Preface

Thank you for using this series inverters.

This series of inverters adopt the most advanced current vector control technology that features low speed rated torque output and ultra-quiet stable running. They are characterized by diverse control modes, up to 36 perfect protection and alarm functions, on-line monitoring and on-line adjustment of a variety of parameters, built-in RS-485 communication interface, flexible operation, and thus satisfy various needs of users.

This series of inverters apply to asynchronous motor (A6 series) and synchronous motor (A6T series), including paper making, textile, food, cement, printing and dyeing, plastic machinery, and other industries. As speed controllers, this series of inverters possesses good adaptability of load, running stability, high precision and good reliability. They can improve the power factor and efficiency, and be used as a power-efficient application.

If you have some problems that can't be solved in operation, please contact the nearest local agents, or contact our company directly.

To ensure the perfect use of this product and the safety of users, please read the user manual carefully before the operation of inverter and keep the manual in proper place for future reference.

The information contained in this manual is subject to change without notice.

Before mounting, commissioning and using the inverter, it is strongly suggested that you must read the safety rules and warnings listed in this book and cautions marked on the inverter to ensure your safety and extending the service life of this equipment. When in operation, pay attention to the situation of load and all notes that related to safety.

Note:

The inverters, drivers, AC drives, and variable frequency drives mentioned in the subsequent descriptions of this manual refer to variable frequency drives (VFD).

	**Danger!**
	◆ This equipment contains dangerous voltage.Operations not accordant with this manual might cause life risk and human injury.Only qualified personnel shall wire the drive.
	◆ Please cut off the power before wiring and inspecting.It is not permissible to touch PCB or interior components before battery control lamp goes off or until 5 minutes after the power has been removed.It is necessary to use meters to confirm the charging capAI3tor has discharged off.Otherwise,a risk of electric shock may happen.
	◆ Don't connect AC power source to the output terminals U,V,W of the inverter.When using the inverter,the earthing terminal of the inverter must be grounded correctly and reliably according to IEC electrical safety regulation.
	**Warning!**
	◆ Unauthorized change of inner wiring and using accessories sold or recommended by unqualified manufacturer may cause fire,electric shock and injury.
	◆ Since body static electricity may cause serious damage to MOS field-effect transistor and other sensitive elements.Please don't touch the interior devices,such as PCB,IGBT module etc.before any measure is taken to prevent static electricity.
	**Caution!**
	◆ Keep all marks and labels are clear to read.Replace the lost or worn mark at any moment.
	◆ Please keep the user manual near the inverter that can be reached easily and give this manual to the users who use the product.

Contents

Chapter 1 Purchase Inspection

1.1 Unpacking Inspection

All inverters have passed the strict tests before delivery. After unpacking, please check if the product is damaged by careless transport, whether the product specification and model are complied with the order, and if it has a quality check passed mark. If there is any problem, please contact the supplier.

Some machine models have the suffix with the character"-N". This is manufacturer information. This character is omitted in this manual. The complete model name of the machine is subject to the machine nameplate.

1.2 Naming Rule

The naming rule of the product is as following:

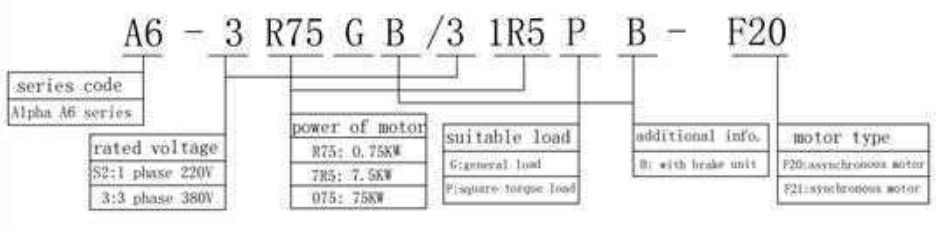


Fig.1-1 Model code

Chapter 2 Installation and Wiring

2.1 Mounting Place Requirements and Management

Attention

·Don't carry the inverter by its cover.The cover cannot support the weight of the inverter and the inverter may drop.

·Please install the inverter on a strong support,failing which the inverter may fall off.

·Don't install the inverter in places where water pipes may leak onto it.

·Don't allow screws,washers and other metal foreign matters to fall inside the inverter,otherwise there is a danger of fire or damage.

·Don't operate the inverter if parts are not complete,otherwise there is a danger of fire or human injury.

·Don't install the inverter under direct sunshine;otherwise,it may be damaged.

·Don't short circuit PB,+and-,otherwise there is a danger of fire or the inverter may be damaged.

·Cable lugs must be connected to main terminals firmly.

·Don't apply supply voltage(AC 220V)to control terminals except terminals TA,TB,TC.

Please mount the inverter as following instructions and maintain appropriate conditions.

2.1.1 Installation Location

The installation location should meet the following conditions:

- Good indoor ventilation；
- Ambient temperature-10℃～40℃.If the ambient temperature exceeds 40℃,external forced heat dissipation or derating is required;
- Humidity should be lower than 95%, no condensing and rain water drops.
- Do not mount the inverter on the timber or other combustible matters.
- Avoid direct sunlight.
- It is strictly forbidden to install in places with flammable, explosive, corrosive gas or liquid
- Mount in the location free of dust, metal powder, corrosive gas or combustible

gas.

- The installation foundation should be solid and free of vibration.
- No electromagnetic interference,away from source of interference.
- When the altitude exceeds 1000m,the heat dissipation effect is poor due to the thin air.Please derate and use it.The rated output decreases by 6%for every 1000m of altitude.

2.1.2 Ambient Temperature

In order to enhance operating reliability of the inverter,be sure where the inverter mounted has a good ventilation;when the inverter is used in a closed case,cooling fans or an air-conditioning must be installed to keep the ambient temperature below 40℃

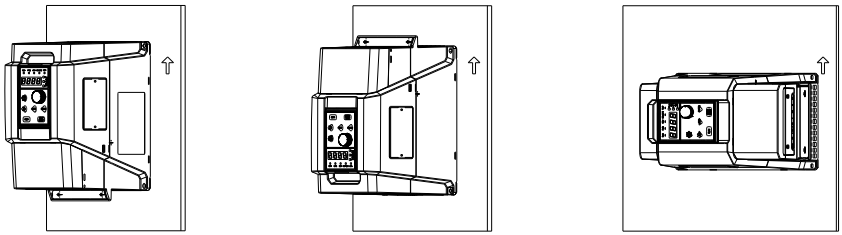
2.1.3 Preventive Measures

During installing,please set a shield to prevent metal debris falling into it,and remove the shield after installing.

Please remove the protection cover board when the ambient temperature is over 40°C or the internal temperature is too high due to other reasons.Otherwise the inverter should be derated.After removing the protection cover,pay attention to avoid small parts falling into the inverter.
If you need to install a dust cover,the machine needs to be derated.

2.2 Installation Direction and Space

Inverters of this series are all equipped fans for forced cooling. In order to be an effective cooling cycle, the inverter must be mounted in the vertical direction, up, down, left and right away from adjacent articles or baffle(wall)maintain adequate space, as Fig.2-1,2-2:



Correct direction Wrong direction(1)(upside down) Wrong direction(2)(transverse)

Fig.2-1 Installation Direction Requirement

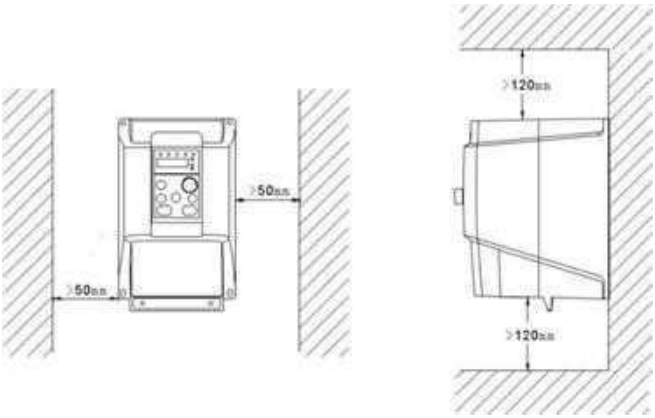


Fig.2-2 Installation Direction and Space

2.3 Main Circuit Wiring

2.3.1 The Main Circuit Terminals Arrangement and Wiring

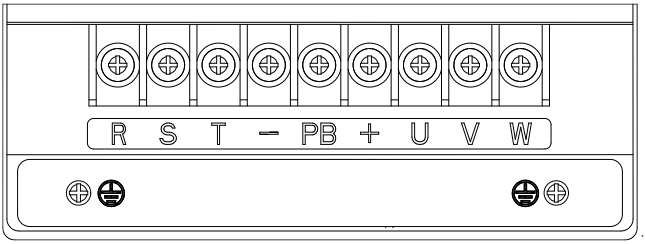


Fig.2-3 Main circuit terminal wiring diagram I

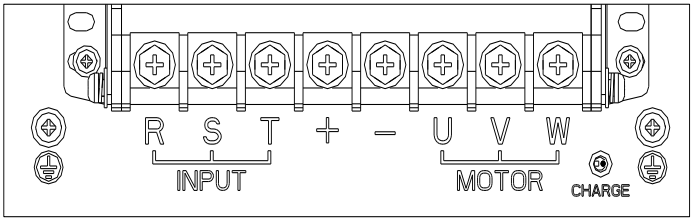


Fig.2-4 Main circuit terminal wiring diagram II

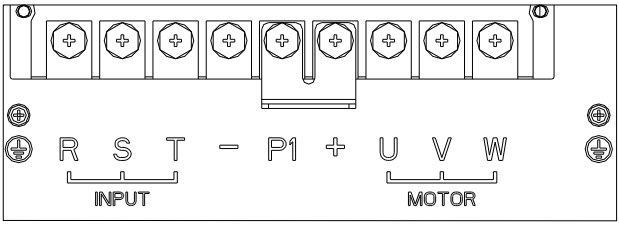


Fig.2-5 Main circuit terminal wiring diagram III

Table 2-1 Description of terminals of main circuit

Terminal symbol	Terminal name and function
L,N/ R,S,T	Single-phase AC 220V input terminals or Three-phase AC 380V input terminals
+,PB	Terminals for an external braking resistor
+,P1	External DC reactor terminal,directly short circuited when not connected to DC reactor
-	DC negative bus output terminal
U,V,W	Three-phase AC output terminals
/PE	Protective earth terminals for input power or earthing terminals for motor cable shield and braking resistor cable shield.

2.3.4 Main Circuit Wiring Operation

Do not mistakenly connect the input power cable to the output terminal; otherwise the components in the inverter will be damaged. Output terminals are prohibited to be grounded. The lines should not be collided with the enclosure, or short connected; otherwise the inverter will be damaged.

Earth terminal PE must be grounded.380V class grounding resistance should be 10Ωor less. The earth wire should never share with electric welder or power equipment. The earth wire should be of conductor diameter specified in the technical standard for electrical equipment, and should be as close to the ground point as possible. On occasions using more than two inverters at the same time, please do not form the earth wire into ring circuit. Proper grounding method and incorrect grounding method are shown in below figure.

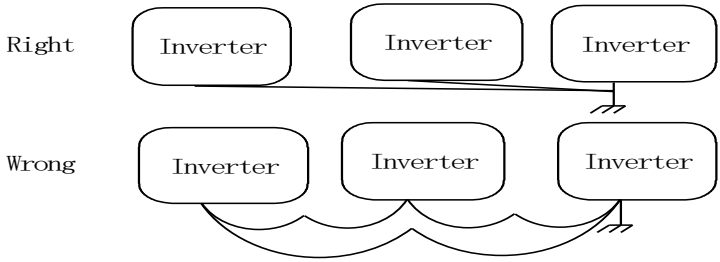


Fig.2-6 Earthing Connection Method

Notes: The neutral point of motor using Y connection can't be connected to earth.
Since the inverter output PWM wave, if a capAI3tor for improving power factor or a lightning varistor is installed on the output side, which would cause tripping or damage to parts, be sure to remove it.
If a contactor or other on-off part is installed between the output and the motor, be sure the on-off operation is done when the inverter has no output, otherwise the inverter would be damaged.

2.4 Control Circuit Connection

2.4.1 Function of Control Circuit Terminals

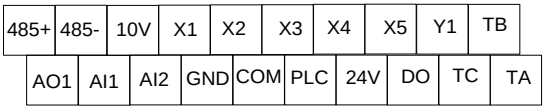


Fig.2-7 Terminal arrangement

In order to reduce interference and attenuation of control signal,the length of control cables should be limited in 50m and away from power cables for more than 30cm.Avoid control wire and power wire being parallel.Try to use STP(Shielded Twisted Pair)to connect analog input and output signal.

Table 2-2 Function of control circuit terminals

Category	Terminal label	Name	Description of terminal function	Specification
Analog input	AI1	Analog input 1	Receive voltage input.	Input voltage range:0~10V(input resistance:30kΩ) Reference ground: GND
	AI2	Analog input 2	Receive voltage/current input. Voltage or current are selected by DIP switch SW7.Voltage input mode is the default mode.	Input voltage range:0~10V(input resistance:30kΩ) Input current range:0~20mA Reference ground: GND

Analog output	AO1	Analog output	Be able to output analog voltage/current. Voltage or current are selected by DIP switch SW2.	Output voltage range:0/2~10V Output current range:0/4~20mA Reference ground: GND
Communication	485+	RS485 communication interface	485 differential signal positive terminal	Standard RS-485 communication interface, Not isolated to GND Please use twisted-pair cable or shielded cable
	485-		485 differential signal negative terminal	
Multi-function input terminal	X1	Multi-function input terminal 1	It can be defined as discrete input terminal through programming.	Optical-isolator input Input resistance: R=3.9kΩ Max input frequency:400Hz/50kHz Input voltage range:0~30V Reference ground: COM
	X2	Multi-function input terminal 2		
	X3	Multi-function input terminal 3		
	X4	Multi-function input terminal 4		
Multi-function input terminal	X5	Multi-function input terminal 5	Terminals X5 can be used as common multi-function terminals(same with X1~X4),it can also be used as high speed pulse input port.	Opto-coupler isolation input Input impedance R=3.9kΩ Maximum input frequency: 50kHz Input voltage range:0~30V Reference ground: COM
Multi-function output	Y1	Open collector output terminal	It can be used as an on-off output terminal. Please refer to Section	Opto-coupler isolated open collector output. Range of operating voltage:0V~26V Maximum output current:50mA Reference ground: COM
	DO	Open collector output terminal	It can be defined as a multi-function output terminal for pulse signal through programming. It can also be used as an on-off output terminal.	Opto-coupler isolated open collector output. Range of operating voltage:0V~26V Maximum output current:50mA Range of Output frequency:0~50kHz Reference ground: COM

Relay output	TA	Relay output	Programmable as a relay output for multiple functions child	TA-TB:NC TA-TC:NO Contact capacity: 250VAC/2A(COSΦ=1.0) 250VAC/1A(COSΦ=0.4) 30VDC/1A
	TB			
	TC			
PLC	Multi-function Input public Common end	Multi-function Input public Common end	The factory is short-circuited with 24V.X terminal supports 24v external supply For power, the SW4 jumper on the right side of the control terminal must be disconnected.	The X terminal supports external 24v power supply.
Power	10V	+10V power supply	Provide+10V power supply externally (Reference ground:GND)	Maximum output current 20 mA Open circuit voltage can be up to 12V
	24V	+24V power supply	Provide+24V power supply externally (Reference ground: COM)	Maximum output current 100mA
Power	GND	+10V Reference GND	Reference GND for analog signal and+10V power supply	Inner Isolated from COM COM for+10V, AI1,AI2,and AO1
	COM	+24V Common GND	Used with other terminals	Isolated from GND
Selection	SW7	AI2 Voltage or current are selected	AI2 voltage and current are selected by DIP switch SW7, Factory default input voltage.	
	SW2	AO1 Voltage or current are selected	AO1 voltage and current are selected by DIP switch SW2, Factory default input voltage.	

2.4.2 Wiring of Control Circuit Terminals

●Wiring of Analog Input Terminals

AI2 terminals accept analog signal input, DIP switch SW7 select the input voltage(0~10V)or the input current(0~20mA).

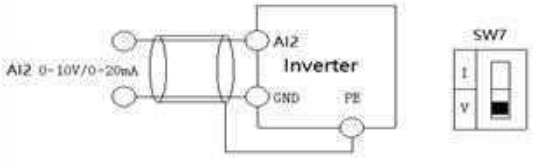


Fig.2-8 Wiring diagram of analog input AI2

●Wiring of Analog Output Terminal

If the analog output terminal AO1 is connected to analog meters,then various kinds of physical values can be indicated.The type of output signal can be selected by the dial switch SW2.

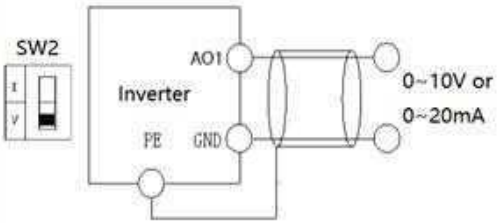


Fig.2-9 Wiring diagram of analog output terminals

Tips

1) Dialing SW to “I” represents current; dialing to “V” represents voltage.
2) Analog input and output signals are easily disturbed by exterior environment, so shielded cables must be used for wiring and the length of the cables should be as short as possible.

●Wiring of Serial Communication Interface

The series of inverters provides users with RS485 serial communication interface, and can compose master-slave control system. The upper computer (a personal computer or PLC controller) can be used for real-time monitoring, Implementation remote control, automatic control and others more complicated operations to inverters in network.

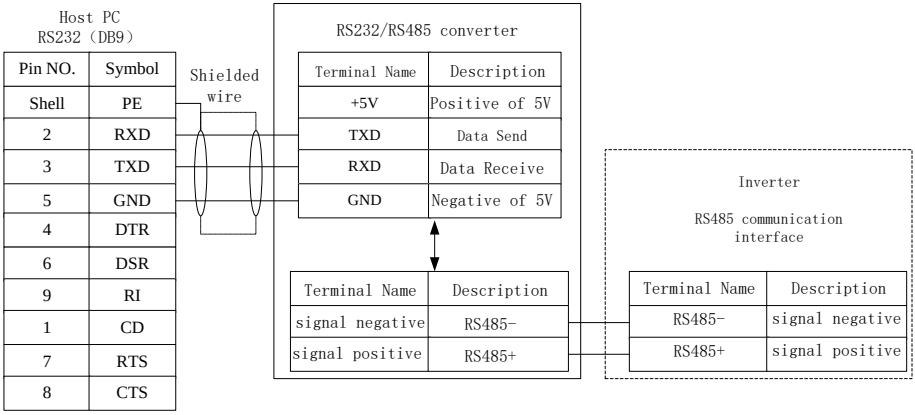


Fig.2-10 Wiring diagram between the upper computer and the inverter

When multiple inverters are connected in one RS485 system, the communication suffers more interference, and a maximum of 31 inverters can be connected through

RS485 serial bus.Wiring is very important.Communication bus must be shielded twisted pair wiring.The following connection method is recommended:

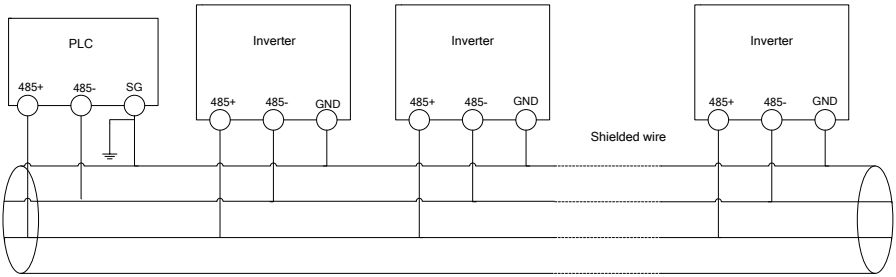


Fig.2-11 Recommended wiring diagrams when PLC is in communication with multiple inverters

The host machine can be a personal computer or PLC controller, and the slave-based machine is this series of inverter. When a PC is used as the host machine, a RS232/RS485 bus adapter should be added between the host machine and the bus; when a PLC controller is used as the host machine, connect the dotted terminals, namely RS485 terminal of slave-based machine and RS485 terminal of the host machine.

●**Multi-Function Input Terminal Wiring**

Dry Contact Way **NPN Transistor Mode**

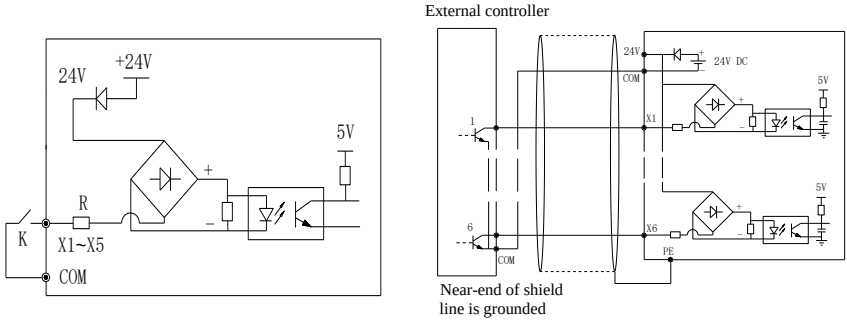


Fig.2-12 Wiring diagram of multi-function input terminals

●Wire Multi-Function Output Terminals

1)Multi-function output terminals Y1 and DO as digital outputs can use the internal 24V power supply of inverter and the wiring method is shown in Fig.2-13.

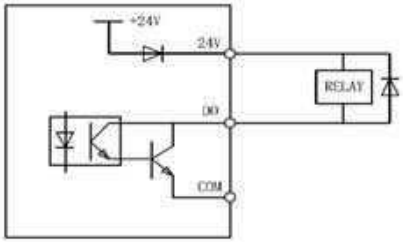


Fig.2-13 Multifunctional digital output wiring method I

2)Multi-function output terminals Y1 and DO as digital outputs can also use the external 9~30V power supply and the wiring method is shown in Fig.2-14.

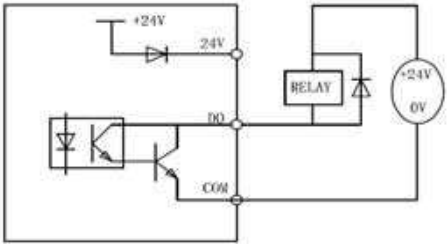


Fig.2-14 Multifunctional digital output wiring method II

- Wiring of Relay Output Terminals TA,TB,TC

  To drive inductive loads(e.g. electromagnetic relays, contactors),it is suggested to add surge voltage absorption circuit, such as the RC absorption circuit, varistor or freewheeling diode(pay attention to the diode polarity when used for DC electromagnetic circuit),etc. Components of absorption circuit should be installed close to both ends of coil of relay or contactor.

Tips

1. Don’t short circuit terminals 24V and COM, otherwise the control board may be damaged.
2. Please use multi-core shielded cable or multi-stranded cable(above 1 mm)to connect the control terminals.
3. When using a shielded cable, the shielded lay’s end that is nearer to the inverter should be connected to PE.
4. The control cables should be as far away(at least 30 cm)from the main circuit and high-voltage cables as possible(including power supply cables, motor cables, relay cables and cables of contactor).The cables should be vertical to each other to reduce the disturbance to minimum.

   Keypad connection interface on the control board adopts RJ-45 fool-proof ports. The control board and key board are connected by RJ-45 plug under default condition. Users can customize extended keypad cable according to actual needs. But the keypad extension cable shall not exceed 1 m, because when it exceeds 1 m, normal work cannot be guaranteed.

   The cables connecting keypad and control board use standard Cat-5e network cable.RJ-45 Interface uses direct connection, namely both sides are connected according to EIA/TIA568B standard. Users can make keypad connection cable by themselves.

2.5 Wiring of Inverter for Basic Operation

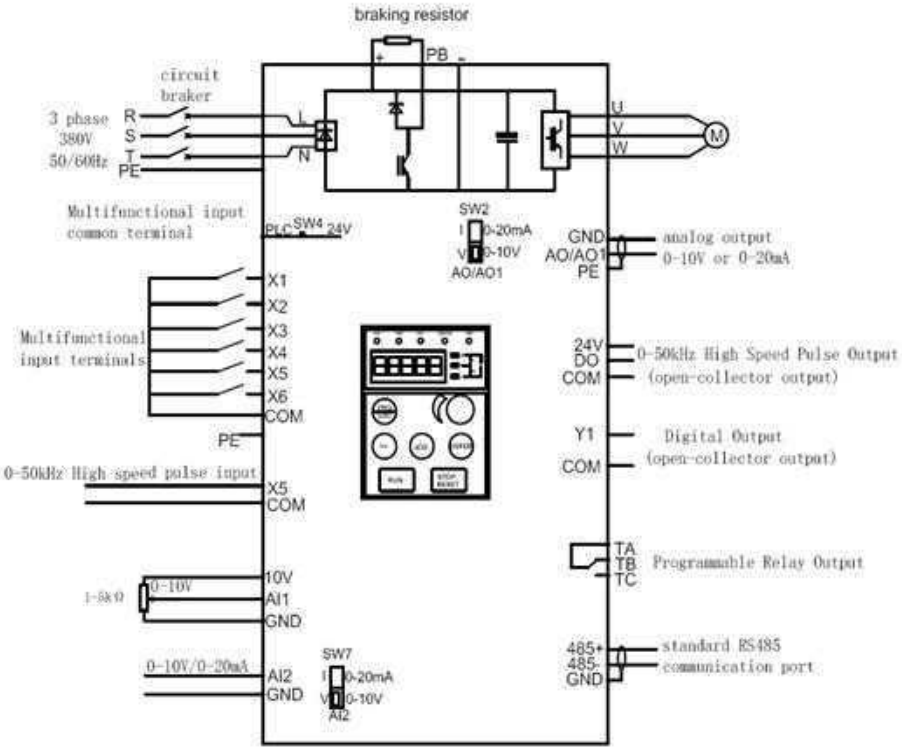


Fig.2-15 wiring diagram

2.6 Wiring Attentions

- Be sure the input power supply of the inverter is cut off then you can remove or replace the motor.
- Be sure the inverter has stopped output then you can switch the motor or switch to mains power supply.
- If a peripheral(brake unit, reactor and filter)is added, test the insulation resistance of the peripheral to earth first and be sure the value not below 4 MΩ.
- Besides shielding the input signal cable and the cable of frequency meter, the cables should be disposed solely, not parallel with the main circuit cable, and far away from it as possible.
- In order to avoid error action caused by interference, the control circuit cable should use stranding shielded cables, and the wiring distance should be less than 50 meters.

- Be sure the shielded layers of shielded cables are not touching other signal cables or shell of equipment, you can use insulating tape to enswathe bare shielding layer.
- The withstand voltage of all the cables should match with the voltage class of the inverter.
- In order to prevent accident, be sure that the control circuit terminal "PE" and the main circuit terminal "PE" are connected to earth, and the earthing cable can’t be shared with other equipment. The size of main circuit earthing cable should be more than one and a half of the main circuit cable. After completion of wiring, please check whether a cable, a bolt or a connector etc.is left inside the inverter, whether the bolts are fastened firmly, and whether the bare cable of terminals short circuit to other terminals.

Chapter 3 Operation

DANGER	1 Only turn on the input power supply after close the front cover.Do not remove the cover while the inverter is powered on.Otherwise there is risk of electric shock. 2 Keep away from the machinery.Otherwise there is risk of injury when the inverter power supply recovers and runs suddenly.
CAUTION	1 When braking resistor is used,the high voltage discharging at its two ends will increase its temperature.Do not touch the braking resistor to avoid danger of electric shock and burn. 2 Before running the inverter,do check again the motor and machinery operating precautions to avoid risk. 3 Do not check signals during operation.It may damage the equipment. 4 All inverter parameters have been preset at the factory.Do not change the settings unless it is required.

3.1 Function and Operation of Keypad

The keypads of the different power rating inverters may have different exterior dimensions. However, all of them have the same array of buttons and LED display. Moreover, operation and function of them are all the same. Every keypad has a LED monitor of 5 digits with 7 segments, buttons, a digital encoder, and LED indicators. User can perform function setting, inverter running, stop, and status monitoring with the keypad.

3.1.1 Keypad Layout

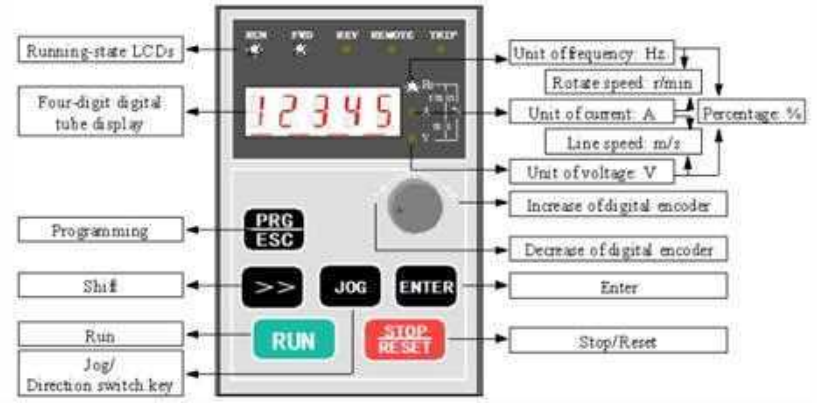


Fig.3-1 Keypad layout and name of each part

The top of the keyboard is the status indicator, the RUN light is on when running, FWD is on when forward rotation, REV is on when reversing, REMOTE light is on when the running command is not controlled by the keyboard, and TRIP light comes on when a fault occurs (see the description of Table 3-2 for details).

In the monitoring state, the digital tube displays the current monitoring content: the fault code is displayed when the fault is displayed; the alarm code is displayed when the alarm is displayed; the PH group is displayed to control the selected monitoring object when it is normal. For the specific correspondence, please refer to the PH group detailed description chapter.

In the programming state, the digital tube displays three levels of menus: function group, function number, and function parameter values. Under the function group display menu, display the function groups"P0"to"PP","A0"to"A6", and C0 groups. Under the function number display menu, display the corresponding function numbers within the group. Under the functional parameter display menu, the parameter values will be displayed.

3.1.2 Description of Button Function

On the inverter keypad, there are seven buttons and one knob. The function of each button is defined as table 3-1.

Table 3-1 Keyboard Key Menu

key	Name of key	Key functions
PRG ESC	Programming /Exit	Enter or exit programming mode. In monitoring mode, press PRG/ESC key to switch to programming mode. First, enter function group, and press ENTER key to enter function code and then function parameters progressively; press PRG/ESC, it will exit from function parameters to function code, then function group, next monitoring state, exit step by step like this; in case of an inverter failure, it can switch failure display and function group. When giving an alarm, switch alarm state and function group.
ENTER	Enter	Enter the sub-menu, or store parameters during parameter setting.
Digital encoder 	Up(clockwise) 	It can increase the function group number, function code number or function code value. In parameter setting mode, LED nixie tube blinking displays modified digit. If turn the knob clockwise, the function code value will increase; in display mode, if the keypad is set to be effective, digital frequency setting, speed PID setting or analog PID digital setting can be increased.

	Down(counterclockwise)	It can reduce the function code group number, function code number or function code value. In parameter setting mode, LED nixie tube blinking displays modified bit. If turn the knob CCW, the function code value will decrease; in display mode, if the keypad is set to be effective, digital frequency setting, speed PID setting or analog PID digital setting can be decreased.
> >	Shift Display switch key	In the editing state, you can select the modification bit of the setting data; In the monitoring state, the display status parameters can be switched.
JOG	Multi-function key	In keyboard mode, press this key to jog, switch the running direction, or switch the command source(related to the definition of PH.01).
RUN	Run	In keypad control mode, it is to run the inverter, and a running command will be given.
STOP RESET	Stop/Reset	In keypad control mode, the key is used to stop the inverter. Clear the failure and return to normal state when there is a failure.

3.1.3 Description of LED Digital Tube and Indicators

On the inverter keypad there are five LED digital tubes,3 unit indicators,5 status indicators. The LED can display the monitoring object, the function parameter values, the fault code, and the warning code. The three unit indicators have eight combinations, and each combination corresponds to one-unit. The combinations and their corresponding units are as Fig.3-2.

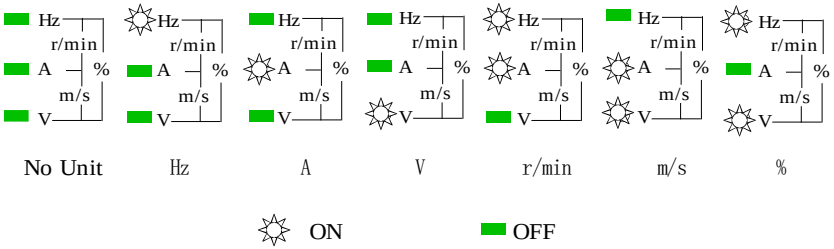


Fig.3-2 Combinations of unit indicator and their means

The five status indicators are just above the LED and the meaning of each indicator is shown in table 3-2.

Note: The forward and reverse indicator light is determined by the internal three-phase wave sequence of the inverter, and it has nothing to do with whether the running direction is finally reversed (P0.09).

Table 3-2 Description of state indicators

Indicator	Display state	The current state of the inverter indicated
RUN Running-state indication	Off	Stop
	On	Running
FWD Forward running direction indication	Off	Reverse rotation or not run
	On	Forward running
	Flicker	Forward rotation start
REV Reverse running direction indication	Off	Forward rotation or not run
	On	Run in reverse
	Flicker	Reverse start
TRIP failure indicator	Off	Normal
	Flicker	Failure
	On	Torque control mode(PD.00=1)
REMOTE indicator (Exclusive for control keypad)	Off	Keypad control state
	On	Terminal control state
	Flicker	Serial communication state

3.1.4 Operation Method of Keypad

Here are some examples of how to run the inverter by the keypad:

Monitoring object switching:

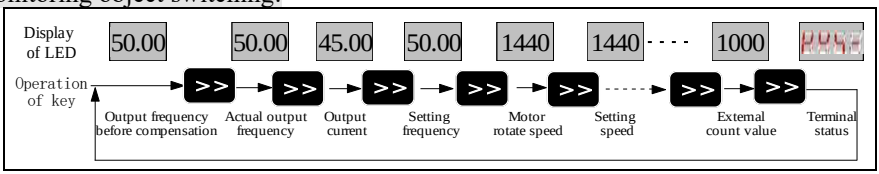


Fig.3-3 Operation of parameters display at running/stop status

Frequency adjustment at common running:(Example: change the setting frequency from 50.00 Hz to 40.00 Hz)

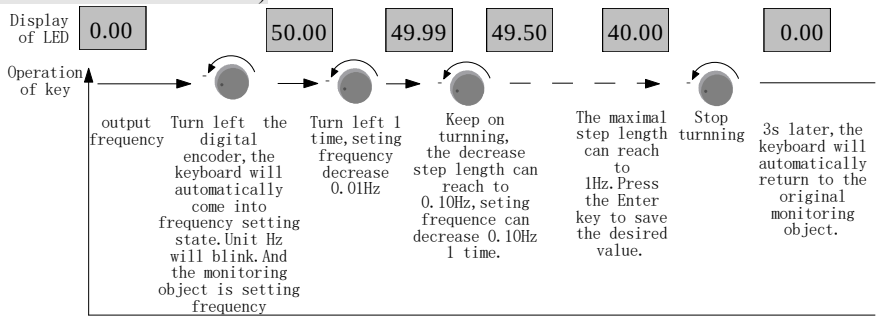


Fig.3-4 Flow chart of frequency setting

This method applies to given frequency parameter adjustment when the initial display state is any state.
When the monitor display is speed setting and analog PID digital setting, these parameters can be modified and displayed directly by turning the knob.

Setting of function code parameters:(example of changing Jog acceleration time, function code P2.01 from 6.0s to 3.2s)

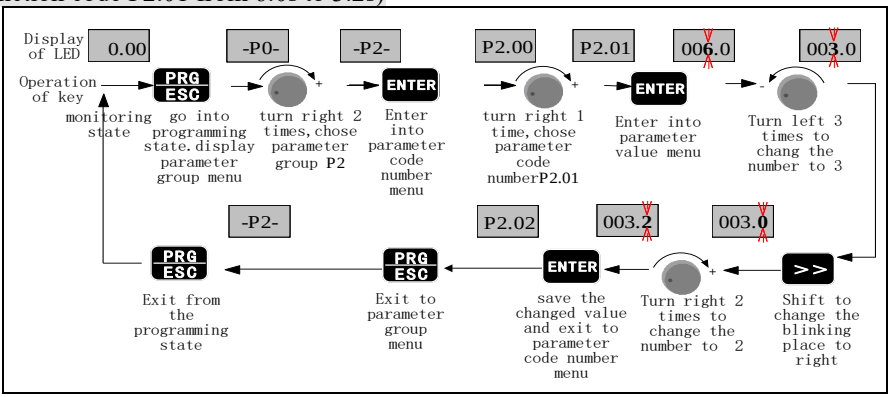


Fig.3-5 Flow chart of parameter setting

In three-level menu state, no flicker digit for a parameter indicates that the function code cannot be modified, and the possible reasons include:

◆Modifying the value is forbidden because the parameter is actual measure value, or running record value or fixed value.

◆The function parameter cannot be changed when the inverter is at running state. However, it can be changed at stop state. So stop the inverter and then change the parameter value.

◆The parameters are protected. Parameter modification is prohibited (PP.04=1), which is parameter protection to avoid mis-operation.

3.2 Run Command Mode Select

The operation command channel of the frequency converter specifies the path for the frequency converter to accept start, stop, and other operations. There are three types of command channels for running:

◆Keyboard control: Use the run, stop/reset, and jog keys on the keyboard for control.

◆Terminal control: use control terminals FWD, REV, COM (two wire type); FWD, REV, HLD (three wire) control.

◆Serial communication control: Start and stop control through the upper computer.

When the frequency converter is in a stopped state, modify the P0.02 code content to achieve control mode conversion. The factory setting is keyboard control (control parameter P0.02 is set to 0). If the operation and stop are controlled by the terminal, it needs to be changed to terminal control. If the stop/reset key is effective during

terminal control, terminal control (STOP key is effective) needs to be selected.

If controlled by serial communication, it is necessary to set the running command channel to serial communication.

If the REMOTE indicator light on the keyboard is off, it indicates that it is in keyboard control mode; If it is on, it indicates terminal control status; If it is flashing, it indicates a serial communication status.

Chapter 4 Parameter Index

Notes:

The symbols in the function code table are described as follows:
"○"parameters can be changed during operation;
Parameters cannot be changed during "×" operation.
"*"Actual detection value or fixed parameter, cannot be changed;
"-"Factory setting, user cannot change.

