Operation manual

VFD200A Series

High Performance vector frequency inverter

Preface

This manual provides you with relevant instructions and precautions for installation, wiring, function parameter setting, routine maintenance, troubleshooting and troubleshooting of the inverter.

In order to fully utilize the functions of the product and ensure the safety of users and equipment, please read this manual carefully before using the inverter. Improper use may cause the inverter to operate abnormally, malfunction, reduce the service life, and even cause equipment damage, personal injury and other accidents!

Please pay special attention to the following safety precautions when handling this product.

- Please ensure to turn off the power when wiring.
- The inverter must be properly grounded.
- The AC power cord must never be connected to the inverter output terminals U, V, W.
- There is a high voltage circuit inside the inverter. It is strictly forbidden to touch the internal parts by hand.
- Only qualified electricians can install, wire, repair and repair the inverter.
- Install the inverter in a suitable environment to prevent direct exposure to high temperatures and sunlight, and to avoid splashing of moisture and water droplets.
- Please perform at least five minutes after the power is turned off during inspection and maintenance.
- Never modify the parts or circuits inside the inverter by yourself.
- Do not test the voltage inside the inverter.
- This series of products cannot be used in situations that endanger personal safety.

Contents

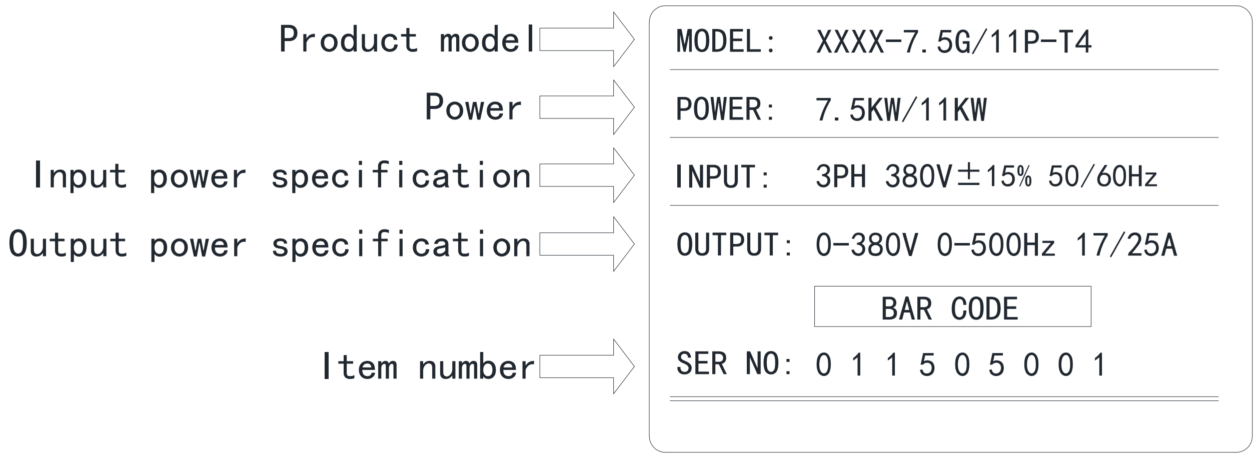
Chapter 1 Production information

1-1 Inspection

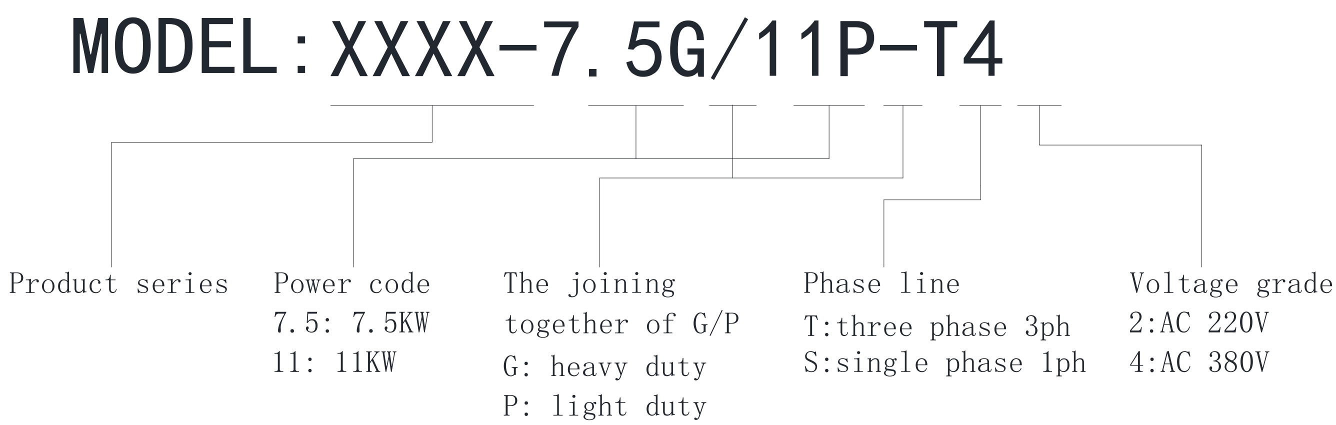
Each inverter is subjected to strict quality control before being shipped from the factory, and is made of enhanced anti-collision packaging. After the customer unpacks, please check the following items:

✧ Check if the inverter is damaged during transportation.
✧ Check the package for instructions (with certificate and warranty card).
✧ Check the inverter nameplate and confirm that it is the product model you ordered.
✧ If you ordered any option for the drive, please check to confirm.

1-2 Name plate



Product model description:



1-3 Specification of inverter

Rated power kW	0.7	1.5	2.2	0.7	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45
Output current A	5	7	11	2.5	3.7	5.1	9	13	17	25	32	38	45	60	75	90
rated voltage V	single-phase 220V			three-phase 380V												
Rated power kW	55	75	90	110	132	160	185	200	220	250	280	315	350	400	450	500
Output current A	110	150	176	210	250	300	340	380	420	470	520	585	650	725	820	900
rated voltage V	three-phase 380V															

Item		Specifications	
Standard functions	Maximum frequency	Vector control：0～500Hz V/F control： 0～500Hz	
	Carrier frequency	0.5kHz～16kHz (The carrier frequency is automatically adjusted based on the load features.)	
	Input frequency resolution	Digital setting: 0.01 Hz Analog setting: maximum frequency x 0.025%	
	Control mode	Sensor-less flux vector control (SFVC) Closed-loop vector control (CLVC) (+PG Card) Voltage/Frequency (V/F) control	
	Startup torque	0.5Hz/150%（SVC)；0Hz/180%（FVC）	
	Speed range	1：100 （SVC）	1：1000 （FVC）
	Speed stability accuracy	±0.5%（SVC）	±0.02%（FVC）
	Torque control accuracy	±5%（FVC）	
	Overload capacity	G type: 60s for 150% of the rated current, 3s for 180% of the rated current P type: 60s for 120% of the rated current, 3s for 150% of the rated current	
	Torque boost	Auto boost; Manual boost: 0.1%~30.0%	
	V/F curve	Straight-line V/F curve Multi-point V/F curve N-power V/F curve (1.2-power, 1.4-power, 1.6-power, 1.8-power, square)	
	V/F separation	2 types: complete separation; half separation	
	Acceleration/deceleration curve	Straight-line ramp S-curve ramp Four groups of acceleration/deceleration time with the range of 0.00s~65000s	

	DC braking	DC braking frequency: 0.00 Hz ~ maximum frequency Braking time: 0.0~100.0s Braking trigger current value: 0.0%~100.0%
	JOG control	JOG frequency range: 0.00Hz~50.00 Hz JOG acceleration/deceleration time: 0.00s~65000s
	Built-in PLC, multiple speeds	It realizes up to 16 speeds via the simple PLC function or combination of DI terminal states
	Built-in PID	It realizes closed loop control system easily.
	Auto voltage regulation (AVR)	It can keep constant output voltage automatically when the mains voltage fluctuation.
	Over-voltage/ Over current stall control	The current and voltage are limited automatically during the running process so as to avoid frequently tripping due to over-voltage/over current.
	Rapid current limit function	It can auto limit running current of frequency inverter to avoid frequently tripping.
	Torque limit and control	(Excavator characteristics) It can limit the torque automatically and prevent frequently over current tripping during the running process. Torque control can be implemented in the VC mode.

Item		specification
Individualized functions	High performance	Control of asynchronous motor is implemented through the high-performance current vector control technology.
	Instant power off not stop	The load feedback energy compensates the voltage reduction so that the frequency inverter can continue to run for a short time.
	Rapid current limit	To avoid frequently over current faults of the frequency inverter.
	Virtual IO	Five sets of virtual input and output for simple logic control
	Timing control	Time range: 0.0~6500.0 minutes
	Multi-motor switching	Four sets of motor parameters for four motor switching control
	Multiple communication protocols	Currently supports communication bus via Modbus-RTU and later will support PROFIBUS-DP, CAN open, etc.
	Motor overheat protection	The optional I/O extension card enables AI3 to receive the motor temperature sensor input (PT100, PT1000) so as to realize motor overheat protection.
	Multiple encoder types	It supports incremental encoder and encoders such as differential encoder, open-collector encoder, resolver, UVW encoder, and SIN/ COS encoder.
	Running command giving	key panel Control terminals Serial communication port You can switch between these giving in various ways.
	Frequency giving	There are 10 kinds frequency giving: digital setting, analog voltage setting, analog current setting, pulse setting, serial communication port setting, panel potentiometer, etc.

		You can switch between these giving in various ways.
Item		**Specification**
run	Auxiliary frequency giving	There are 10 kinds auxiliary frequency giving. It can implement tiny tuning of auxiliary frequency and frequency synthesis.
	Input terminal	Standard: 5 digital input (DI) terminals, one of which supports up to 100 kHz high-speed pulse input 2 analog input (AI) terminals, support 0V~10 V voltage input or 0 mA~20 mA current input Expanding capacity: 5 DI terminals 1 AI terminal supports -10V~10 V voltage input.
	Output terminal	Standard 1 high-speed pulse output terminal (open-collector) that supports 0–100 kHz square wave signal output 1 digital output (DO) terminal 1 relay output terminal 2 analog output (AO) terminals, support 0 mA ~ 20 mA current output or 0 V~10 V voltage output. Expanding capacity: 1 DO terminals 1 relay output terminals
Display	LED display	It displays the parameters.
	Parameters copy	It can implement copy parameters function by PC software.
	Key locking and function selection	It can lock the keys partially or completely and define the function range of some keys so as to prevent disoperation.
	Protection mode	Motor short-circuit detection at power-on, input/output phase loss protection, overcurrent protection, overvoltage protection, under-voltage protection, overheat protection and overload protection, etc.
Environment	Installation location	Indoor, no direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapor, drip or salt.
	Altitude	Lower than 1000 m
	Ambient temperature	-10°C~ +50°C (If the ambient temperature is between 40°C and 50°C, the power grade is reduced for use)
	Humidity	Less than 95%RH, without condensing
	Vibration	Less than 5.9 m/s2 (0.6 g)
	Storage temperature	-20°C ~ +60°C

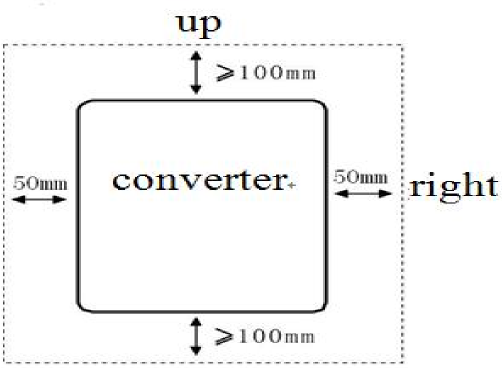
Chapter 2 Installation

2-1 Installation environment

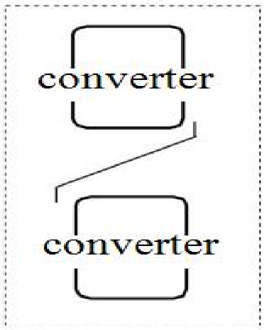
- Locations free of water droplets, vapors, dust and oily dust.
- Non-corrosive, flammable gas and liquid.
- No floating dust metal particles.
- Strong and vibration-free place.
- Locations without electromagnetic noise interference.
- The environment temperature is -10 °C ~ 50 °C. If the environment temperature exceeds 40 °C, please place it in a well ventilated place and delate the inverter.

2-2 Installation method and space

- The inverter should be installed on a structure that does not burn, such as metal, otherwise a fire accident may occur.
- The inverter should be installed vertically and securely with screws. Do not flip, tilt or install horizontally. When the inverter runs, heat is generated. To ensure the passage of the cooling air, a certain space is left during installation (as shown in the figure).
- When installing the inverter in the control cabinet, consider ventilation and heat dissipation to ensure that the ambient temperature of the inverter does not exceed the specified value. Do not install the inverter in a closed box with poor ventilation.
- When installing multiple inverters in the same control cabinet, it is recommended to install them side by side in order to reduce the thermal impact between each other. If it is necessary to install up and down, a partition plate must be provided to reduce the influence of heat generated in the lower part on the upper part (as shown in the figure).
- Do not allow foreign matter such as various fibers, paper sheets, chips (chips) or metal fragments to enter the inverter.



Single installation diagram



Upper and lower installation

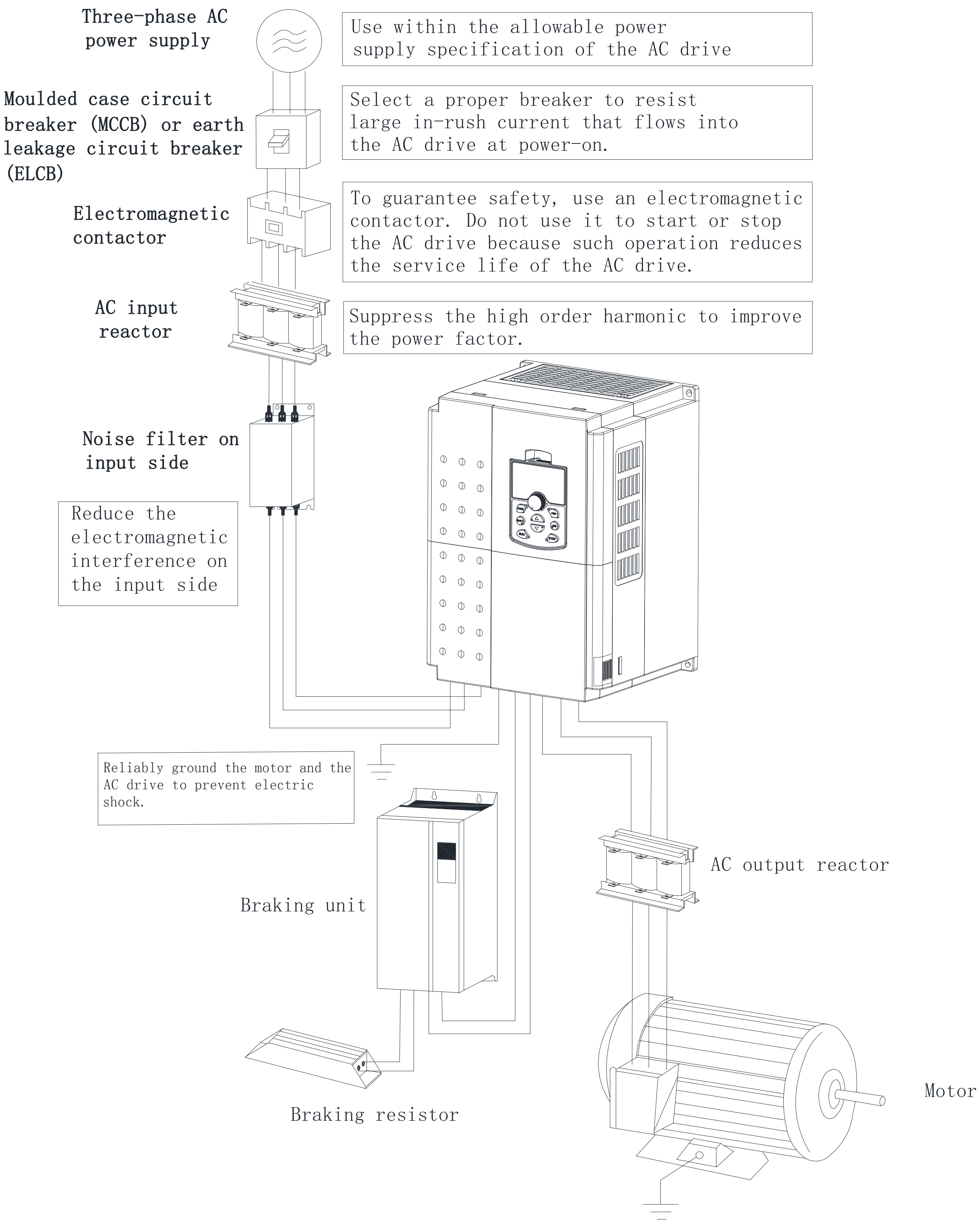
Power level	Installation size	
	A	B
≤15kw	≥20mm	≥100mm
18.5~30kw	≥50mm	≥200mm
≥37kw	≥50mm	≥300mm

Chapter 3 Wiring

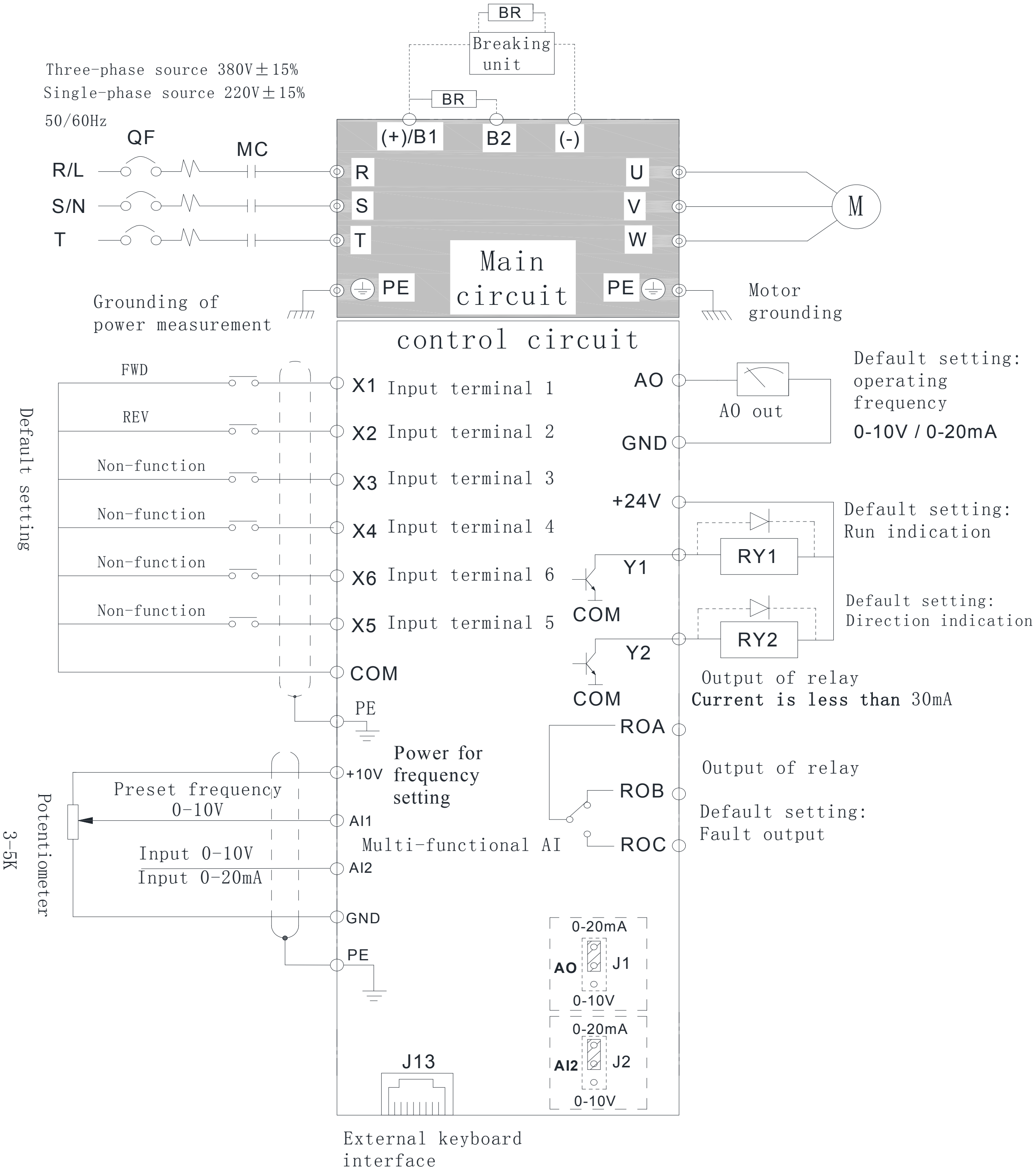
In order to ensure the safety of operators and inverters, it is necessary to be operated by qualified professional electricians. The following are special considerations when wiring：

- Make sure the input power is off before wiring.
- The ground terminal of the inverter must be reliably grounded.
- Verify that the rated voltage of the inverter matches the AC power supply voltage.
- The power cable must be connected to the R, S, and T terminals of the inverter. The motor cable should be connected to the U, V, and W terminals. Do not connect the fault. Otherwise, the inverter will be damaged internally.
- Confirm that the terminals and wires are reliably connected, and the screws of the main circuit terminals are secured.
- Do not touch the main circuit terminals, otherwise there is danger of electric shock.

3-1 Peripheral device connection



3-2 Standard wiring diagram



3-3 Main circuit terminal description

Terminal symbol	Function description
R S T	**Power input terminal for three-phase 380V inverter.**
L N	**（Power input terminal for single-phase 220V inverter）**
U V W	**The inverter output terminal is connected to a three-phase AC**

	motor.
B1 B2	**Braking resistor connection terminal (optional)**
(+) (-)	**External brake unit connection terminal (optional).**
⏚	**Ground terminal.**

✧ When wiring, please follow the electrical regulations to ensure the safety.

3-3-1 Power input terminal R，S，T

◆ A circuit breaker is required between the three-phase AC input power supply and the main circuit terminals (R, S and T). It is better to connect a magnetic contactor (MC) in series to cut off the power supply when the inverter protection function is activated (the R-C surge absorber is required at both ends of the electromagnetic contactor).

◆ If the inverter is equipped with an earth leakage circuit breaker as a leakage fault protection, in order to prevent the leakage circuit breaker from malfunctioning, please select a sensitivity current of 200 mA or more and an operation time of 0.1 second or longer.

◆ In order to prevent the high voltage and high current input into the power supply circuit and damage the rectifier part, it is necessary to connect the AC reactor on the input side, and also improve the power factor of the input side.

◆ Do not use the main circuit power ON/OFF method to control the operation and stop of the inverter. The drive's operation and stop should be controlled using the RUN and STOP keys on the keypad panel or the control loop terminals. If the main power ON/OFF method must be used to control the operation of the inverter, it can only be performed once per hour.

◆ To reduce the interference of the inverter to surrounding equipment, the noise filter can be connected to the input side.

◆ Do not connect the three-phase power supply to the single-phase power supply.

3-3-2 Connection of inverter output terminals U, V, W

◆ The inverter output terminals are connected to the 3-phase motor in the correct phase sequence. If the motor rotates in the wrong direction, the wiring of any two phases of U, V, and W can be exchanged.

◆ The output side of the inverter cannot be connected to the capacitor and the surge absorber.

◆ When the wiring between the inverter and the motor exceeds 50 meters, the distributed capacitance between the lines will generate a large leakage current, which may cause the inverter to over-current trip. At the same time, in order to avoid damage to the motor insulation, the output reactor must be compensated. .

◆ If the installation location of the inverter is quite sensitive to interference, please install an output noise filter to reduce the carrier frequency of the inverter and reduce interference.

3-3-3 Braking resistor and brake unit connection

◆ When the load inertia is large and it is necessary to stop frequently or stop for a short time, when the braking capacity of the inverter is insufficient or to increase the braking torque, etc., the braking resistor or the braking unit may be selected as needed.

◆ The main circuit B1, B2 terminal is connected to the braking resistor (there is B1, B2 terminal indicates that the inverter has built-in braking unit).

◆ When the inverter has no built-in braking unit, the main circuit (+) and (-) terminals are connected to the external braking unit.

◆ Do not connect the main circuit (+) and (-) terminals to the braking resistor.

3-3-4 Inverter Grounding Terminal PE

◆ For safety and noise reduction, the ground terminal PE of the inverter must be well grounded.

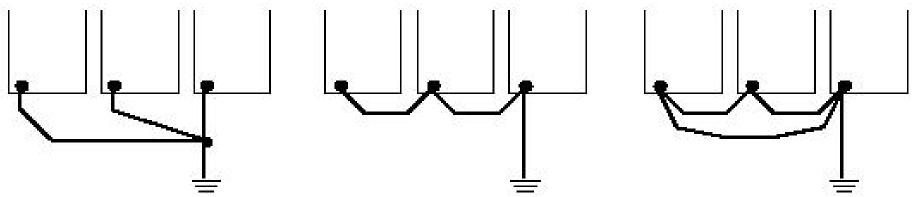
◆ Use the specified standard grounding wire and be as short and thick as possible (grounding impedance 10Ω or less).

◆ The grounding wire of the inverter must not be grounded together with large current loads such as electric welders and high-power motors, but must be grounded separately.

◆ The power supply line generally adopts 5 core wires, of which 3 are fire wires, 1 neutral wire, and 1 ground wire. It is strictly forbidden to use the neutral wire as ground wire.

◆ When multiple inverters are installed together, all inverters must be directly connected to the common ground.

Please refer to the following illustration:



(a) correct　　（b）Not recommended　　（c）Incorrect

3-4 Control circuit terminal description

+24V	Y1	Y2	X1	X2	X3	X4	AO	485-	485+	
	ROA	ROB	ROC	COM	X5	X6	GND	AI1	AI2	+10V

classification	mark	Terminal name	Terminal description and Default Setting
Multi-function input	X1	Multi-function input terminal 1	Default Setting：Forward
	X2	Multi-function input terminal 2	Default Setting：Reverse
	X3	Multi-function input terminal 3	Default Setting：No function
	X4	Multi-function input terminal 4	Default Setting：No function
	X5	Multi-function input terminal 5	Default Setting：No function
	X6	Multi-function input terminal 6	Default Setting：No function，Can be used as a high speed pulse input
	COM	Public terminal	Multi-function input common, +24V power supply reference ground
Analog input	AI1	Analog input 1	0~10V input
	AI2	Analog input 2	0~10V/0~20mA input (J2 optional)
	+10V	Analog power supply	+10V DC 10mA （Potentiometer 3~5K）
	GND	Analog reference ground	Analog input and output reference ground
Multi-function output	Y1	Multi-function input terminal 1	Default Setting：running
	Y2	Multi-function input terminal 2	Default Setting： No output, can be used as high speed pulse output
	ROA	Relay output	Default Setting：Inverter fault output
	ROB	ROA-ROB closed	
	ROC	ROA-ROC open	
Analog output	AO	Analog output terminal	0~10V/0~20mA output (J1 optional) GND means ground
Power supply	+24V	+24V power	+24V DC 100mA COM Power ground
Communication	485+	485 Positive signal	Standard RS-485 serial communication interface Please use twisted pair or shielded wire
	485-	485 Negative signal	

Use a multi-core shielded cable or stranded wire to connect the control terminals. When using a shielded cable (on one end of the drive), it should be connected to the ground terminal PE of the drive. When wiring, the control cable should be away from the main circuit and high-voltage lines (including power lines, motor lines, relays, contactors, etc.) more than 20CM, and avoid parallel placement. It is recommended to use vertical wiring to prevent external interference from generating inverter errors action.

Chapter 4 Keypad operation

4-1 Description of the keyboard panel

Keyboard panel

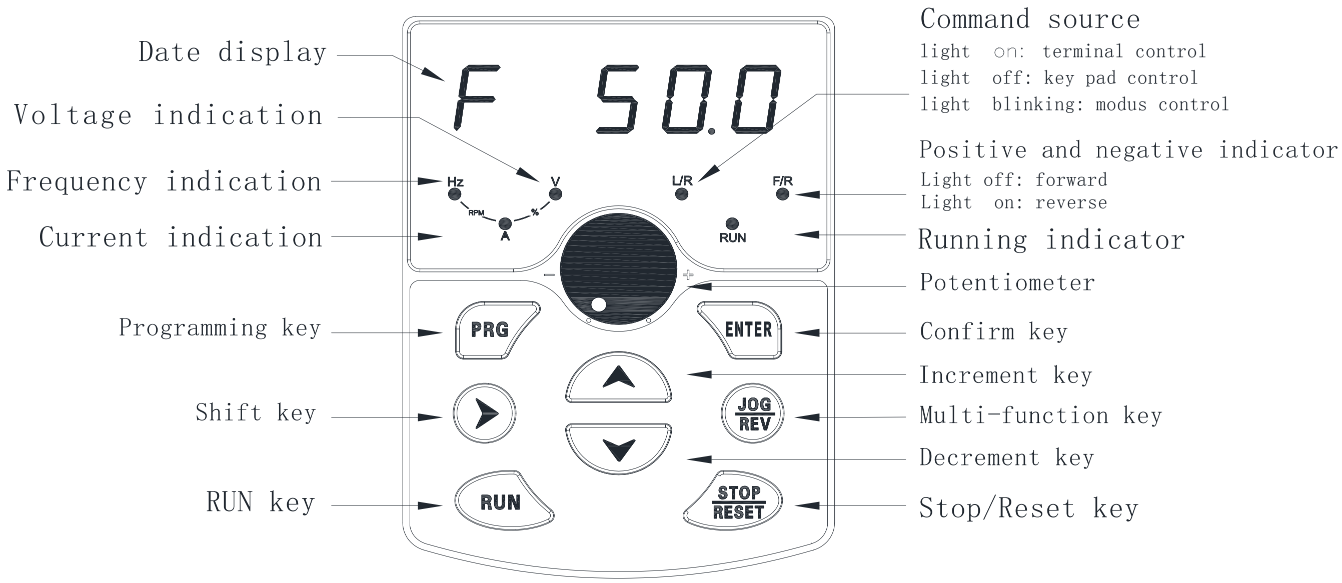


Figure 4-1 Keyboard function

Panel indicator description

RUN	When the light is off, the inverter is in the stop state. When the light is on, the inverter is in the running state.				
L/R	Keyboard operation, terminal operation and communication operation indicator, the light off indicates the keyboard operation control status, the light is on indicates the terminal operation control status, and the light flashes to indicate that it is in the communication operation control state.				
F/R	Positive and negative indicators, when the light is on, it indicates that it is in reverse running mode.				
TUNE	Tuning/torque control/fault indicator. When the light is on, it indicates that it is in the torque control mode. When the light is flashing slowly, it indicates that it is in the tuning state. If the light is flashing, it indicates that it is in the fault state.				
Hz	Lights indicate frequency units	A	Lights up to indicate current unit	V	The light is on to indicate the voltage unit
RMP	The Hz lamp and the A lamp are simultaneously lit to indicate the speed unit.				
%	The A and V lamps are lit at the same time to indicate the percentage unit.				

Digital display area:

A total of 5 LED displays, which can display the set frequency, output frequency, various monitoring data and alarm codes, etc.

Keyboard button description

button	name	function
PRG	Programming key	Enter or exit menu level I.
ENTER	Confirm key	Enter the menu interfaces level by level, and confirm the parameter setting.
△	Increasing key	Increase data or function code.
▽	Decreasing key	Decrease data or function code.
▷	Menu move selection / monitoring key	Select the displayed parameters in turn in the stop or running state, and select the digit to be modified when modifying parameters.
RUN	Running key	Start the frequency inverter in the operation panel control mode.
STOP/RES	Stop/Reset key	Stop the operation when it is in the running state and perform the reset operation when it is in the fault state. The functions of this key are restricted by P7-02.
JOG/REV	Multifunction key	Perform function switchover (such as quick switchover of command source or direction) according to the setting of P7-01.
Potentiometer	Potentiometer knob	Regulate the speed directly by panel potentiometer when P0-03 is set to 4.

4-2 Function code modification, view instructions

Function code modification instructions

The operation panel of the inverter adopts a three-level menu structure for parameter setting and other operations. The three levels of menu are: function parameter group (first level menu) → function code (second level menu) → function code setting value (third level menu)。

The operation process is shown in Figure 4-2.

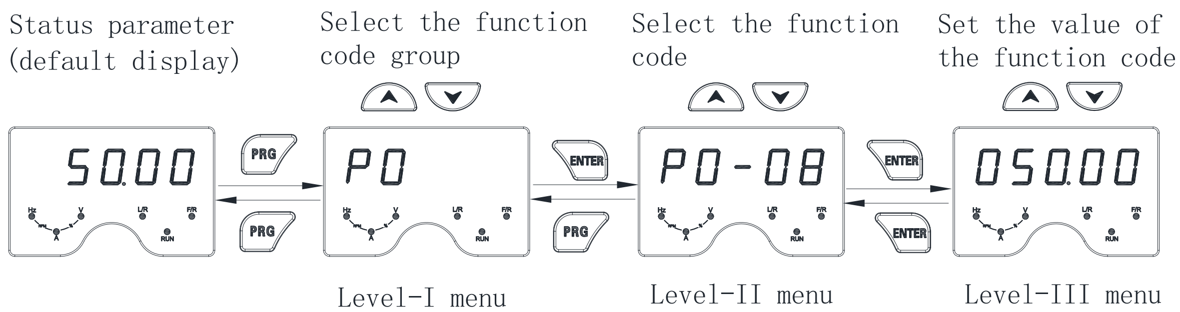
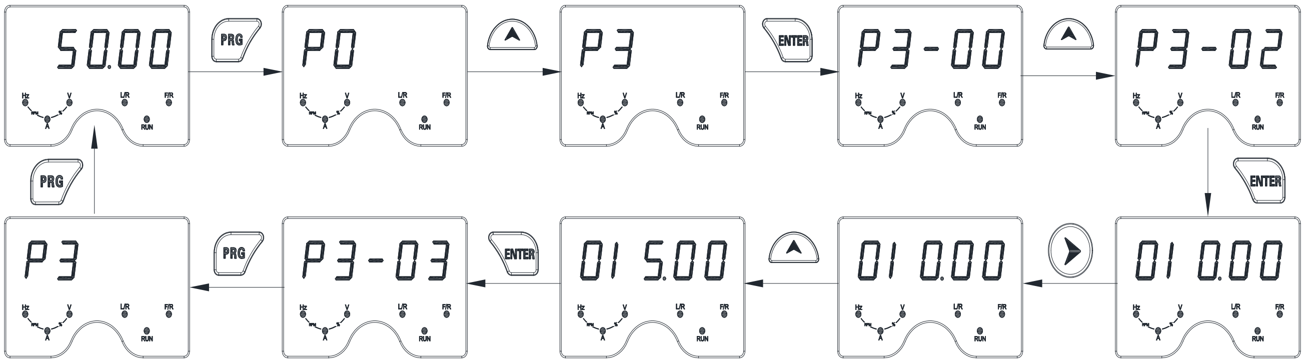


Figure 4-2 Three-level menu operation flow Chart

Note: When operating in a three-level menu, press the PRG or ENTER key to return to the secondary menu. The difference between the two is: press the ENTER key to save the set parameters and return to the second level menu, and automatically transfer to the next function code; press the PRG key to return directly to the second level menu, do not store the parameters, and return to the current function code .

Example: An example of changing the function code P3-02 from 10.00 Hz to 15.00 Hz. (black mark indicates flashing bit)



In the third level menu, if there is no flashing bit in the parameter, it means that the function code cannot be modified. The possible reasons are as follows:

a) The function code is an unmodifiable parameter. Such as the actual detection parameters, operating record parameters.
b) The function code cannot be modified in the running state, and can be modified after it needs to be stopped.

How to view status parameters

In the stop or running state, the shift key can be used to switch between displaying various status parameters. The function code P7-03 (operation parameter 1), P7-04 (operation parameter 2), P7-05 (stop parameter) is selected according to the binary bit to display whether the parameter is displayed.

For example, in the stop state, P7-05 (stop parameter) is set to 33.

P7-05=0000 0000 0011 0011B=33.

The four status parameters of Bit00/Bit01/Bit04/Bit05 are selected: set frequency, bus voltage, AI1 voltage, AI2 voltage, and the key sequence switches to display the selected parameter.

In the running state, P7-03 (operation parameter 1) is set to 7F.

P7-05=0000 0000 0111 1111B=7F

The 7 status parameters of Bit00/Bit01/Bit03/Bit03/Bit04/Bit05/Bit06 are selected: running frequency, set frequency, bus voltage, output voltage, output current, output Power, output torque, key sequence switching to display the selected parameters,

After the inverter is powered off and then powered on, the displayed parameters are defaulted to the parameters selected before the inverter is powered down.

P7-03	LED Running display parameters1	0000～FFFF Bit0: Operating frequency 1 (Hz) Bit1: Setting frequency (Hz) Bit2: bus voltage (V) Bit3: The output voltage (V) Bit4: Output current (A) Bit5: Output Power (KW) Bit6: Output current (%) Bit7: Input status Bit8: Output status Bit9: AI1 Voltage (V) Bit10: AI2 Voltage (V) Bit11: AI3 Voltage (V) Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID set up
P7-04	LED Running display parameters2	0000～FFFF Bit0: PID Feedback Bit1: PLC Stage Bit2: Pulse input frequency (kHz) Bit3: Operating frequency 2 (Hz) Bit4: Remaining running time Bit5: AI1 Pre-correction voltage (V) Bit6: AI2 Pre-correction voltage (V) Bit7: AI3 Pre-correction voltage (V) Bit8: Line speed Bit9: Current power-on time (Hour) Bit10: Current running time (Min) Bit11: PULSE Input pulse frequency (Hz) Bit12: Communication setting Bit13: Encoder feedback speed (Hz) Bit14: Main frequency X display (Hz) Bit15: Auxiliary frequency Y display (Hz)
P7-05	LED Stop display parameter	0000～FFFF Bit00: Setting frequency (Hz) Bit01: bus voltage (V) Bit02: X Input status Bit03: DO Output status Bit04: AI1 Voltage (V) Bit05: AI2 Voltage (V) Bit06: AI3 Voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID set Bit12: PULSE Input pulse frequency (kHz)

User password setting

The inverter provides the user password protection function. When PP-00 is set to non-zero, it is the user password. Exiting the function code editing status password protection takes effect. Press PRG again, "-----" will be displayed. Enter the user password correctly to enter the normal menu, otherwise you will not be able to enter, so you must remember the password after setting the user password.

To cancel the password protection function, only enter with a password and set PP-00 to 0.

Chapter 5 Function parameter

PP-00 is set to a non-zero value, that is, the parameter protection password is set. The parameter menu must be entered after the password is entered correctly. To cancel the password, set PP-00 to 00000.
"○": Indicates that this parameter can be changed while the inverter is running or stopped.
"●": Indicates that this parameter cannot be changed while the inverter is running.
"×": Indicates that this parameter is only the actual detected record value and cannot be changed.

