AS-M30

Low voltage general purpose inverter

User's Manual

CE

Prior to use, please read this User 's Manual carefully.

Please read this user manual carefully before operation.

CAUTION: Please keep this User ' s Manual for future reference.

NOTE: Please retain this reference guide for future reference.

Low voltage general purpose inverter

User Manual|| User's Manual

V 18.05 -R107

Table of contents

1. Preface

Thank you for purchasing our company's high-performance inverter.

This manual briefly introduces the performance, installation wiring, parameter setting and operation of the high-performance inverter. Please read it carefully before use (installation, operation, maintenance, inspection, etc.). In addition, please use the product after understanding the safety precautions of the product.

As the product is constantly improved, this manual is subject to change without prior notice.

1.1 Unpacking Inspection Notes

When unpacking, please carefully confirm:
(1) The box contains the machine you ordered, product certificate, product manual and warranty card;
(2) Whether the product model on the nameplate on the side of the machine is consistent with your order requirements;
(3) Whether the product is damaged during transportation.

If you find any omissions, damage or other problems, please contact our company or agent as soon as possible to resolve them.

Note: Do not install a damaged inverter or one that is missing parts; otherwise, fire or casualties may occur.

2. Safety precautions

2.1 Safety Signs

In this manual, the following two types of safety signs are involved:

Danger: Operations and situations that may result in serious injury or even death;

Caution: Operations and situations that could result in moderate or minor injury, and damage to the equipment.

Please read this manual carefully and follow the required safety precautions when installing, debugging and repairing this system. Any damage or loss caused by illegal operation will not be the responsibility of our company.

2.2 Safety matters

2.2.1 Unpacking and Inspection

Caution Do not install a damaged inverter or one that is missing parts; otherwise, fire or casualties may occur.

2.2.2 Mechanical installation

Danger

- Please install it on non-combustible materials such as metal to prevent fire.
- Do not install it in an environment containing explosive gas or where flammable materials are placed nearby to prevent fire.

Caution

- Please support the bottom of the machine when moving it to prevent the inverter from falling.
- Please install it in a place with little vibration, away from direct sunlight and splashing water to prevent damage to the inverter.
- When placing two or more inverters in the same cabinet, please pay attention to the installation position to ensure the heat dissipation effect.
- Do not drop metal foreign objects such as screws and washers into the inverter to prevent fire or inverter damage.

2.2.3 Electrical wiring

Danger

- The instructions in this manual must be followed and the operation must be performed by professional electrical engineers; otherwise, there is a risk of electric shock.
- The inverter and power supply must be separated by a circuit breaker, otherwise a fire may occur.
- Before wiring, please make sure the inverter is powered off and the charging indicator light is completely off, otherwise there is a risk of electric shock.
- Please correctly ground the inverter according to the standards, otherwise there is a risk of electric shock.

Caution

- Please select the appropriate power cable diameter according to the inverter power level, otherwise accidents may occur.

- Do not connect the input power to the output terminals (U, V, W) of the inverter, otherwise it will cause damage to the drive.
- When connecting the output terminals (U, V, W), pay attention to the rotation direction of the motor.
- Make sure the wiring complies with EMC requirements and safety standards in the area, otherwise accidents may occur.
- Do not connect the brake resistor directly between the DC bus terminals, otherwise it may cause a fire.
- Do not connect any control terminal other than TxA - TxB - TxC to an AC 220V signal, otherwise there is a risk of property damage.

2.2.4 Power on

Danger

- The product has been subjected to a withstand voltage test before leaving the factory. There is no need to test the withstand voltage again before powering on, otherwise it may cause an accident.
- Do not touch the driver and surrounding circuits with wet hands before or after power is turned on. Otherwise, there is a risk of electric shock.
- All covers must be installed and closed before power is applied, otherwise there is a risk of electric shock.
- Do not open the cover after power is on; otherwise, there is a risk of electric shock.
- Do not touch any input or output terminals of the inverter after power is turned on, otherwise there is a risk of electric shock.

Caution

- Before powering on, please confirm whether the input voltage level is consistent with the rated voltage level of the inverter; whether the wiring positions on the power input terminals (R / S / T, L1/L2) and output terminals (U, V, W) are correct; and pay attention to check whether there is a short circuit in the peripheral circuit connected to the driver and whether the connected lines are tight.
- The wiring of all peripheral accessories must comply with the instructions of this manual and be correctly wired according to the circuit connection methods provided in this manual, otherwise accidents may occur.
- Do not change the parameters reserved by the manufacturer at will, otherwise it may cause danger.

2.2.5 Run

Danger

- Do not touch the cooling fan and discharge resistor to test the temperature during operation, otherwise it may cause burns.
- Non-professional technicians are not allowed to detect signals during operation, otherwise personal injury or equipment damage may occur.

Caution

- During operation, avoid having debris fall into the equipment, otherwise it may cause damage to the equipment.
- Do not use the contactor on-off method to control the start and stop of the drive, otherwise it may cause damage to the equipment.

2.2.6 Maintenance and repair

Danger

- Maintenance personnel must follow the specified methods of maintenance and repair. Maintenance personnel must be professional and qualified personnel.
- Before maintenance, the power supply of the inverter must be cut off and maintenance work can only be carried out after 10 minutes.
- All pluggable devices must be plugged in and out when power is off.
- It is strictly forbidden to leave metal wires or other metal objects in the machine, otherwise there is a risk of fire.

Caution

- Do not touch the components on the PCB directly, otherwise static electricity may damage the inverter.
- After repair, make sure all screws are tightened.
- When replacing the fan, pay attention to the ventilation direction of the fan.
- After replacing the control board, the corresponding parameters must be set before operation, otherwise there is a risk of property damage.

2.2.7 Decommissioning

Caution

- Electrolytic capacitors on the main circuit and printed circuit board may explode when burned.
- Plastic parts produce toxic gases when burned.

3. Product Information

3.1 Series Specifications

Table 3.1 Inverter specifications

Single-phase AC 220V					
Adaptive motor power (Heavy load kW)	Rated input current (A)	Rated output current (A)	Adaptive motor power (Light load kW)	Rated input current (A)	Rated output current (A)
0.4	6.3	2.5	-	-	-
0.75	11.5	5	-	-	-
1.5	15.7	7	-	-	-
2.2	27	10	-	-	-
Three-phase AC (380-480) V					
Adaptive motor power (Heavy load kW)	Rated input current (A)	Rated output current (A)	Adaptive motor power (Light load kW)	Rated input current (A)	Rated output current (A)
0.4	2.1	1.5	0.75	3.6	2.6
0.75	3.6	2.6	1.5	6.4	4.1
1.5	6.4	4.1	2.2	8.7	5.5
2.2	8.7	5.5	3	10.9	6.9
3	10.9	6.9	4	14	9.5
4	14	9.5	5.5	20.7	12.6
5.5	20.7	12.6	7.5	26.5	18.5
7.5	26.5	18.5	11	36.6	25
11	36.6	25	15	40	32

3.2 Basic performance and configuration

Table 3.2 Basic performance and configuration

Project		Explanation
Power Input	Rated voltage	Single-phase AC, 220V Three-phase AC, (380-480) V
	Rated frequency	50/60Hz ± 5%
Power Out	Output voltage	0-100% input voltage
	Rated output	Varies by model, see standard specifications for details

Project		Explanation
put	current	
	Overload capacity	150% rated output current for 60s, 200% rated output current for 2s
Control performance	Control method	Constant torque V/ F, quadratic load V/ F, no PG vector control, energy saving mode
	Frequency setting method	External terminals (including logic multi-speed, analog input, UP/DOWN setting, high-speed pulse input (partial power)), keyboard panel, serial communication
	Command giving method	External terminals (i.e. logic inputs), keyboard panel, serial communications
	Frequency setting accuracy	Keyboard panel, UP/DOWN setting: 0.1Hz
		Analog setting, serial communication: 10bit (0.05Hz/50Hz)
	Low frequency torque	No PG V/ F control: 150% rated torque/3Hz
		No PG vector control: 150% rated torque/0.5Hz
	Speed control range	No PG V/ F control 1:40
		No PG vector control 1:200
	Speed control accuracy	No PG V/ F control ±2%
		No PG vector control ±0.2%
	Acceleration and deceleration time	0-3200.0 seconds
	Switching frequency	1.5kHz ~ 12kHz, can automatically reduce the switching frequency according to the junction temperature
Self-contained control power supply	Output voltage	10VDC±5% (1 channel) 24VDC±20% (1 channel)
	Maximum load	10V: Maximum current 10mA, used for reference potentiometer 24V: Maximum current 100mA, used for logic input port
Analog Input	quantity	2 channels: AI1, AI2
	type	DC voltage or DC current
	Maximum input range	AI1: 0-5VDC, or 0-10VDC, or 0/4-20mADC AI2: 0-10VDC, or PTC probe input
Analog Output	quantity	Single-phase AC 220V all & three-phase AC (380-480) V -(0.4kW~1.4kW heavy load): 1 circuit, AO1; Three-phase AC (380-480) V Others: 2 channels, AO1, AO2
	type	DC voltage or DC current
	Maximum output range	0-10VDC, or 0/4-20mADC

Project		Explanation
	Function Selection	Output frequency, output current, speed setting, serial output data and other functions
Logic Input	LI1~LI8	Single-phase AC 220V all & three-phase AC (380-480) V -(0.4kW~1.4kW heavy load): LI1~LI6/P; Three-phase AC (380-480) V Others: LI1~LI8; 0-24VDC power supply Forward, reverse, running, fault reset, multi-speed and other functions are optional
	Enforce valid input	f309 and f310 are mandatory valid inputs, and their configuration functions are always valid during power-on.
Logic Output	LO, CLO	Positive logic and negative logic are optional, the factory default is negative logic
		Logic output or pulse output is optional, the factory default setting is logic output
Relay output	TA , TB , TC T1A , T1B , T1C T2A, T2B, T2C	Single-phase AC 220V all & three-phase AC (380-480) V -(0.4kW~1.4kW heavy load): TA, TB, TC; Three-phase AC (380-480) V Others: T1A-T1B-T1C, T2A-T2B-T2C; TxA is normally open, TxB is normally closed, TxC is a common point Contact capacity: TxA-TxC: 5A@250VAC, 5A@30VDC TxB-TxC: 3A@250VAC, 3A@30VCD Function selection: fault, alarm, set frequency reaching and other functions.
Communication interface	Hardware interface protocol	RS-485
	Software communication protocol	Modbus
structure	Protection level	IP20
	Cooling method	Forced air cooling
environment	Installation location	indoor
	Operating temperature	-10～40°C
	Storage temperature	-20～60ºC
	humidity	Below 95RH% (no condensation)
	Altitude	Below 1000m

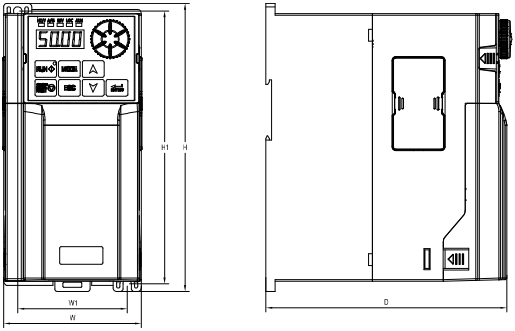
3.3 Overall installation dimensions

3.3.1 Nameplate

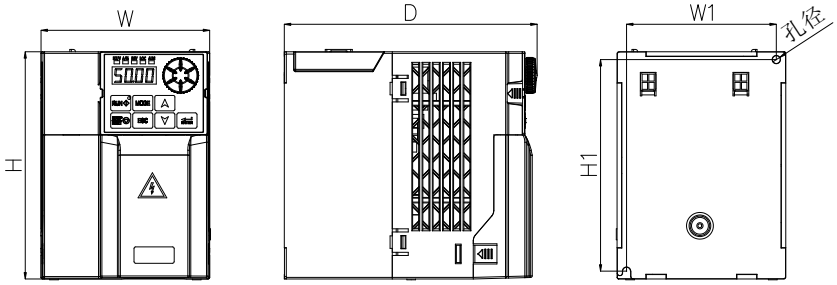
Max Appli Motor:0.75kW
Input:AC1PH 200-240V 50/60Hz 11.5A
Output:AC3PH 0-240V 0-400Hz 5A
Operating Temperature:-10℃~50℃
S/N:

Figure 3.2 Nameplate example

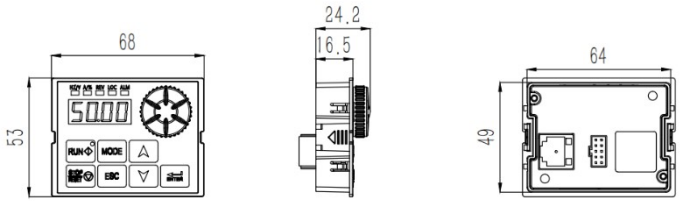
3.3.2 Overall installation dimensions



(a) Single-phase AC 220V all & Three-phase AC (380-480)V 0.4kW~1.5kW heavy load



(b) Three-phase AC (380-480) V Other



Overall dimensions Opening dimensions

(c) Operation panel

Figure 3.3 Appearance and installation dimensions

Table 3.3 Appearance and installation dimensions

Specifications		Dimensions (mm)			Installation size (mm)		
		H	W	D	H1	W1	Aperture
Heavy load (single phase)	0.4kW~2.2kW	170	81	142	161	64.5	Φ5
Heavy load (three phase)	0.4kW~1.5kW						
Light load (three phase)	0.75kW~2.2kW						

Heavy load (three phase)	2.2kW~3kW	145	107	160	135	95	Φ5
Light load (three phase)	3kW~4kW						
Heavy load (three phase)	4kW~5.5kW	200	138	145	188	124	Φ5
Light load (three phase)	5.5kW~7.5kW						
Heavy load (three phase)	7.5kW~11kW	232	153	170	220	139	Φ5
Light load (three phase)	11kW~15kW						

3.4 Care and maintenance

Affected by ambient temperature, humidity, dust and vibration, the components inside the inverter will gradually age, causing inverter failure or reducing the service life of the inverter. Therefore, daily maintenance and regular maintenance of the inverter are required.

3. 4 .1 Daily inspection

Table 3.4 Daily inspection items

project	content
Temperature/humidity	Confirm that the ambient temperature and humidity are within the specified range and there is no condensation;
Oil mist and dust	Confirm that there is no oil mist, dust, or condensed water inside the inverter;
Frequency Converter	Check whether the inverter has abnormal heating or vibration;
fan	Confirm that the fan is operating normally and there is no debris stuck;
Input Power	Confirm that the voltage and frequency of the input power supply are within the allowable range;
Motor	Check whether the motor has abnormal vibration, heating, abnormal noise, phase loss, etc.

3.4.2 Regular inspection

According to the actual working conditions, a regular inspection should be carried out every 3 to 6 months, mainly including the following items:

Table 3.5 Regular inspection items

project	content
PCB, air duct	Is there any dust or dirt? If so, please use dry air to remove it;
Electrolytic Capacitors	Check for leakage, discoloration, or cracking. If so, replace the electrolytic capacitor.
cable	Check whether the surface of power cables and control cables is damaged, and whether the insulation tape has fallen off;
Control Terminals	Check if the screws are loose. If so, tighten them with a screwdriver.
Main circuit	Is there any poor contact? Is there any overheating or arcing at the

terminal	copper busbar connection?
Insulation test	After short-circuiting all input and output terminals of the main circuit, use a megohmmeter (DC 500V) to perform insulation test on the main circuit terminals to ground. The insulation resistance is required to be no less than 5 megohms. It is strictly forbidden to test a single terminal to ground, otherwise there is a risk of damaging the inverter.

3.4.3 Replacement of wearing parts

Fans and filter electrolytic capacitors of the inverter are easily wearing components. To ensure long term, safe and fault free operation of the inverter, the wearing parts should be replaced regularly. Usually, the replacement time of wearing parts is shown in Table 3.6.

Table 3.6 Reference life of wearing parts

Devices	life
fan	30,000 to 40,000 hours
Electrolytic Capacitors	40,000 to 50,000 hours

As the working environment, load conditions and operating time change, the replacement time can be determined by yourself. The judgment criteria are shown in Table 3.7.

Table 3.7 Criteria for replacement of wearing parts

Devices	Cause of damage	Criteria
fan	Bearing wear and blade aging;	Check whether there are cracks on the fan blades, and whether there is any abnormal vibration sound when the machine is turned on;
Electrolytic Capacitors	The ambient temperature is high; Electrolyte aging; Frequent load changes cause the pulsating current to increase;	Check whether there is any liquid leakage, whether the safety valve is protruding, measure the electrostatic capacitance, and measure the insulation resistance.

3.4.4 Storage

When temporarily keeping or storing the inverter for a long time, pay attention to the following points:

(1) Store in a dust-free, well-ventilated place within the specified temperature and humidity range.

(2) Long term storage can lead to deterioration of electrolytic capacitor. Therefore, a power-on test must be performed every 6 months. When powered on, use a voltage regulator to slowly increase the input voltage to the rated value and run it for at least 5 hours with or without load.

3.5 Warranty

(1) The warranty scope only refers to the inverter body;

(2) Under normal use, if a malfunction or damage occurs, the manufacturer will be responsible for a 12 -month warranty (from the date of manufacture). If it exceeds 12 months, a reasonable repair fee will be charged;

(3) Within 12 months, if the following situations occur, a certain maintenance fee will be charged:

- Failure to operate according to the instructions may cause damage to the machine;
- Damage caused by fire, flood, voltage abnormality, etc.;
- Damage caused by using the inverter for non-normal functions;

(4) The relevant service fees will be calculated according to the manufacturer's unified standards. If there is a contract, the principle of contract priority will prevail.

3.6 Scrapping

When scrapping the inverter, please dispose of it as industrial waste.

4. Installation and wiring

4.1 Mechanical Installation

4.1.1 Installation Environment

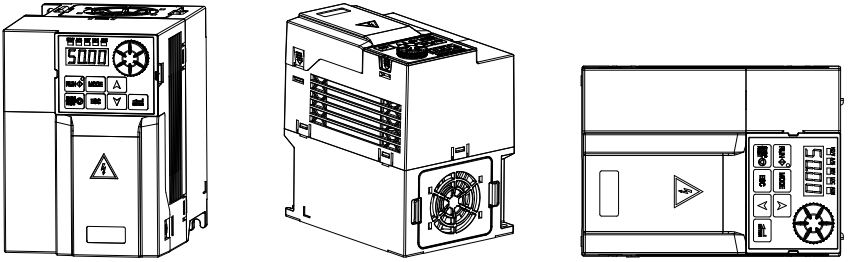
Table 4.1 Installation Environment

environment	condition
Installation location	indoor
temperature	-10 ℃ ~+40 ℃ ; Avoid installing in places where the temperature changes rapidly; When the temperature exceeds the allowable temperature , external forced heat dissipation or derating is required;
humidity	≤ 95%RH, no condensation;
Altitude	1000m or less
Vibration resistance	≤ 5.9 m/s²
other	Avoid installing in places with a lot of dust or metal powder; Avoid installing in places with corrosive or explosive gases and substances; Avoid places exposed to direct sunlight;

4.1.2 Installation direction and spacing

In order to give full play to the heat dissipation effect of the inverter, it must be installed strictly in accordance with the specified direction and spacing.

(1) The inverter must be installed vertically and not upside down to facilitate heat dissipation upwards, as shown in Figure 4.1 ;



(A) Vertical installation (Correct installation method)

(B) Horizontal direction (Incorrect installation method)

(C) Horizontal installation (Incorrect installation method)

Figure 4.1 Installation direction diagram

(2) When installing a single unit, the installation spacing requirements are as shown in Figure 4.2;

Left Up

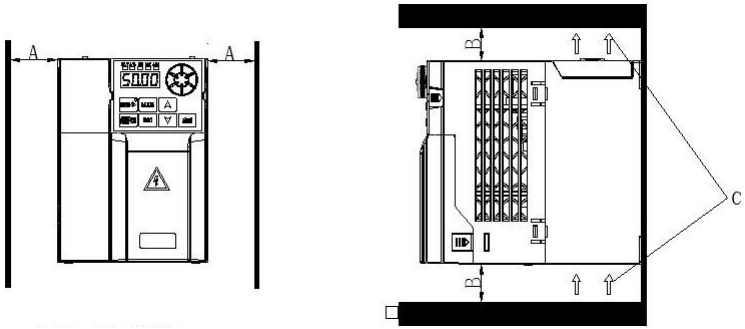


Figure 4.2 Single installation spacing requirements

(3) When multiple units are installed, they are usually installed side by side. The installation spacing requirements are shown in Figure 4.3 .

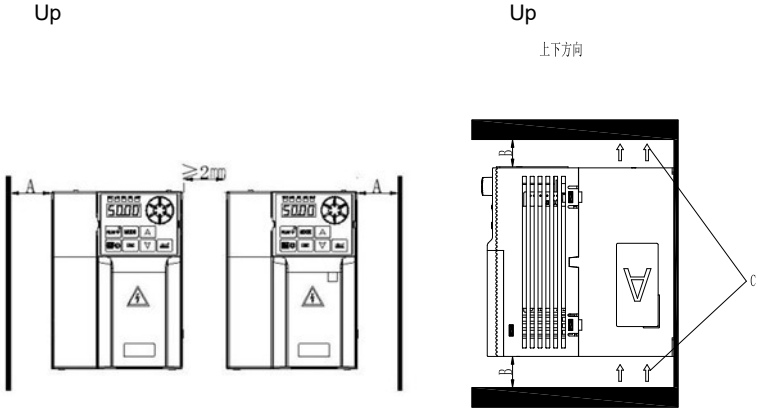


Figure 4.3 Spacing requirements for multiple installations

(4) When multiple units are installed up and down, guide baffles should be added between them to ensure the heat dissipation effect.

4.1.3 Installation Method

(1) Determine the position of each screw hole;

(2) Install the lower screws, but do not tighten them completely, leaving an appropriate gap ;

(3) Insert the U-shaped hole at the bottom of the inverter into the screw installed in (2);

(4) Install the upper screws, being careful not to tighten them completely, leaving an appropriate gap;

(5) Tighten each screw in turn until they are fully tightened.

4.1.4 Installation and removal of cover

Removal of the cover: Use two fingers to hold the buckles on both sides of the bottom of the cover , and then lift it up to remove the cover; then you can install the cable, as shown in Figure 4.4 . After the wiring is completed, buckle the cover.

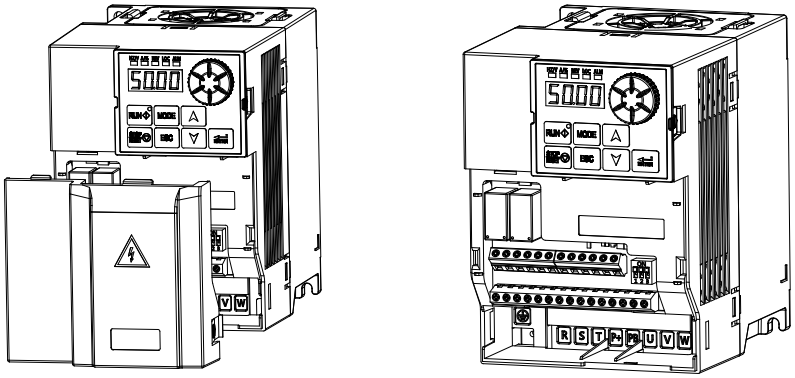
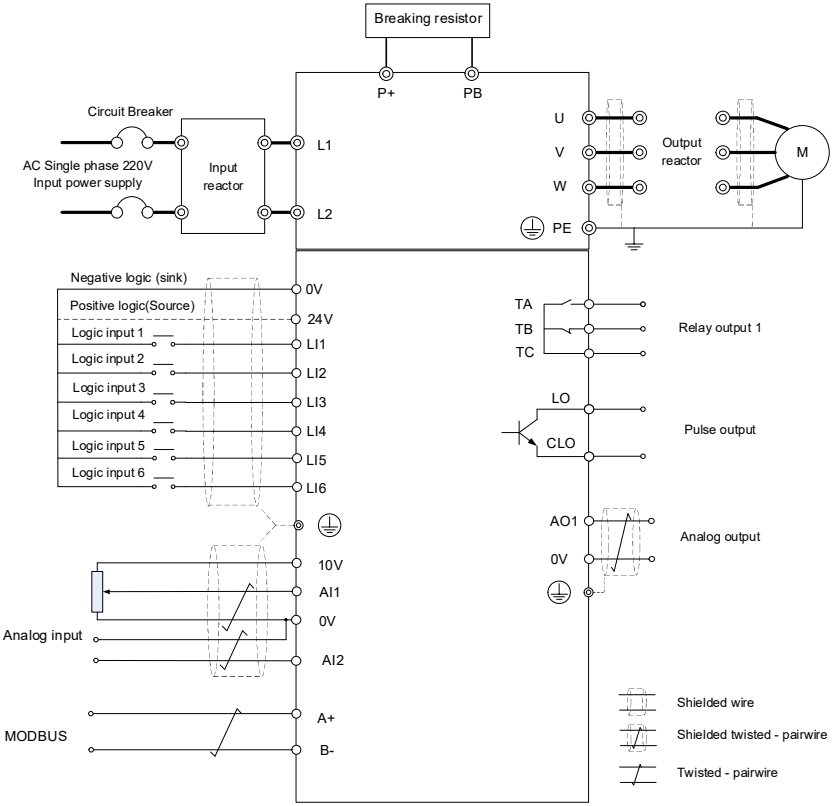


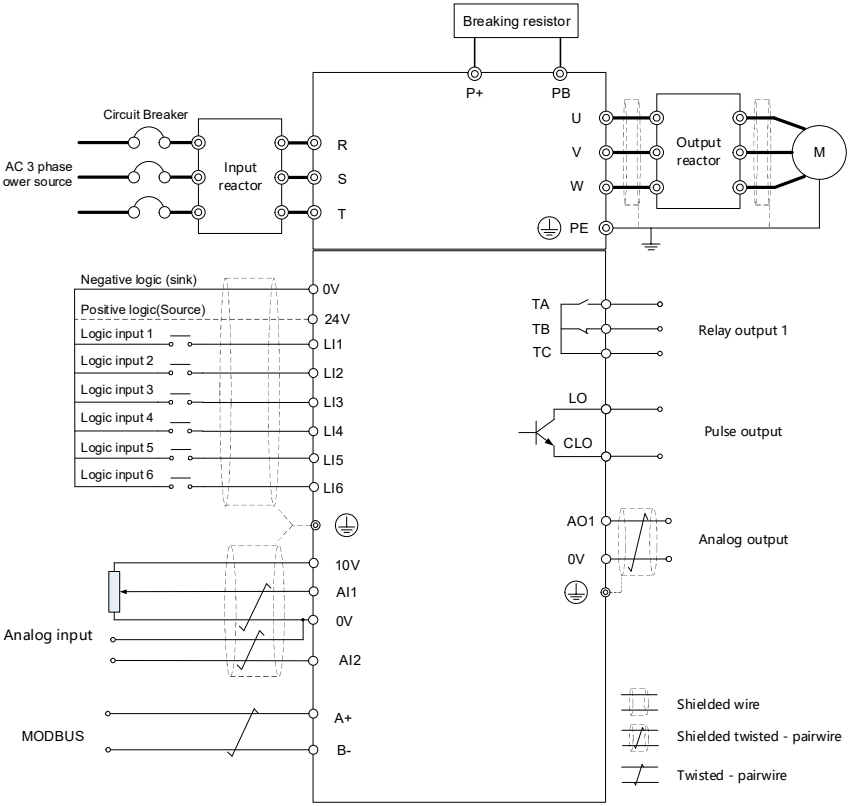
Figure 4.4 Schematic diagram of disassembly of cover plate and outlet plate

4.2 Electrical Wiring

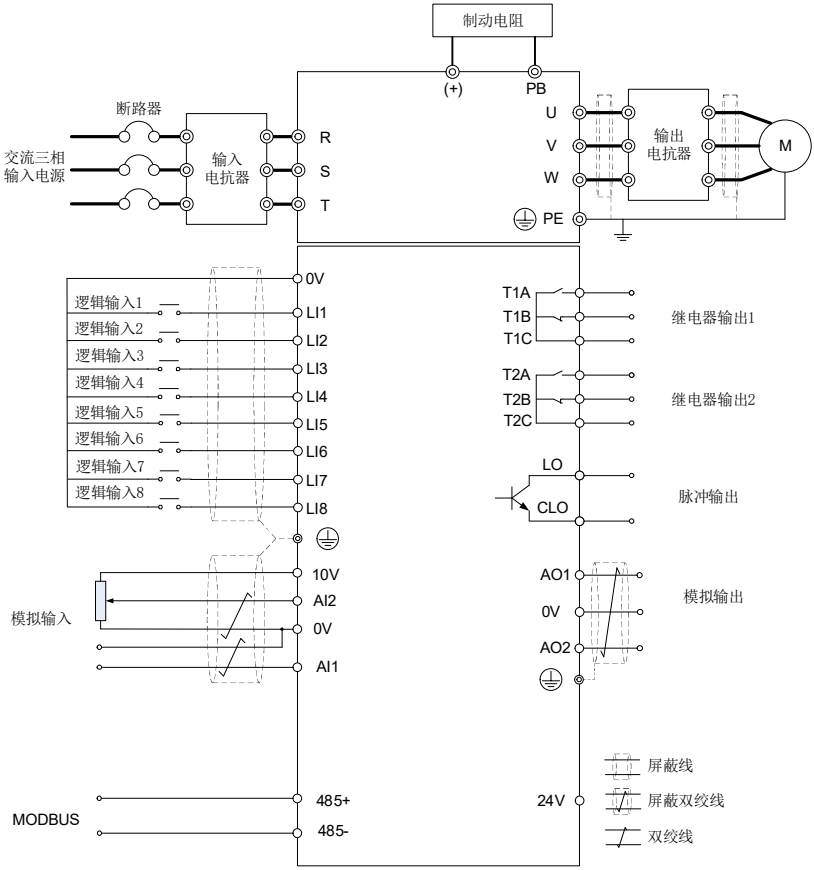
4.2.1 Standard wiring diagram



(a) Single-phase AC 220V full standard wiring diagram



(b) Three-phase AC (380-480)V 0.4 -1.5kW heavy load standard wiring diagram

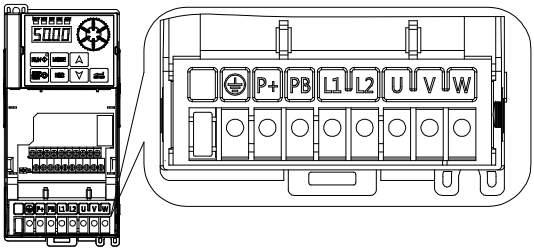


(c) Three-phase AC (380-480) V other standard wiring diagram

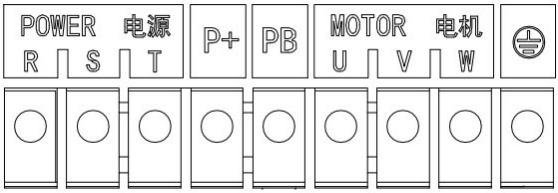
Figure 4.5 Standard wiring diagram

4.2.2 Main circuit power terminal

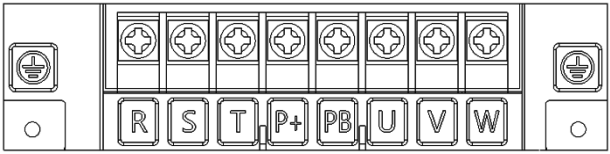
The structure of the product's main circuit power terminals is shown in Figure 4.6, and the functional description is shown in Table 4.2.



(a) Single-phase AC 220V all main circuit power terminals



(b) Single-phase AC 220V all & three-phase AC (380-480)V - 0.4kW~1.4kW heavy-duty main circuit power terminals



(c) Three-phase AC (380-480) V other main circuit power terminals

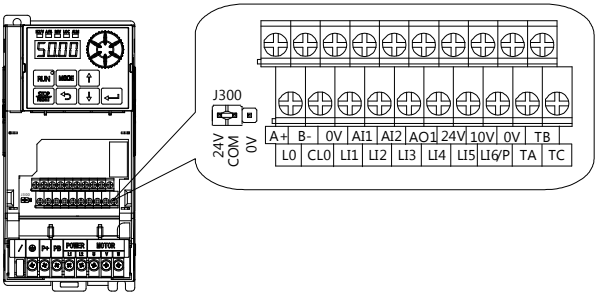
Figure 4.6 Main circuit power terminals

Table 4.2 Main circuit power terminal function description

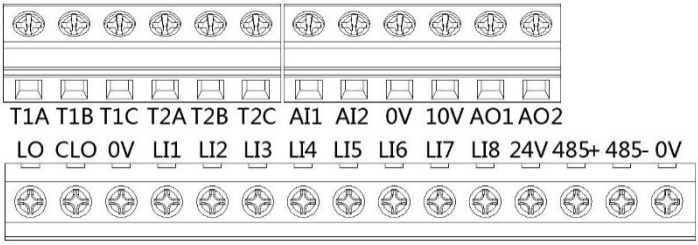
symbol	Function
R, S, T	Three-phase AC power input terminal; Connect to three-phase AC power supply: 380V, 50 Hz/60Hz;
L1, L2	Single-phase AC power input terminal, connect single-phase AC power: 220V, 50Hz/60Hz
U, V, W	The inverter output terminal is connected to the three-phase induction motor;
P+、PB	Braking resistor connection terminal, connect the braking resistor;
⏚	Grounding terminal, protective earth, grounding resistance cannot be greater than 4Ω at 400V/220V level.

4.2.3 Control Terminals

The control terminal structure is shown in Figure 4.7 and the functional description is shown in Table 4.3.



(a) Single-phase AC 220V all & three-phase AC (380-480)V - (0.4kW~1.4kW heavy load)



(b) Three-phase AC (380-480)V Other

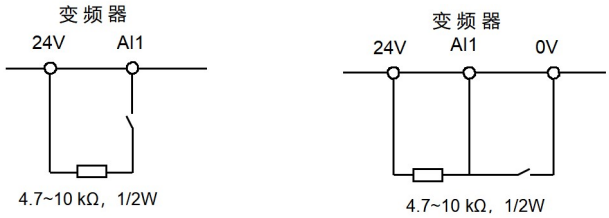
Figure 4.7 Control terminal structure diagram

Table 4.3 Control terminal function description

symbol	name	Features and specifications
0V	The common terminal of the control circuit;	
10V	10V output power supply	Generally used as the working power supply of external potentiometer; Maximum current: 10mA Accuracy: ±5%
24V	24V output power supply	Generally used as the working power supply for logic input terminals; Maximum current: 100mA Accuracy: ±20%
AI1	Voltage/current analog input or Programmable logic input	Voltage or current analog input: Resolution: 10 bits Analog voltage input: 0 ~ +5 V or 0 ~ +10 V, input impedance 30k; Analog current input: 20mA maximum, input impedance 250Ω.

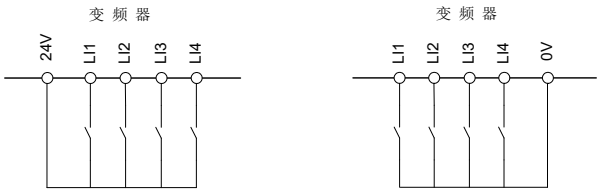
symbol	name	Features and specifications
		By changing the parameter settings, AI1 can also be used as a programmable logic input terminal. When used as a logic input, a resistor (4.7kΩ~10 kΩ, 1/2W) must be added between 24V-AI1, as shown in Figure 4.8; at the same time, AI1 is set to 10V analog voltage input.
AI2	Voltage analog input or Programmable logic input	Voltage analog input: Resolution: 10 bits Maximum range: 0 ~ +10 V, input impedance 30k;
		By changing the parameter settings, AI2 can also be used as a programmable logic input terminal. When used as a logic input, a resistor (4.7kΩ~10 kΩ, 1/2W) must be added between 24V-AI2. The wiring method refers to AI1.
LI1 ~ LI8 (including LI6/P)	Programmable logic input	+24 V power supply
		Positive logic (source): If the port voltage is < 5 V, the input is invalid (OFF). If the port voltage is > 11 V, the input is valid (ON); Negative logic (sink): If the port voltage > 16 V, the input is invalid (OFF), If the port voltage is < 10 V, the input is valid (ON);
		See Figure 4.9 for the logic input connection diagram.
		LI6 /P can be configured as high-speed pulse input, frequency range: 0.00kHz~20kHz
AO1 AO2	Voltage/current analog output	Analog voltage output: 0 ~ +10 V, minimum load impedance is 470Ω; Analog current output: x ~ 20 mA, maximum load impedance is 700Ω;
LO	Pulse output collector	Maximum current: 100mA Maximum voltage: 30V
CLO	Pulse output emitter	
T1A	Relay 1 Normally Open Contact	Maximum switching capacity: T1A-T1C: 5A @ 250VAC, 5A @ 30VDC T1B-T1C: 3A @ 250VAC, 3A @ 30VDC
T1B	Relay 1 Normally Closed Contact	
T1C	Relay 1 common contact	
T2A	Relay 2 Normally Open Contact	Maximum switching capacity: T2A-T2C: 5A @ 250VAC, 5A @ 30VDC T2B-T2C: 3A @ 250VAC, 3A @ 30VDC
T2B	Relay 2 Normally Closed Contact	
T2C	Relay 2 common contact	

symbol	name	Features and specifications
TA	Relay normally open contact	Maximum switching capacity: TA-TC: 5A @ 250VAC, 5A @ 30VDC TB-TC: 3A @ 250VAC, 3A @ 30VDC
TB	Relay normally closed contact	
TC	Relay common contact	
485+/A+	RS485 communication port	485+/A+ is the positive terminal of RS485 differential signal. 485-/B- is the negative end of the RS485 differential signal.
485-/B-		
0V		
SW700	RS485 impedance matching	RS485 terminal resistance control switch.
J300	Logical port type configuration	J300 is a 3-pin connector, from left to right: +24V, COM, 0V Jumper cap connects COM and +24V, logic port configuration negative logic Jumper cap connects COM and 0V, logic port configuration positive logic



(a) Positive logic – source (b) Negative logic – sink

Figure 4.8 Wiring diagram when AI1 is configured as a logic input terminal



(a) Positive logic – source (b) Negative logic – sink

Figure 4.9 Logic input terminal wiring diagram

5. Basic operation

5.1 Operation panel appearance

The operation panel is the human-machine interactive interface of the inverter. Through the operation panel, the user can modify the function parameters, control the operation (start, stop) and monitor the working status of the inverter. For its appearance and functions, please refer to Figure 5.1 and Table 5.1.

