0.0s	☆	0xF512
P5-19	AO2 output filter time	0.0s~655.35s	0.0s	☆	0xF513
P5-20	Reserve	-	-	-	0xF514
P5-21	FMR output delay time	0.0s~3600.0s	0.0s	☆	0xF515
P5-22	RY1 output delay time	0.0s~3600.0s	0.0s	☆	0xF516
P5-23	RY2 output delay time	0.0s~3600.0s	0.0s	☆	0xF517
P5-24	DO1 output delay time	0.0s~3600.0s	0.0s	☆	0xF518
P5-25	Reserve	-	-	☆	0xF519
P5-26	Output terminal valid state selection	0: Positive logic 1: Negative logic Units digit: FM terminal Tens digit: RY1 Hundreds digit: RY2 Thousands digit: DO1 Ten thousand digit: Reserved	00000	☆	0xF51A
P5-27	AO output signal selection	0: Voltage signal 1: Current signal Units digit: AO1 Tens digit: AO2	00	☆	0xF51B

Function code	Name	Setting range	Factory default	Attributes	DEC address
P6 Group start and stop control					
P6-00	Start method	0: Direct start 1: Speed tracking restart	0	☆	0xF600
P6-01	Speed tracking mode	0: Start from shutdown frequency 1: Start from operating frequency 2: Start from maximum frequency	0	★	0xF601
P6-02	Speed tracking speed	1~100	20	☆	0xF602
P6-03	Start frequency	0~P0-08	0.00Hz	☆	0xF603
P6-04	Starting frequency hold time	0.0s~100.0s	0.0s	★	0xF604
P6-05	Starting DC braking current / pre-excitation current	0%~100%	0%	★	0xF605
P6-06	Start DC braking time / pre-excitation time	0.0s~100.0s	0.0s	★	0xF606
P6-07	Acceleration and deceleration mode	0: Linear acceleration and deceleration 1: S-curve acceleration and deceleration A 2: S-curve acceleration and deceleration B	0	★	0xF607

Function code	Name	Setting range	Factory default	Attributes	DEC address
P6-08	S-curve start period time ratio	0.0%~(100.0%-P6-09)	30.0%	★	0xF608
P6-09	S-curve end time ratio	0.0%~(100.0%-P6-08)	30.0%	☆	0xF609
P6-10	Shutdown mode	0: Decelerate to stop 1: Free parking	0	☆	0xF60A
P6-11	DC braking starting frequency at shutdown	0.00Hz~maximum frequency	0.00Hz	☆	0xF60B
P6-12	DC braking waiting time for shutdown	0.0s~100.0s	0.0s	☆	0xF60C
P6-13	Stop DC brake current	0%~100%	0%	☆	0xF60D
P6-14	Stop DC braking time	0.0s~100.0s	0.0s	☆	0xF60E
P6-15	Brake usage	0%~100%	100%	☆	0xF60F
P6-16	Speed Tracking Closed-Loop Current KP	1~60000	2200	☆	0xF610
P6-17	Speed Tracking Closed-Loop Current KI	1~60000	1300	☆	0xF611
P6-18	Speed tracking closed-loop current magnitude	30~200	100	★	0xF612
P6-19	Speed tracking closed-loop current lower limit	10~100	30	★	0xF613
P6-20	Rise time of speed tracking voltage	0.5~3.0	1.1	★	0xF614

Function code	Name	Setting range	Factory default	Attributes	DEC address
P6-21	Demagnetization time	0.00~5.00	0.5	☆	0xF615
P7 Group keyboard and display					
P7-00	Reserve	-	-	-	0xF700
P7-01	MF.K key function selection	0: MF.K is invalid 1: Switch between operation panel command channel and remote command channel (terminal command channel or communication command channel) 2: Forward and reverse switching 3: Forward jogging 4: Reverse jogging	0	☆	0xF701
P7-02	STOP/RST key function	0: Only in the keyboard operation mode, the stop function of the **STOP/RES** key is valid 1: In any operation mode, the stop function of the **STOP/RES** key is valid	1	☆	0xF702
P7-03	LED running display parameter 1	0000~FFFF Bit00: Operating frequency 1 (Hz) Bit01: Setting frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW)	001F	☆	0xF703

Function code	Name	Setting range	Factory default	Attributes	DEC address
		Bit06: Output Torque (%) Bit07: X input state Bit08: Y output state Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: Keyboard potentiometer voltage (V) Bit12: Count value Bit13: Reserve Bit14: Load speed display Bit15: PID setting (water supply macro display pressure value)			
P7-04	**LED running display parameter 2**	0000~FFFF Bit00: PID feedback (water supply macro display pressure value) Bit01: PLC stage Bit02: PLUSE input pulse frequency (kHz) Bit03: Running frequency 2 (Hz) Bit04: Remaining running time Bit05: AI1 voltage before correction (V) Bit06: Voltage before AI2 correction (V) Bit07: Keyboard potentiometer voltage before calibration (V) Bit08: Line speed Bit09: Current power-on time (Hour) Bit10: Current running time (Min) Bit11: PLUSE input pulse frequency (Hz)	0000	☆	0xF704

Function code	Name	Setting range	Factory default	Attributes	DEC address
		Bit12: Communication setting value Bit13:Reserve Bit14: Main frequency X display (Hz) Bit15: Auxiliary frequency Y display (Hz)			
P7-05	**LED shutdown display parameters**	0000~FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: X input state Bit03: Y output state Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: AI3 panel potentiometer voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID setting(pressure) Bit12: PLUSE input pulse frequency (kHz) Bit13: PID feedback (pressure)	0033	☆	0xF705
P7-06	**Load speed display factor**	0.0001~6.5000	1.0000	☆	0xF706
P7-07	**Inverter module heat sink temperature**	0.0℃ ~ 100.0℃	-	●	0xF707
P7-09	**Cumulative running time**	0h~65535h	-	☆	0xF708
P7-10	**Performance version number**	-	-	●	0xF709

Function code	Name	Setting range	Factory default	Attributes	DEC address
P7-11	Function version number	-	-	●	0xF70A
P7-12	Load speed display decimal places	Units: Number of decimal places for U0-14 0: 0 decimal places 1: 1 decimal place 2: 2 decimal places Tens: Number of decimal places for U0-19/U0-29 1: 1 decimal place 2: 2 decimal places	21	☆	0xF70B
P7-13	Cumulative power-on time	0~65535h	-	●	0xF70C
P7-14	Cumulative power consumption	0~65535°	-	●	0xF70D
P7-17	Nixie tube 2 stop monitoring selection	00~99 (Corresponding to group U0 parameter number)	02	☆	0xF710
P7-18	Nixie tube 2 running monitoring selection	00~99 (Corresponding to group U0 parameter number)	04	☆	0xF711
P8 Group auxiliary function					
P8-00	Jog running frequency	0.00Hz~maximum frequency	6.00Hz	☆	0xF800
P8-01	Jog acceleration time	0.0s~6500.0s	20.0s	☆	0xF801
P8-02	Jog deceleration time	0.0s~6500.0s	20.0s	☆	0xF802
P8-03	Acceleration time 2	0.0s~6500.0s	Model confirmed	☆	0xF803

Function code	Name	Setting range	Factory default	Attributes	DEC address
P8-04	Deceleration time 2	0.0s~6500.0s	Model confirmed	☆	0xF804
P8-05	Acceleration time 3	0.0s~6500.0s	Model confirmed	☆	0xF805
P8-06	Deceleration time 3	0.0s~6500.0s	Model confirmed	☆	0xF806
P8-07	Acceleration time 4	0.0s~6500.0s	Model confirmed	☆	0xF807
P8-08	Deceleration time 4	0.0s~6500.0s	Model confirmed	☆	0xF808
P8-09	Jump frequency 1	0.00Hz~maximum frequency	0.00Hz	☆	0xF809
P8-10	Jump frequency 2	0.00Hz~maximum frequency	0.00Hz	☆	0xF80A
P8-11	Jump frequency amplitude	0.00Hz~maximum frequency	0.00Hz	☆	0xF80B
P8-12	Forward and reverse dead time	0.0~3000.0s	0.0s	☆	0xF80C
P8-13	Reverse frequency prohibited	0: Invalid 1: Valid	0	☆	0xF80D
P8-14	The set frequency is lower than the lower limit frequency operating mode	0: Run at the lower limit frequency 1: Stop 2: Run at zero speed	0	☆	0xF80E
P8-15	Droop control	0.00Hz~10.00Hz	0.00Hz	☆	0xF80F
P8-16	Set the cumulative power-on arrival time	0h~65000h	0h	☆	0xF810

Function code	Name	Setting range	Factory default	Attributes	DEC address
P8-17	Set the cumulative running arrival time	0h~65000h	0h	☆	0xF811
P8-18	Boot Protection Selection	0: No protection 1: Protection	0	☆	0xF812
P8-19	Frequency detection value (FDT1)	0.00Hz~maximum frequency	50.00Hz	☆	0xF813
P8-20	Frequency detection hysteresis value	0.0%~100.0%(FDT1 level)	5.0%	☆	0xF814
P8-21	Frequency arrival detection width	0.0%~100.0% (maximum frequency)	0.0%	☆	0xF815
P8-22	Is the jump frequency valid during acceleration and deceleration	0: Invalid 1: Valid	0	☆	0xF816
P8-25	Acceleration time 1 with Acceleration time 2 switching frequency point	0.00Hz~maximum frequency	0.00Hz	☆	0xF819
P8-26	Deceleration time 1 and Deceleration time 2 switching frequency point	0.00Hz~maximum frequency	0.00Hz	☆	0xF81A

Function code	Name	Setting range	Factory default	Attributes	DEC address
P8-27	Terminal jog priority	0: Invalid 1: Valid	0	☆	0xF81B
P8-28	Frequency detection value (FDT2)	0.00Hz~maximum frequency	50.00Hz	☆	0xF81C
P8-29	Frequency detection hysteresis value	0.0%~100.0% (FDT2 level)	5.0%	☆	0xF81D
P8-30	Arbitrary arrival frequency detection value 1	0.00Hz~maximum frequency	50.00Hz	☆	0xF81E
P8-31	Arbitrary arrival frequency detection width 1	0.0%~100.0% (maximum frequency)	0.0%	☆	0xF81F
P8-32	Arbitrary arrival frequency detection value 2	0.00Hz~maximum frequency	50.00Hz	☆	0xF820
P8-33	Arbitrary arrival frequency detection width 2	0.0%~100.0% (maximum frequency)	0.0%	☆	0xF821
P8-34	Zero current detection level	0.0%~300.0%	5.0%	☆	0xF822
P8-35	Zero current detection delay time	0.01s~600.00s	0.10s	☆	0xF823
P8-36	Output current exceeds limit	0.0% (no detection)	200.0%	☆	0xF824

Function code	Name	Setting range	Factory default	Attributes	DEC address
P8-37	Output current over-limit detection delay time	0.00s~600.00s	0.00s	☆	0xF825
P8-38	Arbitrary arrival current 1	0.0%~300.0% (motor rated current)	100.0%	☆	0xF826
P8-39	Arbitrary arrival current 1 width	0.0%~300.0% (motor rated current)	0.0%	☆	0xF827
P8-40	Arbitrary arrival current 2	0.0%~300.0% (motor rated current)	100.0%	☆	0xF828
P8-41	Arbitrary arrival current 2 width	0.0%~300.0% (motor rated current)	0.0%	☆	0xF829
P8-42	Timing function selection	0: Invalid 1: Valid	0	☆	0xF82A
P8-43	Timing run time selection	0: P8-44 setting 1: AI1 2: AI2 3: keyboard potentiometer Note: Analog input range corresponds to P8-44	0	☆	0xF82B
P8-44	Timing run time	0.0Min~6500.0Min	0.0Min	☆	0xF82C
P8-45	AI1 input voltage protection value lower limit	0.00V~P8-46	3.10V	☆	0xF82D

Function code	Name	Setting range	Factory default	Attributes	DEC address
P8-46	AI1 input voltage protection upper limit	P8-45~10.00V	6.80V	☆	0xF82E
P8-47	Module temperature reaches	0℃ ~100℃	75 °C	☆	0xF82F
P8-48	Fan control	0: The fan turns when running 1: The fan keeps turning	0	☆	0xF830
P8-49	Wakeup frequency	Sleep frequency (P8-51) ~ maximum frequency (P0-10)	0.00Hz	☆	0xF831
P8-50	Wake up delay time	0.0s~6500.0s	0.0s	☆	0xF832
P8-51	Sleep frequency	0.00Hz~wake-up frequency (P8-49)	0.00Hz	☆	0xF833
P8-52	Sleep delay time	0.0s~6500.0s	0.0s	☆	0xF834
P8-53	Arrival time setting for this run	0.0Min~6500.0Min	0.0Min	☆	0xF835
P8-54	Output power calibration coefficient	0~6553.5	Model confirmed	☆	0xF836
P8-55	Fire mode selection	0: No function 1: Fire mode 1 2: Fire mode 2 3: Fire mode 3 4: Fire mode 4	0	★	0xF837
P8-56	Force run frequency	0.00Hz~Maximum frequency（P0-10）	50.00Hz	★	0xF838
P8-57	Fire mode operating time	0~65535Min	30	☆	0xF839
P9 Group failure and protection					