P0:Standard Function Parameters

Function Code	Parameter Name	Setting Range	Default	Property	Modbus address
P0.00	G/P type display	1:G type(constant torque load) 2:P type(variable torque load e.g.fan and pump)	Model dependent	*	0xF000
P0.01	Motor 1 control mode	0:Speed Sensorless Vector Control(SVC) 1:with speed sensor vector control(FVC) 2:V/F control	0	×	0xF001
P0.02	Command source selection	0:Operation panel 1:Terminal 2:Communication	0	○	0xF002
P0.03	Main frequency source X selection	0:Digital setting 1:Digital setting 2:AI1 3:AI2 4:AI3 5:Pulse setting(X5) 6:Multi-segment instruction 7:Simple PLC 8:PID 9:Communication setting	0	×	0xF003
P0.04	Auxiliary frequency source Y selection	Refer to P0.03	0	○	0xF005
P0.05	Base value of range of auxiliary Frequency reference for main And auxiliary calculation	0:Relative to maximum frequency 1:Relative to main frequency X	0	○	0xF005
P0.06	Range of auxiliary frequency Reference for main and auxiliary calculation	0%–150%	100%	○	0xF006
P0.07	Frequency source selection	Ones place(Frequency source selection) 0:X 1:X and Y operation 2:Switching between X and Y	00	○	0xF007

Function Code	Parameter Name	Setting Range	Default	Property	Modbus address
		3:Switching between X and"X and Y operation" 4:Switching between Y and"X and Y operation"			
		Tens place(X and Y operation relationship)			
		0:X+Y 1:X-Y 2:Maximum of X,Y 3:Minimum of X,Y			
P0.08	Preset frequency	0.00 to maximum frequency(P0.10)	50.00 Hz	○	0xF008
P0.09	Rotation direction	0:Same direction 1:Reverse direction	0	○	0xF009
P0.10	Maximum frequency	F20:50.00Hz~500.00Hz F21:5.00Hz~500.00Hz	50.00Hz	×	0xF00A
P0.11	Source of frequency upper limit	0:Set by P0.12 1:AI1 2:AI2 3:AI3 4:Pulse setting(X5) 5:Communication setting	0	×	0xF00B
P0.12	Frequency upper limit	Frequency lower limit(P0.14)to maximum frequency(P0.10)	50.00 Hz	○	0xF00C
P0.13	Frequency upper limit offset	0.00 Hz to maximum frequency(P0.10)	0.00 Hz	○	0xF00D
P0.14	Frequency lower limit	0.00 Hz to frequency upper limit(P0.12)	0.00 Hz	○	0xF00E
P0.15	Carrier frequency	0.5~16.0 kHz	Model dependent	○	0xF00F
P0.16	Carrier frequency adjustment with temperature	0:No 1:Yes	1	○	0xF010
P0.17	Acceleration time 1	0.00~650.00s 0.0~6500.0s 0~65000s	Model dependent	○	0xF011
P0.18	Deceleration time 1	0.00~650.00s 0.0~6500.0s 0~65000s	Model dependent	○	0xF012
P0.19	Acceleration/Deceleration time unit	0:1s 1:0.1s 2:0.01s	1	×	0xF013
P0.21	Frequency offset of Auxiliary frequency setting channel for main and auxiliary calculation	0.00 Hz to maximum frequency(P0.10)	0.00 Hz	○	0xF015
P0.22	Frequency reference resolution	2:0.01 Hz	2	-	0xF016
P0.23	Retentive of digital setting frequency upon power failure	0:Not retentive 1:Retentive	2	○	0xF017
P0.24	Motor parameter group selection	0:Motor 1 1:Motor 2	0	×	0xF018
P0.25	Acceleration/Deceleration time base frequency	0:Maximum frequency(P0.10)	0	×	0xF019

Function Code	Parameter Name	Setting Range	Default	Property	Modbus address
		1:Set frequency 2:100 Hz			
P0.26	Base frequency for UP/DOWN modification during running	0:Running frequency 1:Set frequency	0	×	0xF01A
P0.27	Binding command source to frequency source	**Ones place(Binding operation panel command to frequency source)** 0:No binding 1:Frequency source by digital setting 2:AI1 3:AI2 4:AI3 5:Pulse setting(X5) 6:Multi.reference 7:Simple PLC 8:PID 9:Communication setting **Tens place(Binding terminal command to frequency source)** 0–9,same as ones place **Hundreds place(Binding communication command to frequency source)** 0–9,same as ones place	0000	○	0xF01B
P0.28	Serial communication protocol	0:Modbus-RTU	0	×	0xF01C

P1:First Motor Parameters

P1.00	Motor type selection	0:Common IM[note] motor 1:Variable frequency IM 2:PMSM[note] motor	Model dependent	*	0xF100
P1.01	Rated motor power	0.1–1000.0 kW	Model dependent	×	0xF101
P1.02	Rated motor voltage	1–2000 V	Model dependent	×	0xF102
P1.03	Rated motor current	0.01–655.35 A(AC drive power≤55 kW)0.1–6553.5 A(AC drive power>55 kW)	Model dependent	×	0xF103
P1.04	Rated motor frequency	0.01 Hz to maximum frequency	Model dependent	×	0xF104
P1.05	Rated motor speed	1–65535 RPM	Model dependent	×	0xF105
P1.06	Stator resistance (IM motor)	0.001–65.535Ω(AC drive power≤55 kW)0.0001–6.5535Ω(AC drive power>55 kW)	Model dependent	×	0xF106
P1.07	Rotor resistance (IM motor)	0.001–65.535Ω(AC drive power≤55 kW)0.0001–6.5535Ω(AC drive	Model dependent	×	0xF107

		power>55 kW)			
P1.08	Leakage inductive reactance(IM motor)	0.01–655.35 mH(AC drive power≤55 kW)0.001–65.535 mH(AC drive power>55 kW)	Model dependent	×	0xF108
P1.09	Mutual inductive reactance (IM motor)	0.1–6553.5 mH(AC drive power≤55 kW)0.01–.655.35 mH(AC drive power>55 kW)	Model dependent	×	0xF109
P1.10	No.load current (IM motor)	0.01 to P1.03(AC drive power≤55 kW)0.1 to P1.03(AC drive power>55 kW)	Model dependent	×	0xF10A
P1.16	Stator resistance (PMSM motor)	0.001–65.535Ω(AC drive power≤55 kW)0.0001–6.5535Ω(AC drive power>55 kW)	Model dependent	×	0xF110
P1.17	Shaft D inductance (PMSM motor)	0.01–655.35 mH(AC drive power≤55 kW)0.001–65.535 mH(AC drive power>55 kW)	Model dependent	×	0xF111
P1.18	Shaft Q inductance (PMSM motor)	0.01–655.35 mH(AC drive power≤55 kW)0.001–65.535 mH(AC drive power>55 kW)	Model dependent	×	0xF112
P1.20	Back EMF (PMSM motor)	0.1–6553.5 V	Model dependent	×	0xF114
P1.27	Encoder pulses per revolution	1–65535	1024	×	0xF11B
P1.28	Encoder type	0:ABZ incremental encoder 2:Resolver	0	×	0xF11C
P1.30	A/B phase sequence of ABZ incremental encoder	0:Forward1:Reserve	0	×	0xF11E
P1.34	Number of pole pairs of resolver	1–65535	1	×	0xF122
P1.36	Encoder wire-break fault detection time	0.0s:not detection 0.1~10.0s	0.0	○	0xF124
P1.37	Auto-tuning selection	0:No auto-tuning 1:IM motor static auto-tuning mode 1 2:IM motor dynamic auto-tuning 3:IM motor static auto tuning mode 2 11:PMSM motor auto-tuning with load 12:PMSM motor auto-tuning Without load	0	×	0xF125

P2:Analog and pulse input and output terminals

P2.00	X1 terminal function selection	0:No function 1:Forward run FWD or run command 2:Reverse run REV or forward and reverse	1	×	0xF400
P2.01	X2 terminal function selection		4	×	0xF401
P2.02	X3 terminal function selection		9	×	0xF402

P2.03	X4 terminal function selection	running direction 3:Three-wire 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 disabled 11:External fault NO input 12:Multi-reference terminal 1 13:Multi-reference terminal 2 14:Multi-reference terminal 3 15:Multi-reference terminal 4 16:terminal 1 for acc./dec.time selection 17:terminal 2 for acc./dec.time selection 18:Frequency reference setting channel switching 19:UP/DOWN setting clear(terminal,keyboard) 20:Command source switching 1 21:acc./dec.prohibited 22:PID disabled 23:PLC state reset 24:wobble disabled 25:counter input 26:Counter reset 27:Length count input 28:Length reset 29:Torque control prohibited 30:pulse input(only valid for X5) 31:reserved 32:Immediate DC braking 33:External fault NC input 34:frequency modification enabled 35:PID operation direction reverse 36:External stop 1 37:Command source switching 2 38:PID integral disabled 39:Switch between frequency source X and	12	×	0xF403
P2.04	X5 terminal function selection		13	×	0xF404
P2.05	X6 terminal function selection		0	×	0xF405
P2.06	X7 terminal function selection		0	×	0xF406
P2.07	X8 terminal function selection		0	×	0xF407
P2.08	X9 terminal function selection		0	×	0xF408
P2.09	X10 terminal function selection		0	×	0xF409

		preset frequency 40:Switch between frequency source Y and preset frequency 41:Motor terminal selection function 42:Reserved 43:PID parameter switching 44:User-defined fault 1 45:User-defined fault 2 46:Speed/torque control switching 47:Emergency stop 48:External stop 2 49:Deceleration DC injection braking 50:Clear running time 51:Two-wire/three-wire switching 52:Reverse running prohibited 53-59:Reserved			
P2.10	X filter time	0.000s～1.000s	0.010s	○	0xF40A
P2.11	Terminal control mode	0:Two-wire type 1 1:two-wire type 2 2:Three-wire type 1 3:three-wire type 2	0	×	0xF40B
P2.12	Terminal UP/DOWN change rate	0.001Hz/s～65.535Hz/s	1.00Hz/s	○	0xF40C
P2.13	AI curve 1 minimum input	0.00V～P2.15	0.00V	○	0xF40D
P2.14	AI curve 1 minimum input corresponding setting	-100.0%～+100.0%	0.0%	○	0xF40E
P2.15	AI curve 1 maximum input	P2.13～+10.00V	10.00V	○	0xF40F
P2.16	AI curve 1 maximum input corresponding setting	-100.0%～+100.0%	100.0%	○	0xF410
P2.17	AI1 filter time	0.00s～10.00s	0.10s	○	0xF411
P2.18	AI curve 2 Minimum input	0～P2.20	0	○	0xF412
P2.19	AI curve 2 Minimum input corresponding setting	-100.0%～+100.0%	0	○	0xF413
P2.20	AI curve 2 maximum input	P2.18～10.00s	10	○	0xF414
P2.21	AI curve 2 maximum input corresponding setting	-100.0%～+100.0%	100.0%	○	0xF415
P2.22	AI2 filter time	0.00s～10.00s	0.10s	○	0xF416
P2.23	AI curve 3 minimum input	-10.00V～P2.25	0	○	0xF417
P2.24	AI curve 3 minimum input corresponding setting	-100.0%～+100.0%	0	○	0xF418
P2.25	AI curve 3 maximum input	P2.23～+10.00V	10.00V	○	0xF419
P2.26	AI curve 3 maximum input corresponding setting	-100.0%～+100.0%	100.0%	○	0xF41A

P2.27	AI3 filter time	0.00s～10.00s	0.10s	○	0xF41B
P2.28	PULSE minimum input	0.00kHz～P2.30	0.00kHz	○	0xF41C
P2.29	PULSE minimum input corresponding setting	-100.0%～100.0%	0.0%	○	0xF41D
P2.30	PULSE maximum input	P2.28～100.00kHz	50.00kHz	○	0xF41E
P2.31	PULSE maximum input setting	-100.0%～100.0%	100.0%	○	0xF41F
P2.32	PULSE filter time	0.00s～10.00s	0.10s	○	0xF420
P2.33	AI curve selection	Ones place: AI1 curve selection 1:Curve 1(2 points,see P2.13 to P2.16) 2:Curve 2(2 points,see P2.18 to P2.21) 3:Curve 3(2 points,see P2.23～P2.26) 4:Curve 4(4 points,see A1.00 to A1.07) 5:Curve 5(4 points,see A1.08～A1.15) Tens place: AI2 curve selection,same as above Hundreds place: AI3 curve selection,same as above	321	○	0xF421
P2.34	AI below minimum input setting selection	Ones place: AI1 is below the minimum input setting selection 0:Corresponds to the minimum input setting 1:0.0% Tens place: AI2 is lower than the minimum input setting selection,same as above Hundreds place: AI3 is lower than the minimum input setting selection,same as above	000	○	0xF422
P2.35	X1 delay time	0.0s～3600.0s	0.0s	×	0xF422
P2.36	X2 delay time	0.0s～3600.0s	0.0s	×	0xF423
P2.37	X3 delay time	0.0s～3600.0s	0.0s	×	0xF424
P2.38	X terminal effective mode selection 1	0:active high 1:active low Ones place:X1 Tens place:X2 Hundreds place:X3 Thousands place:X4 Ten thousands place:X5	00000	×	0xF425
P2.39	X terminal effective mode selection 2	0:active high 1:active low	00000	×	0xF426

		Ones place:X6 Tens place:X7 Hundreds place:X8 Thousands place:X9 Ten thousands place:X10			

P3:Output terminal

P3.00	DO output mode selection	0:Pulse output(DOP) 1:Digital output(DOR)	0	○	0xF500
P3.01	DOR Output function	0:No output 1:Inverter is running 2:fault output 3:Frequency level detection FDT1 output 4:frequency reached 5:zero-speed running(no output at stop) 6:Motor overload warning 7:Inverter overload warning 8:Set count value reached 9:The specific count value reached 10:length reached 11:PLC cycle completed 12:Cumulative running time arrived 13:Frequency limited 14:Torque limited 15:Ready to run 16:AI1>AI2 17:upper limit frequency reached 18:Lower limit frequency reached(no output atst op) 19:Under voltage status output 20:Communication settings 23:Zero speed running 2(also output at stop) 24:Cumulative power-on time arrived 25:Frequency level detection FDT2 output 26:Frequency 1 arrival 27:Frequency 2 arrival 28:Current 2 arrival 29:Current 2 arrival 30:Arrival set time 31:AI1 exceeding limit 32:Load lost 33:Reverse running 34:Zero current state	0	○	0xF501
P3.02	Relay output function selection(TA-TB-TC)		2	○	0xF502
P3.03	Expansion card relay output function selection (RA-RB-RC)		0	○	0xF503
P3.04	Y1 Output function selection		1	○	0xF504
P3.05	Expansion card Y2 output function selection		4	○	0xF505

		35:IGBT temperature reached 36:Output current exceeding limit 37:lower limit frequency reached(output also when shutdown) 38:Alarm output(all faults) 39:Motor over-temperature warning 40:The running time arrives 41:Fault output(fault for free stop and under-voltage does not output)			
P3.06	DOP Output function	0:running frequency 1:set frequency 2:output current 3:output torque(absolute torque) 4:Output power 5:Output voltage 6:PULSE input(100.0%corresponds to 100.0kHz) 7:AI1 8:AI2 9:AI3(expansion card) 10:length 11:record value 12:Communication settings 13:Motor speed 14:Output current(100.0%corresponds to 1000.0A) 15:Output voltage(100.0%corresponds to 1000.0V) 16:Output torque(actual torque value)	0	○	0xF506
P3.07	AO1 Output function		0	○	0xF507
P3.08	Expansion card AO2 output function		1	○	0xF508
P3.09	DOP Output maximum frequency	0.01kHz～100.00kHz	50.00kHz	○	0xF509
P3.10	AO1 offset	-100.0%～+100.0%	0.0%	○	0xF50A
P3.11	AO1 gain	-10.00～+10.00	1.00	○	0xF50B
P3.12	Expansion card AO2 offset	-100.0%～+100.0%	0.0%	○	0xF50C
P3.13	Expansion card AO2 gain	-10.00～+10.00	1.00	○	0xF50D
P3.17	DOR output delay time	0.0s～3600.0s	0.0s	○	0xF511
P3.18	RELAY1 output delay time	0.0s～3600.0s	0.0s	○	0xF512
P3.19	RELAY2 output delay time	0.0s～3600.0s	0.0s	○	0xF513
P3.20	Y1 output delay time	0.0s～3600.0s	0.0s	○	0xF514

P3.21	Y2 output delay time	0.0s～3600.0s	0.0s	○	0xF515
P3.22	digital output effective state selection	0:positive logic 1:inverse logic Ones place:DOR Tens place:RELAY1 Hundreds place:RELAY2 Thousands place:Y1 Ten thousands place:Y2	00000	○	0xF516
P3.23	AO1 output signal	0:voltage signal 1:current signal	0	×	0xF517

P4 Start/Stop Control

P4.00	Start mode	0:Start directly F20:1:Speed tracking restart F20:2:Pre-excitation start(AC asynchronous motor)	0	○	0xF600
P4.01	Asynchronous motor speed tracking mode	0:Starting from the shutdown frequency 1:start from power frequency 2:Starting from the maximum frequency	0	×	0xF601
P4.02	Speed tracking speed of IM motor	1~100	20	○	0xF602
P4.03	Starting frequency	0.00Hz~10.00Hz	0.00Hz	○	0xF603
P4.04	Start frequency hold time	0.0s~100.0s	0.0s	×	0xF604
P4.05	Braking current before starting	0%~100%	50	×	0xF605
P4.06	Braking time before starting	0.0s~100.0s	0	×	0xF606
P4.07	Acceleration and Deceleration mode selection	0:linear acc./dec. 1:S curve acc./dec.A	0	×	0xF607
P4.08	S curve start time ratio	0.0%~(100.0%-P4.09)	30.0%	×	0xF608
P4.09	S curve end time ratio	0.0%~(100.0%-P4.08)	30.0%	×	0xF609
P4.10	Stop mode selection	0:decelerate to stop 1:free stop	0	○	0xF60A
P4.11	Shutdown DC brake start frequency	0.00Hz~Max.frequency	0.00Hz	○	0xF60B
P4.12	Shutdown DC brake waiting time	0.0s~100.0s	0.0s	○	0xF60C
P4.13	Shutdown DC brake current	0%~100%	50%	○	0xF60D
P4.14	Shutdown DC brake active time	0.0s~100.0s	0.0s	○	0xF60E
P4.15	Braking rate	0%~100%	100%	○	0xF60F
P4.21	Demagnetization time for IM motor	0.00~5.00s	Model dependent	×	0xF615

P5:Auxiliary function

P5.00	Jog running frequency	0.00Hz~Max.frequency	2.00Hz	○	0xF800
P5.01	Jog acceleration time	0.0s~6500.0s	20.0s	○	0xF801
P5.02	Jog deceleration time	0.0s~6500.0s	20.0s	○	0xF802

P5.03	Acceleration time 2	0.0s~6500.0s	Model dependent	○	0xF803
P5.04	Deceleration time 2	0.0s~6500.0s		○	0xF804
P5.05	Acceleration time 3	0.0s~6500.0s		○	0xF805
P5.06	Deceleration time 3	0.0s~6500.0s		○	0xF806
P5.07	Acceleration time 4	0.0s~6500.0s		○	0xF807
P5.08	Deceleration time 4	0.0s~6500.0s		○	0xF808
P5.09	Skip frequency 1	0.00Hz~Max.frequency	0.00Hz	○	0xF809
P5.10	Skip frequency 2	0.00Hz~Max.frequency	0.00Hz	○	0xF80A
P5.11	Amplitude for skip frequency	0.00Hz~Max.frequency	0Hz	○	0xF80B
P5.12	Forward/Reverse rotation dead-zone time	0.0s~3000.0s	0.0s	○	0xF80C
P5.13	Reverse run selection	0:Allow 1:Disable	0	○	0xF80D
P5.14	Run mode when set frequency lower than lower limit	0:run at lower limit frequency 1:stop 2:run at zero frequency	0	○	0xF80E
P5.15	Droop rate	0.00Hz~10.00Hz	0.00Hz	○	0xF80F
P5.16	Accumulative power-on time threshold	0h~65000h	0h	○	0xF810
P5.17	Accumulative run time threshold	0h~65000h	0h	○	0xF811
P5.18	Startup protection selection	0：disabled 1：enabled	0	○	0xF812
P5.19	Frequency detection value 1(FDT1)	0.00Hz~Max.frequency	50.00Hz	○	0xF813
P5.20	Frequency detection hysteresis 1(FDT1)	0.0%~100.0%（FDT1 Level）	5.0%	○	0xF814
P5.21	detection width of Frequency reached	0.0~100.0%(Max.frequency)	0.0%	○	0xF815
P5.22	Jump function enable during accelerating and decelerating	0:disabled 1:enabled	0	○	0xF816
P5.25	Switching frequency for Acc.time 1 and acc.time 2	0.00Hz~Max.frequency	0.00Hz	○	0xF819
P5.26	Switching frequency for Dec.time 1 and dec.time 2	0.00Hz~Max.frequency	0.00Hz	○	0xF81A
P5.27	Terminal jog preferred	0:invalid 1:valid	0	○	0xF81B
P5.28	Frequency detection value 2 (FDT2)	0.00Hz~Maximum frequency	50.00Hz	○	0xF81C
P5.29	Frequency detection hysteresis 2(FDT2)	0.0%~100.0%（FDT2 level）	5.0%	○	0xF81D
P5.30	Detection of frequency 1	0.00Hz~Max.frequency	50.00Hz	○	0xF81E
P5.31	Detection width of frequency 1	0.0~100.0%(Max. frequency)	0.0%	○	0xF81F
P5.32	Detection of frequency 2	0.00Hz~Maximum frequency	50.00Hz	○	0xF820
P5.33	Detection width of frequency 2	0.0~100.0%(Max.Frequency)	0.0%	○	0xF821
P5.34	Zero current detection level	0.0%~300.0% 100.0%Corresponding motor rated current	5.0%	○	0xF822
P5.35	Zero current detection delay time	0.01s~600.00s	0.10s	○	0xF823

P5.36	Output overcurrent threshold	0.0%(not tested) 0.1%to 300.0%(rated motor current)	200.0%	○	0xF824
P5.37	Output over current detection delay time	0.00s~600.00s	0.00s	○	0xF825
P5.38	Detection of current 1	0.0%~300.0% (Motor rated current)	100.0%	○	0xF826
P5.39	Detection width of current 1	0.0%~300.0% (Motor rated current)	0.0%	○	0xF827
P5.40	Detection of current 2	0.0%~300.0% (Motor rated current)	100.0%	○	0xF828
P5.41	Detection width of current 2	0.0%~300.0% (Motor rated current)	0.0%	○	0xF829
P5.42	Timing function selection	0:Disable 1:Enable	0	×	0xF82A
P5.43	Timing duration source	0:P5.44 setting 1:AI1 2:AI2 3:AI3 Analog input range corresponding to P5.44	0	×	0xF82B
P5.44	Timing duration	0.0min~6500.0min	0.0min	×	0xF82C
P5.45	AI1 input voltage lower limit	0.00V~P5.46	3.10V	○	0xF82D
P5.46	AI1 input voltage upper limit	P5-45~10.00V	6.80V	○	0xF82E
P5.47	IGBT temperature threshold	0℃~100℃	75℃	○	0xF82F
P5.48	Cooling fan run mode	0:run during drive run 1:run continuously	0	×	0xF830
P5.49	Wake-up frequency	Hibernating frequency (P5.51)to max.frequency	0.00Hz	○	0xF831
P5.50	Wake-up delay time	0.0s~6500.0s	0.0s	○	0xF832
P5.51	Hibernating frequency	0.00Hz~Wake-up frequency(P5.49)	0.00Hz	○	0xF833
P5.52	Hibernating delay time	0.0s~6500.0s	0.0s	○	0xF834
P5.53	Running time threshold this time	0.0~6500.0 min	0.0min	○	0xF835
P5.54	Output power correction coefficient	0.00%~200.0%	100.0%	○	0xF836

P6:Process Control PID Function

P6.00	PID reference source	0:P6.01 setting 1:AI1 2:AI2 3:AI3 4:X5 pulse setting 5:Communication 6:Multi-reference	0	○	0xFA00
P6.01	PID digital setting	0.0%~100.0%	50.0%	○	0xFA01
P6.02	PID feedback source	0：AI1 1：AI2 2：AI3 3：AI1-AI2 4:X5 pulse setting 5:Communication given6：AI1+AI2	0	○	0xFA02

		7：MAX(|AI1|,|AI2|) 8：MIN(|AI1|,|AI2|)			
P6.03	PID action direction	0:Positive action 1:reaction	0	○	0xFA03
P6.04	PID range for reference and feedback	0~65535	1000	○	0xFA04
P6.05	Proportional gain Kp1	0.0~100.0	20.0	○	0xFA05
P6.06	Integration time Ti1	0.01s~10.00s	2.00s	○	0xFA06
P6.07	Differential time Td1	0.000s~10.000s	0.000s	○	0xFA07
P6.08	PID reversal cut-off frequency	0.00~Max.frequency	2.00Hz	○	0xFA08
P6.09	PID deviation limit	0.0%~100.0%	0.0%	○	0xFA09
P6.10	PID differential limit	0.00%~100.00%	0.10%	○	0xFA0A
P6.11	PID reference change time	0.00~650.00s	0.00s	○	0xFA0B
P6.12	PID feedback filter time	0.00~60.00s	0.00s	○	0xFA0C
P6.13	PID output filter time	0.00~60.00s	0.00s	○	0xFA0D
P6.15	Proportional gain Kp2	0.0~100.0	20.0	○	0xFA0F
P6.16	Integration time Ti2	0.01s~10.00s	2.00s	○	0xFA10
P6.17	Differential time Td2	0.000s~10.000s	0.000s	○	0xFA11
P6.18	PID parameter switching condition	0:No switching 1:Switching via X terminal 2:Auto switching based on deviation 3:Auto switching according to the operating frequency	0	○	0xFA12
P6.19	PID parameter switching deviation 1	0.0%~P6-20	20.0%	○	0xFA13
P6.20	PID parameter switching deviation 2	P6-19~100.0%	80.0%	○	0xFA14
P6.21	PID initial value	0.0%~100.0%	0.0%	○	0xFA15
P6.22	PID initial value holding time	0.00~650.00s	0.00s	○	0xFA16
P6.23	Maximum deviation between two PID outputs in forward direction	0.0%~100.0%	1.0%	○	0xFA17
P6.24	Maximum deviation between two PID outputs in reverse direction	0.0%~100.0%	1.0%	○	0xFA18
P6.25	PID integral property	**Ones place:** integral separation 0:invalid 1:valid **Tens place:** whether to stop integration after output up to the limit 0:Continue 1:Stop	00	○	0xFA19

P6.26	detection level of PID feedback loss	0.0%：Don't judge feedback loss 0.1%~100.0%	0.0%	○	0xFA1A
P6.27	detection time of PID feedback loss	0.0s~20.0s	0.0s	○	0xFA1B
P6.28	PID operation at stop	0:disabled 1:enabled	0	○	0xFA1C

P7:Swing Function,Fixed Length and Count

P7.00	Swing frequency setting mode	0:Relative to central frequency 1:Relative to the max. frequency	0	○	0xFB00
P7.01	Swing frequency amplitude	0.0%~100.0%	0.0%	○	0xFB01
P7.02	Kick frequency amplitude	0.0%~50.0%	0.0%	○	0xFB02
P7.03	Swing cycle	0.1s~3000.0s	10.0s	○	0xFB03
P7.04	Swing frequency triangle wave rise time	0.1%~100.0%	50.0%	○	0xFB04
P7.05	Set length	0m~65535m	1000m	○	0xFB05
P7.06	Actual length	0m~65535m	0m	○	0xFB06
P7.07	Pulses per meter	0.1~6553.5	100.0	○	0xFB07
P7.08	Set count value	1~65535	1000	○	0xFB08
P7.09	Specify count value	1~65535	1000	○	0xFB09

P8:Multi-Reference and Simple PLC Function

P8.00	Multi-reference preset 0	-100.0%~100.0%	0.0%	○	0xFC00
P8.01	Multi-reference preset 1	-100.0%~100.0%	0.0%	○	0xFC01
P8.02	Multi-reference preset 2	-100.0%~100.0%	0.0%	○	0xFC02
P8.03	Multi-reference preset 3	-100.0%~100.0%	0.0%	○	0xFC03
P8.04	Multi-reference preset 4	-100.0%~100.0%	0.0%	○	0xFC04
P8.05	Multi-reference preset 5	-100.0%~100.0%	0.0%	○	0xFC05
P8.06	Multi-reference preset 6	-100.0%~100.0%	0.0%	○	0xFC06
P8.07	Multi-reference preset 7	-100.0%~100.0%	0.0%	○	0xFC07
P8.08	Multi-reference preset 8	-100.0%~100.0%	0.0%	○	0xFC08
P8.09	Multi-reference preset 9	-100.0%~100.0%	0.0%	○	0xFC09
P8.10	Multi-reference preset 10	-100.0%~100.0%	0.0%	○	0xFC0A
P8.11	Multi-reference preset 11	-100.0%~100.0%	0.0%	○	0xFC0B
P8.12	Multi-reference preset 12	-100.0%~100.0%	0.0%	○	0xFC0C
P8.13	Multi-reference preset 13	-100.0%~100.0%	0.0%	○	0xFC0D
P8.14	Multi-reference preset 14	-100.0%~100.0%	0.0%	○	0xFC0E
P8.15	Multi-reference preset 15	-100.0%~100.0%	0.0%	○	0xFC0F
P8.16	Simple PLC operation mode	0:Stop at the end of a single run 1:Keep the final value at the end of a single run 2:keep circulating	0	○	0xFC10
P8.17	Simple PLC retentive selection	Single digit:power-down memory selection 0:No memory when power off 1:power-down memory Tenth place:Stop memory selection 0:Stop and not remember	00	○	0xFC11

		1:shutdown memory			
P8.18	Run Time for Simple PLC reference 0	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC12
P8.19	acceleration/deceleration time for Simple PLC reference 0	0~3	0	○	0xFC13
P8.20	Run Time for Simple PLC reference 1	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC14
P8.21	acceleration/deceleration time for Simple PLC reference 1	0~3	0	○	0xFC15
P8.22	Run Time for Simple PLC reference 2	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC16
P8.23	acceleration/deceleration time for Simple PLC reference 2	0~3	0	○	0xFC17
P8.24	Run Time for Simple PLC reference 3	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC18
P8.25	acceleration/deceleration time for Simple PLC reference 3	0~3	0	○	0xFC19
P8.26	Run Time for Simple PLC reference 4	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC1A
P8.27	acceleration/deceleration time for Simple PLC reference 4	0~3	0	○	0xFC1B
P8.28	Run Time for Simple PLC reference 5	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC1C
P8.29	acceleration/deceleration time for Simple PLC reference 5	0~3	0	○	0xFC1D
P8.30	Run Time for Simple PLC reference 60	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC1E
P8.31	acceleration/deceleration time for Simple PLC reference 6	0~3	0	○	0xFC1F
P8.32	Run Time for Simple PLC reference 7	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC20
P8.33	acceleration/deceleration time for Simple PLC reference 7	0~3	0	○	0xFC21
P8.34	Run Time for Simple PLC reference 8	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC22
P8.35	acceleration/deceleration time for Simple PLC reference 8	0~3	0	○	0xFC23
P8.36	Run Time for Simple PLC reference 9	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC24
P8.37	acceleration/deceleration time for Simple PLC reference 9	0~3	0	○	0xFC25
P8.38	Run Time for Simple PLC reference 10	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC26
P8.39	acceleration/deceleration time for Simple PLC reference 10	0~3	0	○	0xFC27
P8.40	Run Time for Simple PLC reference 11	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC28
P8.41	acceleration/deceleration time for Simple PLC reference 11	0~3	0	○	0xFC29
P8.42	Run Time for Simple PLC reference 12	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC2A
P8.43	acceleration/deceleration time for Simple PLC reference 12	0~3	0	○	0xFC2B

P8.44	Run Time for Simple PLC reference 13	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC2C
P8.45	acceleration/deceleration time for Simple PLC reference 13	0~3	0	○	0xFC2D
P8.46	Run Time for Simple PLC reference 14	0.0s(h~6553.5s(h)	0.0s(h)	○	0xFC2E
P8.47	acceleration/deceleration time for Simple PLC reference 14	0~3	0	○	0xFC2F
P8.48	Run Time for Simple PLC reference 15	0.0s(h)~6553.5s(h)	0.0s(h)	○	0xFC30
P8.49	acceleration/deceleration time for Simple PLC reference 15	0~3	0	○	0xFC31
P8.50	time unit of Simple PLC running	0：s（second） 1：h（hour）	0	○	0xFC32
P8.51	Multi-reference 0 source	0:given by P8.00 1:AI1 2:AI2 3:AI3 4:pulse(X5) 5:PID 6:given by P0.08,can be Modified by UP/DOWN	0	○	0xFC33

P9:V/F Control Parameters

P9.00	VF curve setting	0:straight V/F 1:Multipoint 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:VF complete separation mode 11:VF semi-separated mode	0	×	0xF300
P9.01	Torque boost	0.0%：（Automatic torque boost） 0.1%~30.0%	Model determination	○	0xF301
P9.02	Cut-off frequency of torque boost	0.00Hz~Maximum frequency	50.00Hz	×	0xF302
P9.03	Multi-point VF frequency point 1	0.00Hz~P9.05	0.00Hz	×	0xF303
P9.04	Multi-point VF voltage point 1	0.0%~100.0%	0.0%	×	0xF304
P9.05	Multi-point VF frequency point 2	P9.03~P9.07	0.00Hz	×	0xF305
P9.06	Multi-point VF voltage point 2	0.0%~100.0%	0.0%	×	0xF306
P9.07	Multi-point VF frequency point 3	P9-05~Motor rated frequency(P1.04)	0.00Hz	×	0xF307
P9.08	Multi-point VF voltage point 3	0.0%~100.0%	0.0%	×	0xF308
P9.09	VF slip compensation gain	0.0%~200.0%	0.0%	○	0xF309
P9.10	VF overexcitation gain	0~200	64	○	0xF30A
P9.11	VF oscillation suppression gain	0~100	40	○	0xF30B
P9.13	VF separated voltage source	0:Digital setting(P9.14) 1:AI1 2:AI2	0	○	0xF30D

		3:AI3 4:X5 pulse setting 5:Multi-reference 6:Simple PLC 7:PID 8:Communication Note:100.0%corresponds to the rated voltage of the motor			
P9.14	VF separated voltage digital setting	0V~Motor rated voltage	0V	○	0xF30E
P9.15	VF separation voltage rise time	0.0s~1000.0s Note:It means the time from 0V to the rated voltage of the motor	0.0s	○	0xF30F
P9.16	VF separation voltage drop time	0.0s to 1000.0s Note:It means the time from 0V to the rated voltage of the motor	0.0s	○	0xF310
P9.17	VF separation shutdown mode selection	0:The frequency voltage is independently reduced to 0 1:The frequency decreases after the voltage is reduced to 0	0	○	0xF311
P9.18	Over-current stall action current	50~200%	150%	×	0xF312
P9.19	Over-current stall suppression enable	0:disabled 1:enabled	1（valid）	×	0xF313
P9.20	Over-current stall restrain gain	0~100	20	○	0xF314
P9.21	Compensation factor of speed multiplying current limit	50~200%	50%	×	0xF315
P9.23	Over-voltage stall enable	0 invalid 1 valid	1（valid）	×	0xF317
P9.24	Over-voltage stall restrain frequency gain	0~200	100	○	0xF318
P9.25	Over-voltage stall restrain voltage gain	0~100	30	○	0xF319
P9.26	Over-voltage stall maximum rising frequency limit	0~50Hz	5Hz	×	0xF31A
P9.27	**Slip compensation time (PMSM motor)**	0.1~10.0	0.5	○	0xF31B
P9.28	**Automatic frequency up enable(PMSM motor)**	0:disabled 1:enabled	0	×	0xF31C
P9.29	**Minimum driving torque current(PMSM motor)**	10~100	50	×	0xF31D
P9.30	**Maximum generating torque current(PMSM motor)**	10~100	20	×	0xF31E
P9.31	**Automatic frequency up KP (PMSM motor)**	0~100	50	○	0xF31F
P9.32	**Automatic frequency up KI (PMSM motor)**	0~100	50	○	0xF320
P9.33	**Online torque compensation gain(PMSM motor)**	80~150	100	×	0xF321

PA:Communication Parameter

PA.00	Communication baud rate	**Ones place:** MODBUS baud rate 0:300bps,1:600bps 2:1200bps,3:2400bps 4:4800bps,5:9600bps 6:19200bps,7:38400bps 8:57600bps,9:115200bps **Tens place:**reserved **Hundreds place:** Reserved **Thousands place:** CANlink baud rate 0:20kbps 1:50kbps 2:100kbps 3:125kbps 4:250kbps 5:500kbps 6:1Mbps	5005	○	0xFD00
PA.01	MODBUS data format	0:No check(8-N-2) 1:Even parity(8-E-1) 2:Odd parity(8-O-1) 3:No parity(8-N-1)	0	○	0xFD01
PA.02	Local address	0:broadcast address 1 to 247	1	○	0xFD02
PA.03	MODBUS response delay	0~20ms	2	○	0xFD03
PA.04	Serial port communication timeout	0.0:Invalid 0.1~60.0s	0.0	○	0xFD04
PA.05	MODBUS protocol selection	**Ones place:** MODBUS protocol 0:Non-standard MODBUS 1:Standard MODBUS **Tens place**:reserved	30	○	0xFD05
PA.06	Communication read current resolution	0：0.01A 1：0.1A	0	○	0xFD06
PA.07	Reserved		0	○	0xFD07
PA.08	CANlink communication Timeout time	0.0(invalid) 0.1~60.0s	0	○	0xFD08

PB:Fault and Protection

PB.00	Motor overload protection selection	0:Forbidden 1:Allowed	1	○	0xF900
PB.01	Motor overload protection gain	0.20~10.00	1.00	○	0xF901
PB.02	Motor overload warning coefficient	50%~100%	80%	○	0xF902
PB.03	Overvoltage stall gain	0~100	30	○	0xF903
PB.04	Overvoltage stall protection voltage	650~780V	760V	○	0xF904
PB.07	Short-circuit to ground upon power-on	0:invalid 1:valid	1	○	0xF907
PB.08	Starting voltage of braking unit	700~800V	780V		0xF908
PB.09	Automatic fault reset times	0~20	0	○	0xF909
PB.10	Fault Y action selection during fault automatic reset	0:No action 1:action	0	○	0xF90A
PB.11	Time interval of fault auto reset	0.1s~100.0s	1.0s	○	0xF90B

PB.12	Input phase loss/contactor pull-in protection selection	Ones place:input phase loss protection selection Tens place:Contactor pull-in protection selection 0:Forbidden 1:Allowed	11	○	0xF90C
PB.13	Output phase loss protection selection	0:Forbidden 1:Allowed	1	○	0xF90D
PB.14	First recorded fault	0:No fault 1:reserved 2:Over current during acc. 3:Over current during dec. 4:Over current at constant speed 5:over-voltage during acc. 6:over-voltage during dec. 7:Over current at constant speed 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 abnormal 18:Current detection abnormal 19:Motor tuning abnormal 20:Encoder/PG card abnormal 21:Parameter read and write abnormal 22:Inverter hardware abnormal 23:Motor short to ground 24:Reserved 25:reserved 26:Run time arrived 27:User-defined fault 1 28:User-defined fault 2 29:Power-on time arrived 30:load loss 31:PID feedback loss during operation 40:fast current limit timeout 41:Switch the motor during operation 42:Speed deviation is too large 43:Motor over-speed 45:Motor over	—	*	0xF90E
PB.15	Second recorded fault		—	*	0xF90F
PB.16	Third(latest)recorded fault		—	*	0xF910

		temperature 51:Initial position error 55:Slave failure during master-slave control			
PB.17	Frequency st the third recorded fault	—	—	*	0xF911
PB.18	Current st the third recorded fault	—	—	*	0xF912
PB.19	Bus voltage st the third recorded fault	—	—	*	0xF913
PB.20	X status st the third recorded fault	—	—	*	0xF914
PB.21	Y status at the third recorded fault	—	—	*	0xF915
PB.22	Inverter status at the third recorded fault	—	—	*	0xF916
PB.23	Power-on time for the third recorded fault	—	—	*	0xF917
PB.24	Run time at the third recorded fault	—	—	*	0xF918
PB.27	Frequency at the second recorded fault	—	—	*	0xF91B
PB.28	Current at the second recorded fault	—	—	*	0xF91C
PB.29	Bus voltage at the second recorded fault	—	—	*	0xF91D
PB.30	X status at the second recorded fault	—	—	*	0xF91E
PB.31	Y status at the second recorded fault	—	—	*	0xF91F
PB.32	Inverter status at the second recorded fault	—	—	*	0xF920
PB.33	Power-on time at the second recorded fault	—	—	*	0xF921
PB.34	Run time at the second recorded fault	—	—	*	0xF922
PB.37	Frequency at first recorded fault	—	—	*	0xF925
PB.38	Current at first recorded fault	—	—	*	0xF926
PB.39	Bus voltage at first recorded fault	—	—	*	0xF927
PB.40	X status at the first recorded fault	—	—	*	0xF928
PB.41	Y status at the first recorded fault	—	—	*	0xF929
PB.42	Inverter status at the first recorded fault	—	—	*	0xF92A
PB.43	Power-on time at the first recorded fault	—	—	*	0xF92B
PB.44	Run time at first recorded fault	—	—	*	0xF92C
PB.47	Fault protection action selection 1	0:coast to stop 1:stop according to stop mode 2:keep running	00000	○	0xF92F

		Ones place: motor overload(11) **Tens place:** Input phase loss(12) **Hundreds place:** output phase loss(13) **Thousands place:** External faults(15) **Ten thousands place:**Communication Error(16)			
PB.48	Fault protection action selection 2	**Ones place:** encoder/PG card abnormal(20) 0:coast to stop **Tens place:** Function code read/write abnormal(21) 0:coast to stop 1:stop according to stop mode **Hundreds place:** Reserved **Thousands place:** Motor overheating(25) **Ten thousands place:** Runtime Reached(26)	00000	○	0xF930
PB.49	Fault protection action selection 3	**Ones place:** user-defined fault 1(27) 0:coast to stop 1:stop according to stop mode 2:keep running **Tens place:** User-defined fault 2(28) 0:coast to stop 1:stop according to stop mode 2:keep running **Hundreds place:** Power-on time reached (29) 0:coast to stop 1:stop according to stop mode 2:keep running **Thousands place:** Load loss(30) 0:coast to stop 1:decelerate to stop 2:directly jump to 7%of the rated frequency of the motor and continue to run,and automatically return to the set frequency	00000	○	0xF931

		when the load is not dropped **Ten thousands place:** PID feedback is lost during operation(31) 0:coast to stop 1:stop according to stop mode 2:keep running			
PB.50	Fault protection action selection 4	**Ones place:** Excessive speed deviation(42) 0:coast to stop 1:stop according to stop mode 2：Keep running **Tens place:** Motor overspeed(43) **Hundreds place:** Wrong initial position (51)	00000	○	0xF932
PB.54	Continue running frequency selection in case of fault	0:Run at the current operating frequency 1:Run at the set frequency 2:Run at the upper frequency limit 3:lower limit frequency operation 4:Run at abnormal standby frequency	0	○	0xF936
PB.55	Abnormal standby frequency	0.0%~100.0% (100.0%corresponds to the maximum frequency P0.10)	100.0%	○	0xF937
PB.56	Motor temperature sensor type	0：No temperature sensor 1：PT100 2：PT1000	0	○	0xF938
PB.57	Motor overheat protection threshold	0℃~200℃	110℃	○	0xF939
PB.58	Motor overheat warning threshold	0℃~200℃	90℃	○	0xF93A
PB.59	Power dip ride-through function selection	0:invalid 1:Bus voltage constant control(decelerate) 2:Deceleration stop	0	×	0xF93B
PB.60	Threshold of power dip ride-through function disabled	85%	85%~ 120%	×	0xF93C
PB.61	Judging time of bus voltage recovering from power dip	0.5s	0-100s	×	0xF93D
PB.62	Threshold of power dip ride-through function enabled	80%	60%~ 100%	×	0xF93E
PB.63	Load lost protection enable	0:disabled 1:enabled	0	○	0xF93F

PB.64	detection level of load lost	0.0~100.0%	10.0%	○	0xF940
PB.65	detection time of load lost	0.0~60.0s	1.0s	○	0xF941
PB.67	Over speed detection value	0.0 %~50.0 % (Maximum frequency)	20.0%	○	0xF943
PB.68	Over speed detection time	0~60s	1s	○	0xF944
PB.69	Detection level of speed error	0.0 %~50.0 % (Maximum frequency)	20.0%	○	0xF945
PB.70	Detection time of speed error	0.0s：Not detect 0.1~60.0s	5.0s	○	0xF946
PB.71	Power dip ride-through gain Kp	0~100	40	○	0xF947
PB.72	Power dip ride-through integral coefficient Ki	0~100	30	○	0xF948
PB.73	Deceleration time of power dip ride-through	0~300.0s	20.0s	○	0xF949
PB.74	UVW encoder fault detection enable	0:disabled 1:enabled	1	×	0xF94A