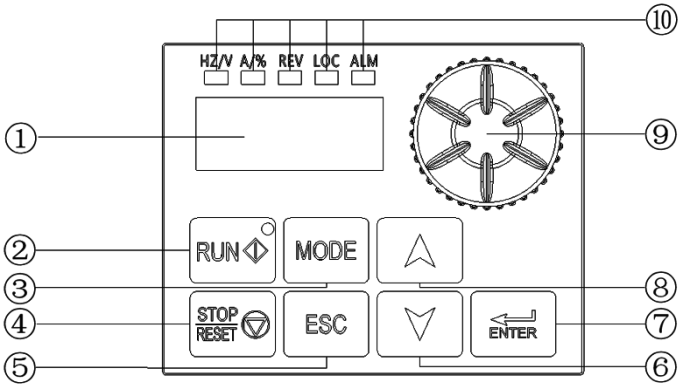


Figure 5.1 Operation panel appearance

Table 5.1 Names and functions of the operation panel components

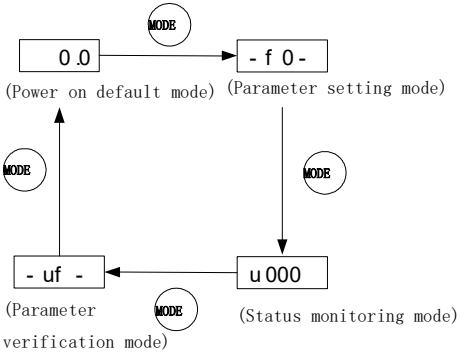
Serial number	name	symbol	Features
1	Data display area	——	The seven-segment LED digital tube is used to display the function parameters and their set values.
2	Run Key	RUN	Turn on the inverter output.
3	Mode key	MODE	Select the operating mode of the inverter or return to the mode from a submenu.
4	Stop/Reset button	STOP	Stops the inverter output and becomes a fault reset button when a fault is detected.
5	Escape key	ESC	Exit the current state and return to the previous state.
6	Down Arrow	▼	Decrease the parameter number and parameter setting value.
7	Confirm key	ENTER	Enter a mode, view a parameter, or confirm a set value.
8	Up Arrow	▲	Add parameter numbers and parameter setting values.
9	Speed knob	——	Adjust the speed.

Serial number	name	symbol	Features
10	Indicator Lights	%	The data currently displayed is in percentage.
		Hz	The unit of the current displayed data is Hz.
		REV	The current running direction is reverse.
		LOC	Currently running locally.
		ALM	Fault indication.

5.2 Basic Operations of the Panel

5.2.1 Operation mode selection

The inverter has four operating modes: power-on default mode, parameter setting mode, status monitoring mode and parameter verification mode. The MODE key can be used to switch between the four modes, as shown in Figure 5.2.



<1>: When f618 = 1, the parameter verification mode will be displayed.

Figure 5.2 Schematic diagram of inverter mode switching

5.2.2 Power-on default mode

The displayed data in the power-on default mode is the current output frequency. You can directly use ▲ or ▼ to modify the digital frequency setting , and then press the ENT key to save the modified data and return to the power-on default mode, or press the ESC key to abandon the modification and return to the power-on default mode, as shown in Figure 5.3 .

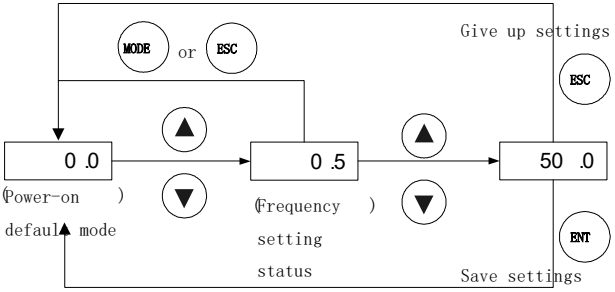


Figure 5.3 Power-on default mode navigation

The displayed data type in the power-on default mode can be freely set, see parameter f610 for details.

5.2.3 Parameter setting mode

There are 10 groups of function parameters in parameter setting mode, namely group f0 , group f1...group f9. Each group contains different numbers of function parameters. The set value of each parameter can be modified by ▲, ▼ and ENT keys , or the modification can be abandoned by ESC key, as shown in Figure 5.4 .

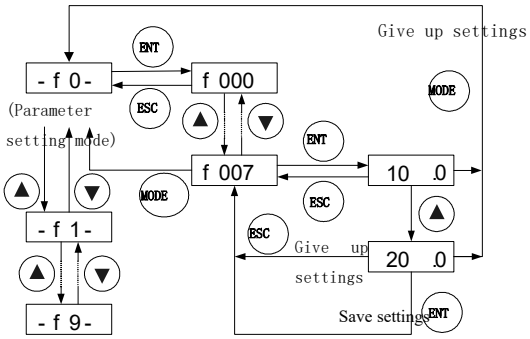
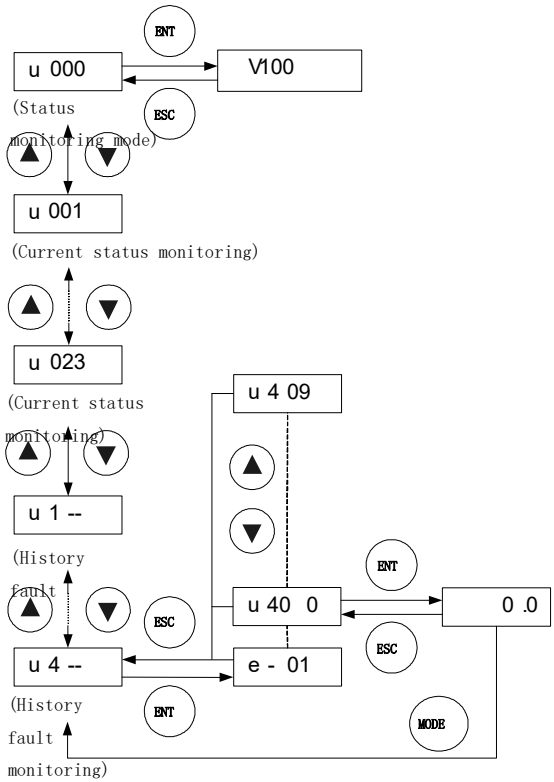


Figure 5.4 Parameter setting mode navigation

5.2.4 Status monitoring mode

The status monitoring mode is mainly used to monitor the current operating status of the inverter or view fault history records. The specific operation is shown in Figure 5.5.



Note: Monitoring parameters can only be viewed, not modified or set.

Figure 5.5 Status monitoring mode navigation

5.2.5 Parameter verification mode

When f618 = 1, press the MODE key to switch to parameter calibration mode.

In parameter verification mode, you can see all parameters that are different from the factory default settings. The setting methods of these parameters are the same as in parameter setting mode, as shown in Figure 5.6.

Note: When no parameters are changed, "-uf-" will not be displayed after pressing the ENT key.

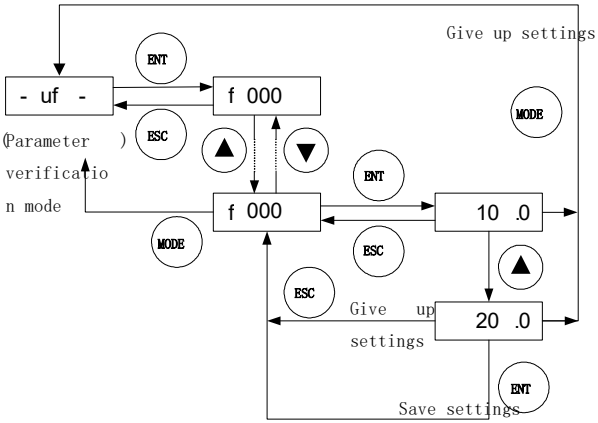


Figure 5.6 Parameter verification mode navigation

5.2.6 Jog

In terminal control mode, when the logic input terminal is set to the jog function, jog control can be realized. For details on the setting of jog frequency and jog stop mode, refer to the introduction of f701 and f702.

5.3 Power on

Before powering on, be sure to check and confirm each item according to Table 5.2, otherwise it may be dangerous.

Table 5.2 Check items before power on

Item	illustration
Input power voltage	Is the power supply voltage connected correctly? The power input terminal wiring is correct and reliable; The inverter and motor are grounded correctly.
Main circuit output terminal	The inverter output terminals U, V, W and the motor three-phase input terminals are connected correctly and reliably.
Control circuit terminals	The connection between control circuit terminals and other control devices is reliable; All control circuit terminals are in the OFF state, and the inverter does not run when powered on.
Load status	Motor load status (connection status with mechanical system).

After powering on, inverter enters the power-on default mode and is in standby state. The displayed data at this time is determined by f610.

5.4 Run

5.4.1 Local control mode

This series inverter provides two control modes: local and remote, which are set by parameter f601.

In local mode, the inverter's command source and frequency reference source are both given by the inverter's own operation panel:

(1) Give commands through the RUN and STOP keys to run and stop the motor;

(2) Use ▲ and ▼ to set the frequency.

(3) Motor rotation direction: ENT key + ▲ key - set the motor to forward rotation;

ENT key + ▼ key - set the motor to reverse rotation (confirm the setting of f522) ;

Restricting the motor to one direction of rotation by parameter f522.

(4) Fault reset: When a fault occurs, press the STOP key. If a-00 is displayed, press the STOP key again to reset the fault. For details, see parameter f600.

5.4.2 Remote control mode

In remote mode, the command source and frequency setting source of the inverter need to be set respectively through parameters f002 and f003. The two can be combined in any way. For details, see parameters f002 and f003.

The following mainly introduces the wiring methods and parameter settings of the six remote control modes, which are:

(1) 2-wire control (including deceleration stop and free stop);

(2) 3-wire control (deceleration stop, free stop);

(3) UP/DOWN acceleration/deceleration control;

(4) Multi-speed control;

(5) Jogging control;

(6) Self-locking switch (level, pulse) forward and reverse control.

(1) Remote mode example 1: 2-wire control

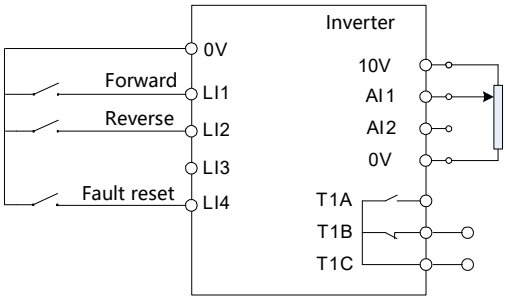


Figure 5.7 2-wire control wiring diagram

Table 5.3 2 - wire control parameter configuration (negative logic)

Code	parameter	Setting value (deceleration stop)	Setting value (free stop)
f002	Run command selection	0	0
f003	Frequency command selection	1	1
f300	AI1 input function (analog or logic selection)	0	0
f301	LI1 logic input function	2	2
f302	LI2 logic input function	3	3
f304	LI4 logic input function	10	10
f305	Analog input mode setting	1	1

f306	Logic Input Type Selection *	1	1
f309	Forced valid logic input function	1	1
f310	Forced valid logic input function 2	0	0
f522	Motor reverse prohibition	0	0
f52 3	Motor stop type	0	2

*Note: Only (2R2G/3P~11G/15P) can be set through this parameter, other models can be set through J300.

(2) Remote Mode Example 2: 3-wire Control (Negative Logic)

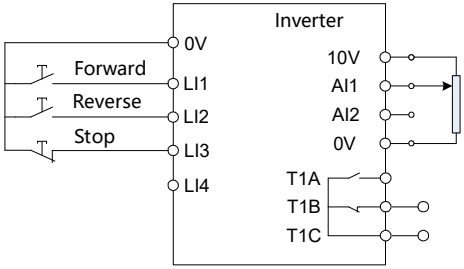


Figure 5.8 3-wire control (negative logic) wiring diagram

Table 5.4 3 - wire control parameter configuration (negative logic)

Code	parameter	Setting value (deceleration stop)	Setting value (free stop)
f002	Run command selection	0	0
f003	Frequency command selection	1	1

f 300	AI1 input function (analog or logic selection)	0	0
f 3 01	LI1 logic input function	2	2
f 3 02	LI2 logic input function	3	3
f 3 03	LI3 logic input function	30	30
f305	Analog input mode setting	1	1
f306	Logic Input Type Selection *	1	1
f30 9	Force valid logic input	1	1
f3 10	Force valid logic input 2	0	0
f 522	Motor reverse prohibition	0	0
f 52 3	Motor stop type	0	3

*Note: Only (2R2G/3P~11G/15P) can be set through this parameter, other models can be set through J300.

(3) Remote mode example 3: UP/DOWN acceleration/deceleration (negative logic)

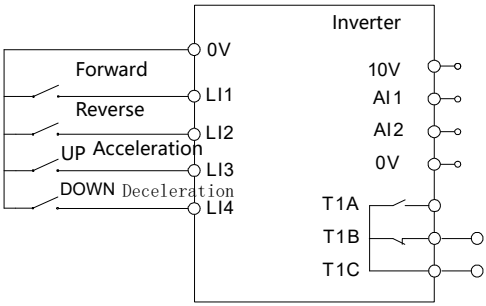


Figure 5.9 UP/DOWN acceleration/deceleration wiring diagram

Table 5.5 UP/DOWN acceleration/deceleration parameter configuration

Code	parameter	Setting Value
f002	Run command selection	0

f003	Frequency command selection	5
f301	LI1 logic input function	2
f302	LI2 logic input function	3
f30 3	LI3 logic input function	23
f30 4	LI4 logic input function	24
f306	Logic Input Type Selection *	1
f30 9	Force valid logic input	1
f3 10	Force valid logic input 2	0
f 522	Motor reverse prohibition	0

*Note: Only (2R2G/3P~11G/15P) can be set through this parameter, other models can be set through J300.

(4) Remote mode example 4: Multi-speed control (negative logic)

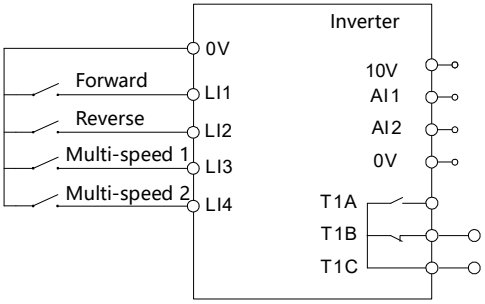


Figure 5. 10- speed multi-stage control wiring diagram

Table 5.6 Multi-speed control parameter configuration (negative logic)

Code	parameter	Setting Value
f002	Run command selection	0
f003	Frequency command selection	3

f301	LI1 logic input function	2
f302	LI2 logic input function	3
f303	LI3 logic input function	6
f304	LI4 logic input function	7
f306	Logic Input Type Selection *	1
f309	Force valid logic input	1
f310	Force valid logic input 2	0
f522	Motor reverse prohibition	0
f000	Frequency digital setting of inverter	Equivalent to multi-speed 0
f716	Multi-speed 1	Multi-speed 1
f717	Multi-speed 2	Multi-speed 2
f718	Multi-speed 3	Multi-speed 3

Note 1: How to set f000: After the inverter is powered on, it displays 0.0. Press ▲ or ▼ to edit the number, which is f000. Press ENT to save.

* Note 2: Only (2R2G/3P ~11G/15P) can be set through this parameter, other models can be set through J300.

(5) Remote mode example 5 : Jog control (negative logic)

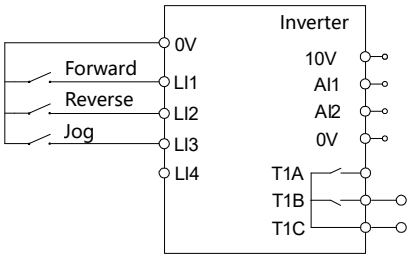


Figure 5.11 Jog control wiring diagram

Table 5.7 Jog control parameter configuration (negative logic)

Code	parameter	Setting Value
f002	Run command selection	0

f301	LI1 logic input function	2
f302	LI2 logic input function	3
f303	LI3 logic input function	4
f306	Logic Input Type Selection *	1
f309	Force valid logic input	1
f310	Force valid logic input 2	0
f522	Motor reverse prohibition	0
f701	Jog frequency	Customize
f702	Jog stop mode	Customize

*Note: Only (2R2G/3P ~11G/15P) can be set through this parameter, other models can be set through J300.

(6) 2-wire control mode 2-self-locking switch (level, pulse) forward and reverse control example 6: (negative logic)

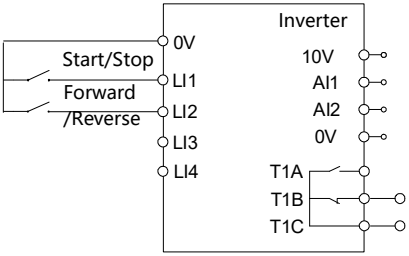


Figure 5.12 2-wire control mode 2 - Self-locking switch forward and reverse control wiring diagram

Table 5.8 2-wire control mode 2-self-locking switch forward and reverse control parameter configuration (negative logic)

Code	parameter	Setting Value
f002	Run command selection	0
f301	LI1 logic input function	76
f302	LI2 logic input function	77
f306	Logic Input Type Selection *	1
f309	Force valid logic input	1
f310	Force valid logic input 2	0
f522	Motor reverse prohibition	0
f537	Forward and reverse control mode selection	1

*Note: Only (2R2G/3P ~11G/15P) can be set through this parameter, other models can be set through J300.

6. Functional parameters

6.1 Parameter table

[-f0-] Group					
Code	illustrate	Parameter Detailed Description	Factory value	Change	User Value
f000	Keyboard digital frequency setting	f009 ~ f008	0.0	○	
f001	Motor control mode	0: Constant torque V/f control 1: Quadratic load V/f control 2: No PG vector (open loop vector) control 3: Energy saving mode	0	●	
f002	Run command channel	0: External terminal 1: Keyboard panel 2: Serial Communication	1	●	
f003	Frequency command selection	0: Keyboard panel potentiometer 1: AI1 2: AI2	3	●	

		3: Keyboard panel (frequency setting) 4: Serial communication (frequency setting) 5: UP/DOWN speed setting 6: AI1+AI2 7: Keyboard panel (PID given) 8: Simple PLC operation selection 9: Frequency of external high-speed pulse input (single-phase AC 220V)			
f004	Run command channel 2	0: External terminal 1: Keyboard panel 2: Serial Communication	0	○	
f005	Frequency command selection 2	0: Keyboard panel potentiometer 1: AI1 2: AI2 3: Keyboard panel (frequency setting) 4: Serial communication (frequency setting) 5: UP / DOWN speed setting 6: AI1+AI2 7: Keyboard panel (PID given) 8: Simple PLC operation selection 9: Frequency of external high-speed pulse input (single-phase AC 220V)	2	○	
f006	Frequency/PID setting source switching	0: f003 and f005 are switched 1: Toggle Disable 2: f003 Switch with f021 frequency source /PID 3: f005 Switch with f021 frequency /PID source	0	○	
f007	Maximum output frequency	30.0~400.0 Hz	50.0	●	
f008	Upper frequency	0.5 Hz ~ f007	50.0	○	
f009	Lower frequency	0.0 Hz ~ f008	0.0	○	
Code	illustrate	Parameter Detailed Description	Factory value	Change	User Value
f010	Acceleration time 1	0.1~3200 s	By model	○	
f011	Deceleration time 1	0.1~3200 s	By model	○	
f012	Carrier frequency level	1.5k~12.0 kHz	By model	○	
f013	Carrier frequency automatically decreases	0: Carrier frequency will not automatically decrease 1: Carrier frequency	1	●	

		automatically decreases			
f014	Random carrier frequency mode	0: Disable 1: Enable	0	○	
f015	Acceleration and deceleration time adaptive control	0: Disable 1: Enabled during acceleration and deceleration 2: Enable during deceleration	0	●	
f016	Manufacturer reserved				
f0 17	Terminal Control Macro	0: Factory setting. 1: 2- wire control (negative logic, ramp stop) 2: 3- wire control (negative logic, ramp stop) 3: Terminal UP/DOWN speed control (Negative logic, ramp stop) 4 ~16: Reserved. 17: PID sleep wake-up control. 18: PID basic control. 19: Reserved 20: JY general macro parameters.	0	●	
f018	Manufacturer reserved				
f0 20	Manufacturer reserved				
f021	Main and auxiliary given frequency calculation relationship	0: Single channel setting 1: f003 + f005 2: f003 – f005 3: MAX (f003, f005) 4: M IN (f003, f005)	0	○	
f022	f005 frequency setting coefficient	0.0 ~ 100.0%	100.0 %	○	
f023	Frequency setting bias of f005	0.0 Hz~400.0 Hz	0.0 Hz	○	
f024	Frequency lower limit selection and f005 = 3 /7 setting	0 ~ 5	0	●	
f099	Manufacturer reserved				

[-f1-] Group					
Code	illustrate	Detailed description	Factory value	Change	User Value
f100	Self-learning enabled	0: Disable 1: f203 is restored to factory default	0	●	

		2: Enable self-learning			
f101	Motor rated frequency	25.0~400.0 Hz	50.0	●	
Code	illustrate	Detailed description	Factory value	Change	User Value
f102	Motor rated voltage	50~660 V	By model	●	
f103	Motor rated current	0.1~200.0 A	By model	●	
f104	Motor rated speed	1000 ~ 30000 rpm	By model	●	
f105	Motor no-load current	10.0~100.0%	By model	●	
f106	Motor thermal current setting	By model	By model	○	
f107	Motor current limitation	By model	By model	●	
f1 08	Second motor rated frequency	25.0~400.0 Hz	50.0	●	
f1 09	Second motor rated voltage	50~660V	By model	●	
f11 0	Second motor thermal current	By model	By model	○	
f11 1	Second motor current limit	By model	By model	○	
f112 - f11 5	Manufacturer reserved				
f 119	Keyboard control options	0: Local panel keyboard 1: External panel keyboard	0	●	
f120	Parameter reset	0: No operation. 1: Restore factory settings. 4: Fault history record cleared. 5: The inverter running time is reset. 6: Fan running time is reset. 7: Type fault (e-36) cleared. 8: P-type machine selection. 9: G type machine selection.	0	●	

[-f2-] Group					
Code	illustrate	Detailed description	Factory value	Change	User Value
f201	Automatic voltage regulation function (AVR function)	0: Automatic voltage regulation disabled - output voltage limiting enabled	3	●	

		1: Automatic Voltage Regulation Enabled—Output voltage limiting enabled. 2: Automatic Voltage Regulation Disabled—Output voltage limiting disabled. 3: Automatic voltage regulation enabled—output voltage limiting disabled.			
f202	Motor voltage boost	0.0~30.0%	By model	○	
f203	Motor torque boost	0.0~30.0%	By model	○	
f204	Slip compensation	0~150%	50	○	
f205	Excitation current coefficient	100~130	100	●	
Code	illustrate	Detailed description	Factory value	Change	User Value
f206	Second motor voltage boost	0~30%	By model	○	
f207	Speed loop response coefficient	1~150	40	●	
f208	Speed loop frequency coefficient	1~100	20	●	
f209	Field weakening stall current level	10~250	100	●	
f210	Weak magnetic frequency level	50~150	100	●	
f211	Maximum voltage output level	90~120%	104	●	
f212	Carrier change step	0.1~14kHz	14.0	●	
f213	Manufacturer reserved				
f214	Manufacturer reserved				
f215	Manufacturer reserved				
f216	Manufacturer reserved				
f217	Multi-point V/f curve setting	0: Multi-point V/f control disabled 1: Reserved by the manufacturer	0	●	

		2: Multi-point V/f control enabled			
f218	V/ f frequency point 1 (f1)	0~ f220	10.0	●	
f219	V/ f voltage point 1 (V1)	0~ 100%	20.0	●	
f220	V/ f frequency point 2 (f2)	f218 ~ f220	20.0	●	
f221	V/ f voltage point 2 (V2)	0~ 100%	40.0	●	
f222	V/ f frequency point 3 (f3)	f220 ~ f101	30.0	●	
f223	V/ f voltage point 3 (V3)	0~ 100%	60.0	●	
f225	Speed coefficient	1 ~ 999	420	●	

[-f3-] Group

Code	illustrate	Detailed description	Factory value	Change	User Value
f300	AI1 input type	0: Analog input 1: Logic input-sink (negative logic) 2: Logic input - source (positive logic)	0	●	
f301	LI1 logic input function	0: Undefined function 1: Run permission 2: Forward run command 3: Run the command in reverse 4: Jog 5: Acceleration / deceleration curve 2 selection 6: Multi-speed position 1 7: Multi-speed position 2 8: Multi-speed position 3 9: Multi-speed position 4	2	●	
f302	LI2 logic input function		3	●	
f303	LI3 logic input function		0	●	
f 304	LI4 logic input function		10	●	
			10	●	
Code	illustrate	Detailed description	Factory value	Change	User Value
f304	LI4 logic input function	10: Fault reset 11: External fault 13: DC braking command 14: PID control disabled 15: Programming parameter lock 16: Operation permission and fault reset 17: Frequency source switched to AI1	10	●	

		18: Forward jog 19: Reverse jog 20: Frequency setting source switching 21: Motor V/Hz parameter switching 22: Motor switching + current limiting + Acceleration and deceleration curve 23: (UP) speed increase command 24: (DOWN) speed decrease command 25: (UP/DOWN) speed clear 26: Negate external fault signal 27: External overheat fault input 28: Negate external overheat fault signal 29: Force local 30: 3- wire control stop input 31: Command source switched to terminal 32: Clear the cumulative kWh display 33: Fire mode inverter operation, See parameter f419 34: Free stop command 35: Negate fault reset 36: Current limit level selection 37: Clear PID integral value 38: Negate PID error signal 39: Forward run command + Acceleration and deceleration curve 2 40: Run the command in reverse + Acceleration and deceleration curve 2 41: Forward run command + Multi-speed position 1 42: Reverse run command + Multi-speed position 1 43: Forward run command + Multi-speed 2 44: Run the command in reverse + Multi-speed 2 45: Forward run command			

		+ Multi-speed position 3 46: Run the command in reverse + Multi-speed position 3 47: Forward run command + Multi-speed 4			
Code	illustrate	Detailed description	Factory value	Change	User Value
f304	LI4 logic input function	48: Reverse run command + Multi-speed 4 49: Multi-speed position 1 + Acceleration and deceleration curve 2 50: Multi-speed position 2 + Acceleration and deceleration curve 2 51: Multi-speed position 3 + Acceleration and deceleration curve 2 5 : Multi-speed position 4 + Acceleration and deceleration curve 2 53: Forward running command + multi-speed position 1 + Acceleration and deceleration curve 2 54: Reverse run command + multi-speed position 1 + Acceleration and deceleration curve 2 55: Forward running command + multi-speed position 2 + Acceleration and deceleration curve 2 56: Reverse run command + multi-speed position 2 + Acceleration and deceleration curve 2 57: Forward run command + multi-speed position 3 + Acceleration and deceleration curve 2 58: Reverse run command + multi-speed position 3 + Acceleration and deceleration curve 2 59: Forward running command + multi-speed position 4 + Acceleration and deceleration curve 2 60: Reverse run command + multi-speed position 4	10	•	

		+ Acceleration and deceleration curve 2 61: UP/DOWN speed clear + Fault Reset 62: Run permission + forward Run command (2- wire control only) 63: Run permission + reverse Run command (2- wire control only) 64: Acceleration / deceleration curve 3 selection 65: Acceleration / deceleration curve 3 + Forward Run Command 76: 2-wire control mode 2 - start-stop control 77: 2-wire control mode 2 - forward and reverse control			
f305	AI1 input signal type	0: 0~5V voltage input 1: 0~10V voltage input 2: Current input	1	●	
f 3 0 6	Logic input type selection	0: Logic input - source (positive logic, sink) 1: Logic input-sink (negative logic, source)	1	●	
f307	AO1 output signal type	0: Current signal output 1: Voltage signal output	1	●	
f308	AI1 logic input function	0~77, see f301 ~ f304	0	●	
f309	Force valid logic input 1	0~77, see f301 ~ f304	1	●	
Code	illustrate	Detailed description	Factory value	Change	User Value
f310	Force valid logic input 2	0~77, see f301 ~ f304	0	●	
f311	Transistor logic output Main function (LO-CLO)	See f315	4	●	
f312	Transistor logic output Auxiliary function	See f315	255	●	
f313	AI2 Input Type	0: Analog input 1: Logic input-sink (negative logic) 2: Logic input - source (positive logic)	0	●	
f314	AI2 logic input	0~75, see f301 ~ f304	0	●	

	function				
f 315	Relay 1 main function (T1A-T1B-T1C)	0: The output frequency is greater than the lower limit frequency 2: Output frequency is equal to upper limit frequency 4: Output frequency is greater than or equal to f337 6: (Set frequency - f339) < output frequency < (Set frequency + f339) 8: (f338 - f339) < output frequency < (f338 + f339) 10: Output frequency is equal to or higher than f338 + f339 12: Speed reference provided by source determined by f003 or f005 = AI1 signal 14: Speed reference provided by source determined by f003 or f005 = AI2 signal 16: AI1 value is equal to or higher than f340 + f341 18: AI2 value is equal to or higher than f342 + f343 20: AI2 is the speed reference source 22: The inverter supplies power to the motor (acceleration, deceleration, constant speed or DC braking) 24: The inverter is ready to run (the run permission is valid and the run command is valid) 26: Motor runs in reverse 28: The inverter is in local mode 30: No fault output during automatic fault reset attempt 32: The estimated motor torque has been at f412 level for a duration that has not exceeded the f414 setting value. 34: The motor current is lower than f408 and the duration exceeds the setting of f410 36: A fault that cannot be	40	•	

		automatically reset occurs 38: An automatic reset fault has occurred 40: Fault input during automatic fault reset attempt 44: Motor thermal state reaches 50% of the motor overload fault level 46: The thermal state of the brake resistor reaches 50% of the brake resistor overload fault level			
Code	illustrate	Detailed description	Factory value	Change	User Value
f 315	Relay 1 main function (T1A-T1B-T1C)	48: Estimated motor torque reaches f412 * 70% 50: Running time ≥ f428 setting 52: The device issues a maintenance alarm warning (fan, circuit board, capacitor need to be replaced) 54: The motor temperature measured by the PTC thermal probe reaches 60% of the trip level 56: Undervoltage alarm is valid 58: Brake closed 60: During motor acceleration 62: Motor deceleration process 64: The motor is accelerating or decelerating 66: Radiator temperature reaches the alarm threshold 68: One PLC cycle is completed 70: One PLC segment speed completed 72: The inverter is ready to receive the running signal 74: Communication address 0xFA15 bit 0 status output 76 ~79: reserved by the manufacturer 80: LI1 input is valid 82: LI2 input is valid 84: PID feedback pressure is equal to or higher than f627 + f628 86: PID feedback pressure is equal to or higher than	40	●	

		f918 + f628 88: Communication address 0xFA15 bit1 status output 90~253: Not used 254: Relay always outputs OFF 255: Relay output is always ON			
f316	Transistor logic output relationship	0: AND logic 1: OR logic	0	●	
f317	Transistor Logic Output Delay	0.0~60.0 s	0.0	○	
f318	Relay 1 closing delay	0.0 ~ 60.0 s	0.0	○	
f319	UP speed Logic input response time	0.0~10.0 s	0.1	○	
f 320	UP speed frequency step	0.0 Hz ~ f007	0.1	○	
f 321	DOWN speed Logic input response time	0.0~10.0 s	0.1	○	
f 322	DOWN speed Frequency step	0.0 Hz ~ f007	0.1	○	
f 323	Initial UP/DOWN Speed frequency	0.0 Hz ~ f007	0.0	○	
f 324	Initial UP/DOWN Speed frequency reset	0 /2/4: Disable 1/3/5: Enable	0	○	
f 3 25	AI1 speed setting level 1	0~100%	0	○	
f 3 26	AI1 output frequency level 1	0.0~400.0 Hz	0.0	○	
Code	illustrate	Detailed description	Factory value	Change	User Value
f327	AI1 speed reference level 2	0~100%	100	○	
f328	AI1 output frequency level 2	0.0~400.0 Hz	50.0	○	
f329	AI2 speed setting level 1	0~100%	0	○	
f330	AI2 output frequency level 1	0.0~400.0 Hz	0.0	○	
f 3 31	AI2 speed reference level 2	0~100%	10 0.0	○	
f 3 32	AI2 output frequency level 2	0.0~400.0 Hz	50.0	○	
f 333	AI1 analog input bias	0~255	By model	○	
f334	AI1 analog input gain	0~255	By model	○	

f335	AI2 analog input bias	0~255	By model	○	
f336	AI2 analog input gain	0~255	By model	○	
f337	Relay output-low speed frequency detection	0.0 Hz ~ f007	0.0	○	
f338	Relay output -Frequency detection 2	0.0 Hz ~ f007	0.0	○	
f339	Relay output -Frequency detection 2 bandwidth	0.0 Hz ~ f007	2.5	○	
f 340	Relay output - AI1 input detection	0~100%	0	○	
f341	Relay output - AI1 input detection bandwidth	0~20%	3	○	
f342	Relay output - AI 2 input detection	0~100%	0	○	
f343	Relay output - AI 2 input detection bandwidth	0~20%	3	○	
f344	Frequency command detection bandwidth	0.0 Hz ~ f007	2.5	○	
f345	Pulse output enable	0: Logic output enable 1: Pulse output enable	0	●	
f346	Pulse output function selection (LO-CLO)	0: Inverter output frequency 1: Output current 2: Reference frequency 3: Motor frequency 4: DC bus voltage 5: Output voltage 6: Input power 7: Output power 8: AI1 given 9: AI2 given 10: Torque 11: Motor torque current 12: Motor overload status 13: Inverter overload status 14: Braking resistor overload status	0	○	

Code	illustrate	Detailed description	Factory value	Change	User Value
f347	100% corresponding pulse number	500~1600	800	○	
f348	Analog output function selection (AO1)	0: Inverter output frequency 1: Output current 2: Reference frequency 3: Motor frequency 4: DC bus voltage 5: Output motor voltage 6: Input power 7: Output power 8: AI1 input value 9: AI2 input value 10: Estimated motor torque 11: Motor torque current 12: Motor thermal status 13: Inverter thermal status 14: Braking resistor overload status 15: Serial communication data 16: 185% calibration 17: 150% calibration 18: 100% calibration	0	○	
f349	Analog output voltage scaling (AO1)	1~1280	By model	○	
f 350	AO1 output slope	0: negative slope 1: Positive slope	1	○	
f351	AO1 output bias	0~100%	0	○	
f352	When AO1 output is Minimum frequency at 0V	0 Hz~f007	0.0	○	
f353	When AO1 output is Maximum frequency at 10V	0 Hz ~ f007	0.0	○	
f354	Analog output voltage offset calibration (AO1)	0~255	By model	○	
f355	LI5 logic input function	See f301 ~ f304	0	●	
f356	LI6 logic input function	See f301 ~ f304	0	●	
f357	LI7 logic input function	See f301 ~ f304	0	●	
f358	LI8 logic input function	See f301 ~ f304	0	●	

f359	Relay 2 main function (T2A-T2B-T2C)	See f315	22	●	
f 360	Relay 2 auxiliary function	See f315	0	●	
f361	Relay 2 Functional logic relationship	0: AND logic 1: OR logic	0	●	
f362	Relay 2 closing delay	0.0 ~ 60.0 s	0.0	●	
f363	Logic input terminal is open and effective	8-digit hexadecimal, each digit has the following options: 1: Closing is valid 2: Disconnection is effective	00	○	
Code	illustrate	Detailed description	Factory value	Change	User Value
f364	Logic input terminal filter time constant	0~200	0	●	
f365	Relay 1 auxiliary function	See f315	255	●	
f366	Relay 1 Functional logic relationship	0: AND logic 1: OR logic	0	●	
f367	Power-on terminal operation detection	0: When powered on, the terminal operation command is invalid	0	●	
f367	Power-on terminal operation detection	1: When powered on, the terminal operation command is valid	0	●	
f368	AO2 output signal type	See f307	1	●	
f3 69	AO2 output function selection	See f348	0	○	
f370	Analog output current scaling (AO2)	0~1280	By model	○	
f371	AO2 output slope	See f350	1	○	
f372	AO2 output bias	See f351	0	○	
f373	Analog output current offset calibration (AO2)	0~255	By model	○	
f374	Percentage of AO monitoring value	0% ~ 250%	0%	○	
f375	Relay 1 off delay	0 ~ 60.0 s	0 . 0	○	
f376	Relay 2 off delay	0 ~ 60.0 s	0 . 0	○	
f377	Multiplexing	0: Normal logic input function	0	●	

	function of LI6/P logic input terminal	1: High-speed pulse input function			
f378	Filter time constant for high-speed pulse input	0.00s ~10.00s	0.10	●	
f379	Minimum input frequency of high-speed pulse	0.00 kHz ~ f380	0.00	●	
f380	Maximum input frequency of high-speed pulse	f379 ~ 2 0.00 kHz	2 0.00	●	
f381	AI2 input signal type	0: 0~5V voltage input 1: 0~10V voltage input 2: Current input	1	●	

[-f4-] Group					
Code	illustrate	Detailed Description	Factory value	Change	User Value
f400	Automatic fault reset times	0: Disable 1-10: Fault reset attempts	0	●	
f401	Motor overload characteristics	0: Overload protection enabled, overload speed reduction disabled (normal motor) 1: Overload protection enabled, overload speed reduction enabled (normal motor) 2: Overload protection disabled, overload speed reduction disabled (normal motor)	0	○	
Code	illustrate	Detailed Description	Factory value	Change	User Value
f401	Motor overload characteristics	3: Overload protection disabled, overload speed reduction enabled (normal motor) 4: Overload protection enabled, overload speed reduction disabled (Forced air cooling) 5: Overload protection enabled, overload speed reduction Enable (forced air cooling) 6: Overload protection disabled, overload speed reduction disabled (forced	0	○	

		air cooling) 7: Overload protection disabled, overload speed reduction enabled (forced air cooling)			
f402	Motor overload time	10-2400 s	300	○	
f403	External fault stop mode	0: Free stop 1: Ramp stop 2: DC injection braking	0	●	
f404	External fault DC braking time	0.0-20.0 s	1.0	○	
f405	Input phase failure detection	0: Disable 1: Enable	0	●	
f406	Output phase loss fault detection	0: Disabled. Output phase loss detection is disabled. 1: When the inverter is powered on and started for the first time, it detects output phase loss. 2: Each time the inverter is started after power-on, it detects output phase loss. 3: During the operation of the inverter, the output phase loss is detected. 4: When the inverter is started and running, the output phase loss is continuously detected. 5: Load side circuit breaker mode. For applications with load side circuit breaker.	0	●	
f407	Underload fault/alarm selection	0: Warning 1: Fault	0	○	
f408	Underload detection level	0~100%	0.00	○	
f409	Underload detection horizontal bandwidth	1~20%	10	○	
f410	Underload detection time	0-255 s	0	○	
f411	Over torque/over current indication selection	0: Over torque alarm : (70 %) 1: Over torque fault 2 : Over torque alarm : (100 %) 3 : Overcurrent alarm : (70 %)	0	○	