Function code	Name	Setting range	Factory default	Attributes	DEC address
P9-00	Motor overload protection selection	0: Disable 1: Enable	1	☆	0xF900
P9-01	Motor overload protection gain	0.20~10.00	1.00	☆	0xF901
P9-02	Motor overload warning coefficient	50%~100%	80%	☆	0xF902
P9-03	Overvoltage stall gain	0~100	30	☆	0xF903
P9-04	Overvoltage stall action voltage	200.0~2000.0V 220V: 380V 380V: 760V	Model confirmed	☆	0xF904
P9-05	Reserve	-	-	-	0xF905
P9-06	Reserve	-	-	-	0xF906
P9-07	Short-circuit protection selection	Units digit: Short-circuit protection selection for power-up 0: Disabled 1: Enabled Tens digit: Short-circuit protection selection for power-up 0: Disabled 1: Enabled	01	☆	0xF907
P9-08	Dynamic braking action voltage	200.0~2000.0V	220V: 360V 380V: 690V	☆	0xF908
P9-09	Fault automatic reset times	0~20	0	☆	0xF909

Function code	Name	Setting range	Factory default	Attributes	DEC address
P9-10	DO action selection during fault automatic reset	0: No action 1: Action	1	☆	0xF90A
P9-11	Fault automatic reset interval time	0.1s~100.0s	6.0s	☆	0xF90B
P9-12	Input phase loss\ contactor pickup protection selection	Units digit: Input phase loss protection selection 0: Disable 1: Enable Tens digit: Contactor pickup protection selection 0: Disable 1: Enable	11	☆	0xF90C
P9-13	Output phase loss protection selection	Units digit: Output phase loss protection selection 0: Disable 1: Enable Tens digit: Output phase loss protection selection before operation 0: Disable 1: Enable	01	☆	0xF90D
P9-14	First failure type	0: No fault 1: Reserved 2: Acceleration overcurrent 3: Deceleration overcurrent 4: Constant speed overcurrent 5: Acceleration overvoltage 6: Deceleration overvoltage 7: Constant speed overvoltage 8: Reserved 9: Undervoltage	-	●	0xF90E
P9-15	Second failure type		-	●	0xF90F

Function code	Name	Setting range	Factory default	Attributes	DEC address
		10: Inverter overload 11: Motor overload12: Input phase loss 13: Output phase loss 14: Module overheating 15: External fault 16: Communication abnormality 17: Reserved 18: Current detection abnormality 19: Motor tuning abnormality 20: Reserved 21: Parameter reading and writing abnormality 22: Reserved 23: Motor short circuit to ground 24: Reserved 25: Reserved 26: Running time reached 27: User-defined fault 1 28: User-defined fault 2 29: Power- on time reached 30: Load off 31: PID feedback lost during running 32: PID low limit fault during operation 33: PID high limit fault during operation 34: Water shortage fault during operation 40: Fast current limit overtime 41: Switch motor during operation 42: Excessive speed deviation			
P9-16	**Third (most recent) failure type**		--	●	0xF910

Function code	Name	Setting range	Factory default	Attributes	DEC address
		43: Motor overspeed 45: Reserved 51: Reserved			
P9-17	Frequency of the third (most recent) failure	-	-	●	0xF911
P9-18	Current at the third (most recent) fault	-	-	●	0xF912
P9-19	Bus voltage at the third (most recent) fault	-	-	●	0xF913
P9-20	Input terminal status at the third (most recent) fault	-	-	●	0xF914
P9-21	Output terminal status at the third (most recent) fault	-	-	●	0xF915
P9-22	The third (most recent) fault occurred.	-	-	●	0xF916
P9-23	Power-on time at the third (most recent) fault	-	-	●	0xF917
P9-24	Running time at the third (most recent) failure	-	-	●	0xF918

Function code	Name	Setting range	Factory default	Attributes	DEC address
P9-27	Second fault frequency	-	-	●	0xF91B
P9-28	Second fault current	-	-	●	0xF91C
P9-29	Bus voltage at second fault	-	-	●	0xF91D
P9-30	Input terminal status at the second fault	-	-	●	0xF91E
P9-31	Output terminal status at the second fault	-	-	●	0xF91F
P9-32	Inverter status at the second fault	-	-	●	0xF920
P9-33	Power-on time at the second fault	-	-	●	0xF921
P9-34	Running time at the second fault	-	-	●	0xF922
P9-37	Frequency at first Fault	-	-	●	0xF925
P9-38	Current at the first Fault	-	-	●	0xF926
P9-39	Bus voltage at first fault	-	-	●	0xF927
P9-40	Input terminal status at the first fault	-	-	●	0xF928

Function code	Name	Setting range	Factory default	Attributes	DEC address
P9-41	Output terminal status at the first fault	-	-	●	0xF929
P9-42	Inverter status at the first fault	-	-	●	0xF92A
P9-43	Power-on time at first failure	-	-	●	0xF92B
P9-44	Uptime to first failure	-	-	●	0xF92C
P9-47	Fault protection action selection 1	Units digit: Motor overload (Err11) Tens digit: Input phase loss (Err12) Hundreds digit: Output phase loss (Err13) Thousands: External fault (Err15) Ten thousandths: Communication abnormality (Err16) 0: Coast to stop 1: Stop according to the stop method 2: Continue running	00000	☆	0xF92F
P9-48	Fault protection action selection 2	Units digit: Reserved Tens digit: Reserved Hundreds digit: Inverter overload (Err10) 0: Coast to stop 1: Derating operation Thousands digit: Reserved Ten thousand digit: Run time reached (Err26) 0: Coast to stop	00000	☆	0xF930

Function code	Name	Setting range	Factory default	Attributes	DEC address
		1: Stop according to the stop method			
P9-49	**Fault protection action selection 3**	Units digit: User-defined fault 1 (Err 27) 0: Coast to stop 1: Stop according to the stop method 2: Continue to run Tens digit: User-defined fault 2 (Err 28) 0: Coast to stop 1: Stop according to the stop method 2: Continue to run Hundreds: Power-on time reached (Err 29) 0: Coast to stop 1: Stop according to the stop method 2: Continue to run Thousands digit: Load loss (Err 30) 0: Coast to stop 1: Decelerate to stop 2: Jump to 7% of the motor's rated frequency and continue to run. Automatically return to the set frequency if there is no load loss Ten thousandths digit: PID feedback loss during operation (Err 31) 0: Coast to stop 1: Stop according to the stop method 2: Continue to run	100.0%	☆	0xF931

Function code	Name	Setting range	Factory default	Attributes	DEC address
P9-50	Fault protection action selection 4	Reserve	-	-	0xF930
P9-54	Continue running frequency selection during fault	0: Run at the current operating frequency 1: Run at the set frequency 2: Run at the upper frequency limit 3: Run at the lower frequency limit 4: Run at the abnormal backup frequency	0	☆	0xF936
P9-55	Abnormal backup frequency	000.0%~100.0% (100.0% corresponds to the maximum frequency P0-10)	100.0%	☆	0xF937
P9-59	Instantaneous no-power-off action selection	0: Disable 1: Decelerate 2: Decelerate to stop	0	☆	0xF93B
P9-60	Momentary power failure pause judgment voltage	P9-62~100.0%	85.0%	☆	0xF93C
P9-61	Instantaneous non-stop voltage recovery judgment time	0.000s~100.00s	0.50s	☆	0xF93D
P9-62	Instantaneous non-stop power-off action judgment voltage	60.0%~100.0% (standard bus voltage)	80.0%	☆	0xF93E

Function code	Name	Setting range	Factory default	Attributes	DEC address
P9-63	Load Loss Protection Selection	0: Invalid 1: Valid	0	☆	0xF93F
P9-64	Load drop detection level	0.000~100.0%	10.0%	☆	0xF940
P9-65	Load drop detection time	0.00~60.0s	1.0s	☆	0xF941
P9-67	Overspeed detection value	0.0~50.0	20.00%	☆	0xF943
P9-68	Overspeed detection time	0.0s: No detection 0.0~60.0s	1.0s	☆	0xF944
P9-69	Speed deviation too large detection value	0.0%~50.0% (maximum frequency)	20.00%	☆	0xF945
P9-70	Excessive speed deviation detection time	0.0s: No detection 0.0~60.0s	5.0s	☆	0xF946
P9-71	Instantaneous stop without stopping gain Kp	0~100	40	☆	0xF947
P9-72	Instantaneous power failure integral coefficient Ki	0~100	30	☆	0xF948
P9-73	Instantaneous stop and non-stop action deceleration time	0~300.0s	20.0s	★	0xF949
P9-74	Reserve				0xF94A
P9-75	Reserve				0xF94B

Function code	Name	Setting range	Factory default	Attributes	DEC address
		PA Group PID function			
PA-00	**PID given source**	0: PA-01 setting 1: AI1 2: AI2 3: Keypad potentiometer 4: PLUSE input pulse setting (DI5) 5: Communication setting 6: Multi-step command setting 7: Pressure given by water supply group AA-01	0	☆	0xFA00
PA-01	**PID value given**	0.0~100.0%	50.0%	☆	0xFA01
PA-02	**PID feedback source**	0: AI1 1: AI2 2: Keypad potentiometer 3: AI1-AI2 4: PLUSE input pulse setting (DI5) 5: Communication setting 6: AI1+AI2 7: MAX (|AI1|, |AI2|) 8: MIN (|AI1|, |AI2|)	0	☆	0xFA02
PA-03	**PID action direction**	0: Positive action 1: Reverse action	0	☆	0xFA03
PA-04	**PID given feedback range**	0~65535	1000	☆	0xFA04
PA-05	**Proportional gain KP1**	0.0~100.0	20.0	☆	0xFA05
PA-06	**Integration time Ti1**	0.01~10.00s	2.00s	☆	0xFA06
PA-07	**Derivative time Td1**	0.000~10.000s	0.000s	☆	0xFA07

Function code	Name	Setting range	Factory default	Attributes	DEC address
PA-08	PID inversion cut-off frequency	0.00~maximum frequency	2.00Hz	☆	0xFA08
PA-09	PID deviation limit	0.0~100.0%	0.0%	☆	0xFA09
PA-10	PID differential limiter	0.00~100.00%	0.10%	☆	0xFA0A
PA-11	PID given change time	0.00~650.00s	0.00s	☆	0xFA0B
PA-12	PID feedback filter time	0.00~60.00s	0.00s	☆	0xFA0C
PA-13	PID output filter time	0.00~60.00s	0.00s	☆	0xFA0D
PA-15	Proportional gain KP2	0.0~100.0	20.0	☆	0xFA0E
PA-16	Integration time Ti2	0.01s~10.00s	2.00s	☆	0xFA0F
PA-17	Derivative time Td2	0.000s~10.000s	0.000s	☆	0xFA10
PA-18	PID parameter switching condition	0: No switching 1: Switch via DI terminal 2: Automatically switch based on deviation	0	☆	0xFA11
PA-19	PID parameter switching deviation 1	0.0%~PA-20	20.0%	☆	0xFA12
PA-20	PID parameter switching deviation 2	PA-19~100.0%	80.0%	☆	0xFA13
PA-21	PID initial value	0.0~100.0%	0.0%	☆	0xFA14
PA-22	PID initial value hold time	0.00~650.00s	0.00s	☆	0xFA15

Function code	Name	Setting range	Factory default	Attributes	DEC address
PA-23	The maximum positive value of the two output deviations	0.00~100.00%	1.00%	☆	0xFA16
PA-24	The reverse maximum value of the two output deviations	0.00~100.00%	1.00%	☆	0xFA17
PA-25	The maximum value of the two output deviations in opposite directions	Units: Integral Separation 0: Ineffective 1: Effective Tens: Whether to stop accumulating after reaching the output limitIntegral 0: Continue accumulating 1: Stop accumulating	00	☆	0xFA18
PA-26	PID feedback loss detection value	0.0%: No feedback loss detected 0.1-100.0%	0.0%	☆	0xFA19
PA-27	PID feedback loss detection time	0.0s~20.0s	0.0s	☆	0xFA1A
PA-28	PID stop operation	0: No calculation during shutdown 1: Calculation during shutdown	1	☆	0xFA1B
Pb Group swing frequency, fixed length and counting					
Pb-00	Reserve	-	-	-	0xFB00
Pb-01	Reserve	-	-	-	0xFB01
Pb-02	Reserve	-	-	-	0xFB02
Pb-03	Reserve	-	-	-	0xFB03