PC:Motor 2 Parameters

PC.00	Motor type selection	0:ordinary IM motor 1:VFD driven IM motor 2:PMSM	Model determination	*	0xA200
PC.01	Motor rated power	0.1kW~1000.0kW	Model determination	×	0xA201
PC.02	Motor rated voltage	1V~2000V	Model determination	×	0xA202
PC.03	Motor rated current	0.01A~655.35A(inverter power≤55kW) 0.1A~6553.5A(inverter power>55kW)	Model determination	×	0xA203
PC.04	Motor rated frequency	0.01Hz~max.frequency	Model determination	×	0xA204
PC.05	Motor rated speed	1rpm~65535rpm	Model determination	×	0xA205
PC.06	Stator resistance of IM motor	0.001Ω~65.535Ω (inverter power≤55kW) 0.0001Ω~6.5535Ω(inverter power>55kW)	Tuning parameters	×	0xA206
PC.07	Rotor resistance of IM motor	0.001Ω~65.535Ω (inverter power≤55kW) 0.0001Ω~6.5535Ω(inverter power>55kW)	Tuning parameters	×	0xA207
PC.08	Leakage inductance of IM motor	0.01mH~655.35mH(inverter power≤55kW) 0.001mH~65.535mH(inverter power>55kW)	Tuning parameters	×	0xA208
PC.09	Mutual inductance of IM motor	0.1mH to 6553.5mH(inverter power≤55kW) 0.01mH~655.35mH(inver	Tuning parameters	×	0xA209

		ter power>55kW)			
PC.10	No-load current of IM motor	0.01A~PC-03(inverter power≤55kW) 0.1A~PC.03(inverter power>55kW)	Tuning parameters	×	0xA20A
PC.16	Stator resistance of PMSM motor	0.001~65.535(inverter power≤55kW) 0.0001~6.5535(inverter power>55kW)	Tuning parameters	×	0xA210
PC.17	D-axis inductance of PMSM motor	0.01mH~655.35mH(inverter power≤55kW) 0.001mH~65.535mH(inverter power>55kW)	Tuning parameters	×	0xA211
PC.18	Q-axis inductance of PMSM motor	0.01mH~655.35mH(inverter power≤55kW) 0.001mH~65.535mH(inverter power>55kW)	Tuning parameters	×	0xA212
PC.20	Back-EMF coefficient of PMSM motor	0.1V~6553.5V/krpm	Tuning parameters	×	0xA214
PC.27	Encoder pulses per revolution	1~65535	1024	×	0xA21B
PC.28	Encoder type	0:ABZ encoder 1:UVW encoder 2:resolver 4:Line-saving UVW encoder	0	×	0xA21C
PC.29	Speed feedback PG selection	0:local PG	0	×	0xA21D
PC.30	AB phase sequence of ABZ encoder	0:forward 1:reverse	0	×	0xA21E
PC.34	Number of Pole Pairs of resolver	1~65535	1	×	0xA222
PC.36	IM motor speed feedback PG disconnection detection time	0.0:No action 0.1s to 10.0s	0	×	0xA224
PC.37	Tuning selection	0:No operation 1:IM static tuning 2:IM complete tuning 11:PMSM tuning With load 12:PMSM tuning without load	0	×	0xA225
PC.38	Proportional gain 1 of speed loop	1~100	30	○	0xA226
PC.39	integration time 1 of speed loop	0.01s~10.00s	0.50s	○	0xA227
PC.40	Switching frequency 1	0.00~PC.43	5.00Hz	○	0xA228
PC.41	Proportional gain 2 of speed loop	1~100	20	○	0xA229
PC.42	Integration time 2 of speed loop	0.01s~10.00s	1.00s	○	0xA22A
PC.43	Switching frequency 2	PC.40~Maximum frequency	10.00Hz	○	0xA22B
PC.44	Vector control slip gain of IM motor	50%~200%	100%	○	0xA22C

PC.45	IM motor SVC torque filter constant	0.000s~0.100s	0.000s	○	0xA22D
PC.47	Torque upper limit source in speed control mode	0:PC.48 setting 1:AI1 2:AI2 3:AI3 4:PULSE pulse 5:Communication 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) (Option 1-7 full scale corresponds to PC.48)	0	○	0xA22F
PC.48	Digital setting of torque upper limit in speed control mode	0.0%~200.0%	150.0%	○	0xA230
PC.49	Torque upper limit source for PMSM speed control mode (generating)	0:PC.50 setting 1:AI1 2:AI2 3:AI3 4:PULSE pulse 5:Communication 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) (Option 1-7 full scale corresponds to PC.50)	0	○	0xA231
PC.50	Digital setting of Torque upper limit for PMSM Speed control mode(generating)	0.0%~200.0%	150%	○	0xA232
PC.51	proportional gain of Excitation control	0~60000	2000/ 3000	○	0xA233
PC.52	integral gain of Excitation control	0~60000	1300/ 500	○	0xA234
PC.53	proportional gain of Torque control	0~60000	2000/ 3000	○	0xA235
PC.54	integral gain of Torque control	0~60000	1300/ 500	○	0xA236
PC.55	IM motor speed loop control integral attribute	0:invalid 1:valid	0	○	0xA237
PC.56	Field weakening mode for PMSM motor	0,1,2	1	○	0xA238
PC.57	Field weakening gain of PMSM motor	0～50	5	○	0xA239
PC.60	generating torque upper limit enable for PMSM	0:disabled 1:enabled	0	○	0xA23C
PC.61	Upper limit of regenerative braking power for IM motor	0.0~200.0	20.0	○	0xA23D
	2nd motor control mode (for PMSM motor)	0:Vector control without speed sensor(SVC) 1:Vector control with Speed sensor(FVC) 2:V/F control	0	×	
PC.62	2nd motor control mode (for IM motor)	0:Vector control without speed sensor(SVC) 1:Vector control with	0	○	0xA23E

		speed sensor(FVC) 2:V/F control			
	2nd motor acceleration/ deceleration time selection (for PMSM motor)	0:same as the first motor 1:acc./dec.time 1 2:acc./dec.time 2 3:acc./dec.time 3 4:Acc./dec.time 4	0		
PC.63	2nd motor acceleration/ deceleration time selection (for IM motor)	0:same as the first motor 1:acc./dec.time 1 2:acc./dec.time 2 3:acc./dec.time 3 4:Acc./dec.time 4	0	○	0xA23F
	2nd motor torque boost (for PMSM motor)	0.0%：Automatic torque boost 0.1%~30.0%	Model determination	○	
PC.64	2nd motor torque boost (for IM motor)	0.0%：Automatic torque boost 0.1%~30.0%	Model determination	○	0xA240
PC.65	2nd motor oscillation suppression gain (for PMSM motor)	0~100	40	○	0xA241
PC.66	2nd motor oscillation suppression gain (for IM motor)	0~100	40	○	0xA242
	Depth of weak magnetic field for PMSM motor (regenerative power limit)	0%~50%	5%		
PC.67	PMSM motor initial position angle detection current	50%~180%	80%	○	0xA243
PC.68	PMSM motor initial position angle detection mode	0,1,2	0	○	0xA244
PC.70	PMSM motor salient pole rate adjustment gain	50~500	100	○	0xA246
PC.71	Maximum torque current ratio control of PMSM	0,1	0	○	0xA247
PC.75	Z signal correction for PMSM motor	0,1	1	○	0xA24B
PC.79	Low speed excitation current for PMSM	0~80%	30%	○	0xA24F
PC.80	Low speed carrier frequency of PMSM	0.8kHz~P0.15	1.5kHz	○	0xA250
PC.81	Low frequency braking Mode of PMSM under SVC	0,1	0	○	0xA251
PC.82	Effective frequency of low-frequency braking of PMSM in SVC mode	0~10.00Hz	2.00Hz	○	0xA252
PC.83	Step size of frequency of low-frequency braking of PMSM In SVC mode	0.0005~1.0000Hz	0.0010Hz	○	0xA253
PC.84	PMSM motor SVC low frequency braking current	0~80%	50%	○	0xA254
PC.85	SVC Speed Tracking	0~1	0	○	0xA255
PC.86	Zero-servo enable of PMSM	0~1	0	○	0xA256
PC.87	PMSM motor switching frequency	0.00～PE.02	0.30Hz	○	0xA257

PC.88	Zero-servo speed loop proportional gain of PMSM	1～100	10	○	0xA258
PC.89	Zero-servo speed loop integration time of PMSM	0.01s～10.00s	0.50s	○	0xA259
PC.90	Anti-reverse enable for PMSM shutdown	0,1	0	○	0xA25A
PC.91	stop angle for PMSM	0.0°～10.0°	0.8°	○	0xA25B

PD:Torque Control and Restricting Parameters

PD.00	Speed/torque control selection	0:speed control 1:torque control	0	×	0xA000
PD.01	Torque setting source in torque control	0:Digital setting(PD.03) 1:AI1 2:AI2 3:AI3 4:PULSE pulse 5:Communication 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) (Option 1-7 full scale corresponds to PE.10)	0	×	0xA001
PD.03	Torque digital setting in torque control mode	-200.0%～200.0%	150.0%	○	0xA003
PD.05	Forward max.frequency in torque control mode	0.00Hz ～ Maximum frequency	50.00Hz	○	0xA005
PD.06	Reverse max.frequency in torque control mode	0.00Hz ～ Maximum frequency	50.00Hz	○	0xA006
PD.07	Acceleration time in Torque control mode	0.00s～650s	0.00s	○	0xA007
PD.08	Deceleration time in Torque control mode	0.00s～650s	0.00s	○	0xA008

PE:Vector Control Parameters for motor 1

PE.00	Speed loop proportional gain 1	1～100	Model determination	○	0xF200
PE.01	Speed loop integration time 1	0.01s～10.00s	0.50s	○	0xF201
PE.02	Switching frequency 1	0.00～PE.05	5.00Hz	○	0xF202
PE.03	Speed loop proportional gain 2	1～100	20	○	0xF203
PE.04	Speed loop integration time 2	0.01s～10.00s	1.00s	○	0xF204
PE.05	Switching frequency 2	PE.02～Max.frequency	10.00Hz	○	0xF205
PE.06	Slip compensation gain for IM motor vector control				
PE.07	Speed feedback filter time For IM motor SVC	0.000s～0.100s	0	○	0xF207
PE.08	Vector control over excitation gain	0~200	64	○	0xF208
PE.09	Torque upper limit source in speed mode(driving）	0:PE.10 1:AI1 2:AI2 3:AI3 4:X5 pulse setting	0	○	0xF209

		5:Communication 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) (Option 1-7 full scale corresponds to PE.10)			
PE.10	Digital setting of torque upper limit in speed mode(driving)	0.0%～200.0%	150.0%	○	0xF20A
PE.11	torque upper limit source in speed mode(generating)	0:PE.12 1:AI1 2:AI2 3:AI3 4:PULSE pulse setting 5:Communication 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) (Option 1-7 full scale corresponds to PE.10)	0	○	0xF20B
PE.12	Digital setting of torque upper limit in speed mode(generating)	0.0%～200.0%	150.0%	○	0xF20C
PE.13	Excitation adjustment proportional gain	0～60000	Model determination	○	0xF20D
PE.14	Excitation adjustment integral gain	0～60000	Model determination	○	0xF20E
PE.15	Torque adjustment Proportional gain	0～60000	Model determination	○	0xF20F
PE.16	Torque adjustment Integral gain	0～60000	Model determination	○	0xF210
PE.17	Speed loop integral separation selection	0:disabled 1:enabled	0	○	0xF211
PE.18	Field weakening mode for PMSM	0,1,2	1	○	0xF212
PE.19	Field weakening gain for PMSM	0～50	5	○	0xF213
PE.20	Maximum weak magnetic current of PMSM	1~300	50	○	0xF214
PE.21	Maximum torque coefficient in the weak magnetic zone of IM motor	50~200%	100%	○	0xF215
	Automatic tuning coefficient of weak magnetic field for PMSM	10~500%	100%		
PE.22	Generating torque Upper limit enabled for IM	0,1	0	○	0xF216
	Integral multiple for weak field control of PMSM	0~1	0		
PE.23	Upper limit of regenerative power of IM	100%～120%	100%	○	0xF217
	Depth of weak magnetic field in PMSM (Regenerative power limit)	0~50%	5%		

PE.24	detection current for rotor initial position angle of PMSM	50%～180%	80%	○	0xF218
PE.25	PMSM initial position angle detection selection	0,1,2	0	○	0xF219
PE.27	PMSM motor salient pole Rate adjustment gain	50～500	100	○	0xF21B
PE.28	Selection of maximum torque current ratio control for PMSM motor	0,1	0	○	0xF21C
PE.32	Incremental encoder Z signal Correction for PMSM	0,1	1	○	0xF220
PE.36	Low speed excitation current for PMSM	0～80%	30%	○	0xF224
PE.37	Low speed carrier frequency for PMSM	0.8K～P0-15	1.5K	○	0xF225
PE.38	Low frequency run mode for PMSM SVC	0,1	0	○	0xF226
PE.39	Low frequency braking effective frequency for PMSM SVC	0～10.00Hz	2.00Hz	○	0xF227
PE.40	Low frequency braking frequency change step size For PMSM SVC	0.0005～1.0000Hz	0.0010Hz	○	0xF228
PE.41	Low frequency braking Current for PMSM SVC	0～80%	50%	○	0xF229
PE.42	SVC Speed Tracking for PMSM	0～1	0	○	0xF22A
PE.43	Zero servo enable for PMSM	0～1	0	○	0xF22B
PE.44	Switching frequency for PMSM	0.00～PE.02	0.30Hz	○	0xF22C
PE.45	Zero servo speed loop proportional gain for PMSM	1～100	10	○	0xF22D
PE.46	Zero servo speed loop integration time for PMSM	0.01s～10.00s	0.50s	○	0xF22E
PE.47	shutdown anti-reverse enable for PMSM	0～1	0	○	0xF22F
PE.48	PMSM stop angle	0.0°～10.0°	0.8°	○	0xF230

PH:Operation Panel and Display

PH.00	Reserved	0	0	—	0xF700
PH.01	JOG key function selection	0:JOG is invalid 1:Switch between the operation panel command channel and remote command channel(terminal command channel or communication command channel) 2:forward and reverse switching 3:forward jog 4:Reverse jog	0	×	0xF701
PH.02	STOP/RESET key stop Function selection	0:Only in keyboard operation mode,STOP/RES key	1	○	0xF702

		Stop function is valid 1:In any operation mode,the STOP/RES key shutdown function is valid			
PH.03	LED running display parameter 1	0000 to FFFF Bit00:Running frequency 1(Hz) Bit01:Set frequency(Hz) Bit02:Bus voltage(V) Bit03:Output voltage(V) Bit04:Output current(A) Bit05:Output power(kW) Bit06:Output torque(%) Bit07:X input status Bit08:Y output status Bit09:AI1 voltage(V) Bit10:AI2 voltage(V) Bit11:AI3 voltage(V) Bit12:count value Bit13:Length value Bit14:Load speed display Bit15:PID setting	401F	○	0xF703
PH.04	LED running display parameter 2	0000 to FFFF Bit00:PID feedback Bit01:PLC stage Bit02:PULSE input pulse frequency(kHz) Bit03:Running frequency 2(Hz) Bit04:Remaining running time Bit05:Voltage before AI1 correction(V) Bit06:Voltage before AI2(V) Bit07:Voltage before AI3(V) Bit08:Line speed Bit09:Current power-on time(Hour) Bit10:Current running time(Min) Bit11:PULSE input pulse frequency(Hz) Bit12:Communication setting value Bit13:encoder feedback speed(Hz) Bit14:Main frequency X display(Hz) Bit15:auxiliary frequency Y display(Hz)	0	○	0xF704
PH.05	LED stop display parameter	0000 to FFFF Bit00:Set frequency(Hz) Bit01:Bus voltage(V)	33	○	0xF705

		Bit02:X input status Bit03:Y 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 setting Bit12:PULSE input pulse frequency(kHz)			
PH.06	Load speed display factor	0.0001～6.5000	1.0000	○	0xF706
PH.07	Inverter module temperature	0℃～120℃	-	*	0xF707
PH.08	Temporary Software Version Number	F.20:for IM motor F.21:for PMSM	-	*	0xF708
PH.09	Cumulative running time	0h～65535h	-	*	0xF709
PH.10	Product ID	-	-	*	0xF70A
PH.11	Software version number	-	-	*	0xF70B
PH.12	Load speed display decimal point	**Ones place**:the number of decimal points for U0.14 0:0 decimal places 1:1 decimal places 2:2 decimal places 3:3 decimal places **Tens place**:U0-19/U0-29 decimal points 1:1 decimal place 2:2 decimal places	21	○	0xF70C
PH.13	Cumulative power-on time	0～65535 hour	-	*	0xF70D
PH.14	Cumulative power consumption	0～65535 degree	-	*	0xF70E

PP:Function code management

PP.00	user password	0～65535	0	○	0x1F00
PP.01	Parameter initialization	0:No operation 01:Restore factory parameters,excluding motor parameters 02:Clear record information	0	×	0x1F01
PP.02	reserved		11	×	0x1F02
PP.03	User changed parameter display selection	0:disable 1:enable	0	○	0x1F03
PP.04	Function code modification attribute	0:Can be modified 1:cannot be modified	0	○	0x1F04

A0:AI/AO Correction

A0.00	AI1 Measured voltage 1	0.500V～4.000V	Factory calibration	○	0xAC00
A0.01	AI1 Display voltage 1	0.500V～4.000V	Factory calibration	○	0xAC01
A0.02	AI1 Measured voltage 2	6.000V～9.999V	Factory calibrati	○	0xAC02

			on		
A0.03	AI1 Display voltage 2	6.000V～9.999V	Factory calibration	○	0xAC03
A0.04	AI2 Measured voltage 1	0.500V～4.000V	Factory calibration	○	0xAC04
A0.05	AI2 Display voltage 1	0.500V～4.000V	Factory calibration	○	0xAC05
A0.06	AI2 Measured voltage 2	6.000V～9.999V	Factory calibration	○	0xAC06
A0.07	AI2 Display voltage 2	6.000V～9.999V	Factory calibration	○	0xAC07
A0.08	AI3 Measured voltage 1	-9.999V～10.000V	Factory calibration	○	0xAC08
A0.09	AI3 Display voltage 1	-9.999V～10.000V	Factory calibration	○	0xAC09
A0.10	AI3 Measured voltage 2	-9.999V～10.000V	Factory calibration	○	0xAC0A
A0.11	AI3 Display voltage 2	-9.999V～10.000V	Factory calibration	○	0xAC0B
A0.12	AO1 Target voltage 1	0.500V～4.000V	Factory calibration	○	0xAC0C
A0.13	AO1 Measured voltage 1	0.500V～4.000V	Factory calibration	○	0xAC0D
A0.14	AO1 Target voltage 2	6.000V～9.999V	Factory calibration	○	0xAC0E
A0.15	AO1 Measured voltage 2	6.000V～9.999V	Factory calibration	○	0xAC0F
A0.16	AO2 Target voltage 1	0.500V～4.000V	Factory calibration	○	0xAC10
A0.17	AO2 Measured voltage 1	0.500V～4.000V	Factory calibration	○	0xAC11
A0.18	AO2 Target voltage 2	6.000V～9.999V	Factory calibration	○	0xAC12
A0.19	AO2 Measured voltage 2	6.000V～9.999V	Factory calibration	○	0xAC13

A3:User-defined function code

A3.00	User Function Code 0	P0-00～PP-xx A0-00～Ax-xx（Except itself） C0-xx～C0-xx	P0.00	○	—
A3.01	User Function Code 1		P0.00	○	—
A3.02	User Function Code 2		P0.00	○	—
A3.03	User Function Code 3		P0.00	○	—
A3.04	User Function Code 4		P0.00	○	—
A3.05	User Function Code 5		P0.00	○	—
A3.06	User Function Code 6		P0.00	○	—
A3.07	User Function Code 7		P0.00	○	—
A3.08	User Function Code 8		P0.00	○	—
A3.09	User Function Code 9		P0.00	○	—
A3.10	User Function Code 10		P0.00	○	—
A3.11	User Function Code 11		P0.00	○	—
A3.12	User Function Code 12		P0.00	○	—
A3.13	User Function Code 13		P0.00	○	—
A3.14	User Function Code 14		P0.00	○	—
A3.15	User Function Code 15		P0.00	○	—
A3.16	User Function Code 16		P0.00	○	—
A3.17	User Function Code 17		P0.00	○	—
A3.18	User Function Code 18		P0.00	○	—
A3.19	User Function Code 19		P0.00	○	—
A3.20	User Function Code 20		P0.00	○	—
A3.21	User Function Code 21		P0.00	○	—
A3.22	User Function Code 22		P0.00	○	—
A3.23	User Function Code 23		P0.00	○	—
A3.24	User Function Code 24		P0.00	○	—
A3.25	User Function Code 25		P0.00	○	—
A3.26	User Function Code 26		P0.00	○	—
A3.27	User Function Code 27		P0.00	○	—
A3.28	User Function Code 28		P0.00	○	—
A3.29	User Function Code 29		P0.00	○	—
A3.30	User Function Code 30		P0.00	○	—
A3.31	User Function Code 31		P0.00	○	—

A5:Point-point Communication

A5.00	Point-point communication selection	0:disabled 1:enabled	0	○	0xA800
A5.01	Master or slave selection	0:Master 1:Slave	0	○	0xA801
A5.02	Selection of action of the slave in point-point communication	**Ones place:** Whether the slave to Follow master command. 0:No 1:Yes **Tens place:** Whether the slave to Sned fault information To master when a fault occurs. 0:No 1:Yes **Hundrds place:** whether the host to alarm	000	×	0xA802

		when slave becomes off-line. 0:No 1:Yes(E16)			
A5.03	The slave received data	0:Torque reference 1:frequency reference	0	○	0xA803
A5..04	zero offset of Received data(torque)	-100.00%～100.00%	0.00%	×	0xA804
A5.05	Gain of received data(torque)	-10.00～100.00	1.00	×	0xA805
A5.06	interruption detection time	0.0～10.0s	1.0s	○	0xA806
A5.07	host data transmission cycle	0.001～10.000s	0.001s	○	0xA807
A5.08	Received data bias(frequency)	-100.00%～100.00%	0.00%	×	0xA808
A5.09	Received data gain(frequency)	-10.00～100.00	1.00	×	0xA809
A5.10	Preventing speeding factor	0.00%～100.00%	10.00%	×	0xA80A

C0:Monitoring Parameters

Function code	Parameter Name	Minimum unit	Modbus address
C0.00	Operating frequency(Hz)	0.01Hz	0x7000
C0.01	Set frequency(Hz)	0.01Hz	0x7001
C0.02	Bus voltage(V)	0.1V	0x7002
C0.03	The output voltage(V)	1V	0x7003
C0.04	Output current(A)	0.01A	0x7004
C0.05	Output Power(kW)	0.1kW	0x7005
C0.06	Output torque(%)	0.1%	0x7006
C0.07	X Input status	1	0x7007
C0.08	Y Output status	1	0x7008
C0.09	AI1 Voltage(V)	0.01V	0x7009
C0.10	AI2 Voltage/Current(mA)	0.01V/0.01mA	0x700A
C0.11	AI3 Voltage(V)	0.01V	0x700B
C0.12	Count value	1	0x700C
C0.13	Length value	1	0x700D
C0.14	Load speed display	1	0x700E
C0.15	PID setting	1	0x700F
C0.16	PID feedback	1	0x7010
C0.17	PLC stage	1	0x7011
C0.18	PULSE input pulse frequency(Hz)	0.01kHz	0x7012
C0.19	Feedback speed(Hz)	0.01Hz	0x7013
C0.20	Remaining running time	0.1Min	0x7014
C0.21	AI1 Voltage before correction	0.001V	0x7015
C0.22	AI2 Voltage/Current before correction	0.001V/0.01mA	0x7016
C0.23	AI3 Voltage before correction	0.001V	0x7017
C0.24	Line speed	1m/Min	0x7018
C0.25	Current power-on time	1Min	0x7019
C0.26	Current running time	0.1Min	0x701A
C0.27	PULSE input pulse frequency	1Hz	0x701B
C0.28	Communication setting	0.01%	0x701C
C0.29	Encoder feedback speed	0.01Hz	0x701D
C0.30	Main frequency X display	0.01Hz	0x701E
C0.31	Secondary frequency Y display	0.01Hz	0x701F
C0.32	View any memory address value	1	0x7020
C0.34	Motor temperature value	1℃	0x7022

C0.35	Target torque(%)	0.1%	0x7023
C0.36	Resolver position	1	0x7024
C0.37	Power factor angle	0.1°	0x7025
C0.38	ABZ position	1	0x7026
C0.39	VF separation target voltage	1V	0x7027
C0.40	VF separation output voltage	1V	0x7028
C0.41	X input status visual display	1	0x7029
C0.42	Intuitive display of Y input status	1	0x702A
C0.43	X function status visual display 1(function 01 to 40)	1	0x702B
C0.44	X function status visual display 2(function 41 to 80)	1	0x702C
C0.45	fault information	1	0x702D
C0.58	Z signal counter	1	0x703A
C0.59	Set frequency(%)	0.01%	0x703B
C0.60	Operating frequency(%)	0.01%	0x703C
C0.61	Inverter status	1	0x703D
C0.62	Current fault code	1	0x703E
C0.63	Point-to-point host communication send value	0.01%	0x703F
C0.64	Number of slaves	1	0x7040
C0.65	Upper torque limit	0.1%	0x7041
C0.73	Motor SN	0:Motor 1 1:Motor 2	0x7049
C0.74	Actual output torque of the motor	-100.0%~100.0%	0x704A

Note:IM represents induction asynchronous motor;PMSM stands for permanent magnet synchronous motor.

Chapter 5 Detailed Function Introductions

5.1 Basic Function(Group P0)

P0.00 G/P type display	Setting range:1-2[1]

The inverter model is set due to different load.
1:G model 2:P model

P0.01 Motor 1 Control mode	Setting range:0-2[0]

Notes:

This parameter is used to select the speed control mode of the inverter.0:Sensorless flux vector control(SVC)

It indicates open-loop vector control,and is applicable to high-performance control applications such as machine tool,centrifuge,wire drawing machine and injection moulding machine.One AC drive can operate only one motor.

1:Vector control with speed sensor(FVC)

It is applicable to high-accuracy speed control or torque control applications such as high-speed paper making machine,crane and elevator.One AC drive can operate only one motor.An encoder must be installed at the motor side,and a PG card matching the encoder must be installed at the AC drive side.

2:Voltage/Frequency(V/F)control

It is suitable for occasions where the load requirement is not high,or one inverter drives multiple motors,such as fans and pumps.It can be used in a situation where one inverter drives multiple motors.

Notes:

The motor parameter tuning process must be carried out when selecting the vector control mode.Only accurate motor parameters can take advantage of the vector control method.By adjusting the speed regulator parameter PE group function code(the second motor is the PC group),you can get better performance.

P0.02 Command source selection	Setting range:0-2[0]

Description:

Select the channel of the inverter control command.Inverter control commands include:start,stop,forward,reverse,jog,fault reset,etc.

0:keyboard command channel("REMOTE"light goes out);

The operation command is controlled by the RUN,STOP/RESET buttons on the keyboard panel.

1:Terminal command channel("REMOTE"light is on);

Run command control by multi-function input terminals forward,reverse,forward jog,reverse jog,etc.

2:Communication command channel("REMOTE"flashes);

The running command is controlled by the host computer through communication.

P0.03 Main frequency source X selection	Setting range:0-9[1]
0:P0.08(no memory when power off)	1:P0.08(memory when power off)
2:AI1	3:AI2
4:AI3	5:Pulse setting(X5)
6:Multi-reference	7:Simple PLC
8:PID	9:Communication

Description:

Select the inverter X frequency command input channel.There are 10 kinds of main given frequency channels:

0:Keyboard setting(no memory when power off)

The frequency can be modified by modifying the value of the function code P0.08,and the set frequency value of the inverter can be changed by the UP and DOWN keys of the keyboard to achieve the purpose of setting the frequency of the keyboard.

1:Keyboard setting(power-down memory)

The frequency can be modified by modifying the value of the function code P0.08,and the set frequency value of the inverter can be changed by the UP and DOWN keys of the keyboard to achieve the purpose of setting the frequency of the keyboard.

When the inverter is powered off and powered on again,the set frequency is the setting frequency at the last power-off time,and the memorized frequency can be corrected by UP and DOWN keys.

2:Analog AI1 setting

3:Analog AI2 setting

The frequency is set by the analog input terminal.The standard configuration of the inverter provides 2 analog input terminals,of which AI1 is 0V~10V voltage input;AI2 is 0~10V/0~20mA input,current/voltage input can be switched by jumper SW7.

100.0%of the analog input corresponds to the maximum frequency(function code P0.10),and-100.0%corresponds to the maximum frequency of the reverse direction(function code P0.10).

4:Analog AI3 setting

The optional I/O expansion card can provide an additional analog input terminal(AI3).

5:High-speed pulse setting(X5)

The frequency setting is set by the terminal high-speed pulse input.The standard configuration of the inverter provides 1 high-speed pulse input(X5).

Pulse voltage:9~30V,pulse frequency:0.0~100.0kHz.

100.0%of the pulse input setting corresponds to the maximum frequency,and-100.0%corresponds to the maximum frequency in the reverse

direction.

Note:Pulse setting can only be input from multi-function terminal X5,and set X5 as high-speed pulse input(P2.04=30).

6:Multi-reference setting

When this frequency setting mode is selected,the inverter runs in multi-reference mode.The parameters of group P2 and group P8 need to be set to determine the given frequency.

7:Simple PLC program setting

Selecting this frequency setting mode,the inverter runs in a simple PLC program.Need to set P8 group parameters to determine the given frequency,running direction,and even the acceleration and deceleration time of each stage.For details,please refer to the introduction of P8 group functions.

8:PID control setting

If this parameter is selected,the inverter operation mode is process PID control.At this time,the P6 group needs to be set.The running frequency of the inverter is the frequency value after PID adjustment.For the meaning of PID given source,given amount and feedback source,please refer to the introduction of P6 group"PID function".

9:Remote communication setting

When it is a point-to-point communication slave and receives data as a frequency reference,use the host to transmit data as the communication reference value(see related instructions in group A5).When using Modbus communication,the data is given by the host computer through the communication address 0x1000.The data format is data with 2 decimal points,and the data range is-P0.10~P0.10.

If the communication protocol is Modbus-RTU,you need to select the corresponding serial communication protocol according to P0.28.

P0.04 Auxiliary frequency source Y selection	Setting range:0-9[0]

The Y frequency instruction is the same as the X frequency instruction when it is used as an independent frequency reference channel(the frequency setting source is selected as the Y reference channel).For details,refer to P0.03.

P0.05 Base value of range of auxiliary Frequency reference for main And auxiliary calculation	Setting range:0-1[0]

Notes:

0:Maximum output frequency.100%of Y frequency setting corresponds to themaximum output frequency.

1:X frequency command.100%of the Y frequency setting corresponds to the frequency given by the X main frequency source.Select this setting if it needs to adjust on the base of X frequency command.

Notes:P0.05 is used only when the frequency Y is used to be superimposed to main reference X.

P0.06 Range of auxiliary frequency Reference for	Setting range:0%–150%[100]

main and auxiliary calculation	

Notes:

When the frequency source is selected as"frequency superposition",the two parameters P0.05 and P0.06 are used to determine the adjustment range of the auxiliary frequency source.Auxiliary frequency adjustment range=P0.06*maximum frequency(when P0.05=0)or=P0.06*X main frequency source set value(when P0.05=1).

P0.07 Frequency source selection	Setting range:ones 0-4[0]Tens 0-3[0]

Notes:

Ones place: Frequency source selection.

0:main frequency source X

1:operation result of main and auxiliary(the operation relationship is determined by the tens place set)

2:Switch between main frequency source X and auxiliary frequency source Y

3:Switch between main frequency source X and operation result of main and auxiliary

4:Switch between Auxiliary frequency source Y and operation result of main and auxiliary

Tens place: Operational relationship between main and auxiliary frequency sources.

0:main X+auxiliary Y 1:main X-auxiliary Y

2:maximum of main X and auxiliary Y 3:Minimum of main X and Auxiliary Y

This parameter selects the frequency reference channel.The frequency is given by the combination of the main frequency source X and the auxiliary frequency source Y.

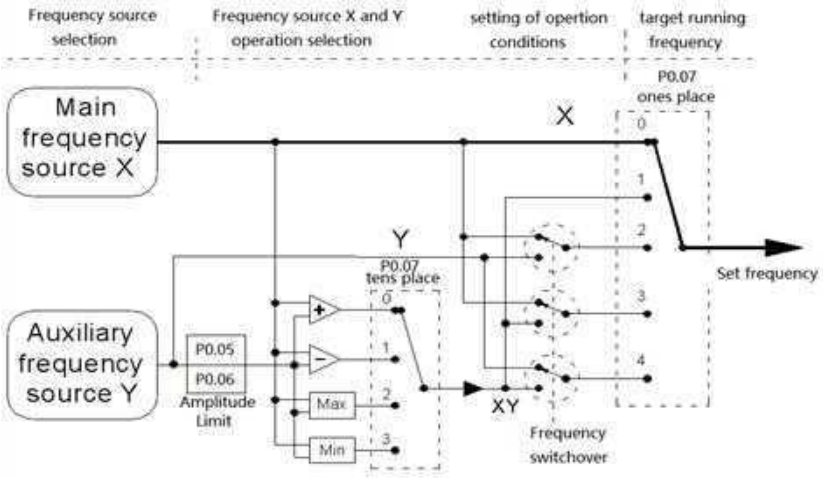


Figure 5-1-1 Schematic diagram of frequency setting method

When the frequency source is selected as the operation result of main and auxiliary,the offset frequency can be set through P0.21,and the offset frequency is superimposed on the main and auxiliary operation result.

P0.08 Preset frequency	Setting range:0.00-P0.10[50.00Hz]

Notes:

When Frequency X command source is set to be Keypad,this parameter is the initial value of inverter reference frequency.

P0.09 Rotation direction	Setting range:0-1[0]

Notes:

0:The default direction.After the frequency converter is powered on,it runs in the actual direction.

1:Run in the opposite direction.Used to change the direction of motor rotation,its function is equivalent to changing the direction of motor rotation by adjusting any two motor wires.

Note: After parameter initialization,the motor's running direction will return to its original state.For situations where it is strictly prohibited to change the motor direction after system debugging,please use it with caution.

P0.10 Maximum frequency	Setting range:50.00H~500.00HZ[50.00Hz]

Notes:

When analog input,pulse input(X5),multi-reference,etc.is used as frequency source,100.0%is relative to P0.10 calibration.

P0.11 Source of frequency upper limit	0-5[0]
0:Set by P0.12	1:AI1
2:AI1	3:AI2
4:Pulse setting(X5)	5:Communication

Notes:

Defines the source of the upper frequency.The upper limit frequency can come from digital setting(P0.12),or from analog input,pulse setting or communication setting.

P0.12 Frequency upper limit	Setting range:P0.14 to P0.10[50Hz]

Notes:

Set the upper limit frequency,the setting range is P0.14 to P0.10.

P0.13 Frequency upper limit offset	Setting range:0.00 Hz to P0.10[0.00Hz]

Notes:

When the upper limit frequency source is set to analog or pulse setting,P0.13 is used as the offset value of the set value,and the offset frequency is added to the upper limit frequency value set by P0.11 as the final upper limit frequency value.

P0.14 Frequency lower limit	Setting range:0.00 Hz to P0.12[0.00Hz]

Notes:

When the frequency command is lower than the lower limit frequency set by P0.14,the inverter can stop,run at the lower limit frequency,or run at zero speed.Which

operation mode can be adopted by P5.14(set frequency is lower than the lower limit frequency operation mode)Settings.

P0.16 Carrier frequency adjustment with temperature	Setting range:0–1

0:No 1:Yes

Notes:

Carrier frequency adjustment with temperature means that when the inverter detects that the temperature of its radiator is high,it will automatically reduce the carrier frequency in order to reduce the temperature rise of the inverter.When the heat sink temperature is low,the carrier frequency is gradually restored to the set value.This function can reduce the chance of inverter overheating alarm.

P0.17 Acceleration time 1	Setting range:0.00–650.00s(P0.19=2) 0.0–6500.0s(P0.19=1),0–65000s(P0.19=0)
P018 Deceleration time 1	Setting range:0.00–650.00s(P0.19=2) 0.0–6500.0s(P0.19=1),0–65000s(P0.19=0)

Notes:

Acceleration time refers to the time required for the inverter to accelerate from zero frequency to the acceleration/deceleration reference frequency(determined by P0.25),See T1 in Figure 5-1-2.Deceleration time refers to the time required for the inverter to decelerate from the acceleration/deceleration reference frequency(determined by P0.25)to zero frequency,see T2 in Figure 5-1-2.

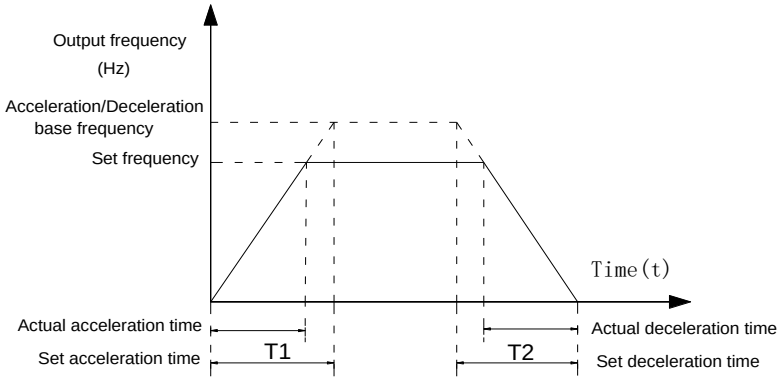


Figure 5-1-2 Schematic diagram of acceleration and deceleration time

When the set frequency is equal to the maximum frequency,the actual acceleration/deceleration time is the same as the set acceleration/deceleration time.

When the set frequency is less than the maximum frequency,the actual acceleration time is less than the set acceleration and deceleration time.

Actual acceleration/deceleration time=set acceleration/deceleration time×(set frequency/maximum frequency)

The inverter has 4 groups of acceleration and deceleration time.

The first group:P0.17,P0.18;

The second group:P5.03,P5.04;

The third group:P5.05,P5.06;

The fourth group:P5.07,P5.08.

The acceleration/deceleration time can be selected by the combination of the acceleration/deceleration time selection terminals in the multifunctional digital input terminal.

P0.19 ACC/DEC unit of time	Setting range:0~2[1]
0:1second	1:0.1 second
2:0.01 second	

P0.21 Frequency offset of Auxiliary frequency setting channel for main and auxiliary calculation	Setting range: 0.00Hz to P0.10[0.00Hz]

This function code is only valid when the frequency source is selected as the main and auxiliary operations.When the frequency source is the main and auxiliary calculation,P0.21 is used as the offset frequency,which is superimposed with the main and auxiliary calculation results as the final frequency setting value,making the frequency setting more flexible.

P0.22 Frequency reference resolution	Setting range:2:0.01Hz[2]
P0.23 Retentive of digital setting frequency upon power failure	Setting range:0~1[0]

0:not retentive 1:retentive

Explanation:

This function is only valid when the frequency source is digitally set."not retentive"means that after the inverter stops,the digital set frequency value is restored to the value of P0.08(set frequency),and the frequency correction by the ∧and∨keys on the keyboard or terminals UP and DOWN is cleared.“retentive”means that after the inverter stops,the digital set frequency is retained as the set frequency at the time of the last stop,and the frequency correction by the keyboard∧and∨keys or terminals UP and DOWN remains valid.

P0.24 Motor parameter group selection	Setting range:0~1[0]
0:Motor parameter group 1	1:Motor parameter group 2

Notes:

The inverter supports the application of dragging two motors in a time-sharing manner.The two motors can set motor nameplate parameters,independent parameter tuning,select different control methods,and independently set parameters related to

running performance.Motor parameter group 1 corresponds to function parameter group P1 and PE group,motor parameter group 2 corresponds to function parameter group PC group.

The user selects the current motor parameter group through the P0.24 function code,and can also switch the motor parameters through the digital input terminal X.When the function code selection conflicts with the terminal selection,the terminal selection shall prevail.

P0.25 Acceleration/Deceleration time base frequency	Setting range:0~2[0]

0:Maximum frequency(P0-10) 1:Set frequency

2:100 Hz

Notes:

The acceleration/deceleration time refers to the acceleration/deceleration time from zero frequency to the frequency set by P0.25.Figure 5-1-2 is a schematic diagram of the acceleration/deceleration time.When P0.25 is selected as 1,the acceleration/

deceleration time is related to the set frequency.If the set frequency changes frequently,the acceleration of the motor will change,so you need to pay attention during application.

P0.26 Base frequency for UP/DOWN modification during running	Setting range:0~1[0]

0:running frequency 1:set frequency

Explanation:

This parameter is valid only when the frequency source is digitally set.It is used to determine the keypad's∨,∨key or terminal UP/DOWN action,which method is used to modify the set frequency,that is,whether the target frequency increases or decreases based on the running frequency,or increases or decreases based on the set frequency.The difference between the two settings is obvious when the inverter is in the process of acceleration and deceleration,that is,if the inverter's operating frequency is different from the set frequency,the different choices of this parameter are very different.

P0.27 Binding command source to frequency source	Setting range:000~999[000]

Ones place:operation panel command binding frequency source selection

0:No binding 1:Digitally set frequency source

2:AI1 3:AI2

4:AI3 5:Pulse setting(X5)

6:Multi-speed running setting 7:Simple PLC program setting

8:PID control setting 9:Remote communication setting

Tens place:

terminal command binding frequency source selection(0 to 9,same as ones place)

Hundreds place:

terminal command binding frequency source selection(0 to 9,same as ones place)

Define the binding combinations between three types of running command channels and nine frequency given channels to facilitate synchronous switching.The meaning of the above frequency given channel is the same as the main frequency source X select P0.03,please refer to the description of P0.03.Different running command channels can be bundled with the same frequency given channel.When the command source has a bundled frequency source,during the validity period of the command source,the frequency source set by P0.03~P0.07 will no longer work.

5.2 First Motor Parameters(Group P1)

P1.00 Motor type selection	Setting range:0-1[0]

0:ordinary IM motor
1:variable frequency driven IM motor
2:PMSM

The asynchronous motor inverter leaves the factory as 0,and the synchronous motor inverter leaves the factory as 2.

P1.01 Rated Motor power	Setting range:0.4~1000.0kW[Depend on model]
P1.02 Rated motor voltage	Setting range:1-2000V
P1.03 Rated motor current	Setting range:0.01–655.35 A(power≤55 kW) 0.1–6553.5 A(power>55 kW)
P1.04 Rated motor frequency	Setting range:0-800V[Depend on model]
P1.05 Rated motor speed	Setting range:1–65535 RPM

P1.06 Motor stator resistance (IM motor)	Setting range: 0.001–65.535**Ω**(power≤55kW)0.0001–6.5535**Ω**(power>55 kW)
P1.07 Motor rotor resistance (IM motor)	Setting range: 0.001–65.535**Ω**(power≤55kW)0.0001–6.5535**Ω**(power>55 kW)
P1.08 Leakage inductive reactance (IM motor)	Setting range: 0.01–655.35mH(power≤55kW)0.001–65.535mH(power>55 kW)
P1.09 Mutual inductive reactance (IM motor)	Setting range: 0.1–6553.5mH(power≤55kW)0.01–-655.35mH(power>55 kW)
P1.10 No-load current(IM motor)	Setting range: 0.01 to P1-03(power≤55 kW) 0.1 toP1-03(power>55 kW)

Notes:

P1.06~P1.10 are the parameters of IM motor.These parameters are generally not on the nameplate of the motor and need to be obtained through automatic tuning of the

inverter.Among them,"IM motor Static Tuning"can only obtain three parameters of P1.06~P1.08,while"IM motor Dynamic Tuning"can obtain all 5 parameters here,as well as encoder phase sequence and current loop PI 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 parameter values of P1.06~P1.10 to restore these 5 parameters to the commonly used standard Y series motor parameters.If it is impossible to tune the asynchronous motor on site,you can enter the corresponding function code above according to the parameters provided by the motor manufacturer.