		4 : Overcurrent fault 5 : Overcurrent alarm : (100 %)			
f412	Over torque detection level	0~250%	130	○	
f413	Over torque level bandwidth	0~100%	10	○	
f414	Over torque detection time	0.0~10.0 s	0.5	○	
Code	illustrate	Detailed Description	Factory value	Change	User Value
f415	Overvoltage fault protection	0: Enable 1: Disable 2: Enable (fast deceleration mode) 3: Enable (dynamic fast deceleration mode)	2	●	
f416	Overvoltage fault operating level	100-150% of nominal DC bus voltage	130	●	
f417	Undervoltage Fault Operation Mode	0: Alarm only (detection level below 60%) 1: Failure (detection level less than 60%) 2: Alarm only (detection level below 50%)	0	●	
f418	Input Power Stop on momentary loss	0: Disable 1: Don’ t choose 2: Stop	0	●	
f419	Forced Speed Enable (Fire Mode)	0: Disable 1: Enable	0	○	
f420	Output phase short circuit detection	0: Every time an operation starts (standard pulse). 1: Only once after power-on (standard pulse). 2: Each time a run starts(short pulse) 3: Only once after power-on (short pulse).	0	●	
f421	Motor overload memory	0: Clear 1: Keep	0	○	
f422	AI1 analog signal lost	1~100%, fault detection level	0	○	
f423	Inverter measures when 4-20mA signal is lost	0: No action 1: Free parking 2: Run at the fallback speed 3. Maintain speed 4: Parking on a slope	0	●	
f424	Falling speed	0.0 Hz ~ f007	0.0	○	
f425	PTC motor	0: Disable	0	○	

	thermal protection	1: Enable (failure mode) 2: Enable (alarm mode)			
f426	PTC critical resistance value	100-9999 Ω	3000	○	
f428	Run time alarm setting	0.0-999.9 h (0.1=10 hours)	610.0	○	
f429	Inverter fault memory	0: Clear 1: Keep	0	○	
f430	The radiator temperature reaches the alarm threshold	0 ~100℃	By model	●	
f431	Analog output current scaling (AO1)	1 ~1280	By model	○	
f432	Analog output current offset calibration (AO1)	0~255	By model	○	
f433	Analog output voltage scaling (AO2)	1 ~1280	By model	○	
f434	Analog output voltage offset calibration (AO2)	0~255	By model	○	
f435	Runtime2 (read only)	0~ 65535	——	●	

[-f5-] Group

Code	illustrate	Detailed description	Factory value	Change	User Value
f500	Flying start (Speed tracking restart)	0: Disable 1: After a short power outage 2: After the runtime permission is restored 3: After a brief power outage or after the operating permission is restored 4: At every startup 5-7: Reserved by the manufacturer 8: DC braking first, then starting. The DC braking current level and braking time are based on f507 and f508 .	0	●	
f 501	Sleep mode delay control	Disable: 0.0 Enable: 0.1-600.0 s	0.1	○	
f 502	No bump switching	0: Disable 1: Enable	1	○	
f 503	Output start	0.5~10.0 Hz	0.5	○	

	frequency				
f 504	Running start frequency	0.0 Hz ~ f007	0.0	○	
f 505	Running start frequency hysteresis	0.0 Hz ~ f007	0.0	○	
f 506	DC braking starting frequency	0.0 Hz ~ f007	0.0	○	
f 507	DC braking current level	By model	By model	○	
f 508	DC braking time	0.0~20.0 s	1.0	○	
f 510	Acceleration/deceleration Curve 1 Type	0: Linear 1: S -curve 1 2: S-curve 2	0	○	
f 511	Acceleration/deceleration Curve 2 Type	0: Linear 1: S -curve 1 2: S-curve 2	0	○	
f 512	Acceleration/deceleration Curve 3 Type	0: Linear 1: S -curve 1 2: S-curve 2	0	○	
f513	Acceleration/deceleration curve 1,2 switching frequency	0.0 Hz ~ f008	0.0	○	
f514	Acceleration/deceleration curve 2,3 switching frequency	0.0 Hz ~ f008	0.0	○	
f515	Keyboard acceleration/deceleration curve selection	1: Acceleration/deceleration curve 1 2: Acceleration/deceleration curve 2 3: Acceleration/deceleration curve 3	1	○	
f516	Acceleration/deceleration Lower limit of the S-curve	0~50%	10	○	
f517	Acceleration/deceleration Upper limit of the S-curve	0~50 %	10	○	
Code	illustrate	Detailed description	Factory value	Change	User Value
f 518	Acceleration time 2	0.0~3200 s	20.0	○	

f 519	Deceleration time 2	0.0~3200 s	20.0	○	
f 520	Acceleration time 3	0.0~3200 s	20.0	○	
f 521	Deceleration time 3	0.0~3200 s	20.0	○	
f 522	Motor reverse prohibition	0: Allow forward and reverse operation 1: Reverse operation is prohibited 2: Forward operation is prohibited	0	●	
f 523	Motor stop type	0: Ramp to stop 1: Keyboard free stop 2: 2 -wire control free stop 3 : 3- wire control free stop	2	○	
f526	Forward and reverse operation priority	0: forward + reverse -> reverse 1: Forward + Reverse -> Stop 2: Forward + Reverse -> First given direction 3: Forward + Reverse -> the given direction 4: Forward + Reverse -> Forward	1	○	
f527	Regenerative braking resistor enable	0: Disable regenerative braking protection. 1: Enable regenerative braking protection. 2: Enable regenerative braking protection (with resistor overload protection).	2		
f528	Regenerative braking resistor value	1.0~1000.0Ω	20.0	●	
f529	Regenerative braking resistor power	0.01~30.0 kW	0.12	●	
f530	Forward and reverse dead time	0.0 ~ 25.0 s	0.0s	○	
f 531	HMI RS485 communication port modbus protocol selection	0 ~1	0	○	
f 532	Input voltage monitoring value gain	0.0 % ~ 900.0 %	100.0 %	●	

f534	Communication address E002H Output current unit selection	0:1A 1:0.1A 2:0.01A	2	○	
f535	PLC preset speed direction 2	0000H ~ FFFFH	0 000H	●	
f 536	PLC speed direction selection	0: PLC speed direction selection is parameter f748 channel. 1: PLC speed direction selection is parameter f535 channel.	0	●	
f537	2-wire control mode 2 enable	0: Disable 2-wire control mode 2. 1: Enable 2-wire control mode 2-self-locking switch (level) to control forward and reverse rotation. 2: Enable 2-push button switch (pulse) to control forward and reverse rotation using 2-wire control mode.	0	●	

[-f6-] Group

Code	illustrate	Detailed Description	Factory value	Change	User Value
f600	Disable the keyboard panel fault reset function	0: Enable 1: Disable	0	○	
f601	Select local/remote mode	0: Local control mode 1: Remote control mode 2: Keep	1	○	
f 6 02	Password verification /input	0~9999	0	○	
f 6 03	Keyboard panel: % or A/V unit	0:% 1: A (ampere) or V (volt)	1	○	
f 6 04	Custom frequency display conversion factors	0: Display frequency in Hz 0.01-200.0: Conversion factor	0.00	○	
f 6 05	Any unit conversion option	0: Display in frequency units 1: Convert PID frequency to arbitrary units	0	●	
f 6 06	Customize frequency display conversion slope	0: negative slope 1: Positive slope	1	○	
f 6 07	Customize frequency display conversion offset	0.00 Hz ~ f007	0.00	○	

f 6 08	Local mode speed reference step change	Disable: 0.00 Enable: 0.01 Hz~ f007	0.00	○	
f 6 09	Panel frequency resolution	0: Disable, the step size is fixed at 0.1Hz 1~255: See parameter description for details	0	○	
f 6 10	Keyboard panel default display	0: Motor operating frequency (Hz or customized display) 1: Speed setting (Hz or customized display) 2: Motor current (% or A) 3: Inverter rated current (A) 4: Inverter thermal status (%) 5: Output power (kW) 6: Internal speed setting (after PID function), (Hz or customized display) 7: Serial communication data 8: Output speed (rpm) 9: Display the counter value of network communication 10: Display communication counter values only when all network communications are in normal status 11: Stop - frequency setting (f900 = 0) / PID setting (f900 ≠ 0), run - output frequency 12: Operation speed (output frequency * f225) 13: Average speed (customizable multi-speed average speed) 14: Segment speed number (currently running segment speed) 15: Running time 2 (non-cumulative running time)	11	○	
Code	illustrate	Detailed Description	Factory value	Change	User Value
f611	Clear keyboard run command	0: Clear the keyboard operation command (when the operation permission terminal is OFF). 1: Keep the keyboard	1	○	

		operation command (when the operation permission terminal is OFF).			
f612	Keyboard digital setting modification disabled	0: Allow the frequency setting (f000) to be modified via keyboard ▲ or ▼. 1: It is forbidden to modify the frequency setting (f000) through the keyboard ▲ or ▼.	0	○	
f613	The keyboard RUN and STOP keys are disabled	0: Allow the use of the RUN/STOP key (in local mode). 1: Disable the use of the RUN/STOP key (in local mode).	0	○	
f 614	Keypad local emergency stop function enable/disable	0: Enable 1: Disable	0	○	
f 616	Cumulative power consumption memory	0: Disable 1: Enable	1	○	
f617	Cumulative power consumption display unit	0: 1 kWh 1: 10 kWh 2: 100 kWh 3: 1000 kWh	By model	○	
f618	User parameter calibration function menu selection	0: Disable display of user parameter calibration function menu. 1: Select to display the user parameter calibration function menu.	0	○	
f619	Inverter internal temperature monitoring 1				
f620	Inverter internal temperature monitoring 2				
f621	LCD contrast adjustment	15~40	25	○	
f622	Manufacturer reserved				
f623	Bit 0: Fan self-running	0: The fan works when the inverter is running 1: The fan works when the inverter is powered on	0	○	
	Bit 1: Positive power monitoring	0: Both positive and negative power are monitored 1: Monitor positive power only			

	Bit 2: Main display quick monitoring	0: Disable 1: Enable			
	Bit 3: Forward/reverse dead time mode selection	0: Forward and reverse dead time mode 1 1: Forward and reverse dead time mode 2			
	BiT3: Overcurrent warning display	0: Display 1: Do not display			
	Bit5: Overvoltage warning display	0: Display 1: Do not display			
	Bit6: Overload warning display	0: Display 1: Do not display			
	Bit7: Overheat warning display	0: Display 1: Do not display			
	Bit8: IGBT overtemperature current level calculation disabled	0: Enable 1: Disable			
Code	illustrate	Detailed Description	Factory value	Change	User Value
f624	default keyboard panel displays 2 values	Same as f610	2	○	
	Quick monitoring 1	Same as f610			
f625	default keyboard panel displays 3 values	Same as f610	1	○	
	Quick Watch 2	1 ~ 8: See f610 9: PID given 10: PID feedback 11~ 15: See f610	10	○	
f626	Default keyboard panel display 4	Same as f610	5		
	Value Quick Monitor 3	1 ~ 8: See f610 9: PID given 10 : PID feedback 11 ~ 15: See f610			
f627	Relay output-PID feedback detection	0.00~99.99	0.00	○	
f628	Relay output-PID feedback detection bandwidth	0.00~99.99	0.00	○	
f629	Manufacturer reserved				

[-f7-] Group

Code	illustrate	Detailed description	Factory value	Change	User Value
f 700	Manufacturer reserved				
f701	Jog frequency	0.0 Hz ~ f007	5.0	○	
f 7 02	Jog stop mode	0: Deceleration and stop 1: Free stop 2: DC braking	0	●	
f 7 03	Hop frequency 1	0.0 Hz ~ f007	0.0	○	
f 7 04	Hop frequency range 1	0.0 ~30.0 Hz	0.0	○	
f 7 05	Hop frequency 2	0.0 Hz ~ f007	0.0	○	
f 7 06	Hop frequency range 2	0.0~30.0 Hz	0.0	○	
f 7 07	Hop frequency 3	0.0 Hz ~ f007	0.0	○	
f 7 08	Hop frequency range 3	0.0~30.0 Hz	0.0	○	
f 7 0 9	Brake control selection	0~3	0	●	
f 710	Brake release frequency	f503 ~20.0Hz	3.0	○	
f 711	Brake release time	0~25.0s	0.5	○	
f 712	Brake closing frequency	f503 ~20.0Hz	3.0	○	
Code	illustrate	Detailed description	Factory value	Change	User Value
f 713	Brake closing time	0~25.0s	1.0	○	
f 7 14	Droop control gain	0~100%	0	○	
f 7 15	Torque band insensitive to droop control	0~100%	10	○	
f 716	Multi-speed 1	f009 ~ f008	3.0	○	
f 717	Multi-speed 2	f009 ~ f008	6.0	○	
f 718	Multi-speed 3	f009 ~ f008	9.0	○	
f 719	Multi-speed 4	f009 ~ f008	12.0	○	
f 720	Multi-speed 5	f009 ~ f008	15.0	○	
f 721	Multi-speed 6	f009 ~ f008	18.0	○	
f 722	Multi-speed 7	f009 ~ f008	21.0	○	
f 723	Multi-speed 8	f009 ~ f008	24.0	○	
f 724	Multi-speed 9	f009 ~ f008	27.0	○	
f 725	Multi-speed 10	f009 ~ f008	30.0	○	
f 726	Multi-speed 11	f009 ~ f008	33.0	○	
f 727	Multi-speed 12	f009 ~ f008	36.0	○	
f 728	Multi-speed 13	f009 ~ f008	39.0	○	
f 729	Multi-speed 14	f009 ~ f008	45.0	○	

f 730	Multi-speed 15	f009 ~ f008	50.0	○	
f731	Manufacturer reserved				
f732	Multi-speed 0 running time	0~ 6500.0s（min）	0 .0	●	
f733	Multi-speed 1 running time	0~ 6500.0s（min）	0 .0	●	
f734	Multi-speed 2 running time	0~ 6500.0s（min）	0 .0	●	
f735	Multi-speed 3 running time	0~ 6500.0s（min）	0 .0	●	
f736	Multi-speed 4 running time	0~ 6500.0s（min）	0 .0	●	
f737	Multi-speed 5 running time	0~ 6500.0s（min）	0 .0	●	
f738	Multi-speed 6 running time	0~ 6500.0s（min）	0 .0	●	
f739	Multi-speed 7 running time	0~ 6500.0s（min）	0 .0	●	
f740	Multi-speed 8 running time	0~ 6500.0s（min）	0 .0	●	
f741	Multi-speed 9 running time	0~ 6500.0s（min）	0 .0	●	
f742	Multi-speed 10 running time	0~ 6500.0s（min）	0 .0	●	
f743	Multi-speed 11 running time	0~ 6500.0s（min）	0 .0	●	
f744	Multi-speed 12 running time	0~ 6500.0s（min）	0 .0	●	
f745	Multi-speed 13 running time	0~ 6500.0s（min）	0 .0	●	
f746	Multi-speed 14 running time	0~ 6500.0s（min）	0 .0	●	
f747	Multi-speed 15 running time	0~ 6500.0s（min）	0 .0	●	
f 748	PLC preset speed direction 1	0 000H ~ FFFFH	0 000H	●	
Code	illustrate	Detailed description	Factory value	Change	User Value
f 749	Simple PLC operation mode	0: Stop after running once. 1: After running once, keep the final value. 2: Run in a loop.	0	●	
f 750	Simple PLC restart mode selection	0: Start running from the first segment. 1: Continue running from the frequency at the time of	0	●	

		interruption.			
f 751	Simple PLC power-off memory selection	0: No memory after power failure. 1: Power-off memory.	0	●	
f 752	Simple PLC running time unit selection	0: Seconds (s). 1: Minutes (min).	0	●	
f753	Non-standard function selection	0: Standard function 1~65535: Non-standard function.	0	○	
f754	AI1 curve selection	0: Curve 1 (2 points) 1: Curve 2 (4 points)	0	○	
f755	AI1 curve 2 set point 1 input	0.0 ~ 100.0%	0.0%	○	
f756	AI1 curve 2 set point 1 output	- 100% ~ 100%	0.0 %	○	
f757	AI1 curve 2 set point 2 input	0.0 ~ 100.0%	30.0 %	○	
f758	AI1 curve 2 set point 2 output	- 100% ~ 100%	3 0.0 %	○	
f759	AI1 curve 2 set point 3 input	0.0 ~ 100.0%	60.0 %	○	
f760	AI1 curve 2 set point 3 output	- 100% ~ 100%	6 0.0 %	○	
f761	AI1 curve 2 set point 4 input	0.0 ~ 100.0%	100.0 %	○	
f762	AI1 curve 2 set point 4 output	- 100% ~ 100%	10 0.0 %	○	
f763	LI1 effective delay	6500.0 ~ 0.0 s	0.0	○	
f764	LI1 invalid delay	6500.0 ~ 0.0 s	0.0	○	
f765	LI2 effective delay	6500.0 ~ 0.0 s	0.0	○	
f766	LI2 invalid delay	6500.0 ~ 0.0 s	0.0	○	
f767	AI1 filter coefficient	0.00~10.00	0.30	○	
f768	AI2 filter coefficient	0.00~10.00	0.30	○	
f769	AO1 filter coefficient	0.00~10.00	0.00	○	
f770	AO2 filter coefficient	0.00~10.00	0.00	○	
f 771	Reverse jog frequency	0.0 Hz ~ f007	0.0	●	
f772	Set password	0~9999	0	○	
f773	Password validity period	0~9999 minutes	5	○	

[-f8-] Group					
Code	illustrate	Detailed Description	Factory value	Change	User Value
f 8 00	Baud rate	0: 9600 bps 1: 19200 bps	1	○	

		2: 4800 bps 3: 2400 bps 4: 1200 bps			
Code	illustrate	Detailed Description	Factory value	Change	User Value
f 8 01	check	0 : No verification 1 : Even parity 2 : Odd parity	1	○	
f 8 02	Slave Address	0-247	1	○	
f 8 03	Communication timeout	0: Communication error detection disabled 1~100s: Communication timeout	0	○	
f 8 04	Sending waiting time	0~2.00 s	0.00	○	
f 805	Communication fault settings	0: The inverter stops according to the ramp, and the serial control is released back to the source defined by f002 and f003. 1: The last command continues to run 2: The inverter stops according to the ramp, and the serial control is maintained 3: The inverter cuts off the power to the motor, and the motor coasts to a stop. Serial control is maintained. 4: The inverter enters the fault state with communication error err5 or network error err8.	4	○	
f 806	Number of motor poles for communication	2~16	2	○	
f813	Block write data 1	0: No selection 1: Communication command control (fa05) 2: Keep 3: Communication frequency setting (fa08) 4 ~ 6: Reserved	0	○	
f814	Block write data 2		0	○	
f815	Block read data 1	0: No selection 1: Status information (fd03) 2: Output frequency (fd12) 3: Output current (fe08) 4: Output voltage (fe10) 5: Fault information (fc39) 6: PID feedback value (fa36) 7: Input terminal information (fd01) 8: Output terminal information (fd02) 9: AI1 input (fe30) 10: AI2 input (fe31)	1	○	
f816	Block read data 2		2	○	

f817	Block read data 3	11: Motor speed (fe50) 12: Output current absolute value (e002) Unit 0.01A 13: Output voltage absolute value (e006) Unit V 14: Absolute value of DC bus input voltage (e009) in V 15: PID given value (FA35) 16: Output torque (FE20), 0.01% of the rated torque of the unit motor 17: Input power (FE28), unit: 0.01kW 18: Output power (FE29), unit 0.01kW 20: Output power accumulation/output electric energy (FE45), the unit is determined by parameter f617 21: Cumulative running time (FE17) Unit: h (hour)	12	○	
f818	Block read data 4		18	○	
f819	Block read data 5		8	○	
Code	illustrate	Detailed Description	Factory value	Change	User Value
f821	Three-phase output current frequency compensation	0000: Disable frequency compensation 0060: Enable frequency compensation	0000	○	
f822 ~ f829	Manufacturer reserved				
f830	PID keyboard setting	0~100%	0.0	○	

[-f9-] Group					
Code	illustrate	Detailed description	Factory value	Change	User Value
f 900	PID control enable /disable	0: PID disabled 1: Enable - Feedback source AI1 2: Enable - Feedback source AI2	0	○	
f 901	PID proportional gain (P control)	0.01~100.0	By model	○	
f 902	PID integral gain (I control)	0.01~100.0	By model	○	

f 903	PID differential gain (D control)	0.00~2.55	0.00	○	
f 904	PID control /delay time	0~2400 s	0	○	
f 905	PI regulator deviation input signal inversion /action direction	0: No/positive effect 1: Yes/negative effect	0	○	
f 906	Wake-up frequency hysteresis bandwidth	0.0 Hz ~ f007	0.2	○	
f 907	When f917 ≠ 0.00 , wake-up deviation (absolute value)	0.00 ~ f917 MPa	0.00	○	
	When f917 = 0.00, the sleep mode PI wake - up threshold based on PI error	0.0 ~ f 007 Hz	0 .0	○	
f 908	When f917 ≠ 0.00 , wake-up threshold (absolute value)	0.00 ~ f917 MPa	0.00	○	
	When f917 = 0.00, the sleep mode PI wake-up threshold based on the PI feedback error	0.0 ~ f007 H	0 .0	○	
f 909	Hibernation selection	0: Sleep is valid (motor stops) 1: Run at the lower frequency limit.	0	●	
f 910	Wake-up control/delay time	0.0 ~ 600.0s	0.0	●	
f 911	When f917 ≠ 0.00 , wake-up threshold (percentage)	0.0 ~ 200.0 %	0.0	○	
	When f917 = 0.00, the wake - up pressure percentage	0 ~ 100.0 %	0 .0	○	
f 912	When f917 ≠ 0.00 , sleep threshold (percentage)	0.0 ~ 200.0 %	0.0	○	
	When f917 = 0.00, the dormant pressure percentage	0 ~ 100.0 %	0 .0	○	
f 913	PID given upper limit	0.0 ~ 100.0 %	100 .0	●	
Code	illustrate	Detailed description	Factory value	Change	User Value
f 914	PID given lower limit	0~ f913	0.0	●	
f915	Sleep control/ delay control	Disable: 0.0 Enable: 0.1-600.0 s	0.1	○	
f916	When f917 ≠ 0.00 , PID gives control deviation	0.0 ~ 100.0 %	0.0	○	
	When f917 = 0.00, the PID keyboard setting	0.0 ~ 100.0 %	0 .0	○	

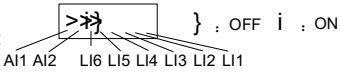
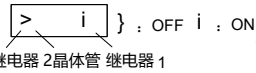
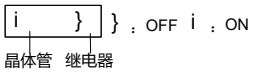
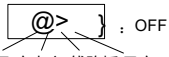
f917	Sensor range (f917 ≠0.00, PID related settings are in absolute value format. The keyboard setting of PID is f918. f917 =0.00, PID related settings are in percentage format. The keyboard setting of PID is f916.)	0.00 ~ 99.99	1. 00	○	
f918	PID setting	0.00 ~ f917	0. 00	○	
f919	Sleep frequency	f009 ~ f008	f009	○	
f920	Sleep Threshold Tolerance	0.0~25.0%	0.0	○	

Note 1: In the "Change" column, "○": indicates that the setting value of the parameter can be changed when the inverter is in the stop or running state; "●": indicates that the setting value of the parameter cannot be changed when the inverter is in the running state;

Note 2: For common user parameters, the communication address is saved after power failure by simply replacing F with 0. For example, the communication address of f908 is 0x0908.

Note 3: For ordinary user parameters, the communication address will not be saved when power is off, and F will be retained, that is, the communication address is the same as the parameter number, for example, the communication address of f908 is 0xF908.

[-u0-] Group		
Code	illustrate	Detailed description
u000	Software Version	Example: v 100 For G-type machine, v = g; for P-type machine, v = p.
u001	Operating frequency	Motor operating frequency, displayed in the dimension set by f604.
u002	Direction of rotation	0 Forward, 1 reverse.
u003	Frequency command	The set frequency is displayed in the dimension set by f604.
u004	Load current	The inverter output current value is displayed in A or as a percentage of the inverter rated current.
u005	Input voltage	The single-phase/ three-phase input voltage effective value is displayed in V or as a percentage of the inverter rated voltage 200 V/ 400 V.
u006	Output voltage	The effective value of the three-phase output voltage is displayed in V or as a percentage of the inverter rated voltage 200V/ 400V .
u007	Input terminal status	Three-phase 380V: >>?> } : OFF i : ON . LI8 ··· LI3 LI2 LI1

		Single phase 220V: 
Code	illustrate	Detailed description
u008	Output terminal status	Three-phase 380V:  Single phase 220V: 
u009	Cumulative running time	The inverter ' s cumulative running time, 1.00=100 hours.
u010	Output speed	Motor shaft output speed (rpm).
u011	Inverter rated current	Rated current value of the inverter (A).
u012	Torque current	Motor torque current, displayed in A or as a percentage of the inverter rated current.
u013	Inverter load factor	Motor current as a percentage of the inverter rated current (%).
u014	Torque	Motor torque, displayed as a percentage of the motor's rated torque.
u015	Input Power	Inverter input power (kW).
u016	Output Power	Inverter output power (kW).
u017	PID feedback	The feedback value of PID is displayed in the dimension set by f604.
u018	Frequency command value after PID	The output command after PID adjustment is displayed in the dimension set by f604.
u019	Input cumulative power	Cumulative input power (kWh).
u020	Output cumulative power	Displays the accumulated output power (kWh).
u021	Communication Count	Displays the count of traffic passing through the network.
u022	Normal communication count	Displays the communication count value passing through the network in normal status.
u023	HMI version number	Example: v 10
u024	Maintenance Information	 ON: Maintenance time has reached and it is

		recommended to replace the device.
u025	Manufacturer reserved	
u026	Given pressure percentage	During PID control, the given pressure percentage is monitored
u027	Feedback pressure percentage	During PID control, feedback pressure percentage monitoring
u034	Monitor high-speed pulse input frequency	0.00 kHz ~ 20.00 kHz
u1--	Historical fault record 1	Enter the most recent fault history
u2--	Historical fault record 2	Enter the second most recent fault history
u3--	Historical fault record 3	Enter the 3rd most recent fault history
u4--	Historical fault record 4	Enter the 4th most recent fault history

Note: u0 group parameters are monitoring parameters, which can be used to view the inverter operation information and fault records.

6.2 Basic parameter group

NO.	name	Setting range	Factory settings
f000	Keyboard digital frequency setting	f009 ~ f008	0.0

In local mode, adjust the motor speed by pressing ▲ or ▼ on the keyboard panel . The motor speed can be adjusted while the inverter is running.

Each time ▲ or ▼ is pressed , the motor frequency changes by 0.1Hz . However , this speed change rate can be changed through parameter f608 .

When the motor speed is adjusted, press the ENT key and the new speed setting value will be stored in f000. When the motor is started again, the motor will directly accelerate to the setting value stored in f000.

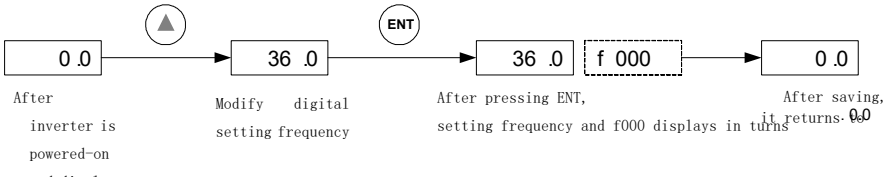


Figure 6.1 Editing method of f000

Note 1: When f003 = 3, f000 is used as the frequency command of the inverter.

NO.	name	Setting range	Factory settings

f001	Motor control mode	0~3	0

0: Constant torque V /f control.

When a single inverter is required to drive more than one motor, Or when the motor self-learning cannot be performed correctly, or the parameters of the controlled motor cannot be obtained through other means, Please select V/ f control mode. Low speed torque can be adjusted manually by setting the motor voltage boost parameter f202.

1: Quadratic load V /f control.

For loads such as centrifugal fans and pumps whose torque requirements increase with the square of the motor speed increment, the quadratic load mode is used, which has an energy-saving effect. The low-speed torque can be adjusted manually by setting the motor voltage boost parameter f202.

2: No PG vector (open loop vector) control.

That is, the speed sensorless vector control mode can be used in high-performance universal variable-speed drives.

3: Energy saving mode.

The frequency converter will monitor the actual load size, and then automatically adjust and optimize the voltage and current applied to the motor to achieve significant energy saving effects.

Note: When selecting vector control mode, motor parameter self-learning must be performed. Only by obtaining accurate motor parameters can the advantages of vector control mode be exerted.

NO.	name	Setting range	Factory settings
f002	Run command channel	0~2	1

0: External terminal, by external terminal LI1~LI8 (terminal functions must be defined) etc. for running command control.

1: Keyboard panel, operate by RUN, STOP/RESET and other buttons on the keyboard panel.

2: Serial communication, the host computer can control the operation command through the built-in RS485 serial communication interface of the inverter.

Note 1: Operation commands include start, stop, forward, reverse, jog, fault reset and other commands.

Note 2: When the inverter is in local control mode (f601 = 0), the f002 setting will be ignored and the keyboard panel will be used to give the run command directly.

NO .	name	Setting range	Factory settings
f003	Frequency /PID setting source selection	0~ 8	3

0: Keyboard panel potentiometer.

1: AI1.

2: AI2.

3: Keyboard panel (frequency setting).

4: Serial communication (frequency setting).

5: External terminal UP / DOWN speed setting.

6: AI1+AI2.

7: Keyboard setting (PID setting).

8: Simple PLC operation selection.

9: Frequency of external high-speed pulse input (single-phase AC 220V).

Note 1: f003 is the multiplexing parameter of frequency setting source and PID setting source.

When f900 = 0 (PID disabled), f003 is the frequency setting source;

When f900 ≠0 (PID enabled), f003 is the PID reference source.

Note 2 : When f900 = 0 and f003 = 3 , the frequency setting can be set directly by the ▲▼ keys in the default state after power-on, or the frequency setting can be set by parameter f000. The two methods have the same effect.

Note 3 : When f900 ≠ 0 and f003 = 7, the PID setting can be set directly by the ▲▼ keys in the default state after power-on, or the PID setting can be set by parameter f918 . The two methods have the same effect.

Note 4: When the inverter is in local control mode (f601 = 0), the f003 setting will be ignored and the keypad panel setting frequency will be used directly.

Note 5: When there is no valid frequency command (for example, the frequency command is below the running start frequency), even if the inverter receives a running command, the motor still cannot run, and the RUN indicator light on the keyboard panel will flash.

Note 6: When using the potentiometer knob of the optional external panel, f003 should be set to 4; if it is a standard panel potentiometer knob, f003 should be set to 0.

NO.	name	Setting range	Factory settings
f004	Run command channel 2	0~2	0

0: External terminal, by external terminal LI1 ~ LI8 (terminal functions must be defined) etc. for running command control.

1: Keyboard panel, operate by RUN , STOP/RESET and other buttons on the keyboard panel .

2: Serial communication, the host computer can control the operation command through the built-in RS485 serial communication interface of the inverter.

Note: The switching between f002 and f004 can be realized by defining the logic input function 67 or 68. When the command source of the inverter is switched to the keypad panel, if f502 = 1, the motor will remain in the running state if it was in the running state before switching the command channel. If f502 = 0, the inverter stops supplying power to the motor regardless of the motor state before switching the command channel.

NO.	name	Setting range	Factory settings
f005	Frequency /PID setting source selection 2	0~ 8	2

0: Keyboard panel potentiometer.

1: AI1.

2: AI2.

3: Keyboard panel (frequency setting).

4: Serial communication (frequency setting).

5: External terminal UP / DOWN speed setting.

6: AI1+AI2.

7: Keyboard setting (PID setting).

8: Simple PLC operation selection

9: Frequency of external high-speed pulse input (single-phase AC 220V)

Note: For switching of the given source of parameters f003 and f005, see f006.

NO.	name	Setting range	Factory settings
f006	Frequency/PID setting source switching	0~3	0

0: f003 and f005 are switched

When f006 = 0, switch between the two frequency/PID reference sources f003 or f005 through a logic input;

1: Toggle Disable

When f006 = 1, switching is disabled.

At this time, if f021 = 0, f003 is used as the frequency /PID given channel, otherwise the frequency /PID given source is determined according to the setting of f021.

2: f003 Switch with the frequency /PID source selected by f021

When f021 = 0, the inverter determines the frequency/PID given source by f003;

When f021 ≠ 0, a logic input switches between the frequency /PID source selected by f003 and f021.

3: f005 Switch with the frequency /PID source selected by f021

When f021 = 0, the inverter determines the frequency/PID given source by f003;

When f021 ≠ 0, a logic input switches between the frequency /PID source selected by f005 and f021.

Note: To use this function, a logic input must be defined as function 20, frequency /PID reference switching.

When the defined logic input is OFF, the inverter determines the frequency /PID reference source by f003.

When the defined logic input is ON, the inverter determines the frequency /PID given source by f005 or f021.

NO.	name	Setting range	Factory settings
f007	Maximum output frequency	30.0 ~ 400.0 Hz	50.0
f008	Upper frequency	0.5 Hz ~ f007	50.0
f009	Lower frequency	0.0 Hz ~ f008	0.0

f007 is used to set the maximum output frequency of the inverter. It is the basis for frequency setting and also the basis for acceleration and deceleration speed. Please pay attention.

f008 is the upper limit value of the frequency command. Even if the frequency command exceeds f008, the frequency command inside the inverter will not exceed f008.

f009 is the lower limit value of the frequency command. If the frequency command value is lower than the set value of f009, the inverter will run at the set value of f009.

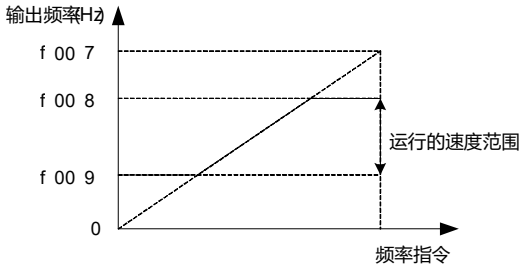


Figure 6.2 Relationship between f007, f008, f009 and running speed

Note 1: f007, f008, f009 should be set carefully according to the motor nameplate parameters. The motor output frequency is affected by not only f008 and f009, but also the starting frequency, DC braking start frequency and jump frequency.

Note 2: Please note that when setting, the maximum output frequency ≥ upper limit frequency ≥ lower limit frequency.

NO.	name	Setting range	Factory settings
f010	Acceleration time 1	0.1 ~ 3200 s	Model settings
f011	Deceleration time 1	0.1 ~ 3200 s	Model settings

f010 will determine the slope of the acceleration ramp, that is, the time required for the inverter to increase from 0.0Hz to the setting value of the maximum output frequency f007.

f011 will determine the slope of the deceleration ramp, that is, the time required for the inverter to decrease from the set value of the maximum output frequency f007 to 0.0Hz.

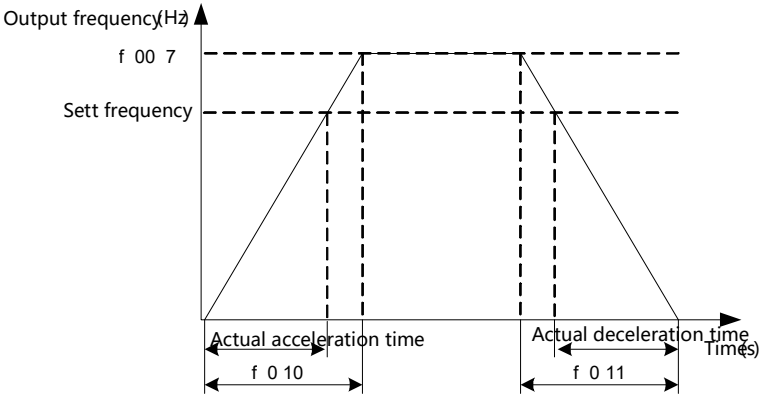


Figure 6.3 Definition of acceleration time and deceleration time

Note: 2 or 3 different acceleration times are required, see parameters f518 and f520; if 2 or 3 different deceleration times are required, see parameters f519 and f521.

NO.	name	Setting range	Factory settings
f012	Carrier frequency level	1.5 ~ 12.0 kHz	Model settings

Advantages of high carrier frequency level: ideal current waveform, less current harmonics, and low motor noise;

Disadvantages of high carrier frequency levels: switching losses increase, inverter temperature rise increases, inverter output capacity is affected, and the inverter needs to be derated at high carrier frequencies; at the same time, the inverter leakage current increases, and the electromagnetic interference to the outside world increases.

The use of low carrier frequency levels is the opposite of the above situation. Too low a carrier frequency will cause unstable low-frequency operation, reduced torque and even oscillation.

Note: The inverter has been reasonably set for the carrier frequency when it leaves the factory. Generally, the user does not need to change this parameter.

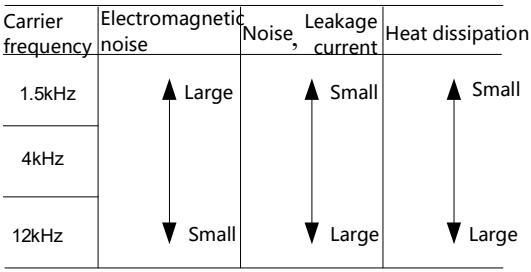


Figure 6.4 Effect of carrier frequency on inverter performance

Table 6.1 Relationship between carrier frequency and inverter model

model	Maximum carrier frequency (kHz)	Minimum carrier frequency (kHz)	Factory frequency (kHz)
0.4 ~ 11 kW	12.0	1.5	4.0
15 ~ 30 kW	8.0	1.5	4.0
37 ~ 500 kW	4.0	1.5	4.0

NO.	name	Setting range	Factory settings
f013	Carrier frequency automatically decreases	0~1	1

0: Disabled, the carrier frequency level will not be automatically reduced.