Function code	Name	Setting range	Factory default	Attributes	DEC address
Pb-04	Reserve	-	-	-	0xFB04
Pb-05	Set length	0~65535m	1000m	☆	0xFB05
Pb-06	Actual length	0~65535m	0m	☆	0xFB06
Pb-07	Pulses per meter	0.1~6553.5	100.0	☆	0xFB07
Pb-08	Set count value	1~65535	1000	☆	0xFB08
Pb-09	Specify count value	1~65535	1000	☆	0xFB09
PC Group multi-segment instructions and simple PLC					
PC-00	Multi-segment instruction 0	-100.0%~100.0%	0.0%	☆	0xFC00
PC-01	Multi-segment instruction 1	-100.0%~100.0%	0.0%	☆	0xFC01
PC-02	Multi-segment instruction 2	-100.0%~100.0%	0.0%	☆	0xFC02
PC-03	Multi-stage instruction 3	-100.0%~100.0%	0.0%	☆	0xFC03
PC-04	Multi-segment instruction 4	-100.0%~100.0%	0.0%	☆	0xFC04
PC-05	Multi-segment instruction 5	-100.0%~100.0%	0.0%	☆	0xFC05
PC-06	Multi-segment instruction 6	-100.0%~100.0%	0.0%	☆	0xFC06
PC-07	Multi-segment instruction 7	-100.0%~100.0%	0.0%	☆	0xFC07
PC-08	Multi-segment instructions 8	-100.0%~100.0%	0.0%	☆	0xFC08
PC-09	Multi-segment instructions 9	-100.0%~100.0%	0.0%	☆	0xFC09
PC-10	Multi-segment instructions 10	-100.0%~100.0%	0.0%	☆	0xFC0A

Function code	Name	Setting range	Factory default	Attributes	DEC address
PC-11	Multi-segment instructions 11	-100.0%~100.0%	0.0%	☆	0xFC0B
PC-12	Multi-segment instruction 12	-100.0%~100.0%	0.0%	☆	0xFC0C
PC-13	Multi-stage instruction 13	-100.0%~100.0%	0.0%	☆	0xFC0D
PC-14	Multi-segment instructions 14	-100.0%~100.0%	0.0%	☆	0xFC0E
PC-15	Multi-segment instruction 15	-100.0%~100.0%	0.0%	☆	0xFC0F
PC-16	Simple PLC operation mode	0: Shut down at the end of a single run 1: Hold final value at the end of a single run 2: Continuously loop	0	☆	0xFC10
PC-17	Easy PLC power-down memory selection	Units digit: Power-off memory selection 0: No memory upon power-off 1: Memory upon power-off Tens digit: Shutdown memory selection 0: No memory upon shutdown 1: Memory upon shutdown	00	☆	0xFC11
PC-18	Simple PLC 0 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC12

Function code	Name	Setting range	Factory default	Attributes	DEC address
PC-19	Simple PLC 0 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC13
PC-20	Simple PLC 1 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC14
PC-21	Simple PLC 1 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC15
PC-22	Simple PLC 2-stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC16
PC-23	Simple PLC 2 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC17
PC-24	Simple PLC 3 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC18
PC-25	Simple PLC 3 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC19

Function code	Name	Setting range	Factory default	Attributes	DEC address
PC-26	Simple PLC 4 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC1A
PC-27	Simple PLC 4 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC1B
PC-28	Simple PLC 5 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC1C
PC-29	Simple PLC 5 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC1D
PC-30	Simple PLC 6 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC1E
PC-31	Simple PLC 6 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC1F
PC-32	Simple PLC 7 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC20
PC-33	Simple PLC 7 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC21

Function code	Name	Setting range	Factory default	Attributes	DEC address
PC-34	Simple PLC 8 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC22
PC-35	Simple PLC 8 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC23
PC-36	Simple PLC 9 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC24
PC-37	Simple PLC 9 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC25
PC-38	Simple PLC 10 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC26
PC-39	Simple PLC 10 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC27
PC-40	Simple PLC 11 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC28
PC-41	Simple PLC 11 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC29

Function code	Name	Setting range	Factory default	Attributes	DEC address
PC-42	Simple PLC 12 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC2A
PC-43	Simple PLC 12 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC2B
PC-44	Simple PLC 13 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC2C
PC-45	Simple PLC 13 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC2D
PC-46	Simple PLC 14 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC2E
PC-47	Simple PLC 14 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC2F
PC-48	Simple PLC 15 stage running time	0.0s (h) ~ 6553.5s (h)	0.0s(h)	☆	0xFC30
PC-49	Simple PLC 15 stage Acceleration and deceleration time selection	0~3	0	☆	0xFC31

Function code	Name	Setting range	Factory default	Attributes	DEC address
PC-50	Simple PLC operation time unit	0: s (second) 1: h (hour)	0	☆	0xFC32
PC-51	Multi-segment instruction 0 given mode	0: Function code PC-00 setting 1: AI1 2: AI2 3: Keyboard potentiometer 4: PULSE input pulse (DI5) 5: PID 6: Preset frequency (P0-08) setting, UP/DOWN adjustable	0	☆	0xFC33
Pd Group communication parameters					
Pd-00	Baud rate	0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS	5	☆	0xFD00
Pd-01	Data format	0: No parity (8-N-2) 1: Even parity (8-E-1) 2: Odd parity (8-O-1) 3: No parity (8-N-1)	0	☆	0xFD01
Pd-02	Local address	1~247	1	☆	0xFD02
Pd-03	Response delay	0~20ms	2	☆	0xFD03
Pd-04	Communication timeout	0.0(Invalid), 0.1s~60.0s	0.0	☆	0xFD04
Pd-05	Data transmission format selection	1: Standard MODBUS protocol	1	☆	0xFD05

Function code	Name	Setting range	Factory default	Attributes	DEC address
Pd-06	Communication reading current resolution	0: 0.01A 1: 0.1A	0	☆	0xFD06
Pd-07	Reserve	-	0	☆	0xFD07
		PP Group user password			
PP-00	User password	0~65535	00000	☆	0x1F00
PP-01	Parameter initialization	0: No operation 01: Restore factory parameters, excluding motor parameters 02: Clear record information 03: Reserve 04: Reserve	000	★	0x1F01
PP-02	Function parameter group display selection	Units digit: Display selection for Group U Tens digit: Display selection for Group A 0: No display 1: Display	11	★	0x1F02
PP-04	Function code modification properties	0: Can be modified 1: Cannot be modified	0	☆	0x1F04
PP-05	G/P model modification	1: G type 2: P type	1	★	0x1F05
		Group A0 torque ccontrol parameters			
A0-00	Speed/torque selection	0: Speed control 1: Torque control	0	☆	0xA000
A0-01	Torque setting source	0: A0-03 setting 1: AI1 setting 2: AI2 setting 3: AI3 keyboard potentiometer setting 4: HDI high-speed pulse setting	0	★	0xA001

Function code	Name	Setting range	Factory default	Attributes	DEC address
		5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) Note: 1-7 full scale corresponds to the A0-03 digital setting			
A0-02	**Reserve**	-	-	-	0xA002
A0-03	**Torque digital setting**	-200.0%~200.0%	150%	☆	0xA003
A0-04	**Reserve**	-	-	-	0xA004
A0-05	**Torque positive maximum frequency**	0.00Hz~maximum frequency (P0-10)	50.00 Hz	☆	0xA005
A0-06	**Torque reverse maximum frequency**	0.00Hz~maximum frequency (P0-10)	50.00 Hz	☆	0xA006
A0-07	**Torque acceleration time**	0~655.35s	0.00s	☆	0xA007
A0-08	**Torque deceleration time**	0~655.35s	0.00s	☆	0xA008
Group A2 second motor parameter 1					
A2-00	**Motor Type Selection**	0: Ordinary asynchronous motor 2: Permanent magnet synchronous motor	0	★	0xA200
A2-01	**Motor rated power**	0.1~1000kW	Model confirmed	★	0xA201
A2-02	**Motor rated voltage**	1~2000V	Model confirmed	★	0xA202

Function code	Name	Setting range	Factory default	Attributes	DEC address
A2-03	Motor rated current	0.01~655.35A (inverter power≤55 kW) 0.1~6553.5A (inverter power>55 kW)	Model confirmed	★	0xA203
A2-04	Motor rated frequency	0.01Hz~maximum frequency	Model confirmed	★	0xA204
A2-05	Motor rated speed	1~65535rpm	Model confirmed	★	0xA205
A2-06	Asynchronous motor stator resistance	0.001Ω ~ 65.535Ω (inverter power ≤55 kW) 0.0001Ω ~ 6.5535Ω (inverter power > 55 kW)	Model confirmed	★	0xA206
A2-07	Asynchronous motor rotor resistance	0.001Ω ~ 65.535Ω (inverter power ≤55 kW) 0.0001Ω ~ 6.5535Ω (inverter power > 55 kW)	Model confirmed	★	0xA207
A2-08	Asynchronous motor leakage inductance	0.01mH ~ 655.35mH (inverter power ≤55 kW) 0.001mH ~ 65.535mH (inverter power> 55 kW)	Model confirmed	★	0xA208
A2-09	Mutual inductance reactance of asynchronous motor	0.1mH ~ 6553.5mH (inverter power ≤55 kW) 0.01mH ~ 655.35mH (inverter power> 55 kW)	Model confirmed	★	0xA209
A2-10	Asynchronous motor no-load current	0.01~P1-03	Tuning parameters	★	0xA2A
A2-16	Synchronous motor stator resistance	0.001Ω to 65.535Ω (Inverter power ≤ 55kW) 0.0001Ω to 6.5535Ω (Inverter power > 55kW)	Tuning parameters	★	0xA210
A2-17	Synchronous motor D-axis inductance	0.01mH to 655.35mH (Inverter power ≤ 55kW) 0.001mH to 65.535mH (Inverter power > 55kW)	Tuning parameters	★	0xA211

Function code	Name	Setting range	Factory default	Attributes	DEC address
A2-18	Synchronous motor Q-axis inductance	0.01mH to 655.35mH (Inverter power ≤ 55kW) 0.001mH to 65.535mH (Inverter power > 55kW)	Tuning parameters	★	0xA212
A2-20	Synchronous motor back electromotive force	0.0V~6553.5V	Tuning parameters	★	0xA214
A2-37	Tuning selection	00: No operation 01: Partial tuning of asynchronous motor parameters at standstill 02: Complete dynamic tuning of asynchronous motor parameters 11: On-load tuning of synchronous motor parameters 12: No-load tuning of synchronous motor parameters	0	★	0xA225
A2-38	Speed loop proportional gain 1	1~100	30	☆	0xA226
A2-39	Speed loop integration time 1	0.01~10.00s	0.50s	☆	0xA227
A2-40	Switching frequency 1	0.00~P2-05	5.00Hz	☆	0xA228
A2-41	Speed loop proportional gain 2	1~100	20	☆	0xA229
A2-42	Speed loop integration time 2	0.01s~10.00s	1.00s	☆	0xA22A
A2-43	Switching frequency 2	P2-02~maximum frequency	10.00Hz	☆	0xA22B

Function code	Name	Setting range	Factory default	Attributes	DEC address
A2-44	Asynchronous motor vector control slip gain	50~200%	150%	☆	0xA22C
A2-45	Asynchronous motor speed loop filter time constant	0.000~0.100s	0.000s	☆	0xA22D
A2-46	Overexcitation gain of asynchronous motor vector control	0~200	64	☆	0xA22E
A2-47	Torque upper limit source in speed control mode	0: Function code P2-10 setting 1: AI1 2: AI2 3: Keyboard potentiometer 4: PULSE pulse setting 5: Communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) The full range of options 1-7 corresponds to P2-10	0	☆	0xA22F
A2-48	In speed control mode Torque upper limit digital setting	0.0% ~ 200.0%	150.0%	☆	0xA230
A2-49	Torque command selection in speed control mode (power generation)	0: Function code P2-12 setting (does not distinguish between motoring and generating) 1: AI1 2: AI2 3: Keypad potentiometer 4: PULSE setting	0	☆	0xA231

