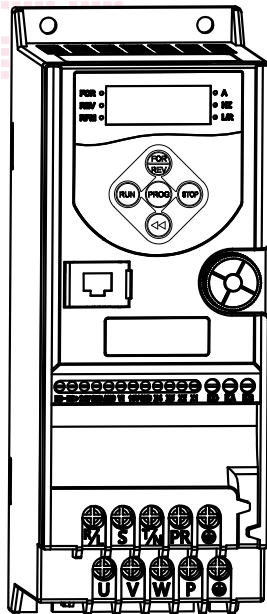# Instruction Manual

Foreword

Thank you for selecting our VFD Inverter.

Before using the AC drive, please read this manual carefully, so as to correctly install and use the AC drive, give full play to its function, and ensure safety.Please keep the instruction manual properly for future maintenance, maintenance and maintenance.

AC drive belongs to power electronic products, for your safety, please be sure to be installed and debugged by professional electrical engineering personnel. There are ⚠ (Attention) and ⚠ (Danger) symbols in this manual to remind you of the safety precautions during the handling, installation, operation and inspection of the frequency converter. Please cooperate to make the frequency converter safer.If you have any doubt, please consult our company or our local agents. Our professionals are happy to serve you.

Due to the upgrade of our products, this manual is subject to change without further notice,please understand.

Catalogue

Chapter 1 Precautions for Safe Use

Security Definition：

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

⚠ (Attention)   Due to the danger caused by failure to operate as required, the AC drive or mechanical system may be damaged.

⚡ (Danger)   The danger caused by failure to operate as required may cause casualties.

1.1 Before power on

⚠ Attention

● The power voltage input must be the same as the AC drive input voltage specification.

● Please choose a safe area to install the AC drive,to prevent high temperature and direct sunlight, to avoid moisture and water droplets.

● The AC drive can only be used in the occasions approved by our company. The unauthorized use environment may lead to fire, gas explosion, electric induction and other accidents.

● If multiple AC drives are installed in the one control cabinet, please add cooling fan to make the temperature in the cabinet lower than 40 ° C to prevent overheating or fire.

● If a contactor is installed on the input side to control the start and stop of the AC drive, the AC drive may be damaged.Generally, it is required to control the start and stop of frequency converter by terminal command. In places where the start and stop are frequent, special attention should be paid to the use of AC drive.

● Please do not install air switch, contactor and other switch devices on the output side,If it is necessary to install due to process and other needs, it must be ensured that the AC drive has no output when the switch acts.In addition, it is forbidden to install capacitance or voltage-sensitive resistance for lightning protection with improved power factor on the output side, otherwise, it will cause frequency converter failure, jump protection or component damage.

● Please use independent power supply, absolutely avoid sharing the same power supply with strong interference equipment such as electric welding machine, otherwise it will cause AC drive protection or AC drive damage.

● Do not conduct voltage withstand test on the components inside the AC drive, which are vulnerable to high voltage damage.

● The IC of AC drive circuit board is easy to be affected and damaged by static electricity. Please do not touch the circuit board.

● Only professional electrical engineers can install, debug and maintain the AC drive.

● When handling the frequency converter, please do not take out the cover directly. It should be carried by the base of the frequency converter to prevent the cover from falling off and avoid the frequency converter from falling down, causing personal injury or damage to the AC drive.

⚡ **Danger**

● Be sure to cut off the power before wiring.

● Please install the frequency converter on metal and other non combustible materials to prevent fire.

● Please do not install the frequency converter in the environment containing explosive gas, otherwise there is a risk of explosion.

● The wiring of main circuit terminals must be correct. R, S and T are power input terminals. They must not be mixed with U, V and W. Otherwise, the AC drive will be damaged during power transmission.

● The terminal must be grounded separately, and the zero line must not be connected, otherwise, the internal fault or protection of the AC drive will be easily caused.

● Do not disassemble or change the internal connection line or parts of the AC drive.

● It is strictly forbidden to refit and replace the control panel and parts without permission, otherwise there will be electric shock, explosion and other dangers.

● Please prevent children or irrelevant persons from approaching the AC drive.

1.2 Power On

⚡ **Danger**

● Never plug in or out any connector on the AC drive (except the operation panel) during power on, so as to avoid damage to the AC drive and casualties.

● Please cover the cover before power on to prevent electric shock and personal injury.

1.3 Operation

⚠ **Attention**

● Do not check the signal on the circuit board during the operation of the AC drive to avoid danger.

● The parameters of the AC drive are optimized when they are delivered. Please adjust them according to the required functions.

● Be sure to consider the speed range allowed by vibration, noise, motor bearing and mechanical device.

⚡ Danger

● It is strictly forbidden to put the motor unit into or cut off during the operation of the frequency converter, otherwise it will cause the over-current tripping of the AC drive, and even burn the main circuit of the AC drive.

● Do not remove the cover when the AC drive is running to prevent injury due to induction.

● When the fault restart function is turned on, the motor will automatically restart after the operation stops. Do not approach the equipment to avoid accidents.

1.4 Power Cut Off

⚠ Attention

● Even if the main power supply, other voltage inputs and shared load (such as the middle DC circuit sharing) have been disconnected, there may still be residual electric energy in the AC drive. Before contacting the electronic devices of the AC drive, the AC drive must wait at least 4 minutes, otherwise there is a risk of electric shock.

Chapter 2 Product Standard Specification

2.1 Product Nameplate
Product Name Plate and the Description of the Type Code:

Product model	MODEL : XXX-1R5G3B
Power Specifications	POWER : 1.5KW
Input Specifications	INPUT : 3PH AC380V 50HZ/60HZ
Output Specifications	OUTPUT : 3PH AC380V 5A 0-600HZ
Product barcode	

A Model explanation

XXX –1R5 G 3 B

B: With brake unit

Inverter Series		Adaptable Motor Power	Voltage Level		Model

R75	Mean0.75KW
1R5	Mean 1.5KW
⋮	⋮

1	1PH AC220V
2	3PH AC220V
3	3PH AC380V
4	1PH AC220V to 3PH AC380V

| G | Heavy Load |
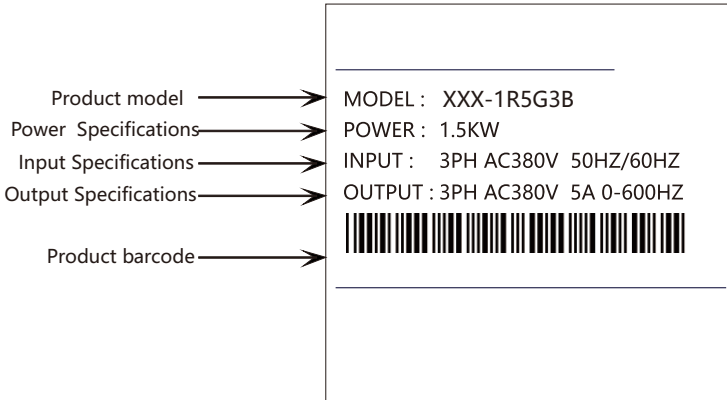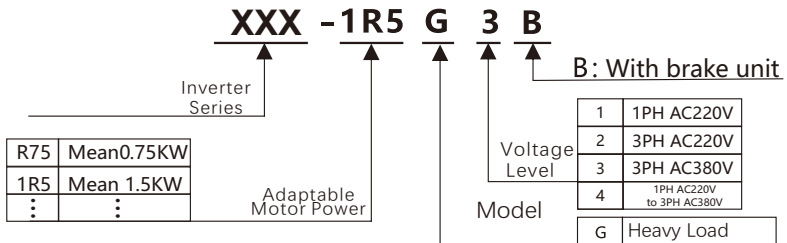
2.2 Product Model Specification

Model	Input Voltage	Input Current (A)	Output Current (A)	Rated Power (KW)
SW100 -R75G1B	1 × 200 - 240V	13.9	4	0.75
SW100 -1R5G1B	1 × 200 - 240V	20.6	7	1.5
SW100 -2R2G1B	1 × 200 - 240V	30.4	9.6	2.2
SW100 -003G1B	1 × 200 - 240V	36.4	13	3
SW100 -004G1B	1 × 200 - 240V	49.7	17	4
SW100 -R75G2B	3 × 200 - 240V	8	5	0.75
SW100 -1R5G2B	3 × 200 - 240V	12	7.5	1.5
SW100 -2R2G2B	3 × 200 - 240V	17.7	11	2.2
SW100 -003G2B	3 × 200 - 240V	23	13	3
SW100 -004G2B	3 × 200 - 240V	27.2	17	4
SW100 -R75G3B	3 × 380 - 440V	3.7	2.3	0.75
	3 × 440 - 480V	3.2	2.1	
SW100 -1R5G3B	3 × 380 - 440V	6.4	4.0	1.5
	3 × 440 - 480V	5.5	3.8	
SW100 -2R2G3B	3 × 380 - 440V	8.9	5.6	2.2
	3 × 440 - 480V	7.7	5.1	
SW100 -003G3B	3 × 380 - 440V	13.4	7.3	3
	3 × 440 - 480V	11.8	7	
SW100 -004G3B	3 × 380 - 440V	15.8	9.9	4
	3 × 440 - 480V	13.6	9	
SW100 -5R5G3B	3 × 380 - 440V	21.3	13.3	5.5
	3 × 440 - 480V	18.4	13	
SW100 -7R5G3B	3 × 380 - 440V	28.3	17.7	7.5
	3 × 440 - 480V	24.4	17	
SW100 -R75G4B	1 × 200 - 240V	13.9	2.5	0.75
SW100 -1R5G4B	1 × 200 - 240V	20.6	3.7	1.5
SW100 -2R2G4B	1 × 200 - 240V	30.4	5.1	2.2
SW100 -003G4B	1 × 200 - 240V	36.4	7	3
SW100 -004G4B	1 × 200 - 240V	49.7	9	4

2.3 Product Technical Specification

Name		Specification
Input Power	Voltage	1PH/3PH200~240V -20%~+10%; 3PH380~480V -20%~+10%;
	Frequency	48-62HZ;
	Max Unbalance	3%;
Output Power	Output Voltage	3PH0~ 100 full voltage input;
	Output Frequency	Vector control;V/F:0-600Hz;
Main Control Function	Control Mode	V/F,Vector control;
	Start Torque	0.5Hz 150%;
	Overload Capacity	150% Rated output current(60s) , 200% Rated output current(1s);
	Carrier Frequency	VF:2K~ 16kHz,Vector: 2 K~ 10KHz;
	Speed Setting Resolution	Digital：0.001Hz; analog：0.5% of Max Operation Frequency;
	Open Loop Speed Control Accuracy	30~4000rpm:Error±8rpm;
	Control Command Source	Operate Panel，Digital Terminal;Communication;
	SetFrequency Source	Panel;Analog；Pulse;Communication;
	Accelerationand Deceleration time	4 Groups Acceleration and Deceleration time is 0.05-3600.00S;
Basic Function		Torque open loop control、Motor self-learn、Motor Pre-excitation、Motor Rotation Compensa -tion、Automatic Load Compensation、Automatic Voltage Stabilizing Function、 Multi-Point V/F curve、Acceleration and Deceleration Curve、DC Braking、AC Braking、Rotation Speed Limited、 Current Limited、Torque Limited、Frequency Tracking Start、Auto Reset Restart、Inching Contr -ol、External Control of Multistage Speed、Mechanical Braking、UP/DOWN Function、 High sp -eed pulse input andoutput function、Counter、Built in PID Controller;
Protect Function		Phase Loss Protection of Power Supply、Short-voltage Protection、Over-voltage Protection、Ov -ercurrent Protection、Over-load Protection、Phase Loss Protection of Output、Output short cir -cuit Protection、Output Grounded Protection、Signal Disconnection、AMA Fail、CPU Fault、Bu -tton Inhibit、Copy Failure、 LCP Communication Error、Parameter Read Only、Value Out of Ran -ge、Not ecutable in Running;

Name		Specification
IO PanelControl Terminal	Input Terminal	4 digital input terminals 1 channel (X3) supports high-speed pulse input up to 100KHZ; 1 analog input terminals (0-10V voltage signal or 0-20mA current signal);
	Output Terminal	1 analog output terminals, support 0-10V voltage output 1 relay output terminals (KA/KB is normally open, KA/KC is normally closed)
	Power Supply Terminals	1 Group10V Power Supply Terminal，Max Output Current:10mA; 1Group 24VPower Supply Terminal，Max Output Current:100mA;
	Communication Terminals	Max Baud Rate38400bit/s
Panel	5-Digit8-Segment LED display	Display the frequency/alarm/Status and other information
	Monitoring Function	Set Value、Output Frequency、Feedback Value、Output Curr-ent、DC Bus Voltage、Output Voltage、Output Power、Out-put Terminals State、Input Terminals State、Input Analog Va-lue、Analog B Output Value、History 1-3 Fault Records and Accumulated Working Hours;
	Indicator Light	Indicator Light FOR、REV、RPM、Hz、A、L/R display various states of AC drive;
Environment	Protection Level	Ip20;
	Operation Temperature	-10°C~40°C，Over 40°C need bigger capacity inverter;
	Operation Humidity	5%-85%(95% No drops of water);
	Vibration	< 5.9m/S2 (0.6g);
	Highest altitude	1000m，Over 1000m need bigger power inverter;
	Length of Motor Wire line	Shielding wire：50m；Unshielding wire：10m;
Others	DC reactor	NO;
	Braking Unit	Built-in .
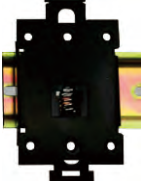
2.4 Description of volume reduction

1.Temperature Derating：If the ambient temperature exceeds 40 ℃, the inverter must be used with reduced capacity.