P1.16 Stator resistance of PMSM	0.001~65.535(power≤55kW) 0.0001~6.5535(power>55kW)
P1.17 D-axis inductance of PMSM	0.01mH~655.35mH(power≤55kW) 0.001mH~65.535mH(power>55kW)
P1.18 Q-axis inductance of PMSM	0.01mH~655.35mH(power≤55kW) 0.001mH~65.535mH(power>55kW)
P1.20 Back-EMF coefficient of PMSM	0.1V~6553.5V

P1.16~P1.20 are the parameters of PMSM motors.These parameters are generally not on the motor nameplate and need to be obtained through automatic tuning of the inverter.Among them,"PMSM motor auto-tuning with load"can only obtain three parameters of P1-16~P1-18,and"PMSM motor auto-tuning without load"can obtain all four parameters here.If it is impossible to tune the PMSM motor on site,you can enter the corresponding function code above according to the parameters provided by the motor manufacturer.

P1.27 Encoder pulses per revolution	Setting range:1–65535[1024]

Notes:

Set the number of pulses per revolution of the ABZ or UVW incremental encoder.In the vector control mode with speed sensor,the encoder pulse number must be set correctly,otherwise the motor operation will be abnormal.

P1.28 Encoder Type	Setting range:0-4[0]

0:ABZ incremental encoder 1:UVW incremental encoder

2:resolver 3:sine and cosine encoder

4:Line-saving UVW encoder

Explanation:

The inverter supports multiple encoder types.Different encoders need to be equipped with different PG cards.Please use the correct PG card when using it.Asynchronous motors generally only use ABZ incremental encoders and resolvers.After installing the PG card,set P1.28 correctly according to the actual situation,otherwise the inverter may not run properly.

P1.30 A/B phase sequence of ABZ incremental encoder	Setting range:0-1[0]

0:forward 1:reverse

This function code is only valid for the ABZ incremental encoder,that is,it is only valid when P1.28=0.Used to set the phase sequence of AB signal of ABZ incremental encoder.This function code is valid for asynchronous motors.When the asynchronous motor is dynamically tuned,the AB phase sequence of the ABZ encoder can be obtained.

P1.33 UVW encoder angle offset	Setting range:0.0°–359.9°[0.0°]
P1.34 Number of pole pairs of resolver	Setting range:1–65535[0]

Notes:

The resolver has a pole pair number.When using this encoder,the pole pair number parameter must be set correctly.

P1.36 Encoder wire-break fault detection time	Setting range:0.0s:No action 0.1~10.0s[0.0s]

Notes:

It is used to set the encoder disconnection fault detection time.When it is set to 0.0s,the inverter will not detect the encoder disconnection fault.When the inverter detects a disconnection fault and the duration exceeds the setting time of P1.36,the inverter alarms E20.

P1.37 Auto-tuning selection	Setting range:0-3[0]
0:No auto-tuning	1:IM motor static auto-tuning1
2: IM motor dynamic auto-tuning	3.IM motor static auto-tuning2
11:PMSM auto-tuning with load	12:PMSM auto-tuning without load

Explanation:

In order to ensure the best control performance of the inverter during vector control of asynchronous motors,please disconnect the load from the motor and use rotary tuning for motor parameter self-learning,otherwise it will affect the vector control effect.When the motor with a large inertia load is not easy to disconnect and vector control is required,use static tuning 2.Before parameter self-learning,the motor type and nameplate parameters P1.00~P1.05 must be correctly set.For closed-loop vector control,the encoder type and pulse number P1.27 and P1.28 must be additionally set.

Tuning action description:Set the motor nameplate parameters and self-learning type,and then press the RUN key,the inverter will perform static tuning.

0:No operation,that is,tuning is prohibited.

1:IM motor static auto-tuning1.It is suitable for occasions where asynchronous motors and large inertia loads are not easy to disconnect and cannot perform rotary tuning.

2:IM motor dynamic auto-tuning.In the process of dynamic tuning,the inverter first performs static tuning,and then accelerates to 80%of the rated frequency of the

motor according to the acceleration time P0.17.After a period of time,it decelerates to stop according to the deceleration time P0.18 and ends Tune.

3:IM motor static auto-tuning2.This is suitable for the case of no encoder,motor self-learning when the motor is stationary(the motor may still have a slight jitter at this time,need to pay attention to safety).Action description:set the function code to 3,and then RUN key,the inverter will perform no-load tuning.

In vector control of PMSM motor,the auto-tuning with load is adopted only when the motor has a large inertia load and it is not easy to disconnect.

The motor type and nameplate parameters P1.01~P1.05 must be correctly set before parameter self-learning.For closed-loop vector control,the encoder type and pulse number P1.27,P1.28 or P1.34 must be additionally set.

11:PMSM auto-tuning with load.This is suitable for occasions where the load of large inertia is not easy to disconnect.

12:PMSM auto-tuning without load.During the no-load tuning process,the inverter first performs static tuning or slowly rotates,and then slowly accelerates to 40%of the rated frequency of the motor.After a period of time,it decelerates to stop and ends tuning.

Note:Motor auto tuning can be carried out in keyboard operation mode,terminal mode,and communication mode.

5.3 Input terminal(Group P2)

P2.00 X1 terminal function selection	default:[1](forward run)
P2.01 X2 terminal function selection	default:[4](forward jog)
P2.02 X3 terminal function selection	default:[9](fault reset)
P2.03 X4 terminal function selection	default:[12](multi-stage speed 1)
P2.04 X5 terminal function selection	default:[13](multi-stage speed 2)
P2.05 X6 terminal function selection	default:[0]
P2.05 X7 terminal function selection	default:[0]
P2.05 X8 terminal function selection	default:[0]
P2.05 X9 terminal function selection	default:[0]
P2.05 X10 terminal function selection	default:[0]

Notes:

The inverter series is equipped with 5 multi-function digital input terminals as standard(X5 can be used as high-speed pulse input terminals)and 2 analog input terminals.If the system needs more input and output terminals,a multi-function input and output expansion card can be selected.Multi-function input/output expansion card has five multi-function digital input terminals(X6 to X10).

This group of parameters is used to set the function corresponding to the digital multi-function input terminal.

0:No function(You can set unused terminals to"No function"to prevent malfunction.)

1:Forward run(FWD)2:Reverse run(REV)

When the running command channel is terminal control,the running command of the inverter is given by the above terminal functions.

3:Three-line operation control

Three-wire control input terminal.For details,refer to P2.11 Three-Wire Function Code Introduction.

4:forward jog(FJOG)5:Reverse jog(RJOG)

For specific jog frequency and acceleration/deceleration time,refer to the descriptions of P5.00,P5.01,and P5.02.

6:Terminal UP 7:Terminal DOWN

The terminals selecting these two functions are used to increase or decrease target frequency when frequency reference is input via external DI terminal,or when frequency source is digital setting.

8:Coast to stop

The inverter blocks the output.At this time,the stopping process of the motor is not controlled by the inverter.This method has the same meaning as coast to stop described in P4.10.

9:Fault reset(RESET)

Function of resetting faults using terminals.Has the same function as the RESET key on the keyboard.With this function,remote fault reset can be realized.

10:Operation pause

The inverter decelerates to stop,but all operating parameters are memorized.Such as PLC parameters,swing frequency parameters,PID parameters.After this terminal signal disappears,the inverter returns to the running state before stopping.

11:Normally open input for external fault

When this signal is sent to the inverter,the inverter reports fault E15,and performs fault handling according to the fault protection action mode(for details,see function code PB.47).

12,13,14,15:Multi-reference terminal 1~4

Through the combination of the states of these four terminals,16-speed setting can be realized.

Note:Multi-reference terminal 1 is low,and multi-reference terminal 4 is high.

Multi-reference 4	Multi-reference 3	Multi-reference 2	Multi-reference 1
BIT3	BIT2	BIT1	BIT0

16,17:Acceleration/deceleration time selection terminal 1,2

Select the 4 groups of acceleration and deceleration time through the combination of the states of these two terminals:

terminal2	terminal1	terminal	**parameter**
OFF	OFF	Acceleration and deceleration time 0	P0.13 P0.14
OFF	ON	Acceleration and deceleration time 1	P5.00 P5.01

ON	OFF	Acceleration and deceleration time 2	P5.02 P5.03
ON	ON	Acceleration and deceleration time 3	P5.04 P5.05

18:Frequency source switching

Used to switch between different frequency sources.According to the setting of the frequency source selection function code(P0.07),this terminal is used to switch between the two frequency sources when it is set to switch between two types of frequency sources.

19:UP/DOWN setting is cleared(terminal,keyboard)

When the target frequency is set to be given by P0.08,this terminal can clear the frequency value changed by the terminal UP/DOWN or the keyboard UP/DOWN,and restore the given frequency to the value set by P0.08.

20:Control command switching terminal 1

When the command source is set to terminal control(P0.02=1),this terminal can switch between terminal control and keyboard control.

When the command source is set to communication control(P0.02=2),this terminal can switch between communication control and keyboard control.

21:acceleration/deceleration prohibited

Ensure that the inverter is not affected by external signals(except the stop command)and maintain the current output frequency.

22:PID control suspended

PID is temporarily disabled,and the inverter maintains the current frequency output.

23:Simple PLC reset

Restart the simple PLC process and clear the previous PLC state memory information.

24:Swing frequency pause

The inverter outputs at the center frequency.The wobble frequency function is suspended.

25:Register input

Input terminal for counting pulses.

26:Counter reset

Clear the counter status.

27:Length count input

Input terminal for length counting.

28:Length reset

The length is cleared.

29:Torque control disabled

The inverter is prohibited from torque control mode,and the inverter will switch to speed control mode.

30:Pulse frequency input(only valid for X5 terminal)

X5 functions as a pulse input terminal.

31:reserved

32:Immediate DC braking

When this terminal is valid,the inverter directly switches to the DC braking state.

33:Normally closed input for external fault

When the external fault normally closed signal is sent to the inverter,the inverter reports fault E15 and stops.

34:frequency modification enable

If the X terminal is valid,frequency modification is allowed;if the X terminal is invalid,frequency modification is prohibited.

35:PID action direction is reversed

When this terminal is valid,the action direction of PID is opposite to the direction set by P6.03.

36:External parking terminal 1

During keyboard control,this terminal can be used to stop the inverter,which is equivalent to the function of the STOP key on the keyboard.

37:Control command switching terminal 2

Used to switch between terminal control and communication control.If the command source is selected as terminal control,the system switches to communication control when the terminal is valid;vice versa.

38:PID integration suspended

When this 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 effective.

39:Switch between frequency source X and set frequency

If this terminal is valid,the frequency source X is replaced by the set frequency(P0.08).

40:Switch between frequency source Y and set frequency

If this terminal is valid,the frequency source Y will be replaced by the set frequency(P0.08).

41:Motor terminal selection function

Through the two states of the terminal,two groups of motor parameters can be switched.For details,see Appendix 3.

42:Reserved

43:PID parameter switching

When the PID parameter switching condition is X terminal(P6.18=1),when this terminal is invalid,PID parameters use P6.05~P6.07;when this terminal is valid,use P6.15~P6.17.

44:User-defined fault 1

45:User-defined fault 2

When user-defined faults 1 and 2 are valid,the inverter will alarm E27 and E28 respectively,and the inverter will select the action mode selected by PB.49 according to the fault protection action for processing.

46:Speed control/torque control switching

This terminal function makes the inverter switching between torque control mode and speed control mode.When this terminal is invalid,the inverter runs in the mode defined by PD.00(speed/torque control mode).If this terminal is valid,it switches to another mode.It can be switched through the terminal during operation,and it takes effect immediately after switching.

47:Emergency stop

When this terminal function is valid,the inverter will stop at the fastest speed,and the current is in the set current upper limit during this stop.This function is used when the system is in an emergency state and the inverter needs to stop as soon as possible.

48:External parking terminal 2

In any control mode(panel control,terminal control,communication control),you can use this terminal function to decelerate and stop the inverter.At this time,the deceleration time is fixed to deceleration time 4.

49:DC braking with deceleration

When this terminal function is valid,the inverter first decelerates to the starting DC braking frequency at stop,and then switches to the DC braking state.

50:The running time is cleared

When this terminal function is valid,the timing time of the inverter's current operation is cleared.This function needs to be used in conjunction with the timing operation(P5.42)and the current operation time arrival(P5.53).

51:Two-line/three-line switching

This terminal function is used to switch between two-wire control mode and three-wire control mode.For example,if P2.11 is set to be two-wire type 1,the terminal will switch to three-wire type 1 when this terminal function is valid.

52:Reverse prohibited

If this terminal function is effective,it is prohibited for the inverter to reverse run.Same function as P5.13.

Four multi-reference terminals can be combined into 16 states,and these 16 states correspond to 16 command values.The details are shown in follow table.

Table 5-3-1 function description of Multi-reference instruction

K4	K3	K2	K1	Instruction setting	parameter
OFF	OFF	OFF	OFF	0	P8.00
OFF	OFF	OFF	**ON**	1	P8.01
OFF	OFF	**ON**	OFF	2	P8.02
OFF	OFF	**ON**	ON	3	P8.03
OFF	**ON**	OFF	OFF	4	P8.04
OFF	**ON**	OFF	**ON**	5	P8.05
OFF	**ON**	**ON**	OFF	6	P8.06
OFF	**ON**	**ON**	**ON**	7	P8.07
ON	OFF	OFF	OFF	8	P8.08
ON	OFF	OFF	**ON**	9	P8.09
ON	OFF	**ON**	OFF	10	P8.10
ON	OFF	**ON**	**ON**	11	P8.11
ON	**ON**	OFF	OFF	12	P8.12
ON	**ON**	OFF	**ON**	13	P8.13
ON	**ON**	**ON**	OFF	14	P8.14
ON	**ON**	**ON**	**ON**	15	P8.15

When the frequency source is selected as multi-reference,100.0%of function codes P8.00~P8.15 corresponds to the maximum frequency P0.10.In addition to the multi-reference speed function,the multi-reference instruction can also be used as a PID reference source,or as a voltage source for VF separation control,to meet the needs of switching between different given values.

Table 5-3-2 Function description of acc./dec.time selection terminal

terminal2	terminal1	Acceleration or deceleration time selection	parameter
OFF	OFF	acceleration time 1	P0.17、P0.18
OFF	ON	acceleration time 2	P5.03、P5.04
ON	OFF	acceleration time 3	P5.05、P5.06
ON	ON	acceleration time 4	P5.07、P5.08

Table 5-3-3 function description of Motor selection terminal

terminal1	Motor	parameter

OFF	motor1	P1、PE
ON	motor2	PC

P2.10 X Filter time	Setting range:0.000~1.000s[0.010s]

Notes:

This parameter sets the software filtering time for the X terminal.If the input terminal is liable to be interfered in the use occasion and causes misoperation,this parameter can be increased to enhance the anti-interference ability.However,increasing the filtering time will cause the response of the X terminal to slow down.

P2.11 Terminal control mode	Setting range:0~3[0]

Notes:

This parameter defines four different ways to control the inverter operation through external terminals.

0:Two-wire control mode 1.This mode is the most commonly used two-wire mode.Example P2.11=0,P2.00(X1)=1(FWD),P2.01(X2)=2(REV)

K1	K2	RUN Command
OFF	OFF	STOP
ON	OFF	FWD RUN
OFF	ON	REV RUN
ON	ON	KEEP

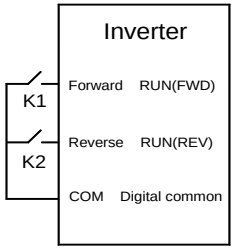


Figure 5-3-1 Two-wire control mode 1

(run and direction are combined)

1:Two-wire control mode 2. The FWD defined when using this mode is the enable terminal.The direction is determined by the state of the defined REV.For example,P2.11=1,P2.00(X1)=1(FWD),P2.01(X2)=2(REV)

K1	K2	RUN Command
OFF	OFF	STOP
ON	OFF	FWD RUN
OFF	ON	STOP
ON	ON	REV RUN

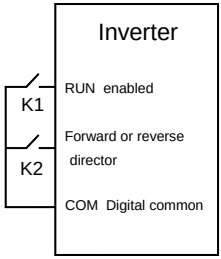


Figure 5-3-2 Two-wire control mode 2

(run and direction are separated)

2:Three-wire control mode 1. In this mode,terminal function 3 is an enable terminal.The forward run command is generated by FWD rising edge and the reverse run command is generated by REV rising edge.Function 3 is normally closed input and function 3 open will cause to stop.For example,as shown in Figure 5-3-3,P2.11=2,P2.00(X1)=1(FWD),P2.01(X2)=2(REV),P2.02(X3)=3.

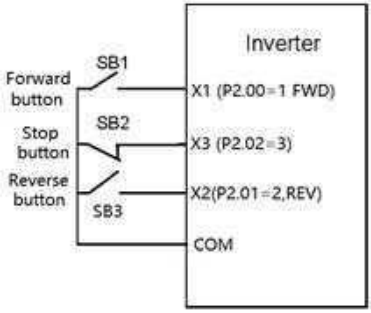


Figure 5-3-3 Three-wire control mode 1

3:Three-wire control mode 2. In this mode,terminal function 3 is an enable terminal.The running command is generated by FWD rising edge,and the REV function determines the direction of run.When the signal of the three wire control function 3 is disconnected,the inverter stops running.For example,as shown in Figure 5-3-4,P2.11=3,P2.00(X1)=1(FWD),P2.01(X2)=2(REV),P2.02(X3)=3.

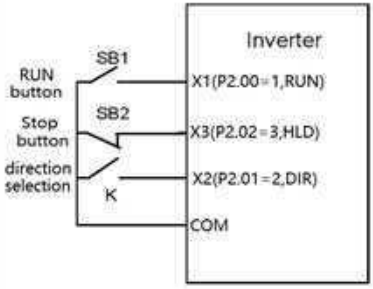


Figure 5-3-4 Three-wire control mode 2

Note: For the two wire control mode,when the FWD/REV terminal is active and the frequency converter is stopped by other sources,even if the control terminal FWD/REV remains active,the frequency converter will not operate after the stop command disappears.If you want the frequency converter to operate,you need to trigger FWD/REV again.For example,effective STOP/RESET shutdown during PLC single cycle shutdown,fixed length shutdown,and terminal control(see PH.02).

P2.12 Terminal UP/DOWN change rate	Setting range:0.001~65.535Hz/s [1.00Hz/s]

This function sets the frequency change rate when using terminal UP/DOWN function to adjust the frequency.

P2.13 Analog curve 1 min. input	Setting range:0.00V~P2.15[0.00V]
P2.14 AI curve 1 min. input setting	Setting range:-100.00%~100.0%[100.0%]
P2.15 Analog curve 1 max. input	Setting range:P2.13~10.00V[10.00V]
P2.16 AI curve 1 max. input setting	Setting range:-100.00%~100.0%[100.0%]
P2.17 AI1 input filter time	Setting range:0.00~10.00s[0.10s]

Notes:

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"(P2.15), the analog voltage is calculated as "Maximum Input", similarly, when the analog input voltage is less than the set "Min Input"P2.13), according to the setting of “AI1 below the minimum input setting selection” (P2.34), it is calculated with the minimum input or 0.0%.

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

AI1 input filter time. It is used to set the software filter time of AI1.When the field analog quantity is easy to be disturbed, please increase the filter time to make the detected analog quantity become stable. The response speed becomes slow. How to set it needs to be weighed according to the actual application.

In different applications, the meaning of the nominal value corresponding to 100.0%of the analog setting is different. Please refer to the description of each application for details.

The following legends show two typical settings:

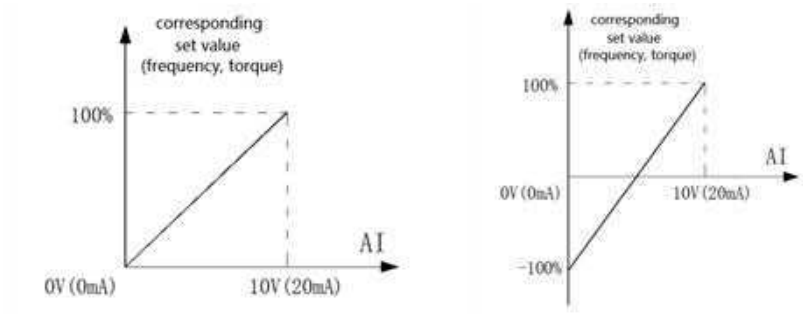


Figure 5-2-5 Correspondence between analog reference and set value

P2.18 AI curve 2 min. input	Setting range:0.00V~P2.20[0.00V]
P2.19 AI curve 2 min. input setting	Setting range:-100.00%~100.0%[0.0%]
P2.20 AI curve 2 max. input	Setting range:P2.18~10.00V[10.00V]
P2.21 AI curve 2 max. input setting	Setting range:-100.00%~100.0%[100.0%]
P2.22 AI2 input filter time	Setting range:0.00~10.00s[0.10s]

Notes:

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

P2.23 AI curve 3 min. input	Setting range:0.00V~P2.25[0.00V]
P2.24 AI curve 3 min. input setting	Setting range:-100.00%~100.0%[0.0%]
P2.25 AI curve 3 max. input	Setting range:P2.23~10.00V[10.00V]
P2.26 AI curve 3 max. input setting	Setting range:-100.00%~100.0%[100.0%]
P2.27 AI3 input filter time	Setting range:0.00~10.00s[0.10s]

Notes:

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

P2.28 PULSE min. input	Setting range:0.00kHz~P2.30[0.00kHz]
P2.29 PULSE min. input setting	Setting range:-100.00%~100.0%[0.0%]
P2.30 PULSE max. input	Setting range:P2.28~50.00kHz[50.00kHz]
P2.31 PULSE max. input setting	Setting range:-100.00%~100.0%[100.0%]
P2.32 PULSE filter time	Setting range:0.00~10.00s[0.10s]

Notes:

This group of function codes defines the corresponding relationship when using X5 terminal pulse as the setting input mode.This set of functions is similar to that of curve 1.

P2.33 AI curve selection	Setting range:000~555[321]

Ones place:

AI1 curve selection 1~5

1：curve 1（2 points，P2.13~P2.16）	2：curve 2（2 points，P2.18~P2.21）
3：curve 2（2 points，P2.23~P2.26）	4：curve 2（4 points，A1.00~A1.07）
5：curve 2（4 points，A1.08~A1.15）	

Tenth place:

AI2 curve selection 1~5(same as above)

Hundreds place:

AI3 curve selection 1~5(same as above)

The ones place and tens place of this function code are used for selection respectively,and the corresponding setting curve of analog input AI1 and AI2.Two analog inputs can select any one of the five types of curves.

Curve 1,curve 2,and curve 3 are 2-point curves,which are set in the function code of group P2,while curve 4 and curve 5 are both 4-point curves,which need to be set in the function code of group A1.

P2.34 AI below minimum input setting selection	Range:000~111[000]

Ones place:

Setting selection when AI1 is below the minimum input.

0:Corresponding minimum input setting

1:0

Tens place:

Setting selection when AI2 is below the minimum input(0~1,the same as above)

Hundreds place:

Setting selection when AI3 is below the minimum input(0~1,the same as above)

This function code is used to set how to determine the analog corresponding value when the analog input less than"minimum input".The ones and tens places of this function code correspond to analog input AI1 and AI2,respectively.

If selected as 0,when the analog input is lower than the"minimum input",then the corresponding analogue setting function code determining the curve"minimum input corresponding to setting"(P2.14,P2.19,P2.24).

If 1 is selected,when the analog input is less than the minimum input,corresponding to the analog set to 0.0%.

P2.35 X1 delay time	Range:0.0~3600.0s][0.0s]
P2.36 X2 delay time	Range:0.0~3600.0s][0.0s]
P2.37 X3 delay time	Range:0.0~3600.0s][0.0s]

It is used to set the delay time of the change when the state of X terminal changes.Currently only X1,X2,X3 have the function of setting the delay time.

P2.38 X terminal effective mode selection 1	Setting range:00000~11111[00000]

Explanation:

ones place:X1 terminal effective state setting

0:active high 1:active low

Tens place:X2 terminal effective state setting(0~1,same as above)

Hundreds place:X3 terminal effective state setting(0~1,same as above)

Thousands place:X4 terminal effective state setting(0~1,same as above)

Ten thousands place:X5 terminal effective state setting(0~1,same as above)

P2.39 X terminal effective mode selection 2	Setting range:00000~11111[00000]

Explanation:

Ones place:X6 terminal effective state setting

0:active high 1:active low

Tens place:X7 terminal effective state setting(0~1,same as above)

Hundreds place:X8 terminal effective state setting(0~1,same as above)

Thousands place:X9 terminal effective state setting(0~1,same as above)
Ten thousands place:X10 terminal effective state setting(0~1,same as above)

Used to set the effective state mode of the digital input terminal.When it is selected as high-level effective,the corresponding X terminal is effective when it is connected to COM,and it is invalid when it is disconnected.When it is selected as active low level,the corresponding X terminal is invalid when it is connected with COM,and it is effective when it is disconnected.

5.4 Output terminal group(Group P3)

This inverter series is equipped with one multi-function relay output terminal,one multi-function digital output terminal,and one DO terminal(can be selected as high-speed pulse output terminal or open-collector switch output).If the above-mentioned output terminals cannot meet the field application,you need to choose a multi-function input/output expansion card.The output terminals of the multi-function input/output expansion card include a multifunctional analog output terminal(AO2),a multifunctional relay output terminal(relay 2),and a multifunctional digital output terminal(Y2).1 DO terminal(can be used as high-speed pulse output or open collector output),2 multi-function analog output terminals.

P3.00 DO output mode selection	Setting range:0-1[0]

The DO terminal is a programmable multi-function terminal.

0:Open collector high-speed pulse output DOP:

The maximum pulse frequency is 100.00kHz. For related functions, see P3.06.

1:Open collector output DOR: See P3.01 for related functions.

P3.01 DOR output selection	Setting range:0~41[0]
P3.02 Relay output function selection(TA-TB-TC)	Setting range:0~41[2]
P3.03 expansion card relay output function selection (RA-RB-RC)	Setting range:0~41[0]
P3.04 Y1 output function selection	Setting range:0~41[1]
P3.05 expansion card Y2 output function selection	Setting range:0~41[4]

Notes:

The above 5 function codes are used to select the functions of 5 digital outputs,of which TA-TB-TC and RA-RB-RC are the relays on the control board and the expansion card,respectively.

The function of the multi-function output terminal is as follows:

0:No output.

1:Run output.During the operation of the frequency converter,when the frequency converter has an output,it outputs an ON signal.

2:Fault output(fault stop).When the inverter fails and stops due to fault,it outputs ON signal.

3:Frequency level detection FDT1 output. Please refer to the description of function codes P5.19 and P5.20.

4:Frequency reached. Please refer to the description of function code P5.21.

5:During zero speed operation(no output when stopped). When the inverter is running and the output frequency is 0,it outputs ON signal.When the inverter is stopped,this signal is OFF.

6:Motor overload pre-alarm.Before the motor overload protection action,judge according to the overload pre-alarm threshold,and output ON signal after exceeding the pre-alarm threshold.Refer to function codes PB.00~PB.02 for motor overload parameter setting.

7:Inverter overload pre-alarm. Output ON signal 10s before the inverter overload protection occurs.

8:The set counting pulse value is reached.When the count value reaches the value set by P7.08,an ON signal is output.

9:The specified count pulse value is reached.When the count value reaches the value set in P7.09,an ON signal is output.Refer to the function description of group P7 for the counting function.

10:Length reached.When the actual length detected exceeds the length set by P7.05,an ON signal is output.

11:The simple PLC cycle is completed. When the simple PLC runs one cycle,a pulse signal with a width of 250ms is output.

12:Cumulative running time is reached. When the cumulative running time of the inverter exceeds the time set in P5.17,an ON signal is output.

13:The output frequency is limited. When the set frequency exceeds the upper or lower limit frequency,and the inverter output frequency also reaches the upper or lower limit frequency,an ON signal is output.

14:The output torque is 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 ON signal at the same time.

15:Ready for operation. When the power supply of the main circuit and control circuit of the inverter is stable,and no fault information is detected by the inverter,the inverter will be ON when the inverter is in a running state.

16:AI1>AI2.When the value of the analog input AI1 is greater than the input value of AI2,the ON signal is output.

17:Upper limit frequency reached.When the running frequency reaches the upper limit frequency,an ON signal is output.

18:The lower limit frequency is reached(not output when stopped).When the running frequency reaches the lower limit frequency,an ON signal is output.This signal is OFF in the stop state.

19:Under voltage state output. When the inverter is under voltage,it outputs ON signal.

20:Communication setting. Please refer to communication protocol.

21:Reserved

22:reserved

23:Zero speed running 2(also output when stopped). When the inverter output frequency is 0,it outputs ON signal.This signal is also ON in the stop state.

24:Cumulative power-on time is reached. When the cumulative power-on time(PH.13)of the inverter exceeds the time set in P5.16,an ON signal is output.

25:Frequency level detection FDT2 output.please refer to the description of function codes P5.28 and P5.29.

26:Frequency 1 reaches the output.please refer to the description of function codes P5.30 and P5.31.

27:Frequency 2 arrives at the output.please refer to the description of function codes P5.32 and P5.33.

28:Current 1 reaches the output.please refer to the description of function codes P5.38 and P5.39.

29:Current 2 reaches the output.please refer to the description of function codes P5.40 and P5.41.

30:Timing arrival output. When the timing function selection(P5.42)is valid,the inverter will output ON signal after the current running time reaches the set timing time.

31:AI1 input exceeds the limit. When the value of analog input AI1 is greater than P5.46(AI1 input protection upper limit)or less than P5.45(AI1 input protection lower limit),an ON signal is output.

32:During the load loss.when the inverter is in the load loss state,it outputs ON signal.

33:In reverse running.when the inverter is in reverse running,it outputs ON signal.

34:Zero current state.please refer to the description of function codes P5.34 and P5.35.

35:module temperature reaches preset value.When the inverter module heat sink temperature(PH.07)reaches the set module temperature reaching value(P5.47),it outputs an ON signal.

36:current exceeds the preset limitation value.please refer to the description of function codes P5.36 and P5.37.

37:The lower limit frequency is reached(it is also output when stopped).When the running frequency reaches the lower limit frequency,an ON signal is output.This signal is also ON in the stop state.

38:Alarm output. When the inverter has a fault and the fault processing mode is to continue running,the inverter will output an alarm.

39:Motor over temperature alarm.When the motor temperature reaches PB.58(motor overheating pre-alarm threshold),it outputs ON signal.(The motor temperature can be viewed through C0.34)

40:When the current running time arrives.when the running time of the inverter this time exceeds the time set by P5.53,it outputs ON signal.

41:Fault output. No output when coast to stop fault and under-voltage fault.

P3.06 DOP output selection	Setting range:0~16［0］
P3.07 AO1 output selection	Setting range:0~16[0]
P3.08 expansion card AO2 output selection	Setting range:0~16[1]

Notes:

DO open-collector high-speed pulse output pulse frequency range is 0.01kHz~P3.09(DO open-collector output maximum frequency),P3.09 can be set between 0.01kHz~100.00kHz.Analog output AO1 and AO2 output range is 0V~10V,or 0mA~20mA.

The range of the corresponding quantities indicated is shown in the following table:

Set value	Function	Range
0	Operating frequency	0~Max.Frequency P0.10
1	Set frequency	0~Max.Frequency P0.10
2	Output current	0~2 times motor rated current
3	Output torque	0~2 times motor rated torque
4	Output Power	0~2 times motor rated power
5	The output voltage	0~1.2 times inverter rated voltage
6	High-speed pulse X5 input	0.01~100.00kHz
7	Analog AI1 input	0~10V

8	Analog AI2 input	0~10V/0~20mA
9	AI3	0~10V
10	length	0~Max setting length
11	Count value	0~maximum count
12	Communication settings	0.0%~100.0%
13	Motor speed	0~Speed corresponding to max.frequency
14	Output current	0.0~1000.0V
15	The output voltage	0.0~1000.0V
16	Motor output torque(actual value,percentage of motor)	-2 times of motor rated torque~ +2 times of motor rated torque

P3.09 DO output max.frequency	Setting range:0.01~100.00kHz[50.00kHz]
P3.10 AO1 offset	Setting range:-100.0%~+100.0%[0.0%]
P3.11 AO1 gain	Setting range:-10.00 to+10.00[1.00]
P3.12 expansion card AO2 offset	Setting range:-100.0%~+100.0%[0.0%]
P3.13 expansion card AO2 gain	Setting range:-10.00 to+10.00[1.00]

Notes:

The above function codes are generally 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,then the actual output is:Y=kX+b,where the 100%bias coefficients of AO1 and AO2 correspond to 10V(Or 20mA),the standard output refers to the quantity corresponding to the analog output when the output is 0V~10V(or 0mA~20mA)without zero offset and gain correction.For example:If the content of the analog output is the operating frequency,you want the actual output to be 8V(or 16mA)when the frequency is 0,as shown in the figure below,you need to set the zero offset to"80%";you want to actually Output 3V(or 6mA),as shown below,you need to set the gain to"-0.50".

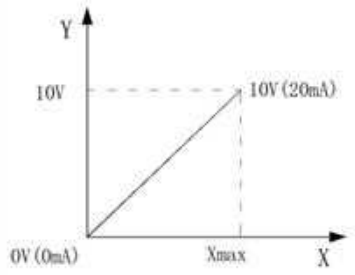


Fig.5-4-1 Output without zero bias or gain

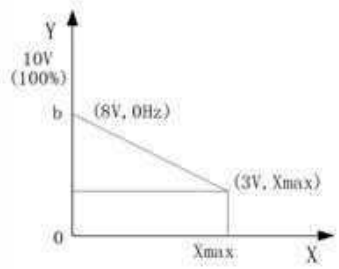


Figure 5-4-2 Output with zero offset or gain(voltage type)

Zero offset b=y-kx=y(when x=0)=8V

When the bias coefficient is 100%,it corresponds to 10v,so when b=8v

Corresponding zero bias coefficient=(8v/10v)×100%=80%

k=(y-b)/x=(actual output-zero offset)/standard output=(3v-8v)/10V=-0.5

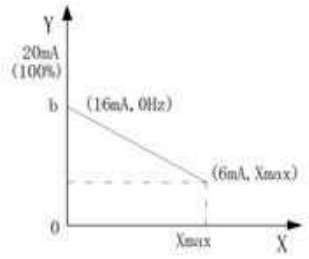


Figure 5-4-3 Output diagram with zero bias or gain(current type)

Zero offset b=y-kx=y(when x=0)=16mA

Corresponding to 20mA at 100%bias coefficient,so when b=16mA

Corresponding zero bias coefficient=(16mA/20mA)×100%=80%

k=(y-b)/x=(actual output-zero offset)/standard output=(6mA-16mA)/20mA=-0.5

P3.17 DO switch output delay time	Range:0.0~3600.0s][0.0s]
P3.18 RELAY1 output delay time	Range:0.0~3600.0s][0.0s]
P3.19 RELAY2 output delay time	Range:0.0~3600.0s][0.0s]
P3.20 Y1 output delay time	Range:0.0~3600.0s][0.0s]
P3.21 Y2 output delay time	Range:0.0~3600.0s][0.0s]

Notes:

Set the delay time from the state change to the actual output change for the open-collector digital output terminal DO,RELAY 1,RELAY 2,Y1 and Y2.

P3.22 digital output effective state selection	Setting range:00000~11111[00000]

Notes:

0:positive logic 1:reverse logic

Ones place:DO terminal effective state setting

Tens place:RELAY1 effective state setting

Hundreds place:RELAY2(on expansion card)effective state setting

Thousands place:Y1 terminal effective state setting

Ten thousands place:Y2(on expansion card)effective state setting

Explanation:

Define the output logic of digital output terminals.

0:Positive logic.The connection between the digital output terminal and the common terminal is in an effective state,while disconnection is in an invalid state.

1:Inverse logic.The connection between the digital output terminal and the common terminal is in an invalid state,while disconnection is in an effective state.

5.5 Start-stop control group(Group P4)

P4.00 Start mode	Setting range:0~2[0]

Notes:

0:Start directly.If the starting DC braking time is set to 0,the inverter starts to run from the starting frequency.If the starting DC braking time is not 0,DC braking is performed first,and then the operation starts from the starting frequency.For small inertia loads,the motor may rotate when starting.

1:Speed tracking restarts.The inverter first judges the speed and direction of the motor,and then starts at the tracked motor frequency,and implements smooth and shock-free starting of the rotating motor.It is suitable for restarting after instant power failure of large inertia load.In order to ensure the performance of speed tracking and restart,it is necessary to set the parameters of motor P1 or PC group accurately.

2:Pre-excitation start of IM motor.Only valid for IM motors,used to establish a magnetic field before the motor runs.For pre-excitation current and pre-excitation time,please refer to the description of function codes P4.05 and P4.06.

If the pre-excitation time is set to 0,the inverter cancels the pre-excitation process and starts from the starting frequency.If the pre-excitation time is not 0,the pre-excitation is started before the start,which can improve the dynamic response performance of the motor.

P4.01 Asynchronous motor speed tracking mode	Setting range:0~2[0]

0:Start from stop frequency. Tracking down from the frequency at power outages.This method is usually selected.

1:Start with power frequency. It is used when the power frequency is switched by frequency conversion,and it is used when the power is off for a long time before restarting.

2:Start from the maximum frequency. Track down from the maximum frequency,generally used for power generation load.

P4.02 Speed tracking speed of IM motor	Setting range:1~100[20]

Notes:

This is used to select the speed of speed tracking when the speed tracking restarts is selected.The larger the parameter,the faster the tracking speed.However,setting it too large may cause the tracking effect to be unreliable.

P4.03 Starting frequency	Setting range:0.00~10.00 Hz[0.00Hz]
P4.04 Starting frequency hold time	Setting range:0.0~100.0s[0.0s]

Notes:

Setting a proper starting frequency can increase the torque at startup.The inverter starts to run from the starting frequency(P4.03).After the starting frequency holding time(P4.04),the inverter accelerates to the target frequency according to the set acceleration time.If the target frequency is less than the starting frequency,the inverter will be in standby state..The starting frequency value is not limited by the lower limit frequency.During forward and reverse switching,the start frequency does not work.

P4.05 Braking current before starting	Setting range:0~100%[0%]
P4.06 Braking time before starting	Setting range:0.0~100.0s[0.0s]

P4.05:The DC current applied during DC braking before starting.The value is the percentage of the rated current of the inverter.

P4.06:DC current duration.If the DC braking time is set to 0,the DC braking is invalid.The greater the DC braking current,the greater the braking torque.

P4.07 acceleration/deceleration mode selection	Setting range:0~2[0]

Notes:

Selection of frequency change mode during startup and operation.

0:Linear type.The output frequency increases or decreases in a straight line.

1:Static S-curve.When the target frequency is fixed,the output frequency increases or decreases according to the S curve.It is suitable for use in places that require gentle start-up or shutdown,such as elevators and conveyor belts.

2:Dynamic S-curve.When the target frequency changes dynamically in real time,the output frequency increases or decreases in real time according to the S curve.It is suitable for occasions with high comfort requirements and fast real-time response.

P4.08 S-curve start time ratio	Setting range:0.0%to(100.0%-P4.09)[30.0%]
P4.09 S-curve end time ratio	Setting range:0.0%to(100.0%-P4.08)[30.0%]

Function codes P4.08 and P4.09 respectively define the time ratio of the beginning and end of the static S curve.The two function codes must satisfy:P4.08+P4.09≤ 100.0%.In Figure 5-4-1,t1 is the parameter defined by parameter P4.08.During this period,the slope of the output frequency change gradually increases.t2 is the time defined by parameter P4.09,during which the slope of the output frequency change gradually changes to 0.In the time between t1 and t2,the slope of the output frequency

change is fixed,that is,the linear acceleration and deceleration are performed in this interval.

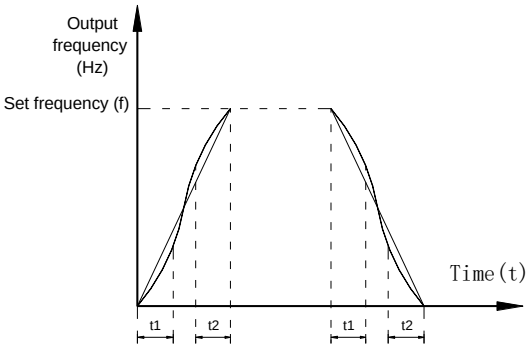


Figure 5-4-1 Schematic diagram of static S curve

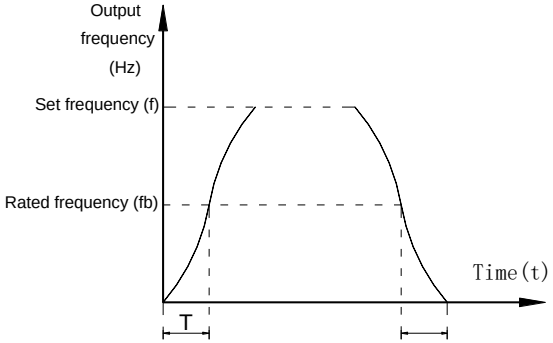


Figure 5-4-2 Schematic diagram of Dynamic S curve

P4.10 Stop mode selection	Setting range:0~1[0]

Notes:

0:Slow down

After the stop command is valid,the inverter reduces the output frequency according to the deceleration mode and the defined deceleration time.The frequency will stop after the frequency is reduced to 0.

1:Coast to stop

After the stop command is valid,the inverter immediately terminates the output.The load stops freely in accordance with mechanical inertia.

P4.11 Shutdown DC brake start frequency	Setting range:0.00Hz~P0.10[0.00Hz]
P4.12 Shutdown DC brake waiting time	Setting range:0.0~36.0s[0.0s]
P4.13 Shutdown DC brake level	Setting range:0.0~100.0%[50.0%]

P4.14 Shutdown DC brake active time	Setting range:0.0~36.0s[0.0s]

Notes:

P4.11:During the deceleration stop process,when this frequency is reached,the shutdown DC brake is started.If the DC braking start frequency is 0,DC braking is invalid,and the inverter will stop according to the set deceleration time.

P4.12:before the shutdown DC braking,the inverter blocks the output,and then starts the DC braking after this delay.Used to prevent over-current faults caused by DC braking at high speeds.

P4.13:Refers to the applied DC braking amount.The larger the value,the larger the braking torque.

P4.14:The duration of the DC braking amount.