Function code	Name	Setting range	Factory default	Attributes	DEC address
		5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 8: Function code F2-12 setting The full scale of options 1-7 is affected by the operating range of P2-10.			
A2-50	**Digital setting of torque upper limit in speed control mode (power generation)**	0.0%~200.0%	150.0%	☆	0xA232
A2-51	**M-axis current loop KP**	0~60000	2000	☆	0xA233
A2-52	**M-axis current loop KI**	0~60000	1300	☆	0xA234
A2-53	**T-axis current loop KP**	0~60000	2000	☆	0xA235
A2-54	**T-axis current loop KI**	0~60000	1300	☆	0xA236
A2-55	**Asynchronous motor speed loop integral properties**	Units digit: Integral separation 0: Invalid 1: Valid	0	☆	0xA237
A2-56	**Reserve**	-	-	-	0xA238
A2-57	**Reserve**	-	-	-	0xA239
A2-58	**Reserve**	-	-	-	0xA23A
A2-59	**Reserve**	-	-	-	0xA23B
A2-60	**The upper limit of power generation voltage is effective**	0: No limit 1: Limit		☆	0xA23C

Function code	Name	Setting range	Factory default	Attributes	DEC address
A2-61	Generating power upper limit	0%-200.0%	Model confirmed	☆	0xA23D
A2-62	Synchronous motor field weakening mode	0,1,2	1	★	0xA23E
A2-63	Synchronous motor field weakening gain	1~50	5	☆	0xA23F
A2-64	Reserve	-	-	☆	0xA240
A2-65	Reserve	-	-	☆	0xA241
A2-66	Reserve	-	-	☆	0xA242
A2-67	Second motor control method and Selection of Motor Types	Unit Digit: Motor Control Mode 0: SVC - Sensorless Vector Control 1: Reserved 2: V/F - Open-loop Speed Control Tens Digit: Motor Type 0: Asynchronous Motor - IM 1: Synchronous Motor - PMSM	02	★	0xA243
A2-68	Second motor acceleration and deceleration time selection	0: Same as motor 1 1: Reserved 2: Acceleration time 2 3: Acceleration time 3 4: Acceleration time 4	0	☆	0xA244
A2-69	Second motor torque boost	0.0%: Automatic torque boost 0.1%~30.0%	Model confirmed	☆	0xA245
A2-70	Reserve	-	-	-	0xA246

Function code	Name	Setting range	Factory default	Attributes	DEC address
A2-71	Second motor oscillation suppression gain	0~100	40	☆	0xA247
Group A3 second motor parameter 2					
A3-00	Synchronous motor output voltage upper limit margin	0%~50%	5%	☆	0xA300
A3-01	Synchronous motor initial position angle detection current	50%~180%	80%	☆	0xA301
A3-02	Synchronous motor initial position angle detection	0: Test at every startup; 1: Do not test; 2: Test at the first startup after power-up;	0	☆	0xA302
A3-03	Synchronous motor speed loop mode selection	0,1	0	☆	0xA303
A3-04	Synchronous motor saliency ratio adjustment gain	50~500	100	☆	0xA304
A3-05	Maximum torque current ratio control	0,1	0	☆	0xA305
A3-06	Reserve	-	-	-	0xA306
A3-07	Current loop KP during tuning	1~100	6	☆	0xA307

Function code	Name	Setting range	Factory default	Attributes	DEC address
A3-08	Current loop KI during tuning	1~100	6	☆	0xA308
A3-09	Z signal correction	0,1	1	☆	0xA309
A3-10	Synchronous motor SVC speed filter level	10~1000	100	☆	0xA30A
A3-11	Synchronous motor SVC speed estimation proportional gain	5~200	40	☆	0xA30B
A3-12	Synchronous motor SVC speed estimation integral gain	5~200	30	☆	0xA30C
A3-13	Synchronous motor SVC initial excitation current limit	30%~80%	30%	☆	0xA30D
A3-14	Low-speed carrier frequency	0.8K~F0-15	1.5k	☆	0xA30E
A3-15	Reserve	-	-	-	0xA30F
A3-16	Reserve	-	-	-	0xA320
A3-17	Reserve	-	-	-	0xA321
A3-18	SVC low frequency braking current	0~80%	50%	☆	0xA322

Function code	Name	Setting range	Factory default	Attributes	DEC address
A3-19	Synchronous machine SVC speed tracking	0~1	0	☆	0xA323
A3-20	Zero servo enable	0: Off 1: On	0	☆	0xA324
A3-21	Switching frequency	0.00~F2-02	0.30Hz	☆	0xA325
A3-22	Zero servo speed loop proportional gain	1~100	10	☆	0xA326
A3-23	Zero servo speed loop integral time	0.01s~10.00s	0.50s	☆	0xA327
A3-24	Reverse is prohibited during shutdown	0~1	0	☆	0xA328
A3-25	Stop angle	0.0o~10.0°	0.8°	☆	0xA329
A3-26	Online parameter identification	0: Off 1: Tune before power-on first run 2: Tune before run	0	☆	0xA32A
A3-27	Online back-EMF identification	0: Off 1: On	0	☆	0xA32B
A3-28	SVC initial position compensation angle	0.0°~359.9°	0.0	☆	0xA32C
Group A5 control optimization parameters					
A5-00	DPWM switching upper limit frequency	5.0Hz~P0-10	8.00Hz	☆	0xA500

Function code	Name	Setting range	Factory default	Attributes	DEC address
A5-01	PWM modulation method	0: Asynchronous modulation 1: Synchronous modulation	0	☆	0xA501
A5-02	Dead zone compensation mode selection	0: No compensation 1: Compensation mode 1	1	☆	0xA502
A5-03	Random PWM Depth	0: Random PWM invalid 1 ~ 10: PWM carrier frequency random depth	0	☆	0xA503
A5-04	Fast current limit enable	0: Disable 1: Enable	1	☆	0xA504
A5-05	Overmodulation coefficient	100~105	105	★	0xA505
A5-06	Undervoltage point setting	100.0~2000.0V	Model confirmed	☆	0xA506
A5-07	Reserve	-	-	☆	0xA507
A5-08	Dead time adjustment	100~200%	150%	☆	0xA508
A5-09	Overvoltage point setting	200.0~2500.0V	Model confirmed	★	0xA509
Group AA intelligent constant pressure parameter supply					
AA-00	Pressure Sensor Range	0~99.99Bar (kg)	10.00	☆	0xAA00
AA-01	Target pressure value given	0~99.99Bar (kg)	5.00	☆	0xAA01
AA-02	Sleep pressure deviation	0.0~Wake-up pressure deviation value (AA-04)	0.1	☆	0xAA02
AA-03	Sleep rate	1~10 Hz/s	2	☆	0xAA03
AA-04	Sleep frequency	0.00~maximum frequency (P0-10)	2.00	☆	0xAA04

Function code	Name	Setting range	Factory default	Attributes	DEC address
AA-05	Holding time	0.0~999.9s	10.0	☆	0xAA05
AA-06	Arousal pressure bias	Sleep pressure deviation value (AA-02) ~ Target pressure (AA-01)	0.3	☆	0xAA06
AA-07	Wake-up delay time	0.0~999.9s	3.0	☆	0xAA07
AA-08	Operating time at rest frequency	0.0~100.0s	1.0	☆	0xAA08
AA-09	Water shortage detection method selection	00: No detection 1: Current detection 2: Pressure detection 3: Both detections	0	☆	0xAA09
AA-10	Water shortage detection pressure	0.0~ Target pressure (AA-01)	0.5	☆	0xAA0A
AA-11	Water shortage detection frequency	0.0~maximum frequency (P0-10)	4.50	☆	0xAA0B
AA-12	Water shortage detection time	0.0~999.9s	20.0	☆	0xAA0C
AA-13	Water shortage detection current	0.0~motor rated current (P1-03)	0	☆	0xAA0D
AA-14	Automatic reset interval time for water shortage fault	1~9999	15	☆	0xAA0E

Function code	Name	Setting range	Factory default	Attributes	DEC address
AA -15	Number of automatic resets for water shortage faults	0~100	0	☆	0xAA0F
AA-16	PID high limit alarm	PID low limit alarm (AA-18) ~ Pressure Sensor Range (AA-00)	100.0	☆	0xAA10
AA-17	PID high limit alarm detection time	0.0~200.0s	0	☆	0xAA11
AA-18	PID low limit alarm	0.0~PID high limit alarm (AA-16)	0.0	☆	0xAA12
AA-19	PID low limit alarm detection time	0.0~200.0s	0.0	☆	0xAA13
AA-20	Automatic operation selection after power on	0: Off 1: On	0	☆	0xAA14
AA-21	Automatic operation delay time	0.1~100.0s	1.0	☆	0xAA15
AA-22	Antifreeze Function Selection	0: Off 1: On	0	★	0xAA16
AA-23	Reserve	0~9999min	0	☆	0xAA17
AA-24	Dead time adjustment	0~9999s	60	☆	0xAA18
AA-25	Overvoltage point setting	0.00~30.00Hz	10.00	☆	0xAA19
AA-26	Dormant Flag	-	-	●	0xAA20

Function code	Name	Setting range	Factory default	Attributes	DEC address
Group Ab Photovoltaic water pump parameters					
Ab-00	Photovoltaic power tracking control mode	0. Disable 1. CVT Mode 2. MPPT Mode	0	☆	0xAB00
Ab-01	CVT mode target voltage ratio	0~99.9%	80%	☆	0xAB01
Ab-02	Photovoltaic open circuit voltage	-	-	★	0xAB02
Ab-03	MPPT upper limit voltage ratio	0~99.9%	99.9%	☆	0xAB03
Ab-04	MPPT lower limit voltage ratio	0~99.9%	0.1%	☆	0xAB04
Ab-05	MPPT search time	0.01s~10.00s	1s	☆	0xAB05
Ab-06	MPPT initial voltage	0~99.9%	80.0%	☆	0xAB06
Ab-07	MPPT PID proportional gain	0~65535	5000	☆	0xAB07
Ab-08	MPPT PID integral gain	0~65535	300	☆	0xAB08
Ab-09	Reserve	-	-	-	0xAB09
Ab-10	Reserve	-	-	-	0xAB0A
Ab-11	MPPT search step	0~30.0V	1.0V	☆	0xAB0B
Ab-12	Actual control target voltage	-	-	★	0xAB0C

Function code	Name	Setting range	Factory default	Attributes	DEC address
Ab-13	Current photovoltaic voltage display	-	-	★	0xAB0D
Ab-14	Output power display	-	-	★	0xAB0E
Ab-15	Sleep wake-up voltage ratio	0~99.9%	80.0%	☆	0xAB0F
Ab-16	Low-speed sleep frequency ratio	0~99.9%	33.3%	☆	0xAB10
Ab-17	Sleep flag	-	-	★	0xAB11
Ab-18	Low-speed sleep judgment time	0~3600s	30s	☆	0xAB12
Ab-19	Low speed shutdown times	0~5	0	☆	0xAB13
Ab-20	Reserve	-	-	-	0xAB14
Ab-21	First sleep wake-up time 1	0~3600s	10s	☆	0xAB15
Ab-22	Second sleep wake-up time 2	0~3600s	30s	☆	0xAB16
Ab-23	The third sleep wake-up time 3	0~3600s	60s	☆	0xAB17
Ab-24	The fourth sleep wake-up time is 4	0~3600s	180s	☆	0xAB18
Ab-25	The fifth sleep wake-up time is 5	0~3600s	3600s	☆	0xAB19

Function code	Name	Setting range	Factory default	Attributes	DEC address
Group AC AIAO correction					
AC-00	AI1 measured voltage 1	0.500V~4.000V	Factory correction	☆	0xAC00
AC-01	AI1 display voltage 1	0.500V~4.000V	Factory correction	☆	0xAC01
AC-02	AI1 measured voltage 2	6.000V~9.999V	Factory correction	☆	0xAC02
AC-03	AI1 display voltage 2	6.000V~9.999V	Factory correction	☆	0xAC03
AC-04	AI2 measured voltage 1	-9.999V~10.000V	Factory correction	☆	0xAC04
AC-05	AI2 display voltage 1	-9.999V~10.000V	Factory correction	☆	0xAC05
AC-06	AI2 measured voltage 2	-9.999V~10.000V	Factory correction	☆	0xAC06
AC-07	AI2 display voltage 2	-9.999V~10.000V	Factory correction	☆	0xAC07
AC-08	AI3 measured voltage 1	0.500V~4.000V	Factory correction	☆	0xAC08
AC-09	AI3 display voltage 1	0.500V~4.000V	Factory correction	☆	0xAC09
AC-10	AI3 measured voltage 2	6.000V~9.999V	Factory correction	☆	0xAC0A
AC-11	AI3 display voltage 2	6.000V~9.999V	Factory correction	☆	0xAC0B
AC-12	AO1 target voltage 1	0.500V~4.000V	Factory correction	☆	0xAC0C
AC-13	AO1 measured voltage 1	0.500V~4.000V	Factory correction	☆	0xAC0D
AC-14	AO1 target voltage 2	6.000V~9.999V	Factory correction	☆	0xAC0E
AC-15	AO1 measured voltage 2	6.000V~9.999V	Factory correction	☆	0xAC0F