2.Altitude Capacity Reduction：The cooling capacity of air decreases at low pressure.It is not necessary to reduce the capacity when the altitude is lower than 1000m, but the ambient temperature or maximum output current shall be reduced when the altitude is above 1000m. For altitudes above 1000 meters, the output should be reduced by 1% every 100 meters, or the maximum ambient temperature should be reduced by 1 °C every 200 meters.

2.5 Accessory

The following accessories are optional. If necessary, the order needs to be explained separately.

	Name：Operate Panel E20Model：LCP-E20. Function：It is used to modify the parameters, monitor the working state and control the operation of the inverter. The panel can be used in a long distance, generally within 15m.
	Name：Network LineModel：NO Function：As the connecting line of the operation panel. Standard：1.5m(Special length required, marked in order).
	Name：Guide rail buckleModel：NO Function：Used as frequency converter holder，Fix the inverter with 2 screws in the middle of the inverter，Then it is stuck on the guide rail.

Chapter 3 Mechanical and Electrical Installation

3.1   Mechanical Installation

3.1.1 Installation Environment

1. Please install the inverter in the place where the ambient temperature is - 10 ℃ ~ 40 ℃.

2.Please install the frequency converter on the surface of the flame retardant object and install it on the mounting support vertically with screws. There should be enough space around for heat dissipation.

3. Please install it in places where vibration is not easy. Vibration shall not be greater than 1.14g.

4. Avoid direct sunlight, humidity, condensation or water drops.

5. Avoid the place with corrosive, flammable and explosive gas in the air.

6. Avoid installing in places with oil, dust and metal dust.

7. During installation, drilling residues, thread ends and screws should be avoided to fall into the inverter, otherwise, the inverter may fail or be damaged.

3.1.2 Appearance and Installation Size
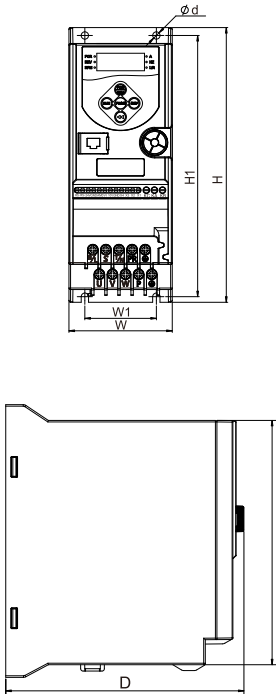
Model	Outline dimension			Installation dimension		
	H	W	D	H1	W1	d
XXX-R75G1B	173	65	151	165	45	4.6
XXX-1R5G1B						
XXX-2R2G1B						
XXX-003G1B	219	85	164	211	65	4.6
XXX-004G1B						
XXX-R75G2B	173	65	151	165	45	4.6
XXX-1R5G2B						
XXX-2R2G2B						
XXX-003G2B	219	85	164	211	65	4.6
XXX-004G2B						
XXX-R75G3B	173	65	151	165	45	4.6
XXX-1R5G3B						
XXX-2R2G3B						
XXX-003G3B						
XXX-004G3B	219	85	164	211	65	4.6
XXX-5R5G3B						
XXX-7R5G3B						
XXX-R75G4B	173	65	151	165	45	4.6
XXX-1R5G4B						
XXX-2R2G4B						
XXX-003G4B	219	85	164	211	65	4.6
XXX-004G4B						

Keyboard and opening size：

Specification	W	H
Pallet cut-out size	76	96
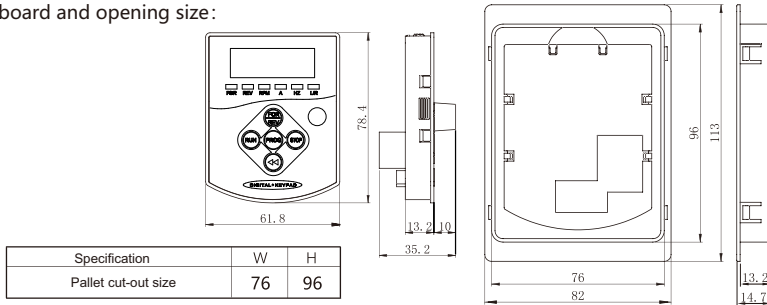
3.1.3Installation of the whole machine

1. Single or Multiple side by side installation

The frequency converter can be installed in a single or side by side. Due to the use of air cooling, in order to ensure the heat dissipation effect, a certain space is reserved above and below the frequency converter, as shown in the figure below.

Min:100mm

Min:100mm

Single or parallel installation
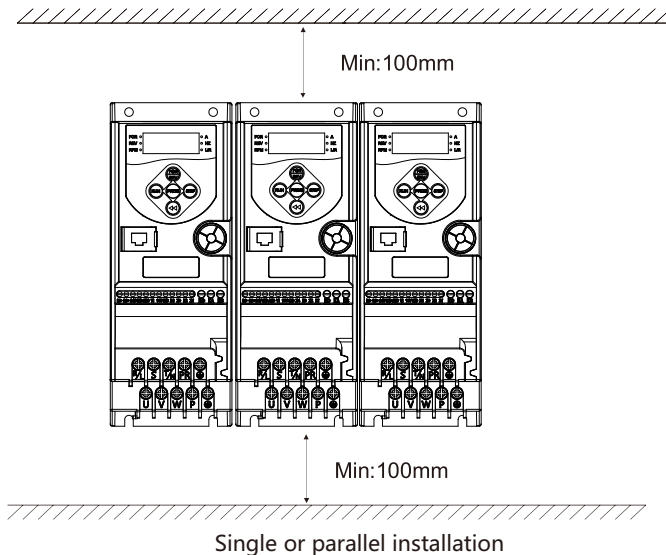
2. Up and Down Installation

When multiple inverters are installed up and down, due to the heat of the down conver -ter, the temperature of the up converter will rise, resulting in failure. Measures such as install -ing heat insulation deflector should be taken to ensure the heat dissipation effect, as shown in the figure.

Heat insulation guide plate
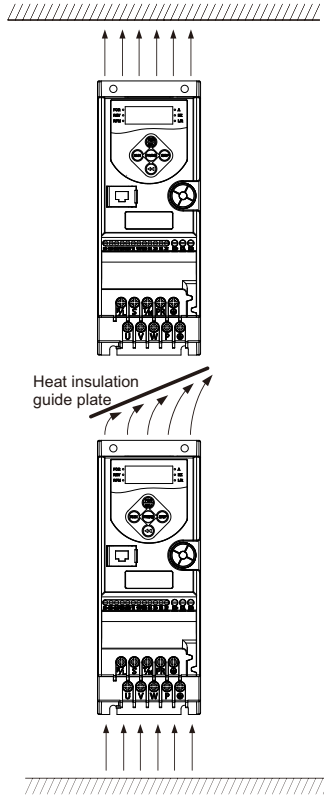
Up-down installation mode

3.2 Product Peripheral Devices

The figure below is the standard configuration diagram of inverter peripheral devices.

power supply

Breaker

Contactors

Ac
input reactor

Input filter

R S T   P PR U V W   PE

Output filter

AC output reactor

Braking resistance

Motor
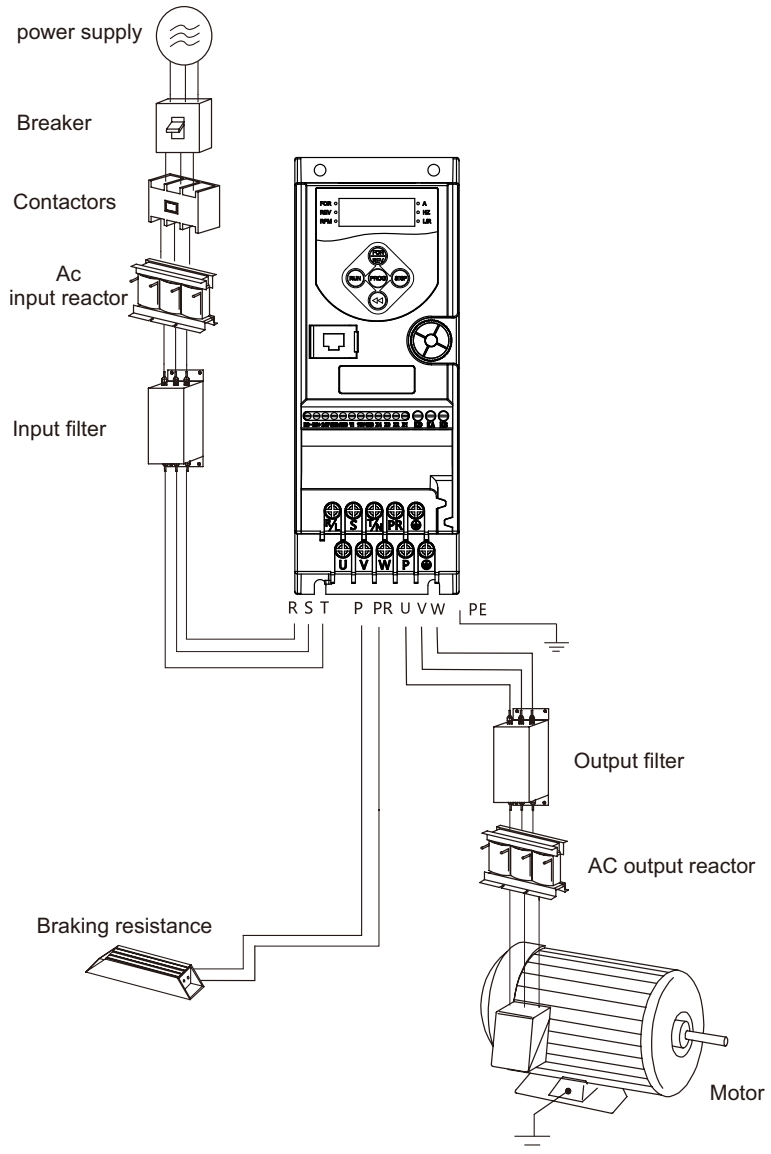
Device Name	Installation Position	Function Description
Air Switch	Input front end	In case of abnormal over-current in the later stage equipment, it can cut off the power supply and protect the later stage.
Contacts	Between air switch and inverter input side	Please don't close and open the contactor frequently (less than twice per minute) when the inverter is on or off, This will cause the failure of the frequency converter. Do not control the start and stop of the frequency converter by closing and opening the contactor, which will reduce the service life of the frequency converter.
AC Input Reactor	Inverter input side	Increase the input side power factor; Improving the influence of unbalanced three phase input AC power supply on the system; Suppression of high order harmonics; Reduce the interference of external conduction and radiation, effectively restrain the influence of pulse current on rectifier bridge.
Input Filter	Inverter input side	Reduce the conduction interference from the power supply end to the inverter, and improve the anti-interference ability of the inverter;Reduce the external conduction and radiation interference of frequency converter.
Braking Resistance		When braking, it can effectively consume the feedback energy of the motor to achieve rapid braking.
Output Filter	Inverter input side	Reduce the external conduction and radiation interference of frequency converter.

3.2.1 Air switch (circuit breaker), fuse, cable and contactor selection:

The following table is a guide for the selection of air switches (circuit breakers), fuses, cables and contactors:

Model	Air switch/fuse(A)	Copper core cable Input/Output(mm²)	Rated working current of contactor(A)
SW100-R75G1B	25	2.5/1.5	16
SW100-1R5G1B	32	2.5/1.5	25
SW100-2R2G1B	40	4/2.5	32
SW100-003G1B	50	6/2.5	40
SW100-004G1B	63	10/4	63
SW100-R75G2B	10	1.5/1.5	10
SW100-1R5G2B	25	2.5/2.5	16
SW100-2R2G2B	25	2.5/2.5	25
SW100-003G2B	40	4/4	32
SW100-004G2B	40	4/4	32
SW100-R75G3B	10	1.5/1.5	10
SW100-1R5G3B	10	1.5/1.5	10.0
SW100-2R2G3B	16	2.5/2.5	10
SW100-003G3B	25	2.5/2.5	25
SW100-004G3B	25	2.5/2.5	25
SW100-5R5G3B	32	4/4	25
SW100-7R5G3B	40	4/4	32
SW100-R75G4B	25	2.5/1.5	16
SW100-1R5G4B	32	2.5/1.5	25
SW100-2R2G4B	40	4/2.5	32
SW100-003G4B	50	6/2.5	40
SW100-004G4B	63	10/4	63

3.2.2 Selection of Brake Components

Users can choose different braking resistance and power according to the actual situation, the calculation method is as follows.However, the resistance value should not be less than the minimum value in the recommended table, otherwise there is a risk of damage to the inverter, and the power can be greater.The greater the inertia of the system, the shorter the deceleration time and the more frequent the braking, the greater the braking resistance power and the smaller the resistance value.

1.Selection of braking resistance

Calculation formula of brake resistance resistance：R=Udh X Udh + (KbX Pmn).

U_{DH} is Upper limit of DC bus，generally.380V equipment's is700V, 220Vquipment's is 400V.

P_{MN} is the rated power of motor.

K_B is the automatic torque coefficient, with a value of 0.8-2.0, 1.0 for general machinery; 1.5 for larger inertia; 2.0 for steel mills and mining machinery.

2.Power selection of braking resistor

Resist Power : $P_b = U_{DH} \times U_{DH} \div R$

RTheoretically, the braking resistance power can be the same as the braking power, but in general, the actual selection will be multiplied by the correction factor, is that braking resistor power,Pr = aPb.

The correction coefficient a = 0.12 - 0.9, 0.12 for frequent acceleration and deceleration, and 0.12 for frequent acceleration and deceleration. For the down escalator and other equipment that need to be in regenerative braking state for a long time, take 0.9; Centrifuge and other equipment, take 0.6.