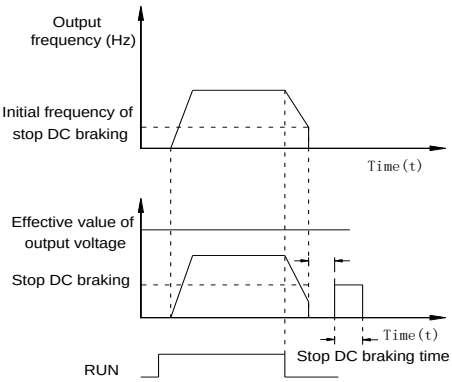


Figure 5-4-3 DC braking

P4.15 Braking rate	Setting range:0~100%[100%]

Notes:

Only valid for frequency converter with built-in brake unit.It is used to adjust the duty ratio of the braking unit.If the braking utilization rate is high,the action duty ratio of the braking unit is high and the braking effect is strong,but the voltage of the inverter bus fluctuates greatly during braking.

P4.21 Demagnetization time for IM motor	Setting range:0.0~5.0s

Notes:

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 easily cause over-voltage fault.

5.6 Enhanced Function(Group P5)

P5.00 JOG running frequency	Setting range:0-P0.10[2.00Hz]
P5.01 JOG acceleration time	Setting range:0.0–6500.0s[20s]
P5.02 JOG deceleration time	Setting range:0.0–6500.0s[20s]

Description:

Define the given frequency and acceleration/deceleration time of the inverter during jog operation.During jog operation,the start mode is fixed to the direct start mode(P4.00=0),and the stop mode is fixed to the deceleration stop(P4.10=0).

P5.03 Acceleration time 2	Setting range:0.0–6500.0s[Depend on Model]
P5.04 Deceleration time 2	Setting range:0.0–6500.0s[Depend on Model]
P5.05 Acceleration time 3	Setting range:0.0–6500.0s[Depend on Model]
P5.06 Deceleration time 3	Setting range:0.0–6500.0s[Depend on Model]
P5.07 Acceleration time 4	Setting range:0.0–6500.0s[Depend on Model]
P5.08 Deceleration time 4	Setting range:0.0–6500.0s[Depend on Model]

Notes:

The acceleration/deceleration time can be selected between P0.17 and P0.18 and the above three groups of acceleration/deceleration time.The meanings are the same.For details,please refer to P0.17 and P0.18.

The acceleration/deceleration time during the running of the inverter can be selected through different combinations of multi-function digital input terminals.For specific usage,please refer to the relevant instructions in function codes P2.01~P2.05.

P5.09 Skip frequency 1	Setting range:0.00 Hz to P0.10[0.00Hz]
P5.10 Skip frequency 2	Setting range:0.00 Hz to P0.10[0.00Hz]
P5.11 Amplitude of skip frequency	Setting range:0.00 Hz to P0.10[0.00Hz]

Notes:

When the set frequency is within the skip frequency range,the actual operating frequency will be the skip frequency boundary.

By setting the skip frequency,the inverter avoids the mechanical resonance point of the load.This inverter can set two skip frequency points.If both skip frequency points are set to 0,this function will not work.

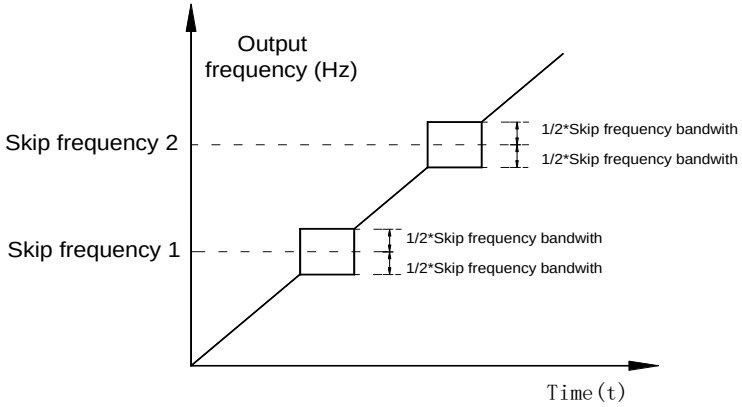


Figure 5-6-1 Schematic diagram of jumping frequency

P5.12 Forward/Reverse rotation dead-zone time	Setting range:0.0–3000.0s[0.0]

Notes:

It is used to set the time when the output is 0 Hz at transition of the AC drive forward rotation and reverse rotation,as shown in the following figure.

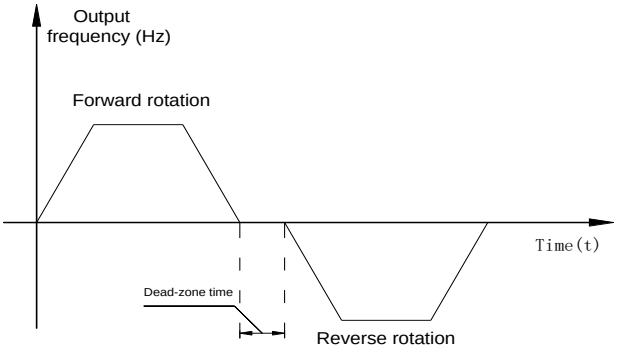


Figure 5-6-2 Schematic diagram of FWD and REV dead zone time

P5.13 Reverse run selection	Setting range:0-1[0]

0:Enabled 1:Disabled

Notes:

When the frequency given by"Communication Setting"or"Analog Setting"is negative,the running direction of the motor will change.This frequency is called"reverse frequency".With this parameter,you can set whether the inverter allows the motor to run in the reverse state.When the motor is not allowed to run in the reverse

direction,set P5.13=1;when P5.13=0,the motor is allowed to run in the reverse direction.

P5.14 Run mode when set frequency lower than lower limit	Setting range:0-2[0]

0:Run at lower limit frequency 1:Stop 2:Run at zero speed

When the set frequency is lower than the lower limit frequency,the running state of the inverter can be selected by this parameter.The inverter provides three operating modes to meet various application requirements.

P5.15 Droop control	Setting range:0.00–10.00 Hz[0.00]

Notes:

The droop rate allows a slight speed difference between the master station and the slave station to avoid conflicts between them.The default value of this parameter is 0.Only when the master and the slave use the speed control mode,the droop rate needs to be adjusted.For each transmission process,the appropriate droop rate needs to be gradually found in practice.It is recommended not to set P5.15 too large.Otherwise,when the load is large,the steady speed will decrease significantly.Both the master and the slave must set the droop rate.Droop speed=synchronization frequency×output torque×droop rate÷10.For example:P5.15=1.00,synchronization frequency is 50Hz,output torque is 50%,then:

Drooping speed=50Hz×50%×1.00÷10=2.5Hz

Inverter actual frequency=50Hz-2.5Hz=47.5Hz

P5.16 Accumulative power-on time threshold	Setting range:0–65000 h[0]

Notes:

When the cumulative power-on time(PH.13)reaches the power-on time set in P5.16,the inverter's multi-function digital Y outputs an ON signal.The following is an example to illustrate its application.For example,combined with the virtual X\Y function,after the set power-on time reaches 100 hours,the inverter fault alarm is output.Program:

Virtual X1 terminal function,set to user-defined fault 1:A4.00=44;virtual X1 terminal effective state,set to originate from virtual Y1:A4.05=0000;virtual Y1 function,set to reach power-on time:A4.11=24;Set the cumulative power-on arrival time to 100 hours:P5.16=100.When the cumulative power-on time reaches 100 hours,the inverter fault output E27.

P5.17 Accumulative running time threshold	Setting range:0–65000 h[0]

Notes:

Used to set the running time of the inverter.When the accumulated running time(PH.09)reaches this set running time,the inverter multi-function digital Y outputs an ON signal.

P5.18 Startup protection selection	Setting range:0–1[0]

0:No 1:Yes

Notes:

If this parameter is set to 1,if the running command is valid when the inverter is powered on(for example,the terminal running command is closed before the power is turned 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 this parameter is set to 1,if the running command is valid at the time of the inverter's fault reset,the inverter will not respond to the running command.The running command must be removed to eliminate the running protection status.Setting this parameter to 1 can prevent the motor from responding to the danger caused by running commands when power-on or fault reset occurs without knowing it.

P5.19 Frequency detection value 1(FDT1)	Setting range:0.00 Hz–P0.10[50.00]
P5.20 Frequency detection hysteresis 1(FDT hysteresis 1)	Setting range:0.0%–100.0%(FDT1)[5.0]

Notes:

When the running frequency is higher than the frequency detection value,the inverter multi-function output Y outputs the ON signal,and after the frequency is lower than a certain frequency value,the Y output ON signal is cancelled.The above parameters are used to set the detection value of the output frequency and the hysteresis value when the output operation is cancelled.Where P5.20 is the percentage of the lag frequency to the frequency detection value P5.19.The following figure is a schematic diagram of the FDT function.

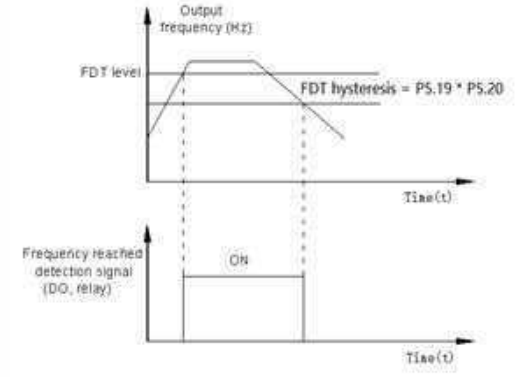


Figure 5-6-3 FDT level diagram

P5.21 Detection width of frequency reached	Setting range:0.00~100%[0.0]

Notes:

The operating frequency of the inverter,when it is within a certain range of the target frequency,the inverter multi-function Y outputs an ON signal.

This parameter is used to set the detection range of frequency arrival.This parameter is a percentage relative to the maximum frequency.The following figure is the schematic diagram of frequency arrival detection.

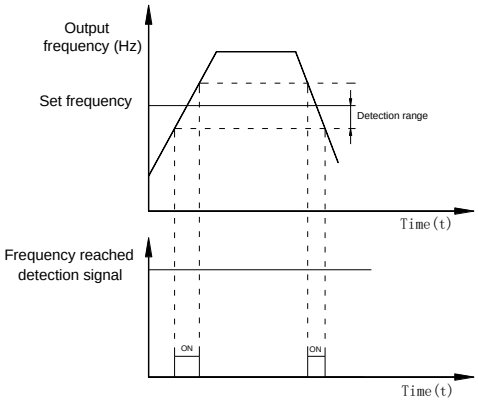


Figure 5-6-4 Frequency arrival detection

P5.22 jump function enable during accelerating and decelerating	Setting range:0–1[0]

0:Disabled 1:Enabled

Notes:

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.The figure below shows the effective jump frequency during acceleration and deceleration.

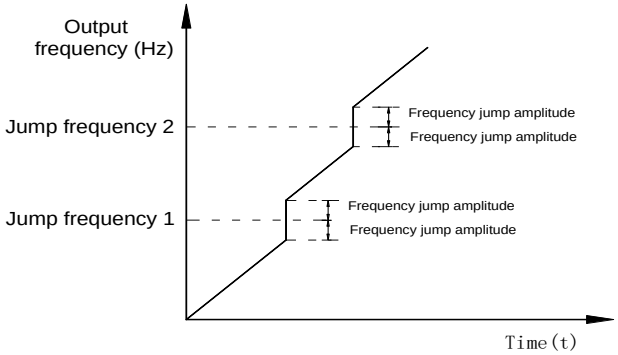


Figure 5-6-5 effective jump frequency during acceleration and deceleration

P5.25 Switching frequency for Acc.time 1 and acc.time 2	Setting range:0.00-P0.10[0.00]
P5.26 Switching frequency for Dec.time 1 and	Setting range:.00-P0.10[0.00]

dec.time 2	

Notes:

This function is valid when the motor is selected as motor 1,and the acceleration/deceleration time is not selected through the X terminal switching.It is used to select different acceleration/deceleration time according to the operating frequency range without using the X terminal during the inverter running process.

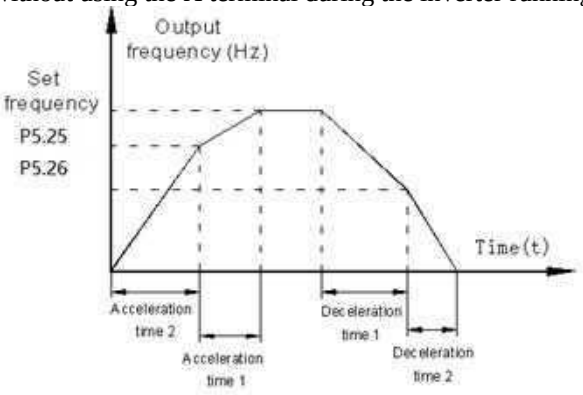


Figure 5-6-6 Switchover of acceleration and deceleration time

During the acceleration process,if the running frequency is less than P5.25,the acceleration time 2 is selected;if the running frequency is greater than P5.25,the acceleration time 1 is selected.During the deceleration process,if the running frequency is greater than P5.26,select the deceleration time 1,and if the running frequency is less than P5.26,select the deceleration time 2.

P5.27 Terminal JOG preferred	Setting range:0-1[0]

0:Disabled 1:Enabled

Notes:

When the terminal JOG preferred is enabled,if the terminal jog command appears during the operation,the inverter will switch to the terminal jog operation state.

P5.28 Frequency detection value 2(FDT2)	Setting range:0.00-P0.10[50.00Hz]
P5.29 Frequency detection hysteresis 2 (FDT hysteresis 2)	Setting range:0.0-100.0%[5.0%]

Notes:

This frequency detection function is the same as FDT1.Please refer to the related description of FDT1.

P5.30 Detection of frequency 1	Setting range:0.00-P0.10[50.00Hz]
P5.31 Detection width of frequency 1	Setting range:0.0-100.0%[0.0%]
P5.32 Detection of frequency 2	Setting range:0.00-P0.10[50.00Hz]

P5.33 Detection width of frequency 2	Setting range:0.0-100.0%[0.0%]

Notes:

When the output frequency of the inverter is within the range of the positive and negative detection range of the frequency detection value,the multifunctional Y outputs ON signal.

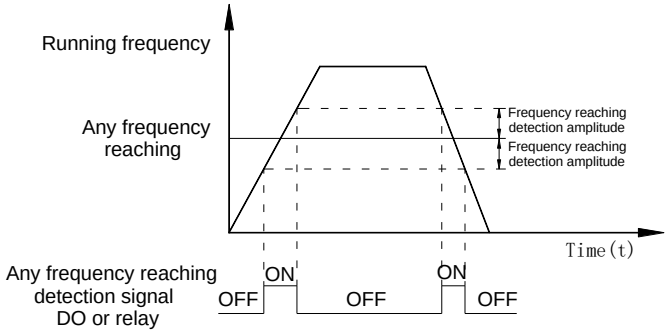


Figure 5-6-7 Diagram of arrival frequency detection

P5.34 Zero current detection level	Setting range:0.0%–300.0%[5.0%]
P5.35 Zero current detection delay time	Setting range:0.00–600.00s[0.10s]

Notes:

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 multi-function Y outputs an ON signal.

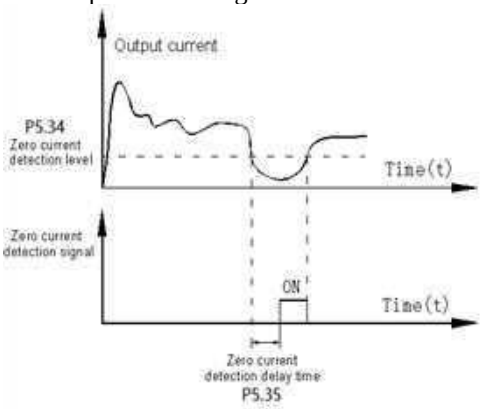


Figure 5-6-8 diagram of Zero current detection

P5.36 Output over current threshold	Setting range:0.1%-300.0%[200.0%]

P5.37 Output over current detection delay time	Setting range:0.00–600.00s[0.0s]

Notes:

When the output current of the inverter exceeds the limit detection point,and the duration exceeds the detection delay time,the inverter multi-function Y outputs an ON signal.

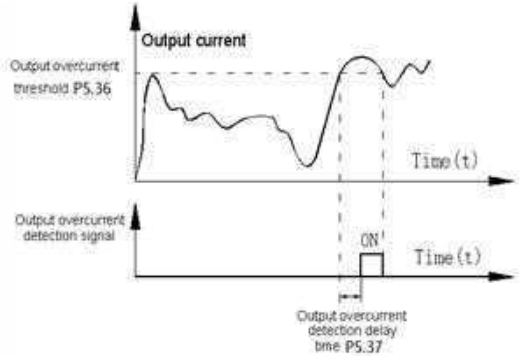


Figure 5-6-9 Diagram of output current overrun detection

P5.38 Detection of current 1	Setting range:0.0%-300.0%[100.0]
P5.39 Detection width of current 1	Setting range:0.0%-300.0%[0.0%]
P5.40 Detection of current 2	Setting range:0.0%-300.0%[100.0%]
P5.41 Detection width of current 2	Setting range:0.0%-300.0%[0.0%]

Notes:

When the output current of the inverter is within the positive and negative detection width of the set current,the multi-function Y of the inverter outputs an ON signal.

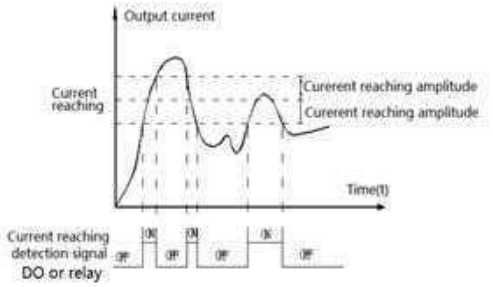


Figure 5-6-10 Diagram of current arrival detection

P5.42 Timing function selection	Setting range:0-1[0]
0:Disabled	1:Enabled

P5.43 Timing duration source	Setting range:0-3[0]
0:P5.44	1:AI1
2:AI2	3:AI3

100%of analog input range corresponds to P5.44.

P5.44 Timing duration	Setting range:0.0–6500.0 min[0.0min]

Notes:

When P5.42 timing function selection is valid,the inverter starts timing when the inverter starts.When the set timing running time is reached,the inverter will automatically stop and the multifunctional Y output ON signal.Each time the inverter starts,it starts counting from 0,and the timing remaining running time can be viewed through C0.20.The timing running time is set by P5.43,P5.44.

P5.45 AI1 input voltage lower limit	Setting range:0.00 V to P5.46[3.10v]
P5.46 AI1 input voltage upper limit	Setting range:P5.45 to 11.00 V[6.80v]

Notes:

When the value of the analog input AI1 is greater than P5.46,or the AI1 input is less than P5.45,the inverter multi-function Y outputs an"AI1 input over limit"ON signal to indicate whether the input voltage of AI1 is within the set range.

P5.47 IGBT temperature threshold	Setting range:0–100°C[75°C]

Notes:

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

P5.48 Cooling fan run mode	Setting range:0-1[0]
0:Fan working during running	1:Fan working continuously

Notes:

It is used to select the operation mode of the cooling fan.When it is set to 0,the inverter will run the fan in the running state.If the temperature of the radiator is higher than 40 degrees,the fan will run in the stopped state.Running.When it is set to 1,the fan runs uniformly after power-on.

P5.49 Wakeup frequency	Setting range:(P5.51)-(P0.10)[0.00 Hz]
P5.50 Wakeup delay time	Setting range:0.0–6500.0s[0.0s]

P5.51 Hibernating frequency	Setting range:0.00 Hz–P5.49[0.00 Hz]
P5.52 Hibernating delay time	Setting range:0.0–6500.0s[0.0s]

Notes:

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

During the operation of the inverter,when the set frequency is less than or equal to P5.51 sleep frequency,after the delay time of P5.52,the inverter enters the sleep state and automatically stops.If the inverter is in sleep state and the current running command is valid,when the set frequency is greater than or equal to the wake-up frequency of P5.49,the inverter starts to start after the delay time of P5.50 elapses.In general,please set the wake-up frequency to be greater than or equal to the sleep frequency.If the wake-up frequency and sleep frequency are set to 0.00Hz,the sleep and wake-up functions are invalid.When the sleep function is enabled,if the frequency source uses PID,whether the sleep state PID is calculated or not is affected by the function code P6.28.At this time,the PID operation at stop must be selected(P6.28=1).

P5.53 Running time threshold this time	Setting range:0.0–6500.0 min[0.0 min]

Notes:

When the running time of this startup reaches this time,the multi-function digital Y of the inverter outputs the"this time of running time"ON signal

P5.54 Output power correction coefficient	Setting range:0.00%–200.0%[100.0%]

Notes:

When the output power(C0.05)does not correspond to the expected value,the output power can be linearly corrected by this value.

5.7 Process Control PID Function(Group P6)

PID control is a commonly used method for process control.By performing proportional,integral,and differential operations on the difference between the feedback signal of the controlled quantity and the target signal,the closed-loop system is formed by adjusting the output frequency of the inverter to stabilize the controlled quantity Target value.It is suitable for process control occasions such as flow control,pressure control and temperature control.The following figure shows the control principle block diagram of process PID.

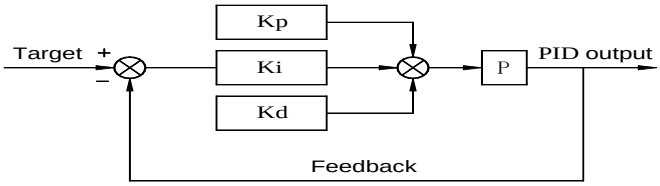


Figure 5-7-1 Process PID functional block diagram

P6.00 PID reference source	Setting range:0–6[0]
0:PA.01	1:AI1
2:AI2	3:AI3
4:Pulse setting(X5)	5:Communication
6:Multi-reference	

P6.01 PID digital setting	Setting range:0.0%–100.0%[50.0%]

Notes:

This parameter is used to select the target quantity given channel of the process PID.The setting target quantity of process PID is relative value,and the setting range is 0.0~100.0%.Similarly,the feedback amount of PID is also a relative amount.The function of PID is to make the two relative amounts the same.

P6.02 PID feedback source	Setting range:0–8[0]
0:AI1	1:AI2
2:AI3	3:AI1–AI2
4:Pulse setting(X5)	5:Communication setting
6:AI1+ AI2	7:MAX(|AI1|,|AI2|)
8:MIN(|AI1|,|AI2|)	

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

P6.03 PID action direction	Setting range:0–1[0]
0:Forward action	1:Reverse action

Notes:

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 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 inversion of the function direction of the multi-function terminal PID(function 35),so you need to pay attention during use.

P6.04 PID range for reference and feedback	Setting range:0–65535[1000]

Notes:

PID given feedback range is a dimensionless unit,used for PID given display C0.15 and PID feedback display C0.16.

The relative value of PID given feedback is 100.0%,corresponding to the given feedback range P6.04.For example,if P6.04 is set to 2000,when the PID setting is 100.0%,the PID setting will display C0.15 as 2000.

P6.05 Proportional gain Kp1	Setting range:0.0–100.0[20.0]
P6.06 Integral time Ti1	Setting range:0.01–10.00s[2.00s]
P6.07 Differential time Td1	Setting range:0.00–10.000[0.000s]

Notes:

Proportional gain Kp1:

Determines the adjustment intensity of the entire PID regulator.The larger the Kp1,the greater the adjustment intensity.The parameter 100.0 means that when the deviation between the PID feedback quantity and the given quantity is 100.0%,the adjustment range of the output frequency command by the PID regulator is the maximum frequency.

Integration time Ti1:

Determines the strength of the integral adjustment of the PID regulator.The shorter the integration time,the greater the adjustment intensity.The integration time means that when the deviation between the PID feedback quantity and the given quantity is 100.0%,the integral regulator continuously adjusts after this time,and the adjustment quantity reaches the maximum frequency.

Differential time Td1:

Determines the strength of the PID regulator's adjustment of the deviation change rate.The longer the differentiation time,the greater the adjustment intensity.Differential time means that when the feedback amount changes by 100.0%within this time,the adjustment amount of the differential regulator is the maximum frequency.

P6.08PID reversal cut-off frequency	Setting range:0.00–P0.10[2.00Hz]

Notes:

In some cases,only when the output frequency of PID is negative(i.e.inverter inversion),can PID control the given quantity and feedback quantity to the same state,but too high inversion frequency is not allowed in some cases.P6.08 is used to determine the upper limit of inversion frequency.When the frequency source is primary+secondary(PID),the upper limit of PID reverse cut-off frequency is not limited,that is,P6.08 is invalid.

P6.09 PID deviation limit	Setting range:0.0%–100.0%[0.0%]

Notes:

When the deviation between PID given value and feedback value is less than P6.09,PID stops adjusting action.In this way,the output frequency is stable when the deviation between the reference and the feedback is small,which is effective for some closed-loop control applications.

P6.10 PID differential limit	Setting range:0.00%–100.00%[0.10%]

Notes:

In the PID regulator,the function of the derivative is relatively sensitive,which can easily cause the system to oscillate.Therefore,the function of the PID derivative is generally limited to a small range.P6.10 is used to set the range of the PID differential output.

P6.11PID reference change time	Setting range:0.00–650.00s[0.00s]

Notes:

PID given change time refers to the time required for the PID given value to change from 0.0%to 100.0%.When the PID setting changes,the PID setting value changes linearly according to the given change time,which reduces the adverse effect of a given sudden change on the system.

P6.12 PID feedback filter time	Setting range:0.00–60.00s[0.00s]
P6.13 PID output filter time	Setting range:0.00–60.00s[0.00s]

Notes:

P6.12 is used to filter the PID feedback quantity.This filtering is beneficial to reduce the influence of the feedback quantity being disturbed,but it will cause the response performance of the process closed-loop system to decrease.P6.13 is used to filter the PID output frequency.This filtering will reduce the abrupt change of the output frequency of the inverter,but it will also reduce the response performance of the process closed-loop system.

P6.15 Proportional gain Kp2	Setting range:0.0–100.0[20.0s]
P6.16 Integral time Ti2	Setting range:0.01–10.00s[2.00s]
P6.17 Differential time Td2	Setting range:0.000–10.000s[0.000S]

P6.18PID parameter switching condition	Setting range:0–3[0]
0:No switchover	1:Switchover via X terminal
2:Automatic switchover based on deviation	3:Automatic switchover based on running frequency

P6.19 PID parameter switching deviation 1	Setting range:0.0%–PA.20[20.0%]
P6.20 PID parameter switching deviation 2	Setting range:PA.19-100.0%[80.0%]

Notes:

In some applications,a set of PID parameters cannot meet the needs of the entire operation process,and different PID parameters need to be used in different situations.This group of function codes is used to switch between two sets of PID parameters.The setting method of the regulator parameters P6.15~P6.17 is similar to the parameters P6.05~P6.07.The two sets of PID parameters can be switched through

the multi-function digital X terminal,or can be automatically switched according to the deviation of the PID.When multi-function X terminal is selected,the multi-function terminal function selection should be set to 43(PID parameter switching terminal).When this terminal is invalid,select parameter group 1(P6.05~P6.07).When the terminal is valid,select parameter group 2(P6.15~P6.17).When the automatic switching is selected,the absolute value of the deviation between the reference and feedback is smaller than the PID parameter switching deviation 1.When P6.19,the PID parameter selects parameter group 1.When the absolute value of the deviation between the reference and feedback is greater than the PID switching deviation 2 P6.20,the PID parameter selection selects parameter group 2.When the deviation between the reference and feedback is between the switching deviation 1 and the switching deviation 2,the PID parameters are linear interpolation values of the two groups of PID parameters,as shown in the figure below.

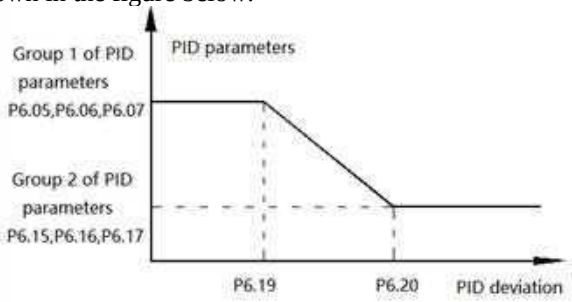


Figure 5-7-2 Diagram of PID parameter switching

P6.21 PID initial value	Setting range:0.0%–100.0%[0.0%]
P6.22 PID initial value holding time	Setting range:0.00–650.00s[0.00s]

Notes:

When the inverter starts,the PID output is fixed to the initial PID value P6.21.After the PID initial value hold time P6.22 is continued,the PID starts the closed-loop adjustment operation,as shown in the figure below.

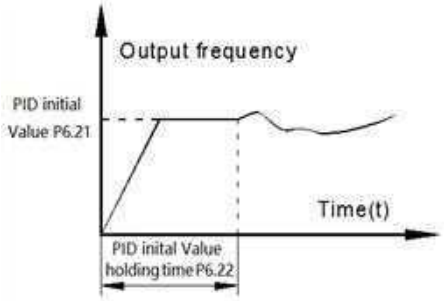


Figure 5-7-3 PID initial value function diagram

P6.23 Maximum deviation between two PID outputs in forward direction	Setting range:0.0%–100.0%[1.00%]
P6.24 Maximum deviation between two PID outputs in reverse direction	Setting range:0.0%–100.0%[1.00%]

Notes:

This function is used to limit the difference between the two beats(2ms/beat)of the PID output in order to suppress the PID output from changing too fast and make the inverter run more stable.P6.23 and P6.24 respectively correspond to the maximum value of the absolute value of the output deviation in the forward and reverse directions.

P6.25 PID integral property	Setting range:0–1[00]

Notes:

Ones place:integral separation

0:invalid 1:valid

Tens place:whether to stop integration after output to the limit

0:Continue to integrate

1:Stop integration

Integral separation:If the integral separation is set to be effective,when the multi-function“PID integration suspended”(function 38)is valid,the integral calculation of the PID will be stopped.At this time,only the proportional and derivative functions of the PID are valid.When the integral separation selection is invalid,the integral separation is invalid regardless of whether the multifunctional digital terminal is valid or not.

Whether to stop integration after output to the limit:After the PID operation output reaches the maximum or minimum value,you can choose whether to stop the integration.If you choose to stop the integration,the PID integration calculation will stop at this time,which may help reduce the overshoot of the PID.

P6.26 Detection level of PID feedback loss	Setting range:0.0%:No detecting 0.1%–100.0%[0.0%]
P6.27 Detection time of PID feedback loss	Setting range:0.0–20.0s

Notes:

This function code is used to judge whether PID feedback is lost.When the PID feedback value is less than the set value of P6.26 and the duration exceeds the set value of P6.27,the inverter alarms E31 and handles it according to the selected fault handling method.

P6.28 PID operation at stop	Setting range:0-1[0]

Notes:

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

5.8 Swing Function,Fixed Length and Count(Group P7)

The swing frequency function is suitable for textile,chemical fiber and other industries,as well as occasions that require traversing and winding functions.

The swing frequency function refers to the output frequency of the inverter,which swings up and down with the set frequency as the center.The trajectory of the running frequency on the time axis is shown in the figure below.The swing amplitude is set by P7.00 and P7.01.When P7.01 When set to 0,the swing amplitude is 0.At this time,the swing frequency has no effect.

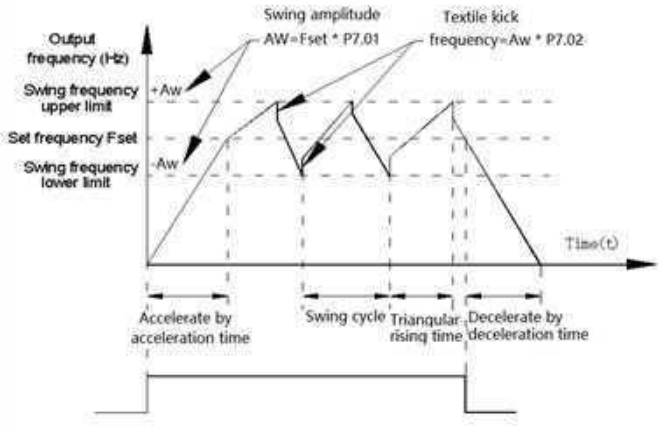


Figure 5-8-1 Diagram of swing function operation

P7.00 Swing frequency setting mode	Setting range:0-1[0]

Notes:

0:Relative to the central frequency(P0.07 frequency source),it is a variable swing system.The swing amplitude changes with the change of the central frequency(set frequency).

1:Relative maximum frequency(P0.10).It is a fixed swing system with fixed swing.

P7.01 Swing frequency amplitude	Setting range:0.0%–100.0%[0.0%]
P7.02 Kick frequency amplitude	Setting range:0.0%–50.0%[50.0%]

Notes:

When the swing amplitude is set relative to the center frequency(P7.00=0),the swing amplitude AW=frequency source P0.07×swing amplitude P7.01.When the swing amplitude is set relative to the maximum frequency(P7.00=1),the swing amplitude AW=the maximum frequency P0.10×the swing amplitude P7.01.The kick frequency amplitude is the frequency percentage of the jump frequency relative to the swing frequency when the swing frequency is running,that is:sudden modulation frequency=swing amplitude AW×kick frequency amplitude P7.02.If the swing amplitude is selected relative to the center frequency(P7.00=0),the sudden frequency is a change value.If the swing amplitude is selected relative to the maximum frequency(P7.00=1),the burst frequency is fixed.The swing frequency operation frequency is restricted by the upper and lower frequency limits.

P7.03 Swing cycle	Setting range:0.0–3000.0s[10.0S]
P7.04 Triangular wave rising time coefficient	Setting range:0.0%–100.0%[50.0%]

Notes:

The triangle wave rise time coefficient P7.04 is the percentage of the triangle wave rise time relative to the swing cycle P7.03.

Triangle wave rise time=swing cycle P7.03×triangle wave rise time coefficient P7.04,the unit is second.

Triangular wave falling time=swing cycle P7.03×(1-triangular wave rising time coefficient P7.04),the unit is second.

P7.05 Set length	Setting range:0–65535m[1000m]
P7.06 Actual length	Setting range:0–65535m[0m]
P7.07 Number of pulses per meter	Setting range:0.1–6553.5[100.0]

Notes:

The length information needs to be collected through the multifunctional digital input terminal.The number of pulses sampled by the terminal is divided by the number of pulses per meter P7.07,and the actual length P7.06 can be calculated.When the actual length is greater than the set length P7.05,the multi-function digital Y outputs the"length reached"ON signal.

During the fixed length control,the multi-function X terminal can be used to perform the length reset operation(X terminal function selection is 28).For details,please refer to P2.00~P2.09.

In the application,the corresponding input terminal function needs to be set to"length counting input"(function 27).When the pulse frequency is high,the X5 port must be used.

P7.08 Set count value	Setting range:0–65535[1000]
P7.09 Designated count value	Setting range:0–65535[1000]

Notes:

The count value needs to be collected through the multifunctional digital input terminal.The corresponding input terminal function needs to be set to"counter input"(function 25)in the application.When the pulse frequency is high,the X5 terminal must be used.When the count value reaches the set count value P7.08,the multi-function digital Y outputs the"set count value reached"ON signal,and then the counter stops counting.When the count value reaches the specified count value P7.09,the multi-function digital Y outputs the ON signal of"specified count value reached".At this time,the counter continues to count until the counter stops at the"set count value".The specified count value P7.09 should not be greater than the set count value P7.08.

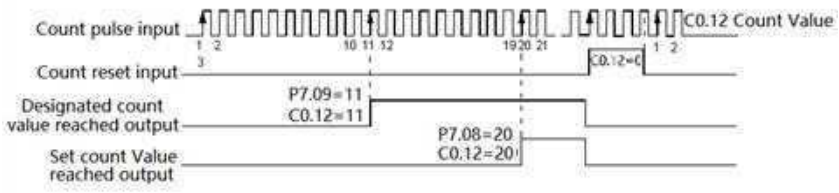


Figure 5-8-2 Set count and designated count

5.9 Multi-Reference and Simple PLC Function(Group P8)

P8.00 Multi-Reference preset 0	Setting range:-100.0%–100.0%[0.0%]
P8.01 Multi-Reference preset 1	Setting range:-100.0%–100.0%[0.0%]
P8.02 Multi-Reference preset 2	Setting range:-100.0%–100.0%[0.0%]
P8.03 Multi-Reference preset 3	Setting range:-100.0%–100.0%[0.0%]
P8.04 Multi-Reference preset 4	Setting range:-100.0%–100.0%[0.0%]
P8.05 Multi-Reference preset 5	Setting range:-100.0%–100.0%[0.0%]
P8.06 Multi-Reference preset 6	Setting range:-100.0%–100.0%[0.0%]
P8.07 Multi-Reference preset 7	Setting range:-100.0%–100.0%[0.0%]
P8.08 Multi-Reference preset 8	Setting range:-100.0%–100.0%[0.0%]
P8.09 Multi-Reference preset 9	Setting range:-100.0%–100.0%[0.0%]
P8.10 Multi-Reference preset 10	Setting range:-100.0%–100.0%[0.0%]
P8.11 Multi-Reference preset 11	Setting range:-100.0%–100.0%[0.0%]
P8.12 Multi-Reference preset 12	Setting range:-100.0%–100.0%[0.0%]
P8.13 Multi-Reference preset 13	Setting range:-100.0%–100.0%[0.0%]
P8.14 Multi-Reference preset 14	Setting range:-100.0%–100.0%[0.0%]
P8.15 Multi-Reference preset 15	Setting range:-100.0%–100.0%[0.0%]

Notes:

Multi-reference instructions can be used in three situations:as a frequency source,as a VF separated voltage source,and as a process PID setting source.In these applications,the dimension of the multi-reference instruction is a relative value,ranging from-100.0%to 100.0%.When used as a frequency source,it is relative to maximum frequency in percentage.When used as a VF separated voltage source,it is relative to the rated voltage of the motor in percentage.As the PID reference is a relative value,multi-reference instructions as the PID setting source do not require dimensional conversion.Multi-reference instructions need to be switched according to the different states of the multi-function digital X terminal.For details,please refer to the related description of group P2.

P8.16 Simple PLC operation mode	Setting range:0–2[0]

Notes:

0:Stop after running once.The inverter will stop automatically after completing a single cycle.It needs to give a run command again to start.

1:Run at the final value after one run.After the inverter completes a single cycle,it automatically maintains the running frequency and direction of the last stage.

2:Cycle operation.The inverter will automatically start the next cycle after completing one cycle,until the system stops when there is a stop command.

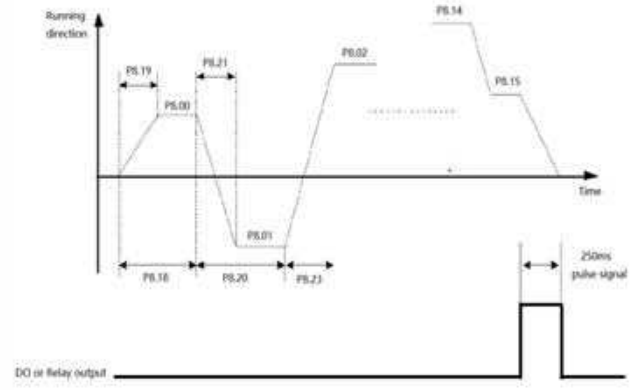


Figure 5-9-1 Simple PLC

P8.17 Simple PLC retentive selection	Setting range:0–1[00]

Notes:

Ones place:power-down memory selection

0:No memory at power down

1:Memory at power down

Tens place:Stop memory selection

0:Stop and not remember

1:Stop and remember

PLC power-down memory refers to the PLC's running phase and running frequency before power-down.It will continue to run from the memory phase when it is powered on next time.If you choose not to remember,the PLC process will be restarted every time the power is turned on.PLC stop memory is to record the previous PLC running phase and running frequency when stopping,and continue to run from the memory phase when next running.If you choose not to remember,the PLC process will be restarted every time you start.

P8.18 Running time for simple PLC reference 0	Setting range:0.0–6500.0s(h)[0.0]
P8.19 Acceleration/deceleration time for simple PLC reference 0	Setting range:0-3[0]
P8.20 Running time for simple PLC reference 1	Setting range:0.0–6500.0s(h)[0.0]
P8.21 Acceleration/deceleration time for simple PLC reference 1	0-3[0]
P8.22 Running time for simple PLC reference 2	Setting range:0.0–6500.0s(h)[0.0]
P8.23 Acceleration/deceleration time for simple PLC reference 2	Setting range:0-3[0]
P8.24 Running time for simple PLC reference 3	Setting range:0.0–6500.0s(h)[0.0]
P8.25 Acceleration/deceleration time for simple PLC reference 3	Setting range:0-3[0]
P8.26 Running time for simple PLC reference 4	Setting range:0.0–6500.0s(h)[0.0]
P8.27 Acceleration/deceleration time for simple PLC reference 4	Setting range:0-3[0]
P8.28 Running time for simple PLC reference 5	Setting range:0.0–6500.0s(h)[0.0]
P8.29 Acceleration/deceleration time for simple PLC reference 5	Setting range:0-3[0]
P8.30 Running time for simple PLC reference 6	Setting range:0.0–6500.0s(h)[0.0]
P8.31 Acceleration/deceleration time for simple PLC reference 6	Setting range:0-3[0]
P8.32 Running time for simple PLC reference 7	Setting range:0.0–6500.0s(h)[0.0]
P8.33 Acceleration/deceleration time for simple PLC reference 7	Setting range:0-3[0]
P8.34 Running time for simple PLC	Setting range:0.0–6500.0s(h)[0.0]

reference 8	
P8.35 Acceleration/deceleration time for simple PLC reference 8	Setting range:0-3[0]
P8.36 Running time for simple PLC reference 9	Setting range:0.0–6500.0s(h)[0.0]
P8.37 Acceleration/deceleration time for simple PLC reference 9	Setting range:0-3[0]
P8.38 Running time for simple PLC reference 10	Setting range:0.0–6500.0s(h)[0.0]
P8.39 Acceleration/deceleration time for simple PLC reference 10	Setting range:0-3[0]
P8.40 Running time for simple PLC reference 11	Setting range:0.0–6500.0s(h)[0.0]
P8.41 Acceleration/deceleration time for simple PLC reference 11	Setting range:0-3[0]
P8.42 Running time for simple PLC reference 12	Setting range:0.0–6500.0s(h)[0.0]
P8.43 Acceleration/deceleration time for simple PLC reference 12	Setting range:0-3[0]
P8.44 Running time for simple PLC reference 13	Setting range:0.0–6500.0s(h)[0.0]
P8.45 Acceleration/deceleration time for simple PLC reference 13	Setting range:0-3[0]
P8.46 Running time for simple PLC reference 14	Setting range:0.0–6500.0s(h)[0.0]
P8.47 Acceleration/deceleration time for simple PLC reference 14	Setting range:0-3[0]
P8.48 Running time for simple PLC reference 15	Setting range:0.0–6500.0s(h)[0.0]
P8.49 Acceleration/deceleration time for simple PLC reference 15	Setting range:0-3[0]

P8.50 Time unit of simple PLC running	Setting range:0-1[0]
0:s(second)	1:h(hour)

P8.51 Multi-reference 0 source	Setting range:0-6[0]
0;given by P8.00	1:AI1
2:AI2	3:AI3
4:pulse(X5)	5:PID
6:given by P0.08,can be modified by UP/DOWN	

Notes:

This parameter determines the given channel of multi-reference instruction 0.In addition to P8.00,multi-reference instruction 0 has a variety of other options to switch between multi-reference instruction and other given modes.When multi-reference is used as the frequency source or simple PLC is used as the frequency source,it is easy to switch between the two frequency sources.