Function code	Name	Setting range	Factory default	Attributes	DEC address
AC-16	AO2 target voltage 1	0.500V~4.000V	Factory correction	☆	0xAC10
AC-17	AO2 measured voltage 1	0.500V~4.000V	Factory correction	☆	0xAC11
AC-18	AO2 target voltage 2	6.000V~9.999V	Factory correction	☆	0xAC12
AC-19	AO2 measured voltage 2	6.000V~9.999V	Factory correction	☆	0xAC13
AC-20	Reserve	-	-	☆	0xAC14
AC-21	Reserve	-	-	☆	0xAC15
AC-22	Reserve	-	-	☆	0xAC16
AC-23	Reserve	-	-	☆	0xAC17
AC-24	AI1 measured current 1	0.000mA~20.000mA	Factory correction	☆	0xAC18
AC-25	AI1 sampling current 1	0.000mA~20.000mA	Factory correction	☆	0xAC19
AC-26	AI1 measured current 2	0.000mA~20.000mA	Factory correction	☆	0xAC1A
AC-27	AI1 sampling current 2	0.000mA~20.000mA	Factory correction	☆	0xAC1B
AC-28	AO1 ideal current 1	0.000mA~20.000mA	Factory correction	☆	0xAC1C
AC-29	AO1 measured current 1	0.000mA~20.000mA	Factory correction	☆	0xAC1D
AC-30	AO1 Ideal Current 2	0.000mA~20.000mA	Factory correction	☆	0xAC1E
AC-31	AO1 measured current 2	0.000mA~20.000mA	Factory correction	☆	0xAC1F
AC-32	AI2 measured current 1	0.000mA~20.000mA	Factory correction	☆	0xAC20

Function code	Name	Setting range	Factory default	Attributes	DEC address
AC-33	AI2 Sampling voltage 2=1	0.000mA~20.000mA	Factory correction	☆	0xAC21
AC-34	AI2 measured current 2	0.000mA~20.000mA	Factory correction	☆	0xAC22
AC-35	AI2 Sampling voltage 2	0.000mA~20.000mA	Factory correction	☆	0xAC23
AC-36	AO2 Ideal Current 1	0.000mA~20.000mA	Factory correction	☆	0xAC24
AC-37	AO2 measured current 1	0.000mA~20.000mA	Factory correction	☆	0xAC25
AC-38	AO2 Ideal Current 2	0.000mA~20.000mA	Factory correction	☆	0xAC26
AC-39	AO2 measured current 2	0.000mA~20.000mA	Factory correction	☆	0xAC27
U0 group parameter monitoring group					
U0-00	Operating frequency (Hz)	-	0.01Hz	●	0x7000
U0-01	Set frequency (Hz)	-	0.01Hz	●	0x7001
U0-02	Bus voltage (V)	-	0.1V	●	0x7002
U0-03	Output voltage (V)	-	1V	●	0x7003
U0-04	Output current (A)	-	0.01A	●	0x7004
U0-05	Output power (kW)	-	0.1kW	●	0x7005
U0-06	Output torque (%)	-	0.1%	●	0x7006
U0-07	DI input state	-	1	●	0x7007

Function code	Name	Setting range	Factory default	Attributes	DEC address
U0-08	FM output status	-	1	●	0x7008
U0-09	AI1 voltage (V)	-	0.01V	●	0x7009
U0-10	AI2 voltage (V)	-	0.01V	●	0x700A
U0-11	AI3 panel potentiometer voltage	-	0.01V	●	0x700B
U0-12	Count value	-	1	●	0x700C
U0-13	Length value	-	1	●	0x700D
U0-14	Load speed display	-	1	●	0x700E
U0-15	PID setting (dimensionless) PID set pressure value	-	1 0.01kg	●	0x700F
U0-16	PID feedback (dimensionless) PID feedback pressure value	-	1 0.01kg	●	0x7010
U0-17	PLC stage	-	1	●	0x7011
U0-18	PLUSE input pulse frequency (Hz)	-	0.01kHz	●	0x7012
U0-19	Feedback speed (unit 0.1Hz)	-	0.1Hz	●	0x7013
U0-20	Remaining run time	-	0.1Min	●	0x7014
U0-21	AI1 voltage before correction	-	0.001V	●	0x7015

Function code	Name	Setting range	Factory default	Attributes	DEC address
U0-22	AI2 voltage before correction	-	0.001V	●	0x7016
U0-23	Voltage before panel potentiometer correction	-	0.001V	●	0x7017
U0-24	Motor speed	-	1m/Min	●	0x7018
U0-25	Current power-on time	-	1Min	●	0x7019
U0-26	Current running time	-	0.1Min	●	0x701A
U0-27	PLUSE input pulse frequency	-	1Hz	●	0x701B
U0-28	Communication settings	-	0.01%	●	0x701C
U0-30	Main frequency X display	-	0.01Hz	●	0x701E
U0-31	Auxiliary frequency Y display	-	0.01Hz	●	0x701F
U0-32	View any memory address value	-	1	●	0x7020
U0-35	Target torque (%)	-	0.1%	●	0x7023
U0-36	Reserve	-	-	-	0x7024
U0-37	Power factor angle	-	0.1°	●	0x7025
U0-39	V/F separation target voltage	-	1V	●	0x7027

Function code	Name	Setting range	Factory default	Attributes	DEC address
U0-40	V/F separation output voltage	-	1V	●	0x7028
U0-41	DI input status intuitive display	-	1	●	0x7029
U0-42	FM input status intuitive display	-	1	●	0x702A
U0-43	DI function status intuitive display 1	-	1	●	0x702B
U0-44	DI function status intuitive display 2	-	1	●	0x702C
U0-45	Fault information	-	1	●	0x702D
U0-59	Set frequency (%)	-	0.01%	●	0x703B
U0-60	Operating frequency (%)	-	0.01%	●	0x703C
U0-61	Inverter status	-	1	●	0x703D
U0-62	Current fault code	-	1	●	0x703E
U0-65	Torque upper limit	-	0.1%	●	0x7041
U0-73	Motor serial number	-	0	●	0x7049
U0-74	Inverter operation	-	0.0	●	0x704A
U0-75	Reserve	-	1	●	0x704B
U0-76	Reserve	-	1	●	0x704C
U0-77	Reserve	-	1	●	0x704D
U0-78	Reserve	-	1	●	0x704E

Chapter 7
Troubleshooting and Maintenance

7.1 Troubleshooting

7.1.1 Handle failure

- When the inverter fails, a fault alarm display screen will appear on the operation panel, and the fault relay will act at the same time, the inverter will stop output, and the motor will stop freely.
- After a fault alarm occurs, record the fault phenomenon in detail, and refer to Table 7-1 to troubleshoot and clear.

Table 7-1 Fault Alarm Contents and Countermeasures

Fault name	Fault Code	Troubleshooting	Troubleshooting Countermeasures
Inverter unit protection	**Err01**	The inverter output circuit is shortcircuited	Eliminate peripheral faults
		The wiring between the motor and the inverter is too long	Install reactor or output filter
		The module is overheated	Check whether the air duct is blocked and whether the fan is working properly.work normally and troubleshoot
		The internal wiring of the inverter is loose	Plug in all cables
		The main control board is abnormal	Seek technical support
		The driver board is abnormal	Seek technical support
		The inverter module is abnormal	Seek technical support
Acceleration overcurrent	**Err02**	There is grounding or short circuit in the output circuit of the inverter	Eliminate peripheral faults

Fault name	Fault Code	Troubleshooting	Troubleshooting Countermeasures
Acceleration overcurrent	**Err02**	The control mode is vector without parameter identification	Carry out motor parameter identification
		The acceleration time is too short	Increase the acceleration time
		Manual torque boost or V/F curve is inappropriate	Adjust manual lifting torque or V/F curve
		Low voltage	Adjust the voltage to the normal range
		Start the rotating motor	Select the speed tracking start or wait for the motor to stop restart
		Sudden load increase during acceleration	Cancel sudden load
Deceleration overcurrent	**Err03**	There is grounding or short circuit in the output circuit of the inverter	Eliminate peripheral faults
		The control mode is vector without parameter identification	Carry out motor parameter identification
		The deceleration time is too short	Increase the deceleration time
		Low voltage	Adjust the voltage to the normal range
		Sudden load increase during deceleration	Cancel sudden load
		No braking unit and braking resistor installed	Install brake unit and resistor
Constant speed overcurrent	**Err04**	There is grounding or short circuit in the output circuit of the inverter	Eliminate peripheral faults
		The control mode is vector without parameter identification	Carry out motor parameter identification

Fault name	Fault Code	Troubleshooting	Troubleshooting Countermeasures
Constant speed overcurrent	**Err04**	Low voltage	Increase acceleration time,Cancel sudden additional load
		Whether there is a sudden load during operation	Adjust the voltage to the normal range
		The selection of frequency inverter is too small	Choose a frequency Inverter with a higher power level
Accelerated overvoltage	**Err05**	The input voltage is too high	Adjust the voltage to the normal range
		During the acceleration process,there is an external force to drive the motor to run	Cancel the external power or install braking resistor
		Acceleration time is too short	Increase the acceleration time
		No braking unit and braking resistor installed	Install brake unit and resistor
Deceleration overvoltage	**Err06**	The input voltage is too high	Adjust the voltage to the normal range
		During the acceleration process,there is an external force to drive the motor to run	Cancel the external power or install braking resistor
		The deceleration time is too short	Increase the acceleration time
		No braking unit and braking resistor installed	Install brake unit and resistor
Constant speed overvoltage	**Err07**	The input voltage is too high	Adjust the voltage to the normal range
		There is an external force to drive the motor during operation	Cancel the external power or install braking resistor
Control power failure	**Err08**	The input voltage is not within the specified range	Adjust the voltage to the range required by the specification

Fault name	Fault Code	Troubleshooting	Troubleshooting Countermeasures
Undervoltage fault	**Err09**	Momentary power failure	Reset fault
		The input voltage of the inverter is not within the range required by the specification	Adjust the voltage to the normal range
		The bus voltage is abnormal	Seek technical support
		The rectifier bridge and buffer resistor are abnormal	Seek technical support
		The driver board is abnormal	Seek technical support
		The control panel is abnormal	Seek technical support
Inverter overload	**Err10**	Whether the load is too large or the motor is blocked	Reduce the load and check the motor and mechanical condition
		The selection of frequency inverter is too small	Choose a frequency inverter with a higher power level
Motor overload	**Err11**	Whether the setting of motor protection parameter P9-01 is appropriate	Set this parameter correctly
		Whether the load is too large or the motor is blocked	Reduce the load and check the motor and mechanical condition
		The selection of frequency inverter is too small	Select a frequency inverter with a higher power level
Input phase loss	**Err12**	The three-phase input power supply is abnormal	Check and eliminate the problems in the peripheral circuit
		The driver board is abnormal	Seek technical support
		Abnormal lightning protection board	Seek technical support
		The main control board is abnormal	Seek technical support

Fault name	Fault Code	Troubleshooting	Troubleshooting Countermeasures
Output phase loss	**Err13**	The lead wire from the inverter to the motor is abnormal	Eliminate peripheral faults
		The three-phase output of the inverter is unbalanced when the motor is running	Check whether the three-phase winding of themotor is normal and troubleshoot
		The driver board is abnormal	Seek technical support
		Module exception	Seek technical support
Module overheating	**Err14**	The ambient temperature is too high	Reduce the ambient temperature
		The air duct is blocked	Clean the air duct
		The fan is damaged	Replace the fan
		The module thermistor is damaged	Replace the thermistor
		The inverter module is damaged	Replace the inverter module
External device Fault	**Err15**	Multi-function terminal X inputs external fault signal	Reset operation
		The virtual IO function inputs an external fault signal	Reset operation
Communication fail	**Err16**	The upper computer is not working properly	Check the wiring of the host computer
		The communication line is abnormal	Check the communication cable
		Reserve	Correctly set the communication expansion card type
		The setting of the communication parameter PD group is incorrect	Correctly set the communication parameters