1: Enabled, the carrier frequency level will be automatically controlled to prevent the inverter from overheating faults. If the inverter detects an impending overheating fault, it will reduce the carrier frequency, thereby reducing the heat generated by the controller. As the temperature approaches normal, the carrier frequency will return to the level selected by parameter f012.

NO.	name	Setting range	Factory settings
f014	Random Carrier Mode	0~1	0

0: Disable.

1: Enabled. Random switching frequency mode may reduce motor noise.

NO.	name	Setting range	Factory settings
f015	Acceleration and deceleration time adaptive control	0~2	0

0: Disable.

1: Enabled during acceleration and deceleration.

2: Enabled during deceleration.

If parameter f015 is set to 1 or 2, the inverter will monitor its own load level and optimize the acceleration and deceleration ramps. The acceleration and deceleration will be self-learned between 1/8 and 8 times the f010 and f011 settings, depending on the inverter rated current and the load level on the motor. f010 and f011 should be set appropriately for the average load in the application. If the motor load increases rapidly during acceleration or deceleration, the acceleration and deceleration time adaptive control function cannot prevent the inverter from overcurrent or overvoltage faults.

If the application requires accurate acceleration or deceleration times, set f015 to 0 and manually set f010 and f011 as required. Manual acceleration and deceleration times can still be suppressed by the motor current limit (see f107) and overvoltage fault protection (see f415) and overvoltage fault operating level (see f416) functions.

NO.	name	Setting range	Factory settings
f016	Manufacturer reserved		

NO.	name	Setting range	Factory settings
f017	Terminal Control Macro	0~19	0

0: Factory setting.

1: 2 -wire control (negative logic, ramp stop).

2: 3- wire control (negative logic, ramp stop).

3: Terminal UP/DOWN speed control (negative logic, ramp stop).

4 ~16: Reserved.

17: PID sleep wake-up control. (f003 =7, f910 =0.1s, f911 =75.0%, f915 =5.0s, f919 =38.0Hz)

18: PID basic control. (f002 = 0, f003 = 7, f367 = 1, f523 = 2, f900 = 1, f917 = 1.00, f918 = 0.20)

19: Reserved.

20: JY general macro parameters.

Note 1: After the terminal control mode is configured, it must be valid in remote mode （f601 = 1). Writing 0 to f017 will not restore the parameter configuration to the factory settings. After completing the configuration, the value of f017 is restored to 0. For example, if you want to configure the inverter control terminal to 2 -wire control mode, just set f017 to 1 and confirm that the inverter is in remote mode to make the inverter run in 2- wire control mode.

Note 2: Negative logic refers to the common terminal of all logic inputs being connected to 0V, and positive logic input refers to the common terminal of all logic inputs being connected to 24V.

Note 3: The first digit on the left of the LED display is the last setting value of f017.

NO.	name	Setting range	Factory settings
f018	Manufacturer reserved		
f020	Manufacturer reserved		
f021	Main and auxiliary frequency/PID given operation relationship	0 ~ 4	0

0: Single channel setting:

When f006 = 0, switch between the two frequency / PID given sources f003 or f005 through a logic input;

When f006 ≠0, the inverter determines the frequency/PID reference source by f003.

1: f003 + f005

When f006 = 0/1, the sum of the frequency /PID given by f003 and f005 is used as the final frequency given, and its value is limited by the upper and lower frequency limits;

When f006 = 2, a logic input switches between f003 and (f003 + f005);

When f006 = 3, switching between f005 and (f003 + f005) is performed by a logic input.

2: f003 - f005

When f006 = 0/1, the difference between the frequency /PID given by f003 and f005 is used as the final frequency given, and its value is subject to the upper and lower limits;

When f006 = 2, a logic input switches between f003 and (f003 - f005);

When f006 = 3, switching between f005 and (f003 - f005) is performed by a logic input.

3: MAX (f003, f005)

When f006 = 0/1, the maximum value of the frequency /PID setting between f003 and f005 is used as the final setting, and its value is subject to the upper and lower limits;

When f006 = 2, a logic input switches between f003 and MAX (f003, f005);

When f006 = 3, switch between f005 and MAX (f003, f005) by a logic input.

4: MIN (f003, f005)

When f006 = 0/1, the minimum value of the frequency /PID setting between f003 and f005 is used as the final setting, and its value is subject to the upper and lower limits;

When f006 = 2, switch between f003 and MIN (f003, f005) through a logic input;

When f006 = 3, switch between f005 and MIN (f003, f005) by a logic input.

Serial number	f021	f006	Final frequency setting
1	0	0	Switch between f003 and f005 via logic input
2	0	1/2/3	f003
3	1/2/3/4	0/1	f021 selected reference source
4	1/2/3/4	2	Switch between the reference source selected by f003 and f021 via logic input
5	1/2/3/4	3	Switch between the reference source selected by f005 and f021 via logic input

[Example 1] When f003 + f005 is calculated and f005 = 3 /7 , the frequency/PID of the f003 channel can be adjusted directly by pressing the ▲▼ keys , and it can be increased or decreased .

◇ The given value remains unchanged when the machine is stopped; the given value is not saved when the power is off, and the original given value of the f003 channel is restored after power is on.

Set to:

Frequency reference: f009 = 0, f003 = any, f005 = 3, f021 = 1, f024 = 1 or 4.

PID setting: f009 ≠ 0, f003 = any, f005 = 7, f021 = 1 , f024 = 1 or 4.

◇ The given value will not be saved when the machine is stopped or powered off, and will be restored to the original given value of the f003 channel.

Set to:

Frequency reference: f009 = 0, f003 = any, f005 = 3, f021 = 1, f024 = 2 or 5.

PID setting: f009 ≠ 0, f003 = any, f005 = 7, f021 = 1 , f024 = 2 or 5.

[Example 2] When f003 ± f005 is calculated and f005 = 5 , the frequency/PID setting of the f003 channel can be adjusted directly through the UP/ DOWN function , and it can be increased or decreased . (Applicable to both frequency setting and PID setting)

◇ The given value remains unchanged during shutdown;

Set as: f003 = any, f005 = 5, f021 = 1 or 2, f023 = 25, f303 = 23, f304 = 24, f323 = 25;

Whether the given value is saved after power failure is determined by parameter f324. It is recommended to set f324 = 4.

◇ The setting is not saved when the machine is stopped or powered off , and is restored to the original setting of the f003 channel.

Settings: f003 = any, f005 = 5, f021 = 1 or 2, f023 = 25, f303 = 23, f304 = 24, f310 = 75, f 323 = 25 (f323 must be set based on f 324 = 6 , and f 323 must = f023), f 324 = 4.

NO.	name	Setting range	Factory settings
f022	f005 frequency reference coefficient	0.0 ~ 100.0%	100.0 %
f023	f005 frequency setting bias	0.0 Hz~400.0 Hz	0.0 Hz

When f021 =1 (f003 + f005) or 2 (f003 - f005), and f005 =0 (keyboard panel potentiometer), or 1 (AI1), or 2 (AI2), or 5 (UP /DOWN), f022 and f023 are used to adjust the reference of f005.

Example 1: Frequency setting processing

Final frequency setting of f005 channel = (original frequency given by channel f005 – f023) *f022.

Example 2: Processing of PID setting (Note: Here, the original setting of f005 must be regarded as the frequency setting)

Final frequency PID setting of f005 channel = f022 * f917 * (original frequency given by f005 channel – f023) / f007 .

Note: The final frequency/PID setting of the f005 channel may be a positive value or a negative value.

NO.	name	Setting range	Factory settings
f024	Frequency lower limit selection and f005 = 3 /7 setting	0-5	0

f024 contains two functions:

Function 1: Select the lower limit value when the panel potentiometer / f000 / UP_DOWN is given;

Function 2: The processing method when f021 = 1 (f003 + f005) and f005 = 3 (frequency setting) or 7 (PID setting) and when adjusting the given frequency by pressing the ▲▼ keys .

f024 set up	Panel potentiometer / f000 / UP _ DOWN set lower limit selection	When f021 = 1 (f003 + f005) and f005 = 3, Use the ▲▼ buttons to adjust the given processing
0	(1) Frequency setting: f009 (2) PID setting: f917 * f009 / f007	▲▼ Press the button to directly adjust the value of f000 , and use f000 as the given source of f005
1		The ▲▼ buttons are used to adjust directly on the basis of the given value of the f003 channel . The given value remains unchanged when the machine is stopped. The given value is not saved when the power is off, and the original given value of the f003 channel is restored after power is on.
2		▲▼ buttons are used to adjust directly based on the given value of the f003 channel . The given value will not be saved when the machine is stopped or powered off, and will be restored to the original given value of the f003 channel.
3	0.0Hz	▲▼ Press the button to directly adjust the value of f000 , and use f000 as the given source of f005
4	0.0Hz	The ▲▼ buttons are used to adjust directly on the basis of the given value of the f003 channel . The given value remains unchanged when the machine is stopped. The given value is not saved when the power is off, and the original given value of the f003 channel is restored after power is on.
5		▲▼ buttons are used to adjust directly based on the given value of the f003 channel . The given value will not be saved when the machine is stopped or powered off, and will be restored to the original given value of the f003 channel.

NO.	name	Setting range	Factory settings
f099	Manufacturer reserved		

6.3 Motor and its protection parameter group

NO.	name	Setting range	Factory settings
f100	Self-learning enabled	0~2	0

0: Disable.

1: f203 is restored to the factory default.

2: Enable self-learning.

Note 1: The timing of self-learning is after f100 is set to 2. When the inverter is started for the first time, it will conduct self-learning. The learning process is usually completed within 3 seconds. At the same time, the panel displays tun1. After the learning is completed, the function code automatically returns to 0.

Note 2: When the motor static parameters are self-learned, it is not necessary to disconnect the motor from the load. Before the motor parameters are self-learned, the motor nameplate parameters must be correctly entered. After self-learning, the motor stator resistance, rotor resistance and leakage inductance will be detected. The no-load current of the motor cannot be measured. Users can enter the corresponding value based on experience, or directly consult the motor manufacturer.

Note 3: During the self-learning process, voltage is applied to the motor and current flows through the motor. Before self-learning, regardless of the setting of f406 , the inverter will detect whether there is a phase loss. If self-learning fails, the inverter displays e-46.

Note 4: Parameter self-learning is only suitable for the first motor（f101~f104).

Note: 5: Before self-learning, ensure the following:

- The motor is connected and its specifications cannot be lower than the inverter by more than one level.
- The motors are completely stopped and powered off, the motors should be cold (room temperature), and only one motor is connected to the drive.
- All motor leads that will be used in the final installation are included in the output circuit during the self-learning process.
- The motor lead should not exceed 30m, otherwise the motor torque may be reduced and optimal motor control may not be achieved.
- There are no load reactors or filters in the motor circuit. Output reactors and filters may cause self-learning errors and reduce the sensorless vector control effect.

NO.	name	Setting range	Factory settings
f101	Motor rated frequency	25.0~400.0 Hz	50.0
f102	Motor rated voltage	50~660V	Model settings
f103	Motor rated current	Model settings	Model

			settings
f104	Motor rated speed	1000 ~ 30000 rpm	Model settings

f101 ~ f104 are the nameplate parameters of the controlled motor.

Note 1: Please set according to the nameplate parameters of the motor. The excellent control performance of vector control requires accurate motor parameters.

Note 2: The inverter provides parameter self-learning function. Accurate parameter self-learning comes from the correct input of the motor nameplate parameters. In order to ensure control performance, please try to ensure that the inverter and motor power match, otherwise, the inverter control performance will be significantly reduced.

Note 3: When the rated power of the inverter is greater than the rated power of the motor, the motor overload protection function needs to be enabled to prevent the motor from burning out. The parameters involved in the motor overload protection function are:

1) f106 or f110 is set to the motor nameplate rated current.

2) f401 = 0 or 4, set to enable overload protection for normal motor or forced air cooling motor.

3) f402 sets the motor overload time, the default is 300 seconds.

Note 4: When the parameter setting value of f104 is greater than the number of digits on the digital tube display, the parameter setting value will automatically hide the unit digit, and only the upper 4 digits will actually be displayed. At the same time, the upper 4 digits and E1 will flash alternately.

NO.	name	Setting range	Factory settings
f105	Motor no-load current	10.0~100.0%	Model settings

Set parameter f105 to the ratio of the motor no-load current and the motor rated current. For details, please consult the motor supplier.

NO.	name	Setting range	Factory settings
f106	Motor thermal current setting	Model settings	Model settings

Set parameter f106 to the rated motor current as shown on the motor nameplate.

Note 1: If parameter f603 = 1, parameter f106 will be adjusted in amperes. If parameter f603 = 0, parameter f106 will be adjusted in percentage. In this case, divide the motor rated current by the inverter rated current (see inverter nameplate) and set parameter f106 to the calculated percentage.

Note 2: The setting of carrier frequency level f012 will not modify the inverter rated current.

NO.	name	Setting range	Factory settings
f107	Motor current limitation	Model settings	Model settings

f107 is used to limit the current of the motor during the motoring or braking process. This function can limit the motor torque and heat generation.

Note 1: The setting of carrier frequency level f012 does not modify the inverter rated current.

Note 2: Do not set parameter f107 below the rated no-load current of the motor. Otherwise, the inverter will think that motor braking is in progress and will increase the frequency applied to the motor.

Note 3: If parameter f603 = 1, parameter f107 will be adjusted in amperes. If parameter f603 = 0, parameter f107 will be adjusted in percentage of the inverter output current shown on the nameplate.

Note 4: When the inverter enters current limit mode, it will:

- The output frequency is adjusted to limit the motor current (downward in motoring state, upward in braking state).
- The keyboard panel displays the code " ---c ", which flashes alternately with the output frequency display.

NO.	name	Setting range	Factory settings
f108	Second motor rated frequency	25.0~400.0 Hz	50.0
f109	Second motor rated voltage	50~660 V	Model settings
f110	Second motor thermal current setting	Model settings	Model settings
f111	Second motor current limit	Model settings	Model settings

For details, see f101, f102, f106, f107.

Note: When the second motor control parameter is valid, only the constant torque V/f control mode (f001 = 1) is valid.

NO.	name	Setting range	Factory settings
f112 - f115	Manufacturer reserved		

NO.	name	Setting range	Factory settings
f119	Keyboard control options	0~1	0

0: Local panel keyboard

1: External panel keyboard

NO.	name	Setting range	Factory settings
f120	Parameter reset	0~9	0

0: No operation.

1: Restore factory settings.

2: User parameter settings backup.

3: Call the user parameter setting backup.

4: Fault history record cleared.

5: The inverter running time is reset.

6: Fan running time is reset.

7: Inverter type fault (e-36) cleared.

8: P-type machine selection.

9: G type machine selection.

Note 1: The first digit on the left of the LED display is the type of reset performed last time. Restoring the factory settings will also clear the fault history. After the parameter reset operation is completed, f120 will automatically reset to 0.

Note 2: The parameter values that will not be reset after f120 is set to 1 are f300, f333, f334, f335, f336, f348, and f349.

Note 3: After the G-type machine is reset, the first digit of parameter u000 displays "g"; after the P-type machine is reset, the first digit of parameter u0 00 displays "p". Therefore, this parameter can be used to check whether the inverter is currently working in the G- type machine state or the P -type machine state. In addition to the different related power level parameters, the overload parameters of the G-type and P-type machines are also different. The G -type machine supports an overload of 150% for 60s, and the P-type machine supports an overload of 120% for 60s.

Note 4: When f120 is set to 1, the inverter actually defaults to reset as a G-type machine.

6.4 Motor control parameter group

NO.	name	Setting range	Factory settings
f 201	Automatic voltage regulation function (AVR function)	0~3	3

0: Automatic voltage regulation disabled—output voltage limiting enabled.

The V/f curve of the motor will be affected by the input voltage fluctuation, which is manifested as the V/f value increasing with the increase of input voltage; when the input voltage is higher than the rated voltage and the motor runs above the rated frequency, the output voltage will not exceed the motor rated voltage f102.

1: Automatic Voltage Regulation Enabled—Output voltage limiting enabled.

The V/f curve of the motor will not be affected by input voltage fluctuations, that is, the V/f value will not change with input voltage fluctuations; when the input voltage is higher than the rated voltage and the motor runs above the rated frequency, the output voltage will not exceed the motor rated voltage f102.

2: Automatic Voltage Regulation Disabled—Output voltage limiting disabled.

The V/f curve of the motor will be affected by the input voltage fluctuation, which is manifested as the V/f value increasing with the increase of input voltage; when the input voltage is higher than the rated voltage and the motor runs above the rated frequency, the output voltage may exceed the motor rated voltage f102.

3: Automatic voltage regulation enabled—output voltage limiting disabled.

The V/f curve of the motor will not be affected by input voltage fluctuations, that is, the V/f value does not change with input voltage fluctuations; when the input voltage is higher than the rated voltage and the motor runs above the rated frequency, the output voltage can exceed the motor rated voltage f102.

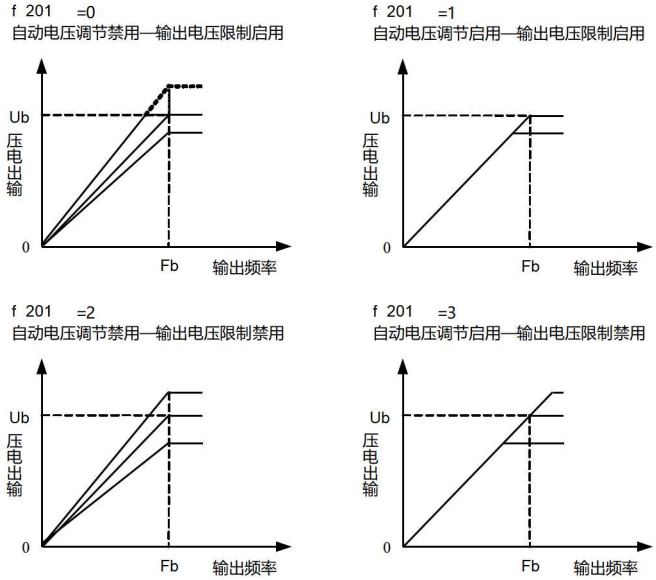


Figure 6.5 AVR function diagram

Note 1: If f001 = 2 (vector control without PG), the automatic voltage regulation will be automatically enabled regardless of the setting value of f201.

Note 2: Automatic voltage regulation is enabled to make it unaffected by grid voltage and load changes, protecting the motor from insulation damage caused by long-term overvoltage or excessive core heating caused by excessive magnetic flux density.

NO.	name	Setting range	Factory settings
f202	Motor voltage boost	0.0~30.0%	Model settings
f203	Motor torque boost	0.0~30.0%	Model settings

When parameter f001 is set to 0 (constant torque V /f control) or 1 (quadratic load V /f control), the motor torque at low speed can be adjusted by parameter f202.

When parameter f001 is set to 2 (vector control without PG), the motor torque at low speed can be adjusted by f203.

Note: If a harmful overcurrent fault occurs during starting or the inverter alarm e- 45, reducing the setting value of parameter f202 or f203 may help.

NO.	name	Setting range	Factory settings

f204	Slip compensation	0~150 %	50

Parameter f204 can be used to fine-tune the inverter's slip compensation function. Increasing the value of parameter f204 will increase the inverter's compensation for motor slip.

Note 1: Before adjusting f204, confirm that parameter motor rated speed f104 is set to the motor rated speed in rpm.

Note 2: The slip compensation coefficient is used to adjust the slip frequency of vector control and improve the speed control accuracy of the system. Proper adjustment of this parameter can effectively suppress the speed static error.

NO.	name	Setting range	Factory settings
f205	Excitation current coefficient	100~130 %	100

Parameter f205 can be used to fine-tune the motor torque in low-speed operation. Increasing the setting of f205 can increase the motor torque in the low-speed operation range.

Note: It is recommended to adjust f205 only when self-learning (f100 = 2) fails to obtain sufficient low-speed torque. The f205 setting may increase the motor's no-load current during low-speed operation. Do not set this parameter to a value that causes the motor's no-load current to exceed its rated operating current.

NO.	name	Setting range	Factory settings
f206	Second motor voltage boost	0~30 %	Model settings

See parameter f202.

NO.	name	Setting range	Factory settings
f207	Speed loop response coefficient	1~150	40
f208	Speed loop stability factor	1~100	20

The response speed and stability of the output speed to the given frequency are adjusted by f207 and f208.

Increasing the f207 setting can increase the response speed to the frequency setting.

Increasing the f208 setting can suppress overshoot and irregular speed oscillation.

Note 1: The factory settings of the two parameters f207 and f208 are based on the assumption that the load (including the motor shaft) inertia is 3 times the motor shaft inertia. If the factory settings of these two parameters are not suitable for the application, adjust them. The adjustment method is, f207 = $40\times\sqrt{a/3}$, f208 = $40\times\sqrt{a/3}$, a is the multiple of the actual load inertia to the motor shaft inertia.

Note 2: When the acceleration time f010 or f518 is set to its minimum value, the inverter output frequency may exceed the current given frequency.

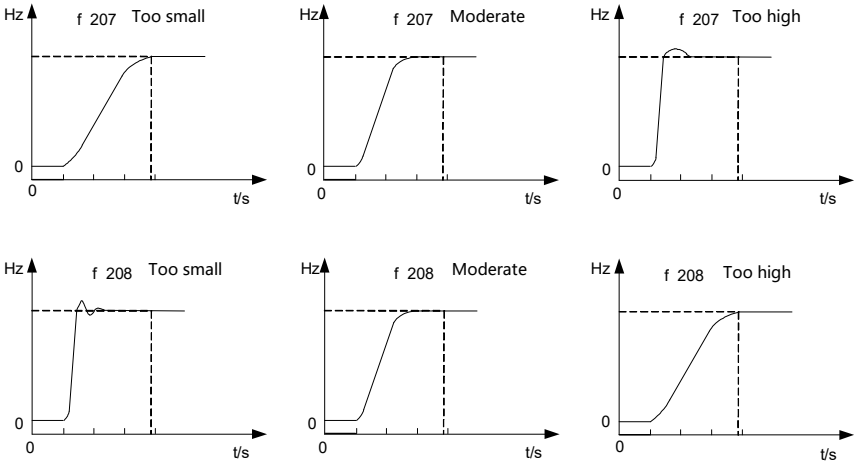


Figure 6.6 Relationship between speed loop parameters and speed response

NO.	name	Setting range	Factory settings
f209	Field weakening stall current level	10~250%	100

When the motor is running above its rated frequency, use parameter f209 to adjust the inverter's response to large and sudden changes in load. If a sudden change in load causes the motor to stall before the inverter reaches the current limit, the setting of f209 can be gradually reduced to avoid the stall.

NO.	name	Setting range	Factory settings
f210	Weak magnetic frequency level	50~150%	100

Use f210 to adjust the drive's response to large drops in the supply voltage when the motor is running above its rated frequency. Such voltage drops can cause motor current fluctuations or motor vibrations. To eliminate these disturbances, set parameter f210 to a value between 80 and 90.

Note 1: Reducing the f210 setting will increase the motor operating current level, so it is necessary to appropriately adjust the f106 value according to the motor capacity.

Note 2: f209 and f210 are used to adjust the characteristics in the area above the fundamental frequency (weakening magnetic field).

NO.	name	Setting range	Factory settings
f211	Maximum voltage output level	90~120%	104

Increasing the setting value of f211 can increase the voltage output when the motor is running above the base frequency (weak magnetic field area); but it may also cause motor vibration. If motor vibration occurs, please do not adjust this parameter.

NO.	name	Setting range	Factory settings
f212	Carrier frequency change step	0.1~14.0kHz	14.0
f 213	Manufacturer reserved		
f214	Manufacturer reserved		
f215	Manufacturer reserved		
f216	Manufacturer reserved		

NO.	name	Setting range	Factory settings
f217	Multi-point V/f curve setting	0~2	0

0: Multi-point V/f control disabled.

1: Reserved by the manufacturer.

2: Multi-point V/f control is enabled. The V/f curve can be defined by setting f218 ~ f223.

NO.	name	Setting range	Factory settings
f218	V/f frequency point 1 (f1)	0~ f220	10.0
f219	V/f voltage point 1 (V1)	0~100%	20.0
f220	V/f frequency point 2 (f2)	f218 ~ f220	20.0
f221	V/f voltage point 2 (V2)	0~100%	40.0
f222	V/f frequency point 1 (f3)	f220 ~ f101	30.0
f223	V/f voltage point 3 (V3)	0~100%	60.0

f218 ~ f223 define the multi-point V/f curve. The setting value of the V/f curve should be set according to the load characteristics of the motor.

Note: V1<V2<V3, f1 < f2 < f3. If the low-frequency voltage is set too high, the motor may overheat or even burn out, and the inverter may lose speed or overcurrent protection.

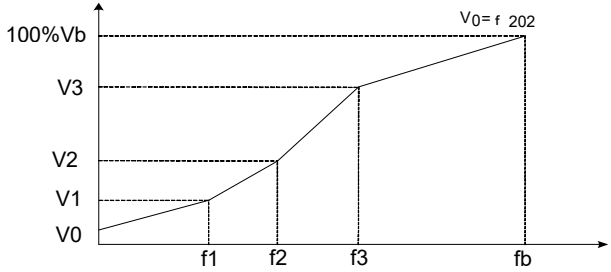


Figure 6.7 Multi-point V/f control (f217 =2)

NO.	name	Setting range	Factory

			settings
f225	Speed coefficient	1~999	420

6.5 Input and output terminal parameter group

NO.	name	Setting range	Factory settings
f300	AI1 input type (analog or logic selection)	0~2	0

0: Analog input.

1: Logic input - sink (negative logic).

2: Logic input - source type (positive logic, source).

Parameter f300 will determine whether the control input terminal AI1 will be used as an analog input or a logic input.

Note 1: When AI1 is configured as analog input, please pay attention to whether parameter f305 is configured correctly (0~5VDC, 0~10VDC, or 0~20mA).

Note 2: When AI1 is configured as sink (negative) logic, ensure that a 0.7k Ω ~10k Ω (0.5 W) resistor is connected between control terminal P24 and AI1.

NO .	name	Setting range	Factory settings
f301	LI1 logic input function	0~77	2
f302	LI2 logic input function	0~77	3
f303	LI3 logic input function	0~77	0
f304	LI4 logic input function	0~77	10

By configuring parameters f301 ~ f304, the four logic terminals LI1 ~ LI4 can be used to send specific function signals (forward, reverse, stop, fault reset, etc.) to the inverter. For detailed function codes and function signals, see Table 6.2.

Table 6.2 Logic input function description

Function serial number	Function Description	Operation
0	Undefined Function	Logic Input Disable
1	Run permission	OFF: The inverter PWM output is disabled and the motor coasts to a stop; ON: The inverter is ready for operation.

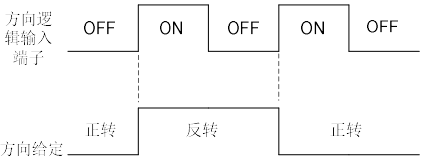
Function serial number	Function Description	Operation
2	Forward run command	2-wire control OFF: The motor decelerates along the ramp until it stops; ON: The motor runs in the forward direction (when the run permission is valid).
		3-wire control. The transition from OFF to ON will start the inverter and the motor will run forward. Other operations have no function.
3	Run command in reverse	2-wire control OFF: The motor decelerates along the ramp until it stops. ON: The motor runs in reverse (when the run permission is valid)
		The transition from OFF to ON of the 3-wire control will start the inverter and the motor will run in reverse. Other operations have no function.
4	Jog	OFF: Jog function disabled ON: Jog function enabled
5	Acceleration/deceleration curve selection	OFF: Acceleration/deceleration curve 1 ON: Acceleration/deceleration curve 2
6	Multi-speed position 1	See f716 ~ f730
7	Multi-speed position 2	See f716 ~ f730
8	Multi-speed position 3	See f716 ~ f730
9	Multi-speed position 4	See f716 ~ f730
10	Fault reset	The transition from ON to OFF will reset the inverter (make sure the fault has been cleared)
11	External fault	OFF: No external fault ON: The motor stops according to the method set by parameter f403, and the keyboard panel displays e-43
13	DC braking command	OFF: No DC braking command ON: DC braking starts, DC braking current level and DC braking time are set by parameters f507 and f508
14	PID control disabled	OFF: Enable PID control ON: Disable PID control The input terminal function of disabling PID control can be used to switch between PID control and open loop control. The input terminal function of clearing PID integral value can be used.
15	Programming parameter lock	OFF: Parameter lock (valid only when parameter f602 = 1) ON: Allow programming changes
16	Run permission Combination with Fault Reset	OFF: The inverter motor output is disabled and the motor coasts to a stop ON: The inverter is ready for operation. The transition from ON to OFF will reset the inverter

Function serial number	Function Description	Operation
		(make sure the fault has been cleared)
17	Frequency source switched to AI1	OFF: Frequency source press f003 ON: Frequency source switches to AI1
18	Forward jog	OFF: Motor stops ON: Forward jog operation
19	Reverse jog	OFF: Motor stops ON: Reverse jog operation
20	Frequency setting source switching	OFF: The inverter follows the speed setting set by parameter f003. ON: The inverter follows the speed setting set by parameter f005 (when f006 = 1)
21	Motor V/f parameter switching	OFF: The 1st motor V/ f parameter group is valid: (f001, f101, f102, f106, f202) ON: The second motor V/ f parameter group is valid: (f001 = 0, f108, f109, f110, f206)
22	Motor switching + Current Limitation +Acceleration and deceleration curve	The first motor control parameter group is valid: (f001, f010, f011, f101, f102, f106, f107, f202, f510) ON: The second motor control parameter group is valid: (f001 = 0, f108, f109, f110, f111, f206, f518, f519, f511)
23	(UP) Speed increase instruction	OFF: No motor speed increase ON: Motor acceleration
24	(DOWN) Speed reduction command	OFF: No motor speed reduction ON: Motor deceleration
25	(UP/DOWN) speed clear	The OFF to ON transition will clear the speed reference in UP/DOWN mode.
26	External fault signal negation	OFF: The motor stops according to parameter f 403 and the keyboard panel displays e -43 ON: No external fault
27	External overtemperature fault input	OFF: No external overheat fault ON: The motor stops and the display panel shows e-25 fault.
28	External overheat fault signal negation	OFF: The motor stops and the display panel shows e- 25 fault. ON: No external overheat fault
29	Force Local	OFF: No forced local function ON: The inverter is forced to be controlled according to f002, f003 and f005.
30	3-wire control stop input	OFF: Decelerate along the ramp to stop ON: The inverter is ready for operation.

Function serial number	Function Description	Operation
31	The command source is switched to the terminal	OFF: Command source press f002 ON: Command source switches to terminal
32	Clear the cumulative function kWh display	OFF: No function ON: Clear kWh memory
33	Fire Mode See parameter f419	OFF: No function ON: The motor runs at the speed set by f730
34	Free parking command	OFF: Motor is ready for operation ON: Motor coasts to stop
35	Fault reset negation	The transition from OFF to ON will reset the inverter (make sure the fault has been cleared)
36	Current limit level selection	OFF: Current limit level 1 (f107) is selected ON: Current limit level 2 (f111) is selected
37	Clear PID integral value	OFF: No operation ON: PID integral value is kept at zero
3 8	PID error signal negation	OFF: PI error input = given - feedback ON: PI error input = feedback - given
39	Forward run command + Acceleration and deceleration curve 2	ON: The motor runs forward and accelerates along the ramp according to acceleration/deceleration curve 2.
40	Run command in reverse + Acceleration and deceleration curve 2	ON: The motor runs in the reverse direction and accelerates along the ramp according to acceleration/deceleration curve 2.
41	Forward run command + Multi-speed position 1	ON: The motor runs forward and multi-speed position 1 is activated
42	Run command in reverse + Multi-speed position 1	ON: The motor runs in reverse and multi-speed position 1 is activated
43	Forward run command + Multi-speed 2	ON: The motor runs forward and multi-speed position 2 is activated
44	Run command in reverse + Multi-speed 2	ON: The motor runs in reverse and multi-speed position 2 is activated
45	Forward run command + Multi-speed position 3	ON: The motor runs forward and multi-speed position 3 is activated
46	Run command in reverse + Multi-speed position 3	ON: The motor runs in reverse and multi-speed position 3 is activated
47	Forward run command + Multi-speed 4	ON: The motor runs forward and multi-speed position 4 is activated
48	Run command in reverse + Multi-speed 4	ON: The motor runs in reverse and multi-speed position 4 is activated
49	Multi-speed position 1 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2 and multi-speed position 1 simultaneously
50	Multi-speed position 2 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2 and multi-speed position 2 simultaneously
51	Multi-speed position 3 +Acceleration and	ON: Activate acceleration curve 2 and multi-speed position 3 simultaneously

Function serial number	Function Description	Operation
	deceleration curve 2	
52	Multi-speed position 4 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2 and multi-speed position 4 simultaneously
53	Forward run command + Multi-speed position 1 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2, forward run command and multi-speed position 1 simultaneously
54	Run command in reverse + Multi-speed position 1 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2, reverse run command and multi-speed position 1 simultaneously
55	Forward run command + Multi-speed 2 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2, forward run command and multi-speed position 2 simultaneously
56	Run command in reverse + Multi-speed 2 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2, reverse run command and multi-speed position 2 simultaneously
57	Forward run command + Multi-speed position 3 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2, forward run command and multi-speed position 3 simultaneously
58	Run command in reverse + Multi-speed position 3 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2, reverse run command and multi-speed position 3 simultaneously
59	Forward run command + Multi-speed 4 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2, forward run command and multi-speed position 4 simultaneously
60	Run command in reverse + Multi-speed 4 +Acceleration and deceleration curve 2	ON: Activate acceleration curve 2, reverse run command and multi-speed position 4 simultaneously
61	UP/DOWN speed clear +Fault Reset	When OFF to ON, clears the frequency level set by the UP/DOWN speed input
62	Run permission +Forward Run Command (2- wire control only)	ON: Simultaneously activates the run permission, forward run command and fault reset function
63	Run permission + Reverse run command (2- wire control only)	ON: Simultaneously activates the run permission, reverse run command and fault reset function

Function serial number	Function Description	Operation
64	Acceleration/deceleration curve 3	ON: The motor accelerates according to acceleration curve 3
65	Acceleration/deceleration curve 3 + Forward Run Command	ON: Activate forward run, acceleration/deceleration curve 3 command simultaneously
66	Acceleration/deceleration curve 3 + Run command in reverse	ON: Activate forward run, acceleration/deceleration curve 3 command simultaneously
67	Command source switching	OFF: Command source based on f002 ON: Command source based on f004
68	Command source +Frequency source switching	OFF: Command source based on f002, frequency source based on f003 ON: Command source based on f004, frequency source based on f005
69	3-wire control stop inversion	OFF: The inverter is ready for operation. ON: Decelerate along the ramp to stop
70	Simple PLC shutdown reset	OFF: Command source based on f002 ON: Command source based on f004
71	Simple PLC hold	OFF: Disable ON: Valid
72	Simple PLC Pause	OFF: Disable ON: Valid
73	PID control + frequency setting source switching	OFF: Control disabled + frequency reference source changed to f005 setting ON: Control disabled + frequency reference source changed to f003 setting
74		OFF: Control disabled + frequency reference source changed to f005 setting ON: Control disabled + frequency reference source changed to f003 setting
7 5	(UP /DOWN) Stop speed clear	ON: (UP /DOWN) Stop speed clear is effective OFF: (UP /DOWN) Stop speed clear is invalid
7 6	2-wire control mode 2 - start-stop control	ON: Start OFF: Stop
7 7	2-wire control mode 2 - forward and reverse control	f537 = 1: ON: Reverse OFF: Forward f537 = 2:

Function serial number	Function Description	Operation
		

Note 1: AI1 can be configured as a logic input terminal with the same function as LI1~LI4 through parameters f300 and f308.

Note 2: AI2 can be configured as a logic input terminal with the same function as LI1~LI4 through parameters f313 and f314.

Note 3: The difference between 2-wire control and 3-wire control lies in whether logic input function 30 (3-wire control stop input) is configured or not.

NO.	name	Setting range	Factory settings
f305	AI1 input signal type	0~2	1

0: 0 ~ 5V voltage input.

1: 0~10V voltage input.

2: Current input.

NO.	name	Setting range	Factory settings
f306	Logic input type selection	0~1	1

0: Logic input - source type (positive logic, source).

1: Logic input - sink type (negative logic, sink).

Note: Only (2R2G/3P ~11G/15P) can be set through this parameter, and other models can be set through J300.

NO.	name	Setting range	Factory settings
f307	AO1 analog output signal type	0~1	1

0: Current signal output.

1: Voltage signal output.

NO.	name	Setting range	Factory settings
f308	AI1 logic input function	0~75	0

When parameter f300 = 1 or 2, AI1 can be configured as a logic input function (after configuration, the role of AI1 is the same as LI1~LI4), and the configuration method of its logic input function is the same as LI1~LI4.

NO.	name	Setting range	Factory settings
f309	Forced valid logic input function	0~75	1
f310	Forced valid logic input function 2	0~75	0

The logic input functions configured for f309 and f310 will remain active while the inverter is powered on.

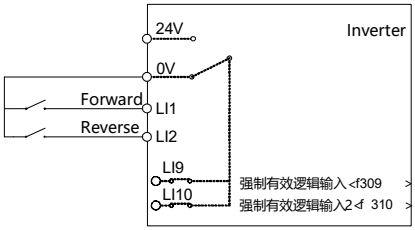


Figure 6.8 Forced valid logic input function

Note 1: For example, f309 = 2, it is equivalent to the forward running command signal being forced to be valid during the inverter power-on period.

Note 2: f309 and f310 are equivalent to configuring the two virtual logic input terminals LI9 and LI10 inside the inverter. These two terminals are always closed during the inverter power-on period, so the configured functions are always valid.