5.10 V/F Control Parameters(Group P9)

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

P9.00 V/F curve setting	Setting range:0-11[0]
0:Linear 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	11:V/F half separation

0:Linear V/F.It is applicable to common constant torque load.

1:Multi-point V/F.It is applicable to special load such as dehydrator and centrifuge.Any such V/F curve can be obtained by setting parameters of P3.03 to P3.08.

2:Square V/F.It is applicable to centrifugal loads such as fan and pump.

3 to 8:V/F curve between linear V/F and square V/F

10:VF complete separation mode.In this mode,the output frequency and output voltage of the inverter are independent of each other,the output frequency is determined by the frequency source,and the output voltage is determined by P9.13(VF separate voltage source).VF complete separation mode is generally used in induction heating,inverter power supply,torque motor control and other occasions.

11:VF semi-separated mode.

In this mode,V(voltage)and F(frequency)are proportional,but the proportional relationship can be set by the voltage source P9.13,and the relationship between V and F is also related to the rated voltage and rated frequency of the motor in group P1.Assuming the voltage source input is X(X is a value of 0~100%),the relationship between the inverter output voltage V and the frequency F is:V/F=2*X*(rated motor voltage)/(rated motor frequency).

P9.01 Torque boost	Setting range:0%–30%
P9.02 Cut-off frequency of torque boost	Setting range: 0.00Hz~max.frequency[50]

Notes:

In order to compensate the low-frequency torque characteristics of V/F control,some boost compensation is made to the output voltage of the inverter at low frequency.However,if the torque boost is set too large,the motor will easily overheat and the inverter will easily over current.When the load is heavy and the starting torque of the motor is insufficient,it is recommended to increase this parameter.Reduces torque boost when the load is light.When the torque boost is set to 0.0,the inverter is in automatic torque boost mode.At this time,the inverter automatically calculates the required torque boost value according to parameters such as the motor stator resistance.Torque boost torque cut-off frequency:Below this frequency,the torque boost torque is valid.Above this set frequency,the torque boost is invalid.See Figure below for details.

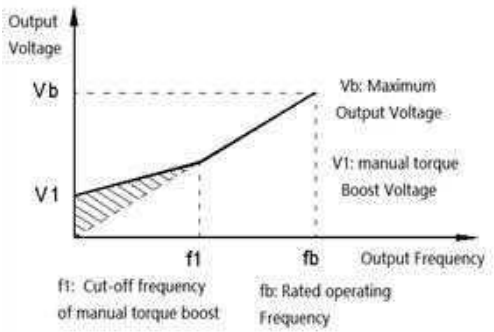


Figure 5-10-1 Manual torque boost

P9.03 Multi-point V/F frequency 1(P1)	Setting range:0.00 Hz to P9.05[0.00Hz]
P9.04 Multi-point V/F voltage 1(V1)	Setting range:0.00 Hz to P9.05[0.00Hz]
P9.05 Multi-point V/F frequency 2(P2)	Setting range:0.00 Hz to P9.05[0.00Hz]
P9.06 Multi-point V/F voltage 2(V2)	Setting range:0.0%–100.0%[0.0%]
P9.07 Multi-point V/F frequency 3(P3)	Setting range:P3.05 to rated motor frequency(P1.04)[0.00]Note:The rated frequency of the second motor is PC.04
P9.08 Multi-point V/F voltage 3(V3)	Setting range:0.0%–100.0%[0.0%]

Notes:

Parameters P9.03~P9.08 define multi-point V/F curve.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 frequency points must meet:V1＜V2＜V3,F1＜F2＜F3.Figure 5-10-2 shows the setting of multi-point VF curve.Setting the voltage too high at low frequencies may cause the motor to overheat or even burn out,and the inverter may be over current stalled or over current protected.

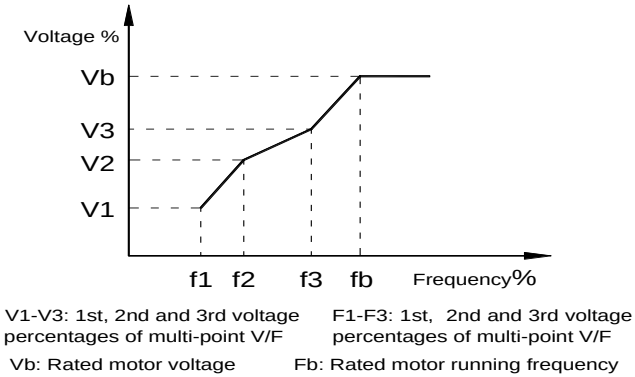


Figure 5-10-2 Multi-point V/F curve setting diagram

P9.09 V/F slip compensation gain	Setting range:0.0-200.0%[0.00%]

Notes:

This parameter is valid only for asynchronous motors.

VF slip compensation can compensate the deviation of the motor speed when the load of the asynchronous motor increases,so that the speed of the motor can be kept basically stable when the load changes.The VF slip compensation gain is set to 100.0%,which means that the slip compensated when the motor has a rated load is the rated slip of the motor,and the rated slip of the motor is calculated by the inverter through the rated frequency and speed of the P1 motor.When adjusting the VF slip compensation gain,it is generally based on the principle that when the rated load,the motor speed is basically the same as the target speed.When the motor speed is different from the target value,the gain needs to be fine-tuned appropriately.

P9.10 V/F over-excitation gain	Setting range:0-200[64]

Notes:

During the deceleration of the inverter,over-excitation control can suppress the rise of the bus voltage and avoid over-voltage faults.The larger the over excitation gain,the stronger the suppression effect.Where overvoltage alarm is easy to occur during the deceleration of the inverter,the over excitation gain needs to be increased.However,if the over-excitation gain is too large,the output current will increase easily,which needs to be weighed in the application.It is recommended to set the over excitation gain to 0 when the inertia is small and the voltage does not increase during the motor deceleration.It is also recommended to set the over excitation gain to 0 when there is a braking resistor.

P9.11 V/F oscillation suppression gain	Setting range:0-100[40]

Notes:

This gain is selected as small as possible on the premise of effective suppression of oscillation,so as not to adversely affect VF operation.When the motor has no oscillation phenomenon,please select this gain as 0.Only when the motor obviously oscillates,it is necessary to appropriately increase the gain.The larger the gain,the more obvious the suppression of the oscillation.When using the oscillation suppression function,the motor rated current and no-load current parameters must be accurate,otherwise the VF oscillation suppression effect is not good.

P9.13 V/F separated voltage source	Setting range:0-8[0]
0:Digital setting(P9.14)	1:AI1
2:AI2	3:AI3
4:Pulse setting(X5)	5:Multi-reference
6:Simple PLC	7:PID
8:Communication	

100.0%corresponding to motor rated voltage(P1.02 or PC.02).

P9.14 V/F separated voltage digital setting	Setting range:0~1000.0[0.0]

Description:

VF separation is generally used in induction heating,inverter power supply and torque motor control.

When VF separation control is selected,the output voltage can be set by function code P9.14,or it can be derived from analog,multi-reference commands,PLC,PID or communication settings.When non-digital setting is used,100%of each setting corresponds to the rated voltage of the motor.When the percentage of analog output output is negative,the set absolute value is used as the effective setting value.

0:Digital setting(P9.14)

The voltage is directly set by P9.14.

1:AI1,2:AI2,3:AI3

The voltage is determined by the analog input terminal.

4.Pulse setting(X5)

Voltage setting is given by terminal pulse.

Pulse given signal specifications:voltage range 9V~30V,frequency range 0kHz~100kHz.

5.Multi-reference

When the voltage source is a multi-reference command,set the parameters of group P2 and group P8 to determine the corresponding relationship between the given signal and the given voltage.Multi-reference command 100.0%refers to the percentage relative to the rated voltage of the motor.

6.Simple PLC

When the voltage source is a simple PLC,P8 group parameters need to be set to determine the given output voltage.

7.PID

The output voltage is generated according to the PID closed loop.For details,please refer to P6 group PID introduction.

8.Communication

Refers to the voltage given by the host computer through communication.VF separation voltage source selection is similar to frequency source selection,please refer to P0.03 main frequency source selection introduction.Among them,various choices correspond to 100.0%of the setting,which refers to the rated voltage of the motor(take the absolute value of the corresponding setting).

P9.15 VF separation voltage rise time	Setting range:0~1000.0[0.0]s
P9.16 VF separation voltage drop time	Setting range:0~1000.0[0.0]s

Notes:

VF separated voltage rise time refers to the time required for the output voltage to accelerate from 0 to the rated voltage of the motor,see t1 in the figure 5-10-3.VF separated voltage drop time refers to the time required for the output voltage to decelerate from the rated motor voltage to 0,see t2 in the figure 5-10-3.

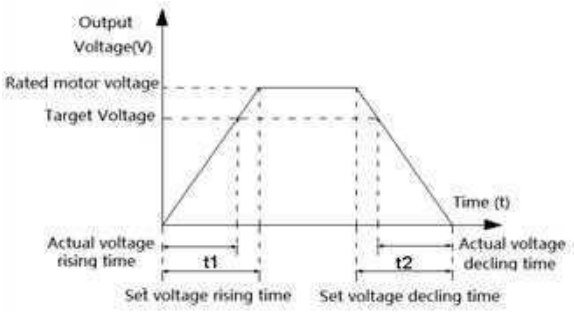


Figure 5-10-3 V/F separation diagram

P9.17 V/F separation shutdown mode selection	Setting range:0-1[0]

Notes:

0:Frequency/voltage is reduced to 0 independently

V/F separation output voltage decreases to 0V according to the voltage drop time(P9.15);V/F separation output frequency decreases to 0Hz according to the deceleration time(P0.18).

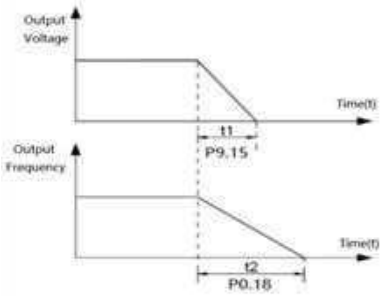


Figure 5-10-4 Voltage and frequency independently reduced to 0

1:The frequency decreases after the voltage is reduced to 0

The V/F separated output voltage is first reduced to 0V according to the voltage drop time(P9.15),and then the frequency is decreased to 0Hz according to the deceleration time(P0.18).

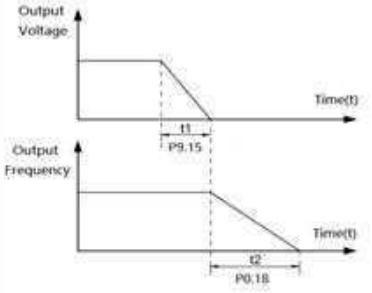


Figure 5-10-5 voltage and frequency decreasing in sequence

P9.18 Over current stall action current	Setting range:50-200%[150%]
P9.19 Over current stall suppression enable	Setting range:0-1[1]

0:Enabled 1:Disable

Inverter output current(torque)limit description:

During acceleration,constant speed,and deceleration,if the current exceeds the over current stall point(150%),the over current stall will take effect.When the current exceeds the over current stall point,the output frequency starts to decrease until the current returns to the over current stall After this point,the frequency starts to accelerate upward to the target frequency,and the actual acceleration time is automatically extended.If the actual acceleration time cannot meet the requirements,you can appropriately increase the"P9.18 over current stall current".

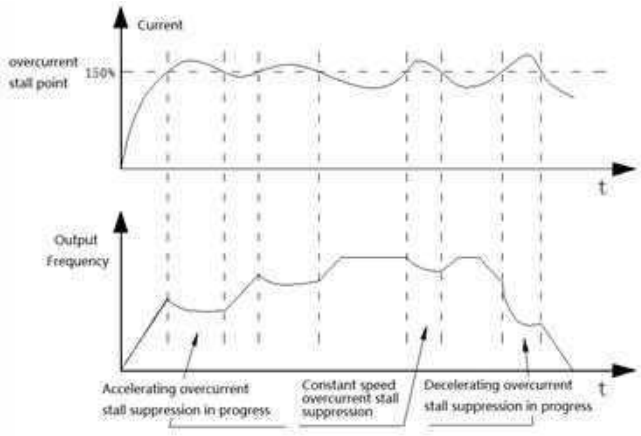


Figure 5-10-6 Schematic diagram of overcurrent stall action

P9.20 Over current stall restrain gain	Setting range:0-100[20]
P9.21 Compensation factor of speed multiplying current limit	Setting range:50-200%[50%]

Explanation:

Reduce the high-speed over current stall operating current.It is invalid when the compensation coefficient is 50.The operating current in the field weakening zone corresponds to P9.18.

In the high-frequency region,the motor drive current is small.Compared to the rated frequency below,the same stall current,the speed of the motor drops greatly.In order to improve the operating characteristics of the motor,the stall operating current above the rated frequency can be reduced.This method has a good effect on acceleration performance when the operating frequency is high,requiring several times weak field and large load inertia.Transient stall action current exceeding the rated frequency=(fs/fn)*k*Limit Cur;fs is the operating frequency,fn is the rated frequency of the motor,k is P9.21,and Limit Cur is P9.18.

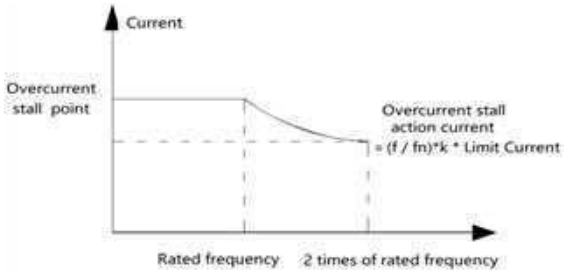


Figure 5-10-7 Diagram of double speed overcurrent stall action

Remarks:

Over current stall action current 150%indicates 1.5 times of the rated current of the inverter.For high-power motors,the carrier frequency is below 2kHz.Due to the increase of the pulsating current,the wave-by-wave current limiting response precedes the over current stall prevention action and generates torque In this case,reduce the over current stall prevention operating current.

P9.22 Over Voltage stall point	Setting range:600.0-800.0V

Notes:

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

If the bus voltage exceeds the over voltage stall point(P9.22),it means that the drive system is already in the power generation state(motor speed>output frequency),the over voltage stall will take effect,adjust the output frequency(consumption of excess electricity),and the actual deceleration time will be automatically pulled long to avoid trip protection,if the actual deceleration time can not meet the requirements,you can appropriately increase the over excitation gain.

P9.23 Over voltage stall enable	Setting range:0-1[1]

0:Disabled 1:Enabled

Explanation:

Default overvoltage stall gain is active.

P9.24 Over voltage stall restrain frequency gain	Setting range:0-200[100]
P9.25 Over voltage stall restrain voltage gain	Setting range:0-100[30]

Notes:

Increasing P9.24 will improve the control effect of the bus voltage,but the output frequency will fluctuate.If the output frequency fluctuates greatly,you can appropriately reduce P9.24.Increasing P9.25 can reduce the overshoot of the bus voltage.

P9.26 Over voltage stall maximum rising frequency limit	Setting range:0-50Hz[5Hz]

Notes:

When using a braking resistor or installing a braking unit or using an energy feedback unit,please note:

Please set P9.11"over excitation gain"to"0".If it is not"0",it may cause excessive current during operation problem.Please set the value of P9.23"Overvoltage Stall Enable"to"0".If it is not"0",it may cause the problem of prolonged deceleration time.

5.11 Communication parameters(Group PA)

Please refer to the relevant section of the appendix"Inverter Communication Protocol".

5.12 Fault and Protection(Group PB)

PB.00 Motor overload protection selection	Setting range:0-1[1]

0:Not protected.There is no motor overload protection feature(use with caution),it is recommended to heat the relay before the motor at this time.

1:Protected.See PB.01,PB.02 for details

PB.01 Motor overload protection gain	Setting range:0.20–10.00[1.00]
PB.02 Motor overload warning coefficient	Setting range:50%–120%[80%]

Notes:

In order to effectively protect different load motors,this parameter needs to be set according to the motor overload capacity.The motor overload protection is an inverse time curve.The motor overload protection curve is shown in the following figure:

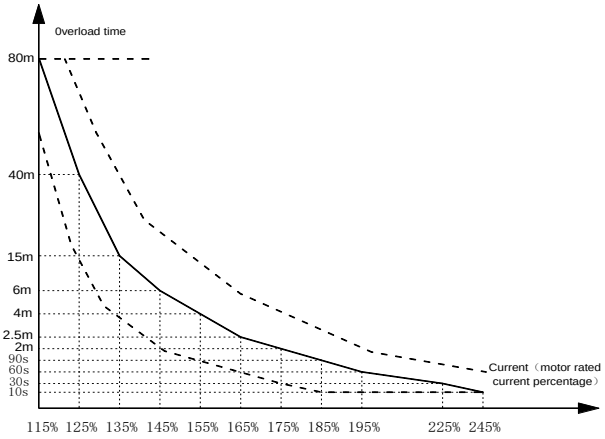


Figure 5-B-1 Schematic of inverse time limit of motor overload protection

1)When the motor running current reaches 175%times the rated current of the motor,the motor will be overloaded(E11)after 2 minutes of continuous operation;when the motor running current reaches 115%times the rated current of the motor,the motor will be reported after 80 minutes Overload(E11).Example:Motor rated current 100A

If PB.01 is set to 1.00,then when the motor running current reaches 125%(125A)of 100A,after 40 minutes,the inverter reports a motor overload fault;if PB.01 is set to 1.20,then when the motor running current When it reaches 125%(125A)of 100A,after 40*1.2=48 minutes,the inverter reports a motor overload fault;the maximum overload is 80 minutes,and the minimum time is 10 seconds.

2)Example of motor overload protection adjustment:The motor is required to run at 150%of the motor current for 2 minutes to report the overload.According to the motor overload curve,the current of 150%(I)is located at 145%(I1)and 155%(I2 In the current range of),145%of current is overloaded for 6 minutes(T1),155%of current is

overloaded for 4 minutes(T2),then the default setting of 150%of the rated current of the motor for 5 minutes is calculated as follows:

T=T1+(T2-T1)*(I–I1)/(I2–I1)=4+(6-4)*(150%–145%)/(155%–145%)=5(minutes)

It can be concluded that the motor is required to report an overload in 2 minutes at 150%motor current,and the motor overload protection gain:

PB.01=2÷5=0.4

Note:The user needs to set the value of PB.01 correctly according to the actual overload capacity of the motor.If this parameter is set too large,the motor may be overheated and damaged,and the inverter may not be alarmed in time.

3)Motor overload warning coefficient indicates that when the motor overload detection level reaches the parameter set value,the multi-function output terminal Y or fault relay(RELAY)outputs a motor overload pre-alarm signal,and this parameter continues to run according to the motor at a certain overload point Calculate the percentage of time without reporting an overload fault.For example:When the motor overload protection gain is set to 1.00 and the motor overload warning coefficient is set to 80%,if the motor current reaches 145%of the rated motor current for 4.8 minutes(80%×6 minutes),the multi-function output terminal Y Or the fault relay RELAY outputs a motor overload warning signal.

This function is used to give a warning signal to the control system through Y before the motor overload fault protection.This early warning coefficient is used to determine the extent to which early warning is performed 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 product of the overload inverse time curve and PB.02,the multifunctional digital Y of the inverter outputs the"motor overload pre-alarm"ON signal.

PB.07 Short-circuit to ground upon power-on	Setting range:0–1[1]

0:Disabled 1:Enabled

Notes:

You can choose to check whether the motor is short-circuited to ground when the inverter is powered on.If this function is valid,the inverter UVW terminal will output voltage for a period of time after power-on.

PB.08 Starting voltage of braking unit	Setting range:200.0-2000.0V

Notes:

The starting voltage V_{break} of the built-in braking unit,the setting reference of this voltage value:$800 \geqslant V_{break} \geqslant (1.414Vs+30)$

Vs-AC power supply voltage of the inverter

Note:Improper voltage setting may cause abnormal operation of the built-in braking unit!

PB.09 Automatic fault reset times	Setting range:0-20[0]

Notes:

When the inverter selects fault automatic reset,it is used to set the number of automatic resets.After this number of times,the inverter remains in a fault state.

PB.10 Fault Y action selection during fault automatic reset	Setting range:0-1[0]

0:No action 1:Action

Notes:

If the inverter is equipped with an automatic fault reset function,whether the fault Y is active during the automatic fault reset can be set through PB.10.

PB.11 Time interval of fault auto reset	Setting range:0.1s–100.0s[1.0s]

Notes:

Waiting time from inverter fault alarm to automatic fault reset.

PB.12 Input phase loss/Contactor pull-in protection selection	Setting range:0–1[1]

0:Disabled 1:Enabled

Unit's digit:Input phase loss protection

Ten's digit:Contactor energizing protection

PB.13 Output phase loss protection selection	Setting range:0–1[1]

0:Forbid 1:Allow

Notes:

Select whether to protect the output phase loss.If you select 0 and the output phase failure will not occur,the actual current will be larger than the current displayed on the panel.There is a risk.Use it with caution.

PB.14 1st recorded fault	Setting range:0–99
PB.15 2nd recorded fault	
PB.16 3rd(latest)recorded fault	

Notes:

Record the last three types of faults of the inverter.0 means no fault.For possible causes and solutions for each fault code,please refer to the relevant instructions in Chapter 8.

PB.17 Frequency at 3rd recorded fault	Setting range:It displays the frequency when the latest fault occurs.
PB.18 Current at 3rd recorded fault	Setting range:It displays the current when the latest fault occurs.
PB.19 Bus voltage at 3rd recorded fault	Setting range:It displays the bus voltage when the latest fault occurs.
PB.20 X status at 3rd recorded fault	Setting range:It displays the status of all X terminals when the latest fault occurs. The sequence is as follows: BIT0-BIT9 corresponding X1-X10 If a X is ON,the setting is 1.If theX is

	OFF,the setting is 0.The value is the equivalent decimal number converted from the X status.
PB.21 Y status at 3rd recorded fault	Setting range:It displays the status of all output terminals when the latest fault occurs. The sequence is as follows: BIT0-BIT4 orresponding Y REL1 REL2 D01 D02 If an output terminal is ON,the setting is 1.If the output terminal is OFF,the setting is 0.The value is the equivalent decimal number converted from the X statuses.
PB.22 Inverter status at 3rd recorded fault	Setting range:Reserved
PB.23 Power-on time at 3rd recorded fault	Setting range:It displays the present power-on time when the latest fault occurs.
PB.24 Running time at 3rd recorded fault	Setting range:It displays the present running time when the latest fault occurs
PB.27 Bus voltage at 2nd recorded fault	Setting range:Same as PB.17–PB.24
PB.28 X status at 2nd recorded fault	Setting range:Same as PB.17–PB.24
PB.29 Bus voltage at 2nd recorded fault	Setting range:Same as PB.17–PB.24
PB.30 X status at 2nd recorded fault	Setting range:Same as PB.17–PB.24
PB.31 Y status at 2nd recorded fault	Setting range:Same as PB.17–PB.24
PB.32 Inverter status at 2nd recorded fault	Setting range:Same as PB.17–PB.24
PB.33 Power-on time at 2nd recorded fault	Setting range:Same as PB.17–PB.24
PB.34 Running time at 2nd recorded fault	Setting range:Same as PB.17–PB.24
PB.37 Frequency at 1st recorded fault	Setting range:Same as PB.17–PB.24
PB.38 Current at 1st recorded fault	Setting range:Same as PB.17–PB.24
PB.39 Bus voltage at 1st recorded fault	Setting range:Same as PB.17–PB.24
PB.40 X status at 1st recorded fault	Setting range:Same as PB.17–PB.24
P9.41 Y status at 1st recorded fault	Setting range:Same as PB.17–PB.24
PB.42 Inverter status at 1st recorded fault	Setting range:Same as PB.17–PB.24
PB.43 Power-on time at 1st recorded fault	Setting range:Same as PB.17–PB.24
PB.44 Running time at 1st recorded fault	Setting range:Same as PB.17–PB.24

PB.47Fault protection action selection 1	Setting range:0-2[00000]

Notes:

Ones place:(Motor overload,E11)

0:Coast to stop 1:Stop according to the stop mode 2:Continue to run

Tens place:(Power input phase loss,E12)

Same as ones place

Hundreds place:(Power output phase loss,E13)

Same as ones place

Thousands place:(External equipment fault,E15)

Same as ones place

Ten thousands place:(Communication fault,E16)

Same as ones place

PB.48 Fault protection action selection 2	Setting range:0-2[00000]

Notes:

Ones place:(Encoder fault,E20)

0:Coast to stop

1:Switch over to V/F control,stop according to the stop mode

2:Switch over to V/F control,continue to run

Tens place:(EEPROM read-write fault,E21)

0:Coast to stop 1:Stop according to the stop mode

Hundreds place:reserved

Thousands place:(Motor overheat,E25)

Same as ones place in P9.47

Ten thousands place:(Accumulative running time reached)

Same as ones place in P9.47

PB.49 Fault protection action selection 3	Setting range:0-2[00000]

Notes:

Ones place:(User-defined fault 1,E27)

Same as ones place in P9.47

Tens place:(User-defined fault 2,E28)

Same as ones place in P9.47

Hundreds place:(Accumulative power-on time reached,E29)

Same as ones place in P9.47

Thousands place:(Load becoming 0,E30)

0:Coast to stop

1:Stop according to the stop mode

2:Continue to run at 7%of rated motor frequency and resume to the set frequency if the load recovers

Ten thousands place:(PID feedback lost during running,E31)

Same as ones place in P9.47

PB.50 Fault protection action selection 4	Setting range:0-2[00000]

Notes:

Ones place:(Too large speed deviation,E42)

Same as ones place in P9.47

Tens place:(Motor over-speed,E43)

Same as ones place in P9.47

Hundreds place:(Initial position fault,E51)

Same as ones place in P9.47

Thousands place:(Speed feedback fault,E52)

Same as ones place in P9.47

Ten thousands place:Reserved

PB.54 Continue running frequency selection in case of fault	Setting range:0-4[0]

0:Current running frequency 1:Set frequency

2:Frequency upper limit 3:Frequency lower limit

4:Backup frequency upon abnormality

PB.55 Abnormal standby frequency	Setting range:0.0–100.0%[100.0]

Notes:

When a fault occurs during the running of the inverter,and the relevant action is set to continue running,the inverter displays A**and runs at the frequency determined by PB.54.When abnormal standby frequency is selected,the value set by PB.55 is a percentage relative to the maximum frequency.

PB.56 Motor temperature sensor type	Setting range:0–2[0]

0:No temperature sensor 1:PT100

2:PT1000

PB.57 Motor overheat protection threshold	Setting range:0–200°C[110°C]
PB.58 Motor overheat warning threshold	Setting range:0–200°C[90°C]

Notes:

The temperature signal of the motor temperature sensor needs to be connected to the multi-function input/output expansion card.This card is an optional accessory.The analog input AI3 of the expansion card can be used as the motor temperature sensor input.The motor temperature sensor signal is connected to AI3 and PGND.The AI3 analog input terminal of the inverter supports PT100 and PT1000 motor temperature

sensors.The sensor type must be set correctly when using it.The motor temperature value is displayed in C0.34.When the temperature of the motor exceeds the motor overheating protection threshold PB.57,the inverter fault alarms and handles according to the selected fault protection action mode.When the motor temperature exceeds the motor overheating pre-alarm threshold PB.58,the inverter multi-function digital Y outputs the motor over-temperature pre-alarm ON signal.

PB.59 power dip ride-through function selection	Setting range:0–2[0]

0:Invalid 1:Bus voltage constant control(decelerate)

2:Decelerate to stop

PB.60 Threshold of power dip ride-through function disabled	Setting range:80.0%–100.0%[85.0%]
PB.61 Judging time of bus voltage recovering from power dip	Setting range:0.00–100.00s[0.50s]
PB.62 Threshold of power dip ride-through function enabled	Setting range:60.0%–100.0%[80.0%]

Notes:

As shown in the figure below:When the bus voltage drops below the"threshold of power dip ride-through function enabled",the ride-through function takes effect and the output frequency of the inverter automatically drops,leaving the motor in the power generation state,and the ride-through function allows feedback the energy to the bus of inverter and this keeps the bus voltage around the"threshold of power dip ride-through function enabled"and allows the system to slow down to 0Hz normally.

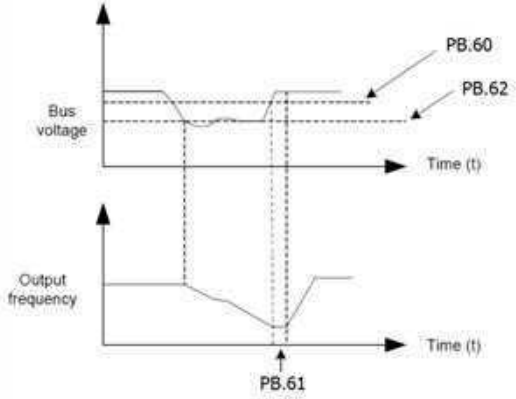


Figure 5-B-2 Schematic diagram of ride through function

PB.63 Load lost protection enable	Setting range:0–1[0]

0:Disabled 1:Enabled

PB.64 Detection level of load lost	Setting range:0.0%–100.0%[10.0%]
PB.65 Detection time of load load lost	Setting range:0.0–60.0s[1.0s]

Notes:

If the off-load protection function is effective,when the inverter output current is less than the off-load detection level PB.64 and the duration is greater than the off-load detection time PB.65,the inverter output frequency is automatically reduced to 7%of the rated frequency.During the load protection period,if the load is restored,the inverter will automatically resume to run at the set frequency.PLC power-off memory refers to memorizing the operation phase and frequency of PLC before power-off.

PB.67 Over-speed detection value	Setting range:0.0%–50.0%[20.0%]
PB.68 Over-speed detection time	Setting range:0.0–60.0s[1.0s]

Notes:

This function is only valid when the inverter is running in vector control with speed sensor.When the inverter detects that the actual speed of the motor exceeds the maximum frequency,the excess value is greater than the overspeed detection value PB.67,and the duration is greater than the overspeed detection time PB.68,the inverter fault alarm E43,and according to the fault protection action mode.When the overspeed detection time is 0.0s,the overspeed fault detection is cancelled.

PB.69 Detection level of speed error	Setting range:0.0%–50.0%[20.0%]
PB.70 Detection time of speed error	Setting range:0.0–60.0s[5.0s]

Notes:

This function is only valid when the inverter is running in vector control with speed sensor.When the inverter detects a deviation between the actual speed of the motor and the set frequency,the deviation is greater than the detection value PB.69,and the duration is greater than the detection time PB.70,the inverter fault alarm E42,And according to the fault protection action mode.When the deviation detection time is 0.0s,the excessive speed deviation fault detection is cancelled.

PB.71 Power dip ride-through gain Kp	Setting range:0–100[40]
PB.72 Power dip ride-through integral coefficient Ki	Setting range:0–100[30]
PB.73 Deceleration time of power dip ride-through	Setting range:0–300.0s

Explanation:

1. In the case of constant bus voltage control,when power is restored to the power grid,the output frequency of the inverter continues to run to the target frequency.In the deceleration stop mode,when the power is restored to the grid,the inverter continues to decelerate to 0 Hz and stops until the inverter issues a start command again.

2. The purpose of non-stop is to ensure that when the power supply is abnormal,the motor can be decelerated and stopped normally,so that the motor can start immediately after the power supply is restored to the normal power supply.Free stop in case of a voltage failure.In a large inertia system,it will take a long time for the motor to stop freely.After the power supply of the grid is normal,because the motor is rotating at a high speed,starting the motor at this time will easily cause the inverter to overload or over current.

PB.74 UVW encoder fault detection enable	Setting range:0~1[1]

0:disabled 1:enabled

When using a UVW encoder,an E20 fault is reported,and additional information C0.45 of 11 or 12 indicates a logic error in the UVW signal line.Firstly,confirm that the encoder is not faulty.If it is confirmed to be a false alarm,this fault can be masked by setting this function code to 0.

5.13 Second motor parameter(PC group)

Please refer to the corresponding content of the first motor parameters.

5.14 Torque Control and Restricting Parameters(Group PD)

PD.00 Speed/Torque control selection	Setting range:0-1[0]

0:Speed control 1:Torque control

Notes:

It is used to select the inverter control mode:speed control or torque control.Note:This function code cannot be used to switch during inverter operation.The multifunctional digital X terminal of the inverter has two functions related to torque control:torque control disable(function 29),speed control/torque control switching(function 46).These two terminals should be used in conjunction with PD.00 to realize the switching of speed and torque control.When the speed control/torque control switching terminal is invalid,the control mode is determined by PD.00.If the speed control/torque control switching is valid,the control mode is equivalent to the value of PD.00 reversed.In any case,when the torque control prohibition terminal is valid,the inverter is fixed to the speed control mode.

PD.01 Torque setting source in torque control	Setting range:0-7[0]
0:Digital setting(A0.03)	1:AI1
2:AI2	3:AI3
4:X5	5:Communication
6:MIN(AI1, A I 2)	7:MAX(AI1, A I 2)

Notes:

PD.01 is used to select the torque setting source.There are 8 torque setting modes.

The torque setting adopts a relative value,and 100.0%corresponds to the rated torque of the motor.The setting range is-200.0~200.0%,which indicates that the maximum torque of the inverter is twice the rated torque of the inverter.When the torque reference is positive,the inverter runs forward.When the torque reference is negative,the inverter runs reverse.

0:Digital setting(PD.03)

Refers to the target torque directly using the setting value of PD.03.

1:AI1 2:AI2

3:AI3

The target torque is determined by the analog input terminal.The inverter control board provides two analog input terminals(AI1,AI2),and the optional I/O expansion card can provide another analog input terminal(AI3).among them

AI1 is a 0~10V voltage input;AI2 can be a 0~10V voltage input or a 0~20mA current input,which is selected by the J8 jumper on the control board;AI3 is a-10~10V voltage input.

The corresponding relationship between the input voltage valuesof AI1,AI2,and AI3 and the target torque can be freely selected by the user through P2.33.The inverter provides 5 sets of correspondence curves,of which 3 sets of curves are straight-line relationships(2-point correspondence),and 2 sets of curves are arbitrary curves with 4-point correspondence.Users can use the P2.13~P2.27 function codes and A1 group Function code setting.Function code P2.33 is used to set AI1~AI3 three analog inputs,which one of the five groups of curves is selected.

The analog is used as the frequency reference,and the voltage/current input corresponds to 100.0%of the setting,which refers to the percentage of the relative torque digital setting PD.03.

4.PULSE pulse(X5)

The target torque is given by the high-speed pulse of terminal X5.Pulse given signal specifications:voltage range 9~30V,frequency range 0~100kHz.Pulse given only from multi-function input at input terminal X5.The relationship between the input pulse frequency of the X5 terminal and the corresponding setting is set through P2.28~P2.31.The corresponding relationship is a two-point linear correspondence relationship.The 100.0%of the corresponding setting of the pulse input refers to the relative torque number Set the percentage of PD.03.

5.Communication

Refers to the target torque given by the communication method.When it is a point-to-point communication slave and it receives data as the torque reference,it uses the master to transmit the data as the communication reference value(see the relevant description of group A5).When using Modbus communication,the data is given by the host computer through the communication address 0x1000.The data format is data with 2 decimal places,and the data range is-P0.10~+P0.10.

If the communication protocol is Modbus-RTU,you need to select the corresponding serial communication protocol according to P0.28.

PD.03 Torque digital setting in torque control mode	Setting range:-200.0%–+200.0%[150.0%]

PD.05 Forward max.frequency in torque control mode	Setting range:0.00Hz-P0.10[50.00Hz]
PD.06 Reverse max.frequency in torque control mode	Setting range:0.00Hz-P0.10[50.00Hz]

Notes:

In torque control,the acceleration/deceleration time of the upper frequency limit is set at P5.07(acceleration)/P5.08(deceleration).It is used to set the maximum forward or reverse frequency of the inverter under torque control mode.When the inverter In torque control,if the load torque is less than the output torque of the motor,the motor speed will continue to increase.To prevent accidents such as overspeed in the mechanical system,the maximum motor speed during torque control must be limited.If it is necessary to dynamically and continuously change the maximum frequency of torque control,it can be achieved by controlling the upper limit frequency.

PD.07 Acceleration time in torque control	Setting range:0.00–650.00s[0.00s]
PD.08 Deceleration time in torque control	Setting range:0.00–650.00s[0.00s]

Notes:

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 and deceleration time,the motor speed can be changed gently.In torque control with small torque starting,it is not recommended to set the torque acceleration and deceleration time;if the torque acceleration and deceleration time is set,it is recommended to increase the speed filter coefficient appropriately;when the torque needs to respond quickly,set the torque control acceleration and deceleration time 0.00s.For example,two motors are hard connected to drive the same load.To ensure that the load is evenly distributed,one inverter is set as the master and the speed control mode is used.The other inverter is the slave and uses torque control.The actual output of the master is transferred.The torque is the torque command of the slave,and the torque of the slave needs to quickly follow the master at this time,then the acceleration and deceleration time of the torque control of the slave is 0.00s.

5.15 Vector control parameters(PE group)

PE.00 Speed loop proportional gain 1	Setting range:1~100[30]
PE.01 Speed loop integration time 1	Setting range:0.01~10.00s[0.50s]
PE.02 switching frequency 1	Setting range:0.00~PE.05[5.00Hz]
PE.03 Speed loop proportional gain 2	Setting range:1~100[20]
PE.04 Speed loop integration time 2	Setting range:0.01~10.00s[1.00s]
PE.05 switching frequency 2	Setting range:PE.02~max.output frequency[10.00Hz]

Notes:

The inverter runs at different frequencies,and can choose different speed loop PI parameters.When the running frequency is less than the switching frequency 1(PE.02),the speed loop PI adjustment parameters are PE.00 and PE.01.When the running frequency is greater than the switching frequency 2,the speed loop PI adjustment parameters are PE.03 and P9.04.Speed loop PI parameters between

switching frequency 1 and switching frequency 2,linear switching of two sets of PI parameters

By setting the proportional coefficient and integration time of the speed regulator,the speed dynamic response characteristics of the vector control can be adjusted.Increasing the proportional gain and decreasing 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 may oscillate.The recommended adjustment method is:if the factory parameters do not meet the requirements,fine-tune based on the factory value parameters,first increase the proportional gain to ensure that the system does not oscillate;then reduce the integration time to make the system have faster response characteristics,and The tone is smaller.

Note:

Improper PI parameter setting may cause excessive speed overshoot.Even an overvoltage fault occurs when the overshoot drops.

PE.06 Slip compensation gain for IM motor vector control	Setting range:50~200%[100%]

Explanation:

For speed sensorless vector control,this parameter is used to adjust the stable speed accuracy of the motor:when the speed of the motor is under load,this parameter is increased,and vice versa.For vector control with speed sensor,this parameter can adjust the output current of the inverter under the same load.This function code is valid for asynchronous motors.

PE.07 Speed feedback filter time for IM motor SVC	Setting range:0.000~1.000s[0.0150s]

Explanation:

The speed feedback filter time of SVC is only effective when P0.01=0.Increasing PE.07 can improve the stability of the motor,but the dynamic response becomes weaker,otherwise the dynamic response becomes stronger,but too small will cause motor vibration.No adjustment is required under normal circumstances.This function code is valid for asynchronous motors.

PE.09 Torque upper limit in speed control mode (driving)	Setting range:0~7[0]

0:PE.10 1:AI1 2:AI2 3:AI3 4:Pulse setting(X5)

5:communication 6:MIN(AI1,AI2)7:MAX(AI1,AI2)

PE.10 Digital setting of torque upper limit in speed control mode(driving)	Setting range:0.0~200.0% [150.0%]
PE.11 Torque upper limit in speed control mode (generating)	Setting range:0~8[0]

0:Parameter PE.12 setting(no distinction between electric and power generation)

1:AI1

2:AI2

3:AI3

4:Pulse setting(X5)

5:Remote communication setting

6:MIN(AI1,AI2)

7:MAX(AI1,AI2)

The full scale of the 1-7 option corresponds to PE.12

PE.12 digital setting of torque upper limit in speed control mode(generating)	Setting range:0.0~200.0%[150.0%]

Explanation:

In speed control mode,the maximum output torque of the inverter is controlled by the torque upper limit source.PE.09 is used to select the setting source of the upper limit of torque.When setting through analog,X5 terminal pulse and communication,the correspondingly set 100%corresponds to PE.10,and 100%of PE.10 corresponds to the inverter Rated output current.For the settings of AI1,AI2,and AI3,please refer to the relevant introduction of group P2(select each curve through P2.33).For the pulse of X5 terminal,please refer to the introduction of P2.28 to P2.32.When the data is used as the torque reference,the torque digital setting is directly sent by the host.See the introduction of group A5 point-to-point communication.Otherwise,the host computer writes-100.00%~100.00%of the data through the communication address 0x1000,of which 100.00%corresponds to PE.10.

Synchronous machine control is to increase the upper limit of generating torque when PE.22 is set to 1,and PE.12 and PE.11 can be set appropriately when the need to limit or prohibit power generation,of which PE.09 and PE.11 The full scale corresponding to the~7 option corresponds to PE.10 and PE.11 respectively.

PE.13 Excitation adjustment proportional gain	Setting range:0~60000
PE.14 Excitation adjustment integral gain	Setting range:0~60000
PE.15 Torque adjustment proportional gain	Setting range:0~60000
PE.16 Torque adjustment integral gain	Setting range:0~60000

Explanation:

Vector control current loop PI adjustment parameter.This parameter will be obtained automatically after the asynchronous motor is dynamically tuned.Generally,no modification is needed.It should be reminded that instead of using the integral time as a dimension,the integral regulator of the current loop directly sets the integral gain.If the current loop PI gain is set too large,the entire control loop may oscillate.Therefore,when the current oscillation or torque fluctuation is large,you can manually reduce the PI proportional gain or integral gain here.

PE.18 **Field Weakening Mode for PMSM**	Setting range:0,1,2[1]
PE.19 **Field weakening gain for PMSM**	Setting range:0~50【5】

This group of parameters is used for the field weakening control of the synchronous motor.