Fault name	Fault Code	Troubleshooting	Troubleshooting Countermeasures
Current sense failure	**Err18**	Check the abnormality of the Hall device	Replace the Hall device
		The driver board is abnormal	Replace the driver board
Motor tuning failure	**Err19**	The motor parameters are not set according to the nameplate	Correctly set the motor parameters according to the nameplate
		The parameter identification process timed out	Check the lead wires from the inverter to the motor
EEPROM Read and write failure	**Err21**	The EEPROM chip is damaged	Replace the main control board
Inverter hardware failure	**Err22**	There is overvoltage	Handle according to overvoltage fault
		There is an overcurrent	Handle according to overcurrent fault
Short circuit fault to ground	**Err23**	The motor is short-circuited to the ground	Replace the cable or motor
Cumulative running time reached fault	**Err26**	The cumulative running time reaches the set value	Use the parameter initialization function to clear the record information
Custom Fault 1	**Err27**	Input the signal of user-defined fault 1 through the multi-function terminal X	Reset operation
		Input the signal of user-defined fault 1 through the virtual IO function	Reset operation
Custom Fault 2	**Err28**	Input the signal of user-defined fault 2 through the multi-function terminal X	Reset operation
		Input the signal of user-defined fault 2 through the virtual IO function	Reset operation

Fault name	Fault Code	Troubleshooting	Troubleshooting Countermeasures
Cumulative power-on time reached fault	**Err29**	The cumulative power-on time reaches the set value	Use the parameter initialization function to clear the record information
Load drop fault	**Err30**	The operating current of the inverter is less than P9-64	Confirm whether the load is off or whether the parameter settings of P9-64 and P9-65 conform to the actual operating conditions
PID feedback lost at runtime Fault	**Err31**	PID feedback is less than the set value of PA-26	Check the PID feedback signal or set PA-26 to an appropriate value
PID low limit fault during operation	**Err32**	PID feedback is lower than the AA-16 setting value	Check the PID feedback signal or set AA-16 to a suitable value
PID high limit fault during operation	**Err33**	PID feedback is higher than the AA-14 setting value	Check the PID feedback signal or set AA-14 to a suitable value
Water shortage during operation	**Err34**	The on-site water pressure is lower than the detection water pressure value set by AA-08	Check whether the AA-08 setting is reasonable. Check whether the outlet valve is closed. Check whether the pressure transmitter is damaged.
Wave-by-wave current limiting fault	**Err40**	Whether the load is too large or the motor is blocked	Reduce the load and check the motor and mechanical condition
		The selection of frequency inverter is too small	Choose a frequency inverter with a higher power level
Switching motor failure while running	**Err41**	Change through the terminals during the operation of the inverter current motor selection	Switch the motor after the inverter stops

Fault name	Fault Code	Troubleshooting	Troubleshooting Countermeasures
Speed deviation is too large	**Err42**	No parameter identification was conducted	Perform parameter identification
		Parameter identification was not performed. The speed deviation detection parameters P9-69/P9-70 are set improperly.	Perform parameter identification Set the test parameters appropriately based on the actual situation.
Wrong initial position	**Err51**	The motor parameters and the actual deviation are too large	Reconfirm whether the motor parameters are correct, focusing on whether the rated current is set too small

7.2 Maintenance

- Due to the influence of environmental temperature, humidity, pH, dust, vibration and other factors, as well as many reasons such as the aging and wear of the components inside the Frequency Inverter, potential failures will occur. Therefore, the controller must be routinely checked during storage and use. or regular maintenance.
- If the inverter has been transported for a long distance, it should be routinely inspected before use to confirm that the product components are complete and the screws are fastened.
- During the use of the inverter, the dust inside the inverter should be cleaned regularly, and the internal fastening screws should be checked to make sure that there is no looseness.

⚠ Danger

- Only professionally trained and authorized qualified professionals can maintain the FC300.
- Maintenance personnel must remove metal ornaments before maintenance. Insulation-compliant clothing and tools must be used for maintenance.
- FC300 has dangerous high voltage inside when it is electrified and running. Before checking and maintaining FC300, disconnect the input power reliably and wait for at least 10 minutes. After confirming that the charging indicator light inside the FC300 is off and the voltage between the power terminals (+) and (-) is lower than 36V, the FC300 cover can be opened for maintenance.

⚠ Warn

- For inverter that have been stored for more than 2 years, when they are powered on for the first time, they should be powered up slowly through a voltage regulator.
- Do not leave wires, tools, screws and other metal objects inside the inverter. Do not modify the inverter without authorization.
- There are static-sensitive IC components inside the inverter, please do not touch the components on the board directly.

Daily maintenance

The FC300 must be operated in a specified environment,see section 3.2. Please do the daily maintenance according to Table 7-2,so as to detect abnormal phenomena in time and prolong the service life of FC300.

Table 7-2 Daily Inspection Items

Inspection object	Check content	Judgment criteria
Operating environment	Temperature humidity	10-+40℃ , 40-50℃ needs derating Less than 95%RH, no condensation
	Dust, water and drip	No conductive dust accumulation, no trace of water leakage
	Gas	Odorless
Inverter	Vibration, heat	Stable vibration and reasonable wind temperature

Inspection object	Check content	Judgment criteria
Inverter	Noise	No abnormal sound
Motor	Fever	Fever without abnormality
	Noise	Uniform noise
Running state parameters	Output current	In the rated range
	The output voltage	In the rated range

Regular maintenance

According to the use environment, the user can conduct a regular routine inspection of FC300 within 3~6 months to eliminate potential failures and ensure long-term high-performance and stable operation of the equipment.The inspection contents are:

- Control terminal screw is not loose, if it is loose, tighten it with a screw batch with appropriate torque and size;
- The power terminals are firmly in contact, and there is no trace of overheating at the copper bar or cable connection;
- Whether the power cables and control cables are damaged, especially if there is no cut on the skin in contact with the metal surface;
- The wire lug insulation bandages of power cables and control signal wires do not fall off or break;
- It is best to use a vacuum cleaner to clean the dust on the circuit board and air duct comprehensively.

Notice
· The inverter has passed the withstand voltage test before leaving the factory, and the user does not need to carry out the withstand voltage test, otherwise the inverter will be damaged if the test is not done properly.
· When conducting an insulation test on the motor, the U/V/W terminals of the inverter must be disconnected, and the motor is tested separately, otherwise the inverter will be damaged.
· Inverter stored for a long time must undergo a power-on test within 2 years. Use a voltage regulator to slowly increase the input voltage of the inverter to the rated value, and power on for at least 5 hours.

Replacement of wearing parts

Vulnerable parts of the inverter mainly include cooling fan and filter electrolytic capacitor. Their service life is closely related to the environment of use and maintenance status. Users can set the replacement period according to the running time.

Inspection object	Cooling fan	Filter electrolytic capacitor
Life time	60,000 hours	50,000 hours
Possible cause of damage	Bearing wear, blade aging	The ambient temperature is high, frequent load jumps cause the pulsating current to increase, and the electrolyte is aging
Criterion	When the inverter is powered off, check whether there are cracks in the fan blades, etc.; when the drive is powered on, check whether the fan is running normally, whether there is abnormal vibration, noise, etc.	Whether the Frequency Inverter often has overcurrent, overvoltage and other faults when it is running under load; whether there is liquid leakage, whether the safety valve has protruded, the measurement of electrostatic capacitance, and the measurement of insulation resistance.

Disposal

When scrapping , please note:

- The electrolytic capacitor inside the inverter may explode if burned.
- Toxic gases are produced when plastic parts are incinerated.
- Please dispose of it as industrial waste.

Chapter 8 Accessories Selection

8.1 Operator panel mounting kit

- The installation components of the operation panel include: the external lead installation base and the external lead extension cable.
- The external mounting base of the operation panel is an optional accessory, please order separately if necessary.The dimensions of the installation base are shown in Figure 8-1, and the unit is mm.

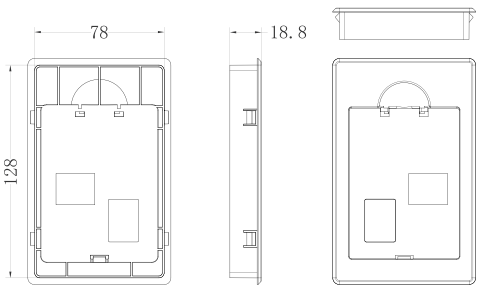


Figure 8-1 The size of the external lead installation base

External extension cable

The external extension cable of the operation panel is an optional accessory, please order separately if necessary.The models are as follows:

- 1.5 m extension cable from the operation panel
- 5 m extension cable from the operation panel

8.2 Selection of braking unit and braking resistor

8.2.1 Selection of resistance value

- During braking, almost all the regenerative energy of the motor is consumed on the braking resistor.
- According to the formula:U*U/R=Pb

- U---- braking voltage for stable braking of the system (different systems are different, for 380VAC system, generally take 700V)
  Pb---- braking power

8.2.2 Power Selection of Braking Resistor

Braking Resistor Theoretically, the power of the braking resistor is the same as the braking power,but the derating is 70%. According to the formula:0.7* Pr =Pb*D
Pr ---- the power of the resistor
D ---- braking frequency (the regeneration process accounts for the proportion of the whole working process), generally take 10%.

Table 8-1 Braking unit and braking resistor selection recommendation table

Model	Adapted motor	Recommended Brake unit	Recommended Brake Resistor	
			Resistance	Minimum power
FC300-2S-0.4GB	0.4kW	Built-in standard	200~300Ω	50W
FC300-2S-0.75GB	0.75kW	Built-in standard	150~250Ω	100W
FC300-2S-1.5GB	1.5kW	Built-in standard	100~150Ω	200W
FC300-2S-2.2GB	2.2kW	Built-in standard	80~100Ω	250W
FC300-2S-4.0GB	4.0kW	Built-in standard	60~80Ω	400W
FC300-2S-5.5GB	5.5kW	Built-in standard	40~50Ω	600W
FC300-2S-7.5GB	7.5kW	Built-in standard	30~40Ω	800W
FC300-2S-11G(B)	11kW	Built-in optional	20~25Ω	1.2kW
FC300-2S-15G(B)	15kW	Built-in optional	15~20Ω	1.5kW
FC300-4T-0.75GB/1.5PB	0.75/1.5kW	Built-in standard	250~350Ω	100W
FC300-4T-1.5GB/2.2PB	1.5/2.2kW	Built-in standard	200~300Ω	200W
FC300-4T-2.2GB/4.0PB	2.2/4.0kW	Built-in standard	150~250Ω	250W
FC300-4T-4.0GB/5.5PB	4.0/5.5kW	Built-in standard	100~150Ω	400W
FC300-4T-5.5GB/7.5PB	5.5/7.5kW	Built-in standard	80~100Ω	600W
FC300-4T-7.5GB/11PB	7.5/11kW	Built-in standard	60~80Ω	800W
FC300-4T-11GB/15PB	11/15kW	Built-in standard	40~50Ω	1.2kW
FC300-4T-15GB/18.5PB	15/18.5kW	Built-in standard	30~40Ω	1.5kW
FC300-4T-18.5GB/22PB	18.5/22kW	Built-in standard	25~30Ω	2kW

Model	Adapted motor	Recommended Brake unit	Recommended Brake Resistor	
			Resistance	Minimum power
FC300-4T-22GB/30PB	22/30kW	Built-in standard	20~25Ω	2.5kW
FC300-4T-30G(B)/37P(B)	30/37kW	Built-in optional	15~20Ω	3kW
FC300-4T-37G(B)45P(B)	37/45kW	Built-in optional	15~20Ω	4kW
FC300-4T-45G(B)/55P(B)	45/55kW	Built-in optional	10~15Ω	4.5kW
FC300-4T-55G(B)	55kW	Built-in optional	10~15Ω	5.5kW
FC300-4T-55G(B)/75P(B)	55/75kW	Built-in optional	10~15Ω	6kW
FC300-4T-75G(B)/90P(B)	75/90kW	Built-in optional	8~10Ω	7.5kW
FC300-4T-90G/110P	90/110kW	External	8~10Ω	9kW
FC300-4T-110G/132P	110/132kW	External	6~8Ω	11kW
FC300-4T-132G/160P	132/160kW	External	6~8Ω	13.2kW
FC300-4T-160G/185P	160/185kW	External	4~6Ω	16kW
FC300-4T-185G	185kW	External	4~6Ω	18kW
FC300-4T-200G/220P	200/220kW	External	4~6Ω	20kW
FC300-4T-220G/250P	220/250kW	External	4-6Ω*2	11kW*2
FC300-4T-250G/280P	250/280kW	External	4-6Ω*2	13kW*2
FC300-4T-280G/315P	280/315kW	External	4-6Ω*2	14kW*2
FC300-4T-315G/355P	315/355kW	External	4-6Ω*2	16kW*2
FC300-4T-355G/400P	355/400kW	External	4-6Ω*3	11kW*3
FC300-4T-400G/450P	400/450kW	External	4-6Ω*3	14kW*3
FC300-4T-450G	450kW	External	4-6Ω*3	14kW*3

Tip: *2, *3 refers to 2, 3 parallel connection.