Model	Recommended value of braking resistance	Recommended power of brake resistor	Breake unit
SW100-R75G1B	≧ 80Ω	150W	Built-in
SW100-1R5G1B	≧ 50Ω	300W	
SW100-2R2G1B	≧ 50Ω	300W	
SW100-003G1B	≧30Ω	500W	
SW100-004G1B	≧ 30Ω	900W	
SW100-R75G2B	≧ 80Ω	150W	
SW100-1R5G2B	≧ 50Ω	300W	
SW100-2R2G2B	≧ 50Ω	300W	
SW100-003G2B	≧30Ω	500W	
SW100-004G2B	≧ 30Ω	900W	
SW100-R75G3B	≧ 300Ω	150W	
SW100-1R5G3B	≧ 200Ω	250W	
SW100-2R2G3B	≧ 100Ω	500W	
SW100-003G3B	≧100Ω	500W	
SW100-004G3B	≧ 100Ω	500W	
SW100-5R5G3B	≧ 80Ω	700W	
SW100-7R5G3B	≧ 65Ω	900W	
SW100-R75G4B	≧ 300Ω	150W	
SW100-1R5G4B	≧ 200Ω	250W	
SW100-2R2G4B	≧ 100Ω	500W	
SW100-003G4B	≧100Ω	500W	
SW100-004G4B	≧ 100Ω	500W	

3.2.3 Type selection of input and output reactors

Guidance on selection of AC input reactor (AC reactor)

Model	Rated Current of Reactor (A)	Maximum Continuous Current of Reactor(A)	Inductance(mH) &3%Impedance
SW100-R75G1B	14	20.85	1.16
SW100-1R5G1B	21	30.9	0.78
SW100-2R2G1B	30	45.6	0.53
SW100-003G1B	50	74.55	0.33
SW100-004G1B	50	74.55	0.33
SW100-R75G2B	8	12	2.02
SW100-1R5G2B	12	18	1.35
SW100-2R2G2B	18	26.55	0.91
SW100-003G2B	27	40.8	0.59
SW100-004G2B	27	40.8	0.59
SW100-R75G3B	3.7	5.55	8.74
SW100-1R5G3B	6.4	9.6	5.05
SW100-2R2G3B	8.9	13.35	3.63
SW100-003G3B	15.8	23.7	2.05
SW100-004G3B	15.8	23.7	2.05
SW100-5R5G3B	21.3	31.9	1.52
SW100-7R5G3B	28.3	42.5	1.14
SW100-R75G4B	14	20.85	1.16
SW100-1R5G4B	21	30.9	0.78
SW100-2R2G4B	30	45.6	0.53
SW100-003G4B	50	74.55	0.33
SW100-004G4B	50	74.55	0.33

Guidance on selection of AC Output reactor (AC reactor)

Model	Rated Current of Reactor (A)	Maximum Continuous Current of Reactor(A)	Inductance(mH) &3%Impedance
SW100-R75G1B	5	7.5	3.23
SW100-1R5G1B	7.5	11.25	2.16
SW100-2R2G1B	11	16.5	1.47
SW100-003G1B	17	25.5	0.95
SW100-004G1B	17	25.5	0.95
SW100-R75G2B	5	7.5	3.23
SW100-1R5G2B	7.5	11.25	2.16
SW100-2R2G2B	11	16.5	1.47
SW100-003G2B	17	25.5	0.95
SW100-004G2B	17	25.5	0.95
SW100-R75G3B	2.3	3.45	14.06
SW100-1R5G3B	4	6	8.08
SW100-2R2G3B	5.6	8.4	5.77
SW100-003G3B	9.9	14.85	3.27
SW100-004G3B	9.9	14.85	3.27
SW100-5R5G3B	13.3	19.95	2.43
SW100-7R5G3B	17.1	26.55	1.83
SW100-R75G4B	2.3	3.45	14.06
SW100-1R5G4B	4	6	8.08
SW100-2R2G4B	5.6	8.4	5.77
SW100-003G4B	9.9	14.85	3.27
SW100-004G4B	9.9	14.85	3.27

3.2.4 Filter selection

Model	Input Filter	Output Filter
	Rated Current(A)	Rated Current(A)
SW100-R75G1B	20	5
SW100-1R5G1B	20	10
SW100-2R2G1B	36	20
SW100-003G1B	50	20
SW100-004G1B	50	20
SW100-R75G2B	10	5
SW100-1R5G2B	10	10
SW100-2R2G2B	20	20
SW100-003G2B	36	20
SW100-004G2B	36	20
SW100-R75G3B	5	5
SW100-1R5G3B	5	5
SW100-2R2G3B	10	10
SW100-003G3B	10	10
SW100-004G3B	10	10
SW100-5R5G3B	20	20
SW100-7R5G3B	20	20
SW100-R75G4B	20	5
SW100-1R5G4B	20	10
SW100-2R2G4B	36	20
SW100-003G4B	50	20
SW100-004G4B	50	20

3.2.5 Installation of residual current circuit breaker

When using frequency converter, it is not recommended to install residual current circuit breaker.

If the frequency converter is equipped with leakage breaker as leakage fault protection, in order to prevent the leakage breaker from misoperation, please select the current sensitivity rating of more than 200mA, and the action time is 0.1s or more.

3.3 Main circuit

3.3.1 Schematic diagram of main circuit terminal

0.4~7.5KW   Main circuit terminal
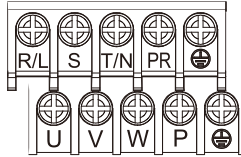
Power input

Main circuit terminal description:

Terminals	Terminal function
R、S、T	Power input terminals
U、V、W	Power output terminals,connect to motor
P、PR	Brake resistor connection terminal

3.4 Control Circuit

3.4.1 Schematic diagram of control circuit terminal

Control loop terminals
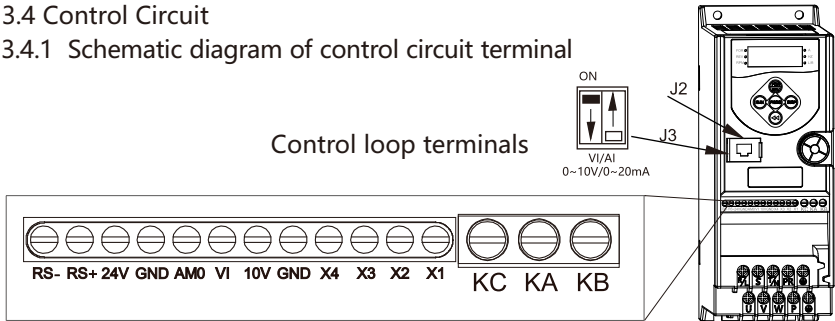
Control Terminal Description：

Terminals	Description	Specifications
X1-X4	Digital input terminal	1.Logic：>DC19V logic is 0; 　　　　<DC14V logic is 1; 2.Input Voltage：0-30V; 3.Input impedance：3.6KΩ; 4.DI3（X3）Configurable as pulse input, range is：0.00-100.00kHz;
+24V	24V power supply	It provides 24V power supply to the outside, which is generally used as working power supply for digital input / output terminals and external sensor power supply；Max output current：100mA
+10V	10V power supply	Max load10mA
VI	Analog input terminals	Select 0-10V voltage input or 0-20mA current input through dialswitchVI default as voltage input; AI default as current input; 1：voltage input:Input impedance 10KΩ 2: current input:Inputimpedance ≤500Ω;
GND	Signal ground	Two signals ground internal connectivity
AM0	Analog output terminals	Default: 0-10V voltage output; 1.Voltage output: load greater than 500Ω;
RS+,RS-	RS485Communication	Maximum baud rate:9600bit/s;
KA-KB-KC	Relay output	1.Resistive load：250VAC 3A/30VDC 3A: 2.Inductive load：250VAC 0.2A/24VDC 0.1 A; （cosφ=0.4）； 3.KA and KB are normally open， 　KA and KC are normally close
J2	Used for external keyboard	For external keyboard
J3	VI input jumper switch	Switch between the and 0-20mA. Remove the cable port cover to see the DIP switch.

3.4.2 Control circuit terminals specifications

The control terminal uses the shrapnel type terminal block：

1. Tube type terminals are recommended for control lines. The recommended specifications are as follows:
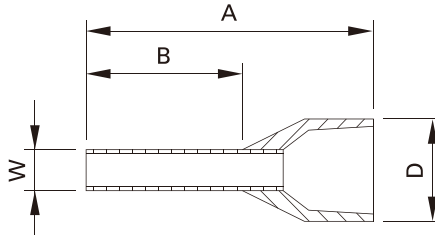
A	B	D（Max）	W
14	8	3.5	1.4

Unit：mm

Diameter specification：Recommended cable size of control terminal:0.3mm².

2. The access line can be directly nailed in and locked.

3. When withdrawing the wire, use a slotted screwdriver to counter the lock to exit，

Specification of slotted screw driver：wide 2.5mm²,thickness 0.4mm²;

4. Ideal stripping diameter：Stripping diameter of wiring end：9mm² is the best diameter.

5. When bare wire wiring, the wiring shall be neatly placed in the middle of the wiring hole.

The relay terminal uses screw type terminal block：

1. Wiring with a flat blade screwdriver，Specification of slotted screw driver: wide 3.5mm² , thickness 0.6mm²;

2. Ideal stripping diameter：Stripping diameter of wiring end：6-7mm² is the best diameter;

3. When bare wire wiring, the wiring shall be neatly placed in the middle of the wiring hole.

4. Wire diameter specification：0.4-1.0mm², Torque: 0.4Nm.

3.4.3 Control circuit wiring diagram
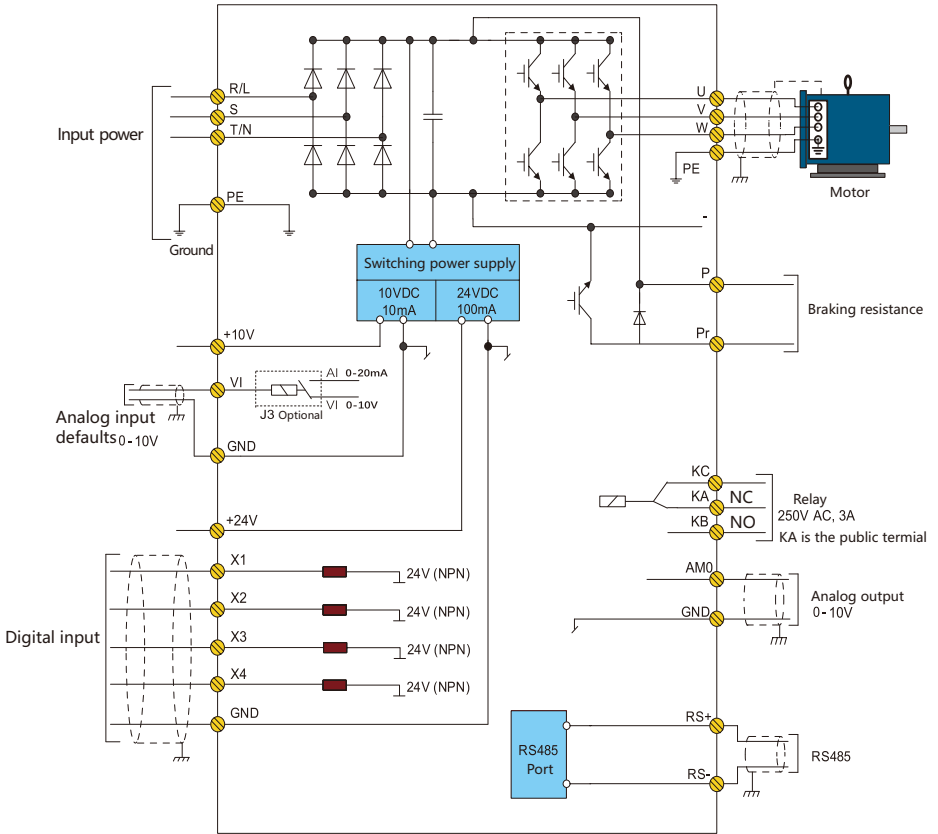
0.4-7.5KW Wiring Diagram

3.4.4 Instruction of digital input terminal

Only open collector NPN connection mode is supported, as follows：
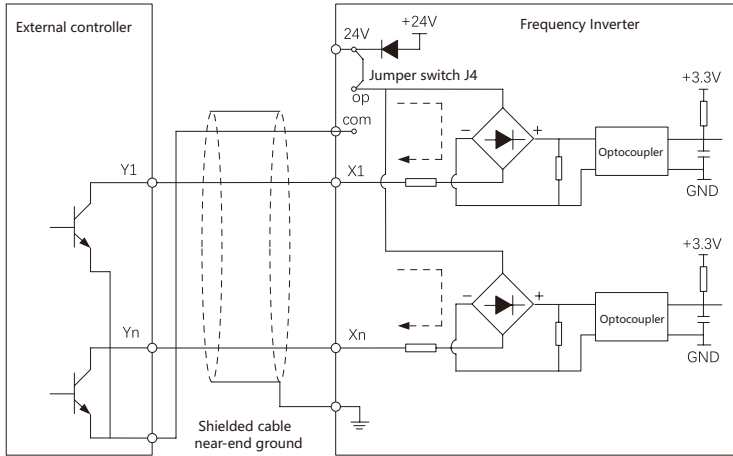
3.4.5 Instruction of analog output terminal
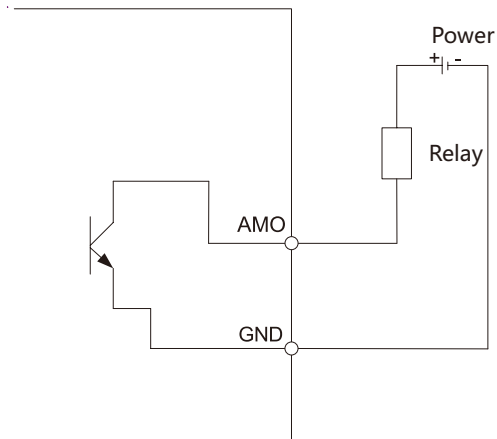
3.5 EMC guidance in electrical wiring
3.5.1 Introduction to EMC standards

The inverter is the latest international standard：IEC/EN61800-3:2004（Adjustable speed electrical drive systems part3: EMC requirements and specific test methods）．

IEC/EN61800-3 Mainly from the electromagnetic interference and anti electromagnetic interference two aspects of the inverter are investigated，Electromagnetic interference mainly tests the radiation interference, conduction interference and harmonic interference of frequency converter（Corresponding to the civil inverter has this requirement).