NO.	name	Setting range	Factory settings
f311	Transistor logic output main function	0~255	4

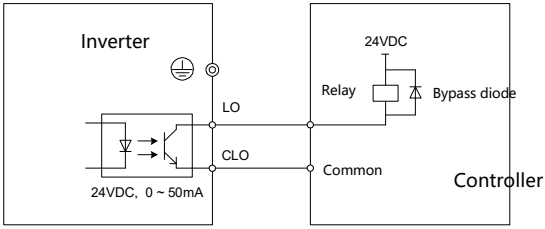


Figure 6.9 Collector logic output wiring diagram

The detailed settings are the same as f315.

NO.	name	Setting range	Factory settings
f312	Transistor logic output auxiliary function	0~255	255

f312 can be used to indicate the auxiliary status signal of the inverter.

NO.	name	Setting range	Factory settings
f313	AI2 input type (analog or logic selection)	0	0

0: Analog input

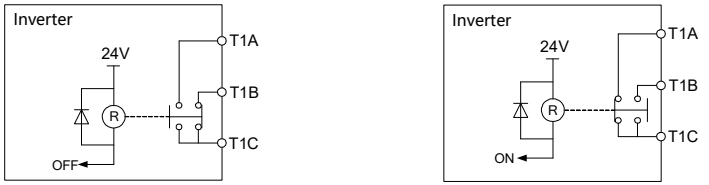
1: Logic input-drain (negative logic, sink)

2: Logic input - source (positive logic, source)

NO.	name	Setting range	Factory settings
f314	AI2 logic input function	0~ 75	0

See f300, and f301 ~ f304 for detailed settings.

NO.	name	Setting range	Factory settings
f315	Relay 1 main function	0~255	40



a) Relay OFF state b) Relay ON state

Figure 6.10 Relay status description

Table 6.3 Relay output function description

Logic Output Function setting value	Relay state	operate
0	OFF	Output frequency is equal to or less than the lower limit frequency setting f009
	ON	Output frequency is greater than the lower limit frequency setting f009
2	OFF	Output frequency is less than upper limit frequency setting f008
	ON	Output frequency equals upper limit frequency setting f008
4	OFF	Output frequency is less than f337 setting
	ON	Output frequency is greater than or equal to f337 setting
6	OFF	Output frequency is greater than (set frequency + f339) or

Logic Output Function setting value	Relay state	operate
		less than (set frequency - f339)
	ON	(Set frequency - f339) < Output frequency < (Set frequency + f339)
8	OFF	The output frequency is greater than (f338 + f339) or less than (f338 - f339)
	ON	(f338 - f339) < Output frequency < (f338 + f339)
10	OFF	Output frequency is equal to or lower than f338 - f339
	ON	Output frequency is equal to or higher than f338 + f339
12	OFF	The speed reference provided by the source determined by f003 or f005 ≠ AI1 signal
	ON	Speed reference provided by source determined by f003 or f005 = AI1 signal
14	OFF	The speed reference provided by the source determined by f003 or f005 ≠ AI2 signal
	ON	Speed reference provided by source determined by f003 or f005 = AI2 signal
16	OFF	AI1 value is equal to or lower than f340 - f341
	ON	AI1 value is equal to or higher than f 40 + f 341
18	OFF	AI2 value is equal to or lower than f342 - f343
	ON	AI2 value is equal to or higher than f342 + f343
20	OFF	AI2 is not the speed reference source
	ON	AI2 is the speed reference source
22	OFF	The inverter has not yet supplied power to the motor
	ON	The inverter is supplying power to the motor (acceleration, deceleration, constant speed or DC braking)
24	OFF	The drive is not ready for operation
	ON	The inverter is ready for operation (operation permission is valid and the operation command is valid)
26	OFF	Motor running forward
	ON	Motor reverse running
28	OFF	The drive is in remote mode
	ON	The drive is in local mode
30	OFF	No inverter failure
	ON	The drive is faulty (no fault output during automatic fault reset attempt)
32	OFF	The motor torque has been at the f412 level for longer than the f414 setting value.
	ON	The motor torque remains at the f412 level for a period of time that does not exceed the f414 setting value.
34	OFF	Motor current is higher than f408 + f409
	ON	The motor current is lower than f408 and lasts longer than f410.
36	OFF	No not automatically reset fault has occurred
	ON	Not Automatically reset fault occurs

Logic Output Function setting value	Relay state	operate
38	OFF	No automatically reset has occurred
	ON	Automatically resettable fault occurs
40	OFF	The inverter has no fault
	ON	The inverter is faulty (fault output during automatic fault reset attempt)
42	OFF	No alarm occurred
	ON	Alarm occurs
44	OFF	Motor thermal state < 50% of motor overload fault level
	ON	The motor thermal condition reaches 50% of the motor overload fault level
46	OFF	Braking resistor thermal state < 50% of the braking resistor overload fault level
	ON	The thermal state of the brake resistor reaches 50% of the brake resistor overload fault level
48	OFF	Estimated motor torque is lower than (f412 * 70 % - f413)
	ON	The estimated motor torque reaches f 412 *70%
50	OFF	Running time < f428 time setting
	ON	Running time ≥ f428 time setting
52	OFF	The device did not issue a maintenance alarm warning
	ON	The device issues a maintenance alarm warning (fan, circuit board, capacitor need to be replaced)
54	OFF	The motor temperature indicated by the PTC thermal probe is less than 60% of the trip level
	ON	The motor temperature indicated by the PTC thermal probe reaches 60% of the trip level
56	OFF	Undervoltage alarm is invalid
	ON	Undervoltage alarm is effective
58	OFF	Brake released
	ON	Brake closed
60	OFF	The motor is not accelerating.
	ON	During motor acceleration
62	OFF	The motor is in the non-deceleration process
	ON	During motor deceleration
64	OFF	The motor is neither accelerating nor decelerating.
	ON	The motor is accelerating or decelerating
66	OFF	The radiator temperature does not reach the alarm threshold
	ON	The radiator temperature reaches the alarm threshold
68	OFF	PLC cycle in progress
	ON	After a PLC cycle is completed, an ON pulse is output
70	OFF	Running at a certain PLC speed

Logic Output Function setting value	Relay state	operate
	ON	After a PLC speed segment is completed, an ON pulse is output
72	OFF	Inverter not ready
	ON	The inverter is ready to receive the running signal
74	OFF	Communication address 0 x FA15 bit 0 OFF
	O N	Communication address 0 x FA15 bit 0 ON
76~ 79	OFF	Not used
	ON	Not used
80	OFF	LI1 input is invalid
	ON	LI1 input is valid
82	OFF	LI 2 input is invalid
	ON	LI 2 input valid
84	OFF	PID feedback pressure is equal to or lower than f627 - f628
	ON	PID feedback pressure is equal to or higher than f627 + f628
86	OFF	PID feedback pressure is equal to or lower than f918
	ON	PID feedback pressure is equal to or higher than f918 + f628
88	OFF	Communication address 0 x FA15 bit1 OFF
	ON	Communication address 0 x FA15 bit1 ON
90 ~253	OFF ON	Not used
	ON	Not used
254	OFF	Relay always outputs OFF
25 5	ON	Relay output is always ON

Note 1: When the logic output function is set to an odd number, the corresponding logic function is inverted. For example, when f315 = 3, it corresponds to the relay output inversion function when f315 = 2.

Note 2: The logic output function includes transistor logic output f311, f312 and relay output f315, f359, f360.

NO.	name	Setting range	Factory settings
f316	Transistor logic output relationship	0~1	0

0: AND relationship, f311 and f312 must be satisfied at the same time, the logic transistor logic output is powered on.

1: OR relationship, when either f311 or f312 is satisfied, the logic transistor logic output is powered on.

NO.	name	Setting range	Factory settings
f317	Transistor Logic Output Delay	0~60.0 s	0.0

f317 corresponds to the time from the inverter prompt signal to the transistor delayed conduction.

NO.	name	Setting range	Factory settings
f318	Relay 1 closing delay time	0.0 ~ 60.0s	0.0

f318 specifies the closing delay time of the normally open contact of relay 1.

NO.	name	Setting range	Factory settings
f319	UP speed logic input response time	0.0~10.0s	0.1
f320	UP speed frequency step	0.0 Hz ~ f007	0.1
f321	DOWN speed logic input response time	0.0~10.0s	0.1
f322	DOWN speed frequency step	0.0 Hz ~ f007	0.1

In remote mode, when parameter f003 or f005 is set to 5, the UP/DOWN logic input terminal will be selected to control the speed command (mechanical potentiometer). Two logic inputs are required, one for increasing the speed command (logic input function 23) and the other for decreasing the speed command (logic input function 24). Logic input function 25 will clear the speed reference accumulated by the UP/DOWN speed logic input.

f319: Sets the maximum activation time of the logic input defined as (UP) speed, limiting the speed increment to only 1 step as specified by parameter f320. Keeping this logic input active for longer than the time set by parameter f319 allows the speed command to be increased in multiple steps.

f320: The frequency increase amount of each effective (UP) speed command will be set.

f321: will set the maximum activation time of the logic input defined as (DOWN) speed, limiting the speed reduction to only 1 step as specified by parameter f322. Keeping this logic input active for longer than the time set by parameter f321 allows the speed command to be reduced in multiple steps.

f322: The frequency reduction amount of each effective (DOWN) speed command will be set.

NO.	name	Setting range	Factory settings
f323	Initial UP/DOWN speed frequency	0.0 Hz ~ f007	0.0

f323 sets the UP/DOWN speed command applied to the inverter when it is first powered on, in Hz. The factory default setting is that the inverter output frequency starts from 0Hz at each start.

NO.	name	Setting range	Factory settings
f324	Initial UP/DOWN speed frequency reset	0~6	0

f324	f323 whether to save after power failure	f323 reset selection

0	Not saved, f323 will not change after each power-off and power-on.	When f323 is reset by logic input function 25 (special reset) or 75 (stop reset), f323 returns to f009.
1	Save, when power is off f323 is set to the last received frequency reference.	
2	Not saved, f323 will not change after each power-off and power-on.	When f323 is reset by logic input function 25 (special reset) or 75 (stop reset), f323 returns to 0.0Hz.
3	Save, when power is off f323 is set to the last received frequency reference.	
4	Not saved, f323 will not change after each power-off and power-on.	When f323 is reset by logic input function 25 (special reset) or 75 (stop reset), f323 returns to its initial value.
5	Save, when power is off f323 is set to the last received frequency reference.	
6	Record the initial value of f323, see the remarks for details.	

Note: When resetting via logic input terminal function 25 or 75, if f323 needs to be restored to its initial value (i.e. f324 = 4 or 5), f324 = 6 must be set after setting f323, or f323 must be set based on f324 = 6 to record the initial value of f323, otherwise the frequency after resetting may be incorrect.

[Example] When the frequency is given by single-channel UP/DOWN, the frequency is not saved at each shutdown and power failure, and is restored to the original given frequency of f323.

◇ The settings are: f003 =5, f021=0, f023=25, f303=23, f304=24, f310=75, f323=25 (f323 must be set based on f324 =6, and f323 must = f023), f324 =4.

NO.	name	Setting range	Factory settings
f325	AI1 speed setting level 1	0~100%	0
f326	AI1 output frequency level 1	0.0~400.0 Hz	0.0
f327	AI1 speed setting level 2	0~100%	100
f328	AI1 output frequency level 2	0.0~400.0 Hz	50.0
f329	AI2 speed setting level 1	0~100%	0
f 330	AI2 output frequency level 1	0.0~400.0 Hz	0.0
f331	AI2 speed setting level 2	0~100%	100
f332	AI2 output frequency level 2	0.0~400.0 Hz	50.0

The relationship between the analog input and the frequency setting is adjusted through parameters f325~f 332, see Figure 6.11.

Note 1: Do not set the same frequency value for speed setting level 1 and speed setting level 2, otherwise alarm a-05 will be prompted.

Note 2: When using a 4-20mA signal, the value of Speed Reference Level 1 should be set to 20%.

Note 3: Further adjustments to the offset and slope of the analog input signal can be made using parameters f333 to f336.

Note 4: When f305 is changed to 2, f325 is automatically changed to 20.

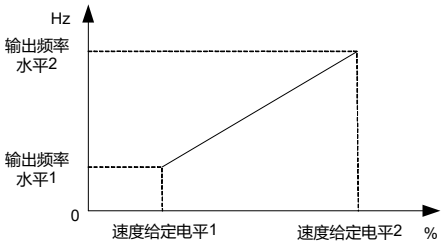


Figure 6.11 Relationship between analog input and frequency setting

NO.	name	Setting range	Factory settings
f333	AI1 analog input bias	0~255	Model settings
f334	AI1 analog input gain	0~255	Model settings
f335	AI2 analog input bias	0~255	Model settings
f336	AI2 analog input gain	0~255	Model settings

Parameters f333 ~ f336 are used to calibrate the relationship between analog input and frequency setting. When adjusting parameters f325 ~ f329 cannot meet the requirements, further calibration can be performed through f333 ~ f336.

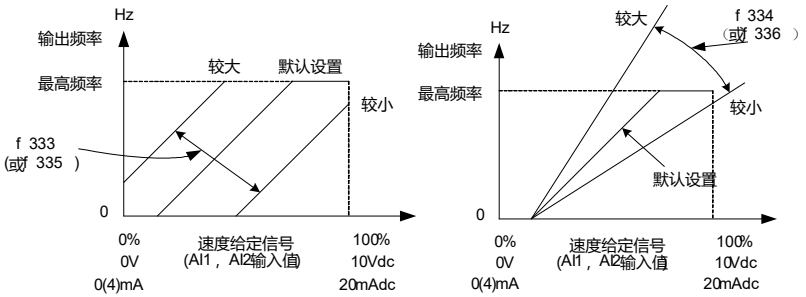


Figure 6.12 Analog input calibration

Note 1: To reduce the signal level required before the inverter output reaches the rated voltage and frequency, the input gain should be increased; otherwise, it should be reduced. However, if the input gain is set too low, the inverter output may never reach the rated voltage and frequency.

Note 2: To reduce the signal level required to start the motor, the input bias should be increased, and vice versa. If the input bias is set too high, the inverter may start the motor when there is no signal at VIA or VIB.

NO.	name	Setting range	Factory settings
f337	Relay output-low speed frequency detection	0.0 Hz ~ f007	0.0

When the inverter output frequency reaches the f337 setting frequency or above, an ON signal is output.

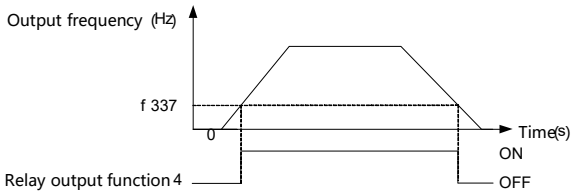


Figure 6.13 Relay output-low speed frequency detection diagram

NO.	name	Setting range	Factory settings
f338	Relay output-frequency detection 2	0.0 Hz ~ f007	0.0
f339	Relay output - frequency detection 2 bandwidth	0.0 Hz ~ f007	2.5

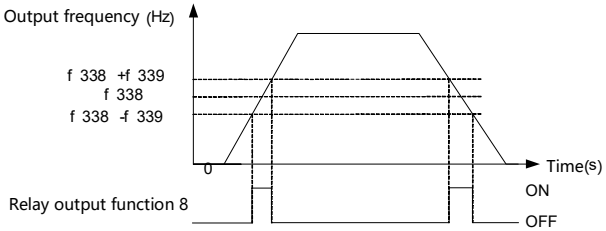


Figure 6.14 Relay output-frequency detection 2 schematic diagram

NO.	name	Setting range	Factory settings
f340	Relay output-AI1 input detection	0~100 %	0
f341	Relay output-AI1 input detection bandwidth	0~20 %	3

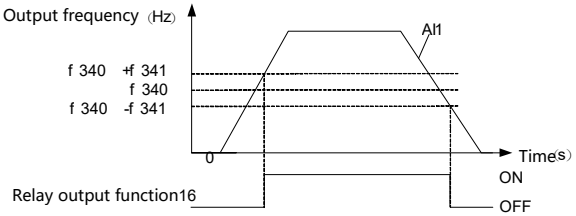


Figure 6.15 Relay output - AI1 input detection diagram

NO.	name	Setting range	Factory settings
f342	Relay output-AI2 input detection	0~100 %	0
f343	Relay output-AI2 input detection bandwidth	0~20 %	3

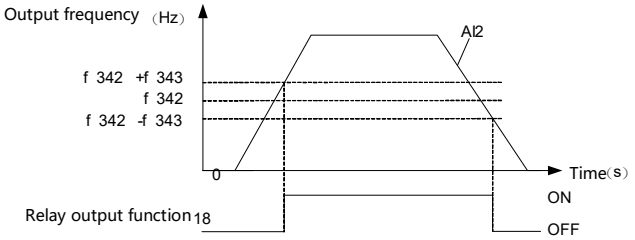


Figure 6. 16 Relay output - AI1 input detection diagram

NO.	name	Setting range	Factory settings
f344	Frequency command detection bandwidth	0.0 Hz ~ f007	2.5

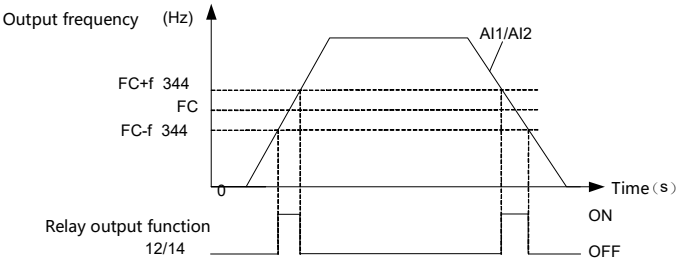


Figure 6.17 Relay output - AI1 input detection diagram

NO.	name	Setting range	Factory settings

f345	Pulse output enable	0~1	0

0: Logic output enabled.

1: Pulse output enabled.

NO.	name	Setting range	Factory settings
f346	Pulse output function selection	0~14	0

Table 6.4 Pulse output function selection

f346 setting value	Function	Maximum signal
0	Inverter output frequency (Output after ramp calculation)	Maximum output frequency f007
1	Output Current	185% of the rated current of the inverter
2	Reference frequency (before PID, inverter given stator frequency, ramp end point)	Maximum output frequency f007
3	Motor frequency (estimated motor output stator frequency after PID)	Maximum output frequency f007
4	DC bus voltage	150% of the rated voltage of the inverter
5	Output voltage	150% of the rated voltage of the inverter
6	Input Power	185% of the rated power of the inverter
7	Output Power	185% of the rated power of the inverter
8	AI1 given	Maximum input value (1023)
9	AI2 given	Maximum input value (1023)
10	Torque	250% of the motor rated torque
11	Motor torque current	Current at 250% of motor rated torque
12	Motor overload status	100%
13	Inverter overload status	100%
14	Braking resistor overload status	100%

NO.	name	Setting range	Factory settings
f347	Output 100% corresponding pulse number (within 1 second)	500~1600	800

f348	AO1 output function selection	0~18	0

AO1 is a multi-function programmable analog output, which is configured by f348. The inverter status value (such as frequency, voltage, current, etc.) output by the AO1 analog output signal is determined by setting the value of f 348 .

Table 6.5 Analog output function selection

f348 setting value	Function	Maximum signal
0	Inverter output frequency (output after ramp operation)	Maximum output frequency f00 7
1	Output Current	185% of the rated current of the inverter
2	Reference frequency (Before PID, inverter sets stator frequency, ramp end point)	Maximum output frequency f00 7
3	Motor frequency (After PID, estimated motor output stator frequency)	Maximum output frequency f00 7
4	DC bus voltage	150% of the rated voltage of the inverter
5	Output motor voltage	150% of the rated voltage of the inverter
6	Input Power	185% of the rated power of the inverter
7	Output Power	185% of the rated power of the inverter
8	AI1 input value	Maximum input value (1023)
9	AI2 input value	Maximum input value (1023)
10	Estimated motor torque	250% of the motor rated torque
11	Motor torque current	Current at 250% of motor rated torque
12	Motor thermal status	100%
13	Drive thermal status	100%
14	Braking resistor overload status	100%
15	Serial communication data	——
16	f374 = 0%~185% corresponds to the AO range	___
17	f374 = 0%~185% corresponds to the AO range	___

18	f374 = 0%~185% corresponds to the AO range	____	
f349	Analog output voltage scaling (AO1)	1~1280	By model

Note: This parameter cannot be reset by f120 = 1.

AO1 signal output is accomplished by adjusting f349 to provide the full-scale deflection of the analog meter.

NO.	name	Setting range	Factory settings
f350	AO1 analog output slope	0~1	1
f351	AO1 analog output bias	0~100%	0

The slope and offset of the AO1 analog output signal can be adjusted using parameters f349, f350 and f351.

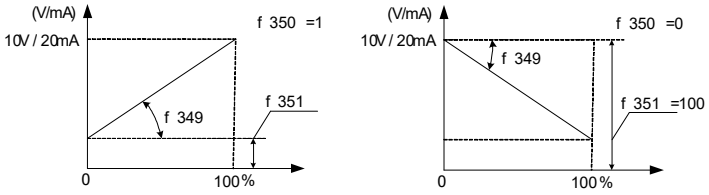


Figure 6.18 Schematic diagram of setting parameters f349, f350 and f351

NO.	name	Setting range	Factory settings
f352	The lowest frequency when AO1 output is 0V	0 Hz ~ f007	0.0
f353	The maximum frequency when AO1 output is 10V	0 Hz ~ f007	0.0

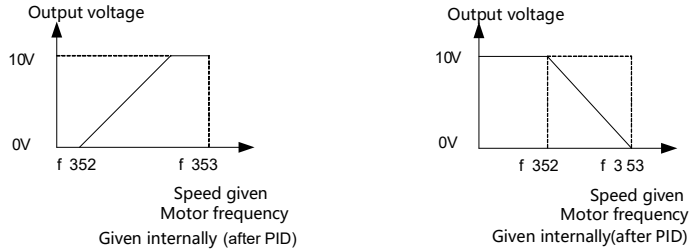


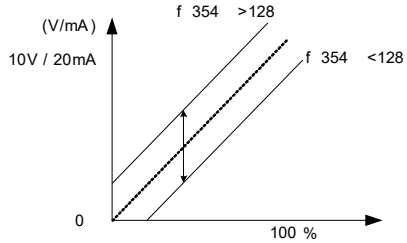
Figure 6.19 Schematic diagram of the f 352 and f 353 settings

Note: When the analog output is frequency, if f352 and f353 are not 0 at the same time, parameters f350 and f351 will not work.

NO.	name	Setting range	Factory settings
f354	Analog output voltage offset calibration (AO1)	0~255	By model

For detailed description of f354, see parameter f348.

Note: This parameter cannot be reset by f120 = 1.



Relationship between analog output curve and f354

NO.	name	Setting range	Factory settings
f355	LI5 logic input function	0~77	0
f356	LI6 logic input function	0~77	0
f357	LI7 logic input function	0~77	0
f358	LI8 logic input function	0~77	0

For the setting of f355 ~ f358, see f301 ~ f304 .

NO.	name	Setting range	Factory settings
f359	Relay 2 main function	0~255	22
f360	Relay 2 auxiliary function	0~255	255
f361	Relay 2 function logic relationship	0~1	0
f362	Relay 2 closing delay time	0.0 ~ 60.0s	0.0

See Transistor Logic Output Function Settings.

NO.	name	Setting range	Factory settings
f363	Logic input terminal open valid selection	00~FF	00

This parameter is displayed in 8-bit hexadecimal (0x00~0xFF), corresponding to the setting bits of LI1~LI8 from right to left. The setting options for each bit are as follows:

0: Closure is valid, the function is activated when the terminal is closed.

1: Disconnection is valid, the function is activated when the terminal is disconnected.

NO.	name	Setting range	Factory settings
f364	Logic input terminal filter time constant	0~ 200	0

Filter time constant unit 1 is equivalent to 2ms

NO.	name	Setting range	Factory settings
f365	Relay 1 auxiliary function	0~255	255

See Table 5.3 "Relay logic output functions".

NO.	name	Setting range	Factory settings
f366	Relay 1 main and auxiliary function output relationship	0~1	0

0: AND relationship, f315 and f365 must be satisfied at the same time, relay 1 will act.

1: OR relationship, when either f315 or f365 is satisfied, relay 1 will operate.

NO.	name	Setting range	Factory settings
f367	Terminal operation function detection at power-on	0~1	0

0: When powered on, the terminal operation command is invalid. The inverter is in the stop state after powering on, regardless of whether the operation command terminal is valid when powered on. If you want to make the inverter run, you must re-enable this terminal. (Invalid first, then valid).

1: When powered on, the terminal operation command is valid. The inverter's operation status after power-on is consistent with the operation command terminal status. If it is valid, it will run, and if it is invalid, it will stop.

Note: When the operation command channel is controlled by terminals, the system will automatically detect the operation terminal status during power-on.

NO.	name	Setting range	Factory settings
f368	AO2 analog output signal type	0~1	1

0: Current signal output.

1: Voltage signal output.

NO.	name	Setting range	Factory settings
f369	AO2 analog output function selection	0~16	0

NO.	name	Setting range	Factory settings
f370	Analog output current scaling (AO2)	0 ~1280	By model

Note: This parameter cannot be reset by f120 = 1.

NO.	name	Setting range	Factory settings
f371	AO2 analog output slope	0~1	1
f372	AO2 analog output bias	0~100%	0

f369, f371 and f372, please refer to the corresponding parameters f348, f350 and f351 of AO1.

For the detailed description of f370, see parameter f348.

Note: Parameter f370 cannot be reset by f120 = 1.

NO.	name	Setting range	Factory settings
f373	Analog output current offset calibration (AO2)	0~255	By model
f374	Percentage of AO monitoring value	0%~250%	0%

f373 and f374, see parameter f348.

Note: For the settings of f369 - f372, refer to the corresponding parameters f348, f349, f350, f351 of AO1.

1) AO1-0~10V calibration is as follows:

   f307=1, f348=18/17/16 When the inverter is stopped, set f374 =1%, adjust the value of f354, and make the actual output voltage 0.1V. Then set f374 =100%/150%/185%, and adjust the value of f349, and make the actual output voltage 10V.

   After calibration is completed, f348 changes back to the internal function variables that need to be monitored.

2) AO1-4~20mA calibration is as follows:

   f307=0, f351=20%, f348 =18/17/16 When the inverter is stopped, set f374 =0%, adjust the value of f432, and make the actual output current 4mA. Then set f374 =100%/150%/185%, and adjust the value of f431, and make the actual output current 20mA.

   After calibration is completed, f348 changes back to the internal function variables that need to be monitored.

3) AO2-0 ~ 10V calibration is as follows:

   f368 =1, f369 =18/17/16 When the inverter is stopped, set f374 =1%, adjust the value of f434, and make the actual output voltage 0.1V. Then set f374 =100%/150%/185%, and adjust the value of f433, and make the actual output voltage 10V.

   After calibration is completed, f369 is modified back to the internal functional variables that need to be monitored.

4) AO2-4~20mA calibration is as follows:

   f368 =0, f372 =20%, f369 =18/17/16 When the inverter is stopped, set f374 =0%, adjust the value of f373, and make the actual output current 4mA. Then set f374 =100%/150%/185%, and adjust the value of f370, and make the actual output current 20mA.

   After calibration is completed, f369 is modified back to the internal functional variables that need to be monitored.

Note: Parameters f349 ~ f373 cannot be reset by f120 = 1.

NO.	name	Setting range	Factory settings
f375	Relay 1 normally open contact delay disconnection time	0.0 ~ 60.0s	0.0
f376	Relay 2 normally open contact delay disconnection time	0.0 ~ 60.0s	0.0

f375 and f376 specify the disconnection delay time of the normally open contacts of relay 1 and relay 2.

NO.	name	Setting range	Factory settings
f377	LI6 /P logic input terminal multiplexing function	0~ 1	0

0: Normal logic input function

1: High-speed pulse input function

NO.	name	Setting range	Factory settings
f378	Filter time constant for high-speed pulse input	0.00s~10.00s	0.10
f379	Minimum input frequency of high-speed pulse	0.00kHz~ f380	0.00
f380	Maximum input frequency of high-speed pulse	f379 ~ 2 0.00kHz	20.00

f379 and f380 are used to set the relationship between the high-speed pulse input frequency and the corresponding setting;

f379 corresponds to the lower limit frequency f009, and f380 corresponds to the maximum output frequency f007.

NO.	Name	Setting range	Factory settings
f381	AI2 input signal type	0~2	1

0: 0 ~ 5V voltage input.

1: 0~10V voltage input.

2: Current input.

6.6 Fault protection parameter group

NO.	name	Setting range	Factory settings
f400	Automatic fault reset times	0~10	0

If f400 > 0 and the fault that occurred is a resettable fault, the inverter will attempt to automatically clear the fault so that it can be restarted. Automatic fault reset attempts will continue until the number of attempts reaches the value set in f400. If the fault condition

cannot be cleared after the number of attempts reaches the value set in f400, the inverter will stop and a manual fault reset will be required.

The fault types that can be automatically reset include overcurrent type fault (e-01 , e- 04), overvoltage type fault (e- 11) , overheating type fault (e- 24), and overload type fault (e- 21, e- 22).

A successful automatic fault reset means that the inverter accelerates the motor to the given speed and no more faults occur.

If no other faults occur within an unspecified period of time after a successful automatic fault reset attempt, the reset attempt counter will be cleared, allowing a complete set of reset attempts to be made on future faults. During the automatic fault reset process, the inverter keypad panel will alternately display a-08 and the power-on default display value (see F610) .

Conditions that allow automatic fault reset:

- If the cause of the fault still exists, no automatic fault reset attempt will be made.
- When fault e- 21 or e- 22 occurs, the inverter will calculate the cooling time required to clear the fault.

The first fault reset attempt will be made after a 1 second delay after the fault occurs. The interval between each subsequent fault reset attempt will increase by one second, as shown in the following table.

Number of attempts	1	2	3	4	5	6	7	8	9	10
Try waiting time	1s	2s	3s	4s	5s	6s	7s	8s	9s	10s

Note 1: Before completing all fault reset attempts,

(1) Output relays set to function 30 (or 31) will not indicate a fault.

(2) Output relay function 38 (or 39) can be used to indicate the occurrence of a fault that can be automatically reset.

(3) Output relay function 40 (or 41) can be used to indicate any type of inverter fault, even during an automatic fault reset attempt.

Note 2: If other types of faults (not the above automatically resettable fault types) occur during the automatic fault reset process, the inverter will stop and manual fault reset is required.

NO.	name	Setting range	Factory settings
f 401	Motor overload characteristics	0~7	0

Table 6.6 Description of f401 motor overload protection

f401	Motor Type	Overload protection	Overload speed reduction
0	Ordinary motor	Enable	Disable
1		Enable	Enable
2	Ordinary motor	Disable	Disable
3		Disable	Enable

4	Forced air cooling motor	Enable	Disable
5		Enable	Enable
6		Disable	Disable
7		Disable	Enable

Note: Overload speed reduction is an optimized function for equipment with variable torque characteristics such as fans, pumps and blowers, where the load current decreases as the operating speed decreases. Do not use the overload stall function for loads with constant torque characteristics (such as conveyors, where the load current is fixed and independent of speed).

NO.	name	Setting range	Factory settings
f402	Motor overload time	10~2400s	300

Parameter f402 determines how long the inverter will trip after a motor overload of 150% .

NO.	name	Setting range	Factory settings
f403	External fault stop mode	0~2	0

0: Free stop 1: Ramp stop 2: DC injection braking

Note: The setting of parameter f403 will determine how the motor stops when logic input function 11 or 27 is activated.

NO.	name	Setting range	Factory settings
f404	External fault DC braking time	0~20.0 s	1.0

If parameter f403 = 2, parameter f404 determines how long the DC current injection into the motor will last when the external fault logic input is active.

NO.	name	Setting range	Factory settings
f 405	Input phase loss fault detection mode	0~1	0

0: Disabled. Input phase failure monitoring will be disabled and loss of one input phase will not cause the drive to fault.

1: Enabled. Loss of one input phase will cause an e-41 fault.

Note: It is recommended to enable input phase loss fault detection, otherwise it may cause machine damage or personal injury.

NO.	name	Setting range	Factory settings
f406	Output phase loss fault detection mode	0~5	0

If output phase loss fault detection is enabled and an output phase loss fault persists for more than 1 second, the drive will fault and display an e- 42 fault code.

0: Disable. Output phase failure detection will be disabled.

1: When the inverter is powered on and started for the first time, it detects output phase loss.

2: Each time the inverter is started after power-on, it detects output phase loss.

3: During the operation of the inverter, the output phase loss is detected.

4: When the inverter is started and running, the output phase loss is continuously detected.

5: Load side circuit breaker mode. This mode is for applications with load side circuit breakers. If a full-phase fault is detected (an output contactor or load side circuit breaker is disconnected), the inverter will not trip and will automatically restart the motor after the inverter detects that a three-phase connection has been reestablished (the output contactor or load side circuit breaker is closed).

NO.	name	Setting range	Factory settings
f407	Underload fault/alarm selection	0~1	0

0: Alarm, relay output function 34 can be used to indicate an underload condition without inverter fault.

1: Fault, if the load level drops below the value set at f408 for a period longer than the setting at f410, the inverter will fault and display fault code e-06.

NO.	name	Setting range	Factory settings
f408	Underload detection level	0~100%	0.00
f409	Underload detection level bandwidth	1~20%	10
f410	Underload detection time	0~255s	0

f409 specifies how much the motor output torque must be increased to cancel the over-torque alarm or over-torque fault. The inverter's response curve to underload conditions is set by parameters f407 ~ f410, see the figure below.

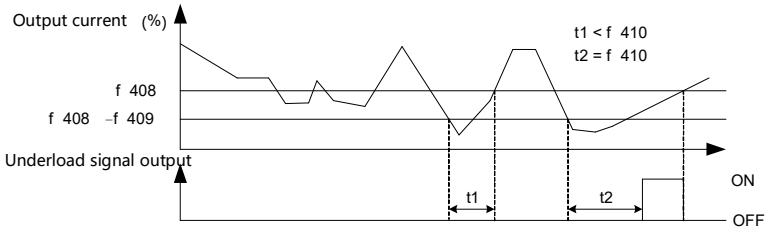


Figure 6.21 Schematic diagram of underload signal output

Note: When f408 is set to 100%, it corresponds to the rated current of the inverter (see the inverter nameplate); when f 408 is set to 20%, it corresponds to 20% of the rated current of the inverter.

NO.	name	Setting range	Factory settings

f411	Over torque/over current indication selection	0~5	0

0: Over torque alarm: (70%)

- ◇ When the torque current reaches 70% of f412 , the relay with function setting 48 will act immediately ;
- ◇ When the torque current reaches 100 % of f412 and the duration reaches f414 , the relay with function setting 32 will operate;
- ◇ When the above relay (function 48 or 32) is activated , the panel does not operate and the inverter does not stop.

1: Over torque fault

- ◇ When the torque current reaches 70% of f412 , the relay with function setting 48 will act immediately, but the panel will not act and the inverter will not stop;
- ◇ When the torque current reaches 100 % of f412 and the duration reaches f414 , the relay with function setting 32 will be activated and the inverter will report fault E-07;

2: Over torque alarm: (100%)

- ◇ When the torque current reaches 100 % of f412 , the relay with function setting 48 will act immediately ;
- ◇ When the torque current reaches 100 % of f412 and the duration reaches f414 , the relay with function setting 32 will operate;
- ◇ When the above relay (function 48 or 32) is activated , the panel does not operate and the inverter does not stop.

3: Overcurrent alarm: (70%)

- ◇ When the output current reaches 70 % of f412 , the relay with function setting 48 will immediately operate ;
- ◇ When the output current reaches 100 % of f412 and the duration reaches f414 , the relay with function setting 32 will operate;
- ◇ When the above relay (function 48 or 32) is activated , the panel does not operate and the inverter does not stop.

4: Overcurrent fault

- ◇ When the output current reaches 70 % of f412 , the relay with function setting 48 will act immediately , but the panel will not act and the inverter will not stop ;
- ◇ When the output current reaches 100 % of f412 and the duration reaches f414 , the relay with function setting 32 will be activated and the inverter will report fault e-07 ;

5: Overcurrent alarm: (100%)

- ◇ When the output current reaches 100% of f412 , the relay with function setting 48 will act immediately ;
- ◇ When the output current reaches 100 % of f412 and the duration reaches f414 , the relay with function setting 32 will operate;
- ◇ When the above relay (function 48 or 32) is activated, the panel does not operate and the inverter does not stop.

Serial number	Action basis		(1) Inverter operating conditions and operation
	Torque current	Output Current	
1	f411 =0	f411 =3	The panel does not operate and the inverter does not stop.

2	f411 =1	f411 =4	When the torque/output current reaches f412 and lasts for f414, the panel reports fault e-07 and the inverter stops.
3	f411 =2	f411 =5	The panel does not operate and the inverter does not stop.

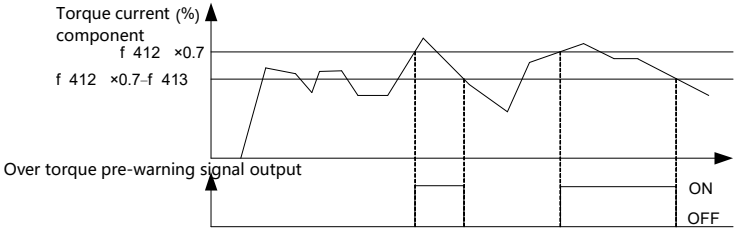
Serial number	Action basis		(2) Relay action conditions	
	Torque current	Output Current	Relay (function 48)	Relay (function 32)
1	f411 =0	f411 =3	When the torque/output current reaches 70% of f412, the relay will operate immediately.	When the torque/output current reaches 100 % of f412 and lasts for f414, the relay will operate.
2	f411 =1	f411 =4		
3	f411 =2	f411 =5	When the torque/output current reaches 100 % of f412, the relay will operate immediately.	