5-1 Basic function parameter

P0 Basic function parameter

Function code	Parameter Name	Setting Range	Default	Property
P0-00	GP type	1：G （Constant torque load model） 2：P （Fan, pump type load model）	1	×
P0-01	Speed control mode selection	0：Speed sensorless vector control（SVC） 1：Speed sensor vector control（FVC） 2：V/F control	2	●
P0-02	Run command source selection	0：Operation panel command channel（LED close） 1：Terminal command channel（LED open） 2：Communication command channel（LED Flashing）	0	○
P0-03	Main frequency source X selection	0: Digital setting (non-retentive at power failure) 1: Digital setting (retentive at power failure) 2：AI1 3：AI2 4: panel potentiometer 5: Pulse setting (X6) 6: Multi-segment instruction 7: Simple PLC 8: PID 9: Communication given	1	●
P0-04	Auxiliary frequency source Y selection	Same as P0-03 (main frequency source X selection)	0	●
P0-05	Frequency offset of auxiliary frequency source for X operation	0: relative to the maximum frequency 1: relative to the frequency source X	0	○
P0-06	Frequency offset of auxiliary frequency source for Y operation	0%～150%	100%	○
P0-07	Frequency source overlay selection	**Ones place: frequency source selection** 0: main frequency source X 1: X and Y operation (operation relationship determined by Tens position)	00	○

		2: Switchover between X and Y 3: Switchover between X and "X and Y operation" 4: Switchover between Y and "X and Y operation" **Tens place: frequency source primary and secondary operation relationship** 0: main + auxiliary 1: main - auxiliary 2: the maximum of the two 3: the minimum of the two		
P0-08	Preset frequency	0.00Hz～Maximum frequency（P0-10）	50.00Hz	○
P0-09	Rotation direction	0: Same direction 1: Reverse direction	0	○
P0-10	Maximum frequency	50.00Hz～500.00Hz	50.00Hz	●
P0-11	Source of frequency upper limit	0：Set by P0-12 1：AI1 2：AI2 3：AI3 4：Pulse setting 5：Communication setting	0	●
P0-12	Frequency upper limit	Frequency lower limit P0-14 ～ Maximum frequency P0-10	50.00Hz	○
P0-13	Frequency upper limit offset	0.00Hz～Maximum frequency P0-10	0.00Hz	○
P0-14	Frequency lower limit	0.00Hz～Upper limit frequency P0-12	0.00Hz	○
P0-15	Carrier frequency	0.5kHz～16.0kHz	Model dependent	○
P0-16	Carrier frequency is adjusted with temperature	0：no 1：yes	0	○
P0-17	Acceleration time 0	0.00s～65000s	Model dependent	○
P0-18	Deceleration time 0	0.00s～65000s	Model dependent	○
P0-19	Acceleration/deceleration unit	0：1S 1：0.1S 2：0.01S	1	●
P0-21	Frequency offset of auxiliary frequency source for X and Y operation	0.00Hz～Maximum frequency P0-10	0.00Hz	○
P0-22	Frequency reference resolution	1：0.1Hz 2：0.01Hz	2	●
P0-23	Digital setting frequency shutdown memory selection	0: Not retentive 1: Retentive	1	○
P0-24	Motor parameter group selection	0：motor parameter1 1：motor parameter 2	0	●
P0-25	Acceleration/Deceleration time base frequency	0：Maximum frequency（P0-10） 1：Setting frequency	0	●

		2：100Hz		
P0-26	Base frequency for UP/DOWN modification during running	0: running frequency 1: setting frequency	0	●
P0-27	Binding command source to frequency source	Single digit: operation panel command binding frequency source selection 0: No binding 1：Digital setting frequency 2: AI1 3：AI2 4: AI3 5：Pulse X6 6: Multi-speed 7：Simple PLC 8: PID 9：Communication given Tens place: terminal command binding frequency source selection Hundreds place: communication command binding frequency source selection Thousands: automatic operation binding frequency source selection	0000	○

P1 motor parameter

Function code	Parameter Name	Setting Range	Default	Property
P1-00	Motor type selection	0：Ordinary asynchronous motor 1：Variable frequency asynchronous motor	0	●
P1-01	Motor rated power	0.1kW～1000.0kW	Model dependent	●
P1-02	Motor rated voltage	1V～2000V	Model dependent	●
P1-03	Motor rated current	0.1A～6553.5A	Model dependent	●
P1-04	Motor rated frequency	0.01Hz～Maximum frequency	Model dependent	●
P1-05	Motor rated speed	1rpm～65535rpm	Model dependent	●
P1-06	Asynchronous motor stator resistance	0.001Ω～65.535Ω	Tuning parameter	●
P1-07	Synchronous motor stator resistance	0.001Ω～65.535Ω	Tuning parameter	●
P1-08	Leakage inductive reactance(asynchronous motor)	0.01mH～655.35mH	Tuning parameter	●
P1-09	Mutual inductive reactance(asynchronous motor)	0.1mH～6553.5mH	Tuning parameter	●
P1-10	No-load current (asynchronous motor)	0.01A～P1-03	Tuning parameter	●
P1-27	Encoder line number	1～65535	1024	●
P1-28	Encoder type	0：ABZ Incremental encoder 1：UVW Incremental encoder	0	●

		2：Resolver		
P1-30	A/B phase sequence of ABZ incremental encoder	0: forward 1: reserve	0	●
P1-31	Encoder mounting angle	0.0 ～ 359.9°	0.0°	●
P1-32	UVW incremental encoder	0: forward 1: reserve	0	●
P1-33	UVW Encoder offset angle	0.0 ～ 359.9°	0.0°	●
P1-34	Rotary transformer pole pair	1～65535	1	●
P1-36	Speed feedback PG disconnection detection time	0.0：no act 0.1s～10.0s	0	●
P1-37	Tuning selection	0：No auto-tuning 1：Static auto-tuning 2：Complete auto-tuning 3：Static full auto-tuning	0	●

P2 Motor vector control parameter

Motor code	Parameter Name	Setting Range	Default	Property
P2-00	Speed loop proportional gain 1	1～100	30	○
P2-01	Speed loop integration time 1	0.01s～10.00s	0.50s	○
P2-02	Switchover frequency 1	0.00～P2-05	5.00Hz	○
P2-03	Speed loop proportional gain 2	1～100	20	○
P2-04	Speed loop integration time 2	0.01s～10.00s	1.00s	○
P2-05	Switchover frequency 2	P2-02～Maximum frequency	10.00Hz	○
P2-06	Vector control slip gain	50%～200%	100%	○
P2-07	Time constant of speed loop filter	0.000s～0.100s	0.028s	○
P2-08	Vector controlled over-excitation gain	0～200	64	○
P2-09	Torque upper limit source in speed control mode	0：function code P2-10 set 1：AI1 2：AI2 3：AI3 4：Pulse setting 5：Communication given 6:MIN（AI1,AI2） 7:MAX（AI1,AI2） 1-7 option correspond to P2-10	0	○
P2-10	Digital setting of torque upper limit in speed control mode	0.0%～200.0%	160.0%	○
P2-13	Excitation adjustment proportional gain	0～60000	2000	○
P2-14	Excitation regulation integral gain	0～60000	1300	○
P2-15	Torque adjustment proportional gain	0～60000	2000	○
P2-16	Torque adjustment integral gain	0～60000	1300	○
P2-17	Speed loop integral separation	0: Invalid 1: Valid	0	○

P2-20	Maximum output voltage coefficient	100%~110%	105%	●
P2-21	Weak magnetic zone maximum torque factor	50%~200%	100%	○

P3 V/F Control parameters

Function code	Parameter Name	Setting Range	Default	Property
P3-00	V/F Curve setting	0：Linear V/F 1： V/F 2：Square V/F 3：1.2-power V/F 4：1.4-power V/F 6：1.6-power 8：1.8-power V/F 9：Reserved 10: V/F complete separation 11: V/F half separation	0	●
P3-01	Torque boost	0.0%（Auto） 0.1%～30.0%	Model dependent	○
P3-02	Cut-off frequency of torque boost	0.00Hz～Maximum frequency	50.00Hz	●
P3-03	Multi-point V/F frequency 1	0.00Hz～P3-05	0.00Hz	●
P3-04	Multi-point V/F voltage 1	0.0%～100.0%	0.0%	●
P3-05	Multi-point V/F frequency 2	P3-03～P3-07	0.00Hz	●
P3-06	Multi-point V/F voltage 2	0.0%～100.0%	0.0%	●
P3-07	Multi-point V/F frequency3	P3-05～Motor rated frequency（P1-04）	0.00Hz	●
P3-08	Multi-point V/F voltage 3	0.0%～100.0%	0.0%	●
P3-09	V/F Slip compensation gain	0.0%～200.0%	0.0%	○
P3-10	V/F over-excitation gain	0～200	120	○
P3-11	V/F oscillation suppression gain	0～100	Model dependent	○
P3-12	Oscillation suppression mode selection	0~4	3	●
P3-13	Voltage source for V/F separation	0: Digital setting(d3-12) 1: AI1 2: AI2 3: AI3 4: Pulse setting(HDI) 5: Multi-function 6: Simple PLC 7: PID 8: Communication setting Note:100.0% corresponds to the rated motor voltage	0	○
P3-14	Voltage digital setting for V/F separation	0 V ~ rated motor voltage	0V	○
P3-15	Voltage rise time of V/F separation	0.0s~1000.0s	0.0s	○
P3-16	Voltage decline time of V/F separation	0.0s ～ 1000.0s note：Indicates the time from 0V changes to the rated voltage of the motor	0.0s	○
P3-17	V/F Separate shutdown mode selection	0: frequency / voltage is independently reduced to 0	0	○

		1: After the voltage is reduced to 0, the frequency is reduced again.		
P3-18	Overcurrent stall operating current	50~200%	150%	●
P3-19	Over-current suppression	0：Invalid 1： Valid	1	●
P3-20	Over current stall gain	0~100	20	○
P3-21	Double speed overrun speed action current compensation coefficient	50~200%	50%	●
P3-22	Overvoltage stall operating voltage	200.0V~2000.0V	Model dependent 220V：380V 380V：760V 480V：850V	●
P3-23	Overvoltage stall enable	0：Invalid 1：Valid	1	●
P3-24	Overvoltage stall suppression frequency gain	0~100	30	○
P3-25	Overvoltage stall suppression voltage gain	0~100	30	○
P3-26	Overvoltage stall maximum rising frequency limit	0~50Hz	5Hz	●
P3-27	Slip compensation time constant	0.1~10.0s	0.5	○
P3-34	Water supply mode selection	0: Turn off water supply mode 1: Turn on the water supply mode	0	●
P3-35	Remote transmission of pressure gauge range	0.00～5.00MPa	1.00 MPa	○
P3-36	Demand target pressure	0.00～P3-39	0.5 MPa	○
P3-37	Dormancy frequency	0.00 Hz～P0-10	25.00Hz	○
P3-38	Sleep latency	0.0～3600.0s	0.0s	○
P3-39	Wake up the pressure	0.0～100.0%	80%	○
P3-40	Wake up time delay	0.0～3600.0s	0.0s	○

P4 Input terminal

function code	Parameter Name	Setting Range	Default	Property
P4-00	X1 Terminal function selection	0: No function 1: Forward RUN (FWD) 2: Reverse RUN (REV) 3: Three-line control 4: Forward JOG (FJOG) 5: Reverse JOG (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Coast to stop 9: Fault reset (RESET) 10: RUN pause 11: Normally open (NO) input of external fault 12: Multi-speed 1 13: Multi-speed 2 14: Multi-speed 3 15: Multi-speed 4	1	●
P4-01	X2 Terminal function selection		2	●
P4-02	X3 Terminal function selection		0	●
P4-03	X4 Terminal function selection		0	●
P4-04	X6 Terminal function selection		0	●
P4-05	X5 Terminal		0	●

	function selection	16: Acceleration/deceleration time selection 1 17: Acceleration/deceleration time selection 2 18: Frequency source switchover 19: Keyboard UP/DOWN setting is cleared (terminal\keyboard) 20: Command source switchover terminal 21: Acceleration/deceleration prohibition 22: PID pause 23: PLC reset 24: swing frequency pause 25: counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control prohibited 30: Pulse frequency input 32: Immediate DC braking 33: Normally closed (NC) input of external fault 34: Frequency modification forbidden 35: PID action direction is reversed 36: External STOP terminal 1 37: Command source switchover terminal 2 38: PID integral pause 39: Switchover between main frequency source X and preset frequency 40: Switchover between auxiliary frequency source Y and preset frequency 43: PID parameter switchover 44: User-defined fault 1 45: User-defined fault 2 46: Speed control/Torque control switchover 47: Emergency stop 48: External STOP terminal 2 49: Deceleration DC braking 50: Clear the current running time 51: Switchover between two-line mode and three-line mode 52: Reverse rotation is prohibited		
P4-06	X7 Terminal function selection		0	●
P4-07	X8 Terminal function selection		0	●
P4-08	X9 Terminal function selection		0	●
P4-10	Input terminal filter time	0.000s～1.000s	0.10s	○
P4-11	Terminal command mode	0: two-wire mode 1 1: two-wire mode 2 2: Three-wire mode 1 3: Three-wire mode 2	0	●
P4-12	Terminal UP/DOWN rate of change	0.001Hz/s～65.535Hz/s	1.00Hz/s	○
P4-13	AI Curve 1 minimum input	0.00V～P4-15	0.00V	○

P4-14	AI Curve 1 minimum input corresponding value	-100.0%～+100.0%	0.0%	○
P4-15	AI Curve 1 maximum input	P4-13～+10.00V	10.00V	○
P4-16	AI Curve 1 maximum input corresponding value	-100.0%～+100.0%	100.0%	○
P4-17	AI1 Filtering time	0.00s～10.00s	0.10s	○
P4-18	AI Curve 2 minimum input	0.00V～P4-20	0.00V	○
P4-19	AI Curve 2 minimum input corresponding value	-100.0%～+100.0%	0.0%	○
P4-20	AI Curve 2 maximum input	P4-18～+10.00V	10.00V	○
P4-21	AI Curve 2 maximum input corresponding value	-100.0%～+100.0%	100.0%	○
P4-22	AI2 Filtering time	0.00s～10.00s	0.10s	○
P4-23	AI Curve 3 minimum input	-10.00V～P4-25	0.00V	○
P4-24	AI Curve 3 minimum input corresponding value	-100.0%～+100.0%	0.0%	○
P4-25	AI Curve 3 maximum input	P4-23～+10.00V	10.00V	○
P4-26	AI Curve 1 maximum input corresponding value	-100.0%～+100.0%	100.0%	○
P4-27	AI3 Filtering time	0.00s～10.00s	0.10s	○
P4-28	Pulse minimum input	0.00kHz～P4-30	0.00kHz	○
P4-29	Pulse minimum input corresponding value	-100.0%～100.0%	0.0%	○
P4-30	Pulse maximum input	P4-28～100.00kHz	50.00kHz	○
P4-31	Pulse maximum input corresponding value	-100.0%～100.0%	100.0%	○
P4-32	Pulse input filtering time	0.00s～10.00s	0.10s	○
P4-33	AI Curve selection	Ones place: AI1 curve selection 1: Curve 1 (2 points, P4-13 to P4-16) 2: Curve 2 (2 points, P4-18 to P4-21) 3: Curve 3 (2 points, P4-23 to P4-26)	321	○

		4: Curve 4 (4 points, A6-00 to A6-07) 5: Curve 5 (4 points, A6-08 to A6-15) Tens place: AI2 curve selection, ibid. Hundreds place: AI3 curve selection, ibid.		
P4-34	AI Below the minimum input setting selection	Ones place: AI1 is lower than the minimum input setting selection 0： corresponding to the minimum input setting 1： 0.0% Tens place: AI2 is lower than the minimum input setting selection, the same as above Hundreds place: AI3 is lower than the minimum input setting selection, the same as above	000	○
P4-35	Input terminal X1 delay time	0.0s～3600.0s	0.0s	●
P4-36	Input terminal X2 delay time	0.0s～3600.0s	0.0s	●
P4-37	Input terminal X3 delay time	0.0s～3600.0s	0.0s	●
P4-38	Input terminal valid mode selection 1	Ones place :X1 Tens place :X2 Hundreds place :X3 Thousands place :X4 Ten thousand: X6 0: The X terminal is connected to COM and the disconnection is invalid. 1: X terminal and COM connection are invalid, the disconnection is valid.	00000	●
P4-39	Input terminal valid mode selection 2	Ones place :X5 Tens place :X7 Hundreds place :X8 Thousands place :X9 0: The X terminal is connected to COM and the disconnection is invalid. 1: X terminal and COM connection are invalid, the disconnection is valid.	00000	●

P5 Output terminal

function code	Parameter Name	Setting Range	Default	Property
P5-00	Y2 Output mode selection	0: Pulse output 1: Switch signal output	1	○
P5-01	Y2 Switch output function selection	0: No function 1: Inverter running 2: Fault output (stop) 3: Frequency-level detection FDT1 output 4: Frequency reached 5: Zero-speed running (no output at stop) 6: Motor overload pre-warning 7: Inverter overload pre-warning 8: Set count value reached 9: Designated count value reached 10: Length reached	0	○
P5-02	Relay output function selection		2	○
P5-03	Relay output function selection 2(Optional)		0	○
P5-04	Y1 output function selection		1	○
P5-05	Y3 output function selection (optional)		4	○

<table>
<tr><td></td><td></td><td>11: PLC cycle completed
12: Accumulative running time reached
13: Frequency limited
14: Torque limited
15: Ready to RUN
16:AI1>AI2
17: Frequency upper limit reached
18: Frequency lower limit reached (no output at stop)
19: Under voltage status output
20: Communication setting
23: Zero-speed running 2 (having output at stop)
24: Accumulative power-on time reached
25: Frequency level detection FDT2 output
26: Frequency 1 reached
27: Frequency 2 reached
28: Current 1 reached
29: Current 2 reached
30: Timing reached
31: AI1 input limit exceeded
32: Load becoming 0
33: Reverse running
34: Zero current state
35: IGBT temperature reached
36: Software current limit exceeded
37: Frequency lower limit reached (having output at stop)
38: Alarm output
39: Motor overheat warning
40: Current running time reached
41: Fault output (There is no output if it is the coast to stop fault and under voltage occurs.)</td><td></td><td></td></tr>
<tr><td>P5-06</td><td>Y2 Pulse output function selection</td><td rowspan="3">0: running frequency
1: set frequency
2: Output current
3: Output torque (absolute value)
4: Output power
5: Output voltage
6: Pulse input (100.0% corresponds to 100.0kHz)
7: AI1 8: AI2
9: AI3 (extended) 10: Length
11: Count value
12: Communication setting</td><td>0</td><td>○</td></tr>
<tr><td>P5-07</td><td>AO Output function selection</td><td>0</td><td>○</td></tr>
<tr><td>P5-08</td><td>AO2 Output function selection (optional)</td><td>1</td><td>○</td></tr>
</table>

		13: Motor speed 14: Output current (55kW and below 100% correspond to 100.0A, 75kW and above 100% correspond to 1000.0A) 15： Bus voltage 1000.0V corresponds to 100%		
P5-09	Y2 Pulse output Maximum frequency	0.01kHz～100.00kHz	50.00kHz	○
P5-10	AO Zero offset coefficient	-100.0%～+100.0%	0.0%	○
P5-11	AO Gain	-10.00～+10.00	1.00	○
P5-12	Extended AO2 zero offset coefficient	-100.0%～+100.0%	0.0%	○
P5-13	Extended AO2 gain	-10.00～+10.00	1.00	○
P5-17	Y2 output delay time	0.0s～3600.0s	0.0s	○
P5-18	Relay output delay time	0.0s～3600.0s	0.0s	○
P5-19	Relay 2 delay time	0.0s～3600.0s	0.0s	○
P5-20	Y1 Output delay time	0.0s～3600.0s	0.0s	○
P5-21	Y3 Delay time (expansion)	0.0s～3600.0s	0.0s	○
P5-22	Output terminal valid mode selection	Ones place :Y2 Tens place: Relay Hundreds place : Relay 2 thousands place : Y1 Ten thousand: Y3 0: The output terminal is connected to COM and the disconnection is invalid. 1: The output terminal is not connected to COM, and the disconnection is valid.	00000	○

P6 Start and stop control

function code	Parameter Name	Setting Range	Default	Property
P6-00	Start mode	0: Direct start 1: Speed tracking restart 2: Pre-excitation start (AC asynchronous machine)	0	○
P6-01	Rotational speed tracking mode	0: Start from stop frequency 1: Start from zero speed 2: Start from maximum frequency	0	●
P6-02	Rotational speed tracking speed	1～100	20	○
P6-03	Startup frequency	0.00Hz～10.00Hz	0.00Hz	○
P6-04	Startup frequency holding time	0.0s～100.0s	0.0s	●
P6-05	Startup DC braking current/Pre-excited current	0%～100%	50%	●
P6-06	Startup DC braking time/Pre-excited time	0.0s～100.0s	0.0s	●
P6-07	Acceleration/Deceleration mode	0: Linear acceleration/deceleration 1: S-curve acceleration/deceleration A	0	●

		2: S curve acceleration and deceleration B		
P6-08	Time proportion of S-curve start segment	0.0%～（100.0%-P6-09）	30.0%	●
P6-09	Time proportion of S-curve end segment	0.0%～（100.0%-P6-08）	30.0%	●
P6-10	Stop mode	0: Decelerate to stop 1: Coast to stop	0	○
P6-11	Initial frequency of stop DC braking	0.00Hz～Maximum frequency	0.00Hz	○
P6-12	Waiting time of stop DC braking	0.0s～100.0s	0.0s	○
P6-13	Stop DC braking current	0%～100%	50%	○
P6-14	Stop DC braking time	0.0s～100.0s	0.2s	○
P6-15	Brake use ratio	0%～100%	100%	○
P6-18	Speed tracking current	30%~200%	Model dependent	●
P6-21	Demagnetization time	0.0~5.0s	Model dependent	●
P6-23	AVR function	0: No effect 1: Only deceleration takes effect 2: The whole process is valid	2	●
P6-24	Overexcitation suppression current value	0～9999	100	●
P6-25	Overexcitation gain	0～9999	300	●

P7 Keypad and display

function code	Parameter Name	Setting Range	Default	Property
P7-01	JOG/REV key function selection	0: JOG/REV key is invalid 1: Switchover between operation panel control and remote command control (terminal or communication) 2: Switchover between forward rotation and reverse rotation 3: Forward JOG 4: Reverse JOG	0	●
P7-02	STOP/RESET key function	0: STOP/RESET key enabled only in operation panel control 1: STOP/RESET key enabled in any operation mode	1	○
P7-03	LED display running parameters 1	0000~FFFF Bit0: Running frequency 1 (Hz) Bit1: Set frequency (Hz) Bit2: Bus voltage (V) Bit3: Output voltage (V) Bit4: Output current (A) Bit5: Output power (kW) Bit6: Output torque (%)	1F	○

		Bit7: Input status Bit8: Output Status Bit9: AI1 Voltage (V) Bit10: AI2 voltage (V) Bit11: AI3 voltage (V) Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting		
P7-04	LED display running parameter 2	0000~FFFF Bit0: PID feedback Bit1: PLC stage Bit2: Pulse input frequency (kHz) Bit3: Running frequency 2 (Hz) Bit4: Remaining running time Bit5: AI1 pre-correction voltage (V) Bit6: AI2 pre-correction voltage (V) Bit7: AI3 pre-correction voltage (V) Bit8: Linear speed Bit9: Current power-on time (Hour) Bit10: Current running time (Min) Bit11: PULSE setting frequency (Hz) Bit12: Communication setting value Bit13: Encoder feedback speed (Hz) Bit14: Main frequency X Display (Hz) Bit15: Auxiliary frequency Y display (Hz)	0	○
P7-05	LED stop display parameters	0000~FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: X input status Bit03: Output status Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: AI3 voltage (V) Bit07: count value Bit08: Length value Bit09: PLC stage Bit10: Load stage Bit11: PID setting Bit12: PULSE setting frequency (kHz)	33	○
P7-06	Load speed display coefficient	0.0001～6.5000	1.0000	○
P7-07	Heatsink temperature of AC drive IGBT	0.0℃～100.0℃	-	×
P7-08	Product ID	-	-	×
P7-09	Accumulative running time	0h～65535h	-	×
P7-10	Product ID	-	-	×

P7-11	Software version number	-	-	×
P7-12	Number of decimal places for load speed display	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	1	○
P7-13	Accumulative power-on time	0～65535h	-	×
P7-14	Accumulative power consumption	0～65535 degree	-	×

P8 Auxiliary Functions

function code	Parameter Name	Setting Range	Default	Property
P8-00	Jog running frequency	0.00Hz～Maximum frequency	2.00Hz	○
P8-01	Jog acceleration time	0.0s～6500.0s	20.0s	○
P8-02	Jog deceleration time	0.0s～6500.0s	20.0s	○
P8-03	Acceleration time 1	0.0s～6500.0s	Model dependent	○
P8-04	Deceleration time 1	0.0s～6500.0s	Model dependent	○
P8-05	Acceleration time 2	0.0s～6500.0s	Model dependent	○
P8-06	Deceleration time 2	0.0s～6500.0s	Model dependent	○
P8-07	Acceleration time 3	0.0s～6500.0s	Model dependent	○
P8-08	Deceleration time 3	0.0s～6500.0s	Model dependent	○
P8-09	Jump frequency 1	0.00Hz～Maximum frequency	0.00Hz	○
P8-10	Jump frequency 2	0.00Hz～Maximum frequency	0.00Hz	○
P8-11	Jump frequency amplitude	0.00Hz～Maximum frequency	0.01Hz	○
P8-12	Forward/Reverse rotation dead-zone time	0.0s～3000.0s	0.0s	○
P8-13	Reverse control enable	0: Allow 1: Prohibit	0	○
P8-14	Running mode when set frequency lower than frequency lower limit	0: Run at the following frequency limit 1: stop 2: Zero speed operation	0	○
P8-15	Droop control	0.00Hz～10.00Hz	0.00Hz	○
P8-16	Set the cumulative power-on arrival time	0h～65000h	0h	○
P8-17	Set cumulative run arrival time	0h～65000h	0h	○
P8-18	Startup protection	0: no protection 1: protection	0	○
P8-19	Frequency detection value FDT1	0.00Hz～Maximum frequency	50.00Hz	○
P8-20	Frequency detection	0.0%～100.0%（FDT1）	5.0%	○

	hysteresis value (FDT1)			
P8-21	Frequency arrival detection width	0.0%～100.0%（Maximum frequency）	0.0%	○
P8-22	Jump frequency during acceleration/deceleration	0：Invalid 1：Valid	0	○
P8-25	Frequency switchover point between acceleration time 1 and acceleration time 2	0.00Hz～Maximum frequency	0.00Hz	○
P8-26	Frequency switchover point between deceleration time 1 and deceleration time 2	0.00Hz～Maximum frequency	0.00Hz	○
P8-27	Terminal JOG priority	0：Invalid 1：Valid	1	○
P8-28	Frequency detection value FDT2	0.00Hz～Maximum frequency	50.00Hz	○
P8-29	Frequency detection hysteresis value (FDT2)	0.0%～100.0%（FDT2）	5.0%	○
P8-30	Arbitrary arrival frequency detection value 1	0.00Hz～Maximum frequency	50.00Hz	○
P8-31	Arbitrary arrival frequency detection width 1	0.0%～100.0%（Maximum frequency）	0.0%	○
P8-32	Arbitrary arrival frequency detection value 2	0.00Hz～Maximum frequency	50.00Hz	○
P8-33	Arbitrary arrival frequency detection width 2	0.0%～100.0%（Maximum frequency）	0.0%	○
P8-34	Zero current detection level	0.0%～300.0% 100.0% Corresponding motor rated current	5.0%	○
P8-35	Zero current detection delay time	0.01s～600.00s	0.10s	○
P8-36	Output overcurrent threshold	0.0%（Not detecting） 0.1%～300.0%（Motor rated current）	200.0%	○
P8-37	Output overcurrent detection delay time	0.00s～600.00s	0.00s	○
P8-38	Arbitrary arrival current 1	0.0%～300.0%（Motor rated current）	100.0%	○
P8-39	Arbitrary current 1 width	0.0%～300.0%（Motor rated current）	0.0%	○
P8-40	Arbitrary arrival current 2	0.0%～300.0%（Motor rated current）	100.0%	○
P8-41	Arbitrary current 2 width	0.0%～300.0%（Motor rated current）	0.0%	○
P8-42	Timing function	0:Invalid 1: Valid	0	●
P8-43	Timing duration source	0：P8-44 setting 1：AI1 2：AI2 3：AI3 Analog input range corresponding P8-44	0	●
P8-44	Timing duration	0.0Min～6500.0Min	0.0Min	●
P8-45	AI1 input voltage protection value lower limit	0.00V～P8-46	3.10V	○
P8-46	AI1 input voltage protection value upper limit	P8-45～10.00V	6.80V	○
P8-47	IGBT temperature threshold	0℃～100℃	75℃	○

P8-48	Cooling fan control	0: The fan is running during operation 1: The fan is always running	0	○
P8-49	Wake-up frequency	Dormant frequency（P8-51）～Maximum frequency（P0-10）	0.00Hz	○
P8-50	Wake-up delay time	0.0s～6500.0s	0.0s	○
P8-51	Dormant frequency	0.00Hz～Wake-up frequency（P8-49）	0.00Hz	○
P8-52	Dormant delay time	0.0s～6500.0s	0.0s	○
P8-53	Current running time reached	0.0Min～6500.0Min	0.0Min	●
P8-54	Output power correction coefficient	0.00% ～ 200.0%	100.0%	○

P9 Failure and protection

function code	Parameter Name	Setting Range	Default	Property
P9-00	Motor overload protection selection	0: Not allow　　1: Allow	1	○
P9-01	Motor overload protection gain	0.20～10.00	1.00	○
P9-02	Motor overload warning coefficient	50%～100%	80%	○
P9-03	Overvoltage stall gain	0 (no stall overvoltage)–100	0	○
P9-04	Overvoltage stall protective voltage	650V～800V	760V	○
P9-05	Overcurrent stall gain	0–100	20	○
P9-06	Overcurrent stall protective current	100%–200%	150%	○
P9-07	Short-circuit to ground upon power-on	0： Invalid 1： Valid	1	○
P9-08	Brake unit action starting voltage	200.0~2000.0V	Model dependent 220V：360V 380V：690V 480V：800V	○
P9-09	Fault auto reset times	0～20	0	○
P9-10	DO action during fault auto reset	0： no act 1： act	0	○
P9-11	Fault auto reset interval	0.1s～100.0s	1.0s	○
P9-12	Input phase loss protection/contactor energizing protection selection	Ones place ： Input phase loss protection option Tens place： Contactor suction protection option 0: Disabled　　1: Enabled	11	○
P9-13	Output phase loss protection selection	0: Disabled　　1: Enabled	1	○

P9-14	First failure type	0: no fault 1: Reserved 2: accelerated overcurrent 3: Deceleration over current 4: Constant speed over current 5: Accelerated overvoltage 6: Deceleration overvoltage 7: Constant speed overvoltage 8: Buffer resistor overload 9: Under voltage 10: Inverter overload 11: Motor overload 12: Input phase loss 13: Output phase loss 14: Module overheating 15: External fault 16: Communication error 17: Contactor abnormality 18: Abnormal current detection 19: Tuning error 20: PG card is abnormal 21: Parameter read and write error 22: Inverter hardware is abnormal 23: Motor short circuit to ground 24: Reserved 26: Run time arrives 27: User Defined Fault 1 28: User-defined fault 2 29: Power on time arrives 30: Offload 31: Loss of PID feedback at runtime 40: Fast current limit timeout 41: Switching motor during operation 42: Speed deviation is too large 43: Motor overspeed 45: Motor overheating 51: Initial position error	—	×
P9-15	Second failure type		—	×
P9-16	Third (most recent) fault type		—	×
P9-17	Frequency at the third failure	—	—	×
P9-18	Current at the third fault	—	—	×
P9-19	Bus voltage at the third fault	—	—	×
P9-20	Third fault input terminal status	—	—	×
P9-21	Third fault output terminal status	—	—	×
P9-22	Inverter status at the third fault	—	—	×
P9-23	Power-on time during the third fault	—	—	×

P9-24	Run time at the third fault	—	—	×
P9-27	Frequency at the second failure	—	—	×
P9-28	Current at the second fault	—	—	×
P9-29	Bus voltage at the second fault	—	—	×
P9-30	Second fault input terminal status	—	—	×
P9-31	Second fault output terminal status	—	—	×
P9-32	Inverter status at the second fault	—	—	×
P9-33	Power-on time during the second fault	—	—	×
P9-34	Run time at the second fault	—	—	×
P9-37	Frequency at the first failure	—	—	×
P9-38	Current at the first fault	—	—	×
P9-39	Bus voltage at the first fault	—	—	×
P9-40	First fault input terminal status	—	—	×
P9-41	First fault output terminal status	—	—	×
P9-42	Inverter status at the first fault	—	—	×
P9-43	Power-on time at the first failure	—	—	×
P9-44	Run time at the first failure	—	—	×
P9-47	Fault protection action selection 1	Ones place：Motor overload（Err 11） 0：free stop 1：Stop by stop mode 2：Keep running Tens place：Input phase loss (Err12) as above Hundreds place：Output phase loss (Err13) as above Thousands place：External fault (Err15) is the same as above Ten thousand: communication abnormality (Err16) is the same as above	00000	○
P9-48	Fault protection action selection 2	Ones place：Encoder/PG card incorrect（Err20） 0：free stop 1：Stop by stop mode 2：keep running Tens place：function code reading and writing incorrect（Err21） 0：free stop	00000	○

		1： stop by stop mode Hundreds place: reserved Thousands place： motor too hot（Err25）same as P9-47 Ten thousand： Run time arrives (Err26) with P9-47		
P9-49	Fault protection action selection 3	Ones place： Custom Fault 1 (Err27) Same as P9-47 Tens place：Custom Fault 1 (Err27) Same as P9-47 Hundreds place： Power-on time arrives (Err29) with P9-47 Thousands place： Offload (Err30) 0: Free parking 1: slow down parking 2: Deceleration to 7% of the rated frequency, automatically return to the set frequency when no load is lost Ten Thousand：PID feedback loss (Err31) with P9-47	00000	○
P9-50	Fault protection action selection 4	ones place： Speed deviation is too large (Err42) with P9-47 Tens place： Motor overspeed (Err43) with P9-47 Hundreds place： Initial position error (Err51) Same as P9-47 Thousands place： Speed feedback error (Err52) with P9-47	00000	○
P9-54	Frequency selection for continuing to run upon fault	0: Run at the current operating frequency 1: run at the set frequency 2: Run at the upper limit frequency 3: Run at the following frequency limit 4: Run at abnormal standby frequency	0	○
P9-55	Abnormal backup frequency	60.0%～100.0% （ 100.0% correspond Maximum frequencyP0-10）	100.0%	○
P9-56	Type of motor temperature sensor	0： No temperature sensor 1： PT100 2： PT1000	0	○
P9-57	Motor overheat protection threshold	0℃～200℃	110℃	○
P9-58	Motor overheat pre-alarm threshold	0℃～200℃	90℃	○
P9-59	Instantaneous power failure action selection	0： Invalid 1: deceleration 2: Deceleration stop	0	○
P9-60	Instantaneous stop action pause judgment voltage	80.0～100.0%	90.0%	○
P9-61	Instantaneous power failure	0.00s～100.00s	0.50s	○

	voltage rise judgment time			
P9-62	Instantaneous power failure action judgment voltage	60.0%～100.0%（Standard bus voltage）	80.0%	○
P9-63	Drop protection option	0：Invalid 1：Valid	0	○
P9-64	Drop detection level	0.0～100.0%	10.0%	○
P9-65	Drop detection time	0.0～60.0s	1.0s	○
P9-67	Overspeed detection value	0.0%～50.0%（Maximum frequency）	20.0%	○
P9-68	Overspeed detection time	0.0s～60.0s	5.0s	○
P9-69	Speed deviation excessive detection value	0.0%～50.0%（Maximum frequency）	20.0%	○
P9-70	Speed deviation too large detection time	0.0s～60.0s	5.0s	○
P9-71	Instantaneous stop non-stop gain Kp	0~100	40	○
P9-72	Instantaneous stop non-stop integral coefficient Ki	0~100	30	○
P9-73	Instantaneous stop and stop motion deceleration time	0~300.0s	20.0s	●

PA PID function

function code	Parameter Name	Setting Range	Default	Property
PA-00	PID setting source	0：PA-01 set 1：AI1 2：AI2 3: AI3 (panel potentiometer) 4: Pulse setting 5: Communication given 6: Multi-speed given	0	○
PA-01	PID digital setting	0.0%～100.0%	50.0%	○
PA-02	PID feedback source	0：AI1 1：AI2 2：AI3/ Panel potentiometer 3：AI1-AI2 4：Pulse setting（X6） 5：Communication given 6：AI1+AI2 7：MAX（|AI1|, |AI2|） 8：MIN（|AI1|, |AI2|）	0	○
PA-03	PID action direction	0: Forward action 1: Reverse action	0	○
PA-04	PID given feedback range	0～65535	1000	○
PA-05	Proportional gain Kp1	0.0～100.0	40.0	○
PA-06	Integration time Ti1	0.01s～10.00s	1.00s	○
PA-07	Derivative time Td1	0.000s～10.000s	0.000s	○
PA-08	Cut-off frequency of PID reverse rotation	0.00～Maximum frequency	2.00Hz	○
PA-09	PID deviation limit	0.0%～100.0%	0.0%	○
PA-10	PID differential limiting	0.00%～100.00%	0.10%	○
PA-11	PID given change time	0.00～650.00s	0.00s	○

PA-12	PID feedback filter time	0.00～60.00s	0.00s	○
PA-13	PID output filtering time	0.00～60.00s	0.00s	○
PA-15	Proportional gain Kp2	0.0～100.0	20.0	○
PA-16	Integration time Ti2	0.01s～10.00s	2.00s	○
PA-17	Derivative time Td2	0.000s～10.000s	0.000s	○
PA-18	PID parameter switchover condition	0: No switchover 1: Switchover via the input terminal 2: Automatic switchover based on deviation	0	○
PA-19	PID parameter switchover deviation 1	0.0%～PA-20	20.0%	○
PA-20	PID parameter switchover deviation 2	PA-19～100.0%	80.0%	○
PA-21	PID initial value	0.0%～100.0%	60.0%	○
PA-22	PID initial value hold time	0.00～650.00s	5.00s	○
PA-25	PID integral attribute	Ones place：Integral separation 0：Invalid 1：Valid Tens place：Whether to stop integral operation when the output reaches the limit 0: Continue to integrate 1: Stop integral operation	00	○
PA-26	PID feedback loss detection value	0.0%：no judge feedback loss 0.1%～100.0%	0.0%	○
PA-27	PID feedback loss detection time	0.0s～20.0s	0.0s	○
PA-28	PID shutdown operation	0: stop does not operate 1: stop operation	1	○

PB Swing frequency, fixed length and counting

function code	Parameter Name	Setting Range	Default	Property
PB-00	Swing frequency setting mode	0：Relative to the center frequency 1：Relative to the Maximum frequency	0	○
PB-01	Swing frequency amplitude	0.0%～100.0%	0.0%	○
PB-02	Kick frequency amplitude	0.0%～50.0%	0.0%	○
PB-03	Wobble cycle	0.1s～3000.0s	10.0s	○
PB-04	Swing frequency triangle wave rise time	0.1%～100.0%	50.0%	○
PB-05	Set length	0m～65535m	1000m	○
PB-06	Actual length	0m～65535m	0m	○
PB-07	Pulse number per meter	0.1～6553.5	100.0	○
PB-08	Set count value	1～65535	1000	○
PB-09	Specified count value	1～65535	1000	○

PC Multi-segment instruction, simple PLC

function code	Parameter Name	Setting Range	Default	Property
PC-00	Multi-segment instruction 0	0.0Hz ～±P0-10	0.0	○
PC-01	Multi-segment instruction 1	0.0Hz ～±P0-10	0.0	○
PC-02	Multi-segment instruction 2	0.0Hz ～±P0-10	0.0	○
PC-03	Multi-segment instruction 3	0.0Hz ～±P0-10	0.0	○
PC-04	Multi-segment instruction 4	0.0Hz ～±P0-10	0.0	○
PC-05	Multi-segment instruction 5	0.0Hz ～±P0-10	0.0	○
PC-06	Multi-segment instruction 6	0.0Hz ～±P0-10	0.0	○
PC-07	Multi-segment instruction 7	0.0Hz ～±P0-10	0.0	○
PC-08	Multi-segment instruction 8	0.0Hz ～±P0-10	0.0	○
PC-09	Multi-segment instruction 9	0.0Hz ～±P0-10	0.0	○
PC-10	Multi-segment instruction 10	0.0Hz ～±P0-10	0.0	○
PC-11	Multi-segment instruction 11	0.0Hz ～±P0-10	0.0	○
PC-12	Multi-segment instruction 12	0.0Hz ～±P0-10	0.0	○
PC-13	Multi-segment instruction 13	0.0Hz ～±P0-10	0.0	○
PC-14	Multi-segment instruction 14	0.0Hz ～±P0-10	0.0	○
PC-15	Multi-segment instruction 15	0.0Hz ～±P0-10	0.0	○
PC-16	Simple PLC operation mode	0: Single run end shutdown 1: Keep the final value at the end of a single run 2: Always cycle	0	○
PC-17	Simple PLC power-down memory selection	Ones place ： Power-down memory selection 0: No power loss, no memory 1: Power failure memory Tens place：Stop memory selection 0: Stop without memory 1: Stop memory	00	○
PC-18	0th run time	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-19	The 0th section acceleration and deceleration time selection	0～3	0	○
PC-20	First run time	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-21	The first stage acceleration and deceleration time selection	0～3	0	○
PC-22	2nd run time	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-23	The second stage acceleration and deceleration time selection	0～3	0	○
PC-24	Third run time	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-25	The third stage acceleration and deceleration time selection	0～3	0	○
PC-26	Stage 4 run time	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-27	Section 4 acceleration and deceleration time selection	0～3	0	○