EMI immunity mainly includes conduction immunity, radiation immunity, surge immunity, fast read burst immunity, ESD immunity and low frequency short circuit immunity of power supply.（The specific test items are：1. Immunity experiment of input voltage sag, terminal and change.2. Experiment on immunity of commutation notch.3. Experiment on immunity of harmonic input.4. Input frequency change experiment.5. Input voltage unbalance test.6. Input voltage fluctuation experiment)

The inverter shall be tested in accordance with the strict requirements of IEC/EN61800-3. It will have good electromagnetic compatibility in an industrial environment until installation and use as shown in this section.

3.5.2 Noise control measures

1. When peripheral equipment and frequency converter share the power supply of the same system, the noise generated by frequency converter will spread to other equipment in the same system through the power line and cause misoperation. At this time, the following measures can be taken：

a. Adding input noise filter at the input end of frequency converter.

b. Install power filter at the power input end of the affected equipment.

c. Isolation transformer is used to separate the noise transmission path between other equipment and frequency converter.

2. The wiring between the peripheral equipment and the frequency converter forms a loop, and the inevitable grounding leakage current of the frequency converter will make the equipment malfunction. At this time, if the grounding of the equipment is disconnected, the misoperation will be reduced.

3. Easily affected equipment and signal lines should be installed as far away from the frequency converter as possible.

4. Shielded cable shall be used for the signal line, and the shielding layer shall be reliably grounded. The signal line cable can be sheathed in the metal tube, and the distance between the metal tubes shall be at least 20cm, and it shall be far away from the frequency converter and its peripheral devices and cables as far as possible, so as to avoid parallel wiring of signal line and power line or bundled wiring of power line.

5. When the signal line must pass through the power cable, it should keep orthogonal crossing.

6. The motor cable should be placed in a thick barrier, such as a pipe with a thickness of more than 2mm or buried in a cement tank. The power cable can also be placed in a metal pipe and grounded with a shielded cable .

7. 4-core motor cable is used, one of which is grounded at the near end of the converter and the other side is connected to the motor housing.

8. The input and output of frequency converter are equipped with radio noise filter and line radiation noise filter respectively, such as ferrite mold choke, which can suppress the radiated noise of power line.

3.5.3 Grounding treatment

The recommended special grounding electrode is shown in the figure below:
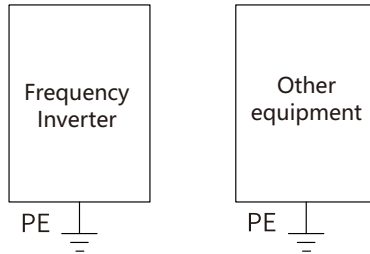
1. The maximum standard size of grounding cable should be used as far as possible to reduce the grounding system impedance.

2. The ground wire should be as short as possible.

3. The grounding point should be as close to the frequency converter as possible.

4. One of the four core motor cables should be grounded on the inverter side, and the other side should be connected to the motor grounding terminal. If the motor and inverter have special grounding electrode, the effect is better.

5. When the grounding terminals of all parts of the system are connected together, the leakage current will become a noise source, which will affect other equipment in the system. Therefore, the grounding terminals of the inverter and other equipment that are vulnerable to interference need to be separated.

6. The grounding cable should be arranged away from the input and output wiring of noise sensitive equipment.

3.5.4 Countermeasures for leakage current suppression.

The leakage current flows through the distributed capacitance between the input and output lines and to the ground of the inverter, which is related to the capacitance value of the distributed capacitance and the carrier frequency. Leakage current is divided into two types: leakage current to ground and leakage current between lines.

1. The leakage current to the ground is not only flowing in the inverter system, it may affect other equipment because of the ground loop, and these leakage currents may make the leakage protector and other equipment malfunction.The higher the carrier frequency of the inverter, the greater the leakage to the ground; The longer the motor cable is, the greater the parasitic capacitance and the greater the leakage current to the ground.Therefore, reducing carrier frequency and selecting motor cable as short as possible are the most direct and effective ways to suppress leakage current.

2. The high-order harmonics of the leakage current between the cables at the output side of the inverter will accelerate the aging of the cables, and may also make other equipment malfunction.The higher the frequency of frequency converter carrier, the larger the leakage current between lines; The longer the motor cable is, the larger the parasitic capacitance is and the larger the leakage current is.Therefore, reducing the carrier frequency and selecting the motor cable as short as possible are the most direct and effective methods to suppress the leakage current.Increasing the output reactor can also effectively suppress the leakage current between lines.

Charter 4 Operation and Display

4.1 Operation panel

The operation panel can modify the parameters, copy, monitor the working status of the inverter and control the operation of the inverter (start and stop) and so on.The shape is shown in the following figure:
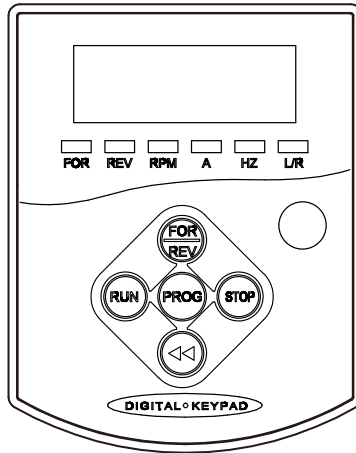
1. Indicator light descriptio

FOR/REV Indicator light:

FOR	REV	State
On	Off	Running FOR
Off	On	Running REV
Off	Off	Stop

Indicator light HZ、A、RPM：The significance of monitoring the display data of frequency converter.

2. Display Screen

A total of 5 LED display, can display the set frequency, output frequency, various monitoring data and alarm code.

3. Keyboard keys

Button	Name	Function
RUN	Operate Button	Start the inverter directly by pressing the key on the panel
STOP	Stop / Reset key	Used to stop the inverter or reset the inverter in case of failure.
◁	Displacement key	Used to display data circularly in the main interface;Or when modifying a parameter, select the modification bit of the parameter.
FOR/REV	FOR and REV switch key	Switch the forward or reverse rotation of the inverter directly on the same pass panel.
PROG	Menu key	Used to enter or return the menu key.
⊛	Encoder	1. Used to adjust the speed of frequency converter. 2. Used to enter menu or confirm data.

4. Encoder

Used for increasing or decreasing data or parameters. Clockwise rotation is increasing, and counterclockwise rotation is decreasing.
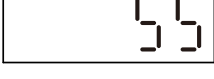
4.2 Parameter Setting

Power on,set parameter P00.02 = 1 or =2/3,Command source is given by external terminal or communication.
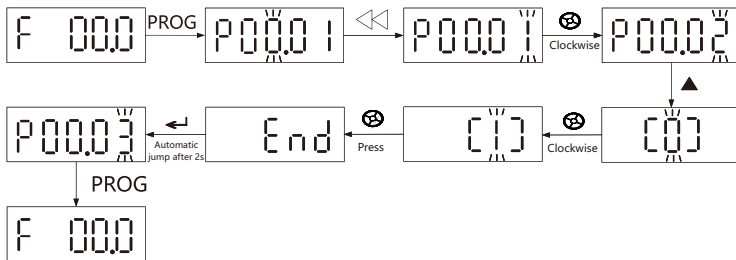
After parameter modification, short circuit digital input terminal X1 and GND（COM） to start the inverter. Otherwise, the frequency converter will be stopped when it is disconnected.

4.3 Monitor running status

Specification	Button	Display on screen	Introduction
Output Frequency	Initial interface	FOR ● REV ○ RPM ○ Γ 50.0 ○ A ● HZ ● L/R	The monitored output frequency parameter is P11.00 -- 50.0Hz, and the display accuracy is: 0.1
Set value	◁◁	FOR ● REV ○ RPM ○ 50.0 ● A ● HZ ● L/R	The monitoring preset setpoint parameter is P11.01 -- 50%, and the display accuracy is : 0.1
Motor Current	◁◁	FOR ● REV ○ RPM ○ A 9.00 ● A ○ HZ ● L/R	The monitoring click current parameter is P11.04 -- 9.00A, and the display accuracy is: 0.01
Motor Voltage	◁◁	FOR ● REV ● RPM ● 380 ○ A ● HZ ● L/R	The output voltage parameter P11.03 of the monitored inverter is 380V, and the display accuracy is: 1
Motor RPM	◁◁	FOR ● REV ○ RPM ● 1440 ○ A ○ HZ ● L/R	The monitoring speed parameter P11.14 is 1440R, and the display precision is: 1
DC Voltage	◁◁	FOR ● REV ○ RPM ● 540 ○ A ○ HZ ● L/R	The monitoring DC voltage parameter P11.02 is 540V, and the display precision is: 1
Inverter temperature	◁◁	FOR ● REV ○ RPM ● 55 ○ A ○ HZ ● L/R	The temperature parameter P11.35 of the monitoring converter is 55 C, and the display precision is 1
Feedback value	◁◁	FOR ○ REV ● RPM ● 20.0 ○ A ● HZ ● L/R	The monitoring feedback value parameter P11.16 is 28.000, and the display precision is 0.001
Analog VI input	◁◁	FOR ○ REV ● RPM ● 10.00 ○ A ● HZ ● L/R	The parameter P11.09 of monitoring analog quantity VI is 10.00V, and the display precision is 0.01

4.4 Check alarm records

If the frequency converter fails, the operation panel will display the fault code, and the reason has been explained. The frequency converter can save the last three fault records. Through P10 parameter group check.

4.5 Display letters comparison table

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z	-	+	.	=
a	b	c	d	e	f	g	h	i	j
k	l	m	n	o	p	q	r	s	t
u	v	w	x	y	z				

Charter 5 Function Parameter List

Parameter	Name	Range	Default value	Change
Group P00 Basic Function Parameter				
P00.01	Control Mode	0:VF Control 1:Vector Control	1	★
P00.02	Command Source Selection	0:Panel Control 1:Terminal Control 2:Communication Control 3:Communication or terminal control	0	★
P00.03	Main frequency source X selection	0:Digital Setting (Preset parameter values) 1:Reserved 2:VI 3:Reserved 4:Keyboard Potentiometer 5:Pulse input 6:Multi-reference 7:Simple PLC 8:PID 9:Communication setting	4	★
P00.04	Auxiliary frequency source Y selection (Reserved)	0:Digital Setting 1:Reserved 2:VI 3:Reserved 4:Keyboard Potentiometer 5:Pulse input 6:Multi-reference 7:Simple PLC 8:PID9:Communication setting	0	★
P00.05	Reserved			
P00.06	Reserved			
P00.07	Reserved			
P00.08	Frequency source selection(Reserved)	Ten's digit:X and Y operation relationship 0:X+Y 1:X-Y 2:Maximum 3:MinimumUnit's	0	☆

Parameter	Name	Range	Default value	Change
P00.08	Frequency source selection(Reserved)	digit:Frequencysourceselection 0:Main frequency source X 1:XandYoperation(operation relation ship determined by ten's digit) 2:Switchover between X and Y 3:Switchover between X and "Xand Yoperation" 4:Switchover between Y and "Xand Yoperation"	0	☆
P00.09	Preset reference value	-100%-100%	0	☆
P00.10	Maximum Frequency	0~655.35Hz	50	★
P00.12	Frequency upper limit	0-P00.10	50	☆
P00.14	Frequency lower limit	0-P00.10	0	☆
P00.15	Below lower limit frequ-ency operation mode	0:Lower limit frequency operate 1:Stop 2:0 speed operate	0	☆
P00.16	Rotation direction	0:Same direction 1:Reverse direction	0	☆
P00.17	Reverse operation forbidden	0:Invalid 1:Valid	1	☆
P00.20	Time precision	0:1s 1:0.1s 2:0.01s	1	☆
P00.22	Acceleration time 1	0~65535s	10	☆
P00.23	Deceleration time 1	0~65535s	10	☆
P00.25	Acceleration time 2	0~65535s	10	☆
P00.26	Deceleration time 2	0~65535s	10	☆
P00.28	Acceleration time 3	0~65535s	10	☆
P00.29	Deceleration time 3	0~65535s	10	☆
P00.31	Acceleration time 4	0~65535s	10	☆
P00.32	Deceleration time 4	0~65535s	10	☆
P00.33	Acceleration time 1 and 2 switch frequency	0~650.00Hz	0	☆

Parameter	Name	Range	Default value	Change
P00.34	Deceleration time 1 and 2 switch frequency	0-650.00HZ	0	☆
P00.40	UP/DOWN Power down memory selection	0:No 1:Yes	0	☆
P00.41	UP/DOWN stop memory selection	0:No 1:Yes	0	☆
P00.42	Base frequency for UP/DOWN modification duringrunning	0:Running frequency 1:Set frequency	0	☆
P00.43	UP/DOWN Step	0.01-100.00HZ	0.01	☆
P00.44	Jump frequency 1	0-P00.10	0	★
P00.45	Jump frequency 2	0-P00.10	0	★
P00.46	Jump frequency width	0-P00.10	0	★
P00.47	JOG frequency	0-P00.12	5	☆
P00.48	JOGAcceleration time	0-65535S　(relative to P00.20)	10	☆
P00.49	JOG Deceleration time	0-65535S　(relative to P00.20)	10	☆
P00.50	Emergency stop deceleration time	0-65535S　(relative to P00.20)	10	☆
P00.60	Start delay time	0~100s	0	☆
P00.61	Start delay function	0:Direct clamping 2:Free running	2	☆
P00.62	Frequency tracking start	0:Invalid 1:Valid	0	☆
P00.63	Minimum starting frequency set value	0-50HZ	0	★
P00.64	Minimum running frequency	0~20Hz	0	☆
P00.65	Synchronous motor start mode	0:Initial position detection start 1:Magnetic start	1	☆
P00.66	Power down start delay	0-3600S	0	☆
P00.70	DC clamping current	0-150%	50	☆
P00.71	Stop brake current	0-150%	50	☆
P00.72	Stop brake time	0-60S	0	☆
P00.73	Cut in frequency of stop brake	0-500HZ	0	☆
P00.74	Influence of synchronous motor on magnetic starting current	0-150%	80	☆