PE.18=0 No field weakening.The synchronous motor does not perform field weakening control.At this time,the maximum value that the motor speed can reach is related to the inverter bus voltage.The advantage is that there is no field weakening current and the output current is small.The disadvantage is that the operating frequency cannot be at the set frequency,if the customer wants to reach a higher speed,the field weakening function needs to be turned on.

PE.18=1 automatic adjustment mode.This field weakening method is simple and reliable.The higher the speed,the higher the field weakening current.When the rated current of the motor is reached,it is not allowed to increase the speed.Otherwise,it will report an overload when running for a long time.In the magnetic field,you can appropriately increase the field weakening coefficient PE.19 of the synchronous motor,but excessive PE.19 will cause current instability.

PE.18=2 The automatic adjustment synthesis mode.The speed of the weak field current adjustment of the automatic adjustment synthesis method is relatively fast.It can be set to this mode when the automatic adjustment cannot meet the requirements,but this mode depends on the motor parameter value,and the stability is not as good as mode 1.

After entering the field weakening,if you want the output voltage to be higher,so that the field weakening current is smaller,you can appropriately reduce the saturation margin of the output voltage of the synchronous motor PE.23,but too small PE.23 will make the output voltage more easily saturate and affect the control performance.

PE.21 Maximum torque coefficient of field weakening for IM	Setting range:50~200%[100%]

Explanation:

This parameter will only take effect when the motor is running above the rated frequency.When the motor needs to accelerate to 2 times the rated frequency of the motor and the actual acceleration time is longer,reduce PE.21 appropriately;when the motor runs at 2 times the rated frequency and the speed drops significantly,increase PE.21,Generally,no changes are required.This function is only valid for IM motors.

PE.22 Generating torque upper limit enabled for IM	Setting range:0~1[0]
PE.23 Upper limit of generating power for IM	Setting range:100~120%[100]

PE.21 **Automatic tuning coefficient of weak magnetic field for PMSM**	Setting range:10~500[100]
PE.22 **Integral multiple for weak field control of PMSM**	Setting range:0~1[0]
PE.23 **Depth of weak magnetic field for PMSM**	Setting range:0~50[5]

PE.24 **Detection current for rotor initial position angle detection of PMSM**	Setting range:50%~180%[80%]

PE.25 **PMSM initial position angle detection selection**	Setting range:0-2[0]

Explanation:

The initial position angle detection is generally used for SVC.Its advantage is that no reversal occurs at startup.The disadvantage is that there is a certain sound.For situations where reverse rotation is not allowed at startup and the position of the motor rotor changes after stopping,PE.25 Must be set to 0,otherwise it can be set to 1 or 2.

FVC is only detected in the case of the ABZ encoder and it is the first time it is powered on.It is recommended not to modify it,otherwise there may be a risk of running.

PE.24 can set the detected current value.The smaller the current is,the lower the sound will be during detection,but too small may cause the position detection to be inaccurate.It is recommended not to modify it in FVC mode.

PE.27 **PMSM salient pole rate adjustment gain**	Setting range:50~500[100]
PE.28 **Maximum torque current ratio control**	Setting range:0-1[0]

Explanation:

This set of function codes is only valid when FVC is controlled and the motor is a salient pole PMSM.The so-called salient pole PMSM is generally a plug-in permanent magnet synchronous motor.The judgment basis is P1.18/P1.17>1.5.After confirming that it is a salient pole PMSM,set PE.28 to 1,the output current will decrease under the same load.If PE.28 is set to 1,the output current does not decrease or even increase under the same load.PE can be adjusted.27,adjust PE.27 until the output current is minimum.

PE.32 **Incremental encoder Z signal correction for PMSM**	Setting range:0-1[1]

Explanation:

This function code is only meaningful when the encoder is an incremental encoder.The Z signal correction is enabled by default,which can eliminate the accumulated position deviation.If the Z signal of the encoder is interfered with in some occasions,it will cause the speed or the output of the motor to deteriorate.In serious cases,even E20 encoder failure may be reported.At this time,PE.32 can be set to 0 to cancel Z signal correction.Although Z signal correction is cancelled,E20 will not be reported again,but if AB signal is due to external interference(generally speaking Z signal is more susceptible to interference)or there are accumulated errors for other reasons,and the car may eventually run.The best solution is to separate the encoder line from the power line,eliminate interference sources,and increase the encoder magnetic ring to reduce the encoder Signal interference.

PE.38 **SVC Low frequency run mode for PMSM**	Setting range:0,1[0]
PE.39 **SVC Low frequency braking effective Frequency for PMSM**	Setting range:0~10.00Hz [2.00Hz]

PE.40 **SVC Low frequency braking frequency change step size for PMSM**	Setting range:0.0005~1.0000Hz [0.0010Hz]
PE.41 **SVC Low-frequency braking current For PMSM**	Setting range:0~80%[50%]

Explanation:

This group of function codes is used for SVC low frequency braking.In the case where the motor needs to be stopped without a small reversal,low frequency braking can be selected,which is similar to the DC braking effect of the asynchronous motor.

When PE.38=1 and the state is decelerating and stopping,once the running frequency is lower than PE.39,low frequency braking will be used to prevent the motor from reversing when it stops.

PE.42 **SVC speed tracking for PMSM**	Setting range:0~1[0]

Explanation:

For applications where SVC needs to start smoothly without stopping the motor,you can set PE.42 to 1 to enable SVC speed tracking.You need to add a mains synchronization card for use.

PE.43 **zero servo enable for PMSM**	Setting range:0~1[0]
PE.44 **switching frequency for PMSM**	Setting range:0.00~PE.02[0.30]
PE.45 **zero servo speed loop proportional gain**	Setting range:1~100[10]
PE.46 **zero servo speed loop integration time**	Setting range:0.01s~10.00s

Explanation:

PMSM FVC zero servo function,in the case where position maintenance is required and zero servo rigidity is required,it can be enabled by setting PE.43 to 1.The default value of PE.43 is 0.Before starting,set PE.43 to 1 and use Speed loop with zero servo,PE.44 is the switching frequency,and PE.45 and PE.46 are the proportional gain and integration time of the speed loop when zero servo.Reduce PE.46,that is,reducing the integration time can enhance zero servo Rigidity,if it is too small,there may be some vibration,and it needs to be adjusted reasonably according to the actual situation.

PE.47 **shutdown anti-reverse enable for PMSM**	Setting range:0~1
PE.48 **PMSM stop angle**	Setting range:0.0°~10.0°

Explanation:

In FVC,setting PE.47 to 1 can prevent reversal when stopping or decelerating to 0Hz.The default value of PE.48 is 0.8 degrees.If inversion still occurs by default,the value of PE.48 can be increased appropriately until no inversion occurs.

5.16 HMI Group(Group PH)

PH.01 JOG Key function selection	Setting range:0-4[0]

Notes:

JOG key refers to multifunctional key.You can set the function of the MJOG key by using this parameter.You can perform switchover by using this key both in stop or running state.

0:This key is disabled.

1:Switchover between operation panel control and remote command control(terminal or communication)

You can perform switchover from the current command source to the operation panel control(local operation).If the current command source is operation panel control,this key is invalid.

2:Switchover between forward rotation and reverse rotation

You can change the direction of the frequency reference by using the MF.K key.It is valid only when the current command source is operation panel control.

3:Forward MJOG

You can perform forward FJOG by using the MJOG key.

4:Reverse MJOG

You can perform reverse RJOG by using the MJOG key.

PH.02 STOP/RESET key stop function selection	Setting range:0~1[0]

Description:

This function code defines the effective selection of **STOP/RESET** stop function.

0:The stop function of the STOP/RESET key is valid only in the keyboard operation mode

1:In any operation mode,the STOP/RESET key stop function is valid

PH.03 LED display running parameters 1	Setting range:0000-FFFF[1F]

Description:

The display content indicated by PH.03 is as follows

BIT15	BIT14	BIT13	BIT12	BIT11	BIT10
PID Setting	Load Speed	Length Value	Count Value	AI3 Voltage	AI2 Voltage
BIT9	BIT8	BIT7	BIT6	BIT5	BIT4
AI1 Voltage	Y Output Status	X Input Status	Output Torque	Output Power	Output Current
BIT3	BIT2	BIT1	BIT0		
Output Voltage	Bus voltage	Setting frequency(kHz)	Running Frequency		

If a parameter needs to be displayed during the running,set the corresponding bit to 1,and set PH.03 to the hexadecimal equivalent of this binary number.

PH.04 LED display running parameters 2	Setting range:0000-FFFF[0]

Description:

The display content indicated by PH.04 is as follows:

BIT15	BIT14	BIT13	BIT12	BIT11	BIT10
Auxiliary frequency Y display(Hz)	Main frequency X display(Hz)	Encoder feedback speed(Hz)	Communication setting value	X5 Pulse setting frequency(Hz)	Current running time(Min)
BIT9	BIT8	BIT7	BIT6	BIT5	BIT4
Current power-on time(Hr)	Linear speed	AI3 voltage before correction	VCC voltage before correction	AI1 voltage before correction	Remaining Running time
BIT3	BIT2	BIT1	BIT0		
Running frequency 2	X5 Pulse setting frequency(kHz)	PLC Stage	PID feedback		

If the above parameters need to be displayed during operation,set the corresponding position to 1,and convert this binary number to hexadecimal and set it to PH.04.

Running display parameters are used to set the parameters that can be viewed when the inverter is in the running state.The maximum number of status parameters that can be viewed is 32.According to the binary digits of PH.03 and PH.04 parameter values,the status parameters to be displayed are selected.The display order starts from the lowest bit of PH.03.

PH.05 LED stop display parameter	Setting range:0000-FFFF[0]

Description:

The display contents of the stop state are as follows:

BIT15	BIT14	BIT13	BIT12	BIT11	BIT10
Reserved	Reserved	Reserved	X5Pulse setting frequency KHz	PID setting	Load speed
BIT9	BIT8	BIT7	BIT6	BIT5	BIT4
PLC stage	Length value	Count value	AI3 voltage(V)	AI2 voltage(V)	AI1 voltage(V)
BIT3	BIT2	BIT1	BIT0		
Y output status	D input status	Bus voltage (V)	Set frequency(Hz)		

If the above parameters need to be displayed during the stop,set the corresponding position to 1,and convert this binary number to hexadecimal and set it to PH.05.

PH.06 Load Speed display factor	Setting range:0.0001-6.5000[1.0000]

Notes:

This parameter is used to adjust the relationship between the output frequency of the AC drive and the load speed.For details,see the description of PH-12.

PH.07 Inverter module temperature	Setting range:-20~100.0°C[-]

Notes:

Displays the temperature of the inverter module IGBT.Different types of inverter modules have different IGBT over-temperature protection values.

PH.08 Product number	Setting range:[-]
PH.09 Accumulative running time	Setting range:0–65535 h[-]
PH.10 Software version	Setting range:[-]
PH.11 function version number	Setting range:[-]

PH.12 Load speed display decimal point	Setting range:0~3[21]

Explanation:

Ones place:0~3

Used to set the number of decimal places for the load speed display.The following example illustrates the calculation method of the load speed:If the load speed display coefficient PH.06 is 2.000 and the load speed decimal point number PH.12 is 2(2 decimal points),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,that is,"set load speed".Taking the set frequency of 50.00Hz as an example,the load speed in the stop state is:50.00*2.000=100.00(2 decimal places display).

Tens place:1~2

1:C0.19/C0.29 are each displayed with a decimal point.

2:C0.19/C0.29 are displayed with 2 decimal points respectively.

PH.13 Cumulative power-on time	Setting range:0–65535 h[0]

Notes:

Displays the cumulative power-on time of the inverter since it was shipped from the factory.

When this time reaches the set power-on time(P5.17),the inverter's multifunctional digital output function(24)outputs an ON signal.

PH.14 Cumulative power consumption	Setting range:0–65535 kWh[-]

5.17 Function code management(Group PP)

PP.00 User password	Setting range:0–65535[0]

Notes:

PP.00 sets any non-zero number,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 set user password.Set PP.00 to 00000,then clear the set user password and invalidate the password protection function.PP.00 is the keyboard password.If it is set to non-zero,enter will take effect immediately.After setting the keyboard password,it is required to enter the password correctly every time before entering the first-level menu from the monitoring mode.

PP.01 Restore default settings	Setting range:0/1/2/4/501[0]

Notes:

0:No operation

1:Restore factory settings,excluding motor parameters

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

2:Clear record information

Clear the inverter fault record information,accumulated running time(PH.09),accumulated power-on time(PH.13),accumulated power consumption(PH.14).

4:backup current user parameters

501:restore user backup parameters

PP.02 Function parameter display attributes	Setting range:0-1[11]

Notes:

Ones place: Group C display selection

0:Do not display

1:display

Tens place:A group display selection

0:Do not display

1:display

The function parameters of the inverter are displayed in sequence,which are P0~PP,A0~A6,and C0~C1 function parameter groups.

PP.03 User changed parameter display selection	Setting range:0-1[0]

0:disable 1:enable

When PP.03 is set to 1,enter the user changed parameter display mode,only displaying parameters that have been changed by the user and are different from the

default value.The display method is to display the letter"c"before the function group name,such as PP.03 displaying as cPP.03.The method to exit this display mode is to set cPP.03 to 0.

PP.04 Function code modification attribute	Setting range:0~1[0]

0:Changeable 1:Unchangeable

Explanation:

The user can set whether the function code parameters can be modified to prevent the danger of the function parameters being changed by mistake.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.

5.18 AI/AO Correction(Group A0)

A0.00 AI1 measured voltage 1	Setting range:0.500–4.000 V[Factory-corrected]
A0.01 AI1 displayed voltage 1	Setting range:0.500–4.000 V[Factory-corrected]
A0.02 AI1 measured voltage 2	Setting range:6.000–9.999 V[Factory-corrected]
A0.03 AI1 displayed voltage 2	Setting range:6.000–9.999 V[Factory-corrected]
A0.04 AI2 measured voltage 1	Setting range:0.500–4.000 V[Factory-corrected]
A0.05 AI2 displayed voltage 1	Setting range:0.500–4.000 V[Factory-corrected]
A0.06 AI2 measured voltage 2	Setting range:6.000–9.999 V[Factory-corrected]
A0.07 AI2 displayed voltage 2	Setting range:-9.999–10.000V[Factory-corrected]
A0.08 AI3 measured voltage 1	Setting range:-9.999–10.000V[Factory-corrected]
A0.09 AI3 displayed voltage 1	Setting range:-9.999–10.000V[Factory-corrected]
A0.10 AI3 measured voltage 2	Setting range:-9.999–10.000V[Factory-corrected]
A0.11 AI3 displayed voltage 2	Setting range:-9.999–10.000V[Factory-corrected]

Description:

This group of function codes is used to calibrate the analog input port to eliminate the effects of the zero offset and gain of the analog input port.

The function parameters of this group have been calibrated before leaving the factory.When the factory value is restored,it will be restored to the factory corrected value.Generally,no calibration is needed at the application site.The actual measured voltage refers to the actual voltage measured by a measuring instrument such as a multimeter.The displayed voltage refers to the voltage display value sampled by the inverter.See the C0 group before AI correction(C0.21,C0.22,C0.23).

When calibrating,input two voltage values at each analog input port,and input the value measured by the multi-meter and the value read by C0 group into the above function code accurately,then the inverter will automatically perform the analog input port Correction of zero offset and gain.For occasions where the user's given voltage does not match the actual sampling voltage of the inverter,the on-site correction method can be used to make the inverter's sampling value consistent with the expected given value.Take AI1 as an example.

Given AI1 voltage signal(about 2V):

Actually measure the voltage value of AI1 and store it in function parameter A0.00;

Check the display value of C0.21 and store it in the function parameter A0.01

Given AI1 voltage signal(about 8V):

Actually measure the voltage value of AI1 and store it in function parameter A0.02;

Check the display value of C0.21 and save it in the function parameter A0.03.

When calibrating AI2 and AI3,the actual sampling voltage viewing positions are C0.22 and C0.23 respectively.

For AI1 and AI2,it is recommended to use 2V and 8V as correction points.

For AI3,it is recommended to sample-8V and 8V as calibration points.

A0.12 AO1 target voltage 1	Setting range:0.500–4.000V[Factory-corrected]
A0.13 AO1 measured voltage 1	Setting range:0.500–4.000V[Factory-corrected]
A0.14 AO1 target voltage 2	Setting range:6.000–0.999V[Factory-corrected]
A0.15 AO1 measured voltage 2	Setting range:6.000–9.999V[Factory-corrected]
A0.16 AO2 target voltage 1	Setting range:0.500–4.000V[Factory-corrected]
A0.17 AO2 measured voltage 1	Setting range:0.500–4.000V[Factory-corrected]
A0.18 AO2 target voltage 2	Setting range:6.000–9.999V[Factory-corrected]
A0.19 AO2 measured voltage 2	Setting range:6.000–9.999V[Factory-corrected]

Notes:

This group of function codes is used to correct the analog output AO.This group of function parameters has been calibrated when leaving the factory.When it is restored to the factory value,it will be restored to the value after factory calibration.Generally,no calibration is required at the application site.The target voltage refers to the theoretical output voltage value of the inverter.Measured voltage refers to the actual output voltage value measured by instruments such as a multi-meter.

5.19 User-defined function(Group A3)

This group of function codes is a user-defined parameter group.The function codes to be used in the-USER menu mode should be customized in this group.The user can select the required parameters in almost all function codes(except for themselves)and aggregate them into group A3,and call them directly in the-USER menu mode as user-defined parameters to facilitate viewing and changing operations.

The A3 group provides up to 32 user-defined parameters.If the parameter display value of group A3 is uP0.00,the user function code is empty.When entering the-USER menu mode,the displayed function codes are defined by A3.00 to A3.31,the sequence is the same as the function code of group A3,if uP0.00,it will skip automatically.

5.20 Point-point Communication(Group A5)

A5.00 Point-point communication selection	Setting range:0–1[0]

0:Disabled 1:Enabled

Select whether the point-to-point communication function is valid.

Point-to-point communication refers to the direct data communication between two or more frequency converters,which is implemented using CANlink.It is used to realize the setting of target frequency and target torque of one or more slaves according to its own frequency or torque signal.When multiple inverter CANlink cards are connected,the CANlink card of the end inverter should be connected to the terminating resistor.For the connection method,see the description in the appendix.When the point-to-point communication is valid,the CANlink communication address of the master and the slave is automatically matched internally,and no special setting is required.The point-to-point communication rate is set by PA.00.

A5.01 Master and slave selection	Setting range:0–1[0]

0:Master 1:Slave

Description:

Used to select whether the inverter is master or slave. For point-to-point communication, only the CAN communication baud rate needs to be set,and the communication address is automatically assigned according to the current master or slave.

A5.02 Slave and master information exchange	Setting range:0–1[011]

Notes:

Ones place:

0:Do not follow host command 1:Follow the host command

Tens place:

0:No fault information is sent 1:Send fault information

Hundreds place:

0:No alarm when the slave is offline 1:Alarm when the slave is offline

When the master-slave controlled slave and P0.02=2(communication control),if the unit digit of this value is set to 1,the slave will run/stop along with the master's running command;the tenth place of the slave is set to 1,When the slave fails,send the fault information to the master;

Hundreds place of master stations are set to 1,when the slave station drops,it will alarm.

A5.03 Data frame selection	Setting range:0–1[0]

0:Master slave control frame (output frequency) 1:Droop control frame (frequency reference)

Description:

A5.03=0:if P5.15 is not equal to 0,the master sends its frequency after drop control to the slave.It is applicable to droop control or speed synchronization control(slave in speed control).In load sharing control(slave in toruqe control),the master sends its output frequency to the slave.In this case,ensure P5.15=0.

A5.03=1:The master sends its frequency reference to the slave.

A5.04 Received data zero bias(torque)	Setting range:-100.00%–100.00%[0.00]
A5.05 Received data gain(torque)	Setting range:-10.00–10.00[1.00]

Notes:

The above two function parameters are mainly used to modify the received torque data and are used to define the relationship of torque command between the master and the slave.If the zero offset is represented by b,the gain is represented by k,the data received by the slave is represented by x,and the actual data used is represented by y.The actual data used is y=kx+b.The range is-100.00%to 100.00%.

A5.06 Point-point communication interruption detection time	Setting range:0.0–10.00[1.0s]

Notes:

Set the detection time for master or slave communication interruption in point-point communication.Setting it to 0 means no detection will be performed.

A5.07 Master data sending cycle	Setting range:0.001–10.000s[0.001]

Notes:

Set the data transmission period of the master during the point-point communication.

A5.08 Zero offset of received data(frequency)	Setting range:-100.00%–100.00[0.00%]
A5.09 Gain of received data(frequency)	Setting range:-10.00–10.00[1.00]

Notes:

The above two function parameters are mainly used to modify the received frequency data and are used to define the relationship of the frequency command between the master and the slave.If the zero offset is represented by b,the gain is represented by k,the data received by the slave is represented by x,and the actual data used is represented by y,then the actual data used is y=kx+b;

The range is-100.00%to 100.00%.

A5.10 Preventing speeding factor	Setting range:0.00%to 100.00%[10.00%]

This parameter is valid when the slave is in torque control and the load sharing operation is followed by the master output torque.When set to 0.00%,the preventing speeding function is invalid.When set to other values,it can effectively detect whether the slave is in over-speed state and take effective protection.The recommended parameter is 5.00%to 20.00%.

A5.11 Windows	Setting range:0.2–10Hz[0.50Hz]

Notes:

This function code is valid during master-slave control.Setting this value can ensure that the master and slave speeds are synchronized within the window range.

5.21 Monitoring Parameters(Group C0)

The C0 parameter group is used to monitor the running status of the inverter.Customers can view it through the panel to facilitate on-site debugging,or read the parameter group value through communication for monitoring by the upper computer.The communication address is 0x7000~0x7044.Among them,C0.00~C0.31 are the running and shutdown monitoring parameters defined in PH.03 and PH.04.Please refer to Chapter 4“Parameter Index”for specific parameter function codes,parameter names,and minimum units.

C0.00 Running frequency	Setting range:0.00–500Hz
C0.01 Set frequency	Setting range:0.00–500Hz

Notes:

Displays the absolute value of the theoretical operating frequency and set frequency of the inverter.See C0.19 for the actual output frequency of the inverter

C0.02 Bus voltage	Setting range:0.0–3000.0 V

C0.03 Output voltage	Setting range:0–1140 V

C0.04 Output current	Setting range: 0.00–655.35 A(power≤55 kW) 0.0–6553.5 A(power>55 kW)

C0.05 Output power	Setting range:0–32767

C0.06 Output torque	Setting range:-200.0%–200.0%

C0.07 X input status	Setting range:0–32767

Notes:

Display the current X terminal input status value.After being converted into binary data,each bit corresponds to an X-terminal input signal.A value of 1 indicates that the input is a high-level signal,and a value of 0 indicates that the input is a low-level signal.The corresponding relationship between each bit and the input terminal is as follows:

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit8	Bit9

X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
Bit10	Bit11	Bit12	Bit13	Bit10	Bit11	Bit12	Bit13	Bit14	Bit15
VX1	VX2	VX3	VX4	VX1	VX2	VX3	VX4	VX5	

C0.08 Y output state	Setting range:0–1023

Notes:

Display the current Y terminal output status value.After converted to binary data,each bit corresponds to a Y signal.A value of 1 indicates that the output is high,and a value of 0 indicates that the output is low.The corresponding relationship between each bit and output terminal is as follows:

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5
Y	Relay 1	Relay 2	Y1	Y2	VY1
Bit6	Bit7	Bit8	Bit9	Bit10	Bit11
VY2	VY3	VY4	VY5		

C0.10 AI2 voltage(V)/current(mA)	Setting range:0.00–10.57 V 0.00–20.00 mA

Notes:

When P2.40 is set to 0,the display unit of AI2 sampling data is voltage(V)
When P2.40 is set to 1,the display unit of AI2 sampling data is current(mA)

C0.14 Load speed	Setting range:0–65535

Notes:

For more details,see the description of PH.12.

C0.15 PID setting	Setting range:0–65535
C0.16 PID feedback	Setting range:0–65535

Notes:

They display the PID setting value and PID feedback value.
•PID setting=PID setting(percentage)*P6.04
•PID feedback=PID feedback(percentage)x*P6.04

C0.18 X5 Input pulse frequency	Setting range:0.00–100.00 kHz

Notes:

Display X5 high-speed pulse sampling frequency,the minimum unit is 0.01KHz

C0.19 Feedback speed	Setting range:-320.00–320.00Hz-500.0–500.0 Hz

Notes:

Display the actual output frequency of the inverter.Function code PH.12(decimal digits for load speed display)The set value of the ten digits indicates the number of

decimal points of C0.19/C0.29.When the number is 2,the display range is-320.00~320.00Hz;when it is set to 1,the number of C0.19 decimal points is 1,and the display range is-500.0~500.0Hz.

C0.20 Remaining running time	Setting range:0.0–6500.0 min

Notes:

When the timer is running,the remaining running time is displayed.For timing operation,please refer to the introduction of parameters P5.42~P5.44.

C0.21 AI1 voltage before correction	0.00–10.57 V
C0.22 AI2 voltage(V)/current(mA)before Correction	0.00–10.57V/0.00–20.000mA
C0.23 AI3 voltage before correction	-10.57–10.57 V

Notes:

Displays the analog input sampled voltage/current actual value.

The voltage/current actually used is linearly corrected so that the deviation between the sampled voltage/current and the actual input voltage/current is smaller.See C0.09,C0.10,C0.11 for the actual correction voltage/current,and see the introduction of group A0 for the correction method.

C0.24 AI1 voltage before correction	Setting range:0–65535 m/min

Notes:

Displays the linear speed of high-speed pulse sampling at the X5 terminal,in meters/minute.According to the number of actual sample pulses per minute and P7.07(pulses per meter),the linear velocity value was calculated.

C0.27 Pulse input frequency	Setting range:0–65535 Hz

Notes:

Display X5 terminal high-speed pulse sampling frequency,the unit is 1Hz.It is the same data as C0.18,but the display unit is different.

C0.28 Communication setting value	Setting range:-100.00%–100.00%

Notes:

Display the data written by the communication address 0x1000

C0.29 Encoder feedback speed	Setting range:-320.00–320.00/-500.0–500.0 Hz

Notes:

Displays the motor running frequency actually measured by the encoder.

Function code PH.12(decimal digits for load speed display)The set value of the ten digits indicates the number of decimal points of C0.19/C0.29.When it is set to 2,the number of decimal points of C0.29 is 2 and the display range It is-320.00~320.00Hz;when it is set to 1,the number of decimal points of C0.29 is 1,and the display range is-500.0~500.0Hz.

C0.30 Main frequency X	Setting range:0.00–500.00 Hz
C0.31 Auxiliary frequency Y	Setting range:0.00–500.00 Hz
C0.34 Motor temperature	Setting range:0–200°C

Notes:

Display the motor temperature value sampled by AI3.For the motor temperature

detection,see the introduction of PB.56.

C0.35 Target torque	Setting range:-200.0%–200.0%

C0.36 Resolver position	Setting range:0–4095

U0.37 Power factor angle	Setting range:-

U0.38 ABZ position	Setting range:0–65535

Notes:

Display the current ABZ or UVW encoder AB phase pulse count.The value is the number of pulses after 4 times the frequency.If it is displayed as 4000,the number of pulses actually passed by the encoder is 4000/4=1000.The value is incremented.When the encoder is reversed,the value is decremented.When it is incremented to 65535,the count is restarted from 0.When it is decremented to 0,the count is restarted from 65535.Check the value to see if the encoder is installed properly.

C0.39 VF separation target voltage	Setting range:0 V to rated motor voltage
U0.40 VF separation output voltage	Setting range:0 V to rated motor voltage

Notes:

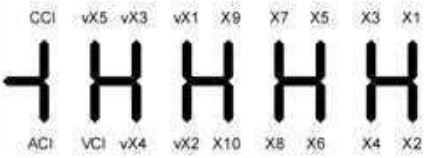
When the display is running in the VF separation state,the target output voltage and the current actual output voltage VF separation are shown in the related introduction of group P9.

C0.41 X terminals state visual display	Setting range:-

Notes:

Visual display of X terminal status,the display format is as follows:

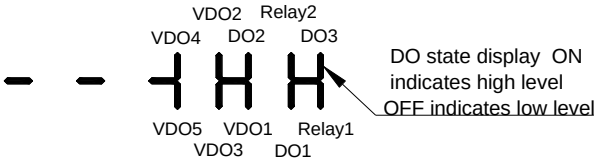
X terminal status display,when it is on,it is high level and when it is off,it is low level.



C0.42 Y state visual display	Setting range:-

Notes:

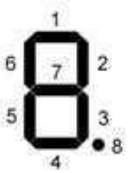
Visual display of Y terminal output status,the display format is as follows:



C0.43 X function state visual display 1	Setting range:-

Notes:

Visual display of terminal function 1~40 is valid.There are 5 digital tubes on the keyboard.Each digital tube display can represent 8 functions.Digital tube is defined as follows:



X function display,on indicates valid,off indicates invalid

the 7-segment LED display functions 1-8,9-16,17-24,25-32 and 33-40 respectively from right to left.

C0.44 X function state visual display 2	Setting range:-

Notes:

Visually display whether terminal functions 41~59 are valid.The display mode is similar to C0.43.The digital tube represents functions 41~48,49~56,57~59 from right to left.

C0.58 Phase Z counting	Setting range:0–65535

Notes:

Displays the current Z-phase pulse count of the ABZ or UVW encoder.When the encoder is rotated forward or reverse,the corresponding value is increased or decreased by 1.Checking this value can check whether the encoder is installed normally.

C0.59 Current set frequency	Setting range:-100.00%–100.00%
C0.60 Current running frequency	Setting range:-100.00%–100.00%

Notes:

It displays the current set frequency and running frequency.100.00%corresponds to the AC drive's maximum frequency(P0.10).

C0.61 AC drive running state	Setting range:0~65535

It displays the running state of the AC drive.The data format is listed in the following table:

C0.61	Bit0	0:Stop 1:Forward 2:Reverse
	Bit1	
	Bi2	0:Constant 1:Accelerate 2:Decelerate
	Bit3	
	Bit4	0:Bus voltage normal 1:Undervoltage

C0.62 Current fault code	Setting range:0–99

Notes:

It displays the current fault code.

C0.65 Torque upper limit	Setting range:-200.00%–200.00%
C0.73 Motor serial number	Setting range:0:Motor 1;1:Motor 2
C0.74 Inverter output torque	Setting range:-300.0%~300.0%

Chapter 6 Troubleshooting

6.1 Fault information and troubleshooting

When the inverter has detected a fault,the keypad will display the fault code,and the inverter will stop PWM output and come into fault protection state.In the fault indicator TRIP will flicker,the fault relay has output and the motor will coast to stop.At this time,you should find the reason of fault and apply corrective actions.If the listed troubleshooting cannot solve the problem,please contact our company directly.After debugging,you can press“STOP/RESET”or reset external terminals to restart the inverter.Notes:the inverter can’t startup even through debugging has been finished if operating signal isn’t removed.You should cut operating signal first and then close again or remove main circuit power supply once to make the fault reset.If the SC fault appeared,the reset is only permitted after 10 seconds.

Table 6-1 Troubleshooting

Fault Name	Display	Possible Causes	Solutions
Inverter unit protection	E01	1:The output circuit is grounded or short circuited. 2:The connecting cable of the motor is too long. 3:The module overheats. 4:The internal connections become loose. 5:The main control board is faulty. 6:The drive board is faulty. 7:The inverter module 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 our company 6:Contact the agent or our company 7:Contact the agent or our company
Over-current during acceleration	E02	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 AC drive 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 AC drive of higher power class.

Fault Name	Display	Possible Causes	Solutions
Over-current during deceleration	E03	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 deceleration. 6:The braking unit and braking resistor are not	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.
Over-current at constant speed	E04	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 AC drive 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 AC drive of higher power class.
Over-voltage during acceleration	E05	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.
Over-voltage during deceleration	E06	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.
Over-voltage at constant speed	E07	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	E08	The input voltage is not within the allowable range.	Adjust the input voltage to the allowable range

Fault Name	Display	Possible Causes	Solutions
Under-voltage	E09	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 drive board is faulty. 6:The main control board is faulty.	1:Reset the fault. 2:Adjust the voltage to normal range. 3-6:Contact the agent or our company
AC drive overload	E10	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 AC drive of higher power class.
Motor overload	E11	1:P9-01 is set improperly. 2:The load is too heavy or locked-rotor occurs on the motor. 3:The AC drive model is of too small power class.	1:Set P9-01 correctly. 2:Reduce the load and check the motor and the mechanical condition. 3:Select an AC drive of higher power class
Power input phase loss	E12	1:The three-phase power input is abnormal. 2:The drive board is faulty. 3:The lightening board is faulty. 4:The main control board is faulty.	1:Eliminate external faults. 2-4:Contact the agent or our company
Power output phase loss	E13	1:The cable connecting the AC drive and the motor is faulty. 2:The AC drive's three-phase outputs are unbalanced when the motor is running. 3:The drive board is faulty. 4:The module is faulty.	1:Eliminate external faults. 2:Check whether the motor three-phase winding is normal. 3-4:Contact the agent or our company
Module overheat	E14	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 module is damaged. 5:The inverter module 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 module.

Fault Name	Display	Possible Causes	Solutions
External equipment fault	E15	1:External fault signal is input via X. 2:External fault signal is input via virtual I/O.	1-2:Reset the operation.
Communication fault	E16	1:The host computer 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 computer. 2:Check the communication cabling. 3:Set P0-28 correctly. 4:Set the communication parameters properly.
Contactor fault	E17	1:The drive board and power supply are faulty. 2:The contactor is faulty.	1:Replace the faulty drive board or power supply board. 2:Replace the faulty contactor.
Current detection fault	E18	1:The HALL device is faulty. 2:The drive board is faulty.	1:Replace the faulty HALL device. 2:Replace the faulty drive board.
Motor auto-tuning fault	E19	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 AC drive and the motor.
Encoder fault	E20	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 fault	E21	The EEPROM chip is damaged.	Replace the main control board.
AC drive hardware fault	E22	1: Over-voltage exists. 2: Over-current exists.	1:Handle based on overvoltage. 2:Handle based on overcurrent.
Short circuit to ground	E23	The motor is short circuited to the ground.	Replace the cable or motor.
Accumulative running time reached	E26	The accumulative running time reaches the setting value.	Clear the record through the parameter initialization function.

Fault Name	Display	Possible Causes	Solutions
User-defined fault 1	E27	1:The user-defined fault 1 signal is input via X.terminal 2:User-defined fault 1 signal is input via virtual	Reset the operation.
User-defined fault 2	E28	1:The user-defined fault 2 signal is input via X terminal 2:The user-defined fault 2 signal is input via virtual	Reset the operation.
Accumulative power-on time reached	E29	The accumulative power-on time reaches the setting value.	Clear the record through the parameter initialization function.
Load lost	E30	The AC drive 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	E31	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	E40	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 AC drive of higher power class.
Motor switchover fault during running	E41	Change the selection of the motor via terminal during running of the AC drive	Perform motor switchover after the AC drive stops.
Too large speed deviation	E42	1:The encoder parameters are set incorrectly. 2:The motor auto-tuning is not performed. 3:P9-69 and P9-70 are set incorrectly. 4:The connection from the inverter output UVW to the motor is abnormal	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. 4.:Check whether the wiring between the inverter and the motor is disconnected
Motor over-speed	E43	1:The encoder parameters are set incorrectly. 2:The motor auto-tuning is not performed. 3:P9-69 and P9-70 are set incorrectly.	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	Possible Causes	Solutions
Motor overheat	E45	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	E51	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.
Brake module protection fault	E60	Brake resistance be shorted or brake module abnormal	Check the brake resistance or Contact the agent or company for technical support

Chapter 7 Peripheral Equipment

7.1 Peripheral Equipment Connection Diagrams

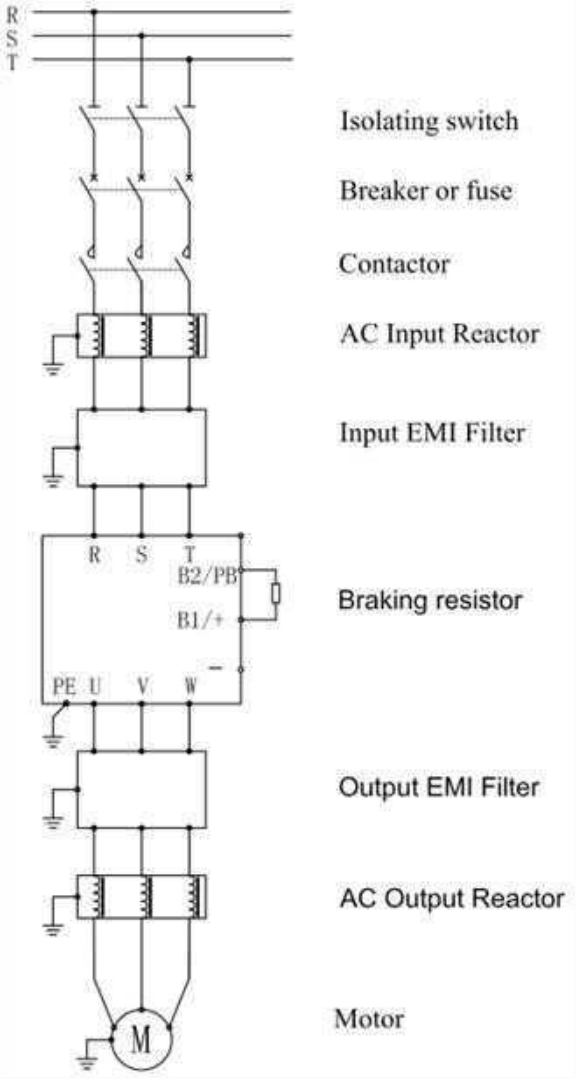


Fig.7-1 3R75GB/31R5PB~3022GB Peripheral Equipment Connection Diagram

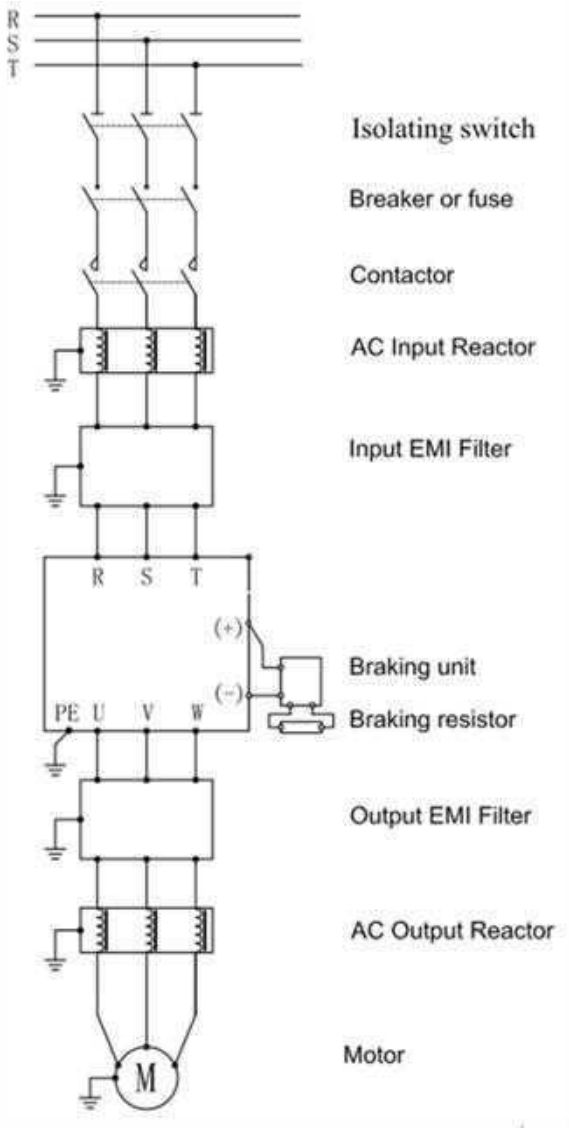


Fig.7-2 3030G and above Peripheral Equipment Connection Diagram

7.2 Function of Peripheral Equipment

Table 7-1 Function of Peripheral Equipment

Peripheral Equipment&Optional parts	Description
Breaker	It is used to cut off the fault current of the inverter rapidly and prevent the power fault caused by fault with the inverter and its circuits.
Contactor	It is used to cut off the main power supply at the time of inverter fault and prevent power failure&restarting after the fault
***AC Reactor**	It is used to improve the input power factor,reduce the higher harmonic and inhibit the power surge
***EMI Filter**	It is used reduce the radio disturbance caused by the inverter.When the wiring distance between the motor and the inverter is less than 20m,it is suggested to be connected to the power supply side;when the distance is over 20m,is suggested to be connected at the output side.
***Braking Unit and Braking resistor**	They are selected and used when the braking torque cannot meet the requirements,and are applicable on occasions of high-inertia load&frequent braking or rapid stop.

Remarks:*-marked items are optional parts.

7.2.1 AC Input Reactor

Using AC input reactor can restrain higher harmonic wave and improve power factor obviously.In the following situation,users are advised to use ac reactor.

- Power supply capacity:Inverter capacity>10:1
- Silicon controlled load and switching controlled power factor compensator are on the same power supply line.
- Degree of three-phase voltage imbalance is more than 3%

7.2.2 Braking Unit and Braking resistor

Brake units are in-built in this series of inverters whose power rating is 15kW and below.When dynamic braking is required,the user just has to connect the braking resistor.The inverter whose power rating is from 18.5kw to 93kw can equip with braking unit..There are not in-built brake units with the inverters of 110kW and above.When the dynamic braking is required,the additional braking unit should be connected.The braking unit consists of the control part,the driving part and the discharging resistance.The control part should be adjusted according to the overvoltage protection action values for this series of inverters.If the discharging resistance part is

provided with the overheating protection,it is suggested that the controlling connection point be connected to the main control circuit.

Refer to the following table for common braking resistors specifications.