PC-28	5th run time	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-29	Section 5 acceleration and deceleration time selection	0～3	0	○
PC-30	Run time of paragraph 6	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-31	Section 6 acceleration and deceleration time selection	0～3	0	○
PC-32	Run time of paragraph 7	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-33	Section 7 acceleration and deceleration time selection	0～3	0	○
PC-34	8th run time	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-35	Section 8 acceleration and deceleration time selection	0～3	0	○
PC-36	9th run time	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-37	The 9th paragraph acceleration and deceleration time selection	0～3	0	○
PC-38	Run time of paragraph 10	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-39	Section 10 acceleration and deceleration time selection	0～3	0	○
PC-40	Run time in paragraph 11	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-41	The 11th paragraph acceleration and deceleration time selection	0～3	0	○
PC-42	Run time in paragraph 12	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-43	The 12th paragraph acceleration and deceleration time selection	0～3	0	○
PC-44	Run time of paragraph 13	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-45	The 13th paragraph acceleration and deceleration time selection	0～3	0	○
PC-46	Run time in paragraph 14	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-47	The 14th paragraph acceleration and deceleration time selection	0～3	0	○
PC-48	Run time in paragraph 15	0.0s（h）～6553.5s（h）	0.0s(h)	○
PC-49	The 15th paragraph acceleration and deceleration time selection	0～3	0	○
PC-50	Simple PLC runtime unit	0：s（second） 1：h（hour）	0	○
PC-51	Multi-segment instruction 0 given mode	0: given by PC-00 1: given by AI1 2: AI2 given 3: AI3 given (panel potentiometer) 4: Pulse given 5: PID given 6: P0-08 can be modified by UP/DOWN	0	○

Pd Communication parameter

function code	Parameter Name	Setting Range	Default	Property
Pd-00	Baud rate	Ones place：MODBUS 0：300BPS 1：600BPS 2：1200BPS 3：2400BPS 4：4800BPS 5：9600BPS 6：19200BPS 7：38400BPS 8：57600BPS 9：115200BPS Tens place：Profibus-DP 0：115200BPs 1：208300BPs 2：256000BPs 3：512000Bps (Hundreds place：Reserved) Thousands place：CANlink Baud rate 0：20 1：50 2：100 3：125 4：250 5：500 6：1M	5005	○
Pd-01	Data Format	0：no checking（8-N-2） 1：even checking（8-E-1） 2：odd checking（8-O-1） 3：no checking（8-N-1）	0	○
Pd-02	Local address	1～247， 0 Broadcast address	1	○
Pd-03	Response delay	0ms～20ms	2	○
Pd-04	Communication timeout	0.0（Invalid） 0.1s～60.0s	0.0	○
Pd-05	Data transfer format selection	Ones place： 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol	31	○
Pd-06	Communication read current resolution	0：0.01A 1：0.1A	0	○
Pd-08	CANlink communication timeout	0.0s：Invalid 0.1~60.0s	0	○

PE Customized function code

function code	Parameter Name	Setting Range	Default	Property
PE-00	User function code 0	P0-00 ～ PP-xx A0-00 ～ Ax-xx U0-xx ～ U0-xx U3-00~U3-xx	U3-17	○
PE-01	User function code 1		U3-16	○
PE-02	User function code 2		P0.00	○
Reserved	Reserved		Reserved	○
PE-28	User function code 28		P0.00	○
PE-29	User function code 29		P0.00	○

PP function code management

function code	Parameter Name	Setting Range	Default	Property
PP-00	User password	0～65535	0	○
PP-01	Parameter	0: no operation	0	●

	initialization	1: Restore factory value, excluding motor parameters 2: Clear record information 4: Backup user current parameters 501: Restore user backup parameters		
PP-02	Function parameter group display selection	Ones place: U group display 0: not displayed 1: display Tens place: A group display 0: not displayed 1: display	11	●
PP-03	Personality parameter group display selection	Ones place: User customization 0: Do not display 1: Display Tens place: User change 0: Do not display 1: Display	00	○
PP-04	Parameter modification property	0: Can be modified 1: Cannot be modified	0	○

A0 Group Torque control parameter

function code	Parameter Name	Setting Range	Default	Property
A0-00	Speed/torque control selection	0: speed control 1: torque control	0	●
A0-01	Torque setting source in torque control	0: Digital setting (A0-03) 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: Communication reference 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) (1-7 options full scale, Corresponding to A0-03 number setting)	0	●
A0-03	Torque digital setting in torque control	-200.0%～200.0%	150.0%	○
A0-05	Forward maximum frequency in torque control	0.00Hz～Maximum frequency	50.00Hz	○
A0-06	Reverse maximum frequency in torque control	0.00Hz～Maximum frequency	50.00Hz	○
A0-07	Acceleration time in torque control	0.00s～65000s	0.00s	○
A0-08	Deceleration time in torque control	0.00s～65000s	0.00s	○

A5 Control optimization parameter

function code	Parameter Name	Setting Range	Default	Property
A5-00	DPWM switchover frequency upper limit	5.00Hz ～Maximum frequency	8.00Hz	○

A5-01	PWM modulation method	0: Asynchronous modulation 1: Synchronous modulation	0	○
A5-02	Dead zone compensation mode selection	0: No compensation 1: Compensation mode 1 2: Compensation mode 2	1	○
A5-03	Random PWM depth	0：Invalid 1～10：Random PWM depth	0	○
A5-04	Rapid current limit	0：Invalid 1：Valid	1	○
A5-05	Current detection compensation	0～100	5	○
A5-06	Under voltage threshold	60.0%～140.0%	100.0%	○
A5-07	SVC optimization mode selection	0: Not optimized 1: Optimized mode 1 2: Optimized mode 2	1	○
A5-08	Dead time adjustment	100%～200%	150%	●
A5-09	Overvoltage threshold	200.0V ～ 2200.0V	Model dependent	●

A6 AI Curve setting

function code	Parameter Name	Setting Range	Default	Property
A6-00	AI curve 4 minimum input	-10.00V ～ A6-02	0.00V	○
A6-01	AI curve 4 minimum input correspondence setting	-100.0% ～ +100.0%	0.0%	○
A6-02	AI curve 4 inflection point 1 input	A6-00 ～ A6-04	3.00V	○
A6-03	AI curve 4 inflection point 1 input corresponding setting	-100.0% ～ +100.0%	30.0%	○
A6-04	AI curve 4 inflection point 2 input	A6-02 ～ A6-06	6.00V	○
A6-05	AI curve 4 inflection point 2 input corresponding setting	-100.0% ～ +100.0%	60.0%	○
A6-06	AI curve 4 maximum input	A6-06 ～ +10.00V	10.00V	○
A6-07	AI curve 4 maximum input corresponding setting	-100.0% ～ +100.0%	100.0%	○
A6-08	AI curve 5 minimum input	-10.00V ～ A6-10	-10.00V	○
A6-09	AI curve 5 minimum input corresponding setting	-100.0% ～ +100.0%	-100.0%	○
A6-10	AI curve 5 inflection point 1 input	A6-08 ～ A6-12	-3.00V	○
A6-11	AI curve 5 inflection point 1 input corresponding setting	-100.0% ～ +100.0%	-30.0%	○

A6-12	AI curve 5 inflection point 2 input	A6-10 ～ A6-14	3.00V	○
A6-13	AI curve 5 inflection point 2 input corresponding setting	-100.0% ～ +100.0%	30.0%	○
A6-14	AI curve 5 maximum input	A6-12 ～ +10.00V	10.00V	○
A6-15	AI curve 5 maximum input corresponding setting	-100.0% ～ +100.0%	100.0%	○
A6-24	AI1 sets the jump point	-100.0% ～ 100.0%	0.0%	○
A6-25	AI1 sets the jump range	0.0% ～ 100.0%	0.5%	○
A6-26	AI2 sets the jump point	-100.0% ～ 100.0%	0.0%	○
A6-27	AI2 sets the jump range	0.0% ～ 100.0%	0.5%	○
A6-28	AI3 sets the jump point	-100.0% ～ 100.0%	0.0%	○
A6-29	AI3 sets the jump range	0.0% ～ 100.0%	0.5%	○

AC AIAO checking

function code	Parameter Name	Setting Range	Default	Property
AC-00	AI1 measured voltage 1	0.500V ～ 4.000V	factory reset	○
AC-01	AI1 display voltage 1	0.500V ～ 4.000V	factory reset	○
AC-02	AI1 measured voltage 2	6.000V ～ 9.999V	factory reset	○
AC-03	AI1 display voltage 2	6.000V ～ 9.999V	factory reset	○
AC-04	AI2 measured voltage 1	0.500V ～ 4.000V	factory reset	○
AC-05	AI2 display voltage 1	0.500V ～ 4.000V	factory reset	○
AC-06	AI2 measured voltage 2	6.000V ～ 9.999V	factory reset	○
AC-07	AI2 display voltage 2	6.000V ～ 9.999V	factory reset	○
AC-08	AI3 measured voltage 1	-9.999V ～ 10.000V	factory reset	○
AC-09	AI3 display voltage 1	-9.999V ～ 10.000V	factory reset	○
AC-10	AI3 measured voltage 2	-9.999V ～ 10.000V	factory reset	○
AC-11	AI3 display voltage 2	-9.999V ～ 10.000V	factory reset	○
AC-12	AO1 target voltage 1	0.500V ～ 4.000V	factory reset	○

AC-13	AO1 measured voltage 1	0.500V ～ 4.000V	factory reset	○
AC-14	AO1 target voltage 2	6.000V ～ 9.999V	factory reset	○
AC-15	AO1 measured voltage 2	6.000V ～ 9.999V	factory reset	○
AC-16	AO2 target voltage 1	0.500V ～ 4.000V	factory reset	○
AC-17	AO2 measured voltage 1	0.500V ～ 4.000V	factory reset	○
AC-18	AO2 target voltage 2	6.000V ～ 9.999V	factory reset	○
AC-19	AO2 measured voltage 2	6.000V ～ 9.999V	factory reset	○

5-2 Monitoring parameter

U0 Group Basic monitoring parameter

function code	Parameter name	Display range	Instruction	Communication address
U0-00	Running frequency	0.01~320.00Hz	Display operating frequency and set frequency (Hz)	7000H
U0-01	Set frequency			7001H
U0-02	Bus voltage	0.0~3000.0V	Display bus voltage (V)	7002H
U0-03	Output voltage	0~1140V	Display inverter output voltage (V)	7003H
U0-04	Output current	0.0~6553.5A	Display inverter output current (A)	7004H
U0-05	Output Power	0~32767kW	Display inverter output power (kW)	7005H
U0-06	Output torque	-200.0~200.0%	Display inverter output torque during operation	7006H
U0-07	Input terminal status	0~32767	Input status: X1~X9 corresponds to Bit0~Bit8	7007H
U0-08	Output terminal status	0~1023	Output terminal status: Y2, relay,	7008H
U0-09	AI1 voltage	0.01V	Y1 corresponds to Bit0, Bit1, Bit3	7009H
U0-10	AI2 voltage	0.01V	Display input AI1 voltage (V)	700AH
U0-11	AI3 voltage	0.01V	Display input AI2 voltage (V)	700BH
U0-12	Count value	0~65535	Display input AI3 voltage (V)	700CH
U0-13	Length value	0~65535	Display count value	700DH
U0-14	Load speed display	0~65535	Display length value	700EH
U0-15	PID setting	0~65535	Display load speed	700FH
U0-16	PID feedback value	0~65535	Display PID settings	7010H
U0-17	PLC stage	0~16	Display PLC operation phase	7011H
U0-18	Input pulse frequency	0.00~10.00kHz	Display X6 input pulse frequency (kHz)	7012H
U0-19	Feedback speed	-320.0~+320.0	Display the actual output frequency of the inverter Hz	7013H
U0-20	Remaining running time	0.0~6500.0 Minutes	Show remaining runtime	7014H
U0-21	AI1 pre-correction voltage	0.01~10.20V	Display AI1 pre-correction voltage	7015H
U0-22	AI2 pre-correction voltage	0.01~10.20V	Display AI2 pre-correction voltage	7016H
U0-23	AI3 pre-correction voltage	0.01~10.20V	Display AI3 pre-correction voltage	7017H
U0-24	Line speed	0~65535m/Min	The number of pulses per minute and	7018H
U0-25	Current power-on time	1Min	PB-07, calculate the line speed value	7019H
U0-26	Current running time	0.1Min	Display current cumulative power-on time	701AH
U0-27	Input pulse frequency	1Hz	Display PULSE input pulse frequency	701BH
U0-28	Communication setting	0.01%	Display communication settings	701CH
U0-29	Encoder feedback speed	0.01Hz	Display encoder feedback speed	701DH
U0-30	Main frequency X	0.01Hz	Display main frequency X display	701EH

U0-31	Auxiliary frequency Y	0.01Hz	Display auxiliary frequency Y display	701FH
U0-32	View memory address values	1	Display to view any memory address value	7020H
U0-33	Synchronous machine rotor position	0.0°	Display synchronous machine rotor position	7021H
U0-34	Motor temperature value	1 ℃	Display motor temperature value	7022H
U0-35	Target torque	0.1%	Display target torque (%)	7023H
U0-36	Rotational position	1	Display the position of the rotation	7024H
U0-37	Power factor angle	0.1	Display power factor angle	7025H
U0-38	ABZ position	0.0	Show ABZ position	7026H
U0-39	VF separation target voltage	1V	Display VF separation target voltage	7027H
U0-40	VF separation output voltage	1V	Display VF separate output voltage	7028H
U0-41	Input status visual display	1	Display input status visual display	7029H
U0-42	Output status visual display	1	Display output status visual display	702AH
U0-43	Input status visual display 1	1	Display input status visual display 1	702BH
U0-44	Input status visual display 2	1	Display input status visual display 2	702CH
U0-45	accident details	0	Display fault information	702DH
U0-58	Z signal counter	-	1	703AH
U0-59	Set frequency (%)	-	0.01%	703BH
U0-60	Operating frequency (%)	-	0.01%	703CH
U0-61	Inverter status	-	1	703DH
U0-62	Current fault code	-	1	703EH
U0-64	Number of slaves	-	1	7040H
U0-65	Torque limit	-	0.01%	7041H
U0-73	Motor serial number	-	0：motor 1 1：motor 2	7046H
U0-74	Actual output torque of the motor	-	-300-300%	7047H

Chapter 6 Parameter Instruction

P0 Basic function

P0-00	GP Type display	1:G type (constant torque load type) 2: P type (fan, pump type load type)	Default：1

📖This parameter is only for the user to view the factory model and cannot be changed.

1: Constant torque load for specified rated parameters

2: Variable torque load (fan, pump load) for specified rated parameters

P0-01	Speed control mode selection	0: No speed sensor vector control (SVC) 1: Speed sensor vector control (FVC) 2: V/F control	Default：2

📖0: No speed sensor vector control, open loop vector control, suitable for normal high performance control applications, one inverter can only drive one motor. Such as machine tools, centrifuges, wire drawing machines, injection molding machines and other loads.

1: There is speed sensor vector control, closed loop vector control, the motor end must be equipped with an encoder, and the inverter must be equipped with the same type of PG card as the encoder. Suitable for high precision speed control or torque control applications. Only one motor can be driven by one inverter. Such as high-speed paper machinery, lifting machinery, elevators and other loads.

2: V/F control, suitable for occasions where the load requirements are not high, or when one inverter drives multiple motors, such as fans and pumps. It can be used in the case where one inverter drives multiple motors.

Note: The motor parameter identification process must be performed when selecting the vector control mode. Only accurate motor parameters can take advantage of the vector control method to achieve better performance.

P0-02	Run command source selection	0: Operation panel command channel (LED off) 1: terminal command channel (LED is lit) 2: Communication command channel (LED flashing)	Default：0

📖Select the inverter running control command mode, the running command includes start, stop, forward and reverse, jog, etc.

0: The operation panel command is controlled by the RUN, STOP and other buttons on the operation panel.

1: Terminal command channel ("L/R" is on), which is controlled by the multi-function input terminal.

2: Communication command channel ("L/R" flashing), the host computer controls the running command through communication mode.

P0-03	Main frequency source X selection	0: Digital setting (non-retentive at power failure) 1: Digital setting (retentive at power failure) 2: AI1 3: AI2 4: panel potentiometer 5: Pulse setting (X6) 6:Multi-segment instruction 7: Simple PLC 8: PID 9: Communication given	Default：1

📖Select the input channel of the main frequency of the inverter。

0: Digital setting (non-retentive at power failure), the main frequency is set by parameter P0-08.

The set frequency value of the inverter can be modified by the ▲ and ▼ keys (terminal UP/DOWN) of the keyboard.

When the inverter is powered off and powered up again, the set frequency is restored to the set value of parameter P0-08.

1: Digital setting (retentive at power failure), the main frequency is set by parameter P0-08.

The set frequency value of the inverter can be modified by the ▲ and ▼ keys (terminal UP/DOWN) of the keyboard.

When the inverter is powered off and powered up again, the set frequency memory is the set frequency at the last power-down time.

(P0-23 is the setting frequency stop memory selection. When the inverter stops, the frequency change amount is memorized or cleared. P0-23 is related to the shutdown, not related to the power-down memory, so pay attention to the application.)

2: Analog AI1 setting, the main frequency is determined by inputting 0V~10V from AI1 terminal.

3: Analog AI2 setting, the main frequency is determined by AI2 input 0V ~ 10V or 4mA ~ 20mA

Control board J2 jumper selects whether AI2 is voltage input U or current input I (20mA corresponds to 10V).The input voltage value of AI1 and AI2 and the corresponding relationship with the target frequency can be set by P4-13~27.

4: Panel potentiometer setting, the main frequency is set by the panel potentiometer.

5: The main frequency is given by the terminal pulse signal. The pulse signal specifications are: voltage range 9V ~ 30V, frequency range 0 ~ 100 kHz. The pulse signal can only be input from terminal X6. (See P4-28~P4-31)

6: Multi-segment command, the main frequency can be composed of four multi-segment terminals with different state combinations corresponding to 16 kinds of set frequency values.

Set PC group function code corresponding to 16 multi-segment instructions, multi-segment command terminal function is set in P4 group

7: The simple PLC main frequency is given by the PLC, and the PLC running frequency and running time are set in the PC group.

8: PID, the main frequency is given by the output controlled by the process PID. Generally used for closed-loop control in the field, such as constant pressure closed-loop control, constant tension closed-loop control, etc., it is necessary to set the PA group PID function parameters.

9: Communication given (optional), the main frequency is given by the host computer through communication.

P0-04	Auxiliary frequency source Y selection	Same as P0-03 (main frequency source X selection)	Default：0

🕮When the auxiliary frequency source Y is used as an independent frequency reference channel (X to Y switching), its usage is the same as that of the main frequency source X P0-03. Note when the auxiliary frequency source is used as the superimposed reference (the composite frequency of the main frequency source X and the auxiliary source Y is given)：

1）When the auxiliary frequency source Y is digitally given, P0-08 does not work. The user adjusts the frequency based on the ▲, ▼ keys of the keyboard or the UP and DOWN of the terminal directly on the basis of the main given frequency.

2) When the auxiliary frequency source is analog input AI1, AI2 or pulse input timing, the frequency range is set by P0-05 and P0-06.

3) The selection of auxiliary frequency source Y and main frequency source X cannot be set to the same channel, that is, P0-03 and P0-04 should not be set to the same value, otherwise it will cause confusion.。

P0-05	Auxiliary source Y range selection when superimposing	0: relative to the maximum frequency 1: relative to the frequency source X	Default：0
P0-06	Auxiliary frequency source Y range when superimposed	0%～150%	Default：100%

🕮When the frequency source is selected as frequency superposition (P0-07 is set to 1, 3 or 4), it is used to determine the adjustment range of the auxiliary frequency source.。

Note: If P0-05 is selected to be relative to the main frequency source X, the range of the auxiliary frequency source will change as the main frequency X changes.。

P0-07	Frequency source overlay selection	Ones place: frequency source selection 0: main frequency source X 1: X and Y operation (operation relationship determined by Tens position) 2: Switchover between X and Y 3: Switchover between X and "X and Y operation" 4: Switchover between Y and "X and Y operation" Tens place: frequency source primary and secondary operation relationship 0: main + auxiliary 1: main - auxiliary 2: the maximum of the two 3: the minimum of the two	Default：00

🕮The frequency reference channel is selected by this parameter. Frequency reference is realized by the combination of the main frequency source X and the auxiliary frequency source Y.

Ones place：Frequency source selection:

0: The main frequency source X frequency X is the target frequency.

1: Main and auxiliary operation results the main and auxiliary operation results are used as the target frequency, and the main and auxiliary operation relationships are described in the "ten place".

2: Main frequency source X and auxiliary frequency source Y are switched. When input terminal function P4-00~09 is set to 18.Input terminal (frequency source switching) is invalid: main frequency X is the target frequency; the input terminal (frequency source switching) is valid: the auxiliary frequency Y is the target frequency.

3: Main frequency source X and main and auxiliary operation result switching When input terminal function P4-00~09 is set to 18.Input terminal (frequency source switching) is invalid: main frequency source X is the target frequency; The input terminal (frequency source switching) is valid: the result of the main and auxiliary operations is used as the target frequency.

4: Auxiliary frequency source Y and main and auxiliary operation result switching When input terminal function P4-00~09 is set to 18.Invalid input terminal: auxiliary frequency Y as the target frequency; The input terminal is valid: the result of the main and auxiliary operations is used as the target frequency.

Tens place: frequency source primary and secondary operation relationship:

0: Main frequency source X + auxiliary frequency source Y is used as the target frequency. Achieve frequency superposition given function.

1: Main frequency source X-auxiliary frequency source Y is used as the target frequency.

2: Take the maximum of the absolute value of the main frequency X and the auxiliary frequency Y as the target frequency.

3: Taking the absolute value of the main frequency X and the auxiliary frequency Y as the minimum target frequency.

When the frequency source is selected as the main and auxiliary operation, the offset frequency is set by P0-21, and the offset frequency is superimposed on the result of the main and auxiliary operations.

P0-08	Preset frequency	0.00Hz～Maximum frequency（P0-10）	Default：50.00Hz

🕮When the frequency source is selected as digital setting or terminal UP/DOWN, the function code value is the initial value of the frequency digital setting of the inverter.

P0-09	Rotation direction	0: Same direction 1: Reverse direction	Default：0

🕮It is used to change the running direction of the motor, which is equivalent to adjusting any two lines of motor U, V and W to change the direction of the motor.

Note: After the parameters are initialized, the motor running direction will return to the original state. For the occasion where it is strictly prohibited to change the motor steering, use it with caution.

P0-10	Maximum frequency	50.00Hz～500.00Hz	Default：50.00Hz

🕮It is used to set the corresponding value of 100.0% for analog input, pulse input, multi-segment command, etc. as the frequency source.

When P0-22=1, the frequency resolution is 0.1Hz, and the setting range of P0-10 is 50.0Hz~3200.0Hz;

When P0-22=2, the frequency resolution is 0.01Hz, and the setting range of P0-10 is 50.0Hz~500.0Hz.

P0-11	Source of frequency upper limit	0: Set by P0-12 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: Communication setting	Default：0

🕮Define the source of the upper limit frequency. When the upper limit frequency is set with the analog input, 100% of the analog input setting corresponds to P0-12.

（For example, when the torque control mode is adopted in the winding control site, the upper limit frequency can be set by analog to avoid the “speeding” phenomenon of material disconnection. When the inverter runs to the upper limit frequency value, the inverter keeps running at the upper limit frequency.）

P0-12	Frequency upper limit	Frequency lower limit P0-14 ~ maximum frequency P0-10	Default：50.00Hz
P0-13	Frequency upper limit offset	0.00Hz to maximum frequency P0-10	Default：0.00Hz

🕮When the upper limit frequency is analog or pulse setting, P0-13 is used as the offset of the set value, and the offset frequency is superimposed with the upper limit frequency value set by P0-11 as the set value of the final upper limit frequency.

P0-14	Frequency lower limit	0.00Hz～frequency upper limit P0-12	Default：0.00Hz

🕮When the running frequency is lower than the lower limit frequency, the inverter can choose to stop, run at the lower limit frequency or run at zero speed, set by P8-14.

P0-15	Carrier frequency	0.5kHz～16.0kHz	Model dependent

📖This function is used to adjust the carrier frequency to reduce motor noise, avoid mechanical resonance points, and reduce ground leakage current and interference. When the carrier frequency is low, the output current higher harmonic component increases, the motor loss increases, and the motor temperature rise increases. When the carrier frequency is high, the motor loss is reduced, the motor temperature rise is reduced, but the temperature rise of the inverter is increased, and the interference is increased.

Adjusting the carrier frequency will affect the following performance：

Carrier frequency	Motor noise	Output current wave	Motor temperature rise	Inverter temperature rise	Leakage current	External radiation interfere
Low	Big	Bad	High	Low	Small	Small
High	Small	Good	Low	High	Big	Big

The frequency setting of the carrier frequency is different for inverters with different powers. If the carrier frequency is set higher than Default, the temperature rise of the inverter radiator will increase. At this time, the user needs to derate the inverter, otherwise the inverter has the danger of overheating alarm.

P0-16	Carrier frequency is adjusted with temperature	0：no 1：yes	Default：0

📖When the inverter detects that its own temperature is high, it automatically reduces the carrier frequency to reduce the temperature rise of the inverter. When the temperature is low, the carrier frequency is gradually restored to the set value. This function can reduce the chance of the inverter overheating alarm.

P0-17	Acceleration time 0	0.00s～65000s	depending
P0-18	Deceleration time 0	0.00s～65000s	depending

📖Acceleration time refers to the time required for the inverter to accelerate from zero frequency to the acceleration/deceleration reference frequency (P0-25), see t1 in Figure 6-1.

Deceleration time refers to the time required for the inverter to decelerate to the zero frequency from the acceleration/deceleration reference frequency (P0-25), see t2 in Figure 6-1.

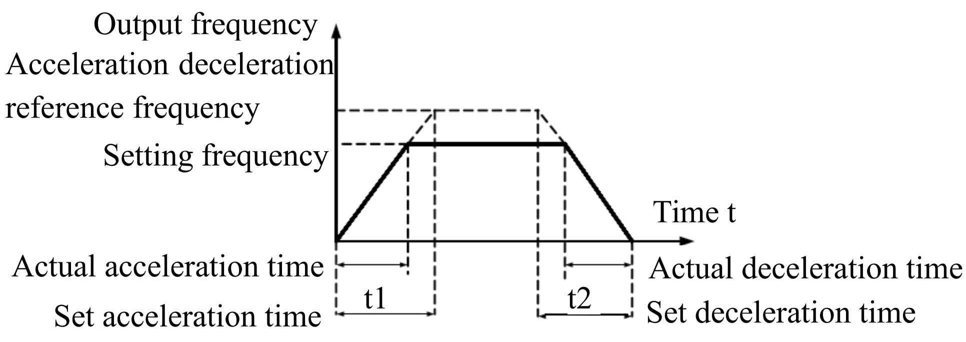


Figure 6-1 Acceleration and deceleration time

The inverter provides 4 sets of acceleration/deceleration time (P8-03~P8-08), and the user can switch from the input terminal.

P0-19	Acceleration/deceleration unit	0：1s　　1：0.1s　　2：0.01s	Default：1

📖Used to set 3 acceleration and deceleration time units, which are 1 second, 0.1 second and 0.01 second respectively。

Note: After modifying this parameter, the decimal places displayed in each acceleration/deceleration time will change, and the corresponding acceleration/deceleration time will also change.

P0-21	Auxiliary frequency source offset frequency when superimposing	0.00Hz～Maximum frequency P0-10	Default：0.00Hz

🕮When the frequency source is used as the main auxiliary operation, P0-21 is used as the offset frequency, and the result of the main and auxiliary operations is superimposed as the final frequency setting value, so that the frequency setting can be more flexible.

P0-22	Frequency reference resolution	1：0.1Hz 2：0.01Hz	Default：2

🕮This parameter is used to determine the resolution of all frequency-dependent function codes.
When the frequency resolution is 0.1Hz, the maximum output frequency can reach 3200Hz.
When the frequency resolution is 0.01 Hz, the maximum output frequency is 600.00 Hz.。
Note: When modifying the function parameters, the decimal places of all frequency-related parameters will change and the corresponding frequency values will also change.

P0-23	Digital setting frequency shutdown memory selection	0: Not retentive 1: Retentive	Default：1

🕮0: It means that after the inverter stops, the digital set frequency value will return to the value of P0-08. The frequency modified by the keyboard ▲, ▼ key or terminal UP, DOWN will be cleared.。

1: means that after the inverter stops, the digital set frequency retains the set frequency of the last stop time, and the frequency modified by the keyboard ▲, ▼ key or terminal UP, DOWN remains valid.

P0-24	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2	Default：0

🕮The inverter drives the application of 2 motors in time division. The 2 motors can set the motor nameplate parameters, independent parameter tuning, select different control modes, and independently set parameters related to running performance.

Motor parameter group 1 the corresponding function parameter group is F1 group and F2 group, and motor parameter group 2 corresponds to function parameter group A2 group. The user can select the current motor parameter group via the F0-24 function code, or switch the motor parameters via the digital input terminal X.

When the function code selection conflicts with the terminal selection, the terminal selection is subject to.

P0-25	Acceleration/Deceleration time base frequency	0: Maximum frequency (P0-10) 1: Set frequency 2: 100Hz	Default：0

🕮Acceleration/deceleration time refers to the acceleration/deceleration time from zero frequency to the frequency set by P0-25. See Figure 6-1.

When P0-25 is selected as 1, the acceleration/deceleration time will change with the change of the set frequency.

P0-26	Base frequency for UP/DOWN modification during running	0: running frequency 1: setting frequency	Default：0

🕮This parameter is valid only when the frequency source is digitally set.

When used to determine the ▲, ▼ key or terminal UP/DOWN action of the keyboard, the target frequency is increased or decreased based on the operating frequency, or is increased or decreased based on the set frequency.

The difference between the two settings is obvious when the inverter is in the acceleration/deceleration process, that is, if the running frequency of the inverter is different from the set frequency, the different choices of the parameters are very different.

P0-27	Binding command source to frequency source	Single digit: operation panel command binding frequency source selection 0: No binding 1: Digital setting frequency 2: AI1 3: AI2 4: AI3 5: Pulse X6 6: Multi-speed 7: Simple PLC 8: PID 9: Communication given Tens: terminal command binding frequency source selection Hundreds: Communication command binding frequency source selection Thousands: automatic running binding frequency source selection	Default：0000

🕮Define the bundle combination between the three running command channels and the nine frequency references to facilitate synchronous switching.

The above frequency given channel has the same meaning as the main frequency source X selects P0-03. Different running command channels can bundle the same frequency given channel. When the command source has a bundled frequency source, the frequency source set by P0-03~P0-07 is no longer active during the valid period of the command source.

P1 First motor parameter

P1-00	Motor type selection	0: General asynchronous motor 1: Variable frequency asynchronous motor	Default：0
P1-01	Motor rated power	0.1kW～1000.0kW	depending
P1-02	Motor rated voltage	1V～2000V	depending
P1-03	Motor rated current	0.1A～6553.5A	depend
P1-04	Motor rated frequency	0.01Hz～Maximum frequency	depend
P1-05	Motor rated speed	1rpm～65535rpm	depend

🕮The above function code is the motor parameter, and the relevant parameters are accurately set according to the motor nameplate.

In order to obtain better VF or vector control performance, motor parameter tuning is required, and the accuracy of the adjustment result is closely related to the correct setting of the motor nameplate parameters.

P1-06	Asynchronous motor stator resistance	0.001Ω～65.535Ω	Tuning parameter
P1-07	Asynchronous motor rotor resistance	0.001Ω～65.535Ω	Tuning parameter
P1-08	Asynchronous motor leakage inductance	0.01mH～655.35mH	Tuning parameter

P1-09	Asynchronous motor mutual inductance	0.1mH～6553.5mH	Tuning parameter
P1-10	Asynchronous motor no-load current	0.01A～P1-03	Tuning parameter

📖P1-06~P1-10 are the parameters of the asynchronous motor. These parameters are generally not on the motor nameplate and need to be automatically tuned by the inverter. Among them, "asynchronous motor static tuning" can only obtain three parameters P1-06~P1-08, and "integrated tuning of asynchronous motor" can obtain encoder phase sequence and current loop PI in addition to all five parameters here. Parameters, etc.

When changing the rated power of the motor (P1-01) or the rated voltage of the motor (P1-02), the inverter will automatically modify the P1-06~P1-10 parameter values and restore these five parameters to the common standard Y series motor parameters. If the asynchronous motor cannot be tuned at the site, you can enter the corresponding function code according to the parameters provided by the motor manufacturer.

P1-27	Encoder line number	1～65535	Default：1024

📖Set the number of pulses per revolution of the ABZ incremental encoder.

In the speed sensor vector control mode, the encoder pulse number must be set correctly, otherwise the motor will not operate normally.

P1-30	ABZ incremental encoder AB phase sequence	0: forward 1: reverse	Default：0

📖 This function code is used to set the phase sequence of the ABZ incremental encoder AB signal.

When the asynchronous motor is fully tuned, the AB phase sequence of the ABZ encoder can be obtained.

P1-31	Encoder mounting angle	0.0 ～ 359.9°	Default：0.0°
P1-32	UVW encoder UVW phase sequence	0: positive 1: reverse	Default：0
P1-33	UVW encoder offset angle	0.0 ～ 359.9°	Default：0.0°
P1-34	Rotary transformer pole pair	1～65535	Default：1

📖 The resolver is extremely logarithmic. When using this encoder, the polar logarithm parameter must be set correctly.。

P1-36	Speed feedback PG disconnection detection time	0.0：No action 0.1s～10.0s	Default：0

📖 It is used to set the detection time of the encoder disconnection fault. When set to 0.0s, the inverter does not detect the encoder disconnection fault. When the inverter detects a disconnection fault and the duration exceeds the set time of P1-36, the inverter alarms ERR20。

P1-37	Tuning selection	0: No auto-tuning　　1: Static auto-tuning 2: Complete auto-tuning　　3: Static full auto-tuning	Default：0

📖 0：No operation, Auto-tuning is prohibited.

1: Static auto-tuning, suitable for asynchronous motors and where the load is not easy to disengage and cannot be fully tuned.

Asynchronous machine static tuning (P1-00~P1-05 must be set correctly) can get three parameters P1-06~P1-08.

Action Description: Set the function code to 1, then press the RUN button, the inverter will perform static tuning.

2: Complete auto-tuning to ensure the dynamic control performance of the frequency converter, please select the full tuning.

Before the asynchronous machine is fully tuned, the motor must be disconnected from the load to keep the motor in no-load state. The parameters P1-00~P1-05 must be correctly set. (The encoder pulse number P1-27 must be set under the closed-loop control with PG card.)

The inverter can obtain five motor parameters P1-06~P1-10, AB phase sequence P1-30 (with PG card) of the encoder, and vector control current loop PI parameters P2-13~P2-16.

Action Description: Set the function code to 2, then press the RUN button, the inverter will perform a complete tuning.

3: Applicable to the case of no encoder, self-learning of the motor parameters under the static state of the motor (the motor may still have slight jitter at this time, need to pay attention to safety)

Action description: Set the function code to 3, then press RUN key, the inverter will perform no-load tuning.

Note: Tuning supports motor tuning in keyboard operation mode, terminal mode and communication mode.

P2 Vector control parameter

P2 function code is valid only for vector control and invalid for VF control.

P2-00	Speed loop proportional gain 1	1～100	Default：30
P2-01	Speed loop integration time 1	0.01s～10.00s	Default：0.50s
P2-02	Switchover frequency 1	0.00～P2-05	Default：5.00Hz
P2-03	Speed loop proportional gain 2	1～100	Default：20
P2-04	Speed loop integration time 2	0.01s～10.00s	Default：1.00s
P2-05	Switchover frequency 2	P2-02～Maximum frequency	Default：10.00Hz

📖 The inverter runs at different frequencies and can select different speed loop PI parameters. When the running frequency is less than the Switchover frequency 1 (P2-02), the speed loop PI adjustment parameters are P2-00 and P2-01. When the running frequency is greater than the Switchover frequency 2, the speed loop PI adjustment parameters are P2-03 and P3-04. Switching the speed loop PI parameter between frequency 1 and frequency 2, linearly switching between two sets of PI parameters, as shown in Figure 6-2.

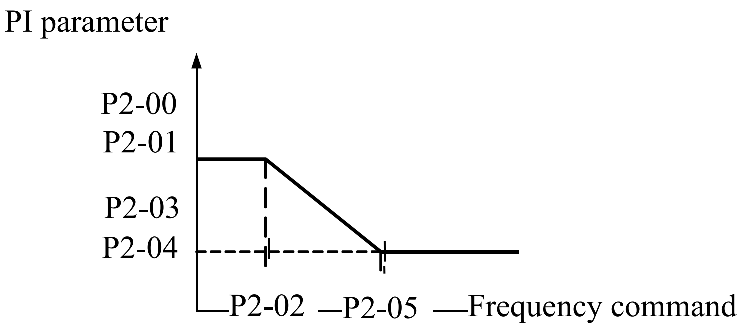


Figure 6-2 PI Parameter diagram

The speed dynamic response characteristic of the vector control can be adjusted by setting the proportionality factor and the integration time of the speed regulator.

Increasing the proportional gain and reducing the integration time can speed up the dynamic response of the speed loop. However, if the proportional gain is too large or the integration time is too small, the system can oscillate. The recommended adjustment method is:

If the factory parameters do not meet the requirements, fine-tune the Default parameter, first increase the proportional gain to ensure that the system does not oscillate; then reduce the integration time, so that the system has faster response characteristics, overshoot and smaller.

Note: If the PI parameters are not set properly, the speed overshoot may be too large. An overvoltage fault occurs even when the overshoot falls back.

P2-06	Vector control slip gain	50%～200%	Default：100%

📖 For speed sensorless vector control, this parameter is increased when the speed is lower when the motor is loaded, and vice versa.

For speed sensor vector control, this parameter can adjust the output current of the inverter under the same load.

For speed sensor vector control, this parameter can adjust the output current of the inverter under the same load.

P2-07	Time constant of speed loop filter	0.000s～0.100s	Default：0.000s

📖 In vector control mode, the output of the speed loop regulator is the torque current command, which is used to filter the torque command. This parameter generally does not need to be adjusted. When the speed fluctuates greatly, the filtering time can be appropriately increased. If the motor oscillates, the parameter should be appropriately reduced. The speed loop filter time constant is small, the inverter output torque may fluctuate greatly, but the speed response is fast.

P2-08	Vector controlled over-excitation gain	0～200	Default：64

📖 During deceleration, the over-excitation control can suppress the rise of the bus voltage and avoid overvoltage faults. The larger the over-excitation gain, the stronger the suppression effect.

In the case where the inverter is easy to overvoltage alarm during the deceleration process, it is necessary to increase the over-excitation gain. However, the over-excitation gain is too large, which tends to cause an increase in the output current, which needs to be weighed in the application.

For applications where the inertia is small, there is no voltage rise during motor deceleration. It is recommended to set the over-excitation gain to 0. For those with braking resistors, it is also recommended to set the over-excitation gain to 0.

P2-09	Torque upper limit source in speed control mode	0：Function code P2-10 setting 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) The full scale of the 1-7 option corresponds to P2-10	Default：0
P2-10	Digital setting of torque upper limit in speed control mode	0.0%～200.0%	Default：160.0%

📖 In the speed control mode, the maximum value of the inverter output torque is controlled by the torque upper limit source.

P2-09 is used to select the setting source of the upper torque limit. When it is set by analog quantity, pulse and communication, the corresponding setting of 100% corresponds to P2-10, and 100% of P2-10 is the rated torque of the inverter.

P2-13	Excitation adjustment proportional gain	0～60000	Default：2000
P2-14	Excitation regulation integral gain	0～60000	Default：1300

P2-15	Torque adjustment proportional gain	0～60000	Default：2000
P2-16	Torque adjustment integral gain	0～60000	Default：1300

🕮 The vector control current loop PI adjusts the parameter, which is automatically obtained after the asynchronous machine is fully tuned, and generally does not need to be modified.

Need to be reminded that the integral regulator of the current loop does not use the integration time as the dimension, but directly sets the integral gain. The current loop PI gain setting is too large, which may cause the entire control loop to oscillate, so when the current oscillation or torque fluctuation is large, the PI proportional gain or integral gain can be manually reduced.

P2-20	Maximum output voltage coefficient	100%~110%	Default：105%

🕮 The maximum output voltage coefficient indicates the boosting capacity of the maximum output voltage of the inverter. Increasing the F2-20 can increase the maximum load capacity of the weak field of the motor, but the increase of the motor current ripple will increase the heat generated by the motor; otherwise, the maximum band of the weak field of the motor The load capacity will decrease, but the motor current ripple will decrease, which will reduce the heat generated by the motor. Generally no adjustment required.