Parameter	Name	Range	Default value	Change
P00.75	Magnetization time of synchronous motor	0.1-60s	3	☆
P00.80	Stop function	0:Free stop 1:DC clamping	0	☆
P00.81	Minimum stop frequency	0-400Hz	0	☆
P00.88	0 speed holding time	1-60	0	☆
P00.89	Current drop time	1-60	0	☆
Group P01 Motor Parameter				
P01.00	Motor Type	0:Asynchronous motor 1:Surface mounted synchronous motor 2:Unsaturated embedded synchronous motor 3:Saturated embedded synchronous motor	0	★
P01.01	Motor Power	Depends on motor specification	Model determination	★
P01.02	Motor Voltage	Depends on motor specification	Model determination	★
P01.03	Motor Frequency	Depends on motor specification	Model determination	★
P01.04	Motor Current	Depends on motor specification	Model determination	★
P01.05	Motor RPM	Depends on motor specification	Model determination	★
P01.06	Motor Rated Torque	Depends on motor specification	Model determination	★
P01.07	Motor Rated Torque	Depends on motor specification	Tuning parameters	★
P01.08	Rotor resistance	Depends on motor specification	Tuning parameters	★
P01.09	Stator leakage reactance	Depends on motor specification	Tuning parameters	★
P01.10	Motor main reactance	Depends on motor specification	Tuning parameters	★
P01.11	D-axis inductance	Depends on motor specification	Tuning parameters	★
P01.12	Q-axis inductance	Depends on motor specification	Tuning parameters	★
P01.13	Number of motor poles	2-100	Model determination	★
P01.14	Negative electrical potential	5-9000	Model determination	★
P01.15	D-axis Saturation inductance	0-655.36	Tuning parameters	★
P01.16	Q-axis Saturation inductance	0-655.36	Tuning parameters	★
P01.17	D-axis Saturation inductanceswitch	0-655.36	Tuning parameters	★
P01.18	Q-axis Saturation inductanceswitch	0-655.36	Tuning parameters	★
P01.20	System inertia	0-65.535	Tuning parameters	★
P01.37	Motor parameter learn own	0:Invalid 1:All parameters learn own 2:Stator resistance learn own	0	★

Parameter	Name	Range	Default value	Change
Group P02 Control Mode Parameters				
P02.00	V/F curve set	0:Straight line 1~9:Reserved	0	☆
P02.01	V/F Torque boost	0-30%	0	☆
P02.02	Cut-off frequency of torque boost	0-655.35Hz	50	☆
P02.03	Multi-point V/F frequency point 1	0.00Hz~P02-05	0	☆
P02.04	Multi-point V/F voltage point 1	0.0%~100.0%	0	☆
P02.05	Multi-point V/F frequency point 2	0.00Hz~P02-07	0	☆
P02.06	Multi-point V/F voltage point 2	0.0%~100.0%	0	☆
P02.07	Multi-point V/F frequency point 3	0.00Hz~P02-09	0	☆
P02.08	Multi-point V/F voltage point 3	0.0%~100.0%	0	☆
P02.09	Multi-point V/F frequency point 4	0.00Hz~P02-12	0	☆
P02.10	Multi-point V/F voltage point 4	0.0%~100.0%	0	☆
P02.11	Multi-point V/F frequency point 5	0.00Hz~P01.03	0	☆
P02.12	Multi-point V/F voltage point 5	0.0%~100.0%	0	☆
P02.15	Voltage source for V/Fseparation	0:Digital setting(P02-16) 1:VI 2:AI 4:Pulse input 5:Multi-reference 6:Simple PLC 7:PID,process closed loop 8:Communication	0	☆
P02.16	Voltage digital setting for V/F separation	0V~motor rated voltage	0	☆

Parameter	Name	Range	Default value	Change
P02.17	Voltage rise time of V/F separation	0~1000s	0	☆
P02.18	Voltage decline time of V/F separation	0~1000s	0	☆
P02.19	Stop mode selection upon V/F separation	0:Frequency and voltage declining to 0 independently 1:Frequency declining after voltage declines to 0	0	☆
P02.20	Automatic voltage stabilizing function	0:OFF 1:ON	1	★
P02.30	Low frequency compensation torques	0-199%	100	☆
P02.31	High frequency compensation torques	0-199%	100	☆
P02.32	Slip Compensation	-400~399%	80	☆
P02.33	Slip Compensation Time Constant	-400~399%	0.1	☆
P02.34	Resonance Dampening	0-3000%	50	☆
P02.35	Resonance Dampening time Constant	0.001-0.05s	0.005	☆
P02.36	Open Magnetisation	0-300%	100	☆
P02.37	Normal Magnetisation Switch point	0-10	1	☆
P02.38	Open Torque compensation	0-25%	0	☆
P02.40	Synchronous motor low speed compensation	0-120%	80	☆
P02.41	Synchronous motor load compensation	0-500%	120	☆
P02.42	Low speed synchronous motor compensation filtering time	0.01-20s	0.8	☆
P02.43	High speed synchronous motor compensation filtering time	0.01-20s	0.8	☆
P02.44	Synchronous motor current filtering time	0.001-1s	0.5	☆
P02.45	Synchronous motor high -speed compensation	-400~400%	10	☆
P02.50	Torque type	0:Constant torque 1:Adjustable torque 3:Optimize torque	0	★
P02.51	Adjust adjustable torque	40-90%	90	★
P02.52	Automatic optimum energy consumption minimum flux	40-75%	66	★

Parameter	Name	Range	Default value	Change
		Group P03 Input Terminals Parameters		
P03.00	Terminal DI Filtering time	2-16ms	4	
P03.01	DI logic	0-65535	0	☆
P03.04	DI 1(X1) Input	0:Invalid 1:Forward running 2:Reverse running 3:Change to Reverse running 4:JOG FWD 5:JOG REV 6:Frequency up 7:Frequency down 8:Slow down and stop 9:Free stop 10:Reset + Free stop 11:Reset 12:Reserved 13:Emergency stop (Free stop) 14:Multi- speed set value bit 0 15:Multi- speed set value bitl 1 16:Multi- speed set value bit 2 17:Multi- speed set value bit 3 18:Acc and Dec time 0 19:Acc and Dec time 1 20:Pulse forward running 21:Pulse reverse running 22:Reserved 24:Frequency source switch 32:Command source switch1 33:Command source switch2 34:Outside failure 35:Reserved 37:Reserved 38:Reserved 40:Reserved 41:PID pause 42:PID opposite direction 43:PID Integral to suspend 44:PID parameter switch 45:PLC reset condition 46:Input high-speed pulse(DI3)	1	☆
P03.05	Terminal DI 2(X2)Input	Parameter as P03.04	2	☆
P03.06	Terminal DI 3(X3) Input	Parameter as P03.04	14	☆

Parameter	Name	Range	Default value	Change
P03.07	Terminal DI 4 (X4)Input	Parameter as P03.04	15	☆
P03.08	Terminal DI 5 (X5)Input	Reserved	16	☆
P03.09	Terminal DI 6(X6)Input	Reserved	17	☆
P03.10	Terminal DI 3 (X3)Input min frequency	0-99.99kHz	0.02	☆
P03.11	Terminal DI3(X3)Input max frequency	0.01-100kHz	50	☆
P03.12	Terminal DI3 Input min -corresponding referen -ce/feedbackvalue	Reference / feedback value -200-+200%	0	☆
P03.13	Terminal DI3 Input max -corresponding referen -ce/feedback value	Reference / feedback value -200-+200%	100	☆
P03.14	Terminal DI 3 Filtering time	1-1000ms	100	☆
P03.20	Interrupt signal detec -tion time	1-99s	10	☆
P03.21	Interrupt signal action	0:Invalid 2:Stop 3:Inching running 4:Running with MAX frequency 5:Stop then warning	0	☆
P03.30	Terminal VI Model	0:Voltage 1:Current	0	☆
P03.31	Terminal VI Min current	0-9.99V	0.20	☆
P03.32	Terminal VI Max current	0.01-10V	10	☆
P03.33	(Reserved)			☆
P03.34	(Reserved)			☆
P03.35	Terminal VI Min referen -ce/feedback value	-200~200%	0	☆
P03.36	Terminal VI Max referen -ce/feedback value	-200~200%	100	☆
P03.37	Terminal VI Filtering time	0.001-10s	0.01	☆
P03.38	Terminal VI Zero Dead Band	0-20V/mA	0	☆
P03.40	(Reserved)			☆
P03.41	(Reserved)			☆
P03.42	(Reserved)			☆

Parameter	Name	Range	Default value	Change
P03.43	(Reserved)			☆
P03.44	(Reserved)			☆
P03.45	(Reserved)			☆
P03.46	(Reserved)			☆
P03.47	(Reserved)			☆
P03.48	(Reserved)			☆
Group 4 Output Terminals Parameters				
P04.00	Relay 1 Function (KA KB KC)	0:Invalid 1:Running 2:Fault output 3:Frequency horizontal detect FDT1 output 4:Frequency arrived 5:0speed running 6:Motor overload protection 7:Converter overload protection 8:Reserved 9:Reserved 10:Reserved 11:PLC circulation 12:Total power on time arrived 13:Frequency limiting 14:Torque limiting 15:Inverter ready 16:VI>AI 17:Limited frequency arrived 18:Lower limited frequency arrived 19:Under-voltage indicate 20:Communication set 21:Reserved 22:Reserved 23:0 Speed Running 2 24:Total power on time arrived 25:Frequency Horizontal Detect FDT 2 Output 26:Frequency 1 Arrived 27:Frequency 2 Arrived 28:Current 1 Arrived 29:Current 2 Arrived 30:Timing arrive 31:VI Output Over Limited 32:Drop Loading 33:REV Running 34:0 Current 35:Module temperature arrived 36:Output current over limited	2	☆

Parameter	Name	Range	Default value	Change
		37:Still output even floor frequency arrived 38:Failure or warning 39:Over temperature warning 40:Running time arrived 41:Failure no under-voltage 42:High pressure 43:Low pressure 44:Pressure arrived	2	☆
P04.01	(Reserved)			☆
P04.02	(Reserved)			☆
P04.03	(Reserved)			☆
P04.09	(Reserved)			☆
P04.10	Relay 1 On Delay Time	0-600s		☆
P04.11	(Reserved)			☆
P04.20	(Reserved)			☆
P04.21	VO (AMO) output type	0:None 10:Output frequency* 11: Feference value 12:Feedback value 13:Motor current 16:Output power 17:Motor Rotational Speed 18:Voltage output 20:Communication control 21:Pulse input 22：Input VI 23:Input AI 26:Busbar voltage 30:Torsional moment output 80:Application control	11	☆
P04.22	Terminal AMO Min output proportion	0-200%	0	☆
P04.23	Terminal AMO Max output proportion	0-200%	100	☆
P04.24	Terminal AMO Min output	0-20	0.00	☆
P04.25	Terminal AMO Max output	0.01-20	10.00	☆
P04.30	(Reserved)			

Parameter	Name	Range	Default value	Change
P04.31	(Reserved)			☆
P04.32	(Reserved)			☆
P04.33	(Reserved)			☆
P04.34	(Reserved)			☆
P04.35	(Reserved)			☆
P04.60	(Reserved)			
P04.61	(Reserved)			
P04.62	(Reserved)			
P04.63	(Reserved)			
P04.64	(Reserved)			
Group P05 PID Parameters				
P05.00	PID setting source	0:Set P05.01 parameter 1:VI 2:(Reserved) 3:Panel Coder 4:Pulse Input 5:Communication given 6:Multistage speed 7:P05.01 add Up/Down	0	☆

Parameter	Name	Range	Default value	Change
P05.01	PID value given	-3000~3000	3	☆
P05.02	Feedback source of process control	0:VI 1:(Reserved) 2:Coder 3:(Reserved) 4:Pulse input Di3 5:Communication given 6:V(Reserved) 7:(Reserved) 8:(Reserved)	0	☆
P05.03	Positive and negative logic of process PI	0:Forward 1:Reverse	0	☆
P05.04	PID Feedback basic value given	0.1-6553.5	10	☆
P05.05	Process PI Proportional Gain	0-1000	20	☆
P05.06	Process PI Integral Time	0.01-655.35s	2	☆
P05.07	Process PI Differential Time	0-10.000s	0	☆
P05.08	PID Reverse stop frequency	0-655.35Hz	0	☆
P05.09	Deviation Limit	0-200%	0	☆
P05.10	Process PID Differential limit	0.1-100	0.1	☆
P05.11	PID Changing time given	0-650s	0.1	☆
P05.12	PID time of filter feedback	0-60s	0	☆
P05.13	PID time of filter output	0-60s	0	☆
P05.15	PID time of filter output	0-10s		☆
P05.16	Process PI Integration time	0.1-655.35		☆
P05.17	Process PI Calculus time	0-10		☆
P05.18	PID parameter switchover condition	0:No switch 2:Deviation switch 3:Frequency switch		☆