Notice

- It is recommended to select the braking resistor according to the resistance value range recommended in the table above.
- A larger resistance value can ensure safety when the braking system fails, but if the resistance value is too high, the braking ability will decrease, which may cause the inverter to have overvoltage protection.
- Please install the braking resistor in a well-ventilated metal cover. The temperature of the braking resistor is very high when it is working. Do not directly.

Appendix A MODBUS Communication Protocol

The inverter provides RS485 communication interface and supports Modbus-RTU communication protocol. Users can realize centralized control through a computer or PLC , set inverter operation commands through this communication protocol, modify or read function code parameters, and read inverter working status and fault information, etc.

1. Agreement

The serial communication protocol defines the content and format of information transmitted in serial communication. These include: host polling (or broad broadcast) format; the encoding method of the host, including: the function code of the required action, transmission data and error checking,etc. The sound from the machine Should also adopt the same structure, including: action confirmation, return data and error checking, etc. If the slave is receiving information When an error occurs, or the action required by the host cannot be completed, it will organize a fault message as a response and feed it back to the host.
Application method: Inverter is connected to the " single master and multiple slaves " PC/PLC control network with RS485 bus as a communication slave.

Bus structure

(1) **Hardware interface**

Comes with communication interface A+, B- terminals.

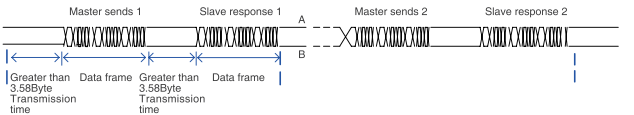
(2) **Topological structure**

Single-master multi-slave system. Each communication device in the network has a unique slave address, one of which is used as a communication host (PC upper computer, PLC , HMI , etc.),the host initiates communication, and performs parameter read or write operations on the slave, and other devices are in the As a communication slave, it responds to inquiries or communication operations from the host to the machine. Only one device can send data at a time, while other devices are receiving.
The setting range of the slave address is 1 ~ 247 , and 0 is the broadcast

communication address. The slave address must be unique in the network.

(3) **Communication transmission method**

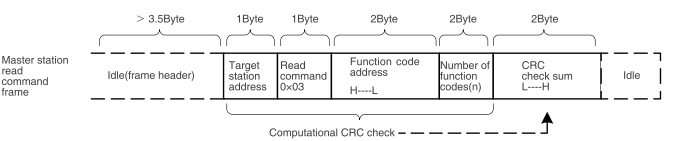
Asynchronous serial, half-duplex transmission mode. In the process of serial asynchronous communication, the data is sent one frame at a time in the form of a message. It is stipulated in the MODBUS-RTU protocol that when the idle time of no data on the communication data line is greater than the transmission time of 3.5Byte , it means a new one. Start of communication frame.



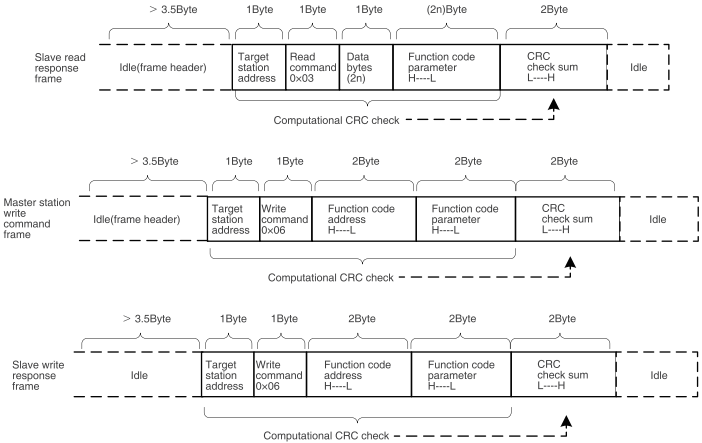
The built-in communication protocol of the inverter is the Modbus-RTU slave communication protocol, which can respond to the "query / command" of the host, or make corresponding actions according to the "query/command" of the host, and respond with communication data . host can refer to a personal computer (PC), industrial control equipment or a programmable logic controller (PLC), etc. The host can not only communicate with a slave, but also issue broadcast information to all lower slaves. For the independent access "query / command" of the host, the accessed slave must return a response frame rate; for the broadcast information sent by the host,the slave does not need to feedback the response to the host.

(4) **Communication data structure**

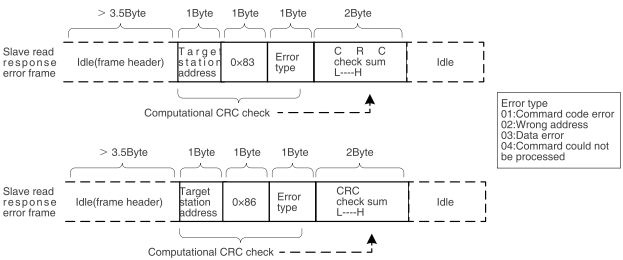
Modbus protocol is as follows, and the inverter only supports reading or writing of Word type parameters. The corresponding communication read operation command is 0x03 ; the write operation command is 0x06 , which does not support byte or bit read and write operations:



Theoretically, the upper computer can read several consecutive function codes at one time (that is, n can reach up to 12) , but be careful not to cross the last function code of this function code group, otherwise an error will be answered.



If the slave detects a communication frame error, or the read and write fails due to other reasons,it will reply with an error frame.



Data frame field description:

Frame header START	Idle for more than 3.5 character transfer times
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 parameter address inside the Frequency Inverter, expressed in hexadecimal ; it is divided into functional code type and non-functional code type (such as running status parameters, Run commands, etc.) parameters, etc., see address definition for details. When transmitting, the high byte comes first and the low byte follows.
Function code address L	
Number of function codes H	The number of function codes read in this frame, if it is 1 , it means read 1 function code. When transmitting, the high byte comes first and the low byte follows. This protocol can only rewrite one function code at a time, without this field.
Number of function codes L	
Data H	Response data, or specially written data, when transmitting, the high byte comes first and the low byte follows.
Data L	
CRC CHK high bit	Detection value: CRC16 check value. When transmitting, the high byte comes first and the low byte follows. For the calculation method, see the description of the CRC check in this section.
CRC CHK low bit	
END	3.5 character time

CMD check method :

- **Check method** —— CRC check method: CRC (Cyclical Redundancy Check) uses the RTU frame format, and the message includes an error detection field based on the CRC method. The CRC field checks the content of the entire message. The CRC field is two bytes and contains a 16 -bit binary value. It is calculated by the transmitting 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, it means that there is an error in the transmission.

- CRC is stored in 0xFFFF first , and then calls a process to compare the continuous 8 -bit bytes in the message with the value in the current register line processing. Only the 8Bit data in each character is valid for CRC , and the start and stop bits and parity bits are all invalid.
- CRC generation, each 8 -bit character is individually exclusive or (XOR) with the contents of the register, and the result moves towards the least significant bit, and the most significant bit is filled with 0 . The LSB is extracted and detected. If the LSB is 1 , the register is exclusive or different from the preset value. If the LSB is 0 , it will not be performed. The whole process is repeated 8 times. After the last bit (bit 8) is complete, the next
- Each 8-bit byte is individually exclusive-ored with the current value of the register. The value in the final register is the CRC value after all bytes in the message have been executed .CRC is added to the message, the low byte is added first, followed by the high byte. The simple function of CRC is as follows:


```
unsigned int CRC16_CHK(unsigned char *data, unsigned char length)
{
    int j = 0;
    unsigned int reg_crc = 0xffff;
    while(length--)
    {
        reg_crc ^= *data++;
        for(j=0;j<8;j++)
        {
            if(reg_crc & 0x01)
            {
                reg_crc = (reg_crc >> 1) ^ 0xa001;
            }
            else
            {
                reg_crc = reg_crc >> 1;
            }
        }
    }
    return reg_crc;
}
```

Function code parameter address marking rules:

Read and write function code parameters (some function codes cannot be changed and are only used by the manufacturer or monitored):
Use the function code group number and label as the parameter address to express the rules:

High byte: P0~PF (Group P), A0~AF (Group A), 70~7F (Group U)
Low byte: 00~FF
For example: if you want to range function code P3-12 , then the access address of the function code is expressed as F30CH

Notice:

- PF group: parameters cannot be read or changed;
- U : can only read, but cannot change parameters.
- Some parameters cannot be changed when the inverter is running; some parameters cannot be changed no matter what state the inverter is in;
- When changing the function code parameters, pay attention to the range, unit and related instructions of the parameters.

A

Function code group number	Newsletter access address	Comm modifies RAM Function code address
P0 ~ PE group	0×F000 ~ 0×FEFF	0×0000 ~ 0×0EFF
A0 ~ AC group	0×A000 ~ 0×ACFF	0×4000 ~ 0×4CFF
U0 group	0×7000 ~ 0×70FF	Read only, not writable

Notice:

- Since the EEPROM is frequently stored, the service life of the EEPROM will be reduced . Therefore, some function codes do not need to be stored in the communication mode, and only need to change the value in RAM .
- If it is a P group parameter, to realize this function, just change the high bit F of the function code address to 0 . If it is a group A parameter, to realize this function, just change the high bit A of the function code address to 4 .
- Write the corresponding function code address of RAM as follows:
- High byte: 00~0F (P group), 40~4F (A group)
- Low byte: 00~FF
- For example: function code P3-12 is not stored in EEPROM , and the address is expressed as 030C H; function code A0-05 is not stored in EEPROM , and the address is represented as 4005 H;

Notice:

This address indicates that it can only be used for writing to RAM , and cannot be used for reading. When reading, it is an invalid address. For all parameters, you can also use the command code 07H to realize this function.

Shutdown / Run Parameters section:

Parameter address	Parameter Description	Parameter address	Parameter Description
1000H	Communication setting value (decimal) -10000~10000	1010 H	PID setting
1001H	Operating frequency	1011 H	PID feedback
1002H	Bus voltage	1012 H	PLC steps
1003H	The output voltage	1013 H	Input pulse frequency, Unit 0.01kHz
1004H	Output current	1014 H	Feedback speed, unit 0.1Hz
1005H	Output Power	1015	Remaining run time
1006H	Output torque	1016	AI1 voltage before correction
1007H	Running speed	1017	AI2 voltage before correction
1008H	DI input flag	1018	AI3 voltage before correction
1009H	DO output flag	1019	Line speed
100AH	AI1 voltage	101A	Current power-on time
100BH	AI2 voltage	101B	Current running time
100CH	AI3 voltage	101C	Input pulse frequency, unit 1Hz
100DH	Count value input	101D	Communication settings
100EH	Length value input	101E	Actual feedback speed
100FH	Load speed	101F	Main frequency X display

Notice:

- The communication setting value is a percentage of the relative value, 10000 corresponds to 100.00% , and -10000 corresponds to -100.00% .
- For frequency dimension data, the percentage is the percentage relative to the maximum frequency (P0-10); for torque dimension data, the percentage is P2-10 , A2-48 , A3-48 , A4-48 (Torque upper limit digital setting, respectively corresponding to the first, second, third and fourth motors).