P2-21	Weak magnetic zone maximum torque factor	50%~200%	Default：100%

🕮 This parameter only takes effect when the motor is running above the rated frequency. When the motor needs to accelerate to 2 times the rated motor frequency and the actual acceleration time is longer, reduce P2-21 appropriately; when the motor runs at 2 times the rated frequency and the speed drops greatly, increase P2-21 appropriately. Generally no need to change.

P3 V/F control parameter

This group of function codes is valid only for V/F control and invalid for vector control. V/F control is suitable for general-purpose loads such as fans and pumps, or an inverter with multiple motors, or applications with large differences in inverter power and motor power.

P3-00	V/F Curve setting	0: Straight line V/F　　1: Multi-point V/F 2: square V/F　　3: 1.2 power V/F 4: 1.4 power V/F　　6: 1.6 power V/F 8: 1.8 power V/F　　9: reserved 10: V/F complete separation mode 11: V/F semi-separation mode	Default：0

🕮 0：Straight line V/F. Suitable for ordinary constant torque loads.

1: Multi-point V/F. Suitable for loads such as dehydrators and centrifuges. Set the P3-03~P3-08 parameters to get any V/F curve.

2: square V/F. Suitable for centrifugal loads such as fans and pumps.

3~8: V/F relationship between straight line V/F and square V/F.

10: V/F complete separation mode. At this time, the output frequency of the inverter is independent of the output voltage, the output frequency is determined by the frequency source, and the output voltage is determined by P3-13. Generally used in induction heating, inverter power, torque motors and other occasions.

11: V/F semi-separation mode. In this mode, V is proportional to F, but the proportional relationship can be set by P3-13, and the relationship between V and F is also related to the rated voltage and rated frequency of the motor of P1 group.

Assuming that the voltage source input is X (X is 0~100%), the relationship between the inverter output voltage V and the frequency F is: V/F=2 * X * (motor rated voltage) / (motor rated frequency)

P3-01	Torque boost	0.0%（Auto） 0.1%～30.0%	depend
P3-02	Cut-off frequency of torque boost	0.00Hz～Maximum frequency	Default：50.00Hz

🕮 In order to compensate for the low-frequency torque characteristics of the V/F control, some boost compensation is applied to the output voltage of the inverter at low frequencies. However, the torque boost setting is too large, the motor is prone to overheating, and the inverter is prone to overcurrent.

It is recommended to increase this parameter when the load is heavy and the motor starting torque is insufficient. The torque boost can be reduced when the load is light.

When the torque boost is set to 0.0, the inverter is automatically torque boosted. At this time, the inverter automatically calculates the required torque boost value according to parameters such as the stator resistance of the motor.

Torque boost cutoff frequency: Under this frequency, the torque boost is valid. If the set frequency is exceeded, the torque boost will be invalid, as shown in Figure 6-3.

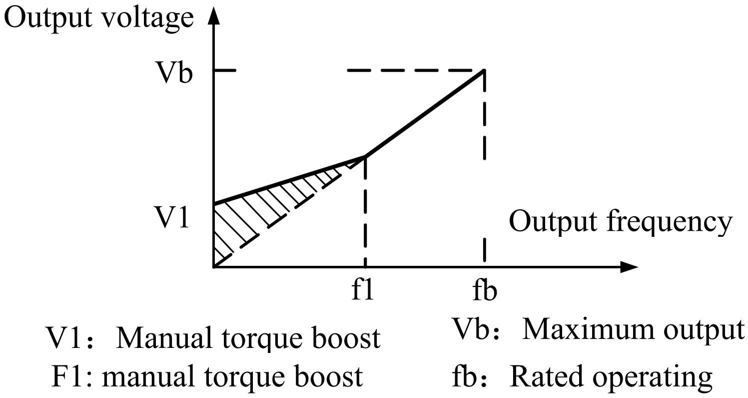


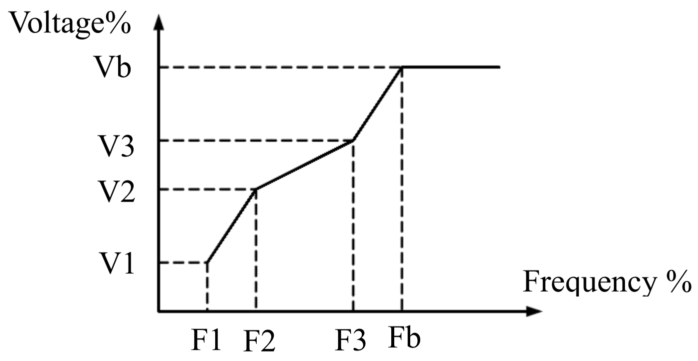
Figure 6-3 Manual torque boost

P3-03	Multi-point V/F frequency point 1	0.00Hz～P3-05	Default：0.00Hz
P3-04	Multi-point V/F voltage point 1	0.0%～100.0%	Default：0.0%
P3-05	Multi-point V/F frequency point 2	P3-03～P3-07	Default：0.00Hz
P3-06	Multi-point V/F voltage point 2	0.0%～100.0%	Default：0.0%
P3-07	Multi-point V/F frequency point 3	P3-05～motor rated frequency（P1-04）	Default：0.00Hz
P3-08	Multi-point V/F voltage point 3	0.0%～100.0%	Default：0.0%

🕮 P3-03～P3-08 Six parameters define multi-segment V/F curves。

The multi-point V/F curve should be set according to the load characteristics of the motor. It should be noted that the relationship between the three voltage points and the frequency point must satisfy: V1 < V2 < V3, F1 < F2 < F3. Figure 6-4 shows the setting of the multi-point V/F curve.

If the voltage is set too high at low frequencies, the motor may overheat or even burn out. The inverter may over-current or over-current protection.



V1-V3: Multi-speed V/F section 1-3 voltage

F1-F3: Multi-speed V/F section 1-3 frequency percentage

Vb：Motor rated voltage Fb：Motor rated running frequency

Figure 6-4 Multi-point V/F curve setting diagram

P3-09	V/F Slip compensation gain	0.0%～200.0%	Default：0.0%

📖 The V/F slip compensation can compensate the motor speed deviation generated by the asynchronous motor when the load increases, so that the motor speed can be basically stabilized when the load changes. The VF slip compensation gain is set to 100.0%, which means that the motor's rated slip is the motor's rated slip when the rated load is applied, and the motor's rated slip is obtained. The inverter is calculated by the rated frequency and rated speed of the P1 motor.

When adjusting the V/F slip compensation gain, the motor speed is basically the same as the target speed under the rated load. When the motor speed is different from the target value, the gain needs to be fine-tuned appropriately.

P3-10	V/F Over-excitation gain	0～200	Default：120

📖 During the deceleration, the over-excitation control can suppress the rise of the bus voltage and avoid overvoltage faults. The larger the over-excitation gain, the stronger the suppression effect.

In the case where the inverter is easy to overvoltage alarm during the deceleration process, it is necessary to increase the over-excitation gain. However, the over-excitation gain is too large, which tends to cause an increase in the output current, which needs to be weighed in the application.

For applications where the inertia is small, there is no voltage rise during motor deceleration. It is recommended to set the over-excitation gain to 0. For those with braking resistors, it is also recommended to set the over-excitation gain to 0.

P3-11	V/F oscillation suppression gain	0～100	depend

📖 The selection method of the gain is as small as possible under the premise of effectively suppressing the oscillation, so as to avoid adversely affecting the operation of the V/F. Select this gain to be 0 when there is no oscillation in the motor. Only when the motor oscillates obviously, the gain needs to be appropriately increased. The larger the gain, the more obvious the suppression of the oscillation. When using the suppression oscillation function, the motor rated current and no-load current parameters are required to be accurate, otherwise the V/F oscillation suppression effect is not good.

P3-13	Voltage source for V/F separation	0: Digital setting (P3-14) 1: AI1 2: AI2 3: AI3 4: Pulse setting (X6) 5: Multi-speed 6: Simple PLC 7: PID 8: Communication reference (100.0% corresponds to rated voltage)	Default：0
P3-14	Voltage digital setting for V/F separation	0V ~ motor rated voltage	Default：0V

🕮 V/F separation is generally used in induction heating, inverter power supply and torque motor control. When V/F separation control is selected, the output voltage can be set by function code P3-14, or it can be from analog quantity, multi-segment instruction, PLC, PID or communication reference. When using non-digital setting, 100% of each setting corresponds to the rated voltage of the motor. When the percentage of the output setting such as analog quantity is negative, the set absolute value is used as the effective setting value.

0: Digital setting (P3-14) the voltage is set directly by P3-14.

1: AI1 2: AI2

3: The AI3 voltage is determined by the analog input terminal.

4: Pulse setting the voltage reference is given by the terminal pulse.

5: Multi-segment command when the voltage source is a multi-segment command, set the P4 group and PC group parameters to determine the output voltage.

6: When the simple PLC voltage source is a simple PLC, you need to set the PC group parameters to determine the given output voltage.

7: PID: The output voltage is generated according to the PID closed loop. For details, see the introduction of the PA group PID.

8: Communication reference the voltage is given by the host computer through communication.

When the above voltage source is selected from 1 to 8, 0 to 100% corresponds to the output voltage 0V to the motor rated voltage.

P3-15	Voltage rise time of V/F separation	0.0s～1000.0s	Default：0.0s
P3-16	Voltage decline time of V/F separation	0.0s～1000.0s	Default：0.0s

🕮 The V/F separation rise time refers to the time required for the output voltage to change from 0V to the rated voltage of the motor. As shown in Figure 6-5.

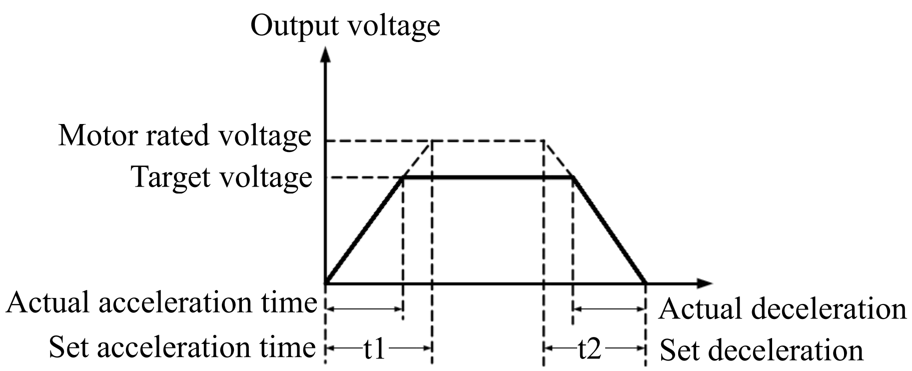


Figure 6-5 V/F Separation diagram

P3-17	V/F Separate shutdown mode selection	0: frequency / voltage is independently reduced to 0 1: After the voltage is reduced to 0, the frequency is reduced again.	Default：0

🕮 0： The frequency/voltage is independently reduced to 0; the V/F separated output voltage is decremented to 0V according to the voltage fall time (P3-15); the V/F separated output frequency is simultaneously decremented to 0Hz according to the deceleration time (P0-18).

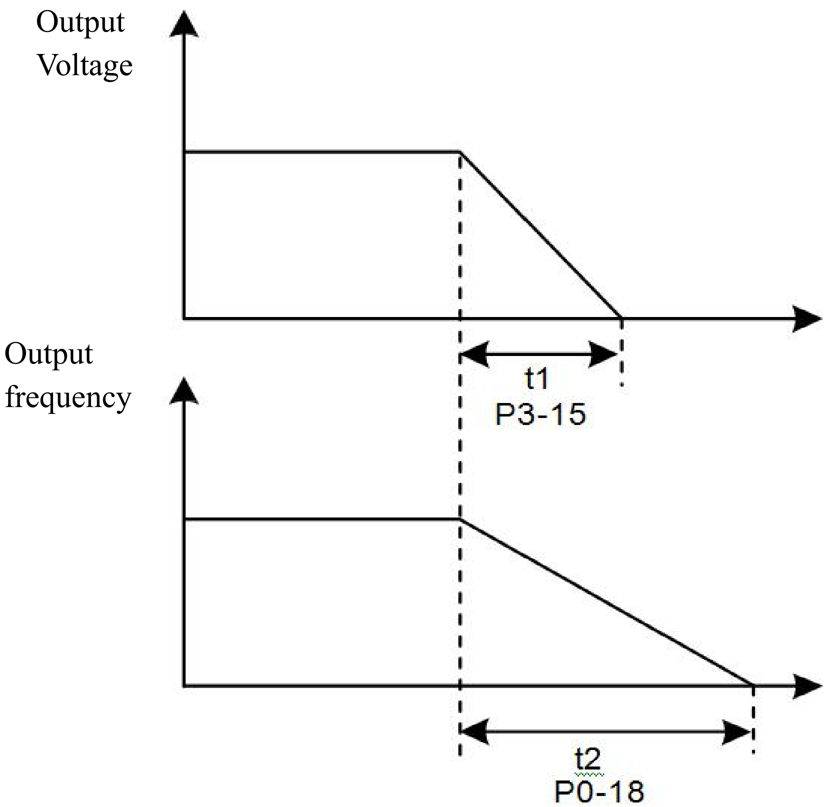


Figure 6-6 V/F Separate output voltage / frequency independently reduced to 0

1: After the voltage is reduced to 0, the frequency is further reduced; the V/F separated output voltage is first decremented to 0V according to the voltage falling time (P3-15), and then the frequency is decremented to 0Hz according to the deceleration time (P0-18).

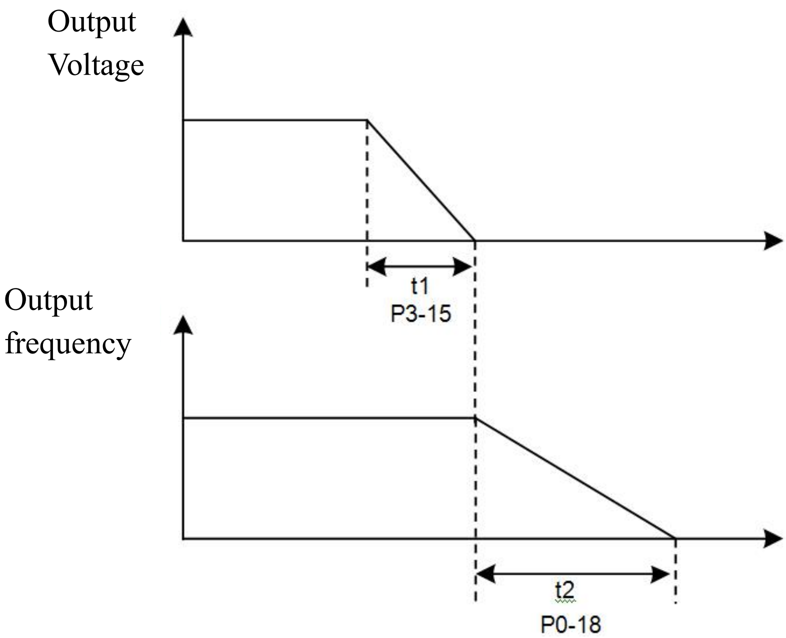


Figure 6-7 V/F separation frequency/voltage drop diagram

Inverter output current (torque) limit in the acceleration, constant speed, deceleration process, if the current exceeds the overcurrent loss current point (150%), the overcurrent speed will work.

When the current exceeds the over-discharge speed point, the output frequency begins to decrease. Until the current returns below the over-discharge speed point, the frequency begins to accelerate upward to the target frequency. The actual acceleration time is automatically lengthened. If the actual acceleration time does not meet the requirements, it may be appropriate. Increase "P1-21 over-current operating current".

P3-18	Overcurrent current	50~200%	Default：150%
P3-19	Over-speed suppression	0 : invalid 1: valid	Default：1
P3-20	Over-speed rejection gain	0~100	Default：20
P3-21	Double speed overrun speed action current compensation coefficient	50~200%	Default：50%

🕮In the high frequency region, the motor drive current is small, and the speed of the motor drops greatly with respect to the same stall current below the rated frequency. In order to improve the operating characteristics of the motor, the stall operating current above the rated frequency can be reduced, in some centrifuges. When the operating frequency is high, requiring several times of weak magnetic field and large load inertia, this method has a good effect on the acceleration performance.

Transition stall current exceeding the rated frequency = (fs/fn) * k * Limit Cur;

Fs is the running frequency, fn is the rated motor frequency, k is F3-21 "double speed over loss speed action current compensation coefficient", Limit Cur is F3-18 "overcurrent speed action current";

Overcurrent loss current 150% means 1.5 times the rated current of the inverter;

For high-power motors, the carrier frequency is below 2 kHz. Due to the increase of the ripple current, the wave-by-wave current-limit response starts before the over-speed prevention action, and the torque is insufficient. In this case, reduce the over-speed prevention operation current.

● Inverter bus voltage limit (and brake resistor turn-on voltage setting)

If the bus voltage exceeds the overvoltage stall point of 760V, indicating that the electromechanical system is already in the power generation state (motor speed > output frequency), the overvoltage stall will work, adjust the output frequency (consuming more feedback than the feedback), the actual deceleration time will be automatic Stretching, avoiding trip protection, if the actual deceleration time cannot meet the requirements, you can increase the over-excitation gain appropriately.

P3-22	Overvoltage stall operating voltage	200.0V~2000.0V	Default：depending
P3-23	Overvoltage stall enable	0 : invalid 1: valid	Default：0
P3-24	Overvoltage stall suppression frequency gain	0~100	Default：30
P3-25	Overvoltage stall suppression voltage gain	0~100	Default：30
P3-26	Overvoltage stall maximum rising frequency limit	0~50Hz	Default：5Hz

🕮Please note when using a braking resistor or installing a brake unit or using an energy feedback unit.

Please set P3-11 “over-excitation gain” value to “0”. If it is not “0”, it may cause excessive current during operation. Please set P3-23 “Overvoltage stall enable” value to “0”. If it is not “0”, it may cause deceleration time to lengthen the problem.

P3-27	Slip compensation time constant	0.1~10.0s	Default： 0.5

🕮The smaller the response time value of the slip compensation is set, the faster the response speed is.

P3-34	Water supply mode selection	0: Turn off water supply mode 1: Turn on the water supply mode	Default：0

🕮 0：Shut off water supply mode The P3-35 ~ P3-40 function is invalid in this mode.

1：Turn on water supply mode After this mode is turned on, PA-00, PA-01, P8-49 ~ P8-52 functions are invalid, and corresponding functions are replaced by P3-35 ~ P3-40.

P3-35	Remote transmission of pressure gauge range	0.00～5.00MPa	Default：1.00 MPa
P3-36	Demand target pressure	0.00～P3-39	Default：0.5 MPa

📖 Set p3-35 according to the actual range of the remote transmission pressure gauge, and then set the desired target pressure value.

P3-37	Dormancy frequency	0.00 Hz～P0-10	Default：25.00Hz
P3-38	Sleep latency	0.0～3600.0s	Default：0.0s

📖 When the feedback pressure is greater than the target pressure, and the operating frequency continues to be less than the sleeping frequency of P3-37, it enters the sleeping state after the sleeping delay of P3-38.

P3-39	Wake up the pressure	0.0～100.0%	Default：80%
P3-40	Wake up time delay	0.0～3600.0s	Default：0.0s

📖 When feedback pressure is less than wake up pressure, After the sleep delay of P3-40 wake up the converter again.

P4 Input terminal

The inverter comes standard with 6 multi-function digital input terminals (X6 can be used as high-speed pulse input terminal), 2 analog input terminals.

P4-00	X1 terminal function selection	Default: 1 Forward RUN (FWD)
P4-01	X2 terminal function selection	Default: 2 Reverse RUN (REV)
P4-02	X3 terminal function selection	Default: 0 (no-function)
P4-03	X4 terminal function selection	Default: 0 (no-function)
P4-04	X6 terminal function selection	Default: 0 (no-function)
P4-05	X5 terminal function selection	Default: 0 (no-function)
P4-06	X7 terminal function selection	Default: 0 (no-function)
P4-07	X8 terminal function selection	Default: 0 (no-function)
P4-08	X9 terminal function selection	Default: 0 (no-function)

📖These parameters are used to set the function of the digital multi-function input terminal. The functions that can be selected are shown in the table below.:

Setting value	Function	Instruction
0	No function	The unused terminals can be set to "No function" to prevent malfunction.
1	Forward RUN (FWD)	The inverter is controlled to rotate forward and reverse by external terminals.
2	Reverse RUN (REV)	
3	Three-wire control	Through this terminal as a three-wire control, see P4-11 for details.
4	Forward JOG	Control the forward and reverse jog operation of the inverter through external terminals. Jog running frequency, jog acceleration/deceleration time see
5	Reverse JOG	

		P8-00~P8-02.
6	Terminal UP	The frequency is incremented or decremented when the frequency is given by the external terminal. When the frequency source is set to digital setting, the set frequency can be adjusted up and down.
7	Terminal DOWN	
8	Coast to stop	The inverter blocks the output, and the motor's stopping process is not controlled by the inverter. This mode has the same meaning as Coast to stop described in P6-10.
9	Fault reset (RESET)	The fault is reset via the terminal. Same as the RESET button on the keyboard.
10	Run pause	Inverter decelerates to stop, but all operating parameters are memorized. Such as PLC parameters, swing frequency parameters, PID parameters. After the terminal signal disappears, the inverter returns to the operating state before stopping.
11	Normally open (NO) input of external fault	When the signal is activated, the fault ERR15 is reported and the fault is processed according to the setting of P9-47.
12	Multi-speed terminal 1	The 16-segment speed or 16 other commands can be set by combining the 16 states of the four terminals. See Table 1 for details.
13	Multi-speed terminal 2	
14	Multi-speed terminal 3	
15	Multi-speed terminal 4	
16	Acceleration/deceleration time selection 1	Through the combination of the four states of the two terminals, four kinds of acceleration/deceleration time are selected. For details, see Appendix 2.
17	Acceleration/deceleration time selection 2	
18	Frequency source switchover	This terminal is used to switch the main frequency between the two frequency sources. See P0-07 for details.
19	UP and DOWN setting clear (terminal, keyboard)	If the frequency source is digital setting, the terminal is used to clear the modification by using the UP/DOWN function or the increment/decrement key on the operating panel, returning the set frequency to the value of P0-08.
20	Command source switchover terminal	If the command source is set to terminal control (P0-02= 1), this terminal is used to perform switchover between terminal control and operating panel control. If the command source is set to communication control (P0-02 = 2), this terminal is used to perform switchover between communication control and operating panel control.
21	Acceleration and deceleration prohibited	Ensure that the inverter is not affected by external signals (except for shutdown commands), Maintain the current output frequency.
22	PID pause	The PID temporarily fails, the inverter maintains the current output frequency, and no PID adjustment is performed.
23	PLC status reset	When the PLC runs paused, this terminal can be restored to the initial state of the PLC.
24	Swing frequency pause	The frequency converter outputs at the center frequency. The swing frequency function is suspended.
25	Counter input	Count the input terminals of the pulse.
26	Counter reset	The counter status is cleared.
27	Length count input	Input terminal for length counting.
28	Length reset	Zero length

29	Torque control prohibited	The inverter is prohibited from performing torque control, and the inverter enters the speed control mode.
30	Pulse frequency input	X6 functions as a PULSE input terminal (only X6 is active).
32	Immediate DC braking	When the terminal is valid, the inverter directly switches to the DC braking state.
33	Normally closed (NC) input of external fault	When the external fault normally closed signal is sent, the inverter reports ERR15 fault and stops.
34	Frequency modification forbidden	When the terminal function is valid, the inverter respond to the frequency change.
35	Reverse PID action direction	When the terminal is valid, the direction of the PID action is opposite to the direction set by PA-03.
36	External STOP terminal 1	When the keyboard is controlled, the terminal can be stopped, which is equivalent to the STOP button function on the keyboard.
37	Command source switchover terminal 2	Used for switching between terminal control and communication control. If the command source is selected as the terminal control, the system switches to communication control when the terminal is valid; vice versa.
38	PID integral pause	When the terminal is valid, the integral adjustment function of the PID is suspended, but the proportional adjustment and differential adjustment functions of the PID are still valid.
39	Switchover between main frequency source X and preset frequency	When the terminal is valid, the frequency source X is replaced by the preset frequency (P0-08).
40	Switchover between auxiliary frequency source Y and preset frequency	When the terminal is valid, the frequency source Y is replaced by the preset frequency (P0-08).
43	PID parameter switchover	When the terminal is invalid, the PID parameter uses PA-05~PA-07; when the terminal is valid, PA-15~PA-17 is used; (PA-18=1)
44	User-defined fault 1	When the user-defined faults 1 and 2 are valid, the inverter will alarm ERR27 and ERR28 respectively, and the inverter will select the action mode selected by P9-49 according to the fault protection action.
45	User-defined fault 2	
46	Speed control/Torque control switchover	The inverter is switched between torque control and speed control mode. When the terminal is invalid, the inverter runs in the control mode defined by A0-00. When the terminal is valid, it switches to the other mode.
47	emergency stop	When the terminal is valid, the inverter stops at the fastest speed, and the current is at the set current limit during the stop. This function is used when the inverter needs to stop as soon as possible in an emergency state.
48	External STOP terminal 2	In any control mode (panel control, terminal control, communication control), this terminal can be used to decelerate the inverter, and the deceleration time is fixed at deceleration time 4.
49	Deceleration DC braking	When valid, the inverter decelerates to the braking start frequency and then DC braking.

50	Clear the current running time	When the terminal is valid, the timing of the inverter running this time is cleared. This function needs to be used together with the timing operation (P8-42) and the current running time arrival (P8-53).
51	Clear the current running time	Used to switch between two-wire and three-wire control. If F4-11 is two-wire type 1, the function is switched to three-wire type 1 when the terming al function is valid. So on and so forth.
52	Reverse reversal	This terminal is valid and the inverter is prohibited from being reversed. Same function as P8-13.

Table1 Multi-segment instruction function description. The four multi-segment command terminals can be combined into 16 state combinations, and each of the 16 state combinations corresponds to 16 command set values. As shown in Table 1:

K4	K3	K2	K1	Instruction setting	Corresponding parameter
OFF	OFF	OFF	OFF	Multi-segment instruction 0	PC-00
OFF	OFF	OFF	ON	Multi-segment instruction 1	PC-01
OFF	OFF	ON	OFF	Multi-segment instruction 2	PC-02
OFF	OFF	ON	ON	Multi-segment instruction 3	PC-03
OFF	ON	OFF	OFF	Multi-segment instruction 4	PC-04
OFF	ON	OFF	ON	Multi-segment instruction 5	PC-05
OFF	ON	ON	OFF	Multi-segment instruction 6	PC-06
OFF	ON	ON	ON	Multi-segment instruction 7	PC-07
ON	OFF	OFF	OFF	Multi-segment instruction 8	PC-08
ON	OFF	OFF	ON	Multi-segment instruction 9	PC-09
ON	OFF	ON	OFF	Multi-segment instruction 10	PC-10
ON	OFF	ON	ON	Multi-segment instruction 11	PC-11
ON	ON	OFF	OFF	Multi-segment instruction 12	PC-12
ON	ON	OFF	ON	Multi-segment instruction 13	PC-13
ON	ON	ON	OFF	Multi-segment instruction 14	PC-14
ON	ON	ON	ON	Multi-segment instruction 15	PC-15

When the frequency source is selected as multi-speed, 100.0% of function code PC-00~PC-15 corresponds to Maximum frequency P0-10. In addition to being a multi-speed function, the multi-segment command can also be used as a given source of PID or as a voltage source for VF separation control to meet the need to switch between different given values.

Schedule 2 Acceleration/deceleration time selection terminal function description

Terminal2	Terminal 1	Acceleration or deceleration time selection	Corresponding parameter
OFF	OFF	Acceleration time 1	P0-17、P0-18
OFF	ON	Acceleration time 2	P8-03、P8-04
ON	OFF	Acceleration time 3	P8-05、P8-06
ON	ON	Acceleration time 4	P8-07、P8-08

P4-10	Input terminal filter time	0.000s～1.000s	Default：0.10s

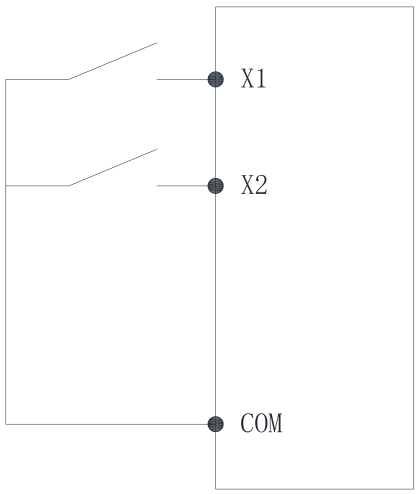
🕮Set the software filter time for the terminal status. If the input terminal is susceptible to interference and cause malfunction, increase this parameter to enhance the anti-interference ability. However, this parameter increase will cause the X terminal to respond slowly.

P4-11	Terminal command mode	0: two-wire mode 1　　1: two-wire mode 2 2: Three-wire mode 1　　3: Three-wire mode 2	Default：0

🕮This parameter defines four different ways to control the operation of the drive via external terminals.

0: Two-wire mode 1， The positive and negative running of the motor is determined by terminals X1 and X2.

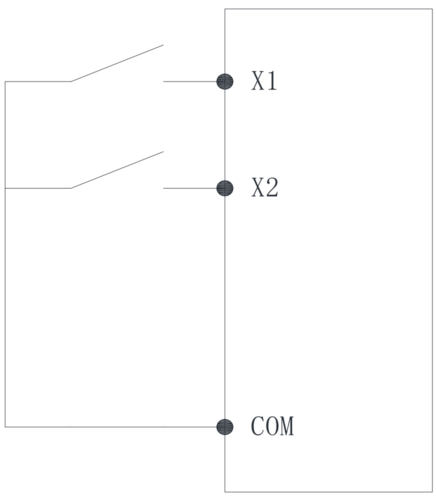
Terminal function settings are as follows:



2-wire control mode 1		
X1	X2	Operation instruction
OFF	OFF	STOP
ON	OFF	FWD
OFF	ON	REV
ON	ON	STOP
Parameter setting	P0-02=1	
	P4-00=1	
	P4-01=2	
	P4-11=0	

Figure 6-8 Two-wire mode 1

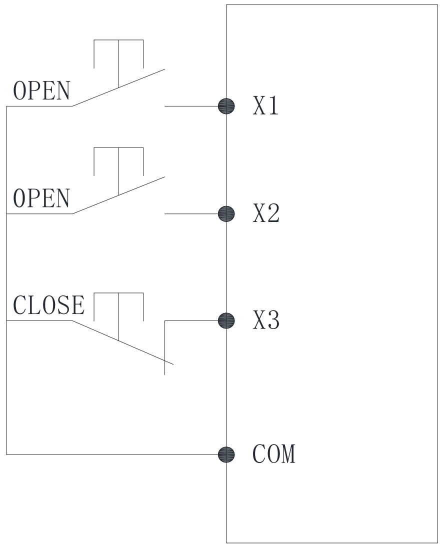
1: Two-wire mode 2, in this mode, the X1 terminal function is the operation enable terminal, and the X2 terminal function determines the running direction. The terminal function settings are as follows:



2-wire control mode 2		
X1	X2	Operation instruction
OFF	OFF	STOP
ON	OFF	FWD
ON	ON	REV
OFF	ON	STOP
Parameter setting	P0-02=1	
	P4-00=1	
	P4-01=2	
	P4-11=1	

Figure 6-9 Two-wire mode 2

2：Three-wire control mode 1, this mode X3 is the enable terminal, and the direction is controlled by X1 and X2 respectively. Terminal function settings are as follows：



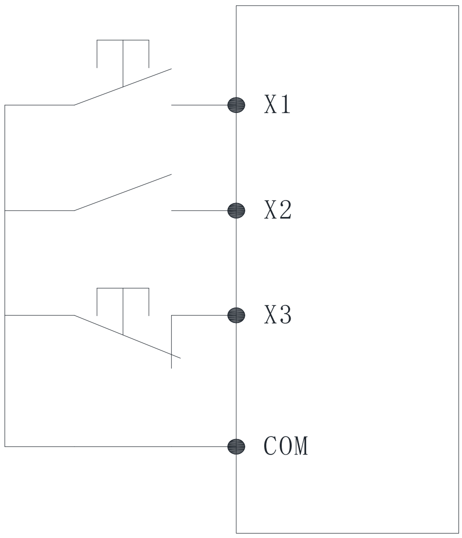
3-wire control mode 1			
X1	X2	X3	Operation instruction
OFF	OFF	ON	STOP
PULSE ON	OFF	ON	FWD
OFF	PULSE ON	ON	REV
OFF/ON		PULSE OFF	STOP
Parameter setting			P0-02=1
			P4-00=1
			P4-01=2
			P4-02=3
			P4-11=2

Figure 6-10 Three-wire control mode 1

As shown in the figure above, in the control mode, when the SB1 button is closed, press the SB2 button to turn the inverter forward. Press the SB3 button to reverse the inverter. When the SB1 button is turned off, the inverter stops. During normal start-up and operation, it is necessary to keep the SB1 button closed. The commands of the SB2 and SB3 buttons are valid at the end of the closing action. The running status of the inverter is based on the last button action of the three buttons.

3: Three-wire control mode 2, the X3 enable terminal of this mode, the running command is given by X1, and the direction is determined by the state of X2.

Terminal function settings are as follows：



3-wire control mode 2			
X1	X2	X3	Operation instruction
OFF	OFF	ON	STOP
PULSE ON	OFF	ON	FWD
PULSE ON	ON	ON	REV
OFF/ON		PULSE OFF	STOP
Parameter setting			P0-02=1
			P4-00=1
			P4-01=2
			P4-02=3
			P4-11=3

Figure 6-11 Three-wire control mode 2

As shown in the above figure, in the control mode, when the SB1 button is closed, press the SB2 button to run the inverter, K disconnects the inverter from forward rotation, K closes the inverter to reverse; when the SB1 button is disconnected, the inverter stops. During normal start-up and operation, the SB1 button must be closed and the SB2 button command will take effect at the end of the closing action.

P4-12	P4-12 terminal UP/DOWN change rate	0.001Hz/s～65.535Hz/s	Default：1.00Hz/s

📖It is used to set the speed at which the terminal UP/DOWN changes when the set frequency is adjusted, that is, the amount of change in frequency per second.

When P0-22 (frequency point) is 2, the value ranges from 0.001 Hz/s to 65.535 Hz/s.

When P0-22 (frequency decimal point) is 1, the value ranges from 0.01 Hz/s to 655.35 Hz/s.

P4-13	AI curve 1 minimum input	0.00V～P4-15	Default：0.00V
P4-14	AI curve 1 minimum input corresponding value	-100.0%～+100.0%	Default：0.0%
P4-15	AI curve 1 maximum input	P4-13～+10.00V	Default：10.00V
P4-16	AI curve 1 maximum input corresponding value	-100.0%～+100.0%	Default：100.0%
P4-17	AI1 filtering time	0.00s～10.00s	Default：0.10s

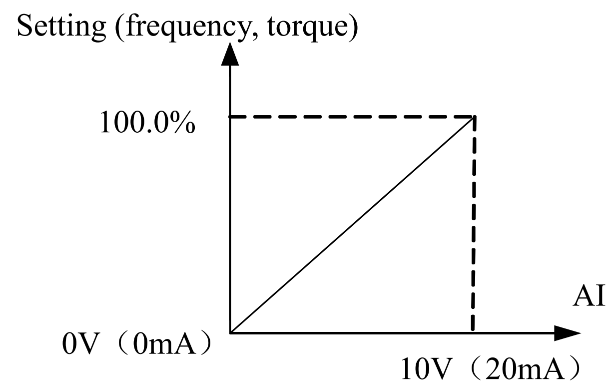
🕮The above function code is used to set the relationship between the analog input voltage and the set value it represents.

When the analog input voltage is greater than the set maximum input (P4-15), the analog voltage is calculated as the maximum input; when the analog input voltage is less than the set minimum input (P4-13), then P4 The -34 setting is calculated with a minimum input or 0.0%.

When the analog input is a current input, the 1mA current is equivalent to 0.5V.

AI1 input filtering time is used to set the software filtering time of AI1. When the field analog quantity is easily disturbed, please increase the filtering time so that the detected analog quantity tends to be stable, but the larger the filtering time is, the analog quantity detection is. The slower the response.

In different applications, the nominal value corresponding to 100.0% of the analog setting is different. For details, please refer to the description of each part. The following illustrations are for two typical settings:



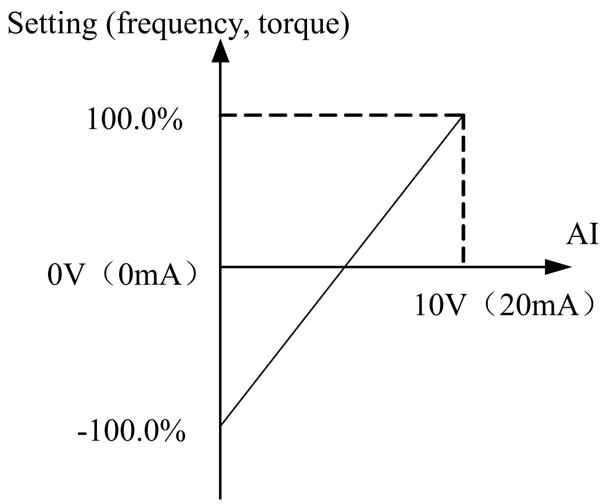


Figure 6-12 Correspondence between analog reference and set amount

P4-18	AI curve 2 minimum input	0.00V～P4-20	Default：0.00V
P4-19	AI curve 2 minimum input corresponding value	-100.0%～+100.0%	Default：0.0%

P4-20	AI curve 2 maximum input	P4-18～+10.00V	Default：10.00V
P4-21	AI curve 2 maximum input corresponding value	-100.0%～+100.0%	Default：100.0%
P4-22	AI2 filtering time	0.00s～10.00s	Default：0.10s

🕮For the function and usage of curve 2, please refer to the description of curve 1.

P4-23	AI curve 3 minimum input	-10.00V～P4-25	Default：0.00V
P4-24	AI curve 3 minimum input corresponding value	-100.0%～+100.0%	Default：0.0%
P4-25	AI curve 3 maximum input	P4-23～+10.00V	Default：10.00V
P4-26	AI curve 3 maximum input corresponding value	-100.0%～+100.0%	Default：100.0%
P4-27	AI3 filtering time	0.00s～10.00s	Default：0.10s

🕮For the function and usage of curve 3, please refer to the description of curve 1.

P4-28	Pulse minimum input	0.00kHz～P4-30	Default：0.00kHz
P4-29	Pulse minimum input corresponding value	-100.0%～100.0%	Default：0.0%
P4-30	Pulse maximum input	P4-28～100.00kHz	Default：50.00kHz
P4-31	Pulse maximum input corresponding value	-100.0%～100.0%	Default：100.0%
P4-32	Pulse input filtering time	0.00s～10.00s	Default：0.10s

🕮This group of function codes is used to set the relationship between the multi-function terminal X6 pulse input frequency and the corresponding setting.

The pulse frequency is only valid at the X6 terminal. The application of this group of functions is similar to curve 1, please refer to the description of curve 1.

P4-33	AI curve selection	Ones place: AI1 curve selection 1: Curve 1 (2 points, P4-13 to P4-16) 2: Curve 2 (2 points, P4-18 to P4-21) 3: Curve 3 (2 points, P4-23 to P4-26) 4: Curve 4 (4 points, A6-00 to A6-07) 5: Curve 5 (4 points, A6-08 to A6-15) Tens place: AI2 curve selection, ibid. Hundreds place: AI3 curve selection, ibid.	Default：321

🕮The ones place, tens place, and hundreds place of the function code are used to select the setting curves corresponding to AI1, AI2, and AI3, respectively.

Three analog inputs can be selected from any of the three curves. Curve 1, curve 2, and curve 3 are 2-point curves, which are set in the P4 group function code.

P4-34	AI is below the minimum input setting selection	Ones place: AI1 is lower than the minimum input setting selection 0: corresponding to the minimum input setting 1:0.0% Tens place: AI2 is lower than the minimum input setting selection, the same as hundreds: AI3 is lower than the minimum input setting selection, ibid.	Default：000

📖The function code is used when the voltage of the analog input is less than the set "minimum input", and the corresponding setting of the analog quantity, the ones, tens, and hundred digits of the function code respectively correspond to the analog input AI1. AI2, AI3.

If 0 is selected, when the AI input is lower than the minimum input, the corresponding setting of the analog quantity is the minimum input corresponding setting (P4-14, P4-19, P4-24). If the selection is 1, the analog input is set to 0.0% when the AI input is lower than the minimum input.