Parameter	Name	Range	Default value	Change
P05.19	Process PID Parameter Switchover Deviation 1	0-100% (Reserved)		☆
P05.20	Process PID Parameter Switchover Deviation 2	0-100% (Reserved)		☆
P05.21	PID Starting value	0-10.00	0	☆
P05.22	PID Time of starting value keeping	0-650.00s	0	☆
P05.23	Output FOR deviation MAX value	0-100%	1	☆
P05.24	Output REV deviation MAX value	0-100%	1	☆
P05.25	PID Integral attribute	00-11	0	☆
P05.26	PID Detection value of feedback lost	0-100%	0	☆
P05.27	PID Detection time of feedback lost	0-20S	0	☆
P05.28	PID Run out and operation	0:Run out but no operation 1:Run out and operation	0	☆
P05.29	Wake up pressure	0-6500	2	☆
P05.30	Wake up delayed time	0-6500s	0	☆
P05.31	Dormant pressure	0-6500	4	☆
P05.32	Dormant delayed time	0-6500s	60	☆
P05.33	Dormant mode set	0:Forbid dormant 1:Pressure arrived 2:Frequency arrived 3:Pressure and frequency arrived at sametime	1	☆
P05.34	Dormant frequency	0-655.35Hz	30	☆
P05.35	Pressure proportion linkage	0:workable 1:forbid	1	☆
P05.36	Wake up pressure linkage setting value	0-6500	1	☆
P05.37	Dormant pressure linkage setting value	0-6500	1	☆
P05.38	High pressure alarm difference set	0-6500	0	☆
P05.39	High pressure alarm delay time	0-6500s	0	☆
P05.40	Low pressure alarm difference set	0-6500	0	☆
P05.41	Low pressure alarm delay time	0-6500s	0	☆

Parameter	Name	Range	Default value	Change
P05.50	MPPT Function Select	0: frequency control mode 1: Mppt mode 1 2: Mppt mode 2 3: Mppt mode 3	0	☆
P05.51	MPPT Min Ref	0-100%	40	☆
P05.52	MPPT Max Ref	0-100%	100	☆
P05.53	MPPT Min DC Voltage	0-800	200	☆
P05.54	MPPT Max DC Voltage	0-800	365	☆
P05.55	MPPT Search Time	0.1-500	1	☆
P05.56	MPPT Search Threshold	Mode1:0.01-20V Mode2:0.01-20% Mode3:0.01-20%	0.2	☆
P05.57	MPPT Start Delay Time	1-6000S	240	☆
P05.58	MPPT Target DC Voltage	1-65535S	270	☆
P05.59	MPPT Water Lack Current	1-500%	50	☆
P05.60	MPPT Water Lack Time	0-6000s	0	☆
Group P06 Multistage Command Parameter				
P06.00	Multistage speed commands 0	-100~100%	0	☆
P06.01	Multistage speed commands 1	-100~100%	0	☆
P06.02	Multistage speed commands 2	-100~100%	0	☆
P06.03	Multistage speed commands 3	-100~100%	0	☆
P06.04	Multistage speed commands 4	-100~100%	0	☆
P06.05	Multistage speed commands 5	-100~100%	0	☆
P06.06	Multistage speed commands 6	-100~100%	0	☆
P06.07	Multistage speed commands 7	-100~100%	0	☆
P06.08	Multistage speed commands 8	-100~100%	0	☆
P06.09	Multistage speed commands 9	-100~100%	0	☆
P06.10	Multistage speed commands 10	-100~100%	0	☆
P06.11	Multistage speed commands 11	-100~100%	0	☆
P06.12	Multistage speed commands 12	-100~100%	0	☆
P06.13	Multistage speed commands 13	-100~100%	0	☆
P06.14	Multistage speed commands 14	-100~100%	0	☆

Parameter	Name	Range	Default value	Change
P06.15	Multistage speed commands 15	-100~100%	0	☆
P06.16	Simple PLC running way	0:Running single time then stop 1:Running single time then stop and keepfinal digital 2:Circulating all the time	1	☆
P06.17	Simple PLC option of drop power memory	Unit:option of drop power memory 0:drop power no memory 1:drop power memory Decade:option of drop power memory 0:drop power no memory 1:drop power memory	0	☆
P06.18	Simple PLC running time unit	0:S, Second 1:H,Hour	0	☆
P06.19	Simple PLCO running time	0-6500	0	☆
P06.20	Simple PLCO variable speed time option	0-3	0	☆
P06.21	Simple PLC1 running time	0-6500	0	☆
P06.22	Simple PLC1 variable speed time option	0-3	0	☆
P06.23	Simple PLC2 running time	0-6500	0	☆
P06.24	Simple PLC2 variable speed time option	0-3	0	☆
P06.25	Simple PLC3 running time	0-6500	0	☆
P06.26	Simple PLC3 variable speed time option	0-3	0	☆
P06.27	Simple PLC4 running time	0-6500	0	☆
P06.28	Simple PLC4variable speed time option	0-3	0	☆
P06.29	Simple PLC5 running time	0-6500	0	☆
P06.30	Simple PLC5 variable speed time option	0-3	0	☆
P06.31	Simple PLC6 running time	0-6500	0	☆
P06.32	Simple PLC6 variable speed time option	0-3	0	☆
P06.33	Simple PLC7 running time	0-6500	0	☆
P06.34	Simple PLC7 variable speed time option	0-3	0	☆
P06.35	Simple PLC8 running time	0-6500	0	☆

Parameter	Name	Range	Default value	Change
P06.36	Simple PLC8 variable speed time option	0-3	0	☆
P06.37	Simple PLC9 running time	0-6500	0	☆
P06.38	Simple PLC9 variable speed time option	0-3	0	☆
P06.39	Simple PLC10 running time	0-6500	0	☆
P06.40	Simple PLC10 variable speed time option	0-3	0	☆
P06.41	Simple PLC11 running time	0-6500	0	☆
P06.42	Simple PLC11 variable speed time option	0-3	0	☆
P06.43	Simple PLC12 running time	0-6500	0	☆
P06.44	Simple PLC12 variable speed time option	0-3	0	☆
P06.45	Simple PLC13 running time	0-6500	0	☆
P06.46	Simple PLC13 variable speed time option	0-3	0	☆
P06.47	Simple PLC14 running time	0-6500	0	☆
P06.48	Simple PLC14 variable speed time option	0-3	0	☆
P06.49	Simple PLC15 running time	0-6500	0	☆
P06.50	Simple PLC15 variable speed time option	0-3	0	☆
P06.51	Multistage speed 0 given way	0:P06.00 given 1:Analog AI1 2:Analog AI2(Reserved) 4:PID5：Preset value	0	☆
Group P07 Communication Parameter				
P07.03	Communication Timeout Time	0.1-650.00s	1	☆
P07.04	Communication Timeout Function	0:Invalid 2:Stop 3:Inching operation 4:Max operation frequency 5:Stop then warn 6:Warning	0	☆
P07.06	Reset Communication Timeout	0:Invalid 1:Reset communication cut	0	☆

Parameter	Name	Range	Default value	Change
P07.30	Protocol	0:MODBUS-RTU 2:Reserved	0	☆
P07.31	Address	1-247	1	☆
P07.32	Baud Rate	0:300b 1:600b 2:1200b 3:2400b 4:4800b 5:9600b	5	☆
P07.33	Digital Form	0:No parity　(1Position Stop) 1:Even parity (1Position Stop) 2:Odd parity (1Position Stop) 3:No parity　(2Position Stop)	0	☆
P07.35	Min. Response Delay	0-0.5s	0.002	☆
P07.36	Max. Response Delay	0.1-10s	5	☆
P07.38	Message Response	0:Every time 1:Only response abnormal message 2:No response	0	☆
P07.39	Programme control	0:Parameter do not save when power off 1:Parameter save when power off	1	☆
Group P08 Assistant Parameter				
P08.01	Over Modulation Function	90-105.5%	100	★
P08.02	Deadband Compensation	0-200	100	☆
P08.07	Max Deadband Compensation	20-1000Hz	500	★
P08.10	DC Circuit Voltage Compensation	0:No compensation 1:Compensation1 2:Compensation2	0	★
P08.20	Switching Frequency	2-16kHZ	5	☆
P08.22	Multi Derating Ctrl Val	0: invalid 1: Turn off DPWM 3: turn off DPWM and carrier drop above 2HZ 5: Turn off PWM and all frequency drop carriers	0	☆
P08.30	Operating mode	0:Normal operating 2:Reset	0	☆
P08.31	(Reserved)			

Parameter	Name	Range	Default value	Change
P08.32	(Reserved)			
P08.35	(Reserved)			
P08.36	(Reserved)			
P08.37	(Reserved)			
P08.40	Frequency detected value 1	0-655.35Hz	50	☆
P08.41	Frequency detected value 1 hysteresis of instrument	0-100%	5	☆
P08.42	Frequency reach to detection width	0-100%	0	☆
P08.43	Frequency detected value 2	0-655.35Hz	50	☆
P08.44	Frequency detected value 2 hysteresis of instrument	0-100%	5	☆
P08.45	Any reach frequency detected value 1	0-655.35Hz	50	☆
P08.46	Any reach frequency detected width 1	0-100%	0	☆
P08.47	Any reach frequency detected value 2	0-655.35Hz	50	☆
P08.48	Any reach frequency detected width 2	0-100%	0	☆
P08.49	0 current detection level	0-300%	5	☆
P08.50	0 current detection delayed time	0-600s	0.1	☆
P08.51	Output current over limited	0-300%	200	☆
P08.52	Output current over limited detection delayed	0-600s	0	☆
P08.53	Any arrived electron flow 1	0-300%	100	☆
P08.54	Width of any arrived electron flow 1	0-300%	0	☆
P08.55	Any arrived electron flow 2	0-300%	100	☆
P08.56	Width of any arrived electron flow 2	0-300%	0	☆
P08.57	Module temperature	0-200℃	75	☆
P08.58	Running time	0-6500min	0	☆
P08.59	Cumulative power on time	0-6500min	0	☆
P08.60	Inverter fan control	0-7	7	☆
P08.61	Motor speed ratio	0-200	50	☆
Group P09 Malfunction and Protect Parameter				
P09.00	Limited value prevent over current losing speed	0-300%	200	☆
P09.01	Current controller 1 proportion	0-300%	100	☆

Parameter	Name	Range	Default value	Change
P09.02	Current controller 1integral	0.005-2s	0.02	☆
P09.04	Torque limited when motor on	0-1000%	150	☆
P09.05	Torque limited when generate electricity	0-1000%	150	☆
P09.08	Over current losing speed alarm delayed	0-60s	60	☆
P09.09	Torque reached to limited alarm delayed	0-60s	60	☆
P09.20	Braking function	0:Invalid 1:Rheostatic brake 2:Alternating braking	0	☆
P09.21	The resistance braking thre-shold depends on the volt-age specifications	Depend to voltage specification	Depends on the model	★
P09.24	The over-voltage stall prev-ent threshold depends on the specifications	Depend to voltage specification	Depends on the model	☆
P09.25	Over voltage control	0:Invalid 2:Model 1 3:Model 2	2	☆
P09.26	Over voltage control integ-ral coefficient	0.01-0.1s	0.05	☆
P09.27	Over voltage control propo-rtion coefficient	0-200%	100	☆
P09.28	Alternating braking inte-gral coefficient	1.0-2.0	1.4	☆
P09.29	Maximum current of alter-nating braking	0-150%	100	☆
P09.40	Motor phases detection	0:Off 1:On	1	★
P09.41	Power imbalance option	0:Failure stop 1:Warning 2:Invalid 4:Warning mid-sensitivity 5:Failure stop mid-sensitivity 6:Failure stop high-sensitivity	0	☆
P09.42	Voltage net drop function	0:Invalid 1:Speed cut 2:Speed cut failure 3:Free revolve stop motor 4:Instantaneous power lost non-stop 5:Instantaneous power lost non-stop failure 6:Failure	0	★
P09.43	Judge voltage from power grid failure	100-800V (Reserve)	180	☆
P09.44	Moment non-stop gain when power supply drop	0-500%	100	☆
P09.45	Moment non-stop recovery threshold when power supply drop	0-65535	200	☆

Parameter	Name	Range	Default value	Change
P09.46	Converter action after voltage failure	0:Failure locked 1:Speed start	0	☆
P09.47	Motor ground detection	0-400	0	☆
P09.50	Motor overload protection option	0:Prohibition 1:Warning after motor overload 2:Alarm after motor overload	0	☆
P09.51	Motor Overload Protection Factor	0.2-60	1	☆
P09.52	Motor Overheating Protection Warning Factor	50-100%	80	☆
P09.58	Synchronous motor stalling protection	0:Off 1:On	0	☆
P09.59	Time of Synchronous motor stalling protection	0.05-1s	0.1	☆
P09.60	Malfunction warning display	0:Blank 1:Normally display 2:Power on failure clearance	2	☆
P09.61	Malfunction locked	0:Unlocked 1:Locked	0	☆
P09.62	Actions when converter breakdown	0:Display fault and Stop motor 1:Sop motor after warning	1	☆
P09.70	Time of automatic reset	0:Manual reset 1:Automatic reset1 time 2:Automatic reset 2 times 3:Automatic reset 3 times 4:Automatic reset 4 times 5:Automatic reset 5 times 6:Automatic reset 6 times 7:Automatic reset 7 times 8:Automatic reset 8 times 9:Automatic reset 9 times 10:Automatic reset 10 times 11:Automatic reset 15 times 12:Automatic reset 20 times 13:Automatic reset unlimited times	0	☆
P09.71	Automatic reset time	0-600s	10	☆
Group P10 Failure Record Parameter				
P10.00	LCP menu options	1:Motor voltage 2:Motor rotational peed 4:DC voltage 8:Temperature 16:Process PID feedback digital	6	☆