NO.	name	Setting range	Factory settings
f412	Over torque detection level	0~250%	130
f413	Over torque detection level bandwidth	0~100%	10
f414	Over torque detection time	0.0~10.0s	0.5

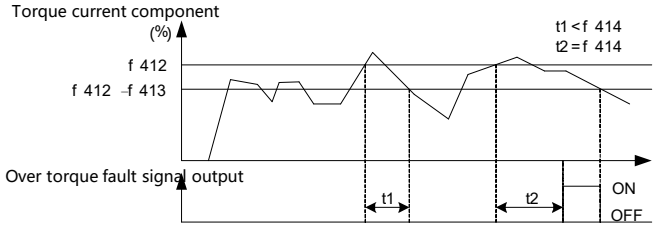
f412 specifies the overtorque level.

f413 specifies how much the motor output torque must be reduced to cancel the overtorque alarm or overtorque fault.

f414 specifies the time that must elapse from the time when overtorque is detected until the inverter reports an overtorque fault.



a) Schematic diagram of over torque alarm output



b) Schematic diagram of over-torque fault output signal

Figure 6.22 Over-torque alarm output and fault signal output

Note 1: The over-torque alarm signal can be output via the relay output function 48.

Note 2: The over-torque fault signal can be output via the relay output function 32.

Note 3: Torque level refers to the torque current level. 100% of the torque level corresponds to the rated current of the inverter.

NO.	name	Setting range	Factory settings
f415	Overvoltage fault protection	0~3	2

0: Enabled. When the inverter detects an impending overvoltage fault, it will take one of the following measures to avoid overvoltage: increase the deceleration time, maintain the motor speed, or increase the motor speed.

1: Disabled, the inverter will not take any measures to avoid DC bus overvoltage fault.

2: Fast deceleration mode, when the inverter detects an impending DC bus overvoltage fault, it will increase the V/ f ratio of the motor.

3: Dynamic fast deceleration mode: Increase V/ f ratio of the motor at the beginning of deceleration of inverter, rather than waiting to detect that the DC bus voltage is close to the fault level.

Note: When the motor speed is reduced, the inverter will absorb regenerative energy from the load and the motor, which often causes a DC bus overvoltage fault. When using fast deceleration mode, this energy will not be fed back to the inverter, but converted into heat energy and dissipated into the motor, so the motor will become more heated.

NO.	name	Setting range	Factory settings
f416	Overvoltage fault operating level	100~150%	130

F416 specifies the DC voltage level at which the F415 setting operation occurs, see figure.

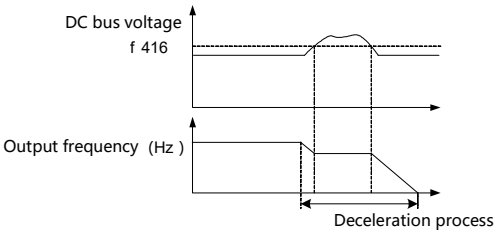


Figure 6.23 Overvoltage fault operating level diagram

NO.	name	Setting range	Factory settings
f 417	Undervoltage Fault Operation Mode	0~2	0

0: Alarm only (detection level below 60%). When the power supply voltage drops below 60% of its rated value, the inverter will stop and display a fault code on the keypad panel, but it will not activate the fault relay. If the power supply voltage rises above 60% of its rated value, the fault code on the keypad panel will be cleared without initiating a fault reset operation, and the inverter will be ready for operation.

1: Fault (detection level less than 60%). When the power supply voltage drops below 60% of its rated value, the inverter will fail and a reset operation is required to clear the fault before restarting.

2: Alarm only (detection level below 50%). Same as f417 = 0, the voltage alarm threshold is 50%.

NO.	name	Setting range	Factory settings
f418	Stops when input power is momentarily lost	0~2	0

0: Disabled, when the inverter loses input power briefly, it will not fault, but a brief reduction in motor voltage and/or current may occur, after which normal operation will resume once normal power is restored.

1: Reserved by the manufacturer.

2: Free stop. When the inverter loses input power temporarily, the inverter will cut off the power to the motor and make it free stop. The keyboard panel will flash a-06. The inverter can only be restarted by triggering a new run command.

NO.	name	Setting range	Factory settings
f419	Forced speed enabled (fire mode)	0~1	0

0: Disable.

1: Enabled.

To enable forced speed mode, set parameter f419 to 1 and define a logic input function 33.

If parameter f419 is set to 1 and the logic input defined as function 33 is activated, the inverter will run at the frequency set by f730. In this case, deactivating the logic input defined as function 33 will not stop the inverter.

The following inverter faults will not stop the inverter: overcurrent fault (e-01), ground short circuit fault (e- 04), overvoltage fault (e- 11), overload fault (e- 21, e- 22, e- 23, e- 24), but will automatically restart.

When the inverter is in local operation mode, it can only be stopped by disconnecting the power supply.

Note 1: The motor operation command is the forward operation command, and the frequency command is the setting value of parameter f730.

Note 2: The following operations will not stop the inverter or motor, disable logic function 33, or press the STOP key, or cause a resettable fault.

NO.	name	Setting range	Factory settings
f420	Output phase short circuit detection mode	0~3	0

0: Every time a run command is given (standard pulse).

1: Only once after power-on (standard pulse).

2: Every time a run command is given (short pulse).

3: Only once after power-on (short pulse).

Note 1: When the inverter is supplying power to a low impedance motor (high motor power), short-duration pulses should be selected.

NO.	name	Setting range	Factory settings
f421	Motor overload memory	0~1	0

0: Clear. If the inverter is powered off and on, the inverter's motor thermal state memory (used for overload calculation) will be cleared.

1: Keep. Even if the inverter is powered off, the inverter's motor thermal state memory will still be kept. If the inverter has a motor overload fault e- 22, the motor can only be restarted after a cooling time (calculated by the inverter).

NO.	name	Setting range	Factory settings
f 422	AI1 analog signal lost	0~100%	0

0: Disable. At this time, the inverter will not monitor the signal status on the analog input terminal AI1.

1 ~ 100: Fault detection level. If the signal on AI1 drops below the selected fault detection level and the low signal level lasts for 300ms or longer, the inverter will fault and the keypad panel will display fault code e-38.

NO.	Name	Setting range	Factory settings
f423	Inverter measures when 4-20mA signal is lost	0~4	0

0: No measures.

1: Free parking.

2: Switching to fallback speed f424 lasts as long as the fault exists, without invalidating the run command.

3: Maintain the speed of the inverter when the fault occurs, and the duration is as long as the fault exists, and the running command does not become invalid.

4: Parking on a slope.

NO.	name	Setting range	Factory settings
f424	Falling speed	0.0 Hz ~ f004	0.0

See f423 = 2.

NO.	name	Setting range	Factory settings
f425	PTC motor thermal protection enabled	0~2	0

0: Disable

1: Enabled (Fault Mode). If the PTC probe triggers a signal indicating a problem, the drive will go into fault state and display the e-25 code.

2: Enabled (alarm mode). If the PTC probe triggers a signal indicating a problem, the inverter will trigger a fault signal and continue to run.

Setting parameter f425 to 1 or 2 converts control terminal AI2 into a PTC motor thermal probe input. See the figure below for wiring details.

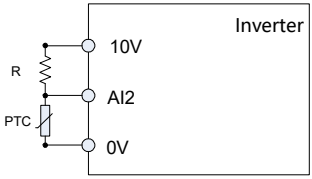


Figure 6.24 PTC wiring example

Note: The PTC resistor must be connected from the AI2 port. A resistor matching the PTC must be connected between 10V and AI2.

NO.	name	Setting range	Factory settings
f 426	PTC critical resistance value	100~9999Ω	3000

f 426 Input the PTC critical resistance value.

NO.	name	Setting range	Factory settings
f 428	Run time alarm setting	0.0~999.9	610.0

If the inverter's cumulative running time exceeds the running time specified by f428, an alarm signal can be output (see relay output of function 50).

Note: 0.1 = 10h.

NO.	name	Setting range	Factory

			settings
f 429	Inverter fault memory	0~1	0

0: Clear. When a fault occurs and the inverter is powered off and on,

If the cause of the fault has been cleared, the drive will reset and can be started.

Information about the fault just cleared is transferred to the fault history.

If the cause of the fault has not been eliminated, the fault will be displayed again and the operating information related to the fault will be transferred to the fault history.

4th to last fault will be cleared from the fault history.

1: Keep. When a fault occurs and the inverter is powered off and on,

If the cause of the fault has been cleared, the drive will reset and can be started. Information about the fault just cleared will be transferred to the fault history.

If the cause of the fault has not been cleared, the original fault code and all its operating data will be available for query as the current fault in monitoring mode.

4th to last fault will be retained in the fault history.

Automatic fault reset will be disabled.

NO.	name	Setting range	Factory settings
f 430	The radiator temperature reaches the alarm threshold	0~100 ℃	60

When the radiator temperature reaches the set value of f430, the inverter can output an alarm signal through the logic output or relay, see logic output function 66.

NO.	name	Setting range	Factory settings
f 431	Analog output current scaling (AO1)	0~1280	By model
f 432	Analog output current offset calibration (AO1)	0~255	By model
f 433	Analog output voltage scaling (AO2)	0~1280	By model
f 434	Analog output voltage offset calibration (AO2)	0~255	By model

For detailed description of f431 ~ f433, see parameter f348 .

Note: Parameters f431 ~ f433 cannot be reset by f120 = 1.

NO.	name	Setting range	Factory settings
f 435	Runtime2 (read only)	0~65535	——

Displays the current running time, not the accumulated running time. Running time 2 is automatically cleared after stopping. The default unit is minutes. You can select minutes or seconds through parameter F752.

6.7 Motor start and stop parameter group

NO.	name	Setting range	Factory settings
f 500	Flying start (speed tracking restart)	0~4	0

0: Disable.

1: After a brief power outage.

2: After the runtime permission is restored.

3: After a brief power outage or after the operating permission has been restored.

4: At every startup.

5 -7: Manufacturer reserved

8: DC braking first, then starting. The DC braking current level and braking time are based on f507 and f508.

Note 1: If the flying start function is enabled when the motor is started, the inverter will detect the motor speed and direction of rotation before powering on. This will allow the motor to be smoothly re-energized when it is coasting to a stop without causing high current or torque shocks.

Note 2: If automatic fault reset is enabled (parameter automatic fault reset f400 is not set to 0), the flying start will always be effective when the motor starts after an inverter fault. If the inverter does not supply power to the motor for a long time, or after DC braking, the flying start will not work.

NO.	name	Setting range	Factory settings
f501	Sleep mode delay control	0.0~600.0s	0.1

0: Disable (0.0). Sleep mode will not be entered.

1: Enable (0.1 to 600.0 s). When the inverter output frequency or the frequency command output after PID adjustment is equal to or lower than f009 for the time set by f501, the inverter will stop the motor along the ramp. When the motor is stopped, "a-10 " will flash on the inverter keypad panel. When the inverter speed setting exceeds f009+f906, the inverter will restart and accelerate the motor to the new speed reference.

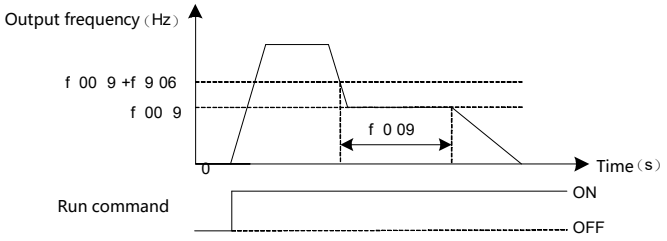


Figure 6.25 Entering sleep mode

Note: If parameter f501 is enabled, the inverter will also be monitored during starting or motor reversing if it is running at a speed of f009 or less.

NO.	name	Setting range	Factory settings
f 502	No bump transition	0~1	1

0: Disable.

1: Enabled.

Table 6.7 f502 Instructions

f502 Setting Value	operation	content
0	Switch from remote control to local control	The inverter stops supplying power to the motor (motor stops)
	Switching from local control to remote control	Immediately operate according to the remote mode operation command and frequency setting.
1	Switch from remote control to local control	Continue to run with the original running command and frequency setting in remote mode.
	Switching from local control to remote control	Immediately operate according to the remote mode operation command and frequency setting.

For example: when f 502 = 1, the inverter runs in remote control mode with a given frequency of 20Hz. At this time, it switches to local mode (set f 601 = 0), and the inverter continues to run in local control mode with 20Hz until the inverter stops and the RUN key is pressed again, and the motor will start running again with the keyboard given command.

NO.	name	Setting range	Factory settings
f 503	Output start frequency	0.5~10.0Hz	0.5

f 503 determines the output frequency of the inverter when it receives a start command. No acceleration time is required to reach the f 503 output starting frequency. f 503 is usually set to the rated slip frequency of the motor. This allows the motor torque to be generated immediately after the start command is given. f 503 should be adjusted if the delay in the motor's response to the start command has a negative impact on the application.

The calculation formula for motor slip frequency is: $f_s = \frac{n_0 - n_N}{n_0} \times f_0$.

n_0——Motor no-load speed (unit: rpm). n_N——Rated speed of the motor (unit: rpm).

f_0——Motor no-load frequency (unit: Hz). f_s——Rated frequency of the motor (unit: Hz).

Example: motor no-load speed = 1500rpm, rated speed = 1430rpm, rated frequency = 50Hz, then the motor slip frequency = 2.3 Hz.

NO.	name	Setting range	Factory settings

f504	Running start frequency	0.0 Hz ~ f007	0.0
f505	Running start frequency hysteresis	0.0 Hz ~ f007	0.0

If the inverter has no faults and has a run enable signal, the inverter will operate and drive the motor when the speed reference level exceeds f504+f505 (see point B in the diagram). It immediately cuts off power to the motor when the output frequency drops below the frequency set by f504 - f505 (see point A in the diagram).

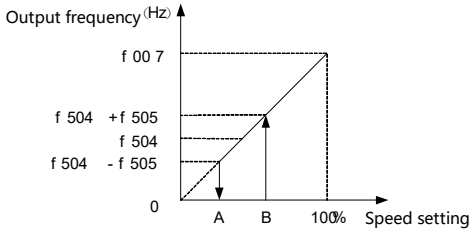


Figure 6.26 Running start frequency

NO.	name	Setting range	Factory settings
f506	DC braking starting frequency	0.0 Hz ~ f007	0.0
f507	DC braking current level	Model settings	Model settings
f508	DC braking time	0.0~20.0 s	1.0

DC braking can force the motor to stop. When DC braking is activated, the keypad panel will display a-07. There are two ways to activate DC braking.

Automatic DC braking: When the frequency drops below f506, DC braking is activated.

Control terminal DC braking command: Once the logic input function 13 is valid, the motor immediately enters the DC braking state.

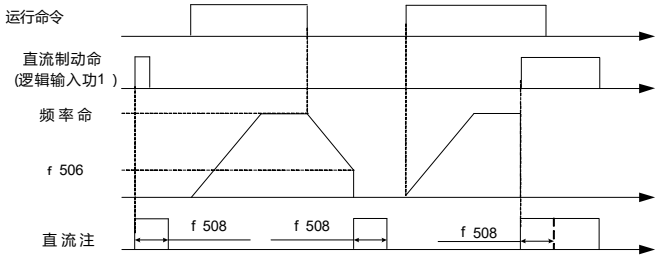


Figure 6.27 DC braking sequence

Note: When the inverter overload alarm or motor overload alarm occurs, the DC braking current will be reduced to 60% to prevent overload fault. The carrier frequency in the DC braking state has nothing to do with the setting value of f012(PWM carrier frequency) and is fixed at 6kHz.

NO.	name	Setting range	Factory

			settings
f510	Acceleration/deceleration curve 1 type	0~2	0

0: Linear, suitable for most occasions.

1: S-curve 1, used in situations where the ramp time needs to be shortened as much as possible while minimizing the impact.

2: S-curve 2, S-curve 2 can be used in high-speed main shaft applications, where the acceleration needs to be reduced when the motor runs above its rated operating frequency (weak magnetic region, reduced output electromagnetic torque).

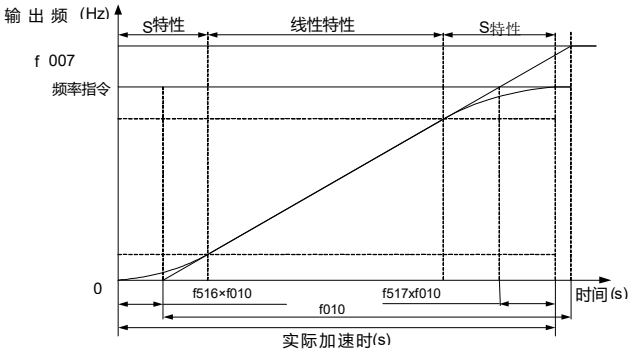


Figure 6.28 S-curve 1

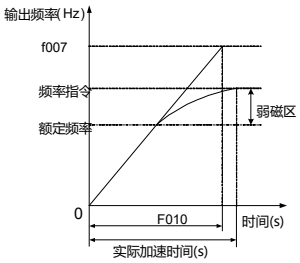


Figure 6.29 S-curve 2

NO.	Name	Setting range	Factory settings
f511	Acceleration/deceleration curve 2 type	0~2	0

0: Linear.

1: S-curve 1.

2: S-curve 2.

NO.	name	Setting range	Factory settings
f512	Acceleration/deceleration curve 3 types	0~2	0

0: Linear.
1: S-curve 1.
2: S-curve 2.

NO.	name	Setting range	Factory settings
f513	Acceleration/deceleration curve 1,2 switching frequency	0.0 Hz ~ f008	0.0
f514	Acceleration/deceleration curve 2,3 switching frequency	0.0 Hz ~ f008	0.0

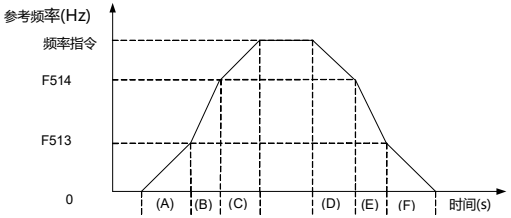


Figure 6.30 Automatic switching of acceleration and deceleration curves

When the setting value of f 513 is not 0, when the inverter output frequency is higher than the setting value of f 513, it is accelerated and decelerated according to f518 and f519.

Note: (A) and (F) acceleration/deceleration curve 1; (B) and (E) acceleration/deceleration curve 2; (C) and (D) acceleration/deceleration curve 3.

NO.	name	Setting range	Factory settings
f515	Keyboard acceleration/deceleration curve selection	1~3	1

1: Acceleration/deceleration curve 1. Acceleration time 1 (f010) and deceleration time 1 (f011) are valid.

2: Acceleration/deceleration curve 2. Acceleration time 2（f518）and deceleration time 2（f519）are effective.

3: Acceleration/deceleration curve 3. Acceleration time 3 (f520) and deceleration time 3 (f521) are effective.

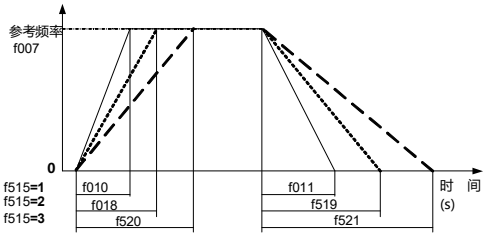


Figure 6.31 Acceleration/deceleration time parameters

NO.	name	Setting range	Factory settings

f516	Acceleration/deceleration S-curve lower limit	0~50 %	10
f517	Acceleration/deceleration S-curve upper limit	0~50 %	10

f516 and f517 are used to adjust the proportion of the upper and lower arcs of the S-curve to the entire acceleration / deceleration time.

NO.	name	Setting range	Factory settings
f518	Acceleration time 2	0.0~3200s	20.0
f519	Deceleration time 2	0.0~3200s	20.0
f520	Acceleration time 3	0.0~3200s	20.0
f521	Deceleration time 3	0.0~3200s	20.0

Switching between acceleration / deceleration time 1, acceleration / deceleration time 2 and acceleration/deceleration time 3 can be achieved in three ways.

- Switching via parameter selection, see f515.
- Switching by frequency threshold, see f513, f514.
- Switched via control terminals, see logic input functions 5, 64 (in remote mode).

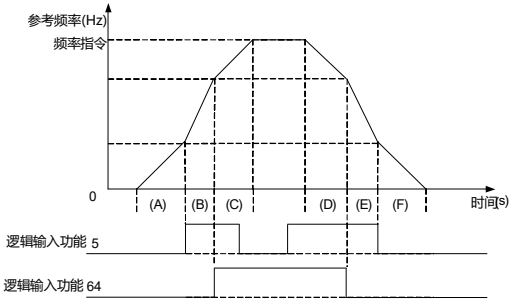


Figure 6.32 Switching the acceleration and deceleration curves through logic input

Table 6.8 Terminal logic input function selection acceleration/deceleration curve

Logical functions 64	Logical function 5	Acceleration/deceleration curve selection
0	0	Acceleration/deceleration curve 1
0	1	Acceleration/deceleration curve 2
1	0	Acceleration/deceleration curve 3
1	1	Acceleration/deceleration curve 3

Table 6.9 Terminal logic input function and switching frequency acting simultaneously to select acceleration/deceleration curve

Reference frequency	Logical function 5	Logical functions 64	Acceleration/deceleration curve selection
Fc =< f513	0	0	ACC1
	1	0	ACC2
	0	1	ACC1
	1	1	ACC2
f513 < Fc =< f514	0	0	ACC2
	1	0	ACC1
	0	1	ACC2
	1	1	ACC1
f514 < Fc	0	0	ACC3
	1	0	ACC3
	0	1	ACC3
	1	1	ACC3

Notes: (A) and (F) acceleration/deceleration curve 1; (B) and (E) acceleration/deceleration curve 2; (C) and (D) acceleration/deceleration curve 3;

NO.	name	Setting range	Factory settings
f522	Motor reverse prohibition	0~2	0

0: Forward and reverse operation are allowed.

1: Reverse running is prohibited.

2: Forward operation is prohibited.

NO.	name	Setting range	Factory settings
f 523	Motor stop type	0~3	2

0: Ramp stop. At this time, if the settings of f506 ~ f508 are valid, the inverter will perform DC braking.

1: Keyboard free stop. When the operation command channel is the keyboard panel, the motor will free stop.

2: 2 -wire control free stop. When the running command is terminal 2-wire control, the motor will free stop.

3: 3 -wire control free stop. When the running command is terminal 3- wire control, the motor will free stop.

Note 1: During free stop, the inverter cannot perform DC braking regardless of whether the DC braking parameters are valid or not.

Note 2: As long as the setting of f523 is not free stop in the corresponding mode, the inverter will decelerate to stop.

NO.	name	Setting range	Factory settings
f 526	Forward and reverse operation priority	0 ~ 4	1

0: When both forward and reverse commands are given, the inverter will run in reverse direction.

1: The inverter stops when both forward and reverse commands are given

2: When the forward and reverse commands are given at the same time, the inverter will run according to the command given first.

3: When the forward and reverse commands are given at the same time, the inverter runs according to the command given later.

4: When the forward and reverse commands are given simultaneously, the inverter runs in the forward direction.

NO.	name	Setting range	Factory settings
f527	Regenerative braking resistor protection enable	0~2	2

0: Disable regenerative braking protection.

1: Enable regenerative braking protection.

2: Enable regenerative braking protection, but disable braking resistor overload protection.

Note 1: To enable the braking resistor protection, f415 must be set to 1 first.

NO.	name	Setting range	Factory settings
f528	Regenerative braking resistor value	1.0~1000.0 ohm	20.0
f529	Regenerative braking resistor capacity	0.01~30.0 kw	0.12

f528 and f529 input the resistance value and power of the regenerative braking resistor respectively.

NO.	name	Setting range	Factory settings
f530	Forward and reverse dead time	0.0 ~ 25.0 s	0.0s

Forward/reverse dead time mode 1 (f623 bit 4 OFF): f530 is only for the case where the direction is switched when the run command is valid . If the run command is cleared first and then the run direction is changed, the setting of f530 is invalid.

Forward/reverse dead time mode 2 (f623 bit 4 ON): f530 is applicable to the case where the direction is switched when the run command is invalid .

Note 1: When the frequency is set via AI1 and f754 = 1 (curve 2):

(1) After the inverter receives the stop command and stops, if the given frequency is 0 Hz, it will start first and then adjust the output frequency . Regardless of whether the given frequency is forward or reverse, the dead time will be ignored and the

inverter will start directly.

(2) The direction of 0 Hz remains consistent, that is, if it was forward rotation before, 0 Hz is forward rotation; if it was reverse rotation before , 0 Hz is reverse rotation. Therefore, during operation, after the given frequency becomes 0 Hz and the motor stops rotating, if the frequency in the same direction before stopping is given again, the dead time is ignored and the motor starts directly. However, when the frequency is given by a potentiometer , the final effect may be affected due to the fluctuation of the given voltage .

Note 2: In addition to the case where AI1 sets the frequency and f754 = 1 (curve 2) , the setting of f530 is also valid. However, there are two points to note:

(1) Currently, f530 has no effect on jogging. For example, when setting f002 = 0 , f301 = 2 , f302 = 19 , f526 = 3 , first run forward through LI1, and then close LI2 at the same time to trigger reverse jogging. At this time , the dead zone setting time of f530 is invalid, and there will be no pause at 0Hz when switching between forward and reverse.

(2) The direction of 0 Hz is no longer consistent in the forward direction.

NO.	name	Setting range	Factory settings
f 531	HMI RS485 communication port modbus protocol selection	0~1	0

0: HMI RS485 communication port is standard modbus protocol

1: HMI RS485 communication port is display Modbus protocol (select this protocol when using Chinese panel or Display)

NO.	name	Setting range	Factory settings
f 532	Input voltage monitoring value gain	0.0%~900.0%	100.0%

f532 parameter is used to calibrate the gain of the input voltage monitor value (u005). The voltage after the gain is f532 * (input voltage monitor value).

NO.	name	Setting range	Factory settings
f 534	Communication address E002H Output current unit selection	0~2	2

0: 1 A (Readable current range: 0 A ~ 65535A)

1: 0.1A (Readable current range: 0.0A ~ 6553.5A)

2: 0.01A (Readable current range: 0.00A ~ 655.35A)

NO.	name	Setting range	Factory settings
f 535	PLC preset speed direction 2	0000H ~ FFFFH	0000H

See f748 parameter description.

NO.	name	Setting range	Factory settings

f 536	PLC speed direction selection	0~1	0

0: PLC speed direction selection is parameter f748 channel.

1: PLC speed direction selection is parameter f535 channel.

6.8 Keyboard panel parameter group

NO.	name	Setting range	Factory settings
f600	Disable the keyboard panel fault reset function	0~1	0

0: Allowed. At this time, the inverter fault can be reset by pressing the STOP key on the keyboard panel.

1: Disabled. At this time, the inverter fault cannot be reset by pressing the STOP key on the keyboard panel.

NO.	name	Setting range	Factory settings
f601	Parameter selection local/remote mode	0~2	1

0: Local control mode, the inverter operation command and frequency command are forced to be given by the keyboard panel.

1: Remote control mode, the inverter operation command source is determined by the set value of f002 , and the frequency command source is determined by the set value of f003 .

2: Keep.

NO.	name	Setting range	Factory settings
f602	Password verification input	0~9999	0

For details, please refer to the f772 and f773 parameter descriptions.

NO.	name	Setting range	Factory settings
f603	Keyboard panel: % or A/V unit	0~1	1

0: % , certain values (such as current and voltage monitoring values) will be displayed as a percentage of the inverter rated value.

1: A (amperes) or V (volts), some parameters (such as current and voltage monitoring values) will be displayed in amperes or volts.

Note 1: The setting value of f603 will only affect parameters and displayed values that can be expressed in amperes or volts, including: motor rated overload current (f106, f110), DC braking current level (f507), motor current limit (f107， f111), undervoltage detection level (f408).

Note 2: The rated motor voltage (f102, f109) is always displayed in volts.

NO.	name	Setting range	Factory settings

f604	Custom frequency display conversion factors	0.00~200.0	0.00

0.00: Frequency display unit is Hz

(0.01~200.0) : Display value = actual frequency × f604 .

Frequency can be converted to running speed (such as line speed, etc.) and displayed on the keyboard panel by setting parameters f604, f606, and f607. For example, if the actual frequency value is 50Hz and f604 = 30.0, the actual display value on the keyboard panel is 1500.

NO.	name	Setting range	Factory settings
f605	Any unit conversion option	0~1	0

0: Frequency can be converted to any unit.

1: Frequency cannot be converted to unit display.

Note: f605 = 1, f604 has no effect.

NO.	name	Setting range	Factory settings
f606	Customize frequency display conversion slope	0~1	1

0 : Negative slope.

1: Positive slope.

NO.	name	Setting range	Factory settings
f607	Custom frequency display conversion bias	0.00Hz ~ f007	0.00

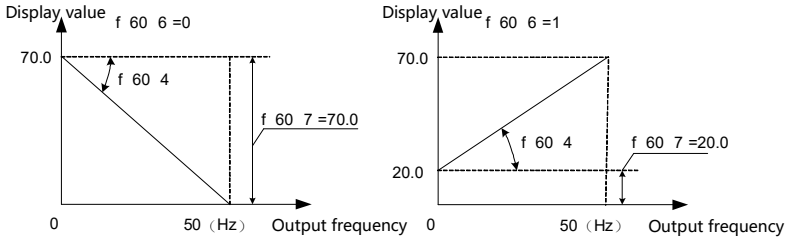


Figure 6.33 Schematic diagram of customized frequency display

When the setting value of f604 is not 0.00 , the relationship between the setting value and the displayed value of the inverter is:

- When f606 = 0 , the frequency displayed on the keyboard panel = f604 x (f607 -actual frequency)
- When f606 = 1 , the frequency displayed on the keyboard panel = f604 x (f607 + actual frequency)

NO.	name	Setting range	Factory settings

f608	Local mode speed reference step change	0.00 Hz ~ f007	0.00

0.00: Disabled. Each time ▲ or ▼ is pressed , the inverter frequency setting increases and decreases in steps of 0.1 Hz .

0.01 ~ f007 : Enabled. In local mode, each time ▲ or ▼ is pressed , the inverter frequency setting will increase or decrease in the step size set by f608 .

Note: When the inverter runs at a frequency such as 10Hz, 20Hz, 30Hz ..., setting f608 = 10.00 will make the operation very convenient.

NO.	name	Setting range	Factory settings
f609	Keyboard panel frequency resolution	0~255	0

0: Disable, the step size is 0.1Hz .

1 ~255 : See the formula below.

If the setting value of parameter f609 is not zero , the frequency display value of the keyboard panel will be determined by the following formula:

The frequency displayed on the keyboard panel = actual frequency of the inverter × f609 ÷f608 .

Note: Parameters f609 and f608 are used together to adjust the incremental step size of the frequency display on the inverter keypad panel. If f604 is enabled, enabling parameters f608 and f609 will not work.

NO.	name	Setting range	Factory settings
f610	Default keyboard panel display value	0~15	0

0: Motor operating frequency (Hz or customized display).

1: Speed reference (Hz or customized display).

2: Motor current (% or A).

3: Rated current of the inverter (A).

4: Inverter thermal status (%).

5: Output power (kW).

6: Internal speed reference (after PID function, Hz or customized display).

7: Serial communication data.

8: Output speed (rpm).

9: Displays the counter value of network communication.

10: Display the communication counter value only when all network communications are in normal status.

11: Stop - frequency setting (f900 = 0) / PID setting (f900≠0), run - output frequency

1 2: Operation speed (output frequency* f225)

13: Average speed (customizable multi-speed average speed)

14: Segment speed number (currently running segment speed)

15: Running time 2 (non-cumulative running time)

Note: Parameter f610 determines the type of default display value of the keyboard panel in power-on mode.

NO.	name	Setting range	Factory settings
f611	Clear keyboard run command	0~1	1

0: Clear the keyboard operation command (when the operation permission terminal is OFF).

1: Keep the keyboard operation command (when the operation permission terminal is OFF).

Note 1: When f611 is 0, if the operation permission terminal is OFF, the inverter will stop.

NO.	name	Setting range	Factory settings
f612	Keyboard digital setting modification disabled	0~1	0

0: Allow the frequency setting (f000) to be modified via keyboard ▲ or ▼ .

1: It is forbidden to modify the frequency setting (f000) through the keyboard ▲ or ▼ .

NO.	name	Setting range	Factory settings
f613	The keyboard RUN and STOP keys are disabled	0~1	0

0: Allow the use of the RUN/STOP key (in local mode).

1: Disable the use of the RUN/STOP key (in local mode).

NO.	name	Setting range	Factory settings
f614	Keypad local emergency stop function enable/disable	0~1	0

0: Enabled. In remote mode, the inverter can be stopped via the keyboard panel.

1: Disabled. In remote mode, the inverter cannot be stopped via the keyboard panel.

NO.	name	Setting range	Factory settings
f616	Cumulative power consumption memory	0~1	1

0: Disabled. When the line power is off and on cycled, the inverter's accumulated power consumption memory displayed in kilowatt-hours (kWh) is cleared.

1: Enabled. The inverter cumulative power consumption memory displayed in kilowatt-hours (kWh) is maintained when the line power is off and on cycled.

NO.	name	Setting range	Factory settings
f617	Cumulative power consumption display unit	0~3	Model settings

0: 1kWh.

1: 10kWh.

2: 100kWh.

3: 1000kWh.

f617 will determine the scale of the kWh display on the keyboard panel.

NO.	name	Setting range	Factory settings
f618	User parameter calibration function menu selection	0~1	0

0: Disable display of user parameter calibration function menu.

1: Select to display the user parameter calibration function menu.

Note 1: Through the user parameter verification function menu, you can check which parameters have been edited by the user and are different from the factory settings.

NO.	name	Setting range	Factory settings
f619	Inverter internal temperature monitoring 1		
f620	Inverter internal temperature monitoring 2		

Note 1: f620 30kW and below (including 30kW) only includes inverter internal temperature detection 1.

NO.	name	Setting range	Factory settings
f621	LCD contrast adjustment	15-40	25

The larger the value, the higher the contrast. The smaller the value, the lower the contrast.

NO.	name	Setting range	Factory settings
f622	Manufacturer reserved		
f623	Additional Features	0000 ~ FFFF	0000

parameter	Functional Description		
f623	Additional Features		
Bit	describe	0	1
0	The fan automatically runs when powered on	OFF	ON
1	Output positive power monitoring	OFF	ON

2	Main display quick monitoring	OFF	ON
3	Forward and reverse dead time mode selection	OFF Forward and reverse dead time mode 1 , the corresponding dead time parameter is f 530 .	ON Forward and reverse dead time mode 2 , the corresponding dead time parameter is f 530 .
4	Overcurrent warning display	show	Do not display
5	Overvoltage warning display	show	Do not display
6	Overload warning display	show	Do not display
7	Overheat warning display	show	Do not display
8	IGBT overtemperature current level calculation disabled	Enable	Disable
9-15	reserve	-	-

Code	name	Setting range	Factory value
f624	Missing keyboard panel display 2	Same f610	2
	Quick monitoring 1	Same as f610	
f625	Missing keyboard panel display 3	Same as f610	1
	Quick Monitoring 2	1-8: See f610 9: PID setting 10: PID feedback 11~15: See f610	
f626	Missing keyboard panel display 4	Same as f610	5
	Quick monitoring parameters 3	1-8: See f610 9: PID setting 10: PID feedback 11~15: See f610	

- Quick monitoring:

Quick monitoring is mainly used for LED panels (including: single LED, dual LED).

In the default state after power-on, the ENT key can be used to switch the display of the parameters set by f610 , f624 , f625 , and f626 . (If it is a dual LED panel, the display is switched on the first line)

The options of f624 are the same as f610 ;

The options (1-8) of f625 and f626 are the same as those of f610. Option 9 is PID reference and option 10 is PID feedback. The details are as follows:

0 : Motor operating frequency (Hz or customized display).

1 : Speed reference (Hz or customized display). (marked by letter F)

2 : Motor current (% or A). (marked with letter c)

3 : Rated current of the inverter (A). (marked with letter C)

4 : Inverter thermal status (%).

5 : Output power (kW).

6 : Internal speed reference (after PID function, Hz or customized display) .

7 : Serial communication data.

8 : Output speed (rpm).

9 : PID given pressure. (marked with letter G)

10 : PID feedback pressure. (marked with letter b)

- Multi-line monitoring:

Multi-line monitoring is mainly used for LCD panels and dual LED panels.

Parameter f624 determines the type of default display value on the second line of the keyboard panel in power-on mode.

Parameter f625 determines the type of default display value on the third line of the keyboard panel in power-on mode.

Parameter f626 determines the type of default display value on the fourth line of the keyboard panel in power-on mode.

NO.	name	Setting range	Factory settings
f627	Relay output-PID feedback detection	0.00~99.99	0.00
f628	Relay output-PID feedback detection bandwidth	0.00~99.99	0.00

f627 and f628 mainly cooperate with the relay function [84] to realize pressure reduction pump control;

f628 is also used in the relay function [86] to monitor the status of the feedback pressure.

NO.	name	Setting range	Factory settings
f629	reserve	-	-

6.9 Additional function parameter group

NO.	name	Setting range	Factory settings
f700	Manufacturer reserved		

NO.	name	Setting range	Factory settings
f701	Jog frequency	0.0 Hz ~ f007	5.0

Frequency command for jog function.

NO.	name	Setting range	Factory settings
f702	Jogging stop mode	0~2	0

0 : Ramp to stop.

1 : Free stop.

2 : DC braking.

Note 1: The jog operation command can be given through the keyboard panel or control terminals.

Note 2: Even if the DC brake and keyboard jog functions are enabled at the same time, it is difficult for them to work at the same time.

NO.	name	Setting range	Factory settings
f703	Hop frequency 1	0.0 Hz ~ f00 7	0.0
f704	Hop frequency range 1	0.0~30.0 Hz	0.0
f705	Hop frequency 2	0.0 Hz ~ f00 7	0.0
f706	Hop frequency range 2	0.0~30.0 Hz	0.0
f707	Hop frequency 3	0.0 Hz ~ f00 7	0.0
f708	Hop frequency range 3	0.0~30.0 Hz	0.0

The function of hopping frequency is to make the inverter's operating frequency avoid the mechanical resonance point of the drive system. Set f703 , f705 , and f707 as the center frequency value of the mechanical resonance band of the drive system. A maximum of three can be set. Do not overlap the jump frequency bands when setting. When the inverter is not running stably within the jump frequency band (i.e. during acceleration or deceleration), the jump frequency band will be ignored.