P4-35	Input terminal X1 delay time	0.0s～3600.0s	Default：0.0s
P4-36	Input terminal X2 delay time	0.0s～3600.0s	Default：0.0s
P4-37	Input terminal X3 delay time	0.0s～3600.0s	Default：0.0s

📖It is used to set the delay time for the inverter to change the state of the input terminal.

Currently only X1, X2, and X3 have the function of setting the delay time.

P4-38	Input terminal valid mode selection 1	Ones place: X1 Tens place: X2 Hundreds place: X3 Thousands place: X4 Ten thousand: X6 0: The X terminal is connected to COM and the disconnection is invalid. 1: X terminal and COM connection are invalid, the disconnection is valid.	Default：00000
P4-39	Input terminal valid mode selection 2	Ones place：X5 Tens place：X7 Hundreds place：X8 Thousands place：X9 0: The X terminal is connected to COM and the disconnection is invalid. 1: X terminal and COM connection are invalid, the disconnection is valid.	Default：00000

📖Used to set the active status mode of the digital input terminal.

0: Positive logic, the corresponding terminal is valid when connected to COM, and the disconnection is invalid.

1: Inverse logic, the corresponding terminal is invalid when connected to COM, and the disconnection is valid.

P5 Output terminal

The inverter comes standard with one multi-function analog output terminal, one multi-function digital output terminal, one multi-function relay output terminal, and one FM terminal (optional as a high-speed pulse output terminal, or as a collector open circuit) Switch output). If the above output terminal does not meet the field application, you need to select the multi-function input and output expansion card.

P5-00	Y2 output mode selection	0: Pulse output 1: Switch output	Default：1

📖The Y2 terminal is a programmable multiplexing terminal that can be used as a high-speed pulse output terminal or as an open collector output terminal. As a pulse output, the maximum frequency of the pulse is 100 kHz, see P5-06.

P5-01	Y2 switching output function selection	Default: 0	Has no function
P5-02	Relay output function selection	Default: 2	Fault output (stop)
P5-03	Relay 2 output selection (extended)	Default: 0	Has no function
P5-04	Y1 output function selection	Default: 1	Inverter running signal output
P5-05	Y3 output selection (extended)	Default: 4	Frequency reached

📖The above function code is used to select the function of 5 digital outputs. The function of the multi-function output terminal is as follows：

Setting value	Function	Instructions
0	No function	Output terminal has no function
1	Inverter running	When the inverter is running (can be 0Hz), it outputs ON signal.
2	Fault output (stop)	When the inverter fails and the fault stops, the ON signal is output.
3	Frequency-level detection FDT1 output	Please refer to the description of function codes P8-19 and P8-20.
4	Frequency reached	Please refer to the description of function code P8-21.
5	Zero-speed running (no output at stop)	When the inverter runs and the output frequency is 0, the ON signal is output. This signal is OFF when the drive is in the stop state.
6	Motor overload pre-warning	Before the motor overload protection action, the ON signal is output after the overload pre-alarm threshold is exceeded. Refer to P9-00~P9-02 for motor overload setting.
7	AC drive overload pre-warning	The ON signal is output 10 s before the inverter overload protection occurs.
8	Set count value reached	When the count value reaches the value set by PB-08, the ON signal is output.
9	Designated count value reached	When the count value reaches the value set by PB-09, the ON signal is output.
10	Length reached	When the actual length of the detection exceeds that set by PB-05, an ON signal is output.
11	PLC cycle completed	The PLC runs a cycle and outputs a pulse signal with a width of 250ms.
12	Accumulative running time reached	When the cumulative running time of the inverter exceeds the setting of P8-17, the output ON signal
13	Frequency limited	When the set frequency exceeds the upper limit frequency or the lower limit frequency, and the inverter output frequency also reaches the upper limit frequency or the lower limit frequency, the ON signal is output.
14	Torque limited	When the inverter is in the speed control mode, when the output torque reaches the torque limit value, the inverter is in the stall protection state and outputs the ON signal.
15	Ready for RUN	When the inverter is stable after power-on, and the inverter does not detect any fault information, the inverter will output an ON signal

		when it is in the operable state.
16	AI1>AI2	When the value of the input AI1 is greater than the input value of AI2, an ON signal is output.
17	Frequency upper limit reached	When the running frequency reaches the upper limit frequency, an ON signal is output.
18	Frequency lower limit reached (no output at stop)	When the running frequency reaches the lower limit frequency, the ON signal is output. This signal is OFF in the stop state.
19	Under voltage status output	When the inverter is under voltage, it outputs ON signal.
20	Communication setting	Please refer to the communication protocol.
23	Zero-speed running 2 (having output at stop)	When the inverter output frequency is 0, the ON signal is output. This signal is also ON in the stop state.
24	Accumulative power-on time reached	The inverter's accumulated power-on time P7-13 exceeds the P8-16 set time output ON signal.
25	Frequency level detection FDT2 output	Please refer to the description of function codes P8-28 and P8-29.
26	Frequency 1 reached	Please refer to the description of function codes P8-30 and P8-31.
27	Frequency 2 reached	Please refer to the description of function codes P8-32 and P8-33.
28	Current 1 reached	Please refer to the description of function code P8-38 and P8-39.
29	Current 2 reached	Please refer to the description of function codes P8-40 and P8-41.
30	Timing reached	When the timing function (P8-42) is valid, the inverter will output the ON signal after the current running time reaches the set timing time.
31	AI1 input limit exceeded	When the value of analog input AI1 is greater than P8-46 (AI1 input protection upper limit) or less than P8-45 (AI1 input protection lower limit), the ON signal is output.
32	Load becoming 0	When the inverter is in the off state, it outputs an ON signal.
33	Reverse running	When the inverter is in reverse operation, it outputs ON signal.
34	Zero current state	Please refer to the description of function code P8-28, P8-29
35	IGBT temperature reached	When the inverter module heatsink temperature (P7-07) reaches the set module temperature arrival value (P8-47), the ON signal is output.
36	Software current limit exceeded	Please refer to the description of function code P8-36, P8-37.
37	Frequency lower limit reached (having output at stop)	When the running frequency reaches the lower limit frequency, the ON signal is output. This signal is also ON during the stop state.
38	Alarm output	When the inverter fails and the fault handling mode is continued, the ON signal is output.
39	Motor overheat warning	When the motor temperature reaches P9-58, the output ON signal
40	Current running time reached	When the inverter runs for longer than P8-53, it outputs ON signal.

P5-06	Y2 pulse output function selection	Default: 0 running frequency
P5-07	AO output function selection	Default: 0 running frequency

P5-08	AO2 output function selection (extension)	Default: 1 set frequency

📖The Y2 terminal output pulse frequency range is 0.01 kHz ~ P5-09 (between 0.01 and 100.00 kHz).

The analog output AO1 and AO2 output range is 0V ~ 10V, or 0mA ~ 20mA. The range of pulse output or analog output, and the calibration relationship of the corresponding function are shown in the following table：

Set value	Function	Function corresponding to pulse or analog output 0.0%~100.0%
0	Running frequency	0 to the maximum output frequency
1	Set frequency	0 to the maximum output frequency
2	Output current	0 to 2 times the rated current of the motor
3	Output torque	0 to 2 times rated motor torque
4	Output Power	0 to 2 times rated power
5	Output voltage	0 to 1.2 times the rated voltage of the inverter
6	PULSE input	0.01kHz～100.00kHz
7	AI1	0V～10V
8	AI2	0V～10V（or 0～20mA）
9	AI3	0V～10V
10	Length	0 to the maximum set length
11	Count value	0 to the maximum count value
12	Communication setting	0.0% to 100.0%
13	Motor rotational speed	0 to the maximum output frequency corresponding to the speed
14	Output current	Output current (55kW and below 100% correspond to 100.0A, 75kW and above 100% correspond to 1000.0A)
15	Output Bus voltage	Bus voltage 1000.0V corresponds to 100%

P5-09	Y2 pulse output Maximum frequency	0.01kHz～100.00kHz	Default：50.00kHz

📖When the Y2 terminal is selected as the pulse output, the function code is used to select the Maximum frequency value of the output pulse.

P5-10	AO zero offset coefficient	-100.0%～+100.0%	Default：0.0%
P5-11	AO gain	-10.00～+10.00	Default：1.00
P5-12	Extended AO2 zero offset coefficient	-100.0%～+100.0%	Default：0.0%
P5-13	Extended AO2 gain	-10.00～+10.00	Default：1.00

📖The above function code is used to correct the zero drift of the analog output and the deviation of the output amplitude. It can also be used to customize the required AO output curve. If the zero offset is represented by "b", the gain is represented by k, the actual output is represented by Y, and the standard output is represented by X, the actual output is: Y = kX + b. Among them, the zero offset coefficient of AO1 and AO2 corresponds to 10V (or 20mA), and the standard output refers to the output of 0V~10V (or 0mA~20mA) corresponding to the analog output without zero offset and gain correction.

For example, if the analog output is the running frequency, it is desirable to output 8V when the frequency is 0, and output 3V when the frequency is Maximum frequency, then the gain should be set to “-0.50” and the zero offset should be set to “80%”.

P5-17	Y2 output delay time	0.0s～3600.0s	Default：0.0s
P5-18	Relay output delay time	0.0s～3600.0s	Default：0.0s
P5-19	Relay 2 delay time	0.0s～3600.0s	Default：0.0s

P5-20	Y1 output delay time	0.0s～3600.0s	Default：0.0s
P5-21	Y3 delay time (extended)	0.0s～3600.0s	Default：0.0s

🕮Set the delay time of the output terminal from the state change to the actual output change

P5-22	Output terminal valid mode selection	Ones place:Y2 Tens place: Relay Hundreds place: Relay 2 Thousands place: Y1 Ten thousand: Y3 0: The output terminal is connected to COM and the disconnection is invalid. 1: The output terminal is not connected to COM, and the disconnection is valid.	Default：00000

🕮Define the valid state selection for the multi-function output terminal.

0: Positive logic, the digital output terminal and the corresponding common terminal are connected to the active state, and the disconnection is in the invalid state.

1: Inverse logic, the digital output terminal and the corresponding common terminal are connected to an inactive state, and the disconnection is in an active state.

P6 Start and stop control

P6-00	Start model	0: Direct start　　1: Speed tracking restart 2: Pre-excitation start (AC asynchronous machine)	Default：0

🕮0：Direct start if the DC braking time is 0, the inverter will start running at the start frequency. If the DC braking time is not 0, the DC braking is performed first, and then the starting frequency is started. Suitable for small inertia loads.

1: Speed tracking restart the inverter first judges the speed and direction of the motor, and then starts with the tracked motor frequency, and implements a smooth and non-impact start for the rotating motor. Instantaneous power failure restart for large inertia loads. In order to ensure the performance of the speed tracking restart, it is necessary to accurately set the parameters of the motor P1 group.

2: Asynchronous machine pre-excitation start Used to establish the magnetic field before the motor runs. Pre-excitation current and pre-excitation time are described in function code P6-05 and P6-06. If the pre-excitation time is set to 0, the inverter cancels the pre-excitation process and starts from the start frequency. If the pre-excitation time is not 0, the pre-excitation is restarted first, which can improve the dynamic response performance of the motor.

P6-01	Rotational speed tracking mode	0: Start from stop frequency 1: Start from zero speed 2: Start from maximum frequency	Default：0

🕮In order to better complete the speed tracking process, select the way the inverter tracks the motor speed:

0: Track down from the frequency at power failure. This method is usually used.

1: Tracking starts from 0 frequency, and is used when the power failure time is long and then restarted.

2: Track down from the Maximum frequency, generally used for generating loads.

P6-02	Rotational speed tracking speed	1～100	Default：20

🕮Select the speed of the speed tracking. The larger the parameter, the faster the tracking speed. However, setting too large may cause the tracking effect to be unreliable.

P6-03	Startup frequency	0.00Hz～10.00Hz	Default：0.00Hz
P6-04	Startup frequency holding time	0.0s～100.0s	Default：0.0s

🕮To ensure motor torque at start-up, set the appropriate starting frequency. In order to fully establish the magnetic flux when the motor is started, the starting frequency needs to be maintained for a certain period of time.

The starting frequency P6-03 is not limited by the lower limit frequency. However, when the set target frequency is less than the start frequency, the inverter does not start and is in the standby state.

The start frequency hold time does not work during the forward and reverse switching. The start frequency hold time is not included in the acceleration time, but is included in the run time of the simple PLC.

P6-05	Startup DC braking current/Pre-excited current	0%～100%	Default：50%
P6-06	Startup DC braking time/ Pre-excited time	0.0s～100.0s	Default：0.0s

🕮Start DC braking, which is generally used to stop the running motor and then start. The pre-excitation is used to first activate the asynchronous motor to establish a magnetic field and then increase the response speed.

Starting DC braking is only effective when the startup mode is direct startup. At this time, the inverter first performs DC braking according to the set starting DC braking current, and then starts running after the DC braking time is started. If the DC braking time is set to 0, it will start directly without DC braking. The greater the DC braking current, the greater the braking force.

If the starting mode is asynchronous machine pre-excitation start, the inverter first establishes the magnetic field according to the preset pre-excitation current, and then starts running after the set pre-excitation time. If the pre-excitation time is set to 0, it will start directly without the pre-excitation process.

Start DC braking current / pre-excitation current, which is a percentage of the rated current of the inverter.

P6-07	Acceleration/Deceleration mode	0: Linear acceleration and deceleration 1: S curve acceleration and deceleration A 2: S curve acceleration and deceleration B	Default：0

🕮Select the way the frequency change of the inverter during start and stop.

0: Linear acceleration/deceleration the output frequency is incremented or decremented by a straight line. Choose from 4 acceleration and deceleration times.

1: S curve acceleration and deceleration A

The output frequency is incremented or decremented according to the S curve. The S-curve is used in places where gentle start or stop is required, such as elevators, conveyor belts, etc. The function codes P6-08 and P6-09 respectively define the time ratio of the start and end segments of the S-curve acceleration/deceleration.

2: S curve acceleration and deceleration B

In the S-curve acceleration/deceleration B, the motor rated frequency fb is always the inflection point of the S-curve. As shown in Figure 6-12. It is generally used in applications where fast acceleration and deceleration are required in high-speed areas above the rated frequency.

When the set frequency is above the rated frequency, the acceleration and deceleration time is

$$t=[\ \frac{4}{9}\times(\frac{f}{fb})^2+\frac{5}{9}\ ]\times T$$

Where f is the set frequency, the rated frequency of the fb motor, and T is the time from the 0 frequency acceleration to the nominal frequency fb.

P6-08	Time proportion of S-curve start segment	0.0%～（100.0%-P6-09）	Default：30.0%
P6-09	Time proportion of S-curve end segment	0.0%～（100.0%-P6-08）	Default：30.0%

🕮The function codes P6-08 and P6-09 respectively define the ratio of the initial segment and the end segment time of the S-curve acceleration/deceleration A. The two function codes should satisfy: P6-08 + P6-09 ≤ 100.0%.

In Figure 6-13, t1 is the time defined by parameter P6-08, and the slope of the output frequency change gradually increases during this period. T2 is the time defined by parameter P6-09, during which the slope of the output frequency change gradually changes to zero. During the time between t1 and t2, the slope of the output frequency change is fixed, that is, the interval is linearly accelerated or decelerated.

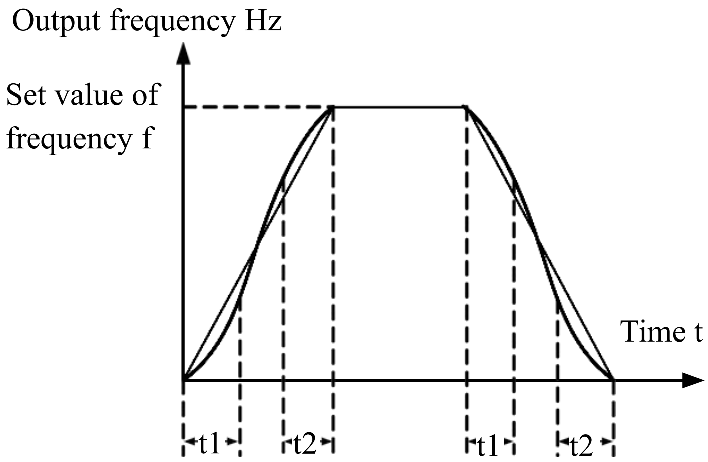


Figure 6-13 Schematic diagram of S-curve acceleration/deceleration A

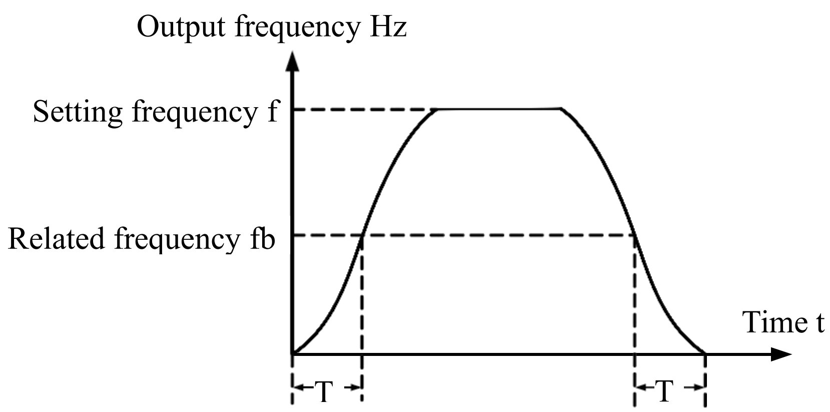


Figure 6-14 Schematic diagram of S-curve acceleration and deceleration B

P6-10	Stop mode	0: Decelerate to stop	1: Coast to stop	Default：0

🕮0： Deceleration stop after the stop command is valid, the inverter reduces the output frequency according to the deceleration time, and the frequency drops to 0 and then stops.

1: Free stop after the stop command is valid, the inverter will immediately terminate the output. At this time, the motor will stop freely according to the mechanical inertia.

P6-11	Initial frequency of stop DC braking	0.00Hz～Maximum frequency	Default：0.00Hz
P6-12	Waiting time of stop DC braking	0.0s～100.0s	Default：0.0s
P6-13	Stop DC braking current	0%～100%	Default：50%
P6-14	Stop DC braking time	0.0s～100.0s	Default：0.2s

📖DC braking start frequency at stop: When the inverter stops, when the running frequency decreases to this frequency, DC braking starts.

DC brake waiting time at stop: After the running frequency is reduced to the stop DC braking start frequency, the inverter stops output for a period of time before starting the DC braking process. Used to prevent malfunctions such as overcurrent that may be caused by DC braking at higher speeds.

DC braking current at stop: refers to the output current during DC braking, as a percentage of the rated motor current. The larger the value, the stronger the DC braking effect, but the greater the heat generated by the motor and the inverter.

DC braking time at stop: The time during which the DC braking amount is maintained. This value is 0 and the DC braking process is cancelled. The DC braking process of the shutdown is shown in the schematic diagram of Figure 6-15.

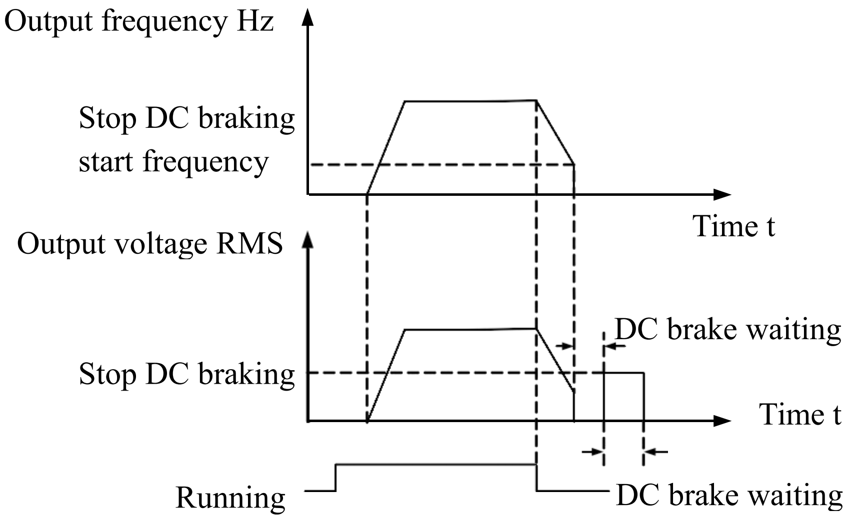


Figure 6-15 Schematic diagram of DC braking at stop

P6-15	Brake use ratio	0%～100%	Default：100%

📖Only valid for inverters with built-in brake unit.

It is used to adjust the duty ratio of the brake unit. When the brake usage rate is high, the duty ratio of the brake unit is high and the braking effect is strong. However, the voltage of the inverter bus voltage fluctuates greatly during the braking process.

P6-18	Speed tracking current	30%~200%	Default：depending

📖The maximum current limit of the speed tracking process is within the range of the "speed tracking current" setting. If the set value is too small, the effect of the speed tracking will be worse.

P6-21	Demagnetization time	0.0~5.0s	Default：depending

📖The demagnetization time is the minimum interval between stop and start. This function code will only take effect after the speed tracking function is turned on. If the setting value is too small, it will cause overvoltage fault.

P6-23	**AVR function**	0: No effect 1: Only deceleration takes effect 2: The whole process is valid	Default：2

📖0: No effect No AVR processing is carried out during the operation of the frequency converter

1: Only deceleration takes effect

The frequency converter is only AVR processed during deceleration

2: The whole process is valid

AVR processing is carried out during the operation of the frequency converter

P7 Keyboard and display

P7-01	JOG/REV key function selection	0: F/R key is invalid 1:Switchover between operation panel control and remote command control (terminal or communication) 2: Switchover between forward rotation and reverse rotation 3: Forward JOG 4: Reverse JOG	Default：0

📖JOG/REV The key is a multi-function key, and the function of the JOG/REV key can be set by this function code. This key can be used to switch between stop and run.

0: This key has no function.

1: Keyboard command and remote operation switcher. Refers to the switching of the command source, that is, the current command source and keyboard control (local operation) switching. If the current command source is keyboard control, this key function is invalid.

2: Forward/reverse switching the direction of the frequency command is switched by the JOG/REV button. This function is only available when the command source is the operator panel command channel.

3: Forward jog through the keyboard JOG / REV Key to achieve forward jog

4: Reverse jog through the keyboard JOG/REV key to achieve reverse jog

P7-02	STOP/RESET key function selection	0: STOP/RESET key enabled only in operation panel control 1: STOP/RESET key enabled in any operation mode	Default：1

P7-03	LED display running parameters 1	7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 Running frequency 1 Set frequency (Hz) Bus voltage (V) Output voltage (V) Output current (A) Output power (kW) Output torque (%) X input status 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 Output statue AI1 voltage AI2 voltage AI3 voltage Count value Length value Over load speed display PID set If you need to display the above parameters during operation, set the corresponding position to 1, and convert this binary number to hexadecimal and then set it to P7-03.	Default：1F
P7-04	LED display running parameters 2	7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 PID feedback PLC stage Input frequency Running frequency 2 Remaining running time AI 1 default voltage AI 2 default voltage AI 3 default voltage 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 Line speed Current power-on time Current running time Pulse Input Communication setting PG card speed feedback Main frequency X display Auxiliary frequency Y display If you need to display the above parameters during operation, set the same as P7-03.	Default：0

P7-05	LED display stop parameters	7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 Frequency setting Bus voltage X input statue Output statue AI 1 voltage AI 2 voltage AI 3 voltage Count value 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 Length value PLC stage Overload speed PID setting Pulse input Reserved Reserved Reserved If you need to display the above parameters after stop, set the same as P7-03.	Default：33

🕮Display parameters are used to set the parameters that can be viewed when the inverter is running or stopped.

The maximum number of status parameters that can be viewed is 32. According to the P8-03~P7-05 parameter values, the status parameters to be displayed are selected. The display order starts from the lowest bit of P7-03.

P7-06	Load speed display coefficient	0.0001～6.5000	Default：1.0000

🕮When the load speed needs to be displayed, the corresponding relationship between the inverter output frequency and the load speed is adjusted by this parameter. Refer to the description of P7-12 for the specific correspondence.

P7-07	Heatsink temperature of AC drive IGBT	0.0℃～100.0℃	-

🕮The temperature of the inverter module IGBT is displayed. Different models of inverter module IGBT over-temperature protection values are different

P7-09	Accumulative running time	0h～65535h	-

🕮Displays the cumulative running time of the drive. When the running time reaches the setting P8-17, the terminal (12) outputs an ON signal.

P7-10	Product ID	-	-
P7-11	Software version number	-	-
P7-12	Number of decimal places for load speed display	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	Default：1

🕮Used to set the number of decimal places for the load speed display. The following example illustrates how the load speed is calculated:

If the load speed display coefficient P7-06 is 2.000, the load speed decimal point P7-12 is 2 (2 decimal places), when the inverter running frequency is 40.00Hz, the load speed is: 40.00*2.000 = 80.00 (2 decimal places) display.

If the inverter is in the stop state, the load speed is displayed as the speed corresponding to the set frequency, which is "set the load speed". Taking the set frequency 50.00Hz as an example, the load speed in the stop state is: 50.00*2.000 = 100.00 (2 decimal places are displayed)

P7-13	Accumulative power-on time	0h～65535h	-

🕮The cumulative power-on time of the inverter from the factory is displayed.

When this time reaches the set power-on time (P8-17), the output terminal (24) outputs an ON signal.

P7-14	Accumulative power consumption	0kW～65535	-

🕮Displays the cumulative power consumption of the inverter

P8 Accessibility

P8-00	JOG running frequency	0.00Hz～Maximum frequency	Default：2.00Hz
P8-01	JOG acceleration time	0.0s～6500.0s	Default：20.0s
P8-02	JOG deceleration time	0.0s～6500.0s	Default：20.0s

🕮Define the given frequency and acceleration/deceleration time of the inverter when jogging. When jog running, the start mode is fixed to the direct start mode (P 6-0 0 = 0), and the stop mode is fixed to the deceleration stop (P6-10 = 0).

P8-03	Acceleration time 1	0.0s～6500.0s	depend
P8-04	Deceleration time 1	0.0s～6500.0s	depend
P8-05	Acceleration time 2	0.0s～6500.0s	depend
P8-06	Deceleration time 2	0.0s～6500.0s	depend
P8-07	Acceleration time 3	0.0s～6500.0s	depend
P8-08	Deceleration time 3	0.0s～6500.0s	depend

🕮The inverter provides 4 sets of acceleration and deceleration time, which are P0-17\P0-18 and the above three groups of acceleration and deceleration time.

The definitions of the four groups of acceleration and deceleration are exactly the same. Please refer to the descriptions of P0-17 and P0-18. Through the different combinations of multi-function input terminals, you can switch between 4 groups of acceleration/deceleration time, see P4-01~P4-05.

P8-09	Jump frequency 1	0.00Hz～Maximum frequency	Default：0.00Hz
P8-10	Jump frequency 2	0.00Hz～Maximum frequency	Default：0.00Hz
P8-11	Frequency jump amplitude	0.00Hz～Maximum frequency	Default：0.01Hz

🕮When the set frequency is within the skip frequency range, the actual operating frequency will run at a skip frequency that is closer to the set frequency. By setting the skip frequency, the inverter can be avoided from the mechanical resonance point of the load.

Two skip frequency points can be set. If both skip frequencies are set to 0, the skip frequency function is canceled. The principle of the hopping frequency and the hopping frequency amplitude is shown in Figure 6-16.

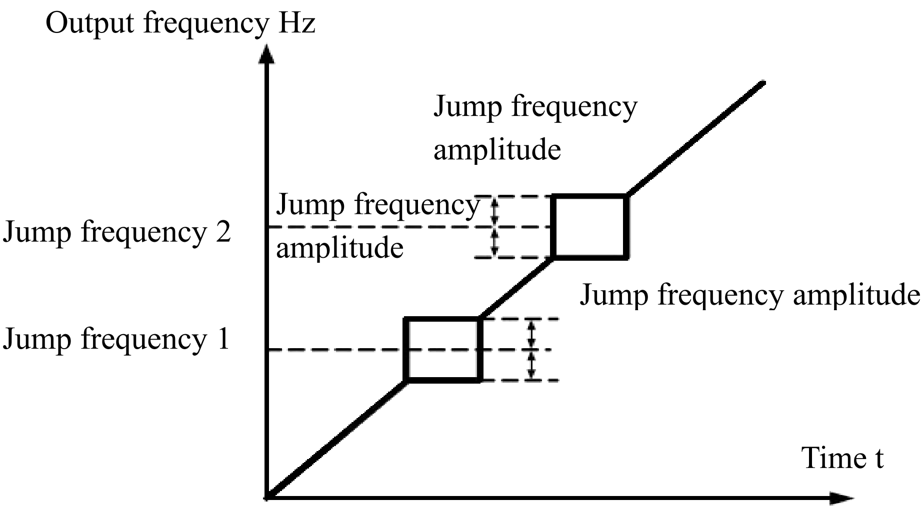


Figure 6-16 Schematic diagram of the hopping frequency

P8-12	Forward/Reverse rotation dead-zone time	0.0s～3000.0s	Default：0.0s

📖Set the transition time at the output 0 Hz during the forward/reverse transition of the inverter, as shown in Figure 6-17.

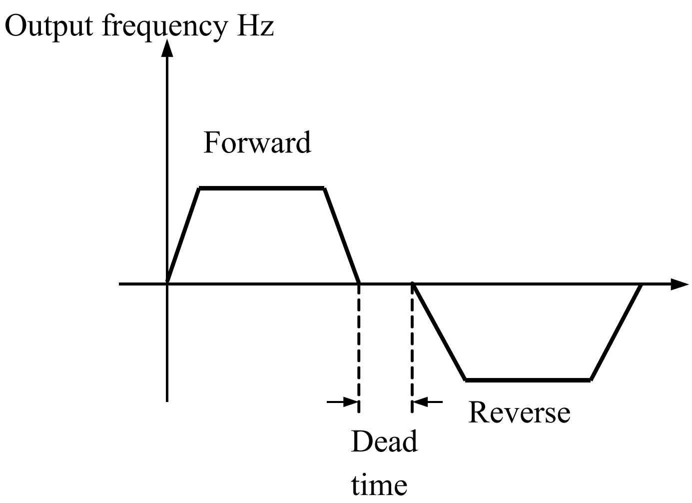


Figure 6-17 Schematic diagram of the positive and negative dead time

P8-13	Reverse control enable	0：Allow	1: Prohibit	Default：0

📖Use this parameter to set whether the inverter is allowed to run in the reverse state. If the motor is not allowed to reverse, set P8-13=1.

P8-14	Running mode when set frequency lower than frequency lower limit	0: Run at the following frequency limit 1: Stop 2: Zero speed operation	Default：0

📖When the set frequency is lower than the lower limit frequency, the running status of the inverter can be selected by this parameter.

P8-15	Droop control	0.00Hz～10.00Hz	Default：0.00Hz

📖This function is generally used for load distribution when multiple motors are dragging the same load. The droop control means that as the load increases, the output frequency of the inverter decreases, so that when multiple motors are dragged by the same load, the output frequency of the motor in the load drops more, thereby reducing the load of the motor and realizing the operation of multiple motors. The load is even.

This parameter refers to the frequency drop value of the output when the inverter outputs the rated load.

P8-16	Accumulative power-on time threshold	0h～65000h	Default：0h

📖When the accumulated power-on time P7-13 reaches the power-on time set by P8-16, the inverter multi-function outputs ON signal.

P8-17	Accumulative running time threshold	0h～65000h	Default：0h

📖Used to set the running time of the inverter.

When the accumulated running time P7-09 reaches this set running time, the inverter multi-function outputs ON signal.

P8-18	Startup protection	0：Not protected　　1: protected	Default：0

📖This parameter relates to the safety protection function of the frequency converter.

If the parameter is set to 1, if the running command of the inverter is valid (for example, the terminal running command is closed before power-on), the inverter does not respond to the running command, and the running command must be removed once. After the running command is valid again. The inverter responds.

In addition, if the parameter is set to 1, if the running command of the inverter fault reset time is valid, the inverter does not respond to the running command, and the running command must be removed before the running protection state can be eliminated.

Setting this parameter to 1 can prevent the danger caused by the motor responding to the running command when power is turned on or when the fault is reset without knowing it.

P8-19	Frequency detection value FDT1	0.00Hz～Maximum frequency	Default：50.00Hz
P8-20	Frequency detection hysteresis value FDT1	0.0%～100.0%（FDT1 Level）	Default：5.0%

📖When the running frequency is higher than the frequency detection value, the inverter multi-function outputs ON signal, and after the frequency is lower than the detection value, the output ON signal is canceled.

The above parameters are used to set the detection value of the output frequency and the hysteresis value of the output action release. Where P8-20 is the percentage of the hysteresis frequency relative to the frequency detection value P8-19. Figure 6-18 shows the function of the FDT function

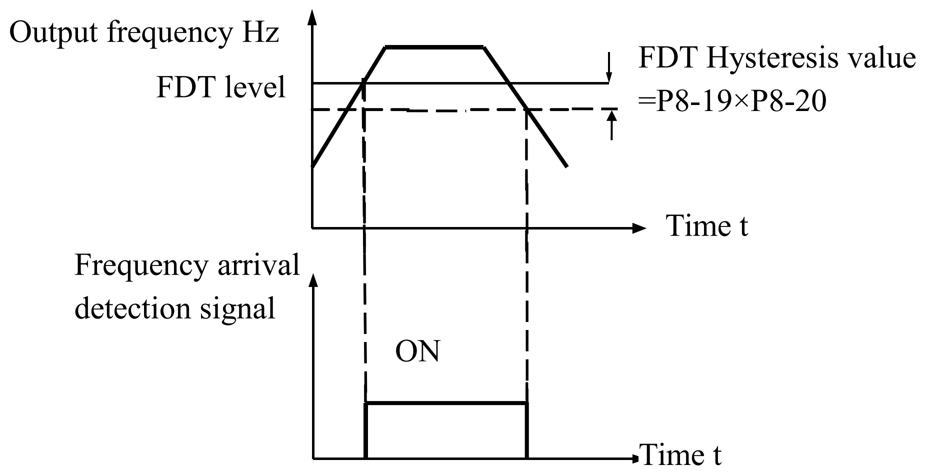


Figure 6-18 FDT level diagram

P8-21	Frequency arrival detection width	0.0%～100.0%（Maximum frequency）	Default：0.0%

📖When the running frequency of the inverter is within a certain range of the target frequency, the inverter multi-function outputs ON signal.

This parameter is used to set the detection range of the frequency arrival, which is a percentage relative to the Maximum frequency.

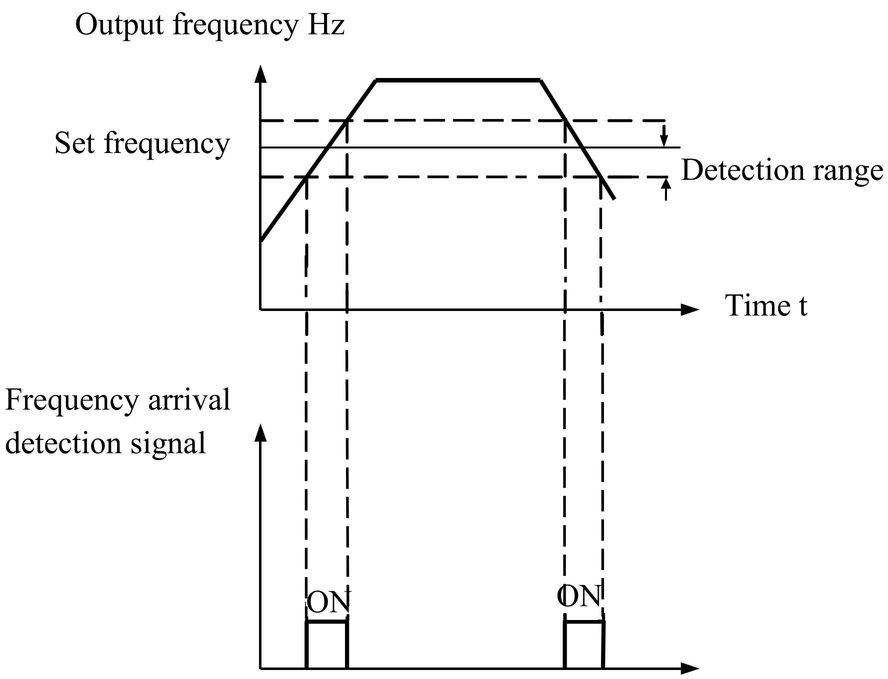


Figure 6-19 Schematic diagram of frequency arrival detection amplitude

P8-22	Jump frequency during acceleration/deceleration	0: invalid 1: valid	Default：0

📖This function code is used to set whether the skip frequency is valid during acceleration and deceleration.

When set to valid, when the running frequency is in the skip frequency range, the actual running frequency will skip the set skip frequency boundary. Figure 6-20 shows the effective hopping frequency during acceleration and deceleration.

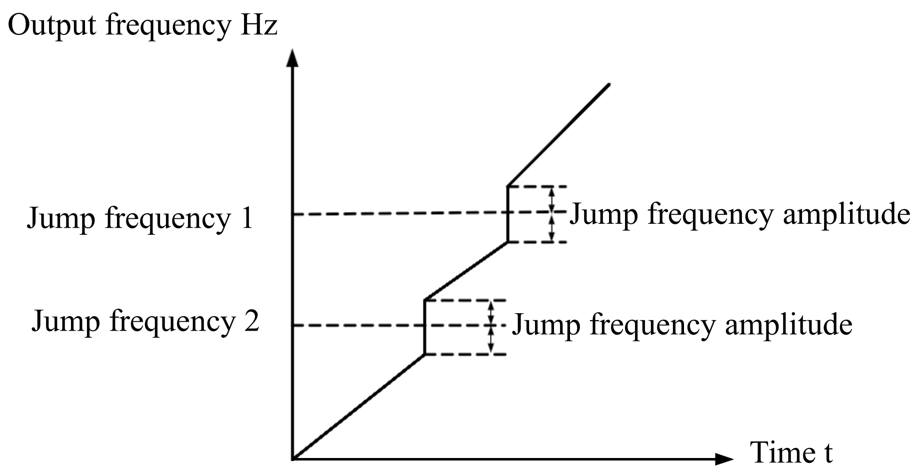


Figure 6-20 Schematic diagram of the hopping frequency during acceleration and deceleration

P8-25	Frequency switchover point between acceleration time 1 and acceleration time 2	0.00Hz～Maximum frequency	Default：0.00Hz
P8-26	Frequency switchover point between deceleration time 1 and deceleration time 2	0.00Hz～Maximum frequency	Default：0.00Hz

🕮This function is effective when the acceleration/deceleration time is not selected by switching the input terminal. It is used to select different acceleration/deceleration time according to the operating frequency range without passing through the input terminal during the running of the inverter.

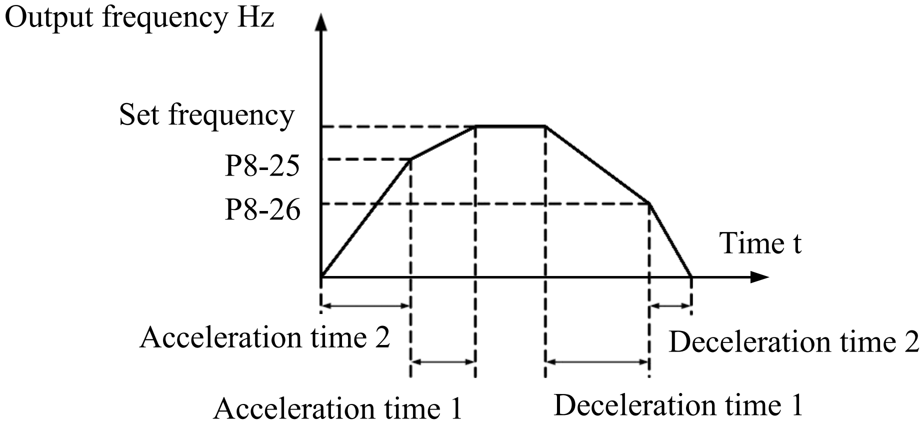


Figure 6-21 Schematic diagram of acceleration/deceleration time switching

Figure 6-21 shows the switching of acceleration/deceleration time. During the acceleration process, if the running frequency is less than P8-25, the acceleration time 2 is selected; if the running frequency is greater than P8-25, the acceleration time 1 is selected.

During deceleration, if the running frequency is greater than P8-26, the deceleration time 1 is selected. If the running frequency is less than P8-26, the deceleration time 2 is selected.

P8-27	Terminal JOG preferred	0：Invalid 1: Valid	Default：1

🕮This parameter is used to set whether the terminal jog function has the highest priority.