Parameter	Name	Range	Default value	Change
P10.00	LCP menu options	32:Counter A 64:Counter B 128:Input VI 256:Input AI 512:Input pulse 1024:Output pulse 2048:Custom physical quantities (reserved) 4096:Output power 8192:Process PID given digital	6	☆
P10.01	RUN button	0:Invalid 1:Valid	1	☆
P10.02	OFF button	0:Invalid 1:Valid 2:Reset valid	1	☆
P10.04	Parameter locked	0:Invalid 1:Protect	0	☆
P10.05	Copy parameter	1:Sectional parameter up load 2:All parameter up load 3:Down load parameter(To be on again when the power is cut off the electricity)	0	★
P10.10	Days of running	0-9999d	━	●
P10.11	Hours of running	0-60000h	━	●
P10.12	Total power	0-65535kwh	━	●
P10.13	Time of electricity on	0-65535	━	●
P10.14	Number of overheating	0-65535	━	●
P10.15	Number of over voltage	0-65535	━	●
P10.16	Number of reset power	0:No reset 1:Reset	0	●
P10.17	Hours of reset running	0:No reset 1:Reset	0	●
P10.20	First failure type refer to failure form	Refer to Failure list	━	●
P10.21	Second failure type refer to failure form	Refer to Failure list	━	●
P10.22	Third failure type refer to failure form	Refer to Failure list	━	●
P10.30	First failure frequency	---	━	●
P10.31	First failure current	---	━	●
P10.32	First failure voltage	---	━	●
P10.33	First failure DI	---	━	●
P10.34	First failure DO	---	━	●

Parameter	Name	Range	Default value	Change
P10.35	Power on time of first failure	---	━	●
P10.36	Running time of first failure	---	━	●
P10.40	Second failure frequency	---	━	●
P10.41	Second failure current	---	━	●
P10.42	Second failure voltage	---	━	●
P10.43	Second failure DI	---	━	●
P10.44	Second failure DO	---	━	●
P10.45	Power on time of second failure	---	━	●
P10.46	Running time of second failure	---	━	●
P10.50	Third failure frequency	---	━	●
P10.51	Third failure current	---	━	●
P10.52	Third failure voltage	---	━	●
P10.53	Third failure DI	---	━	●
P10.54	Third failure DO	---	━	●
P10.55	Power on time of third failure	---	━	●
P10.56	Running time of third failure	---	━	●
P10.70	Software version	---	━	●
P10.71	Main board Software version	---	━	●
Group P11 Digital Monitoring Parameter				
P11.00	Frequency output			●
P11.01	Set digital			●
P11.02	DC voltage			●
P11.03	Motor voltage			●
P11.04	Motor current			●
P11.05	Frequency output			●
P11.06	Torsional moment output %			●
P11.07	DI input condition			●
P11.08	DO output condition			●
P11.09	VI digital input			●
P11.10	AI digital input			●

Parameter	Name	Range	Default value	Change
P11.11	AI digital input 3			●
P11.12	Counter A			●
P11.13	Counter B			●
P11.14	Motor rotational speed			●
P11.15	PID reference value			●
P11.16	Feedback value			●
P11.17	PLC stage			●
P11.18	Pulse frequency input			●
P11.19	Frequency feedback Hz			●
P11.20	Rest of running time			●
P11.21	VI voltage before emended			●
P11.22	AI voltage before emended			●
P11.23	AI voltage before emended 3			●
P11.25	Current time of power on			●
P11.26	Total time of power on			●
P11.27	Current running time			●
P11.29	Set communication value			●
P11.30	Coder feedback speed P11.31 display main frequency X			●
P11.31	Display main frequency X			●
P11.32	Display main frequency Y			●
P11.34	Synchronous motor rotor Angle P11- 35 converter temperature			●
P11.35	Inverter Temperature			●

Attention：labeled"* "is tolerant parameter,
P010、P011 Parameter is subject to frequency converter actually display,
☆ means that the setting value of this parameter can be changed when the inverter is in shutdown or running state.
★ means that the setting value of the parameter cannot be changed when the inverter is in operation.
• means that the value of this parameter is the record value of actual detection and cannot be changed.
- means that the factory value of the parameter is related to the power or model.
See the corresponding parameter description for the specific value.

Chapter 6 Parameters Description

P00 Basic Functional Parameters

Parameter	Name	Range	Default value	Change
P00.01	Control Mode	0:VF 1:Vector Control	1	

0: V/F control :

    It is suitable for application scenarios such as low control performance requirements, special motor types or multiple motors driven by one inverter, such as fan and water pump loads,The value of V/F could be set in Parameter P00.02.

1: Vector control:

    It is suitable for applications with high requirements for low frequency torque or control performance. The performance of vector control is better than that of V / F control, but it is more sensitive to motor parameters.Before use, the motor parameters need to be static fully self-learning, corresponding to P01 group of parameters to set.

Noted that the motor parameter identification process must be carried out when the vector control mode is selected.Only accurate motor parameters can give full play to the advantages of vector control. For PMSM, vector control is generally selected, and V/F control can also be selected for small power motor applications.

Parameter	Name	Range	Default value	Change
P00.02	Option of order source	0:Panel Control 1:Terminal control 2:Communication control 3:Communication or terminal control	0	

    Select input channel of inverter control command.

    Frequency converter control commands include: start, stop, forward rotation, reverse rotation, inching, etc.

0: Panel control

    The operation panel is controlled by the run and stop / reset buttons on the operation panel.

1：Terminal control

    The terminal command is controlled by the multi-function input terminals FWD, REV, JOG FWD, JOG REV, etc.

2:Communication control

    The communication command is given by the upper computer through communication. For functions related to communication, please refer to the description of communication parameter group (group P07) and communication protocol.

3: Communication or terminal control

    When this channel is selected, when the terminal and communication channel inform the access status, any channel can control the frequency converter by giving the action command.

Parameter	Name	Range	Default value	Change
P00.03	Main frequency source X option (Reserved)	0:Digital set (Preset reference value) 2:VI 3:(Reserved) 4:Panel coder 5:Pulse input 6:Command of multi-speed 7:Simple PLC 8:PID 9:Communication given	4	

There are nine kinds of input channels for the main frequency X of the inverter.
0:Digital set(Preset reference value)

Set the initial value of frequency to P00.09. When the external UP/Down is connected, the frequency can be changed by UP/Down. When the inverter is powered off and then powered on, the set frequency will be restored to P00.09. It can also be used with P00.40 and P00.41 memory functions.
2: VI

The frequency is set by 0-10V analog (default), and the user can freely select the analog quantity setting of VI port as 0-20mA or 4-20mA through the dial switch.
3:Reserved.
4:Panel coder；

The frequency given from analog terminal VI.
5:Pulse input

The frequency given from terminals pulse. Pulse decide the sign specification. Frequency range from 0Khz to 100KHz. Pulse given only can input from multi-function terminal.
6:Command of multi-speed

When selecting the operation mode of multi section command, different set frequency values should be corresponding to different state combinations of digital input terminals.

When the digital input terminal is used as a multi segment command terminal, it needs to be set in group P03.
 7 :Simple PLC

When the frequency source is simple PLC, the frequency source of the inverter can switch between 0-15 arbitrary frequency commands. The holding time of 0-15 frequency commands can be set by the user of their acceleration and deceleration time.
8: PID;

The feedback of PID control is selected as the given frequency, which is generally used in the process closed-loop control on site. When PID is used as a given frequency source, it is necessary to set P05 groups of relevant parameters.
9:Communication given

Users can choose according to P07 group parameters.

Parameter	Name	Range	Default value	Change
P00.04	Assistant frequency source Y option (Reserved)	0:Digital set 2:VI 3:AI 4:Panel coder 5:Input pulse 6:Order of multi-speed 7:Simple PLC 8:PID 9:Communication given	0	

When the auxiliary frequency source is used as an independent frequency given channel, its usage is the same as that of the main frequency source X for the usage, please refer to the relevant description of P00.03.

When the auxiliary frequency source is used as the superposition timing(frequency switch between X+Y,X to X+Y or Y to X+Y), please noted.

1.When the auxiliary frequency source is digital, the prefabricated frequency does not work. The frequency adjustment by the user through the potentiometer is directly based on the main given frequency.

2.When the auxiliary frequency source is given by analog input or pulse input, 100% of the input setting corresponds to the auxiliary frequency source range, which can be set through P00.05/P00.06.

3.The frequency source is pulse input timing, similar to analog quantity timing.

Noted:Auxiliary frequency source y selection and main frequency x selection cannot be set to the same channel, that is, p00.03 and p00.04 should not be set to the same channel, otherwise it is easy to cause confusion.

Parameter	Name	Range	Default value	Change
P00.05	Option range of assistant frequency source Y (Reserved)	0:Relative maximum frequency 1:Relative main frequency source X	0	
P00.06	Range of assistant frequency source (Reserved)	0~200%	100	

When the frequency source is selected as "frequency superposition", these two parameters are used to determine the adjustment range of the auxiliary frequency source.

P00.05 is used to determine the corresponding object in the range of auxiliary frequency source. You can select the relative maximum frequency or relative to the main frequency source X.

If the relative main frequency source is selected, the range of the auxiliary frequency source will change with the change of the main frequency X.

Parameter	Name	Range	Default value	Change
P00.07	Biased frequency of assistant frequency source Y(Reserved)	0~P0.10	0	

The modified function code is only valid when the frequency source is selected as the main and auxiliary operation.

When the frequency source is used as the main and auxiliary operation, p00.07 is used as the offset frequency, and the superposition of the main and auxiliary operation results is used as the final frequency setting value, which makes the frequency setting more flexible.

Parameter	Name	Range	Default value	Change
P00.08	Frequency source selection (Reserved)	Ten's digit:X and Y operation relationship 0:X+Y 1:X-Y 2:Maximum 3:Minimum Unit's digit:Frequency source selection 0:Main frequency source X 1:X and Y operation(operation relationship determined by ten's digit) 2:Switchover between X and Y 3:Switchover between X and "X and Y operation" 4:Switchover between Y and "X and Y operation"	0	

The given frequency channel is selected by this parameter. Through the combination of the main frequency source X and the auxiliary frequency source y, the frequency source is given.
0: Bit: main frequency source x
     The main frequency source x is used as the target frequency.
1: Main and auxiliary operation results;
     The main and auxiliary operation results are taken as the target frequency, and the main and auxiliary operation relationship is shown in the "ten bit" description of the function code.
2: Switching between main frequency source X and auxiliary frequency source y
     When p00.08 = 24 (frequency source switching) is invalid, the main frequency x is the target frequency. When p00.08 = 24 is valid, the auxiliary frequency y is the target frequency.
3: When the main frequency source X switches with the main and auxiliary operation results
     When p00.08 = 24 (frequency source switching) is invalid, the main frequency x is used as the target frequency. When p00.08 = 24 (frequency source switching) is valid, the result of primary and secondary frequency operation is taken as the target frequency.
4: When the main frequency source Y switches with the main and auxiliary operation results
     When p00.08 = 24 (frequency source switching) is invalid, the main frequency x is used as the target frequency. When p00.08 = 24 (frequency source switching) is valid, the result of primary and secondary frequency operation is taken as the target frequency.

Ten bits: main and auxiliary operation relationship of frequency source.
0: X+Y
1: X-Y
2: Maximum
     The absolute maximum of the main frequency X and the auxiliary frequency y is taken as the target frequency.
3: Minimum
     The absolute minimum of the main frequency X and the auxiliary frequency y is taken as the target frequency
     In addition, when the frequency source is selected as the main and auxiliary operation, the offset frequency can be set through P00.07, and the offset frequency can be superimposed on the main and auxiliary operation results, so as to flexibly respond to various needs.

Parameter	Name	Range	Default value	Change
P00.09	Preset reference value	-100%~100%	50	

When the frequency source (p00.03) is selected as "digital setting" or "terminal up, terminal down", the function code value is the initial value of frequency digital setting of frequency converter.

Parameter	Name	Range	Default value	Change
P00.10	Maximum frequency	0~655.35Hz	50	

Used to set the maximum output frequency of the inverter. Its frequency setting is the basis of acceleration and deceleration. Please pay attention to it. In VFD, when analog input, pulse input and multi section command are used as frequency source, 100% of them are calibrated relative to P00.10.

Parameter	Name	Range	Default value	Change
P00.12	Upper limited frequency	0~P00.10	50	

The upper limit value of the output frequency of the frequency converter, which should be less than or equal to the maximum frequency P00.10.

Parameter	Name	Range	Default value	Change
P00.14	Lower limited frequency	0~P00.10	0	

The floor limit value of the output frequency of the frequency converter.

Parameter	Name	Range	Default value	Change
P00.15	Below lower floor frequency operation model	0:Floor frequency operation 1:Motor stop 2:No speed operation	0	

When the set frequency is lower than the lower limit frequency, the running state of the inverter can be selected by this parameter. VFD provides three modes, low frequency operation, 0-speed operation and shutdown.

Parameter	Name	Range	Default value	Change
P00.16	Rotation Direction Selection	0:default direction 1:opposite default direction	0	

By changing the function code, the purpose of motor turning can be realized without changing the motor wiring, which is equivalent to adjusting any two of the motor (U / V / W) to realize the conversion of motor rotation direction.

Tips: after parameter initialization, the motor running direction will return to the original state, and it is strictly forbidden to change the motor steering after system debugging.

Parameter	Name	Range	Default value	Change
P00.17	Forbid REV	0:Invalid 1:Valid	1	

This parameter is used to set whether the inverter is allowed to reverse the running state, and the system defaults to reverse prohibition. In the case of motor reversal, the parameter value of P00.17 must be "0".