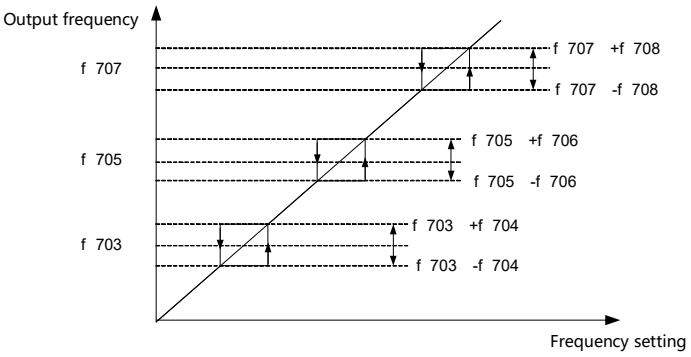


Figure 6.34 Jump frequency parameter setting diagram

NO.	name	Setting range	Factory settings
f709	Brake control selection	0 ~3	0

0: Disable, do not enable the brake function.

1: Forward

2: Reverse

3: Same as f522 (when f522 is not 0) Set the same direction

NO.	name	Setting range	Factory settings
f710	Brake release frequency	0.0~20.0 Hz	3.0
f711	Brake release time	0.0 ~25.0s	0.5
f712	Brake closing frequency	0.0~20.0 Hz	3.0
f713	Brake closing time	0.0 ~25.0s	1.0

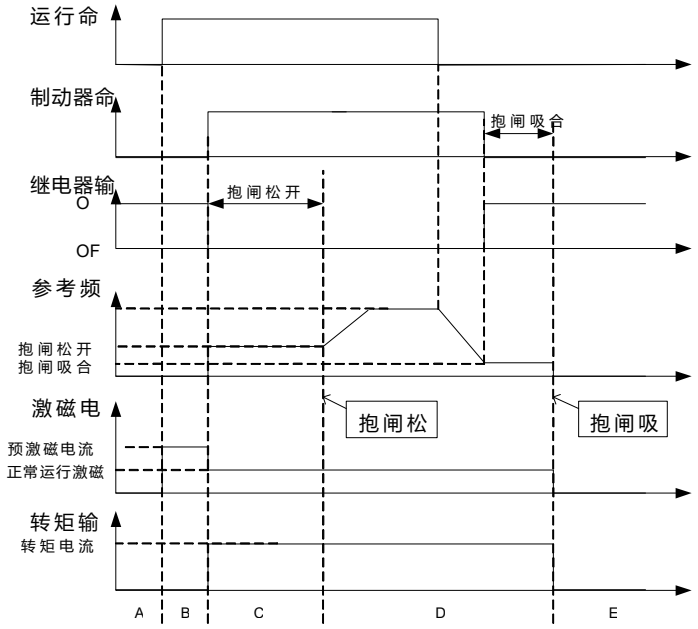


Figure 6.35 Brake logic timing diagram

NO.	name	Setting range	Factory settings
f714	Droop control gain	0~100%	0
f715	Torque band insensitive to droop control	0~100%	10

When multiple motors drive the same load, since different motors have different rated speeds, the loads they bear will be different. The droop control function can adjust the speed drop of the motor under the same load. The load on the motors is balanced under this condition. The speed drop or droop allowed by the motor driving the load is determined by the load current level and the settings of parameters f714 and f715 .

In driving, droop control reduces the inverter output frequency. In regenerative braking, droop control increases the inverter output frequency. Even if enabled, droop control must be effective under the following conditions:

- The load current exceeds the level set by parameter f715 .
- The inverter output frequency is between the output starting frequency f503 and the maximum output frequency f007 .

The allowable droop △ f can be calculated by the following formula: △ f = f008×f714× (Load current- f715)

Note 1: When parameter f008 >100Hz , f008 is calculated as 100 Hz.

Note 2: If (load current – f715 =0), then the droop is 0.

Assuming the speed reference is set to 50Hz and △f = 3.8Hz , the output frequency will be : f1 = 50-3.8 = 46.2 (Hz).

NO.	name	Setting range	Factory settings
f716	Multi-speed 1	f009 ~ f008	3.0
f717	Multi-speed 2	f009 ~ f008	6.0
f718	Multi-speed 3	f009 ~ f008	9.0
f719	Multi-speed 4	f009 ~ f008	12.0
f720	Multi-speed 5	f009 ~ f008	15.0
f721	Multi-speed 6	f009 ~ f008	18.0
f722	Multi-speed 7	f009 ~ f008	21.0
f723	Multi-speed 8	f009 ~ f008	24.0
f724	Multi-speed 9	f009 ~ f008	27.0
f725	Multi-speed 10	f009 ~ f008	30.0
f726	Multi-speed 11	f009 ~ f008	33.0
f727	Multi-speed 12	f009 ~ f008	36.0
f728	Multi-speed 13	f009 ~ f008	39.0
f729	Multi-speed 14	f009 ~ f008	45.0

f730	Multi-speed 15	f009 ~ f008	50.0

Note: f716 ~ f730 set the frequency of multi-speed operation. Four logic inputs (LI1 ~ LI4) can select up to 15 operating frequencies. Multi-speed operation frequency control is only effective when the inverter is in logic input control (f002 = 0). For more information about multi-speed, see the inverter logic input function table.

Table 6.10 Correspondence between logic input terminal status and multi-speed

Frequency setting	Multi-speed bit 4	Multi-speed bit 3	Multi-speed bit 2	Multi-speed bit 1
Non-multi-speed operation mode	0	0	0	0
Multi-speed 1	0	0	0	1
Multi-speed 2	0	0	1	0
Multi-speed 3	0	0	1	1
Multi-speed 4	0	1	0	0
Multi-speed 5	0	1	0	1
Multi-speed 6	0	1	1	0
Multi-speed 7	0	1	1	1
Multi-speed 8	1	0	0	0
Multi-speed 9	1	0	0	1
Multi-speed 10	1	0	1	0
Multi-speed 11	1	0	1	1
Multi-speed 12	1	1	0	0
Multi-speed 13	1	1	0	1
Multi-speed 14	1	1	1	0
Multi-speed 15	1	1	1	1

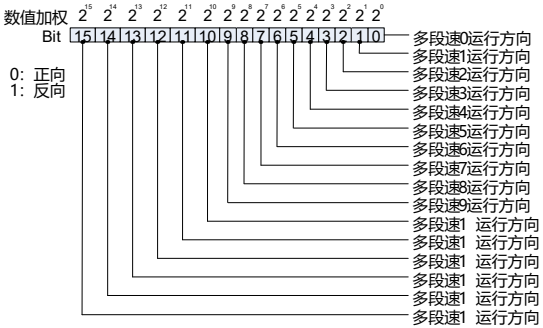
NO.	name	Setting range	Factory settings
f731	Manufacturer reserved		
f732	Multi-speed 0 running time	0~6500.0s (min)	0.0
f733	Multi-speed 1 running time	0~6500.0s (min)	0.0
f734	Multi-speed 2 running time	0~6500.0s (min)	0.0
f735	Multi-speed 3 running time	0~6500.0s (min)	0.0
f736	Multi-speed 4 running time	0~6500.0s (min)	0.0
f737	Multi-speed 5 running time	0~6500.0s (min)	0.0
f738	Multi-speed 6 running time	0~6500.0s (min)	0.0
f739	Multi-speed 7 running time	0~6500.0s (min)	0.0
f740	Multi-speed 8 running time	0~6500.0s (min)	0.0
f741	Multi-speed 9 running time	0~6500.0s (min)	0.0
f742	Multi-speed 10 running time	0~6500.0s (min)	0.0
f743	Multi-speed 11 running time	0~6500.0s (min)	0.0
f744	Multi-speed 12 running time	0~6500.0s (min)	0.0
f745	Multi-speed 13 running time	0~6500.0s (min)	0.0
f746	Multi-speed 14 running time	0~6500.0s (min)	0.0
f747	Multi-speed 15 running time	0~6500.0s (min)	0.0

When the PLC is running, multi-speed 0 refers to the setting value of f000 .

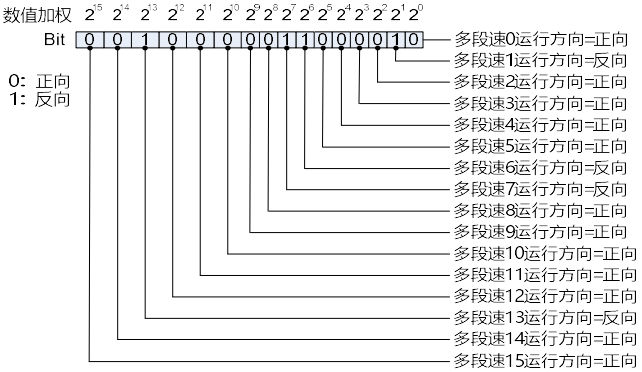
NO.	name	Setting range	Factory settings
f748	PLC preset speed direction 1	0000H ~ FFFFH	0000H

Setting method: The running direction is set according to the 16-bit binary number and converted into a decimal value before entering this parameter.

(1) Setting instructions:



(2) Setting example:



Parameter setting value:

$f\,748 = Bit15 * 2^{15} + Bit14 * 2^{14} + \ldots + Bit1 * 2^{1} + Bit0 * 2^{0}$

$= 0 * 2^{15} + 0 * 2^{14} + 1 * 2^{13} + \ldots + 1 * 2^{7} + 1 * 2^{6} + \ldots + 1 * 2^{1} + 0 * 2^{0}$

= 8192 + 128 + 64 + 2 = 8386

(3) Power quick solution table:

$2^{15} = 32768$, $2^{14} = 16384$, , $2^{13} = 8192$, $2^{12} = 4096$, $2^{11} = 2048$,

$2^{10} = 1024$, $2^{9} = 512$, , $2^{8} = 256$, $2^{7} = 128$, $2^{6} = 64$,

$2^{5} = 32$, $2^{4} = 16$, , $2^{3} = 8$, $2^{2} = 4$, $2^{1} = 2$, $2^{0} = 1$

NO.	name	Setting range	Factory settings
f749	Simple PLC operation mode selection	0~2	0

0: Stop after running once. The inverter stops automatically after completing a single cycle and needs to be given a run command again to start.

1: Keep running at the final value after running once. The inverter automatically keeps the running status of the last section after completing a single cycle.

2: Cycle operation. After the inverter completes one cycle, it automatically starts the next cycle until it stops when there is a stop command.

NO.	name	Setting range	Factory settings
f 750	Simple PLC restart mode selection	0~1	0

0: Start from the first stage. If the machine stops during operation (due to a stop command or a fault), it will start from the first stage after restarting.

1: Continue to run from the frequency at the time of interruption. If the inverter stops during operation (due to a stop command or a fault), the inverter automatically records the running time of the current stage, and automatically enters the stage after restarting, and continues to run for the remaining time at the frequency defined in the stage.

NO.	name	Setting range	Factory settings
f 751	Simple PLC power-off memory selection	0~1	0

0: No memory after power outage.

1: Power-off memory.

Note: PLC power-off memory refers to memorizing the PLC operation stage and frequency before power-off.

Serial number	f 750	f 751	Power outage status	Status when powering on and running again
1	0	0	Downtime	Start running from the first stage of the PLC
			Running	Start running from the first stage of the PLC
2	1	0	Downtime	Start running from the first stage of the PLC
			Running	Start running from the first stage of the PLC
3	0	1	Downtime	Start running from the first stage of the PLC
			Running	Starts running from the operating frequency when power was off
4	1	1	Downtime	Start running from the frequency at which it stopped
			Running	Starts running from the operating frequency when power was off

NO.	name	Setting range	Factory settings
f 752	Simple PLC running time unit selection	0~1	0

0: Seconds (s).

1: Minutes (min).

NO.	name	Setting range	Factory settings
f753	Non-standard function selection	0~65535	0

0: Standard function .

1~65535 : Non-standard function.

Note: 1) This parameter takes effect after the inverter is powered off and then powered on again.

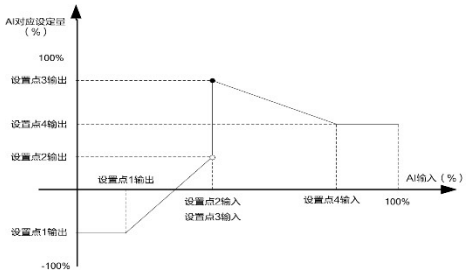
2) This parameter cannot be reset by f120 = 1 .

NO.	name	Setting range	Factory settings
f 754	AI1 curve selection	0 ~ 1	0

0: Curve 1 (2 points , see f325 ~ f328)

1: Curve 2 (4 points , see f755 ~ f762)

AI1 has two setting curves, which can be selected by parameter f754 . Curve 1 is a 2-point straight line, and curve 2 is a 4-point curve (as shown in the figure below) .



When setting the corresponding frequency of AI1 through the 4-point curve in the figure above :

(1) The frequency set by AI1 can be positive or negative . When it is positive, it will run forward, and when it is negative , it will run reversely . And f530 can set the dead time when switching between forward and reverse directions during operation .

(2) When AI1 input < f755 , the output frequency is f756 ;

When AI1 input > f761 , the output frequency is f762 .

(3) Allow AI1 given frequency to have a step change.

NO.	name	Setting range	Factory settings

f 755	AI1 curve 2 set point 1 input	0.0 ~ 100.0%	0.0%
f756	AI1 curve 2 set point 1 output	-100% ~ 100%	0.0%
f 757	AI1 curve 2 set point 2 input	0.0 ~ 100.0%	30.0%
f 758	AI1 curve 2 set point 2 output	-100% ~ 100%	30.0%
f 759	AI1 curve 2 set point 3 input	0.0 ~ 100.0%	60.0%
f 760	AI1 curve 2 set point 3 output	-100% ~ 100%	60.0%
f 761	AI1 curve 2 set point 4 input	0.0 ~ 100.0%	100.0%
f 762	AI1 curve 2 set point 4 output	-100% ~ 100%	100.0%
f 763	LI1 effective delay	6500.0 ~ 0.0 s	0.0
f 764	LI1 invalid delay	6500.0 ~ 0.0 s	0.0
f 765	LI2 effective delay	6500.0 ~ 0.0 s	0.0
f766	LI2 invalid delay	6500.0 ~ 0.0 s	0.0
f767	AI1 filter coefficient	0.00~10.00	0.30
f768	AI2 filter coefficient	0.00~10.00	0.30
f769	AO1 filter coefficient	0.00~10.00	0.00
f770	AO2 filter coefficient	0.00~10.00	0.00

Description: f767, f768 are the filter coefficients of analog input AI1 and AI2. Properly increasing these values can enhance the anti-interference ability of analog input, but will weaken its sensitivity.

f769 and f770 are the filter coefficients of analog output AO1, AO2 Increasing this value appropriately can enhance the stability of analog output, but will reduce its sensitivity.

NO.	Name	Setting range	Factory settings
f 771	Reverse jog frequency	0.0 Hz ~ f007	0.0

0: Reverse jog frequency is prohibited. At this time, no matter forward jog or reverse jog, the jog frequency is according to f701 , the jog acceleration time is 0.1s (not adjustable), and the deceleration time is according to f011 .

0.1~20.0: Enable reverse jog frequency. At this time, when jogging in the forward direction, the jog frequency is set according to f701 , and the acceleration and deceleration time of the forward jog is set according to f518 and f519 ; when jogging in the reverse direction, the jog frequency is set according to f771 , and the acceleration and deceleration time of the reverse jog is set according to f520 and f521 .

NO.	name	Setting range	Factory settings
f772	Set password	0~9999	0
f773	Password validity period	0~9999 minutes	5

Password protection function description:

1. When f772 = 0 , the password protection function is invalid : no matter what the value of f602 is , any parameter can be modified ;

2. When f772 ≠0 , the password protection function takes effect :

(1) If f602 ≠ f772 , only f602 itself and the default keyboard setting frequency at power-on can be modified ;

(2) If f602 = f772 , you can modify any parameter ; but after the time set by f773 , f602 automatically reset to 0, and the protection parameters will be modified . If you want to continue to modify the parameters, you need to use f602 to enter the password again.

3. When the password protection function is valid , if f602 ≠ f772 , " ---- " will be displayed when checking the value of f772 ; if f602 = f772 , the normal password setting will be displayed when checking the value of f772 .

4. When the password protection function is valid , if f602 ≠ f772 , when checking the value of f772 or modifying the value of other parameters, f602 will be reset to 0 to increase the difficulty of password cracking; if f602 = f772 , the value of f602 remains unchanged during any operation .

5. When the password protection function is valid and f602=f772, if f773 = 0, f602 will be always valid and will not be reset automatically .

6.10 Communication function parameter group

NO.	name	Setting range	Factory settings
f800	Baud rate	0~1	1

0: 9600 bps.

1:19200 bps.

2:4800 bps.

3: 2400 bps

4:1200 bps.

NO.	name	Setting range	Factory settings
f801	Verification Options	0~2	1

0: No parity check, data format <8, N, 1>.

1: Even parity, data format <8, E, 1>.

2: Odd parity, data format <8, O, 1>.

NO.	name	Setting range	Factory settings
f802	Slave Address	0~247	1
f803	Communication timeout	0~100	0

0: Communication timeout detection disabled.

1-100: timeout period, 1=1s.

NO.	name	Setting range	Factory settings
f804	Sending waiting time	0~2.00s	0.00
f805	Communication fault settings	0~4	4

0 : The inverter stops according to a ramp and serial control is released back to the source defined by f002 and f003 .

1 : The last command continues to run.

2 : The inverter stops according to the ramp and the serial control is maintained.

3 : The inverter cuts off the power to the motor, the motor coasts to a stop, and the serial control is maintained.

4 : The inverter enters the fault state with communication error e- 33 or network error e- 35 .

NO.	name	Setting range	Factory settings
f806	Number of poles of motor used for communication	2~16	2

NO.	name	Setting range	Factory settings
f 813	Block write data 1	0~6	0
f 814	Block write data 2	0~6	0

0: No selection

1: Communication command control (fa05)

2: Reserved

3: Communication frequency setting (fa05)

4 ~ 6 : Reserved

Note: (1) The settings of f813 - f814 will only take effect after the power is turned off and the LED display turns black, and then the power is turned on again.

(2) The block write start address is 1813H (hexadecimal 1813).

(3) Write the number of registers: 2 (must be 2).

NO.	name	Setting range	Factory settings
f 815	Block read data 1	0~ 2 1	1
f 816	Block read data 2	0~ 2 1	2
f 817	Block read data 3	0~ 2 1	12
f 818	Block read data 4	0~ 2 1	18
f 819	Block read data 5	0~ 2 1	8

0: No selection

1: Status information (fd03)

2: Output frequency (fd12)

3: Output current (fe08)

4 : Output voltage (fe10)

5 : Fault information (fc39)

6 : PID feedback value (fa36)

7 : Input terminal information (fd01)

8 : Output terminal information (fd02)

9 : AI1 input (fe30)

10 : AI2 input (fe31)

11 : Motor speed (fe50)

12: Output current absolute value (E 002), unit 0.01A

13: Output voltage absolute value (E 006), unit V

14: Absolute value of DC bus input voltage (E 009), unit V

15: PID given value (FA35)

16: Output torque (FE20), unit 0.01% of the rated torque of the motor

17: Input power (FE28), unit: 0.01kW

18: Output power (FE29), unit 0.01kW

19: Input power accumulation/input electric energy (FE44), the unit is determined by parameter f617

20: Output power accumulation/output electric energy (FE45), the unit is determined by parameter f617

21: Cumulative running time (FE17), unit: h (hours)

Note : (1) The settings of f815 - f819 will only take effect after the power is turned off and the LED display turns black, and then the power is turned on again.

(2) The block read start address is 1815H (hexadecimal 1815)

(3) The number of registers to be read ranges from 2 to 5.

NO.	name	Setting range	Factory settings
f821	Three-phase output current frequency compensation	0000~0060	

f821 = 0000 , three-phase output current frequency compensation is disabled;

f821 = 0060 , three-phase output current frequency compensation is enabled;

In some specific occasions, due to the different characteristics of different motors, if the three-phase output current oscillates, check the value of f821 . If the value of f821 is 0060 , the frequency compensation has been invested, then try to change the value of f821 to 0000 and check the output effect of the three-phase current;

If the value of f821 is 0000 and frequency compensation is not enabled, try changing the value of f821 to 0060 to check the three-phase current output effect. If the problem is not solved, please contact after-sales technical support.

NO.	name	Setting range	Factory settings
f82 2 - f8 29	Manufacturer reserved		

f830	PID keyboard setting	0~100%	0.0

100% setting of f830 corresponds to 100% of PID feedback signal (AI1 or AI2, see f900). For example, when the feedback channel is AI1, and f305 = 0 (analog input voltage is 5V), the maximum feedback signal of the pressure sensor is 5V, then f830 = 100% can make the pressure sensor output full scale, that is, output 5V.

Note 1: When f900 = 0, the f830 setting is invalid.

6.11 Process PID parameter group

PID control is a common method for process control. It adjusts the output frequency of the inverter by performing proportional, integral and differential operations on the deviation between the feedback signal of the controlled quantity and the target quantity signal, forming a negative feedback system to stabilize the controlled quantity at the target quantity. It is suitable for process control such as flow control, pressure control and temperature control. The basic control principle block diagram is as follows:

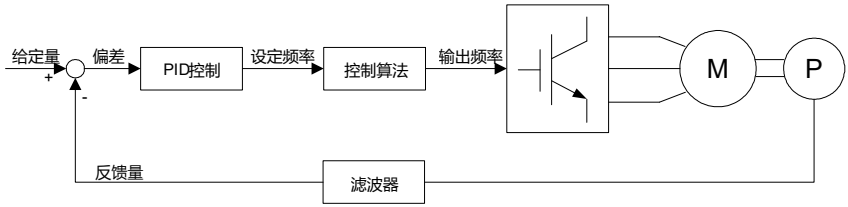


Figure 6.36 PID control basic principle block diagram

f900 ~ f908 define the inverter built-in process PID control function parameters. The process PID control function block diagram is shown below .

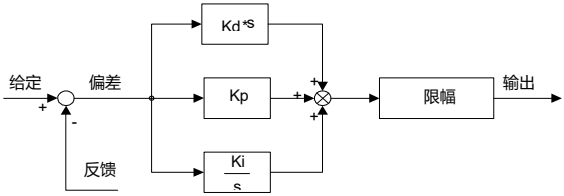


Figure 6.37 PID regulator block diagram

f917 is the setting of the PID sensor range. When the sensor range is 0 (f917 = 0.00), the PID related settings are in percentage form. The keyboard setting of PID is f916 . The parameters are as follows:

NO .	name	Setting range	Factory settings
f 900	PID control enabled	0~2	0

0: PID disabled.

1: Enabled, the feedback source is AI1.

2: Enabled, the feedback source is AI2.

Note: PID reference source (f003) and feedback source (f900) cannot be set to the same channel.

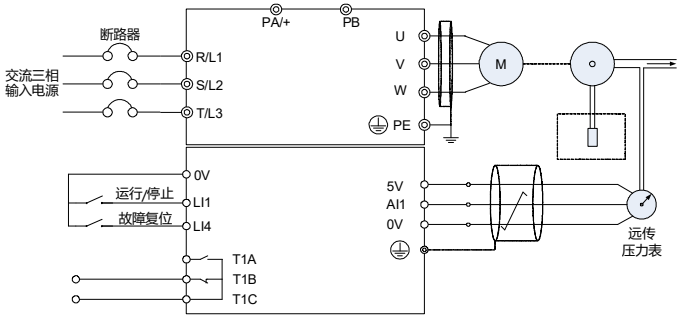


Figure 6 .38 PID external connection example

PID given and PID feedback, see the table below.

Table 6.11 PID given source and PID feedback source

PID given source		PID feedback source
f003 (f005) setting value	Given source	f 900 setting
0	Keyboard Potentiometer	f900 = 1: AI1, 0~5V or 0~10V DC or 4~20mA DC. f 900 = 2 : A I2, 0~10V DC .
1	AI1	
2	AI2	
3	Keyboard panel	
4	Communication Settings	
5	UP/DOWN speed control	
6	Do not use	
7	PID keyboard setting (see f830)	
- (In remote mode, f002 = 0)	Multi-speed setting	

NO.	name	Setting range	Factory settings
f 901	PID proportional gain (P control)	0.01~100.0	Model settings
f 902	PID integral gain (I control)	0.01~100.0	Model settings
f 903	PID differential gain (D control)	0.00~2.55	0.00

Control effect of f901: The larger the setting value, the faster the response, and the smaller the deviation between the target value and the feedback value after stabilization; however, if the setting value is too large, the control object may vibrate and become unstable. In addition, if the setting value is small, the deviation between the target value and the feedback value after stabilization will become larger.

Control effect of f902: Eliminate residual deviation. Any deviation that remains after proportional gain adjustment can be cleared over time by the integral gain function. The larger the set value, the faster the response to deviation changes, but it may also cause instability such as oscillation .

Control effect of f903: When there is jump feedback in the system, this parameter needs to be adjusted. The differential gain will adjust the inverter response time according to the rapid changes in the process. Unnecessarily increasing the differential gain value may cause large fluctuations in the motor speed and cause system instability.

NO.	name	Setting range	Factory settings
f904	PID control waiting time	0~2400s	0

When f904 is set to a value greater than 0s, the inverter will not enter PID control immediately when starting. During the time set by f904 , the inverter will ignore the feedback signal and accelerate the motor to the speed set by the given input.

NO.	name	Setting range	Factory settings
f905	PI regulator deviation input signal inversion	0~1	0

0: Disable.

1: Enabled.

Note: There are two ways to reverse the PID regulator: Set f905 = 1, or define the logic input function as 38 and close the corresponding input terminal.

NO.	name	Setting range	Factory settings
f906	Sleep mode wake-up hysteresis bandwidth	0.0 Hz ~ f00 7	0.2

When the inverter is in sleep mode, once it detects that the frequency command is greater than f009 + f906 , the inverter will re-accelerate the motor to the given frequency. See f501 or f915 .

NO.	name	Setting range	Factory settings
f 907	Sleep mode wake-up threshold based on PI deviation	0.0 Hz ~ f007	0.0

When the inverter is in sleep mode, once it detects that the deviation between PID given and PID feedback is greater than f907 , the inverter exits sleep mode.

NO.	name	Setting range	Factory settings
f 908	Sleep mode wake-up threshold based on PI feedback	0.0 Hz ~ f007	0.0

When the inverter is in sleep mode, once it detects that the PID feedback value is less than f908 (f905 = 0), the inverter exits sleep mode.

NO.	name	Setting range	Factory

			settings
f909	Sleep action selection	0~1	0

0: Sleep is enabled (motor stops after a delay).

1: Run at the lower frequency limit.

NO.	name	Setting range	Factory settings
f910	Sleep delay wake-up time	0~600.0s	0.0

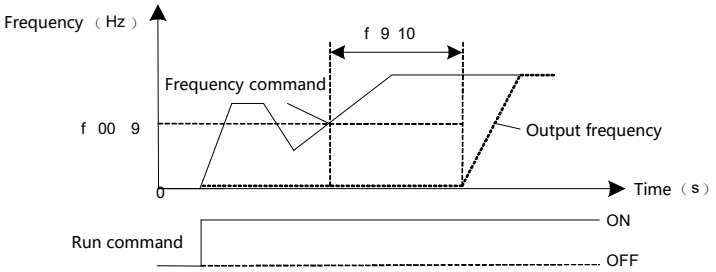


Figure 6.39 Schematic diagram of sleep and wake-up

NO.	name	Setting range	Factory settings
f911	Wake-up pressure percentage	0~100.0%	0.0

When the PID feedback is detected to be less than f911 , the inverter exits the sleep mode.

NO.	name	Setting range	Factory settings
f912	Sleep pressure percentage	0~100%	0

When the PID feedback is detected to be greater than f912 , the inverter enters sleep mode.

NO.	name	Setting range	Factory settings
f913	PID given upper limit pressure	0~100%	100
f914	PID given lower limit pressure	0~100%	0

f900 is not 0, f913 and f914 are valid, and the pressure setting is limited between f913 and f914 .

NO.	name	Setting range	Factory settings
f915	Sleep mode delay control	0.0~600.0s	0.1

0: Disable (0.0). Sleep mode will not be entered.

1: Enable (0.1 to 600.0s). When the inverter output frequency or the frequency command output after PID adjustment is equal to or lower than f009 for the time set by f915 , the

inverter will stop the motor along the ramp. When the motor is stopped, " a - 10 " will flash on the inverter keyboard panel . When the inverter speed setting exceeds f009+f906 is reached, the inverter will restart and accelerate the motor to the new speed reference.

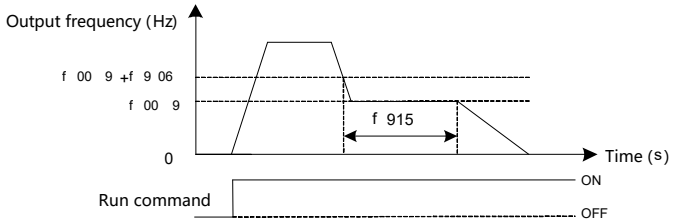


Figure 5.40 Entering sleep mode

Note 1: If parameter f915 is enabled, the inverter will also be monitored when running at a speed of f009 or less during starting or motor reversal .

Note 2: f915 and f501 are completely equivalent. When one is changed, the other will be automatically updated.

NO.	name	Setting range	Factory settings
916	PID keyboard setting	0~100%	0.0

100% of f916 corresponds to 100% of PID feedback signal (AI1 or AI2, see f900) . For example, when the feedback channel is AI1, and f305 = 0 (analog input voltage is 5V), the maximum feedback signal of the pressure sensor is 5V, then f916 = 100% can make the pressure sensor output full scale, that is, output 5V.

Note 1 : When f900 = 0 , f916 setting is invalid.

Note 2: f916 and f830 are completely equivalent. When one is changed, the other will be automatically updated.

f917 is the setting of the PID sensor range. When the sensor range is not 0 (f917 ≠ 0.00), the PID related settings are in absolute value form. The keyboard setting of PID is f918 . The parameters are as follows:

NO.	name	Setting range	Factory settings
f 900	PID control enable/disable	0~2	0

0: PID disabled.

1: Enabled, the feedback source is AI1.

2: Enabled, the feedback source is AI2.

Note 1: The control parameter for enabling or disabling the PID function is f900 , not the PID reference source selection parameter f003 .

Note 2: PID reference source (f003) and feedback source (f900) cannot be set to the same channel.

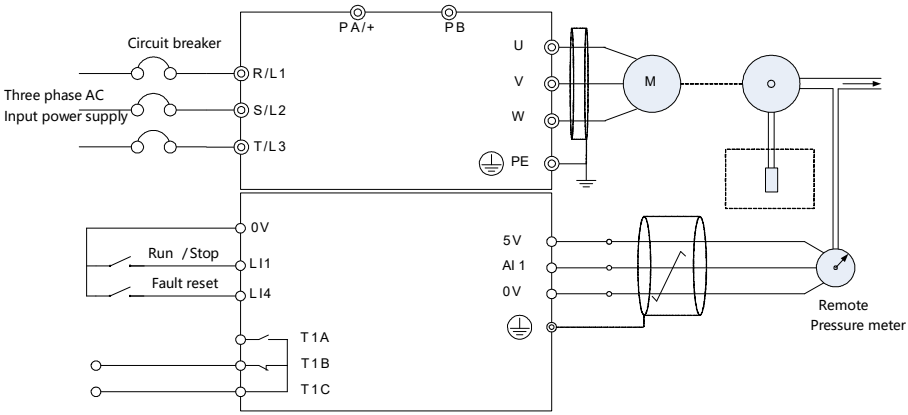


Figure 5.38 PID external connection example

PID given and PID feedback, see the table below.

Table 6.11 PID given source and PID feedback source

PID given source		PID feedback source
f003 (f005) Settings	Given source	f900 setting
0	Keyboard Potentiometer	f900 =1: AI1, 0~5V or 0~10V DC or 4~20mA DC . f 900 = 2 AI2, 0~10V DC.
1	AI1	
2	AI2	
3	Keyboard panel (frequency setting) - not recommended	
4	Communication setting (frequency setting)	f900 = 1: AI1, 0~5V or 0~10V DC or 4~20mA DC . f 900 = 2: AI2, 0~10V DC .
5	UP/DOWN speed control	
6	Do not use	
7	Keyboard panel (PID given) - f918	
- (In remote mode, f002 = 0)	Multi-speed setting	

Note 1: f003 is the reusable parameter of the frequency reference source and the PID reference source.

When f900 = 0 (PID disabled), f003 is the frequency setting source;

When f900 ≠0 (PID enabled), f003 is the PID reference source.

Note 2: The control parameter to enable or disable the PID function is f900 , not f003 .

Note 3: When the PID given source selects f003 = 7, the PID given can be set directly by the ▲▼ keys in the default state of power-on, or the PID given can be set by parameter f918 . The two methods have the same effect.

Note 4: Through f021 and other related parameters, the given values of f003 (main given value) and f005 (auxiliary given value) can be calculated as the final PID given value, realizing the main and auxiliary calculation function of PID given value. For details, please refer to parameters f021 ~ f024 , f006 .

NO.	name	Setting range	Factory settings
f 901	PID proportional gain (P control)	0.01~100.0	Model settings
f 902	PID integral gain (I control)	0.01~100.0	Model settings
f 903	PID differential gain (D control)	0.00~2.55	0.00

Control effect of f901: The larger the setting value, the faster the response, and the smaller the deviation between the target value and the feedback value after stabilization; however, if the setting value is too large, the control object may vibrate and become unstable. In addition, if the setting value is small, the deviation between the target value and the feedback value after stabilization will become larger.

Control effect of f902: Eliminate residual deviation. Any deviation that remains after proportional gain adjustment can be cleared over time by the integral gain function. The larger the set value, the faster the response to deviation changes, but it may also cause instability such as oscillation .

Control effect of f903: When there is jump feedback in the system, this parameter needs to be adjusted. The differential gain will adjust the inverter response time according to the rapid changes in the process. Unnecessarily increasing the differential gain value may cause large fluctuations in the motor speed and cause system instability.

NO.	name	Setting range	Factory settings
f904	PID control waiting/delay time	0~2400s	0

When f904 ≠0, the inverter will not enter PID control immediately upon startup. PID control is enabled after the delay time set by f904 .

During the time set by f904, PID is disabled, f003 switches to the frequency reference source selection channel, and the motor accelerates to the speed corresponding to the corresponding reference source. For example, when f003 = 7, the corresponding output frequency = f007 * f918 / f917.

NO.	name	Setting range	Factory settings
f905	PI regulator deviation input signal inversion/action direction	0~1	0

0: Disabled/positive action. When PID feedback is less than given value, the inverter output frequency increases; otherwise, the inverter output frequency decreases.

1 : Enable/reverse . When PID feedback is less than given, the inverter output frequency decreases; otherwise, the inverter output frequency increases.

Note: There are two ways to invert the PID regulator: Set f905 = 1, or define the logic input function as 38 and close the corresponding input terminal.

NO.	name	Setting range	Factory settings
f906	Wake-up frequency hysteresis bandwidth	0.0 Hz ~ f007	0.2
f 907	Wake-up deviation (absolute value)	0.00 ~ f917	0.00
f 908	Wake-up threshold (absolute value)	0.00 ~ f917	0.00

NO.	name	Setting range	Factory settings
f910	Wake-up control/delay time	0.0~600.0s	0.0
f911	Wake-up threshold (percentage)	0.0~200.0%	0.0

There are three wake-up modes: deviation wake-up, threshold wake-up (absolute value or percentage) and frequency wake-up. The following is an explanation based on the case of f905 = 0 (deviation signal inversion disabled / positive action).

(1) Deviation wake-up: If the following conditions are met, the inverter exits the sleep state.

●(Given - Feedback) > Wake-up deviation (parameter f907);

- The duration of the above status ≥ wake-up control / delay time (f910).

(2) Threshold wake-up: If the following conditions are met, the inverter exits the sleep state.

- Feedback < wake-up threshold (parameter f908 or (f918 * f911 %);
- The duration of the above status ≥ Wake-up control: delay time (f910).

(3) Frequency wake-up: If the following conditions are met, the inverter enters the sleep state.

- Running frequency ≥ sleep frequency (f919) + wake-up frequency hysteresis bandwidth (f906);
- The duration of the above two states ≥ wake-up control / delay time (f910).

Note 1: The priority is: deviation wake-up > threshold wake-up (absolute value) > threshold wake-up (percentage) > frequency wake-up, that is, only when the high-priority parameter = 0, will it enter the low-priority wake-up mode.

Note 2: The settings of f907 and f908 use absolute values. When it is a pressure signal, 1.00 means 1.0MPa .

Note 3: The setting of f911 adopts percentage, and the reference value corresponding to 100% is PID given f918.

NO.	name	Setting range	Factory settings
f909	Sleep action selection	0~1	0

0: Sleep is enabled (motor stops after a delay).

1: Run at the lower frequency limit.

NO.	name	Setting range	Factory settings
f912	Sleep threshold (percentage)	0.0~200.0%	0.0
f915	Sleep control/delay time	0.0~600.0s	0.1
f919	Sleep frequency	f 009 ~ f008	f 009
f920	Sleep Tolerance	0.0~25.0%	0.0

There are two modes of sleep: feedback threshold sleep (percentage) and frequency sleep. The following is an explanation of the situation where f905 = 0 (deviation signal inversion disabled/positive action) .

(1) Feedback threshold sleep:

When the feedback is greater than the sleep threshold (f918 * f912 %), and the duration is greater than or equal to the sleep time (f915), the system enters the sleep state.

(2) Frequency sleep: When the following three conditions are met at the same time, the inverter enters sleep mode.

- Feedback ≥ (f918 - f918 * f920 %);
- Output frequency ≤ sleep frequency f919 ;
- The duration of the above two conditions is ≥ the sleep time f915 .

Note 1: Priority: threshold sleep > frequency sleep (that is, only when the sleep threshold f912 = 0, the frequency sleep mode is entered).

Note 2: When f915 = 0, the sleep function is disabled .

Note 3: The settings of f912 and f920 are both in percentage. The reference value corresponding to 100% is PID given f918 .

NO.	name	Setting range	Factory settings
f913	PID given upper limit	0.0~100.0%	100.0
f914	PID given lower limit	0.0~ f 913	0.0

When f900 ≠ 0, f913 and f914 are valid, and the PID setting is limited to f913 ~ f914 .

Example: When setting a given value through f918 , the value of f918 itself may exceed [f914 , f913] range, but the actual given value will be limited to [f914 , f913].

f913 and f914 are in percentage, and the reference value corresponding to 100% is the sensor range f917 .