When the terminal jog priority is valid, if the terminal jog command appears during operation, the inverter switches to the terminal jog operation state.

P8-28	Frequency detection value FDT2	0.00Hz～Maximum frequency	Default：0.00Hz
P8-29	Frequency detection hysteresis value (FDT2)	0.0%～100.0%（FDT2 level）	Default：5.0%

🕮This frequency detection function is identical to the function of FDT1. Please refer to the description of function codes P8-19 and P8-20.

P8-30	Arbitrary arrival frequency detection value 1	0.00Hz～Maximum frequency	Default：50.00Hz
P8-31	Arbitrary arrival frequency detection width 1	0.0%～100.0%（Maximum frequency）	Default：0.0%
P8-32	Arbitrary arrival frequency detection value 2	0.00Hz～Maximum frequency	Default：50.00Hz

P8-33	Arbitrary arrival frequency detection width 2	0.0%～100.0%（Maximum frequency）	Default：0.0%

🕮When the output frequency of the inverter is within the positive and negative detection range of any arrival frequency detection value, the ON signal is output. Figure 6-22 shows a schematic of this function.

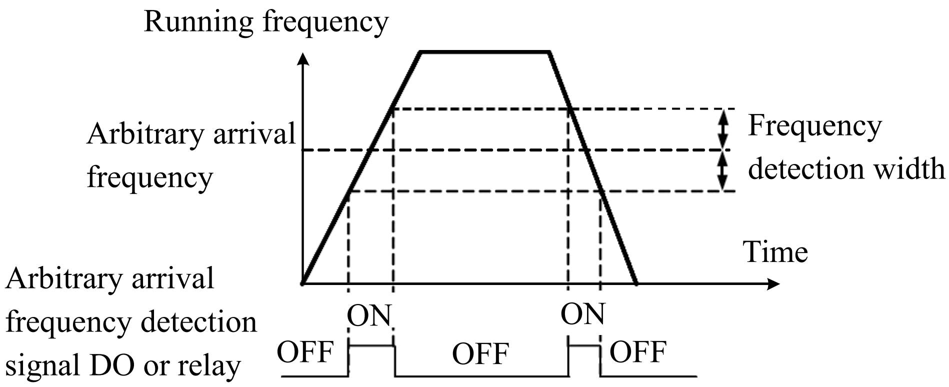


Figure 6-22 Schematic diagram of arbitrary arrival frequency detection

P8-34	Zero current detection level	0.0%~300.0% 100.0% corresponds to the rated current of the motor	Default：5.0%
P8-35	Zero current detection delay time	0.01s～600.00s	Default：0.10s

🕮When the output current of the inverter is less than or equal to the zero current detection level and the duration exceeds the zero current detection delay time, the inverter outputs ON signal. Figure 6-23 Schematic diagram of zero current detection.

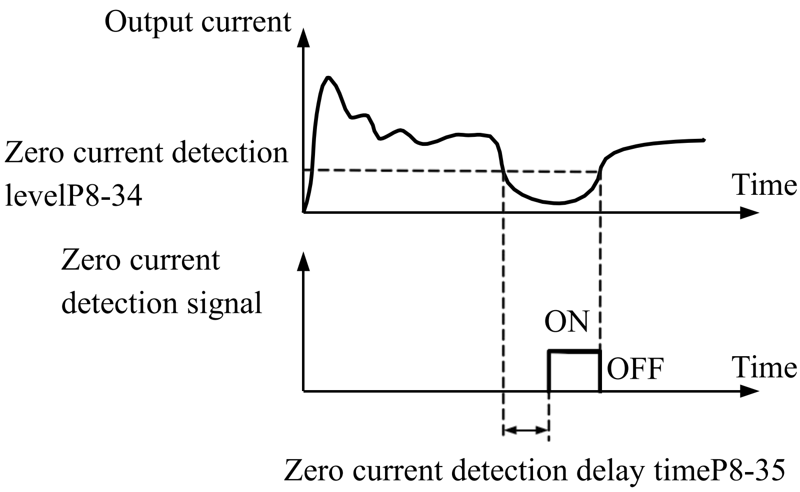


Figure 6-23 Schematic diagram of zero current detection

P8-36	Output overcurrent threshold	0.0% (not detected) 0.1%~300.0% motor rated current	Default：200.0%
P8-37	Output overcurrent detection delay time	0.00s～600.00s	Default：0.00

🕮When the output current of the inverter is greater than or exceeds the detection point and the duration exceeds the software over-current detection delay time, the inverter outputs an ON signal. Figure 6-24 shows the output current over-limit function.

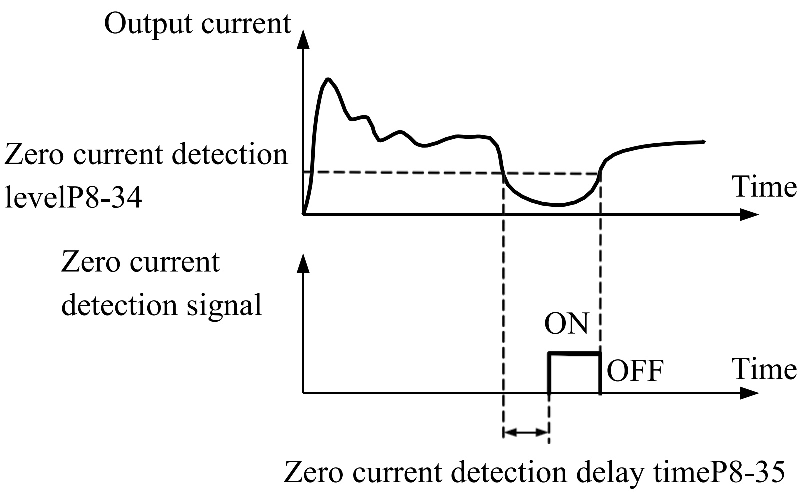


Figure 6-24 Schematic diagram of output current overrun detection

P8-38	Arbitrary arrival current 1	0.0% to 300.0% (rated motor current)	Default：100.0%
P8-39	Arbitrary current 1 width	0.0% to 300.0% (rated motor current)	Default：0.0%
P8-40	Arbitrary arrival current 2	0.0% to 300.0% (rated motor current)	Default：100.0%
P8-41	Arbitrary current 2 width	0.0% to 300.0% (rated motor current)	Default：0.0%

🕮When the output current of the inverter is within the positive and negative detection width of any set current, the inverter outputs an ON signal.

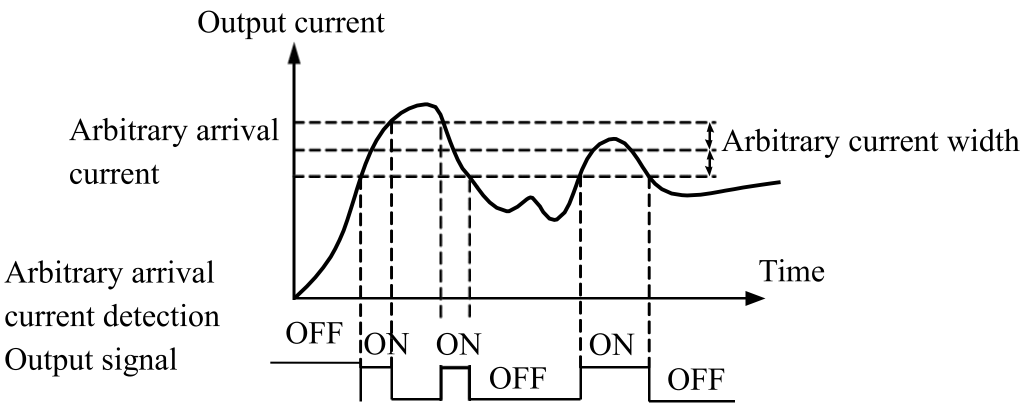


Figure 6-25 Schematic diagram of arbitrary arrival current detection

P8-42	Timing function selection	0: Invalid 1: Valid	Default：0
P8-43	Timing duration source	0：P8-44 1：AI1 2：AI2 3：AI3 Analog input range corresponds to P8-44	Default：0
P8-44	Timing duration	0.0Min～6500.0Min	Default：0.0

🕮This group of parameters is used to complete the timing operation of the inverter.

When the P8-42 timing function selection is valid, the inverter will start timing when it starts. After the set timing running time, the inverter will automatically stop and output the ON signal. Each time the inverter starts, it starts from 0, and the remaining running time can be viewed through U0-20. The scheduled running time is set by P8-43 and P8-44, and the time unit is minute.

P8-45	AI1 input voltage protection value lower limit	0.00V～P8-46	Default：3.10V
P8-46	AI1 input voltage protection value upper limit	P8-45～10.00V	Default：6.80V

🕮When the value of analog input AI1 is greater than P8-46 or less than P8-45, the inverter multi-function output "AI1 input overrun" ON signal is used to indicate whether the input voltage of AI1 is within the set range.

P8-47	IGBT temperature threshold	0℃～100℃	Default：75℃

🕮When the temperature of the inverter radiator reaches this temperature, the inverter multi-function outputs "module temperature reached" ON signal.

P8-48	Cooling fan control	0: The fan is running during operation 1: The fan is always running	Default：0

🕮Used to select the action mode of the cooling fan,

0: The fan runs in the running state. If the radiator temperature is higher than 40 degrees in the stop state, the fan will run. When the radiator is below 40 degrees in the stop state, the fan will not run.

1: The fan keeps running after power-on.

P8-49	Wake-up frequency	Dormant frequency（P8-51）～Maximum frequency（P0-10）	Default：0.00Hz
P8-50	Wake-up delay time	0.0s～6500.0s	Default：0.0s
P8-51	Dormant frequency	0.00Hz to wake-up frequency (P8-49)	Default：0.00Hz
P8-52	Dormant delay time	0.0s～6500.0s	Default：0.0s

🕮This set of parameters is used to implement sleep and wake-up functions in water supply applications.

During the running of the inverter, when the set frequency is less than or equal to the dormant frequency of P8-51, after the delay time of P8-52, the inverter enters the sleep state and stops automatically.

If the inverter is in the sleep state and the current running command is valid, when the set frequency is greater than or equal to the P8-49 wake-up frequency, after the delay time of the time P8-50, the inverter starts to start.

In general, please set the wake-up frequency (P8-49) to be greater than or equal to the dormant frequency (P8-51). When the wake-up frequency and sleep frequency are both set to 0.00 Hz, the sleep and wake-up functions are invalid.

When the dormant function is enabled, if the frequency source is PID, whether PID operation is performed in the dormant state is determined by PA-28. In this case, select PID operation enabled in the stop state (PA-28 = 1).

P8-53	Current running time reached	0.0Min～6500.0Min	Default：0.0

🕮If the current running time reaches the value set in this parameter, the corresponding output becomes ON, indicating that the current running time is reached.

P8-54	Output power correction coefficient	0.00% ～ 200.0%	Default：100.0%

🕮When the output power (U0-05) is not equal to the required value, you can perform linear correction on output power by using this parameter.

P9 Failure and protection

P9-00	Motor overload protection option	0：Prohibited 1: allowed	Default：1
P9-01	Motor overload protection gain	0.20～10.00	Default：1.00

🕮0：The motor overload protective function is disabled. The motor is exposed to potential damage due to overheating. A thermal relay is suggested to be installed between the inverter and the motor.

1: At this time, the inverter judges whether the motor is overloaded according to the inverse time curve of the motor overload protection. The shortest time to report motor overload is 2 minutes. If you need to adjust the motor overload current and time, please set P9-01.

(Be careful to confirm whether the rated current of the motor is correct before setting.) Reduce the value of P9-01 to make the motor protection advance. The user needs to correctly set the value of P9-01 according to the actual overload capacity of the motor. The motor is overheated and the inverter is not alarming!

P9-02	Motor overload warning coefficient	50%～100%	Default：80%

🕮This function is used to output an early warning signal to the control system before motor overload fault protection. This early warning coefficient is used to determine how much early warning is given before motor overload protection. The larger the value, the smaller the early warning amount. When the cumulative output current of the inverter is greater than the inverse of the overload inverse time curve and P9-02, the inverter outputs the "motor overload pre-alarm" ON signal.

P9-03	Overvoltage stall gain	0 (no stall overvoltage)–100	Default：0
P9-04	Overvoltage stall protective voltage	650V～800V	Default：760V

🕮When the DC bus voltage exceeds the value of P9-04 (Overvoltage stall protective voltage) during deceleration of the inverter, the inverter stops deceleration and keeps the present running frequency. After the bus voltage declines, the inverter continues to decelerate. P9-03 (Overvoltage stall gain) is used to adjust the overvoltage suppression capacity of the inverter. The larger the value is, the greater the overvoltage suppression capacity will be.

In the prerequisite of no overvoltage occurrence, set P9-03 to a small value. For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and an overvoltage fault may occur.
If the overvoltage stall gain is set to 0, the overvoltage stall function is disabled. The overvoltage stall protective voltage setting 100% corresponds to the base values in the following table:

Voltage Class	Corresponding Base Value
Single-phase 220 V	290 V
Three-phase 380 V	530 V
Three-phase 480 V	620 V

P9-05	Overcurrent stall gain	0–100	Default：20
P9-06	Overcurrent stall protective current	100%–200%	Default：150%

🕮When the output current exceeds the overcurrent stall protective current during acceleration/deceleration of the inverter, the inverter stops acceleration/deceleration and keeps the present running frequency. After the output current declines, the inverter continues to accelerate/decelerate. P9-05 (Overcurrent stall gain) is used to adjust the overcurrent suppression capacity of the inverter. The larger the value is, the greater the overcurrent suppression capacity will be. In the prerequisite of no overcurrent occurrence, set P9-05 to a small value.

For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and overcurrent fault may occur. If the overcurrent stall gain is set to 0, the overcurrent stall function is disabled.

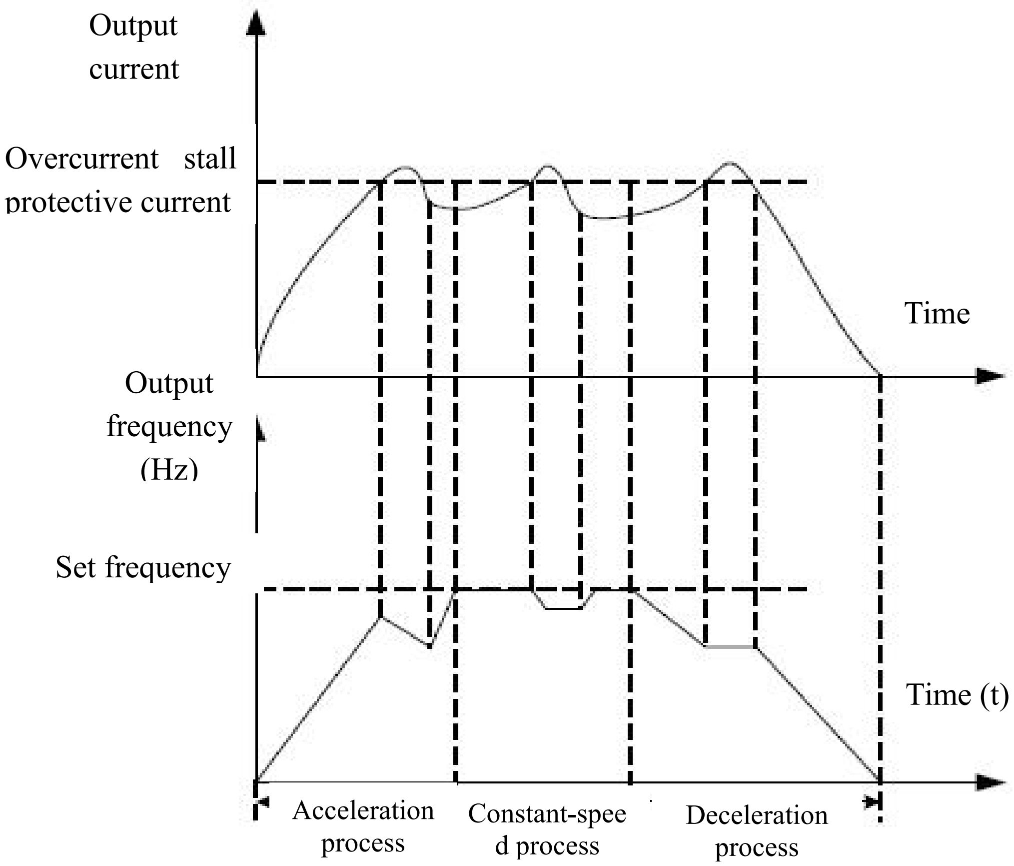


Figure 6-26 Diagram of the overcurrent stall protection function

P9-07	Power-on short circuit protection option	0: Invalid 1: Valid	Default：1

📖The inverter can be selected to detect whether the motor is shorted to ground when it is powered on. If this function is enabled, the UVW terminal of the inverter will have a voltage output for a period of time after power-on.

P9-08	Brake unit action starting voltage	200.0~2000.0V	Default：depend

📖The starting voltage Vbreak of the built-in braking unit action, the setting of this voltage value is as follows:

$$800 \geq Vbreak \geq (1.414Vs+30)$$

Vs- Input AC power supply voltage of the inverter Note: Improper setting of this voltage may cause the built-in brake unit to operate abnormally!

P9-09	Number of automatic resets	0～20	Default：0

📖When the inverter selects fault automatic reset, the number of automatic resets can be set. After the number of times, the inverter outputs a fault status.

P9-10	Fault output action selection during automatic fault reset	0：No action 1：action	Default：0

🕮When the fault automatic reset function is set in the inverter, the fault output is activated during the automatic fault reset.

P9-11	Fault auto reset interval	0.1s～100.0s	Default：1.0s

🕮The waiting time from the inverter fault alarm to the automatic fault reset.

P9-12	Input phase loss protection option	0: Prohibited 1: Allowed	Default：1

🕮Choose whether to protect the input phase loss.

The inverter has the input phase loss protection function from the 18.5kW G type machine and above. The power of the 18.5kW P type machine has no input phase loss protection function regardless of whether P9-12 is set to 0 or1

P9-13	Output phase loss protection option	0：Prohibited　　1: allowed	Default：1

🕮Choose whether to protect the output phase loss.

P9-14	First failure type		—
P9-15	Second failure type		—
P9-16	Third failure type (last time)		—

🕮Record the last three fault types of the inverter, 0 is no fault. For the possible causes and solutions of each fault code, please refer to Chapter 7 for related instructions.

<table>
<tr><td>P9-17</td><td>Frequency at the third failure</td><td>Frequency at the most recent failure</td></tr>
<tr><td>P9-18</td><td>Current at the third fault</td><td>Current at the last fault</td></tr>
<tr><td>P9-19</td><td>Bus voltage at the third fault</td><td>Bus voltage at the most recent fault</td></tr>
<tr><td>P9-20</td><td>Third fault input terminal status</td><td>The status of the digital input terminals in the most recent fault, in the order:
<table>
<tr><td>BIT9</td><td>BIT8</td><td>BIT7</td><td>BIT6</td><td>BIT5</td><td>BIT4</td><td>BIT3</td><td>BIT2</td><td>BIT1</td><td>BIT0</td></tr>
<tr><td>X10</td><td>X9</td><td>X8</td><td>X7</td><td>X5</td><td>X6</td><td>X4</td><td>X3</td><td>X2</td><td>X1</td></tr>
</table>
When the input terminal is ON, its corresponding secondary position is 1, and OFF is 0. The status of all inputs is converted to decimal display.</td></tr>
<tr><td>P9-21</td><td>Third fault output terminal status</td><td>The status of all output terminals in the most recent fault, in the order:
<table>
<tr><td>BIT4</td><td>BIT3</td><td>BIT2</td><td>BIT1</td><td>BIT0</td></tr>
<tr><td>Y3</td><td>Y1</td><td>REL2</td><td>REL1</td><td>Y2</td></tr>
</table>
When the output terminal is ON, its corresponding secondary position is 1, and OFF is 0. The status of all outputs is converted to decimal display.</td></tr>
<tr><td>P9-22</td><td>Inverter status at the third fault</td><td>—</td></tr>
<tr><td>P9-23</td><td>Power-on time during the third fault</td><td>The current power-on time at the last fault</td></tr>
<tr><td>P9-24</td><td>Run time at the third fault</td><td>The current running time of the most recent failure</td></tr>
<tr><td>P9-27</td><td>Frequency at the second failure</td><td rowspan="3">Same as P9-17～P9-24</td></tr>
<tr><td>P9-28</td><td>Current at the second fault</td></tr>
<tr><td>P9-29</td><td>Bus voltage at the second fault</td></tr>
</table>

P9-30	Second fault input terminal status		
P9-31	Second fault output terminal status		
P9-32	Inverter status at the second fault		
P9-33	Power-on time during the second fault		
P9-34	Run time at the second fault		
P9-37	Frequency at the first failure	Same as P9-17～P9-24	
P9-38	Current at the first fault		
P9-39	Bus voltage at the first fault		
P9-40	First fault input terminal status		
P9-41	First fault output terminal status		
P9-42	Inverter status at the first fault		
P9-43	Power-on time at the first failure		
P9-44	Run time at the first failure		
P9-47	Fault protection action selection 1	Ones place: Motor overload (Err11) 0: Free stop 1: Stop by stop mode 2: continue to run Tens place: input phase loss (Err12) as above Hundreds place: output phase loss (Err13) as above Thousands place: external fault (Err15) as above Ten thousand: communication abnormality (Err16) is the same as above	Default：00000
P9-48	Fault protection action selection 2	Ones place: Encoder/PG card exception (Err20) 0: Free stop 1: Stop by stop mode 2: continue to run Tens place: function code read and write exception (Err21) 0: Free stop 1: Stop by stop mode Thousands place: Motor overheating (Err25) with P9-47 Ten thousand: Run time arrives (Err26) with P9-47	Default：00000
P9-49	Fault protection action selection 3	Ones place: Custom Fault 1 (Err27) Same as P9-47 Tens place: Custom Fault 2 (Err28) Same as P9-47 Hundreds place: Power-on time arrives (Err29) with P9-47 Thousands place: Drop (Err30) 0: Free parking 1: slow down parking 2:Deceleration to 7% of the rated frequency, automatically return to the set frequency when no load is lost Ten Thousand: PID feedback loss (Err31) with P9-47	Default：00000
P9-50	Fault protection action selection 4	Ones place: speed deviation is too large (Err42) with P9-47 Tens place: Motor overspeed (Err43) with P9-47 Hundreds place: initial position error (Err51) with P9-47 Thousands place: speed feedback error (Err52) with P9-47	Default：00000

🕮When “Freewheeling” is selected, the inverter displays Err** and stops directly.

When “Stop in stop mode” is selected: The inverter displays A** and stops according to the stop mode. After the stop, Err** is displayed. When "Continuous operation" is selected: The inverter continues to run and displays A**, and the running frequency is set by P9-54.

P9-54	Continue to run frequency selection when fault occurs	0: Run at the current operating frequency 1: run at the set frequency 2: Run at the upper limit frequency 3: Run at the following frequency limit 4: Run at abnormal standby frequency	Default：0
P9-55	Abnormal backup frequency	60.0%～100.0% （100.0% Maximum frequencyP0-10）	Default：100.0%

📖When a fault occurs during the operation of the inverter and the fault is handled in the continuous mode, the inverter displays A** and operates at the frequency determined by P9-54.

When the abnormal standby frequency is selected, the value set by P9-55 is the percentage relative to the Maximum frequency.

P9-59	Instantaneous power failure action selection	0：Invalid 1: Deceleration 2: Deceleration stop	Default：0
P9-60	Reserved	P9-62～100.0%	Default：100.0%
P9-61	Instantaneous power failure voltage rise judgment time	0.00s～100.00s	Default：0.50s
P9-62	Instantaneous power failure action judgment voltage	60.0%～100.0%(standard bus voltage)	Default：80.0%

📖This function means that when the instantaneous power failure or sudden voltage drop occurs, the inverter compensates the DC bus voltage of the inverter by reducing the output speed and reducing the output voltage of the inverter to maintain the inverter running.

If P9-59=1, the inverter will decelerate when the power is suddenly lost or the voltage suddenly drops. When the bus voltage returns to normal, the inverter will accelerate to the set frequency. The basis for judging that the bus voltage returns to normal is that the bus voltage is normal and the duration exceeds the set time of P9-61. If P9-59=2, the inverter decelerates until the shutdown occurs in the event of an instantaneous power failure or sudden voltage drop.

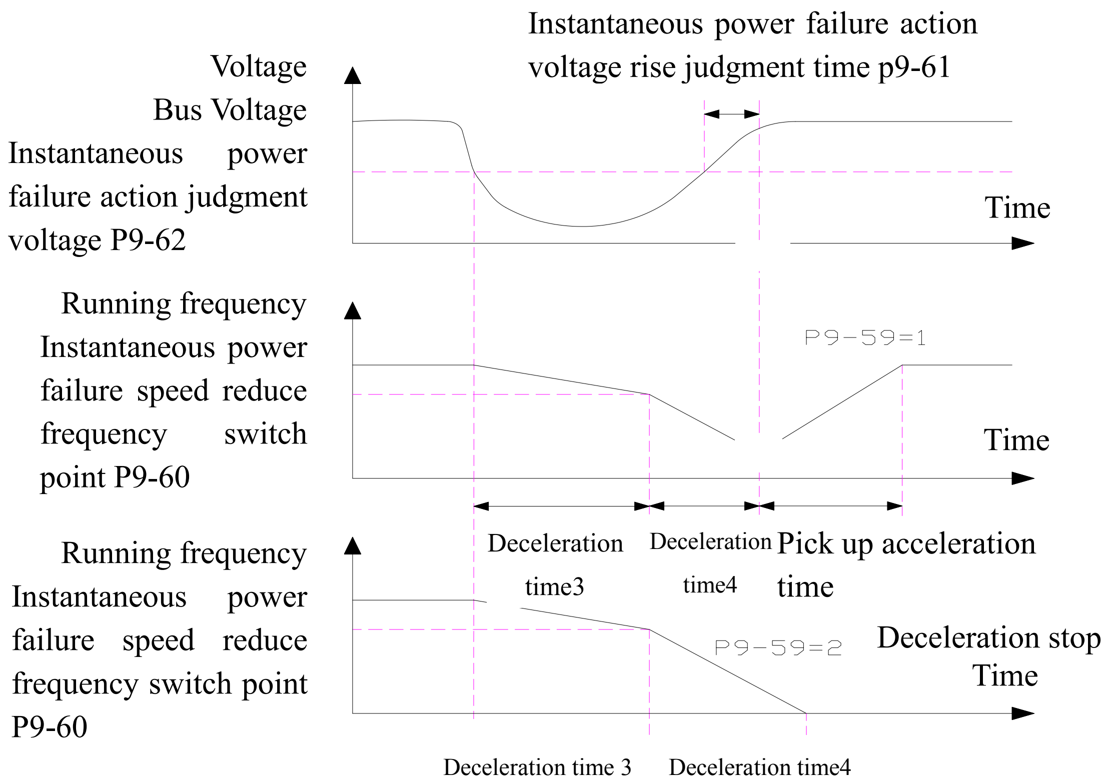


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Figure 6-27 Schematic diagram of instantaneous power failure

P9-63	Drop protection option	0: Invalid 1: Valid	Default：0
P9-64	Drop detection level	0.0～100.0%	Default：10.0%
P9-65	Drop detection time	0.0～60.0s	Default：1.0s

🕮If the load-shedding protection function is valid, when the inverter output current is less than the load-detection detection level P9-64 and the duration is greater than the load-off detection time P9-65, the inverter output frequency is automatically reduced to 7% of the rated frequency. During load-shed protection, if the load recovers, the drive automatically returns to operating at the set frequency.

P9-67	Overspeed detection value	0.0%～50.0%（Maximum frequency）	Default：20.0%
P9-68	Overspeed detection time	0.0s～60.0s	Default：5.0s

🕮This function is only available when the drive is running with speed sensor vector control.

When the inverter detects that the actual speed of the motor exceeds the set frequency, the excess value is greater than the overspeed detection value P9-67, and the duration is longer than the overspeed detection time P9-68, the inverter fault alarm Err43, and according to the fault protection action mode deal with.

P9-69	Speed deviation excessive detection value	0.0%～50.0%（Maximum frequency）	Default：20.0%
P9-70	Speed deviation too large detection time	0.0s～60.0s	Default：0.0s

🕮This function is only available when the drive is running with speed sensor vector control.

When the inverter detects that the actual speed of the motor deviates from the set frequency, the deviation amount is greater than the speed deviation excessive detection value P9-69, and the duration is greater than the speed deviation excessive detection time P9-70, the inverter fault alarm Err42, And according to the fault protection action mode.

When the speed deviation is too large and the detection time is 0.0s, the speed deviation excessive fault detection is canceled.

P9-71	Instantaneous stop non-stop gain Kp	0~100	Default：40
P9-72	Instantaneous stop non-stop integral coefficient Ki	0~100	Default：30
P9-73	Instantaneous stop and stop motion deceleration time	0~300.0s	Default：20.0s

🕮 (1)When the bus voltage is constant, when the grid resumes power supply, the inverter output frequency continues to run to the target frequency. When the grid is restored, the inverter will continue to decelerate to 0Hz and stop until the inverter issues the start command again.

(2) The purpose of instantaneous stop is to ensure that when the power supply of the power grid is abnormal, the motor can be decelerated and stopped normally, so that the motor can be started immediately after the grid is restored to normal power supply, and will not suddenly owe because the motor is not properly powered by the grid. In the high inertia system, the motor can stop for a long time. When the power supply is normal, the motor can easily cause the inverter to overload or over-current faults because the motor is rotating at high speed.

PA process control PID function

PID control is a common method of process control. By proportional, integral and differential calculation of the difference between the controlled feedback signal and the target signal, the output frequency of the inverter is adjusted to form a closed-loop system, so that the controlled quantity is stable. Target value.

It is suitable for process control situations such as flow control, pressure control and temperature control. Figure 6-28 shows the control principle block diagram of process PID

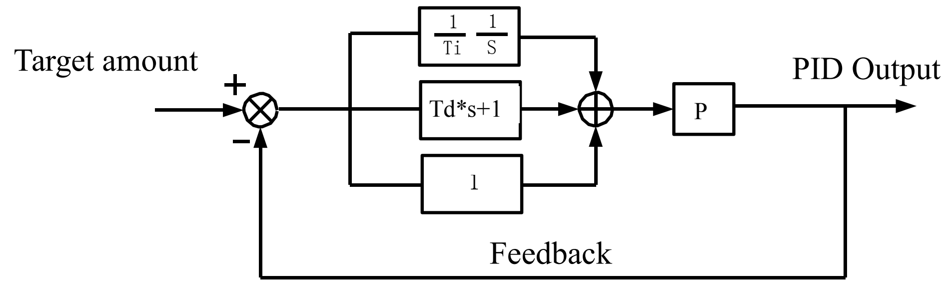


Figure 6-28 Process PID block diagram

PA-00	PID given source	0: PA-01 setting 2: AI2 4: Pulse setting 6: Multi-speed given	1: AI1 3: AI3 (panel potentiometer) 5: Communication given	Default：0
PA-01	PID value given	0.0%～100.0%		Default：50.0%

🕮This parameter is used to select the target channel for the process PID.

The set target amount of the process PID is a relative value, and the setting range is 0.0% to 100.0%. The feedback amount of the same PID is also the relative amount, and the role of the PID is to make the two relative quantities the same.

PA-02	PID feedback source	0: AI1 2: AI3/panel potentiometer 4: Pulse setting (X6) 6: AI1+AI2 8:MIN(|AI1|, |AI2|)	1: AI2 3: AI1-AI2 5: Communication given 7:MAX(|AI1|, |AI2|)	Default：0

🕮This parameter is used to select the feedback signal channel of the process PID.
The feedback amount of the process PID is also a relative value, and the setting range is 0.0% to 100.0%.

PA-03	PID action direction	0: Forward action 1: Reverse action	Default：0

🕮Forward action: When the PID feedback signal is less than the given amount, the inverter output frequency rises. Such as winding tension control occasions.

Reverse action: When the feedback signal of the PID is less than the given amount, the output frequency of the inverter decreases. Such as unwinding tension control occasions.

This function is affected by the reverse direction of the multi-function terminal PID (function 35), so you need to pay attention to it during use.

PA-04	PID given feedback range	0～65535	Default：1000

📖 PID given feedback range is a dimensionless unit for the PID given display U0-15 and the PID feedback display U0-16. The relative value of the given feedback of the PID is 100.0%, corresponding to the given feedback range PA-04. For example, if PA-40 is set to 2000, when the PID is given 100.0%, the PID given display U0-15 is 2000.

PA-05	Proportional gain Kp1	0.0～100.0	Default：40.0
PA-06	Integration time Ti1	0.01s～10.00s	Default：1.00s
PA-07	Derivative time Td1	0.000s～10.000s	Default：0.000s

📖Proportional gain Kp1:

Determine the adjustment strength of the entire PID regulator, the larger the Kp1, the greater the adjustment intensity. The parameter 100.0 indicates that when the deviation between the PID feedback amount and the given amount is 100.0%, the adjustment range of the PID regulator to the output frequency command is the Maximum frequency.

Integration time Ti1: Determines the strength of the PID regulator integral adjustment. The shorter the integration time, the greater the adjustment intensity. The integration time means that when the deviation between the PID feedback amount and the given amount is 100.0%, the integral regulator continuously adjusts through the time, and the adjustment amount reaches the Maximum frequency.

Derivative time Td1: Determines the strength of the PID regulator's adjustment to the rate of change of the deviation. The longer the differentiation time, the greater the adjustment intensity. The derivative time means that when the feedback amount changes by 100.0% during this time, the adjustment amount of the differential regulator is the Maximum frequency.

PA-08	PID reverse cutoff frequency	0.00～Maximum frequency	Default：2.00Hz

📖In some cases, only when the PID output frequency is negative (the inverter reverse rotation), it is possible for the PID to control the given amount and the feedback amount to the same state, but the excessive reverse frequency is not allowed for some occasions. PA-08 is used to determine the upper limit of the inversion frequency.

PA-09	PID deviation limit	0.0%～100.0%	Default：0.0%

📖P When the deviation between the PID given amount and the feedback amount is smaller than PA-09, the PID stops the adjustment action. In this way, the output frequency is stable when the deviation from the feedback is small, which is effective for some closed-loop control applications.

PA-10	PID differential limiting	0.00%～100.00%	Default：0.10%

📖In the PID regulator, the function of the differential is relatively sensitive, and it is easy to cause the system to oscillate. For this reason, the role of the PID differential is generally limited to a small range, and the PA-10 is used to set the range of the PID differential output.

PA-11	PID given change time	0.00～650.00s	Default：0.00s

📖PID given change time, refers to the time required for the PID reference value to change from 0.0% to 100.0%.

When the PID given changes, the PID set value changes linearly according to the given change time, which reduces the adverse effect of the given sudden change on the system.

PA-12	PID feedback filter time	0.00～60.00s	Default：0.00s
PA-13	PID output filtering time	0.00～60.00s	Default：0.00s

📖PA-12 is used to filter the amount of PID feedback. This filtering helps to reduce the influence of feedback on the feedback, but it will bring the response performance of the process closed-loop system.

PA-13 is used to filter the PID output frequency, which will attenuate the sudden change of the inverter output frequency, but it will also bring the response performance of the process closed-loop system.

PA-15	Proportional gain Kp2	0.0～100.0	Default：20.0
PA-16	Integration time Ti2	0.01s～10.00s	Default：2.00s
PA-17	Derivative time Td2	0.000s～10.000s	Default：0.000s
PA-18	PID parameter switchover condition	0: No switchover 1: Switchover via the input terminal 2: Automatic switchover based on deviation	Default：0
PA-19	PID parameter switchover deviation 1	0.0%～PA-20	Default：20.0%
PA-20	PID parameter switchover deviation 2	PA-19～100.0%	Default：80.0%

🕮In some applications, a set of PID parameters cannot meet the requirements of the entire running process, and different PID parameters need to be used in different situations. This set of function codes is used for switching between two sets of PID parameters. The setting of the regulator parameters PA-15~PA-17 is similar to the parameters PA-05~PA-07.

The two sets of PID parameters can be switched by the multi-function X terminal, or can be automatically switched according to the deviation of the PID.

When the multi-function X terminal is selected for switching, the multi-function terminal function selection should be set to 43 (PID parameter switching terminal). When the terminal is invalid, select parameter group 1 (PA-05~PA-07). When the terminal is valid, select the parameter group. 2 (PA-15~PA-17).

When automatic switching is selected, the absolute value of the deviation between the given and feedback is less than the PID parameter switching deviation 1 PA-19, and the PID parameter selects parameter group 1. When the absolute value of the deviation between the given and the feedback is greater than the PID switching deviation 2 PA-20, the PID parameter selection selects parameter group 2. When the deviation between the given and feedback is between the switching deviation 1 and the switching deviation 2, the PID parameter is the linear interpolation value of the two sets of PID parameters, as shown in Figure 6-29.

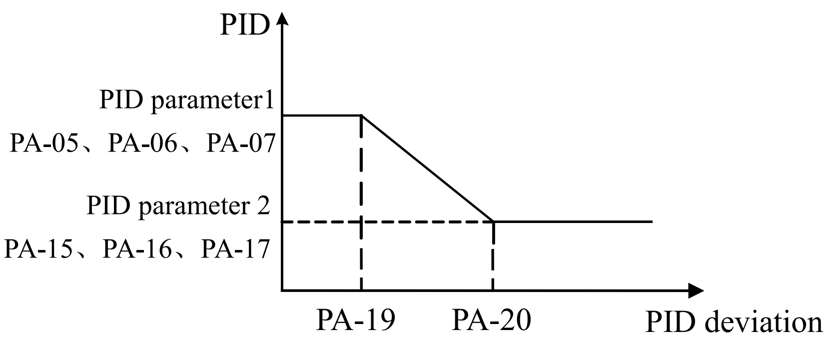


Figure 6-29 PID parameter switching

PA-21	PID initial value	0.0%～100.0%	Default：60.0%
PA-22	D initial value hold time	0.00～650.00s	Default：5.00s

🕮When the inverter starts, the PID output is fixed to the PID initial value PA-21. After the PID initial value hold time PA-22, the PID starts the closed-loop adjustment operation. Figure 6-30 shows the function of the PID initial value.

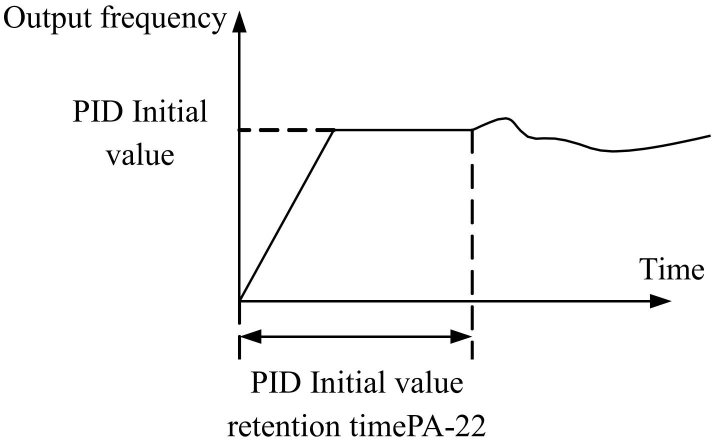


Figure 6-30 Schematic diagram of PID initial value function

PA-25	PID integral attribute	Ones place：Integral separation 0: Invalid 1: Valid Tens place: Whether to stop integral operation when the output reaches the limit 0: Continue to integrate 1: Stop integral operation	Default：00

📖Integral separation:

If the integral separation is set to be effective, when the multi-function digital X-integration pause (function 22) is valid, the integral PID integration of the PID stops the calculation, and at this time, the PID only proportional and differential action is effective.

When the integral separation selection is invalid, the integral separation is invalid regardless of whether the multi-function digital X is valid or not.

Whether to stop integral operation when the output reaches the limit: If "Stop integral operation" is selected, the PID integral operation stops, which may help to reduce the PID overshoot.

PA-26	PID feedback loss detection value	0.0%：Do not judge feedback loss 0.1%～100.0%	Default：0.0%
PA-27	PID feedback loss detection time	0.0s～20.0s	Default：0.0s

📖This function code is used to judge whether the PID feedback is lost.

When the PID feedback amount is less than the feedback loss detection value PA-26 and the duration exceeds the PID feedback loss detection time PA-27, the inverter alarms the fault Err31 and processes according to the selected fault processing mode.

PA-28	PID shutdown operation	0：No operation at stop 1：Operation at stop	Default：1

📖It is used to select whether the PID continues to operate under the PID stop state. In general applications, the PID should stop computing in the shutdown state.