Table 7-2 Motor power and brake resistor selection

Voltage (V)	Motor Power(kW)	Resistance Value(Ω)	Resistance Power (kW)	Voltage (V)	Motor Power(kW)	Resistance Value(Ω)	Resistance Power (kW)
Three-phase 380V	0.75	300	0.4	Three-phase 380V	93	20/3	18
	1.5	300	0.4		110	20/3	18
	2.2	200	0.5		132	20/4	24
	4	200	0.5		160	13.6/4	36
	5.5	100	0.8		185	13.6/4	36
	7.5	75	0.8		200	13.6/5	45
	11	50	1		220	13.6/5	45
	15	40	1.5		250	13.6/5	45
	18.5	30	4		280	13.6/6	54
	22	30	4		315	13.6/6	54
	30	20	6		355	13.6/7	63
	37	16	9		400	13.6/8	72
	45	13.6	9		450	13.6/8	81
	55	20/2	12		500	13.6/8	100
	75	13.6/2	18				

At braking,the regenerated energy of motor is almost consumed on the braking resistor.The braking power can be calculated according to the following formula:

$$U*U/R=Pb$$

In the formula,R is the value of selected braking resistor,U is the braking voltage at stable braking of the system(it varies with different systems;for the 380VAC system,it is generally taken as 700V),and Pb is the braking power.Theoretically,the power of braking resistor is the same with the braking power,but generally 70%of it will be used.Power required by the braking resistor can be calculated according to the following formula:

$$0.7*Pr=Pb*D$$

In the formula,Pr is power of the braking resistor,and D is the braking frequency(proportion of the regeneration process in the whole working process),which can be selected according to the following table:

Table 7-3 Reference for Braking Frequency

Application Occasion	Elevator	Uncoiling &Coil Taking	Centrifuge	AAI2dental Braking Load	General Application
Braking Frequency	20%~30%	20~30%	50%~60%	5%	10%

7.2.3 Leakage protector

Due to the presence of ground-regulated capacitance or distributed capacitance in the inverter,the motor and the input and output leads,and because this series of inverters are low-noise,the carrier used is higher.Therefore,the ground leakage current of the inverter is large,and the large-capacity models are more obvious.Sometimes,the leakage protection circuit may even malfunction.

When encountering the above problems,in addition to properly reducing the carrier frequency,shortening the lead and installing the output reactor,a leakage protector should also be installed.When installing and using a leakage protector,pay attention to the following points:

The leakage protector should be installed on the input side of the inverter,which is more suitable after the circuit breaker.

The operating current of the leakage protector should be greater than 10 times the leakage current(the sum of the leakage currents of the line,EMI filter,motor,etc.)when the line is not using the inverter under power frequency power supply.

7.2.4 Capacitor box

This option is specially used for occasions where the power supply needs continuous operation when the power outage time is large(more than 20ms).

It can be ordered from our company.When ordering,we need to indicate the actual load size and the continuous operation time after power failure,so that our company can make it.

Since the installation of this option will affect some parameters in the machine,it is not recommended to be equipped by the user.

Chapter 8 Maintenance

Danger

1. Please do not touch the terminals of inverter,which are provided with the high voltage.
   There is the danger of electric shock.
2. Before power is supplied,please do install the terminal casing well.When the casing is dismantled,please do cut off the power supply.
   There is the danger of electric shock.
3. Maintenance and inspection cannot be started until the main circuit power supply is cut off and the CHARGE LED indicator light is confirmed to go out.
   There is the danger of residual voltage on the electrolytic capAI3tor.
4. Non-professionals are not allowed to do the job of maintenance and inspection.
   There is the danger of electric shock.

Caution

1. As the CMOS integrated circuit is installed on the keypad panel,the control circuit board and the driving circuit board,please pay special attention when they are used.If the circuit boards are touched with the finger directly,the integrated chips on them may be damaged by the electrostatic induction.
2. Please do not change the connection lines or dismantle the terminal lines when power is supplied.
   There is the danger of electric shock.
3. Please do not check the signal during operation.Otherwise,the equipment may be damaged.

8.1 Inspection and Maintenance

Inverter is a typical product which combines the power electronics technology with the microelectronics technology.Therefore,it double features with industrial Equipment and microelectronics Equipment.The change of environment such as temperature,humidity,smog and internal components aging will cause kinds of faults to the inverter.For long time reliable operation,daily inspection and regular maintenance(at least 3 or 6 months interval)is needed.

8.1.1 Daily Inspection

Before inverter running,please check below:

- Whether there is abnormal sound or vibration with the motor;

- whether the inverter and the motor heat up abnormally;
- whether the environment temperature is too high;
- whether the load ammeter indicates the same value as usual:
- whether the cooling fan of inverter operates normally;
- Whether the braking resistor has the good earthing insulation.

The daily maintenance and inspection content is showed in Table 8-1.

Table 8-1 Content and Notice for Daily Maintenance&Inspection

No.	Inspection Item	Inspection Part	Inspection Content	Judgment Standard
1	Display	LED Monitor	Whether the display is abnormal.	Determine according to the use state(e.g.when nothing is displayed after power is supplied,the braking resistor and the earthing insulation can be checked)
2	Cooling System	Fan	Check whether it rotates flexibly,whether there is abnormal sound,and whether it is jammed by dust.	No abnormality
3	Inverter Body	Inside the Machine Case	Temperature rising,abnormal sound,peculiar smell and accumulated dust	No abnormality
4	Working Environment	Surrounding Environment	Temperature,humidity,dust and harmful gas,etc	According to Clause 2.2
5	Voltage	Input&Output Terminals	Input and output voltage	According to the technical specifications in Appendix 2
6	Load	Motor	Temperature rising,abnormal sound and vibration	No abnormality

8.1.2 Regular Maintenance

The power supply must be cut off before regular maintenance.Only after the monitor has no display and charge LED has gone off 5~10 minutes can the maintenance begin.Otherwise,you will risk electric shock because there are storage capacitors within the inverter that will hold charge even after the input power is disconnected.

The regular maintenance contents and cautions are listed in Table 8-2.

Table 8-2 Content of Regular Maintenance&Inspection

Inspection Item	Inspection Content	Countermeasure
Screws of main circuit terminals and control circuit terminals	whether the screws are loosened	Tighten them with the screwdrivers
Heat Radiator	whether there is dust	Purge it with the 4~6kg/cm^2 dry compressed air
PCB(Printed Circuit Board)	whether there is dust	Purge it with the 4~6kg/cm^2 dry compressed air
Cooling Fan	whether it rotates flexibly,whether there is abnormal sound or vibration,and whether there is accumulated dust or blocking object	Replace the cooling fan and clear the dust&foreign objects
Power device	whether there is dust	Purge it with the 4~6kg/cm^2 dry compressed air
Electrolytic CapAI3tor	Check whether there is color variation,peculiar smell,bubbles and liquid leaked,etc.	Replace the electrolytic capAI3tor
Braking resistor	whether the earthing insulation is good	Put the braking resistor at the dry and insulated place

During the inspection,do not disassemble the device or shake the device at will,and do not unplug the connector at will.Otherwise,the inverter may not operate normally or enter the fault display state,or even cause device failure or damage to the main switch device IGBT module or other devices.

When the measurement is required,it should be noted that various different instruments may come up with greatly different measurement results.It is

recommended to use a moving coil voltmeter to measure the input voltage,a bridge voltmeter to measure the output voltage,a clamp ammeter to measure the input and output current,and an electric watt-meter to measure the power.When the conditions are not met,the same kind of table can be used for measurement and make a record for comparison.

For waveform testing,it is recommended to use an oscilloscope with a scanning frequency greater than 40MHz.An oscilloscope with a frequency above 100MHz should be used when testing transient waveforms.The oscilloscope must be electrically isolated before testing.

When the power supply is seriously asymmetric or the three-phase current is unbalanced,it is recommended to use the three-wattmeter method to measure power.

Since this product has been tested for electrical insulation and dielectric strength before leaving the factory,users do not need to do such tests and each such test will reduce the product's insulation withstand voltage level.Improper tests may even Cause damage to product components.If it is really necessary to do this kind of test,it is recommended to be operated by a skilled technician.

If the main circuit withstand voltage test is used,a pressure tester with a time and leakage current that can be set to a capacity must be used.This test will reduce the life of the product.For the main circuit insulation test,all the main circuit terminals R,S,T,U,V,W,PB(P1),+,-must be reliably short-circuited,and then use a meg-ohmmeter with a similar voltage level(250V for the 220V level),500V for 380V,1000V for 660V).The control loop cannot be measured with a meg-ohmmeter,and can be measured with a multi-meter resistance file.

For 380V class products,the insulation resistance of the main circuit to the ground should not be less than 5MΩ,and the insulation resistance of the control circuit to the ground should not be less than 3MΩ.

8.1.3 Regularly-replaced Elements

To ensure the long-term and reliable operation of inverter,regular care and maintenance should be carried out for internal electronic elements of the inverter.The life of these electronic elements varies with the environment and conditions where the inverters are used.Generally,if the inverter is used continuously,the elements can be replaced according to the following table,which also depends on the using environment,load conditions and inverter state,and other specific conditions.

As showed in Table 8-3,the maintenance term is just for user’s reference when it is used.

Table 8-3 Replacement Time for Wearing Elements of Inverter

Name of Element	Standard Years for Replacement
Cooling Fan	2~3 years
Electrolytic CapAI3tor	4~5 years
Printed Circuit Board	5~8 years

8.2 Storage and Protection

If the inverter is not used immediately after purchased and has to be stored temporarily or permanently,the following should be done:

- It should be put in the place within the specified temperature&humidity scope,without damp,dust and metal dust,and with good ventilation.
- If it is unused for over one year,the charging test should be conducted to restore the characteristics of electrolytic capAI3tor of the main circuit.During charging,the input voltage of the inverter should be increased to the rating value slowly with the voltage regulator.The energizing time should be at least 1~2 hours.
- The above test should be conducted at least once a year.
  The voltage withstand test cannot be conducted casually,as it will reduce the life of inverter and even damage the elements.For the insulation test,the 500V mega-ohmmeter whose insulation resistance is not less than 4 MΩcan be used.

Appendix 1 External Dimension and Installation Dimension

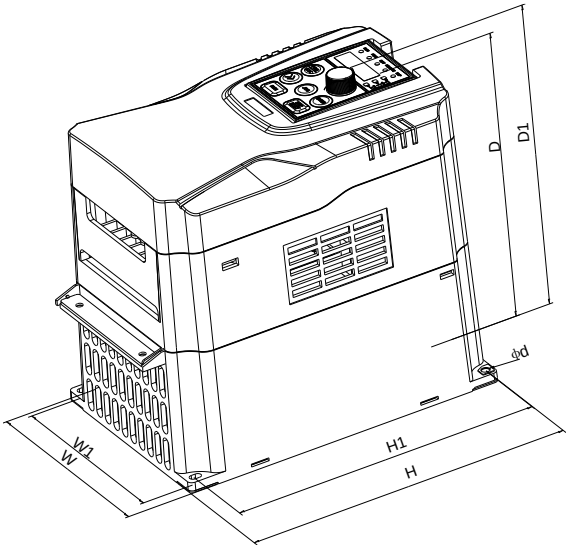


Fig.A1-1 Schematic outline

Table A1-1 External Dimension(unit:mm)

Model	H	H1	W	W1	D	D1	d
3R75GB/32R2PB~ 32R2GB/3004PB	185	175	120	110	162	172	4.5
3004GB/35R5PB~ 35R5GB/37R5PB-N	195	182	130	119	175	185	4.5
37R5GB/3011PB~ 3011GB/ 3015PB-SJ	255	238	180	166	191	200	7
3015GB/3018PB~ 3022GB/ 3022PB-SJ	295	284	180	135	210	220	6

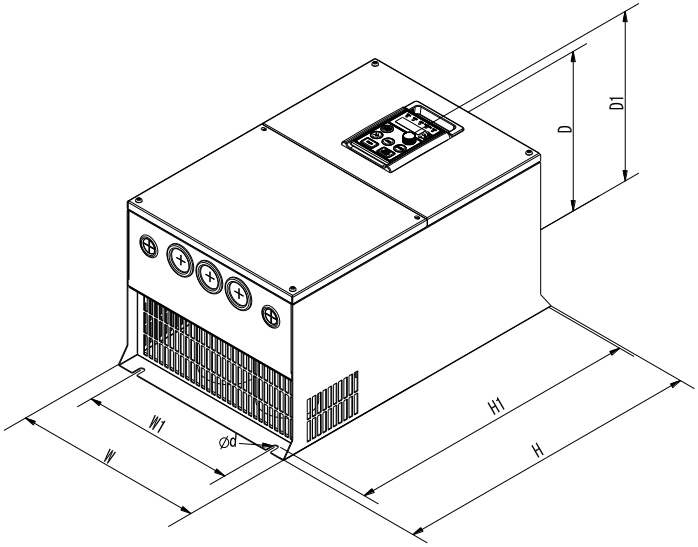


Fig.A1-2 Schematic outline

Table A1-2 External Dimension(unit:mm)

Model	H	H1	W	W1	D	D1	d
3030P-N,3030G/3037P～3037G/3045P-N	460	440	285	230	188	203	8
3045G/3055P-N～3055G/3075P-N	535	512	320	180	231	250	8
3075G/3093P-N～3093G/3110P-N	560	542	375	245	274	292	8
3110G/3132P-N～3132G-N	657	630	458	338	285	303	10
3160P，3160G/3200P-N～3200G/3220P-N	809	783	520	420	360	378	10

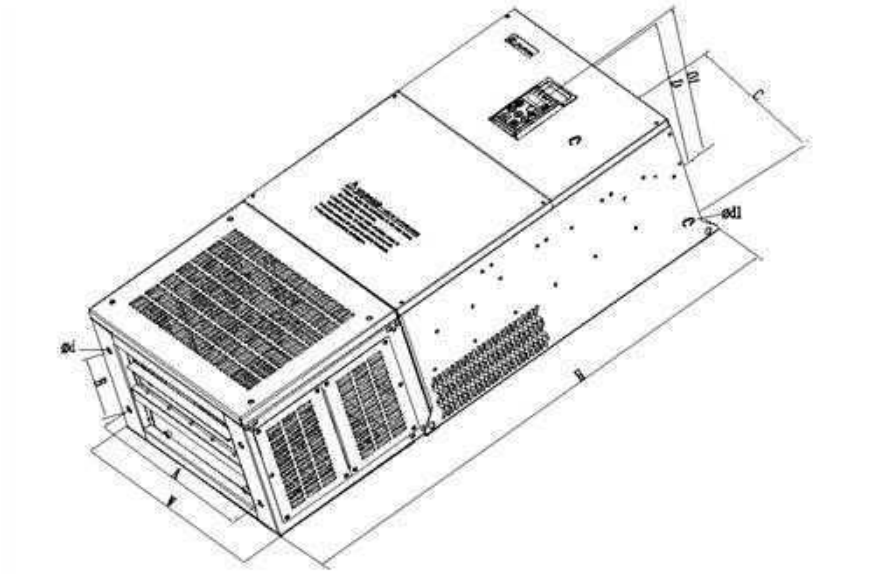


Fig.A1-3 Schematic outline

Table A1-3 External Dimension(unit:mm)

Model	H	W	D	D1	A	B	C	Φd	Φd1
3220G/3250P-N～3250G/3280P-N	1274	620	385	404	550.5	239	420	14	12
3280G/3315P-N～3400G/3450P-N	1607	800	412	430	732	266	300+300	14	12
3450G/3500P-N～3630G-N	1800	1000	480	498	900	300	/	22	/

Appendix 2 Technical Specifications

Inverter model information

Product Series	Model	Input power	Power capacity（kVA）	Input Current（A）	Output current（A）	Adapted motor（kW）
A6/A6T	3R75GB/31R5PB	Three-phase 380V: 304~456V, voltage imbalance rate ＜3%, frequency imbalance rate ＜±5%	1.6/3.2	3.7/5.4	2.5/4.0	0.75/1.5
	31R5GB/32R2PB		3.2/4.8	5.4/7.0	4.0/6.0	1.5/2.2
	32R2GB/3004PB		4.8/6.0	7.0/10.7	6.0/9.0	2.2/4
	3004GB/35R5PB		6.0/8.6	10.7/15.5	9.0/13	4/5.5
	35R5GB/37R5PB		8.6/11.2	15.5/20.5	13.0/17.0	5.5/7.5
	37R5GB/3011PB		11.2/17.0	20.5/26.0	17.0/25.0	7.5/11
	3011GB/3015PB		17.0/21.0	26.0/35.0	25.0/32.0	11/15
	3015GB/3018PB		21.0/24.0	35.0/38.5	32.0/37.0	15/18.5
	3018GB/3022PB		24.0/30.0	38.5/46.5	37.0/45.0	18.5/22
	3022GB		30.0	46.5	45.0	22
	3030P		40.0	62.0/	60.0	30
	3030G/3037P		40.0/50.0	62.0/76.0	60.0/75.0	30/37
	3037G/3045P		50.0/60.0	76.0/92.0	75.0/90.0	37/45
	3045G/3055P		60.0/72.0	92.0/113.0	90.0/110.0	45/55
	3055G		72.0	113.0	110.0	55
	3075P		100.0	157.0	152.0	75
	3075G/3093P		100.0/116.0	157.0/180.0	152.0/176.0	75/93
	3093G/3110P		116.0/138.0	180.0/214.0	176.0/210.0	93/110
	3110G/3132P		138.0/167.0	214.0/256.0	210.0/253.0	110/132
	3132G/3160P		167.0/200.0	256.0/307.0	253.0/304.0	132/160
	3160G/3185P		200.0/230.0	307.0/350.0	304.0/342.0	160/185.0
	3185G/3200P		230.0/250.0	350.0/385.0	342.0/380.0	185.0/200.0
	3200G/3220P		250.0/280.0	385.0/430.0	380.0/426.0	200.0/220.0
	3220G/3250P		280.0/320.0	430.0/500.0	426.0/480.0	220.0/250.0
	3250G/3280P		320.0/342.0	500.0/548.0	480.0/520.0	250.0/280.0
	3280G/3315P		342.0/395.0	548.0/625.0	520.0/600.0	280.0/315.0
	3315G/3355P		395.0/445.0	625.0/710.0	600.0/680.0	315.0/355.0
	3355G/3400P		445.0/500.0	710.0/760.0	680.0/750.0	355.0/400.0
	3400G/3450P		500.0/565.0	760.0/830.0	750.0/820.0	400.0/450.0
	3450G/3500P		565.0/625.0	830.0/910.0	820.0/900.0	450.0/500.0
	3500G/3560P		625.0/690.0	910.0/970.0	900.0/950.0	500.0/560.0

Other technical specifications

Rated Output Voltage	0~Rated input voltage
Maximum Overload Current	Type G:150%1minute,180%20s Type P:120%1minute,150%1s
Control Mode	V/F control,open-loop vector control,close-loop vector control
Frequency Control Scope	low frequency mode:0.00~400.0Hz high frequency mode:0.0~1000Hz(reserve)
Frequency Precision	digital command±0.01％(-10℃~+40℃) analog command±0.01％(25℃±10℃)
Set Frequency Resolution	digital command 0.01Hz; analog command 1/1000 maximum frequency
Output Frequency Resolution	0.01Hz
Frequency Setting Signal	0~10V,0~20mA
Acceleration & Deceleration Time	0.1~3600s (acceleration and deceleration time are set independently)
Braking Torque	reach 125%with additional braking resistor
Voltage/Frequency Characteristic	4 types of fixed V/F characteristics are optional; any V/F characteristic can be set;
Protection Function	overvoltage, under-voltage, current limit, overcurrent, overload, electronic thermal relay, overheat, overvoltage stalling, load short circuit, earthing, under-voltage protection, input phase loss, output phase loss, earthing and interphase short circuit, and motor overload protection, etc.
Ambient Environment Temperature	-10℃~+40℃
Humidity	5~95%RH(without condensation)
Storage Temperature	-40℃~+70℃
Application Site	indoors(without corrosive gas)
Installation Site	With the altitude not more than 1000m, and free of dust, corrosive gas and direct sun shining. Deration 6%per 1000 meters above 1000m.
Vibration	＜5.9m/s^2(0.6g)
Protection Class	IP20

Appendix 3 MODBUS Communication

This series of inverters provides RS485 communication interface and supports Modbus-RTU slave communication protocol. Inverter users can realize centralized control through the host computer (computer or PLC), and can control, monitor, and modify and view the inverter. Inverter communication data can be divided into function code data and non-function code data. The latter includes operation commands, operation status, operation parameters, and alarm information.

◆ **Inverter function code data**

Function code data is an important setting parameter of the inverter, including group P and group A parameters. See the function parameter brief table for the definition of function code data communication address.

◆ **Inverter non-function code data**

Inverter non-function code data	Status data (read only)	Group C monitoring parameters, inverter fault description, inverter operating status
	Control parameters (write only)	Control commands, communication settings, digital output terminal control, analog output AO1 control, analog output AO2 control, high-speed pulse (DO)output control, parameter initialization

○ **Status data**

Status data is divided into monitoring parameters group C, AC drive fault description, inverter running status.

C group parameter monitoring parameters

The monitoring data of group C are described in Chapter 4 and Chapter 5.The address definition can be found in the functional parameter summary table.

AC drive Fault description:

When the communication Reads the AC drive fault description, the communication address is fixed to 8000H, the host reads the address data, then can get:

The current fault code of the AC drive and the fault code are defined in Chapter 5 P9.14 Function Code.

AC drive running status:

When the communication Reads the AC drive running status, the communication address is fixed to 3000H, the host reads the address data, then can get:

The current running status of the AC drive, the definition as follows:

AC drive running status address	Read the status word definition
3000H	1:Run forward
	2:Run reverse
	3:Stop

○ **Control parameters**

Control parameters are divided into control commands, digital output terminal control, analog output AO1 control, analog output AO2 control, high-speed pulse output control.

Control command: When P0.02(command source) is set to 2: communication control, the host can control the related commands such as start and stop of the inverter through the communication address. The control commands are defined as follows:

Control command address	Command function
2000H	1:Run forward
	2:Run reverse
	3:Forward jog
	4:Reverse jog
	5:Coast to stop
	6:Decelerate to stop
	7:Fault reset

Communication setting: The communication set value is mainly used for the communication set data of frequency source, torque upper limit source, VF separation voltage source, PID set source, PID feedback source, etc. of the inverter. Its communication address is 1000H.When the host sets the communication address value, the data range is-10000~10000, corresponding to the given value-100.00%~100.00%.

Digital output terminal control: When the digital output terminal function is selected as 20: communication control, the host computer through the communication address, can realize the control of AC drive the digital output terminal, defined as follows:

Digital output terminal control address	Commend content
2001H	BIT0:Y1 output control BIT1:Y2 output control BIT2:RELAY1 output control BIT3:RELAY2 output control BIT4:Y output control BIT5:VY1 BIT6:VY2 BIT7:VY3 BIT8:VY4 BIT9:VY5

Analog output AO1,AO2,high-speed pulse output Y control: When the analog output AO1, AO2, high-speed pulse output Y output function is selected as 12: communication setting, the host through the communication address, can realize the control of AC drive analog, high-speed pulse output, defined as follows:

Output Control Address		Commend content
AO1	2002H	0~7FFF represent

AO2	2003H	0%~100%
Pulse output	2004H	

Parameter initialization: When you want to achieve initialize operation of the AC drive parameters through the host computer,you need use this function.

If PP.00(user password)is not 0,firstly you need verify password through the communication, after verification, in 30 seconds, the host computer initializes the parameters.

The user's password verification address is 1F00H,and write the correct user password directly to the address， then the password verification finish。

Communication parameters for the initialization address is 1F01H, the data content is defined as follows:

Parameter Initializes communication address	**Command function**
1F01H	1: Restore factory parameters
	2: Clear the log information
	4: Restore the user backup parameters
	501: Backs up the user's current parameters

Parameter lock password verification:(If the return is 8888H, which means that the password check passed)

Password address	Password contents
1F00H	*****

◆ **Modbus communication protocol**

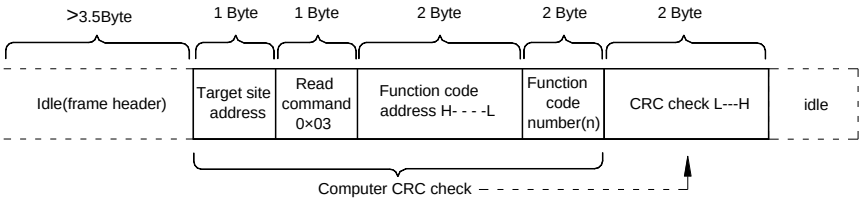
○ **Protocol content**

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

○ **Protocol Format**

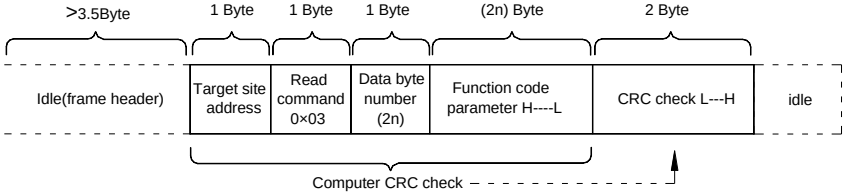
This series AC drive Modbus-RTU protocol communication data format is as follows, the AC drive supports only Word-type parameter read or write, the corresponding communication read operation command is Ox03; write operation command is 0x06, does not support byte or bit Read and write operations:

The master reads command frame:

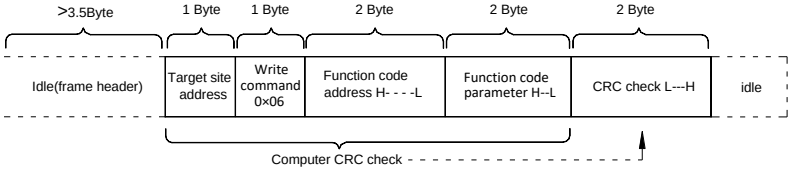


In theory, the host can read several function codes at a time (n can be up to 12), but pay attention to be not over the last function code of the group. Otherwise, it will reply the error.

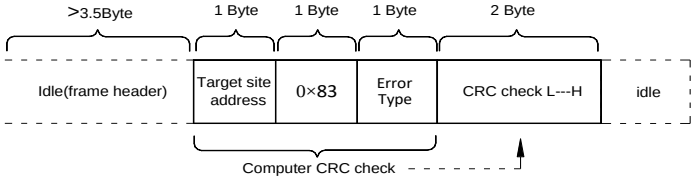
The slave reads command frame:



The master write command frame:



The slave write command frame:



If the slave detects a communication frame error,or if the read or write is otherwise unsuccessful, the error frame is acknowledged.

Error type:
01: Command code error
02: address error
03: data error
04: command can not be processed

Data frame field description:

START	More than 3.5 bytes idle time between frames
ADR	Communication address range:1~247；0=broadcast address
CMD	03:read slave parameter；06: write slave parameter
CMD ADR H	Parameter address in the AC drive is hexadecimal notation, divided into function code and non-function code (such as running status parameter, running command, etc.). See address definition. Function code Address L when transmitting, the high byte in front, low byte in the post.
CMD ADR L	
CMD NO H	The number of function codes read in this frame. If 1,it means reading 1 function code. When transmitting, the high byte is first and the low byte is followed. This protocol can only overwrite one function code at a time, without this field.
CMD NO L	
DATA H	The data to be responded, or the data to be written, When transmitting, with the high byte first and the low byte being the last.
DATA L	
CRC LOW	Detected value: CRC16 Check value. When transmitting, the low byte first and the high byte second. CRC high-bit calculation method is described in this section CRC check.
CRC HIGH	
END	3.5 bytes idle time

◆ **Function Code Parameter Address Identification rule**

Read and write function code parameters, and take function code group number and label number as parameter address expression rules:

High byte: completely determined by the group number.

Low order byte:00~FF, determined by the sequence number in the group.

High byte of address of function code group:

Function group	High byte of Address of RAM	High byte of address of EEPROM
P0	0x00	0xF0
P1	0x01	0xF1
P2	0x04	0xF4
P3	0x05	0xF5
P4	0x06	0xF6
P5	0x08	0xF8
P6	0x0A	0xFA
P7	0x0B	0xFB
P8	0x0C	0xFC
P9	0x03	0xF3
PA	0x0D	0xFD

Function group	High byte of Address of RAM	High byte of address of EEPROM
PB	0x09	0xF9
PC	0x42	0xA2
PD	0x40	0xA0
PE	0x02	0xF2
PF	-----	-----
PH	0x07	0xF7
PL	0x45	0xA5
PP	------	0x1F
A0	0x4C	0xAC
A1	0x46	0xA6
A2	0x47	0xA7
A3	-----	-----
A4	0x41	0xA1
A5	0x48	0xA8
C0	0x70	-----

Setting and status parameters：

Parameter address	Parameter description
1000H	*Communication setting value(-10000~10000)
1001H	Running frequency
1002H	Bus voltage
1003H	Output voltage
1004H	Output current
1005H	Output power
1006H	Output torque
1007H	Running speed
1008H	X terminals input symbol
1009H	Y output symbol
100AH	AI1 voltage
100BH	AI2 voltage
100CH	AI3 voltage
100DH	Count value input
100EH	Length input
100FH	Load speed
1010H	PID setting
1011H	PID feedback
1012H	PLC step

Parameter address	Parameter description
1013H	X5 terminals unit:0.1Hz
1014H	Feedback speed，unit:0.1Hz
1015H	Remaining runtime
1016H	AI1 Preregulation voltage
1017H	AI2 Preregulation voltage
1018H	AI3 Preregulation voltage
1019H	Line speed
101AH	The current power-on time
101BH	The current running time
101CH	X5 input pules frequency，unit:1Hz
101DH	Communication setting value
101EH	Actual feedback speed
101FH	Main frequency X
1020H	Auxiliary frequency Y

*Note:

The communication setting value is a percentage of the relative value,10000 corresponds to 100.00%, -10000 corresponds to-100.00%.

For the data of the frequency dimension, the percentage is the percentage of the maximum frequency (P0.10); for the data of the torque dimension, the percentage is PE.10, PC.48(the upper limit of the torque is set numerically, respectively, corresponding to the first and second motor).

The AC Drive fault description:

The AC Drive Fault address	The AC Drive fault information
8000H	0000: No fault 0001: Reserve 0002: Accelerated overcurrent 0003: Decelerated overcurrent 0004: Constant speed overcurrent 0005: Accelerated overvoltage 0006: Decelerated overvoltage 0007: Constant speed overvoltage 0008: Buffer resistance overload fault 0009: Undervoltage fault 000A: The AC drive overload 000B: Motor overload 000C: Input phase loss 000D: output phase loss 000E: module overheat

8000H	000F: external fault 0010: communication error 0011: contactor error 0012: Current detection fault 0013: Motor tuning fault 0014: Encoder/PG card fault 0015: Parameter read and write exception 0016: The AC drive hardware fault 0017: Motor ground short fault 0018: reserved 0019: reserved 001A: Running time arrives 001B: User-defined fault 1 001C: User-defined fault 2 001D: Power-up time is reached 001E: Out of load 001F: PID feedback is lost during running 0028: Fast current limit timeout fault 0029: Switch the motor fault during running 002A: The speed deviation is too large 002B: Motor over speed 002D: Motor overtemperature 005A: The encoder line number setting is incorrect 005B: Missing encoder 005C: Initial position error 005E: Speed feedback error

◆ **PA Group Communication Parameter Description**

PA.00	Baud rate	Factory default	6005
	range	Digit: MODBUS Baud rate	
		0:300bps 1:600 bps 2:1200 bps 3:2400 bps 4:4800 bps 5:9600 bps 6:19200 bps 7:38400 bps 8:57600 bps 9:115200 bps	

This parameter is used to set the data transfer rate between host and AC drive. Note that the host and the AC drive must set the same baud rate, otherwise, communication cannot be carried out. The higher the baud rate, the faster the communication speed.

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

PA.02	Native address	Factory default	1
	Setting address	1~247，0 broadcast address	

When the native address is stetted to 0, is the broadcast address, to achieve PC broadcast function.

Local address is unique (except broadcast address), which is to achieve the host computer and inverter point-to-point communication.

PA.03	Response delay	Factory default	2ms
	Setting range	0~20ms	

Response delay: refers to the middle interval time from AC drive Data reception ends to send data to the host. If the response delay is less than the system processing time, the response delay is based on the system processing time. If the response delay is longer than the system processing time, after processing the data, the system waits until the response delay time is reached before sending data to the upper computer.

PA.04	Communication overtime time	Factory default	0.0 s
	Setting range	0.0 s（invalid）；0.1~60.0s	

When the function code is set to 0.0s, the communication timeout parameter is invalid. When the function code is set to a valid value, the communication error(E16) is reported if the interval between the primary communication and the next communication exceeds the communication timeout. Normally, it is set to invalid. If the secondary parameters are set in the system for continuous communication, the communication status can be monitored.

PA.05	Communication protocol selection	Factory default	0
	Setting range	0: Non-standard Modbus-RTU protocol 1: Standard Modbus-RTU protocol	

PA.05=1: Selects the standard Modbus protocol.

PA.06	Communication Read current resolution	Factory fault	0
	Setting range	0:0.01A；1:0.1A	

Used to determine the unit of output current when the communication reads the output current.

Appendix 4 Dimension of Keypad and tray

4.1 Keypad

Fig.A4-1 Keypad Dimension

Table A4-1 Keypad Installation Dimension(Unit:mm)

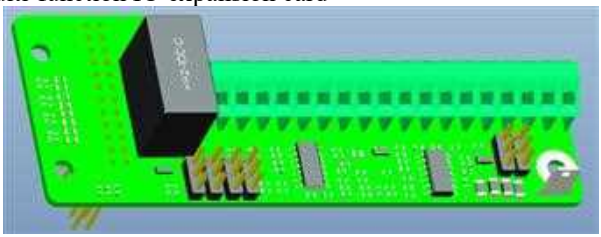
Specifications	w	d
S2R4GB~S22R2GB,3R75GB/31R5PB~35R5GB/37R5PB	49±0.2	76.5±0.2
37R5GB/3011PB and above	61±0.2	96.5±0.2

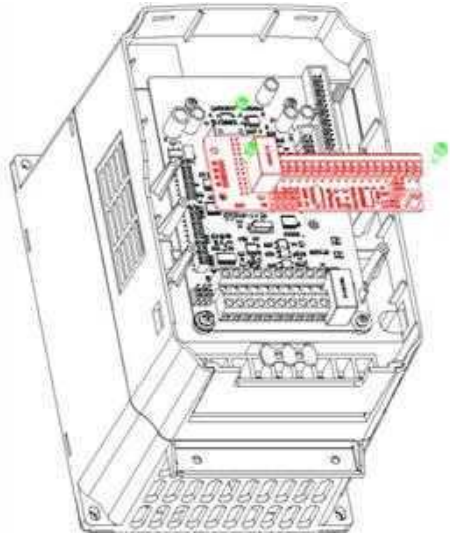
4.2 Keypad's tray

Fig.A4-2 Keypad's tray Installation Dimension(Unit:mm)

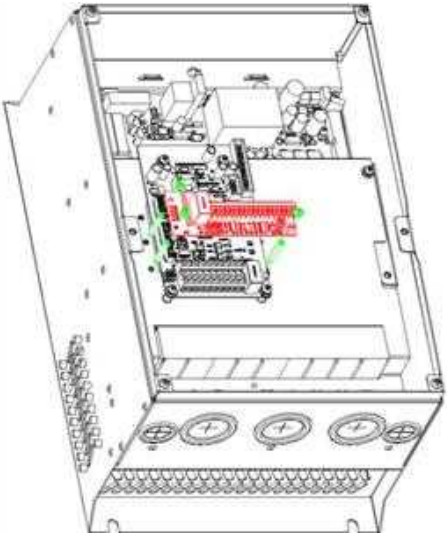
Appendix 5 Expansion card

5.1 A33PI01 multi-function IO expansion card





0.75~18.5kW



22~400kW

A33PI01 IO expansion card is an I/O expansion card launched by Alpha Electric and used with A6/A6T series inverters.It contains the following resources:

project	specification	description
Input terminal	5 digital signal inputs	
	1 analog voltage signal input	Support-10V~10V voltage input signal
Output terminal	1 relay signal output	
	1 digital signal output	
	1 analog signal output	
communication	CAN communication interface	Support CAN communication protocol

The appearance and installation method of the A33PI01 expansion card are shown in the figure,please install it when the inverter is completely powered off.Align the I/O

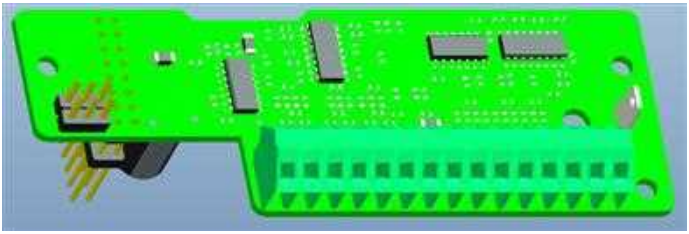
expansion card and the expansion card interface and positioning holes of the inverter control board;fix them with screws.

A33PI01 expansion card terminal function description is shown in the following table:

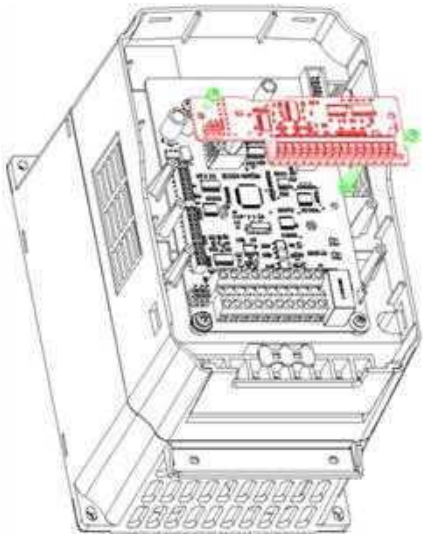
category	Terminal Label	name	Terminal function description	specification
Analog input	AI3	Analog input 3	Receive analog voltage input.	1.Accept analog voltage input and temperature detection resistance input 2.Input voltage range:DC-10V~10V 3.PT100,PT1000 temperature sensor 4.Use SW4 to determine the input mode,and multiple functions cannot be used at the same time
Analog output	AO2	Analog output	Provide analog voltage/current output. The voltage and current are selected by DIP switch SW5.The factory default input voltage	Current output range:0～20mA/ 4～20mA/ Voltage output range:0～10V/ 2～10V Reference ground:GND
Multi-function input terminal	X6	Multi-function input terminal 6	Programmable is defined as a switch input terminal with multiple functions. For details, please refer to the input terminal function introduction.	Optocoupler isolated input,input impedance R=3.9kΩ Maximum input frequency:400 Hz,input voltage range:0~30V, reference ground:COM
	X7	Multi-function input terminal 7		
	X8	Multi-function input terminal 8		
	X9	Multi-function input terminal 9		
	X10	Multi-function input terminal 10		
Multi-function output	Y2	Open collector output terminal	Programmable is defined as the switch output terminal.Function introduction of output terminal.	Optocoupler isolated open collector output.Operating voltage range:0V~26V, maximum output current:50mA, reference ground:COM.
Relay output	RA	Relay output	Programmable definition as relay output terminals for multiple functions	RA-RC:Normally open. Contact capacity:,250VAC/2A(COSΦ=1), 250VAC/1A(COSΦ=0.4) 30VDC/1A
	RC			
CAN	CNH/CNL	Communication interface terminal	CAN Protocol communication terminal	
PLC1	Multi-function input common	Multi-function input terminal common	The factory is short-circuited with 24V.	X terminal supports external 24v power supply.
power supply	24V	+24Vpower supply	Provide external+24V power supply (Reference place:COM)	Maximum output current 100mA
	GND	Analog signal reference ground	Analog signal reference ground	Internally isolated from COM
	COM	+24VPower common	Use with other terminals	Isolated from GND

Jumper	SW4	AI3 Voltage and temperature switching	AI3 voltage and temperature are selected by DIP switch SW4, and the factory default input voltage.	
	SW5	AO2 Voltage and current switching	AO2 voltage and current are selected by DIP switch SW5, and the factory default input voltage.	
	SW2	PLC terminal switching	The PLC terminal is connected to 24v, COM is selected by SW2,and the factory default is shorted to 24V.	
	J3/J7	Temperature detection PT100,PT1000 switch	The J3 jumper is on the upper side, and the J7 jumper ison the left side,set to PT100,otherwise it is PT1000.The factory default is PT100.	Need to set PB.56 function code.
	SW1	CAN terminal matching resistance	The factory default is not connected to the matching resistor	

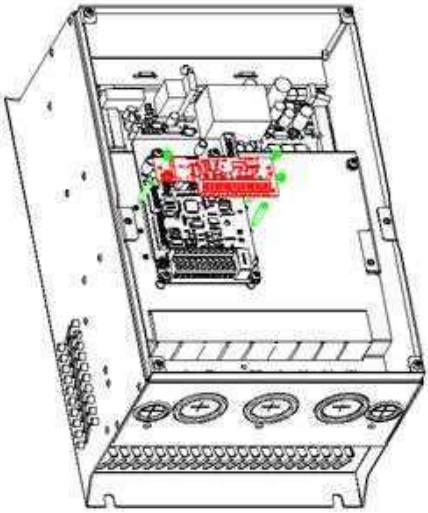
5.2 Instructions for universal encoder expansion card



0.75~18.5kW



22~400kW



Equipped with a variety of universal encoder expansion cards(ie PG cards),as an optional accessory,it is a mandatory option for the inverter to do closed-loop vector control.The corresponding PG card is selected according to the encoder output form.The specific models are as follows:

Expansion Card	description
A6-PG01	Differential input PG card with 1:1 frequency division output
A6-PG04	Resolver PG card

A33PG01 Differential encoder PG card

Serial number	signal	description
1	A+	Encoder output A signal is positive
2	A-	Encoder output A signal negative
3	B+	Encoder output B signal is positive
4	B-	Encoder output B signal negative
5	Z+	Encoder output Z signal is positive
6	Z-	Encoder output Z signal negative
7	5V	Provide 5V/100mA power
8	COM	Power ground
9	PE	Shield terminal

A33PG04 resolver PG card

Serial number	signal	description
1	EXC1	Resolver excitation negative
2	EXC1	Resolver excitation negative
3	SIN	Resolver feedback SIN positive
4	SIN	Resolver feedback SIN positive
5	COS	Resolver feedback COS positive
6	COS	Resolver feedback COS positive
7	5V	Provide 5V/100mA power
8	COM	Power ground
9	PE	Shield terminal

Appendix 6 Inverter Warranty Card

Inverter Warranty Card

Name of User:	
Address of User:	
Contact Person:	Tel.:
P.C.:	Fax:
Type:	Serial No.:
Date of Purchase:	Date of Fault:

Fault Details

Motor:KW_Pole	Application of Motor:
Fault Occurrence Time:power supply,no-load,load%Others:	
Fault Phenomena:	
Fault Display:OC OL OU OH LU None Others:	
Control Terminal Used:	
Operation after Resetting: Yes No	Output Voltage:Yes No
Total Working Time:Hrs	Fault Frequency:Hz

Installation Site Details

Power Voltage:U-V:____V,V-W:____V,W-U:____V	
Transformer CapAI3ty:KVA	Inverter Earthing:Yes No
Distance from the Power Source:m	Distance from the Motor:m
Vibration:No,Medium,Strong	Dust:No,Medium,Much
Others:	