NO.	name	Setting range	Factory settings
f916	PID given control deviation	0.0~100.0%	0.0
f917	Sensor range	0.00 ~ 99.99	1.00
f918	PID setting	0.00 ~ f917	0.00

f917 is the setting of the sensor range. When the sensor range is not 0 (f917 ≠ 0.00), the PID related settings are in absolute value form. The keyboard setting of PID is f918. When the sensor range is 0 (f917 = 0.00), the PID related settings are in percentage form. The keyboard setting of PID is f916 .

The settings of f917 and f918 are both absolute values. When it is a pressure signal, 1.00 means 1.0MPa .

f916 is the maximum deviation allowed between feedback and given value. Within the deviation range, the PID regulator stops working. Reasonable setting of this value can adjust the accuracy and stability of the PID system.

f916 uses percentage, and the reference value corresponding to 100% is PID given f918 . Therefore, the allowable deviation range of actual pressure is: [f918 − f918 * f916 %, f918 + f918 * f916 %].

6.12 Monitoring function parameter group

Table 6.12 Real-time monitoring parameters

NO .	name	content
u000	Software Version	Example: v 100 For G-type machine, v = g ; for P-type machine, v = p ;
u001	Operating frequency	Motor operating frequency, displayed in the dimension set by f604 .
u002	Direction of rotation	0 Forward, 1 reverse.
u003	Frequency command	The set frequency is displayed in the dimension set by f604 .
u004	Load current value	The inverter output current value is displayed in A or as a percentage of the inverter rated current.
u005	Input voltage	Effective value of the single-phase/ three-phase input voltage is displayed in V or as a percentage of the inverter rated voltage (200V / 400V).
u006	Output voltage	Effective value of the single-phase/ three-phase output voltage is displayed in V or as a percentage of the inverter rated voltage (200V / 400V).
u007	Input terminal status	>>?> } : OFF i : ON . LI8 ··· LI3 LI2 LI1
u008	Output terminal status	> i } : OFF i : ON 继电器2 晶体管 继电器1
u009	Cumulative running time	The inverter’ s cumulative running time, 1.00=100 hours.
u0 10	Output speed	Motor shaft output speed (rpm).
u0 11	Inverter rated current	Rated current value of the inverter (A).

NO .	name	content
u0 12	Torque current	Motor torque current, displayed in A or as a percentage of the inverter rated current.
u0 13	Inverter load factor	Motor current as a percentage of the inverter rated current (%).
u0 14	Torque	Motor torque, displayed as a percentage of the motor's rated torque.
u01 5	Input Power	Inverter input power (kW).
u01 6	Output Power	Inverter output power (kw)
u01 7	PID feedback	The feedback value of PID is displayed in the dimension set by f604 .
u01 8	Frequency command value after PID	The output command after PID adjustment is displayed in the dimension set by f604 .
u01 9	Input cumulative power	Cumulative input power (kWh)
u0 20	Output cumulative power	Cumulative output power (kWh)
u02 1	Communication Count	Communication count value passing through the network
u02 2	Normal communication count	The communication count value passing through the network under normal conditions
u0 23	HMI version number	v 10
u0 24	Maintenance Information	@> } : OFF i : ON 累计运行时间 主电容 线路板 风扇 ON: Maintenance time has arrived.
u0 25	Manufacturer reserved	
u0 26	When f917 = 0.00, the given pressure percentage	During PID control, the given pressure percentage is monitored
	When f917 ≠ 0.00, the absolute value of the given pressure	During PID control, the absolute value of the given pressure is monitored (1.00=1.00Mpa=10kg/cm ^{2})
u0 27	When f917 = 0.00, the feedback pressure percentage	During PID control, feedback pressure percentage monitoring
	When f917 ≠0.00, the absolute value of the feedback pressure	During PID control, feedback pressure absolute value monitoring (1.00=1.00Mpa=10kg/cm ^{2})

NO .	name	content
u0 34	Monitor high-speed pulse input frequency	0.00 kHz ~ 20.00 kHz
u1--	Historical fault record 1	Enter the most recent fault history
u2--	Historical fault record 2	Enter the second most recent fault history
u3--	Historical fault record 3	Enter the 3rd most recent fault history
u4--	Historical fault record 4	Enter the 4th most recent fault history

Note: u007 If AI1 is not defined as a logic input function, the input terminal status corresponding to AI1 will not be displayed.

Table 6.13 The nth most recent fault history (n=1,2,3,4)

Parameter Code	Parameter meaning	content
-	Historical fault type code	Display fault code (e.g. overcurrent during acceleration displays e-01)
un 0 0	Continuous tripping times	Displays the number of consecutive occurrences of the fault recorded in the fault history.
u n 01	Operating frequency	Displays the motor operating frequency in the dimension set by f604 .
un 0 2	Direction of rotation	0 Forward, 1 Reverse
u n 0 3	Frequency command	Displays the set frequency in the dimension set by f 6 04 .
u n 04	Load current value	The inverter output current value is displayed in A or as a percentage of the inverter rated current.
u n 0 5	Input voltage	The effective value of the single-phase/ three-phase input voltage is displayed in V or as a percentage of the inverter rated voltage 200V / 400V .
u n 0 6	Output voltage	The effective value of the three-phase output voltage is displayed in V or as a percentage of the inverter rated voltage 200V / 400V .
un07	Input terminal status	>>?> } : OFF i : ON . LI8 ··· LI3 LI2 LI1
un 08	Output terminal status	> i } : OFF i : ON . 继电器2 晶体管 继电器1
un 09	Cumulative running time	Displays the inverter's cumulative running time, 0.01=1 hour.

Note: If the fault history record is empty, the historical fault type code is displayed as nerr , and the corresponding fault history record cannot be queried.

7. Fault diagnosis and countermeasures

7.1 Fault codes, causes and solutions

When a fault occurs, the inverter will perform the following actions: the keyboard panel will flash the fault code, the inverter will stop output, and the motor will coast to a stop.

Table 7.1 Fault indication and countermeasures

Fault Codes	Fault type	Possible causes of failure	Countermeasures
e-01	Overcurrent protection	The acceleration time or deceleration time is too short. The V/f parameter setting is incorrect. The inverter starts the rotating load. The drive is supplying power to a low impedance motor. Phase short circuit or ground fault. Sudden load fluctuations.	Increase the acceleration time (f0 10 or f 518) and deceleration time (f0 11 or f 519). Set the V/f parameters correctly. Enable flying start. Adjust carrier frequency Check for phase short circuit or grounding. Reduce load fluctuations.
e- 0 2	Phase short circuit	Phase-to-phase output short circuit. Motor impedance is too low.	Check the wiring and insulation conditions.
e- 03	Start-up overcurrent	Ground fault. The IGBT unit is damaged.	Check whether the wiring and the machine are grounded.

Fault Codes	Fault type	Possible causes of failure	Countermeasures
			Contact the manufacturer for repair.
e- 04	Ground Fault	A short circuit or ground fault has occurred. The IGBT unit is damaged.	Check whether the wiring and the machine are grounded. Contact the manufacturer for repair.
e- 06	Underload fault	The inverter output current is less than the low current detection threshold.	Check whether the settings of parameters f407 ~ f410 are correct .
e- 07	Over torque fault	The estimated motor torque has reached the level set by f412 .	Set according to the parameters f411 ~ f414 as needed . Confirm the load condition.
e-09	Hardware current limiting fault	Actual current of the motor has reached twice the rated current of the inverter	Increase the acceleration time (f010 or f518) and deceleration time (f010 or f519). Correctly set V/ f parameters Reduce load fluctuations
e- 11	Overvoltage fault	The input voltage fluctuates abnormally; The grid capacity is higher than 200KVA; The grid has capacitor switching for improving power factor; The power grid has machines that use thyristors. The load during inverter rotation. The output phase may be missing. The deceleration time is too short.	Install line reactors. Enable regenerative brake resistor protection. Enable flying start (f500 = 1). Set f418 = 2 . Determine the cause of the output phase loss (such as a bad connection, output open circuit, or open motor winding) and correct the problem. Increase the deceleration time parameter (f011 or f519) . Enable overvoltage fault protection (f415).
e- 12	DC bus undervoltage	Input voltage is too low.	Check input voltage. Set f 417 (alarm or trip). Enable flying start (f500 = 1). Set parameter f418 = 2.
e- 21	Inverter overload	The acceleration time is too short. The DC braking current level is too high. V /f parameter setting is incorrect. The inverter starts the rotating load. The load is too large.	Increase the acceleration time parameter (f0 10 or f 518) . Reduce the f 507 and f 508 settings. Set V /f parameters correctly. Set parameter f418 = 2. Use a frequency converter with a higher power rating.

Fault Codes	Fault type	Possible causes of failure	Countermeasures
e- 22	Motor overload	V /f parameter setting is incorrect. The motor is blocked. The motor continues to run at low speed. The load applied to the motor is too large.	Set V /f parameters correctly. Check the load.
e- 23	Braking resistor overload	Improper selection of brake resistor specifications.	Select a brake resistor that is more suitable for the working conditions. Disable brake resistor load protection f527 = 2.
e- 24	Inverter overheating	The inverter cooling fan is not working. The ambient temperature is too high. Some of the chassis vents are blocked. There is a heat source near the inverter.	After cooling, reset the inverter fault and restart operation. Increase the free space around the inverter and remove any heat sources near the inverter to reduce the ambient temperature.
e- 25	Motor PTC Overheating fault	External PTCs embedded in the motor windings indicate motor overheating.	Correct the motor overload condition. Check whether the PTC is working properly. Check logic input functions 27 and 28.
e- 31	EEPROM Fault	Data write and read errors occurred. The inverter loses power during parameter reset.	Restart to clear the fault. If the fault is not cleared, contact the manufacturer to have the inverter repaired.
e- 32	Control board failure	The control board does not work.	Contact the manufacturer to repair the inverter.
e- 33	Communication failure	Network communication error.	Check network control devices and cables. Check the setting of communication timeout f803 . Check the remote keypad panel cable.
e-3 4	Current Sensors Fault	The current sensor is abnormal.	Replace the inverter.
e-3 5	Network Error	Network communication failure	Check network control devices and cables.
e-36	Frequency Converter Type Error	Inverter hardware failure	f120 =7, if there is still an error, please contact the manufacturer to repair the inverter.

Fault Codes	Fault type	Possible causes of failure	Countermeasures
e-3 8	AI1 signal lost	The AI1 analog signal level is lower than the level set by parameter f422 .	Check the signal on AI1 and eliminate the cause of the signal loss. Confirm that parameter f422 is set correctly.
e- 39	Communication error inside the inverter	Communication error between the keyboard panel and the control board CPU.	Contact the manufacturer to repair the inverter.
e- 41	Input phase loss	There is a phase loss on the input side of the main circuit. There is something wrong with the internal parts of the inverter.	Identify the cause of input phase loss and correct it. Set parameter f 405 to 0.
e- 42	Output phase loss	There is a phase loss on the output side of the main circuit.	Identify the cause of the input phase loss (such as poor connection, output disconnection, or open motor winding) and correct it. Set parameter f 406 =0.
e-43	Emergency Stop	The motor works in remote mode and the keyboard panel is used to perform the stop operation.	Perform a fault reset.
e- 4 5	Torque boost is too large	Torque boost parameter f203 is too high. Motor impedance is too low.	Repeat the inverter self-learning, and then adjust parameter f203 downward .
e-4 6	Self-learning error	Check whether the motor rated parameters are set correctly. The motor capacity is much smaller than the inverter capacity. The motor cable is too thin. The motor is rotating at the start of the self-learning.	Correctly set the motor rated parameters. Use a larger capacity inverter. Use thicker motor cable. Make sure the motor is stopped before starting self-learning.
e- 98	External panel communication failure	Communication error between the external panel and the internal CPU.	Check whether the external panel is reliably connected to the lower network port (next to the 485 terminal) and whether the 485 is connected to the MDBUS communication network cable. If the connection fails, replace

Fault Codes	Fault type	Possible causes of failure	Countermeasures
			the new network cable and contact the manufacturer to repair the inverter.
e- 99	High power display board communication failure	Communication error between the display panel and the internal CPU of inverters with a power of 15 kW or above.	Check whether the panel and the APP Internet port are connected reliably If the network cable cannot be connected, replace it with a new one and contact the manufacturer to repair the inverter.

7.2 Prompt and alarm code description

Table 7.2 Prompt information display and countermeasures

Prompt code	Display instructions	Display reason	Countermeasures
a-00	Acceptable Fault reset	When the fault code is displayed, this display will appear when the STOP key is pressed.	Press the STOP key again to clear the fault. External logic input reset button pops up
a-01	Undervoltage prompt	Insufficient input voltage.	Check the three-phase input power. If the power is normal, the inverter needs to be repaired.
0 .0 (flashing)	Invalid operating permission (PWM disabled)	In remote control mode, the terminal corresponding to logic input function 1 is not closed.	Configure a logic input function to 1 (including f309 , f310) and close the terminal.
a-05	Frequency Points Setting exceptions	The frequency points of point 1 and point 2 are set too close.	Increase the setting interval between f 3 25 and f 3 27 . Increase the setting interval between f 3 29 and f 3 31 .
a-06	Short power outage Free stop	f418 is set to 2 and a brief power failure occurs.	Input the operation signal to the inverter again or reset the inverter.
a-07	DC braking	DC braking is activated.	If the code disappears after a few seconds, the inverter is normal.
a-08	Running retry	The inverter is restarting. Flying start is enabled.	The code is displayed briefly and then disappears, and the inverter is in restarting state.
a-10	Low speed sleep	See parameter f 501 .	This function can be disabled, or the frequency command can be increased to f009 + f906 .

Prompt code	Display instructions	Display reason	Countermeasures
a-11	Keyboard key failure	A key on the keyboard panel is pressed continuously for more than 20 seconds, or the keyboard panel is damaged.	If the alarm does not disappear after releasing all buttons, the inverter needs repair.
a-12	Initializing parameters	See parameter f120 .	If it disappears after being displayed briefly, the inverter is normal.
a-13	Analog signal loss	The level of the analog input terminal is lower than the setting of f422 .	Check if the analog input terminal is short-wired or if f422 is set correctly.
e1	Exceeds the displayable digits by 1	The displayed number of digits is greater than 4.	Try decreasing the f604 setting .
tun1	Self-learning in progress	The inverter is performing self-learning.	If the code is displayed briefly and then disappears, the inverter is normal.

Table 7.3 Pre-alarm code display

Code	type	illustrate
---c	Overcurrent warning	The inverter is in current limitation, see parameters f107 and f111 .
--u-	Overpressure warning	The inverter is approaching an overvoltage fault, see parameters f415 and f416 .
I ---	Overload warning alarm	This code is displayed when the motor or inverter overload counter exceeds 50%.
-h --	Overheat warning	The inverter is approaching an overtemperature fault.

Note: Pre-alarm type can appear at the same time, such as overheat pre-alarm and overcurrent pre-alarm appear at the same time, and the corresponding pre-alarm codes are -h-c .

7. 3 Restarting the inverter after a fault

After the inverter fails, the cause of the failure must be eliminated before the inverter can be restarted. The inverter fault can be reset according to the following operations.

(1) After the inverter fault is eliminated, press the STOP key on the keyboard panel. The panel displays a-00 . Press the STOP key again to reset the inverter fault. At this time, you can re-energize the motor.

(2) When the inverter is in remote control mode and f002 = 0, if the input function of any logic input terminal is configured as 10, the inverter can use this terminal to reset the inverter fault.

(3) When the inverter is in remote control mode and f002 = 2, fault reset is completed through remote communication equipment, see Appendix A. Serial communication.

(4) Turn off the power to the inverter and then turn it on again.

Note: When the fault is motor overload or inverter overload (e- 21 or e- 22) , the inverter cannot be reset if the calculated cooling time has not expired. The calculated cooling time is specified as follows： e- 21， 30 seconds after the fault occurs ; e- 22， 120 seconds after the fault occurs .

Appendix A: Serial Communications

Serial communication is the information exchange channel between the inverter and the host computer . Through serial communication, users can use personal computers or industrial control equipment (such as PLC, etc.) as the host to set the operating frequency of the inverter (slave) , give operating commands, modify or read parameters, read working status and fault information, etc., to achieve remote or centralized control of the inverter.

This series inverter adopts RS485 bus and Modbus protocol.

A1. RS485 bus

Serial communication bus of this series inverter is RS485 two-wire system, and the external interface is terminal block. The terminal names are as follows.

Table A.1 Terminal name assignment

Power range	Terminal Symbols	Terminal name	Terminal Function
Single-phase AC 220V all & Three-phase AC (380-480)V -(0.4kW~1.4kW heavy load)	A+	RS485 communication port	RS485 differential signal positive terminal
	B-		RS485 differential signal negative terminal
Three-phase AC (380-480)V Other	485+		RS485 differential signal positive terminal
	485-		RS485 differential signal negative terminal

RS485 two-wire system is half-duplex serial communication. At the same time, the host and slave cannot send and receive data at the same time, only one can send and the other can receive.

The RS485 two-wire system supports master-slave topology , that is, one host with multiple slaves, up to 31 slaves.

In the case of multi-machine communication or long-distance communication, it is recommended to connect the signal ground of the host and the common terminal of the inverter to improve the anti-interference ability of communication.

A2 . Modbus protocol

Modbus is a master-slave communication protocol, in which the host dominates the entire communication process: the slave will only execute an action or (and) feedback information to the host when the host sends a command to the slave, otherwise the slave will not perform any operation; slaves cannot communicate directly with each other.

The conversation between the master and slave can be divided into two categories:

(1) Point-to-point mode: The host sends a command to a slave individually, and the corresponding slave executes an action or (and) feedbacks information.

When the host command is correct, the slave executes the corresponding action and feeds back the result information to the host;

When the host command is wrong, the slave directly feeds back the error information to the host without performing any action.

(2) Broadcast mode: The host sends commands to all slaves, and all slaves execute the actions but do not feedback any information.

The Modbus protocol has two transmission modes: RTU and ASCII. This series of inverters only supports the RTU mode.

A2.1 Modbus-RTU message

The so-called "message" is a combination of communication data. When communicating in Modbus-RTU mode, the message is directly represented by hexadecimal code (1-9, AF), and two hexadecimal codes form a byte. The message format is shown in the figure below.

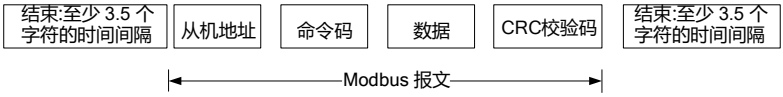


Figure A.2 Modbus message format

As shown in Figure A.2, during the communication process, the master and slave machines use a time interval of at least 3.5 characters to determine the start and end of the Modbus message. The Modbus message contains the complete data information to be sent, which is the slave address, command code, data, and CRC check code in order. Its length changes with the command code .

Modbus-RTU communication messages are divided into three categories:

(1) Query (request) message: command request message sent by the host to the slave;

(2) Normal response message: the feedback message from the slave when the host command is correct;

(3) Error response message: The feedback message from the slave when the host command is wrong/invalid.

For a detailed explanation of the various parts of the Modbus-RTU message, see Table A.2.

Table A.2 Explanation of each part of Modbus-RTU message

Serial number	name	illustrate
1	Slave Address	● The slave address is configurable between 0 and 247. ● When the host queries, if the slave address is set to 0, the dialogue is in broadcast mode, and all slaves execute commands but do not feedback information; if the slave address is set to 1-247, the dialogue is in point-to-point mode, and only the slave with a matching address executes commands and feedbacks information. ● In point-to-point mode, when the matching slave responds, it returns its own slave address.
2	Command code	● This series of inverters only supports some command codes of the standard Modbus protocol. ● There are two host query command codes and slave normal response command codes, which are: (1) 03H: read one word (2 bytes); (2) 06H: write one word (2 bytes). ● In case of error response, the slave feedback command code is: (host query command code + 80H).
3	data	● This part is the main content of communication and the core of data exchange. Its content and length vary with the command code. For details, please refer to the specific explanation of each command code in the following.
4	CRC Check code	● The CRC (Cyclical Redundancy Check) check code is used by the receiving device to detect errors in the received data and determine whether the received data is correct. For the generation of the CRC check code, see "A2.3 Cyclic Redundancy Check". Note: The CRC checksum is sent with the low-order byte first and the high-order byte later. In addition, Modbus-RTU messages adopt the sending order of "high-order byte first, low-order byte later".

A2.2 Detailed explanation of various command messages

A2.2.1 Read one word (2 bytes)——Command code 03H

1. Host query message

Table A.3 Command code 03H host query message format

Slave Address	Command code	Communication address		Read words		CRC checksum	
1 byte	1 byte	2 bytes		2 bytes		2 bytes	
		High	Low	High	Low	Low	High
	03H						

(1) Slave address, CRC check code: see Table A.2 .

(2) Command code: 03H, request to read N words (2 * N bytes) from the slave. Note that the maximum value of N is 5.

(3) Communication address: The address of the data to be read. This address is not the real physical address where the data is stored, but a number corresponding to the data. Each control, status, and monitoring parameter of this series of inverters corresponds to a communication address, see " A2.5 Communication Parameters " for details .

(4) Read word count: The length of the read data, with words (2 bytes) as the counting unit. If a request is to read one word, set it to 0001H.

2. The slave responds normally

Table A.4 Command code 03H: Normal response message from slave

Slave Address	Command code	Number of bytes read	Read data 1		…	Read data N		CRC checksum	
1 byte	1 byte	1 byte	2 bytes		…	2 bytes		2 bytes	
			High	Low	…	High	Low	Low	High
	03H				…				

(1) Slave address, CRC check code: see Table A.2.

(2) Command code: 03H, consistent with the host's request command code.

(3) Number of read bytes: The length of the data to be read, in bytes. If the host requests to read a word (2 bytes), the number of read bytes fed back by the slave is set to 02H.

Note: The counting unit for reading the data length here is different from the counting unit in the query message.

(4) Read data 1~ Read data N : Query the data corresponding to the communication address in the message.

3. Slave error response message

Table A.5 Command code 03H slave error response message

Slave Address	Command code	Error Code	CRC checksum	
1 byte	1 byte	1 byte	2 bytes	
			Low	High
	83H			

(1) Slave address, CRC check code: see Table A.2 .

(2) Command code: 83H, which is the sum of 03H and 80H.

(3) Error code: Indicates the reason why the slave cannot execute the host command . For details , see "A2.4 Error Code".

4. Example: Read the upper frequency limit

Host query message: 01 03 00 08 00 01 05 C8

Normal response message: 01 03 02 13 88 B5 12 (assuming the current upper limit frequency is 50Hz)

Error response message: 01 83 03 01 31 (assuming the read word count is changed from 0001 to FFFF)

A2.2.2 Write a word (2 bytes)——Command code 06H

1. Host query message

Table A.6 Command code 06H host query message format

Slave Address	Command code	Communication address		Writing Data		CRC checksum	
1 byte	1 byte	2 bytes		2 bytes		2 bytes	
		High	Low	High	Low	Low	High
	06H						

(1) Slave address, CRC check code: see Table A.2 .

(2) Command code: 06H, requesting to write one word (2 bytes) to the slave.

(3) Communication address: The address of the data to be read. This address is not the real physical address where the data is stored, but a number corresponding to the data. Each control, status, and monitoring parameter of this series of inverters corresponds to a communication address, see "A2.5 Communication Parameters" for details.

(4) Write data: Request the slave to write data.

A2.2.3 Write multiple words (2 * N bytes) ——Command code 10H

1. Host query message

Table A.7 Command code 10H host query message format

Slave Address	Command code	Communication first address		Write Word count		Write Number of bytes	Write data 1		…	Write data N		CRC checksum	
1 byte	1 byte	2 bytes		2 bytes		1 byte	2 bytes		…	2 bytes			
		High	Low	High	Low		High	Low	…	High	Low	Low	High
	10H								…				

(1) Slave address, CRC check code: see Table A.2 .

(2) Command code: 10H, request to write N words (2 * N bytes) of the slave. Note that the maximum value of N is 5.

(3) Communication first address: the first address of the data to be written . This address is not the real physical address where the data is stored, but a number corresponding to the data. Each control, status, and monitoring parameter of this series of inverters corresponds to a communication address, see "A2.5 Communication Parameters" for details.

(4) Number of words written: The number of words written to the slave.

(5) Number of bytes written: Number of bytes written to the slave = number of words written * 2.

(6) Write data 1~ write data N : data requested to be written by the slave.

2. The slave responds normally

Table A.8 Command code 10H slave normal response message format

Slave	Command	Communication	Number of words	CRC checksum

Address	code	first address		written			
1 byte	1 byte	2 bytes		2 bytes		2 bytes	
		High	Low	High	Low	Low	High
	10H						

(1) Slave address, CRC check code: see Table A.2 .

(2) Command code: 10H, consistent with the host's request command code.

(3) Communication initial address: consistent with the communication initial address of the host .

(4) Number of words written: The same as the number of words written by the host .

3. Slave error response message

Table A.9 Command code 10H slave error response message format

Slave Address	Command code	Error Code	CRC checksum	
1 byte	1 byte	1 byte	2 bytes	
			Low	High
	90H			

(1) Slave address, CRC check code: see Table A.2.

(2) Command code: 90H , which is the sum of 10H and 80H.

(3) Error code: See "A2.4 Error code" for details.

4. Example: Write 5 consecutive parameters starting from parameter f300

Host query message: 01 10 03 00 00 05 0A 00 01 00 03 00 04 00 01 00 0B 9D AE

(Assume that the five parameters are set as f300 = 1; f301 = 3; f302 = 4; f303 = 1; f304 = 11)

Normal response message: 01 10 03 00 00 05 00 4E

Error response message: 01 90 03 0C 01 (assuming data setting error)

Table A.10 Error code description

Error Code	description
01	Command code error
	● A command code other than 03H, 06H, or 10H is set in the query message.
02	Communication address error
	● The communication address being accessed does not exist. ● The register corresponding to the communication address is not allowed to perform the action required by the current command code.
03	Data setting error
	● The data written exceeds the allowable range of the register. ● A parameter in the query message is set incorrectly.
04	Unable to proceed with host request
	● An error occurred while writing data. ● Currently, the register corresponding to the communication address

	does not allow the action required by the command code.

A2.3 Cyclic Redundancy Check (CRC)

Modbus-RTU communication messages use cyclic redundancy check (CRC) for transmission error detection.

During each communication, the sender calculates the CRC check code of the data to be sent according to the CRC rules, and then attaches it to the data to be sent together; after receiving the data, the receiver recalculates the CRC check code according to the same rules, but the calculation does not include the received CRC check code. It is compared with the received CRC check code. If the two are not equal, it is considered that the data transmission is incorrect.

The verification of messages of this series of inverters adopts the CRC16 rule. Each CRC check code is 2 bytes, containing a 16-bit binary value. The specific calculation method is as follows:

(1) Initialize the CRC register (16 bits) to 0xFFFF;

(2) XOR the first byte of the message (i.e., the slave address) with the lower 8 bits of the CRC register, and put the result back into the CRC register;

(3) Shift the contents of the CRC register right by one bit and fill the highest bit with 0;

(4) Check the shifted bits after right shift:

If the shifted bit is 0, repeat (3), that is, shift right one bit again;

If the shifted bit is 1, the CRC register is "XORed" with 0xA001, and the calculation result is placed back into the CRC register;

(5) Repeat (3) and (4) until the data is right-shifted 8 times, and the same process is performed on the entire 8-bit data;

(6) Repeat steps (2) to (5) to process the next byte in the message;

(7) After all bytes in the message are calculated according to the above steps, the content of the CRC register is the CRC check code.

After obtaining the CRC check code according to the above method, attach it to the sent data for transmission. For the Modbus-RTU communication protocol, the high and low bytes of the CRC check code need to be exchanged, that is, the low byte is sent first and the high byte is sent later.

When the software calculates the CRC check code, there are two methods: table lookup method and online calculation method. The table lookup method has a fast calculation speed, but the table data takes up a certain amount of space; while the online calculation method does not require table data, saves space, but is more time-consuming. In actual application, you can choose the appropriate algorithm according to the specific situation.

A2.4 Error Codes

When the slave fails to execute the host request, the slave will feedback the corresponding error code to indicate the current error cause. The specific meaning of the error code is detailed in the table below.

Table A.11 Error code description

Error Code	Description
01	Command code error

	● A command code other than 03H or 06H is set in the query message.
02	Communication address error
	● The communication address being accessed does not exist.
02	● The register corresponding to the communication address does not allow the action required by the current command code .
03	Data setting error
	● The data written exceeds the allowable range of the register. ● A parameter in the query message is set incorrectly.
04	Unable to proceed with host request
	● An error occurred while writing data. ● Currently, the register corresponding to the communication address does not allow the action required by the command code.

A2.5 Communication parameters

1. Control parameters

By editing the control parameters through serial communication, the function setting, operating frequency setting, start and stop control of the inverter can be realized .

(1) Basic parameters

The basic parameters are divided into 10 groups (F0-F9), which mainly control the function settings of the inverter. For detailed explanation and value range, please refer to " 6. Function parameters ".

Note: The communication address of the basic parameters corresponds to the respective display code. The communication address is exactly the same as the display code when the power is off; the communication address is not exactly the same as the display code when the power is off, and the highest bit F needs to be changed to 0 (zero);

For example: if the display code of the parameter "motor control mode" is f001 , the corresponding communication address not saved when power is off is 0xF001, and the corresponding communication address saved when power is off is 0x0001;

For example, if the display code of the parameter "jog stop mode" is f702 , the corresponding communication address not saved after power failure is 0xF702, and the corresponding communication address saved after power failure is 0x0702;

(2) Communication control word (communication address: FA05)

A.1 2 Detailed explanation of communication control words

Bit	Functional Description	0	1	default value
0	Jog	Non-jog	By jog frequency	0
1	Forward/Reverse	Forward	Reversal	0
2	Run/Stop	stop	run	0
3	Free parking	No Action	Free parking	0
4	Emergency Stop	No Action	Emergency Stop	0
5	Fault reset	No Action	Reset	0
6	Frequency setting by communication	Disable	Enable	0

Bit	Functional Description	0	1	default value
7	Give commands via communication	Disable	Enable	0
8	Multi-speed position 1	OFF	ON	0
9	Multi-speed position 2	OFF	ON	0
10	Multi-speed position 3	OFF	ON	0
11	Multi-speed position 4	OFF	ON	0
12	Motor parameter switching	Parameters of the first motor	Parameters of the second motor	0
13	PI control disabled	Allow PID control	Disable PID control	0
14	Acceleration and deceleration curve switching	Acceleration and deceleration curve 1	Acceleration and deceleration curve 2	0
15	DC braking	No DC braking	DC braking starting	0

(3) Communication operation frequency setting (communication address: FA08)

A.13 Communication operation frequency setting

Bit	Functional Description	default value
0-15	The operating frequency data set by the communication, Hexadecimal setting: 50Hz —> (50Hz) × 100 = 5000 —> 1388H, That is, to set 50Hz, 1388H must be written to FA08.	0.0

(4) Communication analog output setting (communication address: FA16)

A.14 Communication analog output setting

Bit	Functional Description	Lower limit	Upper limit	default value
0-15	Analog output data of communication settings (Corresponding analog output function: 15)	0 (0000H)	1023 (03FFH)	0

2. Monitoring parameters

By reading the monitoring parameters through serial communication, you can view the operating status of the inverter. The following table describes the monitoring parameters.

A.15 Monitoring parameter description 1

Serial number	Mailing address	Functional Description	unit	Remark
1	FD03	Real-time operation status	-	See Table A.1 9 for details
2	FD 12	Real-time operating frequency	0.01Hz	
3	FE18	Actual output frequency	0.01Hz	
4	FE 09	DC bus input voltage	0.01%	
5	FE 10	Output voltage	0.01%	
6	FE 08	Output Current	0.01%	

Serial number	Mailing address	Functional Description	unit	Remark
7	FE 20	Output torque	0.01%	
8	FE 29	Output Power	0.01kW	
9	FE 50	Motor speed (estimated)	1rpm	
10	FE 11	Logic Input	-	See Table A.1 7 for details
11	FE 12	Logic Output	-	See Table A.1 8 for details
12	FE 30	Analog input AI1 (10-bit accuracy)	-	Range (0-1023)
13	FE 31	Analog input AI2 (10-bit accuracy)	-	Range (0-1023)
14	FC 39	Fault monitoring	-	See Table A. 20 for details
15	FA35	Given pressure percentage	-	See Table 6.12 for details
16	FA36	Feedback pressure percentage	-	See Table 6.12 for details
17	FE41	Inverter rated current	0.1A	
18	FE51	The high-speed pulse input frequency is converted into the operating frequency value of the inverter	0.01Hz	0.00Hz~400.00Hz
19	FE52	High-speed pulse input frequency value	0.01kHz	0.00kHz~2 0 .00kHz

A.16 Monitoring parameter description 2

Serial number	Communication address	Functional Description	unit	Remark
1	E000	Real-time operation status	-	See Table A.19 for details
2	E001	Real-time operating frequency	0.01Hz	
3	E002	Output Current	According to f534 setting	It is recommended to adjust f534 = 1
4	E003	Fault monitoring	-	See Table A. 20 for details
5	E004	PID setting		
6	E005	PID Feedback		
7	E006	Output voltage	V	
8	E007	Motor speed (estimated)	1rpm	
9	E008	Output torque	0.01%	

Serial number	Communication address	Functional Description	unit	Remark
10	E009	DC bus input voltage	V	
11	E010	Input Power	0.01kW	
12	E011	Output Power	0.01kW	
13	E012	Input power accumulation	Wh	
14	E013	Output power accumulation	Units according to parameters	
14	E013	Output power accumulation	f617 OK	
15	E014	Cumulative running time	h(hour)	
16	E015	Logic Input	-	See Table A.17 for details
17	E016	Logic Output	-	See Table A.18 for details
18	E017	Analog input AI1 (10-bit accuracy)	-	Range (0-1023)
19	E018	Analog input AI2 (10-bit accuracy)	-	Range (0-1023)

Table A.1 7 Logic input status monitoring

Communication address	Functional Description		
FE11/ FD01 /E015	Logic input status monitoring		
Bit	Description	0	1
0	Terminal LI1	OFF	ON
1	Terminal LI2	OFF	ON
2	Terminal LI3	OFF	ON
3	Terminal LI4	OFF	ON
4	Terminal LI5	OFF	ON
5	Terminal LI6	OFF	ON
6	Terminal LI7 or AI1 as logic input	OFF	ON
7	Terminal LI8 or AI2 as logic input	OFF	ON

8-15	reserve	-	-

Table A.1 8 Logic Output Status Monitoring

Mailing address	Functional Description		
FE12/ FD02 /E016	Logic output status monitoring		
Bit	description	0	1
0	Terminal LO-CLO	OFF	ON
1	Relay T2	OFF	ON
2	Relay T1	OFF	ON
3-15	reserve	-	-

Table A.1 9 Real-time operation status monitoring

Communication address	Functional Description		
FD0 3 /E000	Real-time operation status monitoring		
Bit	description	0	1
0	reserve	-	-
1	Fault	No fault	Tripped
2-8	reserve	-	-
9	Forward/Reverse	Forward	Reversal
10	Run/Stop	stop	run
11-15	reserve	-	-

Table A.20 Fault Monitoring

Communication address	Functional Description	
FC39/E003	Fault monitoring	
Value	Corresponding fault	Panel Display

0000H	No fault	nerr
0001H	Acceleration overcurrent	e-01
0002H	Deceleration overcurrent	e-01
0003H	Constant speed overcurrent	e-01
0008H	Input phase loss	e-41
0009H	Output phase loss	e-42
000AH	Acceleration overvoltage	e-11
000BH	Deceleration overvoltage	e-11
000CH	Constant speed overvoltage	e-11
000DH	Inverter overload	e-21
000EH	Motor overload	e-22
0010H	Overheat trip	e-24
0011H	Emergency trip	e-43
0012H	EEPROM error 1 (write error)	e-31
0013H	EEPROM error 2 (read error)	e-31
0014H	EEPROM error 3 (internal error)	e-31
0018H	External communication error	e-33
001AH	Current detection fault	e-34
001CH	Inverter hardware current limiting fault	e-09
001EH	Undervoltage	e-12

Appendix B : Braking unit/resistor selection

When the motor needs to decelerate quickly or accurately in the transmission application, in order to obtain the required braking torque and avoid excessive pump-up voltage during deceleration that affects the safe operation of the equipment, a braking unit

and a braking resistor are required to release the energy fed back to the DC bus. Under normal working conditions, the braking resistor can be selected according to the configuration in Table B.1.

Table B.1 Braking resistor selection reference

Specifications	Braking unit		Braking resistor		
	Specification	quantity	Resistance	power	quantity
0.4kW heavy load - single phase AC	built-in	1	200 Ω	80W	1
0.75kW heavy load - single phase AC		1	150 Ω	80W	1
1.5kW heavy load - single phase AC		1	100 Ω	100W	1
2.2kW heavy load - single phase AC		1	70Ω	100W	1
0.4kW heavy load/0.75kW light load - three-phase AC		1	900 Ω	9 0W	1
0.75kW heavy load/1.5kW light load - three-phase AC		1	750 Ω	110W	1
1.5kW heavy load/2.2kW light load - three-phase AC		1	400 Ω	260W	1
2.2kW heavy load/3kW light load - three-phase AC		1	250 Ω	320W	1
3kW heavy load/4kW light load - three-phase AC		1	250 Ω	320W	1
4kW heavy load/5.5kW light load - three-phase AC		1	150 Ω	400W	1
5.5kW heavy load/7.5kW light load - three-phase AC		1	100 Ω	520W	1
7.5kW heavy load/11kW light load - three-phase AC		1	75Ω	1040W	1
11kW heavy load/15kW light load - three-phase AC		1	50 Ω	1040W	1

Appendix C: Certificate of Conformity and Warranty Card

保 修 卡

客户名称:_____

详细地址:_____

联 系 人:_____ 联系电话:_____

产品型号:_____

产品编号:_____

购买日期:_____ 故障时间:_____

适配电机:_____ 设备名称:_____

故障说明:_____

_____

_____

注：请将此卡与故障产品一起发到我司，谢谢!

合 格 证

检 验 员:_____

产品型号:_____

产品编号:_____

日　　期:_____

本产品经我们品质控制、品质保证部门检验，其性能参数符合随机附带《使用说明书》标准，准予出厂。