PB Swing frequency, fixed length and counting

The swing frequency function is suitable for textile, chemical fiber and other industries, as well as occasions requiring traverse and winding functions. The swing frequency function refers to the inverter output frequency, which swings up and down with the set frequency as the center, and the running frequency is in the time axis.

As shown in Figure 6-31, the swing amplitude is set by PB-00 and PB-01. When PB-01 is set to 0, the swing is 0. At this time, the swing frequency does not work.

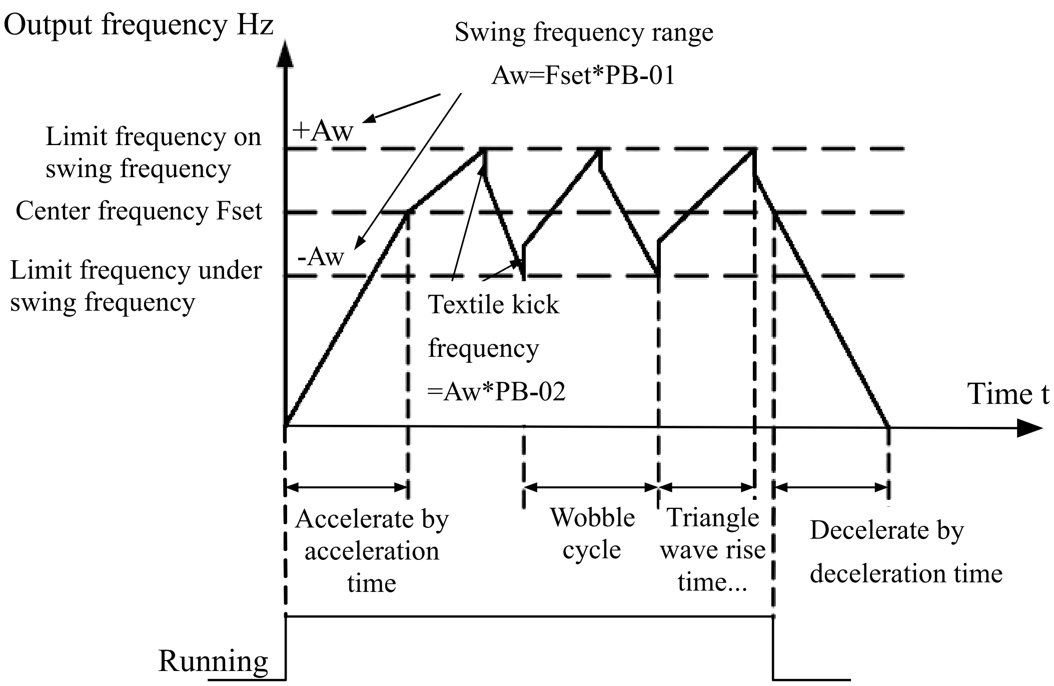


Figure 6-31 Schematic diagram of swing frequency operation

PB-00	Swing frequency setting method	0：Relative to the center frequency 1: relative to Maximum frequency	Default：0

📖This parameter is used to determine the reference amount of the swing.

0：Relative to the center frequency (P0-07 frequency source), it is a variable swing system. The swing varies with the center frequency (set frequency).

1: Relative to the Maximum frequency (P0-10), for a fixed swing system, the swing is fixed.

PB-01	Swing frequency range	0.0%～100.0%	Default：0.0%
PB-02	Kick frequency amplitude	0.0%～50.0%	Default：0.0%

📖This parameter is used to determine the value of the swing value and the kick frequency.

When the swing is set relative to the center frequency (PB-00 = 0), the swing AW = frequency source P0-07 × swing amplitude PB-01. When setting the swing relative to the Maximum frequency (PB-00 = 1), the swing AW = Maximum frequency P0 - 10 × swing amplitude PB-01.

The amplitude of the kick frequency is the percentage of the frequency of the kick frequency relative to the swing when the swing frequency is running, that is, the burst frequency = swing AW × kick frequency amplitude PB-02. If the swing is selected relative to the center frequency (PB-00 = 0), the burst frequency is the change value. If the swing is selected relative to the Maximum frequency (PB-00 = 1), the burst frequency is a fixed value.

The swing frequency is limited by the upper and lower frequencies.

PB-03	Wobble cycle	0.1s～3000.0s	Default：10.0s

PB-04	Swing frequency triangle wave rise time	0.1%～100.0%	Default：50.0%

📖Wobble cycle: The time value of a complete wobble cycle.

The triangular wave rise time coefficient PB-04 is the time percentage of the triangular wave rise time relative to the swing frequency period PB-03. Triangle wave rise time = swing frequency period PB-03 × triangle wave rise time coefficient PB-04, in seconds. Triangle wave fall time = swing frequency period PB-03 × (1 - triangular wave rise time coefficient PB-04), in seconds.

PB-05	Set length	0m～65535m	Default：1000m
PB-06	Actual length	0m～65535m	Default：0m
PB-07	Pulse number per meter	0.1～6553.5	Default：100.0

📖The above function code is used for fixed length control.

The length information is collected by the multi-function input terminal, and the number of pulses sampled by the terminal is divided by the number of pulses per meter PB-07, and the actual length PB-06 can be calculated. When the actual length is greater than the set length PB-05, the output length reaches the ON signal.

During the fixed length control, the length reset operation can be performed through the input terminal (28).In the application, the corresponding input terminal function needs to be set to “length count input” (27).   When the pulse frequency is high, the X6 port must be used.

PB-08	Set count value	1～65535	Default：1000
PB-09	Specified count value	1～65535	Default：1000

📖The count value needs to be collected through the multi-function digital input terminal. In the application, the corresponding input terminal function needs to be set to “counter input” (function 25). When the pulse frequency is high, the X6 port must be used.

When the count value reaches the set count value PB-08, the multi-function digital output "sets the count value reached" ON signal, and then the counter stops counting.

When the count value reaches the specified count value PB-09, the multi-function digital output "specified count value reaches" ON signal, at which time the counter continues to count until the "set count value" is stopped.

The specified count value PB-09 should not be greater than the set count value PB-08. Figure 6-32 is a schematic diagram of setting the arrival of the count value and the arrival of the specified count value.

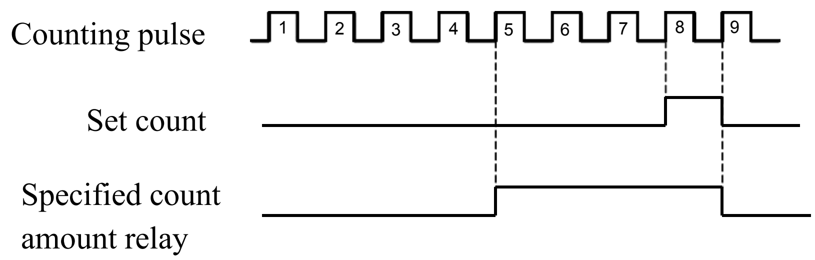


Figure 6-32 Setting the count value given and the specified count value

PC Multi-segment instruction and simple PLC function

The multi-stage command of the inverter has more functions than the normal multi-speed. In addition to the multi-speed function, it can also be used as a voltage source for VF separation and a given source for the process PID. To this end, the dimensions of the multi-segment instructions are relative values.

PC-00	Multi-segment instruction 0	0.0Hz ～±P0-10	Default：0.0
PC-01	Multi-segment instruction 1	0.0Hz ～±P0-10	Default：0.0
PC-02	Multi-segment instruction 2	0.0Hz ～±P0-10	Default：0.0
PC-03	Multi-segment instruction 3	0.0Hz ～±P0-10	Default：0.0
PC-04	Multi-segment instruction 4	0.0Hz ～±P0-10	Default：0.0
PC-05	Multi-segment instruction 5	0.0Hz ～±P0-10	Default：0.0
PC-06	Multi-segment instruction 6	0.0Hz ～±P0-10	Default：0.0
PC-07	Multi-segment instruction 7	0.0Hz ～±P0-10	Default：0.0
PC-08	Multi-segment instruction 8	0.0Hz ～±P0-10	Default：0.0
PC-09	Multi-segment instruction 9	0.0Hz ～±P0-10	Default：0.0
PC-10	Multi-segment instruction 10	0.0Hz ～±P0-10	Default：0.0
PC-11	Multi-segment instruction 11	0.0Hz ～±P0-10	Default：0.0
PC-12	Multi-segment instruction 12	0.0Hz ～±P0-10	Default：0.0
PC-13	Multi-segment instruction 13	0.0Hz ～±P0-10	Default：0.0
PC-14	Multi-segment instruction 14	0.0Hz ～±P0-10	Default：0.0
PC-15	Multi-segment instruction 15	0.0Hz ～±P0-10	Default：0.0

🕮Multi-segment instructions can be used in three situations: as a frequency source, as a VF-separated voltage source, as a set source for the process PID. In three applications, the dimension of the multi-segment instruction is ranging from -(P0-10) to(P0-10). When used as a frequency source, it is a actual frequency; when the VF is separated from the voltage source, it is relative to the rated voltage of the motor. Percentage; since the PID given is originally a relative value, the multi-segment instruction does not require a dimension conversion as a PID setting source.

The multi-segment instruction needs to be switched according to the different states of the multi-function digital X. For details, please refer to the relevant description of the P4 group.

PC-16	Simple PLC operation mode	0：Single run end shutdown 1: Keep the final value at the end of a single run 2: Always cycle	Default：0

🕮The simple PLC function has two functions: as a frequency source or as a voltage source for VF separation.

When the simple PLC is used as the frequency source, the positive and negative of PC-00~PC-15 determine the running direction. If it is negative, it means the inverter runs in the opposite direction.

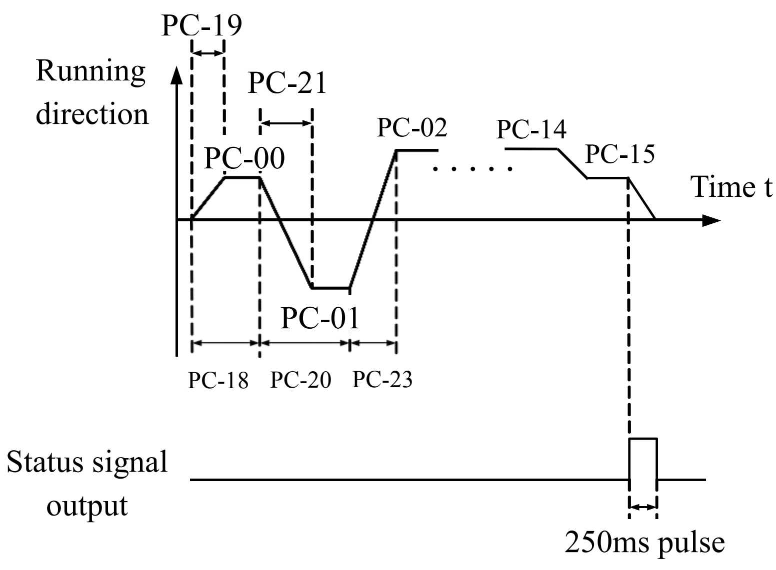


Figure 6-33 Simple PLC schematic

As a frequency source, the PLC has three modes of operation. When the VF is separated as a voltage source, these three modes are not available. Among them:

0: Single run end shutdown

After the inverter completes a single cycle, it will stop automatically and need to give the running command again to start.

1: After the single run ends, the final value is maintained. After the inverter completes a single cycle, Automatically maintain the running frequency and direction of the last segment.

2: Always cycle the inverter after completing a cycle, it will automatically start the next cycle until it stops when there is a stop command.

PC-17	Simple PLC power-down memory selection	Ones place：Power-down memory selection 0: No power loss, no memory 1: Power failure memory Tens place: stop memory selection 0: Stop without memory 1: Stop memory	Default：00

📖PLC power-down memory refers to the operating phase and operating frequency of the PLC before the power-down, and continues to run from the memory phase the next time the power is turned on. If you choose not to remember, the PLC process will be restarted every time you power up.

The PLC stop memory records the previous PLC running phase and running frequency when it stops, and continues to run from the memory phase in the next run. If you choose not to remember, the PLC process will be restarted each time you start.

PC-18	0th run time	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-19	The 0th section acceleration and deceleration time selection	0～3	Default：0
PC-20	First run time	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-21	The first stage acceleration and deceleration time selection	0～3	Default：0
PC-22	2nd run time	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-23	The second stage acceleration and deceleration time selection	0～3	Default：0
PC-24	Third run time	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-25	The third stage acceleration and deceleration time selection	0～3	Default：0
PC-26	Stage 4 run time	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-27	Section 4 acceleration and deceleration time selection	0～3	Default：0
PC-28	5th run time	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-29	Section 5 acceleration and deceleration time selection	0～3	Default：0
PC-30	Run time of paragraph 6	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-31	Section 6 acceleration and deceleration time selection	0～3	Default：0
PC-32	Run time of paragraph 7	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-33	Section 7 acceleration and deceleration time selection	0～3	Default：0
PC-34	8th run time	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-35	Section 8 acceleration and	0～3	Default：0

	deceleration time selection		
PC-36	9th run time	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-37	The 9th paragraph acceleration and deceleration time selection	0～3	Default：0
PC-38	Run time of paragraph 10	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-39	Section 10 acceleration and deceleration time selection	0～3	Default：0
PC-40	Run time in paragraph 11	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-41	The 11th paragraph acceleration and deceleration time selection	0～3	Default：0
PC-42	Run time in paragraph 12	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-43	The 12th paragraph acceleration and deceleration time selection	0～3	Default：0
PC-44	Run time of paragraph 13	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-45	The 13th paragraph acceleration and deceleration time selection	0～3	Default：0
PC-46	Run time in paragraph 14	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-47	The 14th paragraph acceleration and deceleration time selection	0～3	Default：0
PC-48	Run time in paragraph 15	0.0s（h）～6553.5s（h）	Default：0.0s(h)
PC-49	The 15th paragraph acceleration and deceleration time selection	0～3	Default：0
PC-50	Simple PLC runtime unit	0: s (seconds) 1: h (hours)	Default：0
PC-51	Multi-segment instruction 0 given mode	0: Given by PC-00 1: Given by AI1 2: AI2 given 3: panel potentiometer 4: PULSE 5: PID given 6: P0-08 can be modified by UP/DOWN	Default：0

📖This parameter determines the given channel of the multi-segment instruction 0.

In addition to the PC-00, the multi-segment instruction 0 has a variety of other options to facilitate switching between multiple short instructions and other given modes. When a multi-segment command is used as a frequency source or a simple PLC as a frequency source, switching between the two frequency sources can be easily realized.

PP User password

PP-00	user password	0～65535	Default：0

📖PP-00 sets any non-zero number, then the password protection function takes effect. The next time you enter the menu, you must enter the password correctly. Otherwise, you cannot view and modify the function parameters. Please remember the user password you set.

If PP-00 is set to 00000, the set user password will be cleared, and the password protection function will be invalid.

PP-01	Parameter initialization	0：No operation 1: Restore Default, excluding motor parameters 2: Clear record information 4: Backup user current parameters 501: Restore user backup parameters without operation	Default：0

📖Restore factory settings, excluding motor parameters:

After setting PP-01 to 1, most of the inverter's function parameters are restored to the factory default parameters, but the motor parameters, frequency command decimal point (P0-22), fault record information, cumulative running time (P7-09), cumulative power-on Time (P7-13) and accumulated power consumption (P7-14) are not restored.

2. Clear the record information: clear the inverter fault record, accumulated operation/power-on time (P7-09/P7-13), and accumulated power consumption (P7-14).

4. Backup user current parameters: Back up the current setting values of all function parameters to facilitate the customer to recover after the parameter adjustment is disordered.

501. Restore user backup parameters: restore the user parameters that were backed up before, that is, restore the backup parameters by setting PP-01 to 4.

PP-02	Function parameter group display selection	Function parameter group display selection	Default：11
PP-04	Function code modification attribute	0：Can be modified 1: not modifiable	Default：0

📖Whether the user can set the function code parameter can be modified to prevent the risk of the function parameter being mistakenly changed.

When the function code is set to 0, all function codes can be modified; when set to 1, all function codes can only be viewed and cannot be modified.

A0 Torque Control Function

A0-00	Speed/torque control selection	0: Speed control 1: Torque control	Default：0

📖Used to select the inverter control mode: speed control or torque control.

The multi-function input terminals of the inverter are equipped with torque control inhibition (function 29) and speed control/torque control switching (function 46).

When the speed control/torque control switching terminal is invalid, the control mode is determined by A0-00. If the terminal is valid, the value corresponding to A0-00 is inverted.

In any case, when the torque control inhibit terminal is valid, the inverter is fixed to the speed control mode.

A0-01	Torque setting source selection in torque control mode	0：Digital setting (A0-03) 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: Communication reference 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 1-7 option full scale, corresponding to A0-03 digital setting	Default：0
A0-03	Torque digital setting	-200.0%～200.0%	Default：150.0%

📖A0-01 is used to select the torque setting source mode. The torque setting uses a relative value, and

100.0% corresponds to the rated torque of the inverter.

When the torque is set to 1~7 mode, 100% of communication, analog input and pulse input correspond to the percentage of A0-03.0-01

A0-05	Torque control forward maximum frequency	0.00Hz～Maximum frequency	Default：50.00Hz
A0-06	Torque control reverse maximum frequency	0.00Hz～Maximum frequency	Default：50.00Hz

🕮It is used to set the forward or reverse maximum running frequency of the inverter under the torque control mode.

When the inverter torque is controlled, if the load torque is less than the motor output torque, the motor speed will continue to rise. To prevent accidents such as flying in the mechanical system, the maximum motor speed during torque control must be limited.

A0-07	Torque control acceleration time	0.00s～65000s	Default：0.00s
A0-08	Torque control deceleration time	0.00s～65000s	Default：0.00s

🕮In the torque control mode, the difference between the motor output torque and the load torque determines the speed change rate of the motor and the load, so the motor speed may change rapidly, causing problems such as excessive noise or mechanical stress. By setting the torque control acceleration/deceleration time, the motor speed can be changed gently.

However, for situations where fast torque response is required, the torque control acceleration/deceleration time must be set to 0.00 s.

A5 Control optimization parameter

A5-00	DPWM switching upper limit frequency	0.00Hz～15.00Hz	Default：12.00

🕮Only valid for VF control. The wave-forming mode of the asynchronous machine VF is determined. Below this value is the 7-segment continuous modulation mode, and the opposite is the 5-segment intermittent modulation mode.

In the case of 7-segment continuous modulation, the switching loss of the inverter is large, but the current ripple is small; in the 5-segment intermittent debugging mode, the switching loss is small and the current ripple is large; but at high frequencies, it may cause The instability of the motor operation generally does not need to be modified.

Please refer to function code P3-11 for VF operation instability. For function loss and temperature rise, please refer to function code P0-15.

A5-01	PWM Modulation	0: Asynchronous modulation 1: Synchronous modulation	Default：0

🕮Only valid for VF control. Synchronous modulation means that the carrier frequency changes linearly with the output frequency conversion, ensuring that the ratio (carrier ratio) of the two is constant, and is generally used when the output frequency is high, which is beneficial to the output voltage quality.

At lower output frequencies (below 100 Hz), synchronous modulation is generally not required because the ratio of carrier frequency to output frequency is higher at this time, and the advantage of asynchronous modulation is more obvious.

When the running frequency is higher than 85 Hz, the synchronous modulation takes effect, and the frequency is fixed below the asynchronous modulation mode.

A5-02	Dead zone compensation mode selection	0: No compensation 1: Compensation mode 1 2: Compensation mode 2	Default：1

🕮This parameter generally does not need to be modified. Only when there is a special requirement for the quality of the output voltage waveform, or when the motor has an abnormality such as oscillation, it is necessary to try to switch to select different compensation modes. Compensation mode 2 is recommended for high power.

A5-03	Random PWM depth	0：Invalid 1~10: Random PWM Depth	Default：0

🕮By setting a random PWM, the monotonous and harsh motor sound can be softened and it can help reduce external electromagnetic interference. When the random PWM depth is set to 0, the random PWM is invalid. Adjusting the random PWM different depths will give different effects.

A5-04	Fast current limiting	0：Invalid 1: Valid	Default：1

🕮Enable the fast current limiting function to minimize the overcurrent fault of the inverter and ensure the uninterrupted operation of the inverter. If the inverter continues to be in the fast current limit state for a long time, the inverter may be damaged by overheating, etc. This situation is not allowed.，

Therefore, when the inverter is quickly limited for a long time, it will alarm Err40, indicating that the inverter is overloaded and needs to stop.

A5-05	Current detection compensation	0～100	Default：5

🕮It is used to set the current detection compensation of the inverter. If the setting is too large, the control performance may be degraded. Generally do not need to be modified.

A5-06	Under voltage setting	60.0%～140.0%	Default：100.0%

🕮It is used to set the voltage value of the inverter under voltage fault Err09. The inverter with different voltage levels is 100.0%, corresponding to different voltage points:

Single phase / three phase 220V：200V
Three phase 380V：350V
Three phase 480V：450V
Three phase 690V：650V

A5-07	SVC optimization mode selection	0：Not optimized 1: Optimized mode 1 2: Optimized mode 2	Default：1

🕮Optimization Mode 1: Used when there is a higher torque control linearity requirement.

Optimization Mode 2: Use when there is a requirement for higher speed stability.

A5-08	Dead time adjustment	100%～200%	Default：150%

🕮Set for 1140V voltage level. Adjusting this value can improve the effective voltage usage. If the adjustment is too small, the system may be unstable. User modification is not recommended

A5-09	Overvoltage setting	200.0V ～ 2200.0V	Default：depend

🕮Used to set the voltage value of the inverter overvoltage fault. The different voltage levels are respectively:

Voltage Level	Overpressure point Default
Single phase 220V	400.0V
Three phase 220V	400.0V
Three phase 380V	810.0V
Three phase 480V	890.0V

Default is also the upper limit of the internal overvoltage protection of the inverter. This parameter setting takes effect only when the A5-09 setting value is less than the respective voltage level Default. Above Default, the Default is the standard.

A6 group AI curve setting

A6-00	AI curve 4 minimum input	-10.00V ～ A6-02	Default：0.00V
A6-01	AI curve 4 minimum input correspondence setting	-100.0% ～ +100.0%	Default：0.0%
A6-02	AI curve 4 inflection point 1 input	A6-00 ～ A6-04	Default：3.00V
A6-03	AI curve 4 inflection point 1 input corresponding setting	-100.0% ～ +100.0%	Default：30%
A6-04	AI curve 4 inflection point 2 input	A6-02 ～ A6-06	Default：6.00V
A6-05	AI curve 4 inflection point 2 input corresponding setting	-100.0% ～ +100.0%	Default：60%
A6-06	AI curve 4 maximum input	A6-06 ～ +10.00V	Default：10.00V
A6-07	AI curve 4 maximum input corresponding setting	-100.0% ～ +100.0%	Default：100%
A6-08	AI curve 5 minimum input	-10.00V ～ A6-10	Default： -10.00V
A6-09	AI curve 5 minimum input corresponding setting	-100.0% ～ +100.0%	Default： -100.0%
A6-10	AI curve 5 inflection point 1 input	A6-08 ～ A6-12	Default： -3.00V
A6-11	AI curve 5 inflection point 1 input corresponding setting	-100.0% ～ +100.0%	Default： -30.0%
A6-12	AI curve 5 inflection point 2 input	A6-10 ～ A6-14	Default：3.00V
A6-13	AI curve 5 inflection point 2 input corresponding setting	-100.0% ～ +100.0%	Default：30.0%
A6-14	AI curve 5 maximum input	A6-12 ～ +10.00V	Default：10.00V
A6-15	AI curve 5 maximum input corresponding setting	-100.0% ～ +100.0%	Default：100.0%

🕮The functions of curves 4 and 5 are similar to those of curve 1 curve 3, but curve 1 is a straight line, while curve 4 and curve 5 are 4-point curves, which allows for a more flexible correspondence. The figure below is a schematic diagram of curve 4 curve 5. 4

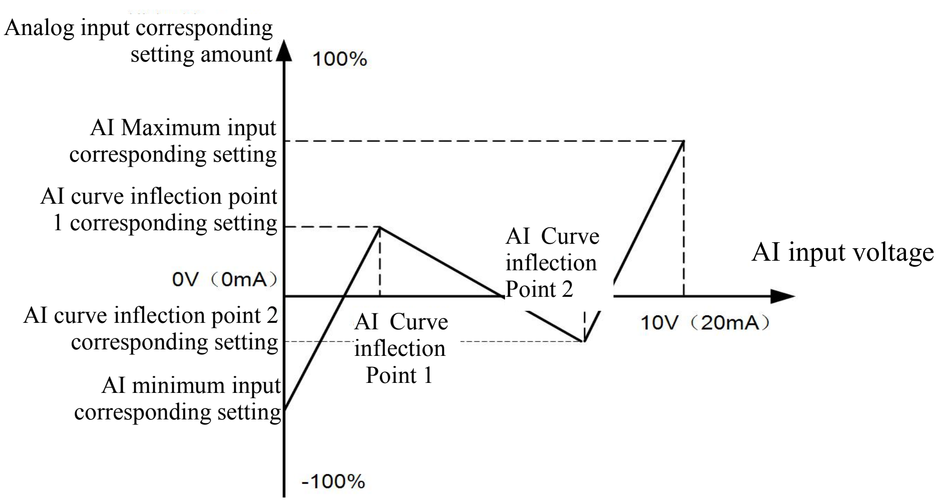


Figure 6-34 Schematic diagram of curve 4 and curve 5

Note that when setting curve 4 and curve 5, the minimum input voltage of the curve, the inflection point 1 voltage, the inflection point 2 voltage, and the maximum voltage must be increased in turn. AI curve selection F4-33 is used to determine how the analog inputs AI1~AI3 are selected among the 5 curves.

A6-24	AI1 sets the jump point	-100.0% ～ 100.0%	Default：0.0%
A6-25	AI1 sets the jump range	0.0% ～ 100.0%	Default：0.5%
A6-26	AI2 sets the jump point	-100.0% ～ 100.0%	Default：0.0%
A6-27	AI2 sets the jump range	0.0% ～ 100.0%	Default：0.5%
A6-28	AI3 sets the jump point	-100.0% ～ 100.0%	Default：0.0%
A6-29	AI3 sets the jump range	0.0% ～ 100.0%	Default：0.5%

🕮The inverter analog input AI1~AI3 has the set value jump function. The jump function is to fix the analog amount corresponding set value to the value of the jump point when the analog amount is set to change in the upper and lower sections of the jump point.

E.g.:

The voltage of analog input AI1 fluctuates around 5.00V, the fluctuation range is 4.90V~5.10V, the minimum input of AI1 is 0.00V corresponding to 0.0%, and the maximum input of 10.00V corresponds to 100%, then the detected AI1 is set at. Fluctuations between 49.0%~51.0%.

Set AI1 to set jump point A6-24 to 50.0%, and set AI1 to set jump width A6-25 to 1.0%. When AI1 is input, after hopping function processing, the corresponding AI1 input corresponding setting is fixed to 50.0%. AI1 is transformed into a stable input that eliminates fluctuations.

AC AIAO Correction

AC-00	AI1 measured voltage 1	0.500V ～ 4.000V	factory reset
AC-01	AI1 display voltage 1	0.500V ～ 4.000V	factory reset
AC-02	AI1 measured voltage 2	6.000V ～ 9.999V	factory reset
AC-03	AI1 display voltage 2	6.000V ～ 9.999V	factory reset
AC-04	AI2 measured voltage 1	0.500V ～ 4.000V	factory reset
AC-05	AI2 display voltage 1	0.500V ～ 4.000V	factory reset
AC-06	AI2 measured voltage 2	6.000V ～ 9.999V	factory reset
AC-07	AI2 display voltage 2	6.000V ～ 9.999V	factory reset
AC-08	AI3 measured voltage 1	-9.999V ～ 10.000V	factory reset
AC-09	AI3 display voltage 1	-9.999V ～ 10.000V	factory reset
AC-10	AI3 measured voltage 2	-9.999V ～ 10.000V	factory reset
AC-11	AI3 display voltage 2	-9.999V ～ 10.000V	factory reset

🕮This set of function codes is used to correct the analog input AI to eliminate the effects of zero offset and gain on the AI input. The function parameters of this group have been corrected at the factory. When the default is restored, it will be restored to the factory-corrected value. Generally no correction is required at the application site.

The measured voltage refers to the actual voltage measured by a measuring instrument such as a multi-meter. The display voltage refers to the voltage display value sampled by the inverter. See the U0 group AI correction voltage (U0-21, U0-22 and U0-23) display.

During calibration, input two voltage values for each AI input port, and respectively input the value measured by the multi-meter and the value read by the U0 group into the above function code, the inverter will automatically perform the zero offset of the AI. Correction of the gain.

For the case where the user's given voltage does not match the actual sampling voltage of the inverter, the field calibration method can be used to make the sampling value of the inverter consistent with the expected set value. Take AI1 as an example. The field calibration method is as follows:

Given AI1 voltage signal (about 2V)

Actual measurement of AI1 voltage value, stored in function parameter AC-00 View U0-21 display value, stored in function parameter AC-01;

Given AI1 voltage signal (about 8V)

Actual measurement of AI1 voltage value, stored in function parameters AC-02

View U0-21 display value, save function parameters AC-03

When AI2 and AI3 are corrected, the actual sampling voltage viewing positions are U0-22 and U0-23 respectively.

For AI1 and AI2, it is recommended to use 2V and 8V as the calibration point pair AI3. It is recommended to sample -8V and 8V as the correction point.

AC-12	AO1 target voltage 1	0.500V ～ 4.000V	factory reset
AC-13	AO1 measured voltage 1	0.500V ～ 4.000V	factory reset
AC-14	AO1 target voltage 2	6.000V ～ 9.999V	factory reset
AC-15	AO1 measured voltage 2	6.000V ～ 9.999V	factory reset
AC-16	AO2 target voltage 1	0.500V ～ 4.000V	factory reset
AC-17	AO2 measured voltage 1	0.500V ～ 4.000V	factory reset
AC-18	AO2 target voltage 2	6.000V ～ 9.999V	factory reset
AC-19	AO2 measured voltage 2	6.000V ～ 9.999V	factory reset

🕮This set of function codes is used to correct the analog output AO.

The function parameters of this group have been corrected at the factory. When the default is restored, it will be restored to the factory-corrected value. Generally no correction is required at the application site.

The target voltage is the theoretical output voltage value of the inverter. The measured voltage refers to the actual output voltage measured by an instrument such as a multi-meter.

Chapter 7 Faults and Solutions

7-1 Fault alarm and Solutions

When the inverter fails during operation, the inverter will immediately protect the motor from output, and the inverter fault relay contact will act and display the fault code on the inverter display panel. Before seeking service, users can perform self-checking according to the tips in this section to analyze the cause of the fault. If the fault cannot be solved, please seek technical support from our company or product agent.

Fault name	display	Troubleshoot the cause	solutions
Inverter unit protection	Err01	1: The output circuit is grounded or short circuited. 2: The connecting cable of the motor is too long. 3: The IGBT overheats. 4: The internal connections become loose. 5: The main control board is faulty. 6: The driver board is faulty. 7: The AC drive IGBT is faulty.	1: Eliminate external faults. 2: Install a reactor or an output filter. 3: Check the air filter and the cooling fan. 4: Connect all cables properly 5: Contact the agent or company to support
Overcurrent during acceleration	Err02	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The acceleration time is too short. 4: Manual torque boost or V/F curve is not appropriate. 5: The voltage is too low. 6: The startup operation is performed on the rotating motor. 7: A sudden load is added during acceleration. 8: The inverter model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto-tuning. 3: Increase the acceleration time. 4: Adjust the manual torque boost or V/F curve. 5: Adjust the voltage to normal range. 6: Select rotational speed tracking restart or start the motor after it stops. 7: Remove the added load. 8: Select an inverter of higher power class.
Overcurrent during deceleration	Err03	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The deceleration time is too short. 4: The voltage is too low. 5: A sudden load is added during	1: Eliminate external faults. 2: Perform the motor auto-tuning. 3: Increase the deceleration time. 4: Adjust the voltage to normal range. 5: Remove the added load. 6: Install the braking unit and braking resistor.

Fault name	display	Troubleshoot the cause	solutions
		deceleration. 6: The braking unit and braking resistor are not installed.	
Overcurrent at constant speed	Err04	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The voltage is too low. 4: A sudden load is added during operation. 5: The inverter model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto-tuning. 3: Adjust the voltage to normal range. 4: Remove the added load. 5: Select an inverter of higher power class.
Overvoltage during acceleration	Err05	1: The input voltage is too high. 2: An external force drives the motor during acceleration. 3: The acceleration time is too short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Cancel the external force or install a braking resistor. 3: Increase the acceleration time. 4: Install the braking unit and braking resistor.
Overvoltage during deceleration	Err06	1: The input voltage is too high. 2: An external force drives the motor during deceleration. 3: The deceleration time is too short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor. 3: Increase the deceleration time. 4: Install the braking unit and braking resistor.
Overvoltage at constant speed	Err07	1: The input voltage is too high. 2: An external force drives the motor during deceleration.	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor.
Control power supply fault	Err08	The input voltage is not within the allowable range.	Adjust the input voltage to the allowable range.
Under voltage	Err09	1: Instantaneous power failure occurs on the input power supply. 2: The AC drive's input voltage is not within the allowable range. 3: The bus voltage is abnormal. 4: The rectifier bridge and buffer resistor are faulty. 5: The driver board is faulty. 6: The main control board is faulty.	1: Reset the fault. 2: Adjust the voltage to normal range. 3: Contact the agent or company to support.
Inverter overload	Err10	1: The load is too heavy or locked rotor occurs on the motor. 2: The inverter model is of too	1. Reduce the load and check the motor and mechanical conditions. 2, select the inverter with a larger power

Fault name	display	Troubleshoot the cause	solutions
		small power class.	level
Motor overload	Err11	1: P9-01 is set improperly. 2: The load is too heavy or locked rotor occurs on the motor. 3: The inverter model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an inverter of higher power class.
Power input phase loss	Err12	1: The three-phase power input is abnormal. 2: The driver board is faulty. 3: The Lightning protection board is faulty. 4: The main control board is faulty.	1: Eliminate external faults. 2: Contact the agent or company to support.
Power output phase loss	Err13	1: The cable connecting the inverter and the motor is faulty. 2: The AC drive's three-phase outputs are unbalanced when the motor is running. 3: The driver board is faulty. 4: The IGBT is faulty.	1: Eliminate external faults. 2: Check whether the motor three-phase winding is normal. 3: Contact the agent or company to support.
IGBT overheat	Err14	1: The ambient temperature is too high. 2: The air filter is blocked. 3: The fan is damaged. 4: The thermally sensitive resistor of the IGBT is damaged. 5: The inverter IGBT is damaged.	1: Lower the ambient temperature. 2: Clean the air filter. 3: Replace the damaged fan. 4: Replace the damaged thermally sensitive resistor. 5: Replace the inverter IGBT.
External equipment fault	Err15	1: External fault signal is input via terminal.	Reset the operation.
Communication fault	Err16	1: The host controller is in abnormal state. 2: The communication cable is faulty. 3: P0-28 is set improperly. 4: The communication parameters in group PD are set improperly.	1: Check the cabling of host controller. 2: Check the communication cabling. 3: Set P0-28 correctly. 4: Set the communication parameters properly.
Contactor failure	Err17	1: The driver board and power supply are faulty. 2: The contactor is faulty. 3: Three-phase input power shortage.	1: Replace the faulty driver board or power supply board. 2: Replace the faulty contactor. 3: check the three-phase input power.
Current detection fault	Err18	1: The HALL device is faulty. 2: The driver board is faulty.	1: Replace the faulty HALL device. 2: Replace the faulty driver board.

Fault name	display	Troubleshoot the cause	solutions
Motor auto-tuning fault	Err19	1: The motor parameters are not set according to the nameplate. 2: The motor auto-tuning times out.	1: Set the motor parameters according to the nameplate properly. 2: Check the cable connecting the inverter and the motor.
Encoder fault	Err20	1: The encoder type is incorrect. 2: The cable connection of the encoder is incorrect. 3: The encoder is damaged. 4: The PG card is faulty.	1: Set the encoder type correctly based on the actual situation. 2: Eliminate external faults. 3: Replace the damaged encoder. 4: Replace the faulty PG card.
EEPROM read-write failure	Err21	The EEPROM chip is damaged.	Replace the main control board.
Inverter hardware fault	Err22	1: Overvoltage exists. 2: Overcurrent exists.	1: Handle based on overvoltage. 2: Handle based on overcurrent.
Short circuit to ground	Err23	The motor is short circuited to the ground.	Replace the cable or motor.
Accumulative running time reached	Err26	The accumulative running time reaches the setting value.	Clear the record through the parameter initialization function.
User-defined fault 1	Err27	Check the signal of the terminal input custom fault 1	Reset the operation
User-defined fault 2	Err28	Check the signal of the terminal input custom fault 2	Reset the operation
Accumulative power-on time reached	Err29	The accumulative power-on time reaches the setting value.	Clear the record through the parameter initialization function.
Load becoming 0	Err30	The inverter running current is lower than P9-64	Check that the load is disconnected or the setting of P9-64 and P9-65 is correct.
PID feedback lost during running	Err31	The PID feedback is lower than the setting of PA-26.	Check the PID feedback signal or set PA-26 to a proper value.
Pulse-by-pulse current limit fault	Err40	1: The load is too heavy or locked rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an inverter of higher power class.
Motor switchover fault during running	Err41	Change the selection of the motor via terminal during running of the inverter.	Perform motor switchover after the inverter stops.
Too large speed deviation	Err42	1: The encoder parameters are set incorrectly. 2: The motor auto-tuning is not performed. 3: P9-69 and P9-70 are set	1: Set the encoder parameters properly. 2: Perform the motor auto-tuning. 3: Set P9-69 and P9-70 correctly based on the actual situation.

Fault name	display	Troubleshoot the cause	solutions
		incorrectly.	
Motor over-speed	Err43	1: Set the encoder parameters properly. 2: Perform the motor auto-tuning. 3: Set P9-69 and P9-70 correctly based on the actual situation.	1: Set the encoder parameters properly. 2: Perform the motor auto-tuning. 3: Set P9-69 and P9-70 correctly based on the actual situation.
Motor overheat	Err45	1: The cabling of the temperature sensor becomes loose. 2: The motor temperature is too high.	1: Check the temperature sensor cabling and eliminate the cabling fault. 2: Lower the carrier frequency or adopt other heat radiation measures.
Initial position fault	Err51	The motor parameters are not set based on the actual situation.	Check that the motor parameters are set correctly and whether the setting of rated current is too small.
Braking unit overload	Err61	Resistance of braking resistor is too small.	Replace a braking resistor of larger resistance.
Short-circuit of braking circuit	Err62	Braking IGBT is abnormal.	Contact the agent or company to support.

7-2 Common faults and solution

The following fault conditions may be encountered during the use of the inverter. Please refer to the following method for simple fault analysis.

Table 7-1 Common faults and solutions

No.	Fault phenomenon	Possible Causes	solutions
1	There is no display at power-on.	1: There is no power supply to the inverter or the power input to the inverter is too low. 2: The power supply of the switch on the driver board of the inverter is faulty. 3: The rectifier bridge is damaged. 4: The control board or the operating panel is faulty. 5: The cable connecting the control board and the driver board and the operating panel breaks.	1: Check the power supply. 2: Check the bus voltage. 3: Re-connect the 8-core and 34-core cables. 4: Contact the agent or company to support.
2	“FZKJ” is displayed at power-on.	1: The cable between the driver board and the control board is in poor contact. 2: Related components on the control board are damaged. 3: The motor or the motor cable is short circuited to the ground. 4: The HALL device is faulty.	1: Re-connect the 8-core and 34-core cables. 2: Contact the agent or company to support.