Control command input to the inverter: (write only)

Command word address	Command function
2000H	0001: Forward running
	0002: Reverse operation
	0003: Forward jogging
	0004: Reverse jog
	0005: Free stop
	0006: Deceleration to stop
	0007: Fault reset

Read inverter status: (read only)

Status word address	Status word function
3000H	0001: Forward running
	0002: Reverse operation
	0003: Stop

Parameter lock password verification: (if the return is 8888H , it means the password verification is passed)

Password address	Enter the content of the password
1F00H	*****

Digital output terminal control:(write only)

Command address	Command content
2001H	BIT0: FM output control BIT1: AO2 output control BIT2: RELAY1 output control BIT3: RELAY2 output control BIT4: FMR output control BIT5: VDO1 BIT6: VDO2 BIT7: VDO3 BIT8: VDO4 BIT9: VDO5

Analog output AO1 control: (write only)

Command address	Command content
2002H	0~7FFF means 0%~100%

Analog output AO2 control: (write only)

Command address	Command content
2003H	0~7FFF means 0%~100%

Analog output AO2 control: (write only)

Command address	Command content
2004H	0~7FFF means 0%~100%

Inverter fault description

Inverter fault address	Inverter fault information
8000H	0000: No fault 0001: Reserved 0002: Acceleration overcurrent 0003: Deceleration overcurrent 0004: Constant speed overcurrent 0005: Acceleration overvoltage 0006: Deceleration overvoltage 0007: Constant speed overvoltage 0008: Buffer resistor overload fault 0009: Undervoltage fault 000A: Inverter overload 000B: Motor overload 000C: Input phase loss 000D: Output phase loss 000E: Module overheating 000F: External fault 0010: Abnormal communication 0011: Abnormal contactor 0012: Current detection failure 0013: Motor tuning failure 0014: Encoder /PG card failure 0015: Abnormal reading and writing of parameters 0016: Inverter hardware failure 0017: The motor is short-circuited to the ground 0018: Reserved 0019: Reserved 001A: Run time reached 001B: User-defined fault 1 001C: User-defined fault 2 001D: The power-on time is reached 001E: Load off 001F: Loss of PID feedback while running 0028: Fast current limit timeout fault 0029: Switching motor failure while running 002A: The speed deviation is too large 002B: Motor over speed 002D: Motor over temperature 005A: Encoder line number setting error 005B: No encoder connected 005C: Initial position error 005E: Speed feedback error

• PD group communication parameter description

Pd-00	Baud rate	Factory default	6005
	Setting range	MODUBS baud rate	
		0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS	5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS

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

A

• Digital output terminal control: (Write only)

Pd-01	Data Format	Factory default	0
	Setting range	0: No parity: data format <8,N,2> 1: Even check: data format <8,E,1> 2: Odd parity: data format <8, O, 1> 3: No parity: data format <8-N-1>	

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

Pd-02	Local address	Factory default	1
	Setting range	1~247 , 0 is broadcast address	

- When the local address is set to 0 , it is the broadcast address to realize the broadcast function of the host computer.
- The local address is unique (except the broadcast address), which is the basis for realizing the point-to-point communication between the upper computer and the Frequency Inverter.

Pd-03	**Response delay**	**Factory default**	**2ms**
	Setting range	0~20ms	

Response delay: refers to the interval between the end of the inverter receiving data and sending data to the upper computer. If the response delay is small If the response delay is longer than the system processing time, the response delay is longer than the system processing time. After the system finishes processing the data, it will wait until the response delay time is up before sending data to the host computer.

Pd-04	**Communication timeout**	**Factory default**	**0.0 s**
	Setting range	0.0 s (Inactive) 0.1~60.0s	

- When this function code is set to 0.0 s , the communication timeout parameter is invalid.
- When this 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 The system will report a communication failure error (Err16). Normally, it is set to invalid. If in a system with continuous communication, By setting the secondary parameters, you can monitor the communication status.

Pd-05	**Communication Protocol Selection**	**Factory default**	**0**
	Setting range	0: non-standard Modbus protocol; 1: Standard Modbus protocol	

Pd-05=1: Select standard Modbus protocol.
Pd-05=0: When reading the command, the number of bytes returned by the slave is one byte more than the standard Modbus protocol,

Pd-06	**Communication reading current resolution**	**Factory default**	**0**
	Setting range	0 : 0.01A 1 : 0.1A	

- It is used to determine the output unit of the current value when the communication reads the output current.
- The function code data is an important setting parameter of the inverter. There are group P and group A function parameters. The parameter groups are as follows:

Function code data	P (readable and writable)	P0 , P1 , P2 , P3 , P4 , P5 , P6 , P7 , P8 , P9 , PA , PB , PC , PD , PE , PF
	A (readable and writable)	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:

- When reading function code data for communication, for P0~PF, A0~AF group function code data, the upper sixteen digits of the communication address are directly the function group number, and the lower sixteen digits.are directly the serial number of the function code in the function group. Examples are as follows:
- **P0-16 function parameter:** its communication address is F010H, where F0H represents the function parameter of P0 group, and 10H represents the hexadecimal data format of serial number 16 in the function group.
- AC-08 function parameters: its communication address is AC08, where ACH represents the function parameters of AC group, and 08H represents the hexadecimal data format of the function code in the function group number 08
- When writing function code data for communication, for P0~PF group function code data, the high sixteen bits of the communication address are divided into 00~0F or F0~FF according to whether it is written into EEPROM, and the low sixteen bits are directly It is the serial number of the function code in the function group, for example as follows:

- **Write function in parameter P0-16:** Writing to EEPROM, its communication address is F010H.Not necessary to write to EEPROM, its communication address is 0010H.When writing EEPROM data for communication, for the function code data of group A0 ~ AF , the high sixteen bits of the communication address are divided into 10~4F or A0~AF, and the low sixteen bits are directly the serial number of the function code in the function group. Examples are as follows:
- **Write function parameter AC-08:** Writing to EEPROM , its communication address is AC08H.Not necessary to write to EEPROM , its communication address is 4C08H.

• Non-function code data

Non-function code data	Status data (readable)	U monitoring parameters, inverter fault description, inverter running status
	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

• Status data

State data is divided into U group monitoring parameters, inverter fault description, and inverter running status.

1. Group U parameter monitoring parameters

U monitoring data, see the function description of group U0 in the manual, and its address is defined as follows:

U0 ~ UF , the high sixteen bits of the communication address are 70~7F, and the low sixteen bits are the serial numbers of the monitoring parameters in the group, examples are as follows:

U0-11 , its communication address is 700BH.

• Inverter fault description

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

• Inverter running status

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 of this address, which is defined as follows:

Inverter running state communication address	Read status word definition
3000H	1: Forward running
	2: Reverse operation
	3: Shutdown

• Control parameters

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

• Control commands

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

Control command communication address	Command function
2000H	1: Forward running
	2: Reverse operation
	3: Forward jogging
	4: Reverse jog
	5: Free stop
	6: Deceleration to stop
	7: Fault reset

• Communication settings

The communication setting value is mainly used for the given data when the medium frequency source, torque upper limit source, VF separation voltage source, PID given source, PID feedback source, etc. are selected as communication given. The communication address is 1000H, and the host computer sets When the communication address is valued, its data range is -10000 ~ 10000 , corresponding to the relative given value -100.00%-100.00%

• Digital output terminal control

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

A

Digital output terminal control communication address	Command content
2001H	BiT0: FM output control BiT1: AO2 output control BiT2: RELAY1 output control BiT3: RELAY2 output control BiT4: FMR output control BiT5: VDO1 BiT6: VDO2 BiT7: VDO3 BiT8: VDO4 BiT9: VDO5

• Analog output AO1 , AO2, high-speed pulse output FMP control

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

Output control communication address		Command content
AO1	2002H	0~7FFF means 0%~100%
AO2	2003H	
FMP	2004H	

• **Parameter initialization**

This function needs to be used when it is necessary to realize the parameter initialization operation of the inverter through the host computer.

If PP-00 (user password) is not 0 , it is necessary to pass the password verification first, after the verification is passed, after 30 seconds, the upper computer will perform parameter initialization.

The communication address for user password verification by communication is 1F00H, and the correct user password can be directly written into this address to complete the password verification.

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: Back up the user's current parameters

Appendix B European Fire Mode Functional Applications

(1) Terminal function code set P4-00~P4-06 added terminal function code 55:
(2) 55: Fire mode trigger terminal

New function code:

P8-55	**Fire mode selection**	Ex-factory value	0
		Setting range	0: No function 1: Fire Mode 1 2: Fire Mode 2 3: Fire Mode 3 4: Fire Mode 4
P8-56	**Force run frequency**	Ex-factory value	50.00Hz
		Setting range	0.00 Hz~ Maximum Frequency (P0-10)
P8-57	**Fire Drill Time**	Ex-factory value	30
		Setting range	0.0s~6553.5 Min

Fire function application:

- **P8-55=0 No function.** Even if the fire mode trigger terminal (55) of the P4 group is triggered, it is invalid.
- **P8-55=1 (fire mode 1)** The start-stop control of the inverter is determined by the P0-02 selection, and the frequency source is determined by the P0-03 selection. The fire mode trigger terminal (55) triggers the fire mode but it (55) can't start the inverter. Once the terminal (55) is removed, the inverter can be shut down by the command source. The mode 1 is mainly used to debug the fire mode.
- **P8-55=2 (fire mode 2)** The fire mode trigger terminal (55) triggers the fire mode, but it (55) can't start the inverter. The inverter needs to be started by the starting mode selected by the command source (P0-03). When the inverter is started and the fire mode triggered, the removal of starting

terminal or the fire mode trigger terminal will not shut down the inverter. The mode 2 can be used to verify fire mode or fire drills.

- **P8-55=3 (fire mode 3)** The fire mode triggers terminal (55) triggers the fire mode and the inverter operates at a forced frequency (P8-56), any stop command can't shut down the inverter until power failure or machine damage. The mode 3 is suitable for use in real fire situations.
- **P8-55=4 (fire mode 4)** The fire mode triggers terminal (55) triggers the fire mode. The inverter operates at a forced frequency (P8-56) and lasts for a fire drill time (P8-57). The inverter cannot be shut down until the drill time is reached. Once the drill time is reached, the inverter will stop automatically. If the terminal (55) triggers again, the fire mode will be retriggerred and the timing will restart. Note: The mode 4 can't be triggered when the Fire Drill Time (P8-57) value is 0. The mode 4 is suitable for real fire situations and fire drills.

Note:

(1) Because of the forced operation frequency in mode 3 and 4, when the fire mode triggers terminal (55) triggers, the frequency source P0-03 will be forced to switch to 1: 'Digital setting'.

(2) If the fire mode triggers terminal (55) fails, in the mode 1:
· The inverter can be shut down by a stop command.
· If a fault occurs, the inverter will display an error code.
This mode 1 is mainly used for fire mode function debugging, not for standard fire mode.

(3) When the fire mode is activated, the inverter will not stop until the power is cut off or the machine is blown up.

(4) Even if the inverter is in a fault state, as long as the inverter is not damaged, the fault will be forced to be cleared and the inverter will be forced to start when the fire mode is triggered.

(5) The rotation operation by default in fire mode is forward. Reverse operation or reverse jog can be realized when other terminals are set for this purpose. If you want to prohibit reverse operation or reverse jog in fire mode, you need to set the terminal function that is not used by the P4 function group to 0 : No function.
Warning: Determine the consequences of property damage or personal safety accidents caused by fire mode.

Product After-Sales Service Policy

The company solemnly promises that, from the day the user purchases the product from our company (hereinafter referred to as the manufacturer), the user enjoys the following after-sales warranty services for the product.

① This product has a 24-month free warranty from the date of purchase from the manufacturer (except for products exported to foreign countries/non-standard machines).

② If the product has quality problems within one month from the date of purchase by the user from the manufacturer, the manufacturer will guarantee refund, replacement and warranty.

③ If the product has quality problems within three months from the date of purchase by the user from the manufacturer, the manufacturer will guarantee replacement and warranty.

④ This product enjoys paid lifetime service from the date of purchase from the manufacturer.

⑤ Disclaimer: Product failures caused by the following reasons are not within the scope of the manufacturer's 24-month free warranty service commitment:

(1) The user does not operate correctly according to the procedures listed in the "Product Manual";

(2) The user repairs the product without communicating with the manufacturer or modifies the product without authorization, resulting in product failure;

(3) The use of the product in the standard scope of use of the product in the user's country of origin causes product failure;

(4) The user's poor use environment leads to abnormal aging of product components or causes failures;

(5) Product damage caused by force majeure such as earthquake, fire, wind and flood disasters, lightning strike, abnormal voltage or other natural disasters;

(6) During the transportation process after the user purchases the product, the product is lost due to improper selection of the transportation method or other external force intrusion; (the transportation method is reasonably selected by the user, and the company assists in handling the consignment procedures)

⑥ The manufacturer has the right not to provide warranty service under the following circumstances:

(1) When the brand, trademark, serial number, nameplate and other marks marked by the manufacturer on the product are damaged or unrecognizable;

(2) When the user fails to pay off the purchase price in accordance with the "Purchase and Sales Contract" signed by both parties;

(3) When the user deliberately conceals the improper use of the product during installation, wiring, operation, maintenance or other processes from the after-sales service provider of the manufacturer.

⑦ Janson Controls Technologies (Shenzhen) Co.,Limited reserves the final interpretation right of this policy.

JANSON CONTROLS

Janson Controls Technologies(Shenzhen)Co.,Limited

Add: 3rd Floor, Building E, Fuxing Industrial Park,
No.110, Zhangqi Road, Guixiang Community,
Guanlan Street, Longhua District, Shenzhen, China.
Tel: +86-0755-29611160
http: //www.jansoncontrols.com
Email: info@jansoncontrols.com