		5: The power input to the inverter is too low.	
3	“Err23” is displayed at power-on.	1: The motor or the motor output cable is short-circuited to the ground. 2: The inverter is damaged.	1: Measure the insulation of the motor and the output cable with a megger. 2: Contact the agent or company to support.
4	The inverter display is normal upon power-on. But “FZKJ” is displayed after running and stops immediately.	1: The cooling fan is damaged or locked-rotor occurs. 2: The external control terminal cable is short circuited.	1: Replace the damaged fan. 2: Eliminate external fault.
5	Err14 (IGBT overheat) fault is reported frequently.	1: The setting of carrier frequency is too high. 2: The cooling fan is damaged, or the air filter is blocked. 3: Components inside the AC drive are damaged (thermal coupler or others).	1: Reduce the carrier frequency (P0-15). 2: Replace the fan and clean the air filter. 3: Contact the agent or company to support.
6	The motor does not rotate after the inverter runs.	1: Check the motor and the motor cables. 2: The AC drive parameters are set improperly (motor parameters). 3: The cable between the driver board and the control board is in poor contact. 4: The driver board is faulty.	1: Ensure the cable between the inverter and the motor is normal. 2: Replace the motor or clear mechanical faults. 3: Check and re-set motor parameters.
7	The input terminals are disabled.	1: The parameters are set incorrectly. 2: The external signal is incorrect. 3: The control board is faulty.	1: Check and reset the parameters in group P4. 2: Re-connect the external signal cables. 3: Contact the agent or company to support.
8	The motor speed is always low in CLVC mode.	1: The encoder is faulty. 2: The encoder cable is connected incorrectly or in poor contact. 3: The PG card is faulty. 4: The driver board is faulty.	1: Replace the encoder and ensure the cabling is proper. 2: Replace the PG card. 3: Contact the agent or company to support.
9	The inverter reports overcurrent and overvoltage frequently.	1: The motor parameters are set improperly. 2: The acceleration/deceleration time is improper. 3: The load fluctuates.	1: Re-set motor parameters or re-perform the motor auto-tuning. 2: Set proper acceleration deceleration time. 3: Contact the agent or company to support.
10	Err17 is reported upon power-on or running.	The soft startup contactor is not picked up.	1: Check whether the contactor cable is loose.

			2: Check whether the contactor is faulty. 3: Check whether 24 V power supply of the contactor is faulty. 4: Contact the agent or company to support.
11	8.8.8.8.8. Is displayed upon power-on.	Related component on the control board is damaged.	Replace the control board.

Chapter 8 Inspection and maintenance

Inspection and maintenance of the inverter requires professional and qualified personnel, and pay attention to the following matters：

- ✧ Maintenance personnel must follow the specified methods of maintenance and maintenance.
- ✧ The power of the inverter must be turned off for 5 minutes before maintenance.
- ✧ Do not directly touch the components on the PCB, otherwise it will be easily damaged by static electricity.
- ✧ After maintenance is complete, you must confirm that all screws are tightened.

8-1 Maintenance

Due to the influence of the environment (such as temperature, humidity, smoke, etc.) of the inverter and the aging of components inside the inverter, various faults may occur in the inverter. Therefore, the inverter must be inspected daily and regularly maintained during storage and use. Daily inspection and maintenance refer to the following table：

Check issues	inspection cycle		Check content	Criteria and maintenance
	anytime	regular		
Operating environment	√		1,Temperature, humidity 2. Dust, moisture 3. Gas	1. Temperature <50 ° C, humidity < 90%, 2. No frost, no odor, no flammable, explosive gas
cooling system		√	1.Installation environment 2. Inverter body fan	1. The installation environment is well ventilated and the air duct is non-blocking 2. The main body fan works normally without abnormal noise
Frequency converter	√		1.Vibration, temperature rise 2. Noise 3. Internal dust, stolen goods 4. Wires, terminals	1. Smooth vibration, normal air outlet temperature 2. No abnormal noise, no odor 3. Completely remove with dry compressed air 4. The fastening screws are not loose
Motor	√		1.Vibration, temperature rise 2. Noise	1. Smooth operation and normal temperature 2. No abnormalities, uneven noise
Input and output parameters	√		1. Input voltage 2. Output current	1. The input voltage is within the specified range 2. The output current is below the rated value

8-2 Inspection and replacement of consumable parts

Some components in the inverter will wear or degrade during use. To ensure stable and reliable operation of the inverter, preventive maintenance should be performed on the inverter and replace parts if necessary:

Component	Service Life	Possible Damage Reason	Judging Criteria
Fan	2 to 3 years	➢ Bearing worn ➢ Blade aging	➢ Input power supply in poor quality ➢ High ambient temperature ➢ Frequent load jumping ➢ Electrolytic aging
Electrolytic capacitor	4 to 5 years	➢ Input power supply in poor quality ➢ High ambient temperature ➢ Frequent load jumping ➢ Electrolytic aging	➢ Whether there is liquid leakage. ➢ Whether the safe valve has projected. ➢ Measure the static capacitance. ➢ Measure the insulating resistance.

8-3 Storage

This product is best placed in the original packaging before installation. If the machine is not used for the time being, in order to make the product meet the warranty of the company and future maintenance, please pay attention to the following matters during storage.:

- ➢ Must be placed in a dirt-free, dry location
- ➢ The ambient temperature of the storage location must be in the range of -20 ° C to +60 ° C.
- ➢ The relative humidity of the storage location must be in the range of 0% to 95% without condensation.
- ➢ Avoid storage in environments containing corrosive gases and liquids.
- ➢ It is best to store it properly on a shelf or countertop.
- ➢ Long-term storage will lead to deterioration of electrolytic capacitors. It is best to ensure that the power is turned on within 2 years, and the power-on time is not less than 5 hours.

8-4 Inverter warranty

The company will provide repair services in the following cases::

✧ If it fails or is damaged under normal use conditions:

1) During the warranty period (from within 18 months after delivery or within 1 year of delivery to the end user), the company provides free repairs.
2) If it is more than 18 months, reasonable maintenance fees will be charged.

✧ Even within the warranty period, a certain maintenance cost should be charged for the failure caused by the following reasons:

1) Failures caused by failure to use the operating manual or beyond the standard.
2) Failure caused by self-repair and modification without permission.
3) Failures caused by improper storage and improper handling.
4) The fault caused when the inverter is used for abnormal functions.
5) Machine damage due to fire, salt erosion, gas corrosion, earthquake, storm, flood, lightning, voltage abnormality or other force majeure.

✧ Even if the warranty period is exceeded, the company also provides lifetime paid repair service.

Chapter 9 Appendix

Appendix A Modbus communications

The series of inverter provides RS485 communication interface, and adopts MODBUS communication protocol. User can carry out centralized monitoring through PC/PLC to get operating requirements. And user can set the running command, modify or read the function codes, the working state or fault information of frequency inverter by Modbus communication protocol.

A.1 about Protocol

This serial communication protocol defines the transmission information and use format in the series communication and it includes master-polling (or broadcasting) format, master coding method and the content includes function code of action, transferring data and error checking. The response of slave is the same structure, and it includes action confirmation, returning the data and error checking etc. If slave takes place the error while it is receiving the information or cannot finish the action demanded by master, it will send one fault signal to master as a response.

A.2 Application Methods

The frequency inverter will be connected into a “Single-master Multi-slave” PC/PLC control net with RS485 bus as the communication slave.

A.3 Bus structure

(1) Hardware interface.

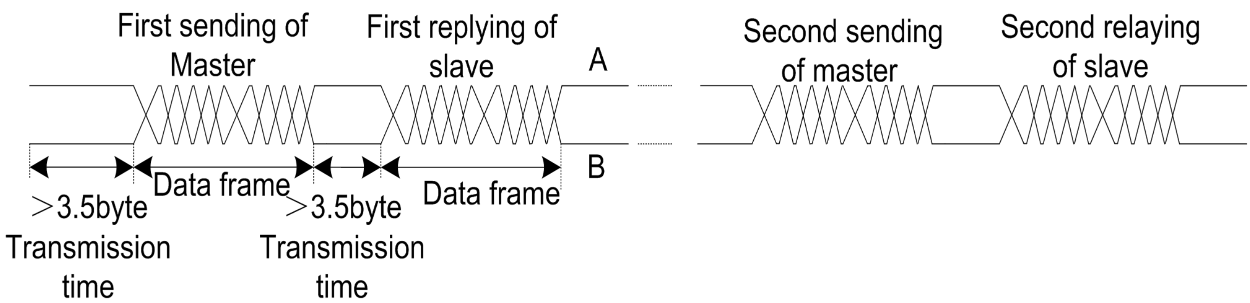
The “485+” and “485-“terminals on frequency inverter are the communication interfaces of Modbus

(2) Topological mode

It is a “Single-master Multi-slave” system. In this network, every communication machine has a unique slave address. One of them is as “master” (usually PC host machine, PLC and HMI, etc.), actively sends out the communication, to read or write the parameters of slave. Other machines will be used as slave and response to the inquiry/command from master. At one time only one machine can send the data and other machines are in the receiving status. The setup range of slave address is 0 to 247. Zero refers to broadcast communication address. The address of slave must is exclusive in the network.

(3) Transmission mode

There provide asynchronous series and half-duplex transmission mode. In the series asynchronous communication, the data is sent out frame by frame in the form of message. According to the Modbus-RTU protocol, when the free time of no transmission in communication data lines is more than the transmission time of 3.5byte, it indicates that a new start of communication frame.

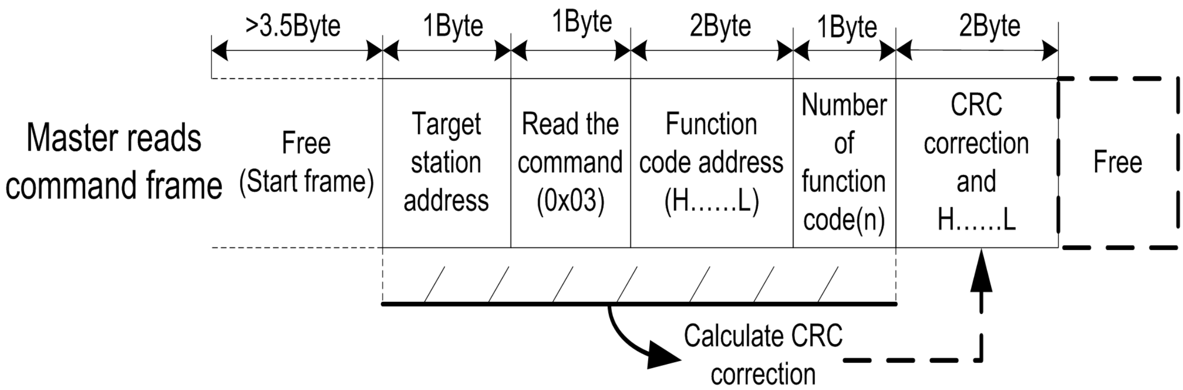


The series inverter has built-in the Modbus-RTU communication protocol, and is applicable to response the slave “Inquiry/command” or doing the action according to the master’s “Inquiry / Command” and response to the data.

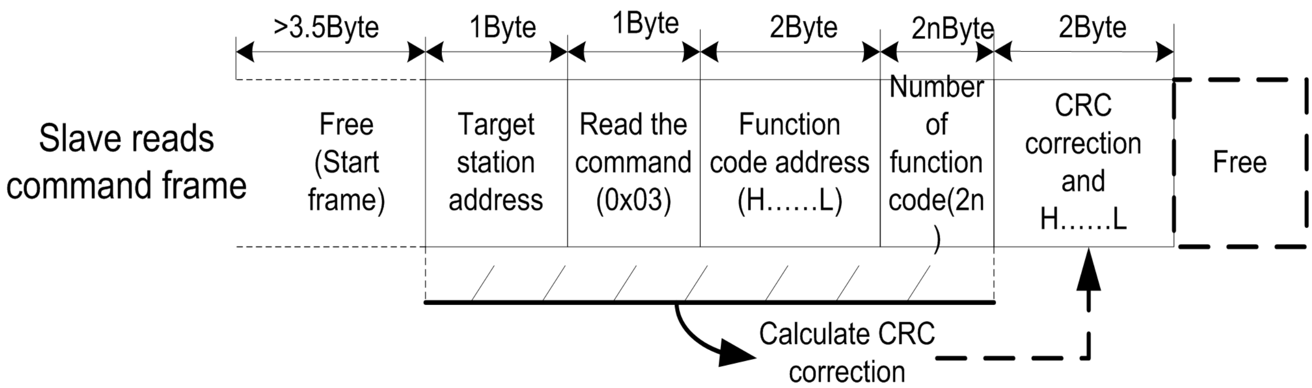
Here, master is personnel computer (PC), industrial machine or programmable logical controller (PLC), and the slave is inverter. Master not only visits some slave, but also sends the broadcast information to all the slaves. For the single master "Inquiry/Command", all of slaves will return a signal that is a response; for the broadcast information provided by master, slave needs not feedback a response to master machine.

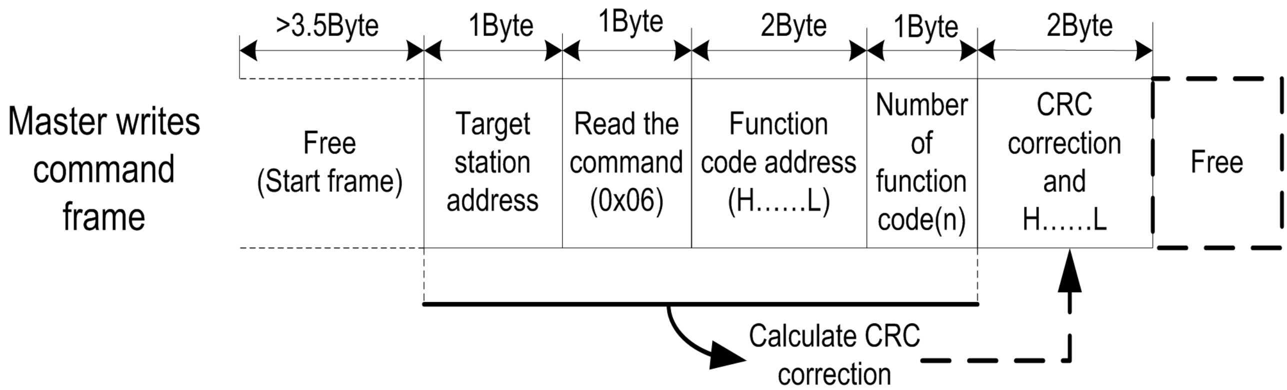
Communication data structure

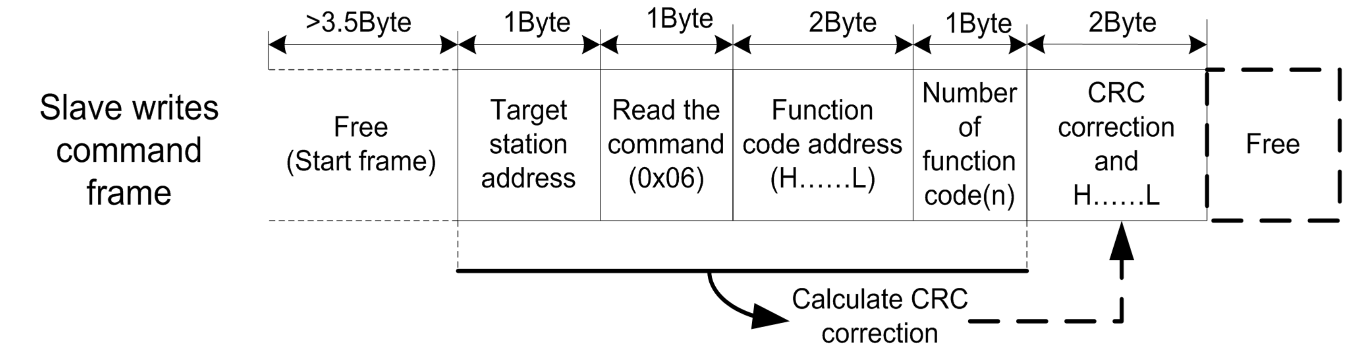
Modbus protocol communication data format of the series inverter is shown as following. The inverter only support the reading and writing of Word type parameters, the corresponding reading operation command is "0x03", the writing operation command is "0x06". The writing and reading operation of byte or bit is not supported.



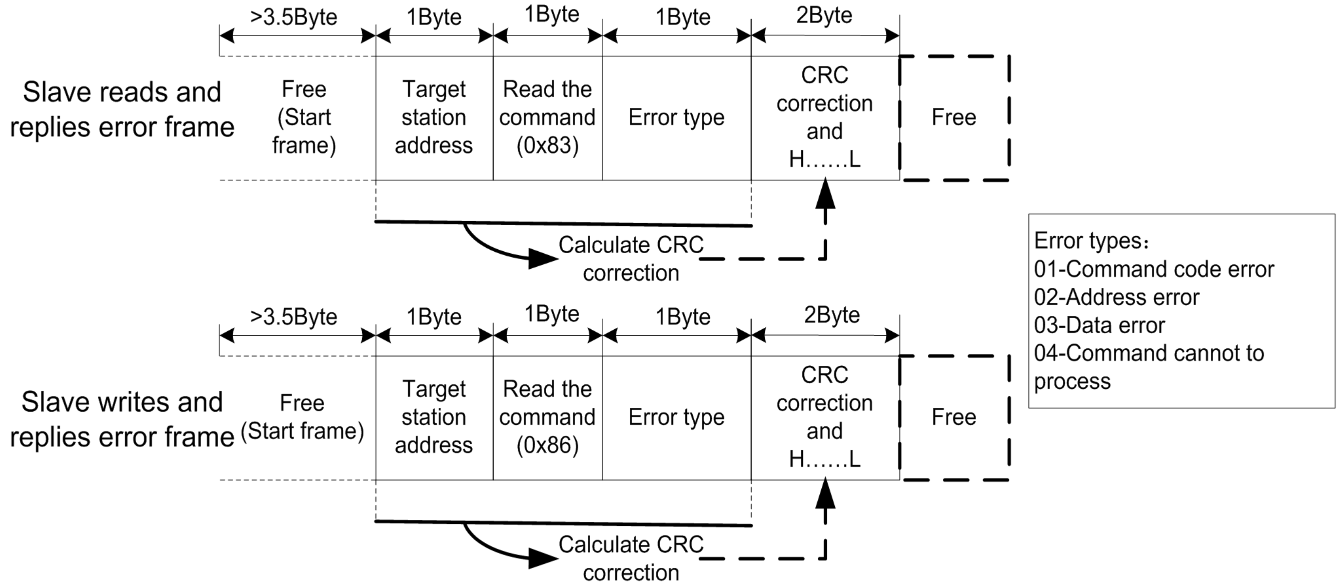
In theory, the host computer can continuously read several function codes once (that is, the maximum value of "n" is 12), but note that not to jump across the last function code in this function group to avoid the wrong reply.







If the wrong communication frame was detected by the salve or other reasons caused the failure of reading and writing, the wrong frame will be replied.



RTU frame format:

Frame header (START)	Greater than the 3.5-byte transmission idle time
Slave address(ADR)	Communication address:1 to 247(0: broadcast address)
Command code(CMD)	03: Read slave parameters 06: Write slave parameters
Function code address(H)	It is the internal parameter address of the inverter, expressed in hexadecimal format. The parameters include functional parameters and non-functional parameters (running status and running command). During transmission, low-order bytes follow the high-order bytes.
Function code address(L)	
Number of function code(H)	It is the number of function codes read by this frame. If it is 1, it indicates that one function code is read. During transmission, low bytes follow high bytes. In the present protocol, only one function code is read once, and this field is unavailable.
Number of function code(L)	
Data(H)	It is the response data or data to be written. During transmission, low-order bytes follow the high-order bytes.
Data(L)	
END	It is 3.5-byte transmission time.

CRC Checking

In RTU mode, messages include an error-checking field that is based on a CRC method. The CRC field checks the contents of the entire message. The CRC field is two bytes, containing a16-bit binary value. The CRC value is calculated by the transmitting device, which appends the CRC to the message. The receiving device recalculates a CRC during receipt of the message, and compares the calculated value to the actual value it received in the CRC field.

If the two values are not equal, that means transmission is error

The CRC is started by 0xFFFF.Then a process begins of applying successive eight-bit bytes of the message to the current contents of the register. Only the eight bits of data in each character are used for generating the CRC. Start and stop bits, and the parity bit, do not apply to the CRC. During generation of the CRC, each eight-bit character is exclusive Oared with the register contents. Then the result is shifted in the direction of the least significant bit (LSB), with a zero filled into the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB was a 1, the register is then exclusive Oared with a preset, fixed value. If the LSB was a 0, no exclusive OR takes place. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next eight-bit byte is exclusive Oared with the register's current value, and the process repeats for eight more shifts as described above. The final contents of the register, after all the bytes of the message have been applied, is the CRC value.

When the CRC is appended to the message, the low-order byte is appended first, followed by the high-order byte. Unsigned int crc_chk_value (unsigned char *data_value, unsigned char length

```
{
        unsigned int crc_value=0xFFFF;
        int i;
        while(length--)
        {
            crc_value^=*data_value++;
            for(i=0;i<8;i++)
            {
                if (crc_value&0x0001)
                {
                    crc_value=(crc_value>>1)^0xa001;
                }
                else
                {
                crc_value=crc_value>>1;
                }
            }
        }
        return (crc_value);
        }
```

Definition of communication parameter address

Read and write function-code parameters (Some functional code is not changed, only for the manufacturer use.)

The group number and mark of function code is the parameter address for indicating the rules.

High level bytes: P0~PF (Group P), A0-AF (Group A), 70-7F (Group U)

Low level bytes: 00 to FF

For example, to read parameter P3-12, communication address of P3-12 is expressed as 0xF30C.

Note:

Some parameters cannot be changed during operation, some parameters regardless of what kind of state the inverter in, the parameters cannot be changed. Change the function code parameters, pay attention to the scope of the parameters, units, and relative instructions.

Function code group	Communication inquiry address	Inquiry address When Communication modifies RAM
P0～PF	0xF000～0xFFFF	0x0000～0x0FFF
A0～AF	0xA000～0xAFFF	0x4000～0x4CFF
U0 Group	0x 7000～0x 70FF	

Besides, due to EEPROM be frequently stored, it will reduce the lifetime of EEPROM. In the communication mode, and some function codes don't have to be stored as long as change the RAM value.

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

If it is a group A parameter, to achieve this function, just change the high bit A of the function code address to 4; the corresponding function code address is expressed as follows: high byte: 00~0F (P group), 40~4F (Group A) Low byte: 00~FF

For example, the function code P3-12 is not stored in the EEPROM, the address is expressed as 0x030C; the function code A0-05 is not stored in the EEPROM, the address is represented as 0x4005; the address indicates that only the RAM can be written, the read operation cannot be performed, read When it is an invalid address. For all parameters, you can also use command code 07 to implement this function.

Parameter address	Parameter description	Parameter address	Parameter description
1000H	Communication set value(-10000 ~ 10000)(Decimal)	1011H	PID feedback
1001H	Running frequency	1012H	PLC process
1002H	DC Bus voltage	1013H	Pulse input frequency, unit: 0.01KHz
1003H	Output voltage	1014H	Feedback speed
1004H	Output current	1015H	Remaining running time
1005H	Output power	1016H	Voltage before AI1 correction
1006H	Output torque	1017H	Voltage before AI2 correction
1007H	Running speed	1018H	Voltage before AI3 correction
1008H	X input terminal	1019H	Linear speed
1009H	DO output terminal	101AH	Present power-on time
100AH	AI1 voltage	101BH	Present running time
100BH	AI2 voltage	101CH	Pulse input frequency, unit:1Hz
100CH	AI3 voltage	101DH	Communication setting value
100DH	Counting value input	101EH	Actual feedback speed
100EH	Length value input	101FH	Main frequency X display
100FH	Load speed	1020H	Auxiliary frequency Y display
1010H	PID setting		
Note	✧ Communication setting value indicates percentage: 10000 corresponds to 100.00%, and -10000 corresponds to -100.00%. ✧ With regard to frequency, communication reference is a percentage of P0-10 (maximum frequency). ✧ With regard to torque, communication reference is a percentage of P2-10		

	and A2-48 (corresponding to motor 1 and motor 2, respectively).

Stop/start parameter

Note:

Communication setting value is the percentage of relative value, 10000 corresponds to 100%, -10000 correspond to -100.00%.

Control command input frequency inverter: (write in only)

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

Read inverter status: (read only)

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

Parameter locking password collation: (If the feedback is the 8888H, it indicates the password collation passed)

Password address	Contents of input password
1F00H	*****

Digital output terminal control: (write in only)

Address Of locking password command	Contents of locking password command
2001H	BIT0: DO1 output control BIT1: DO2 output control BIT2: Relay 1 output control BIT3: Relay 2 output control BIT4: FMR output control BIT5:VDO1 BIT6:VDO2 BIT7:VDO3 BIT8:VDO4

Analog output AO1 control: (write in only)

Command word address	Command function
2002H	0~7FFF indicates 0%~100%

Analog output AO2 control: (write in only)

Command word address	Command function
2003H	0~7FFF indicates 0%~100%

Pulse output control: (write in only)

Command word address	Command function
2004H	0~7FFF indicates 0%~100%

Inverter fault description:

Inverter fault description	Inverter fault information	
8000H	0000: No fault	0015: EEPROM read-write in fault
	0001: Reserved	0016: Frequency inverter hardware fault
	0002: Acceleration over current	0017: Short circuit to ground fault
	0003: Deceleration over current	0018: Reversed
	0004: Constant speed over current	0019: Reversed
	0005: Acceleration over voltage	001A: Accumulative running time reached
	0006: Deceleration over voltage	001B: User-defined fault 1
	0007: Constant speed over voltage	001C: User-defined fault 2
	0008: Buffer resistor fault	001D: Accumulative power-on time reached
	0009: Under-voltage fault	001E: Off load
	000A: Frequency inverter overload	001F: PID lost during running
	000B: Motor overload	0028: Fast current limit fault
	000C: Input phase failure	0029: Motor switchover fault during running
	000D: Output phase failure	002A: Too large speed deviation
	000E: IGBT overheat	002B: Motor over-speed
	000F: External equipment fault	002D: Motor overheat
	0010: Communication fault	005A: Encode lines setting fault
	0011: Contactor fault	005B: Not connect to the encoder
	0012: Current detection fault	005C: Initial location fault
	0013: Motor auto-tuning fault	005E: Speed feedback fault
	0014: Encoder/PG fault	

A.4 Communication parameters

Pd-00	Baud ratio	Default	5005
	Setting range	Unit's digit：MODUBS	
		0：300BPS	5：9600BPS
		1：600BPS	6：19200BPS
		2：1200BPS	7：38400BPS
		3：2400BPS	8：57600BPS
		4：4800BPS	9：115200BPS

This parameter is used to set the data transfer rate from host computer and the frequency inverter. Please note that baud ratio of the host computer and the inverter should be consistent. Otherwise, the communication is impossible. The higher the baud ratio is, the faster the communication is.

Pd-01	Modbus data format	Default	0
	Setting Range	0: No check, data format <8,N,2> 1: Even parity check, data format<8,E,1> 2: Odd Parity check, data format<8,O,1> 3: No check, data format <8,N,1> Valid for Modbus	

The host computer and frequency inverter setup data format must be consistent, otherwise, communication is impossible.

Pd-02	Broadcast address	Default	1
	Setting Range	1~247，0 is broadcast address	

When the local address is set to 0, that is, broadcast address, it can realize the broadcast function of host computer.

Pd-03	Modbus response delay time	Default	2ms
	Setting Range	0~20ms	

After the data is finished, wait until the response delay time expires before sending data to the host computer.。

Pd-04	Communication timeout	Default	0.0 s
	Setting Range	0.0 s（Invalid） 0.1~60.0s	

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

When the function code is set to time value, if the interval time between the communication and the next communication is beyond the communication timeout, the system will report communication failure error (Err16). At normal circumstances, it will be set as invalid. If in the continuous communication system, set this parameter, you can monitor the communication status.

Pd-05	Communication protocol selection	default	31
	Setting Range	Ones place：MODUBS 0: Non-standard Modbus protocol 1: standard Modbus protocol	

Pd-05=31：Choose the standard Modbus protocol.

Pd-05=30：When reading a command, the slave returns one byte more than the standard Modbus protocol.

Pd-06	Communication read current resolution	Default	0
	Setting range	0：0.01A 1：0.1A	

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

Appendix B　Brake resistor selection

During the running process of the inverter, if the speed of the controlled motor drops too fast, or the motor load shakes too fast, its electromotive force will reverse the internal capacitance of the inverter through the inverter, so that the voltage across the power module is pumped up, which is easy. Damage to the inverter. The internal control of the inverter will suppress this situation according to the load situation. When the braking performance does not meet the customer's requirements, an external braking resistor is needed to achieve timely release of energy.

The external braking resistor belongs to the energy-consuming braking mode, and its energy will be completely dissipated in the power braking resistor. Therefore, the power of the braking resistor and the choice of resistance must be reasonable and effective. The following are the recommended braking resistor power and resistance values for this drive. According to the load, the user can change the value appropriately, but it cannot be less than the minimum required by the inverter.

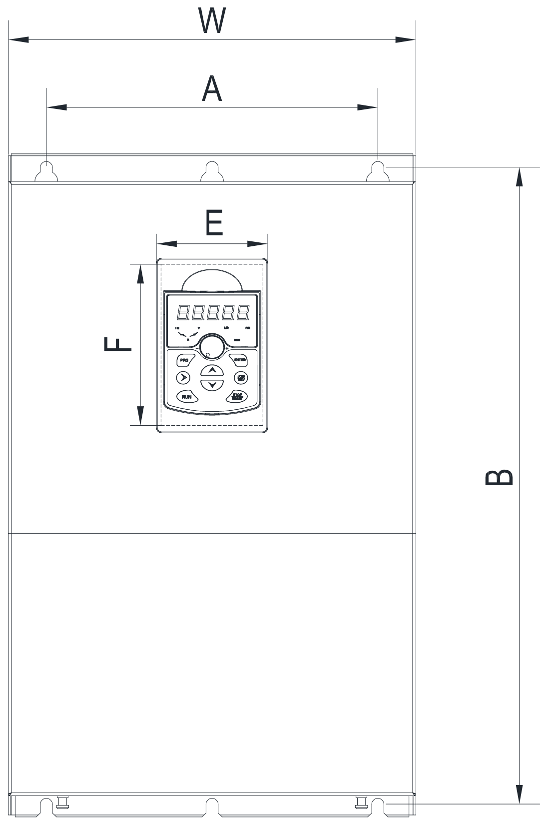
Inverter power	Braking Unit	Recommended resistance value	Minimum resistance	Number
0. 75KW-220V	Built-in (standard)	80W	≥ 80Ω	1
1. 5KW-220V		200W	≥ 55Ω	1
2. 2KW-220V		200W	≥ 35Ω	1
3. 7KW-220V		300W	≥ 25Ω	1

Inverter power	Braking Unit	Recommended resistance value	Minimum resistance	Number
0. 75KW-380V	Built-in (standard)	150W	≥ 300Ω	1
1. 5KW-380V		150W	≥ 220Ω	1
2. 2KW-380V		250W	≥ 200Ω	1
3. 7KW-380V		400W	≥ 130Ω	1
5. 5KW-380V		500W	≥ 90Ω	1
7. 5KW-380V		800W	≥ 65Ω	1
11KW-380V		1KW	≥ 43Ω	1
15KW-380V		1. 3KW	≥ 32Ω	1
18. 5KW-380V		1. 5KW	≥ 25Ω	1
22KW-380V		1. 5KW	≥ 22Ω	1
30KW-380V	External	2. 5KW	≥ 16Ω	1
37KW-380V		3. 7kW	≥ 12. 6Ω	1
45KW-380V		4. 5kW	≥ 9. 4Ω	1
55KW-380V		5. 5kW	≥ 9. 4Ω	1
75KW-380V		7. 5kW	≥ 6. 3Ω	1
90KW-380V		4. 5kW	≥ 9. 4Ω	2
110KW-380V		5. 5kW	≥ 9. 4Ω	2
132KW-380V		6. 5kW	≥ 6. 3Ω	2
160KW-380V		16kW	≥ 6. 3Ω	2
185KW-380V		20kW	≥ 2. 5Ω	1
200KW-380V		20kW	≥ 2. 5Ω	1
220KW-380V		22kW	≥ 2. 5Ω	1
250KW-380V		12. 5kW	≥ 2. 5Ω	2
280KW-380V		14kW	≥ 2. 5Ω	2
315KW-380V		16kW	≥ 2. 5Ω	2
350KW-380V		17kW	≥ 2. 5Ω	2
400KW-380V		14kW	≥ 2. 5Ω	3
450KW-380V		15kW	≥ 2. 5Ω	3
500KW-380V		17kW	≥ 2. 5Ω	3

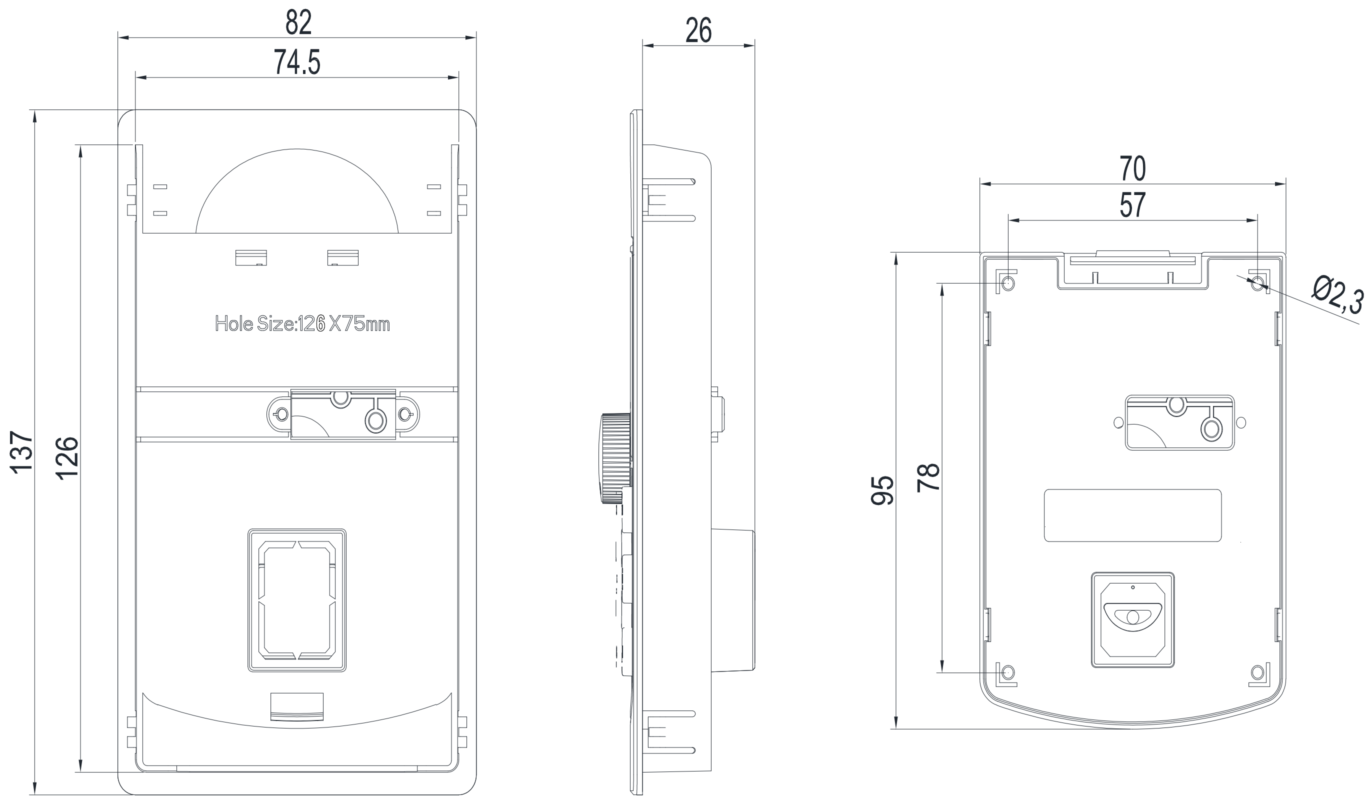
Note：When the braking resistor is working, the surface has high voltage and high temperature. Please consider the safety and flammability of the surrounding environment when installing.

Appendix C　Appearance dimensions and installation dimensions

Overall dimensions and mounting whole dimensions of the inverter



Overall dimensions and mounting whole dimensions of the Keypad base and the Operating keyboard



※: Keypad base mounting hole size: width E=74.5 mm; Long F = 126 mm

<table>
<tr><th colspan="2" rowspan="2">Model</th><th colspan="2">Installation dimension</th><th colspan="3">Appearance dimension</th><th rowspan="2">Mounting screw (mm)</th></tr>
<tr><th>A(mm)</th><th>B(mm)</th><th>H(mm)</th><th>W(mm)</th><th>D(mm)</th></tr>
<tr><td colspan="2">0.75G/1.5P-T4</td><td rowspan="4">107</td><td rowspan="4">175</td><td rowspan="4">185</td><td rowspan="4">118</td><td rowspan="4">167</td><td rowspan="4">Φ4.5</td></tr>
<tr><td colspan="2">1.5G/2.2P-T4</td></tr>
<tr><td colspan="2">2.2G/3.7P-T4</td></tr>
<tr><td colspan="2">3.7G/5.5P-T4</td></tr>
<tr><td colspan="2">5.5G/7.5P-T4</td><td>107</td><td>175</td><td>185</td><td>118</td><td>187</td><td>Φ4.5</td></tr>
<tr><td colspan="2">7.5G/11P-T4</td><td rowspan="2">148</td><td rowspan="2">235</td><td rowspan="2">247</td><td rowspan="2">160</td><td rowspan="2">190</td><td rowspan="2">Φ5.5</td></tr>
<tr><td colspan="2">11G/15P-T4</td></tr>
<tr><td colspan="2">15G/18.5P-T4</td><td rowspan="3">205</td><td rowspan="3">305</td><td rowspan="3">320</td><td rowspan="3">220</td><td rowspan="3">205</td><td rowspan="3">Φ5.5</td></tr>
<tr><td colspan="2">18.5G/22P-T4</td></tr>
<tr><td colspan="2">22G/30P-T4</td></tr>
<tr><td colspan="2">30G/37P-T4</td><td rowspan="2">180</td><td rowspan="2">416</td><td rowspan="2">432</td><td rowspan="2">255</td><td rowspan="2">234.5</td><td rowspan="2">Φ7</td></tr>
<tr><td colspan="2">37G/45P-T4</td></tr>
<tr><td colspan="2">45G/55P-T4</td><td rowspan="2">244</td><td rowspan="2">497</td><td rowspan="2">518</td><td rowspan="2">300</td><td rowspan="2">260</td><td rowspan="2">Φ9</td></tr>
<tr><td colspan="2">55G/75P-T4</td></tr>
<tr><td colspan="2">75G/90P-T4</td><td rowspan="3">300</td><td rowspan="3">598</td><td rowspan="3">620</td><td rowspan="3">390</td><td rowspan="3">300</td><td rowspan="3">Φ11</td></tr>
<tr><td colspan="2">90G/110P-T4</td></tr>
<tr><td colspan="2">110G/132P-T4</td></tr>
<tr><td colspan="2">132G/160P-T4</td><td rowspan="2">350</td><td rowspan="2">745</td><td rowspan="2">780</td><td rowspan="2">480</td><td rowspan="2">360</td><td rowspan="2">Φ12</td></tr>
<tr><td colspan="2">160G/185P-T4</td></tr>
<tr><td>185G/200P-T4</td><td rowspan="2">Hanging</td><td rowspan="2">400</td><td rowspan="2">830</td><td rowspan="2">855</td><td rowspan="2">500</td><td rowspan="2">360</td><td rowspan="2">Φ12</td></tr>
<tr><td>200G/220P-T4</td></tr>
<tr><td>185G/200P-T4</td><td rowspan="2">Cabinet type</td><td rowspan="2">/</td><td rowspan="2">/</td><td rowspan="2">1138.4</td><td rowspan="2">500</td><td rowspan="2">360</td><td rowspan="2">/</td></tr>
<tr><td>200G/220P-T4</td></tr>
<tr><td>220G/250P-T4</td><td rowspan="4">Hanging</td><td rowspan="4">480</td><td rowspan="4">942</td><td rowspan="4">970</td><td rowspan="4">650</td><td rowspan="4">418</td><td rowspan="4">Φ13</td></tr>
<tr><td>250G/280P-T4</td></tr>
<tr><td>280G/315P-T4</td></tr>
<tr><td>315G/350P-T4</td></tr>
<tr><td>220G/250P-T4</td><td rowspan="4">Cabinet type</td><td rowspan="4">/</td><td rowspan="4">/</td><td rowspan="4">1320</td><td rowspan="4">650</td><td rowspan="4">418</td><td rowspan="4">/</td></tr>
<tr><td>250G/280P-T4</td></tr>
<tr><td>280G/315P-T4</td></tr>
<tr><td>315G/350P-T4</td></tr>
<tr><td>350G/400P-T4</td><td rowspan="4">Cabinet type</td><td rowspan="4">/</td><td rowspan="4">/</td><td rowspan="4">1720.4</td><td rowspan="4">800</td><td rowspan="4">490</td><td rowspan="4">/</td></tr>
<tr><td>400G/450P-T4</td></tr>
<tr><td>450G/500P-T4</td></tr>
<tr><td>500G-T4</td></tr>
</table>

※:Due to the continuous improvement of the products, the information provided by the company is subject to change, please refer to the actual product, and request the latest installation size from our customer service.