Parameter	Name	Range	Default value	Change
P00.20	Time precision	0:1s 1:0.1s 2:0.01s	1	

In order to meet the needs of all kinds of sites, VFD provides three kinds of acceleration and deceleration time units, which are 1s, 0.1s and 0.01 so.

Note: when modifying this function parameter, the decimal places displayed by the four groups of acceleration and deceleration time will change, and the corresponding acceleration and deceleration time will also change. Special attention should be paid in the application process.

Parameter	Name	Range	Default value	Change
P00.22	Acceleration time 1	0~65535s	3	
P00.23	Deceleration time 1	0~65535s	3	
P00.25	Acceleration time 2	0~65535s	3	
P00.26	Deceleration time 2	0~65535s	3	
P00.28	Acceleration time 3	0~65535s	3	
P00.29	Deceleration time 3	0~65535s	3	
P00.31	Acceleration time 4	0~65535s	3	
P00.32	Deceleration time 4	0~65535s	3	

Acceleration time refers to the time required for the output frequency of the converter to rise from zero frequency to the target frame rate. Deceleration time refers to the time required for the output frequency of the inverter to decrease from the target frequency to zero frequency. VFD provides four groups of acceleration and deceleration time, and the definition of acceleration and deceleration time is exactly the same.

Parameter	Name	Range	Default value	Change
P00.33	Acceleration time 1 and 2 switch frequency	0~650.00Hz	0	
P00.34	Deceleration time 1 and 2 switch frequency	0~650.00Hz	0	

This function is valid when motor 1 is selected and acceleration and deceleration time is not selected through DI (x) terminal switching. It is used to select different acceleration and deceleration time according to the operating frequency range instead of DI (x) terminals during the operation of the inverter.

In acceleration process 1, if the operation frequency is less than p00.33, select acceleration time 2; if the operation frequency is greater than p00.33, select acceleration time 1.

During deceleration, if the running frequency is greater than p00.34, select deceleration time 1, if the running frequency is less than p00.34, select acceleration time 2.

Parameter	Name	Range	Default value	Change
P00.40	UP/DOWN Power down memory selection	0:No 1:Yes	0	
P00.41	UP/DOWN stop memory selection	0:No 1:Yes	0	

This function is only valid when the frequency source is set as digital.

"No memory" means that after the power failure of the inverter, the digital set frequency value is restored to the preset frequency value, and the frequency correction of the encoder or terminal is cleared.

"Memory" means that after the frequency converter is shut down, the digital set frequency remains the set frequency of the last shutdown time, and the frequency correction made by the encoder or terminal remains effective.

Parameter	Name	Range	Default value	Change
P00.42	Base frequency for UP/ DOWN modification during running	0:Running frequency 1:Set frequency	0	

This parameter is only valid when the frequency source is set as digital.

It is used to determine the way to correct the set frequency when the keyboard encoder or terminal up / down acts, that is, whether the target frequency is increased or decreased on the basis of the set frequency or on the basis of the operation frequency.

The difference between the two settings is obvious when the frequency converter is in the process of acceleration and deceleration, that is, if the operating frequency of the frequency converter is different from the set frequency, the different selection of this parameter is very different.

Parameter	Name	Range	Default value	Change
P00.43	UP/DOWN Step	0.01~100.00Hz	0.01	

It is used to set the speed of frequency change when the terminal up / down adjusts the set frequency, that is, the change of frequency per second.

Parameter	Name	Range	Default value	Change
P00.44	Jump frequency 1	0~P00.10	0	
P00.45	Jump frequency 2	0~P00.10	0	
P00.46	Jump frequency width	0~P00.10	0	

When the set frequency is within the range of jumping frequency, the actual running frequency will run at the jumping frequency which is far away from the set frequency. By setting the jumping frequency, the inverter can avoid the mechanical resonance point of the load.

VFD can set two jumping frequency points. If both jumping frequencies are set to 0, the jumping frequency function will be canceled.
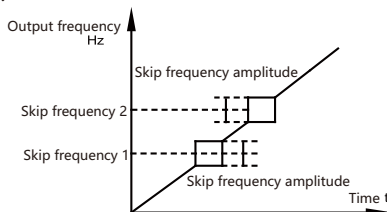
Parameter	Name	Range	Default value	Change
P00.47	Jog frequency	0~P00.12	5	
P00.48	Jog Acceleration time	0-65535S (relative to P00.20)	10	
P00.49	Jog Deceleration time	0-65535S (relative to P00.20)	10	
P00.50	Emergency stop deceleration time	0-65535S (relative to P00.20)	10	

Define the given frequency and acceleration and deceleration time of frequency converter when inching.

During inching operation, the start mode is fixed as direct start mode, and the stop mode is fixed as deceleration stop mode.

Parameter	Name	Range	Default value	Change
P00.60	Start delay time	0~100s	0	
P00.61	Start delay function	0:Direct clamping 2:Free running	2	

The start delay time is the delay time from the start command to the motor acceleration. When it is set to 0.0, the start delay function is invalid. The start delay function refers to the function executed by the inverter within the start delay time.

0: Direct clamping

During the start delay time, the inverter uses DC clamping function to brake the motor.

2: Free running

During the starting delay time, the motor is in free running state and is not controlled by the inverter.

Note: all acceleration times do not include start-up delay time. When the frequency tracking start is valid, the start delay function is invalid.

Parameter	Name	Range	Default value	Change
P00.62	Frequency tracking start	0:Invalid 1:Valid		0

The frequency tracking function is suitable for inertial load, which can be started after the power supply is cut off suddenly. When the frequency tracking is effective, the frequency converter first judges the speed and direction of the motor, and then starts the motor with the tracking frequency, and starts the motor smoothly and without impact.

Parameter	Name	Range	Default value	Change
P00.63	Minimum starting frequency set value	0~50Hz	0	

When the absolute value of the frequency reference value of the inverter is greater than or equal to the minimum operating frequency, the inverter will output. This feature is off by default.

Parameter	Name	Range	Default value	Change
P00.64	Minimum running frequency	0~20Hz	0	

When the absolute value of frequency converter operating frequency is less than the minimum frequency, the motor directly changes from the current value to the minimum frequency with negative minimum frequency. This function is off by default.

Parameter	Name	Range	Default value	Change
P00.65	Synchronous motor start mode	0:Initial position detection start 1:Magnetic start	1	

Because synchronous motor does not know the actual position of rotor when starting, it needs a process of magnetic field (parking) or initial position detection (IPD). This parameter is used to set the starting mode of synchronous motor. The starting time of initial position detection is very fast, and ts can be ignored. When starting, the magnetization time is determined by the parameter P00.75.

Parameter	Name	Range	Default value	Change
P00.70	DC clamping current	0-150%	50	

The DC clamping function uses top heating motor or brake motor. The essence of DC cla -mping and DC braking control is the same, both of them brake the motor by supplying DC power to the motor, and both of them need the degaussing process of the motor. But the timing of DC clamping and DC braking is different; DC clamping can be used to start the delayed preheating motor and stop the motor. There is no time limit for DC clamping when it stops. DC braking can only be used to stop the motor when it stops, which is limited by DC braking time.

Parameter	Name	Range	Default value	Change
P00.71	Stop brake current	0-150%	50	
P00.72	Stop brake time	0-60s	0	
P00.73	Cut in frequency of stop brake	0-500Hz	0	

DC braking: it is applicable to the situation where the torque output needs to be maintained after braking to zero speed.

DC braking current: refers to the output current during DC braking, which is the percentage of the value relative to the rated current of the motor. The larger the value is, the stronger the DC effect is, the greater the heating of the motor and frequency converter is, and the greater the overcurrent risk of the frequency converter is.

DC braking time: the holding time of DC braking amount. If it is set to 0.0, the DC braking is closed.

DC braking cut in frequency: when the output frequency of the frequency converter is lower than this frequency, the DC braking process starts. When it is set to 0.0, the DC braking is closed.

Parameter	Name	Range	Default value	Change
P00.74	Influence of synchronous motor on magnetic starting current	0-150%	80	
P00.75	Magnetization time of synchronous motor	0.1-60s	3	

When the starting mode of synchronous motor is equal to 1 at P00.65, this group of parameters has effect on magnetic starting. P00.75 is used to determine the start-up time, P00.74 is used to determine the start-up current, and 100% corresponds to the rated current of P01.04 motor.

Parameter	Name	Range	Default value	Change
P00.80	Stop function	0:Free stop 1:DC clamping	0	
P00.81	Minimum stop frequency	0-400Hz	0	

Stop function refers to the action performed by the frequency converter when the frequency converter receives the stop signal or the running signal is disconnected and the output frequency drops to P00.81 of stop function.

0: Free stop

When the frequency converter receives the stop signal or the operation signal is disconnected, the output frequency drops to P00.81of the stop function.

1: DC clamping

When the frequency converter reaches the stop signal or the running signal is disconnected, and the motor decelerates to P00.81 according to the mechanical inertia, the frequency converter uses the DC clamping function to brake the motor. Refer to P00.70-P00.73 for DC clamping instructions.

P01 Motor Parameter

Parameter	Name	Range	Default value	Change
P01.00	Motor Type	0:Asynchronous motor 1:Surface mounted synchronous motor 2:Unsaturated embedded synchronous motor 3:Saturated embedded synchronous motor	0	

This parameter is used to select the motor type. Depending on the type of motor, the following parameters will be different when applied.

Parameter	Name	Range	Default value	Change
P01.01	Motor Power	Depends on motor specification	Model determination	
P01.02	Motor Voltage	Depends on motor specification	Model determination	
P01.03	Motor Frequency	Depends on motor specification	Model determination	
P01.04	Motor Current	Depends on motor specification	Model determination	
P01.05	Motor RPM	Depends on motor specification	Model determination	
P01.06	Motor Rated Torque	Depends on motor specification	Model determination	

The factory values of the above motor parameters are determined by the inverter model. No matter which control mode is adopted, it is recommended to set the relevant parameters accurately according to the motor nameplate. After changing the motor parameters, the parameter value of P01.07-P01.10 will be automatically modified in the inverter.

Parameter	Name	Range	Default value	Change
P01.07	Stator resistance	Depends on motor specification		
P01.08	Rotor resistance	Depends on motor specification		
P01.09	Stator leakage reactance	Depends on motor specification		
P01.10	Motor main reactance	Depends on motor specification		
P01.11	D-axis inductance	Depends on motor specification		
P01.12	Q-axis inductance	Depends on motor specification		

Generally, this group of parameters is not on the motor nameplate, which needs to be obtained by setting motor parameters or motor self-learning. Note: users should not change this group of parameters at will.

Parameter	Name	Range	Default value	Change
P01.13	Number of motor poles	2-100		4

This parameter is used to set the number of motor poles.

Parameter	Name	Range	Default value	Change
P01.14	Negative electrical potential	5-9000	Depends on the motor data	

When the magnetic field changes, the conductor nearby will produce an induced electromotive force, which is in the opposite direction to the voltage originally applied to both ends of the coil. Back EMF is usually determined by rated current and self-learning of motor.

Parameter	Name	Range	Default value	Change
P01.15	D-axis Saturation inductance	0-655.36	Depends on the motor data	
P01.16	Q-axis Saturation inductance	0-655.36	Depends on the motor data	

Generally, this group of parameters is not on the motor nameplate, which needs to be obtained through motor self-learning.

Parameter	Name	Range	Default value	Change
P01.17	D-axis Saturation inductance switch	0-655.36	100	
P01.18	Q-axis Saturation inductance switch	0-655.36	100	

Generally, this group of parameters is not on the motor nameplate, which needs to be obtained through motor self-learning.

Parameter	Name	Range	Default value	Change
P01.20	System inertia	0-65.535	Depends on the motor data	

Generally, this group of parameters is not on the motor nameplate, which needs to be obtained through motor self-learning.

Parameter	Name	Range	Default value	Change
P01.37	Motor parameter learn own	0:Invalid 1:All parameters learn own 2:Stator resistance learn own	0	

Using the motor self-learning function can obtain accurate motor parameters and further optimize the control performance. With the same power motor configuration, the inverter has built-in reasonable motor parameters, so there is no need for self-learning in general.

0: Invalid

1: Self-learning all parameter.

Including P01.07 Stator resistance,P01.09 Stator leakage reactance,P01.10 Motor main reactance,P01.11 D-axis inductance and P01.12 Q-axis inductance.

If LC filter is used between inverter and motor, only this option can be selected; Both full parameter self-learning and stator resistance self-learning are static self-learning, so the motor does not need to be disconnected from the load. Before using the motor self-learning function, the following parameters should be set according to the motor nameplate:

P01.01 motor power、 P01.02 motor voltage、 P01.03 motor frequency、 P01.04 motor current、 P01.05 motor RPM、 P01.06 motor torque、 P01.13 number of motor poles.

In order to obtain accurate motor data, the inverter should carry out self-learning in the motor cooling state. This function is not available when the motor is running.

P02 Control Mode Parameter

Parameter	Name	Range	Default value	Change
P02.00	V/F curve set	0:Straight line 1~9 Reserved	0	

0: Straight line V/F

Suitable for ordinary torque load.

Parameter	Name	Range	Default value	Change
P02.01	V/F Torque boost	0-30%	0	
P02.02	Cut-off frequency of torque boost	0-655.35Hz	50	

In order to compensate the low-frequency torque characteristics of V / F control, the output voltage of the inverter at low frequency is compensated. But the torque lifting setting is too large, the motor is easy to overheat, and the frequency converter is easy to over-current.

When the load is heavy and the motor starting torque is not enough, it is suggested to increase this parameter. The torque increase can be reduced when the load is light. When the torque increase is set to 0.0, the inverter will automatically calculate the required torque increase value according to the parameters of motor electronic resistance.

Torque boost, torque cut-off frequency: under this frequency, torque boost is effective; beyond this set frequency, torque boost is invalid.

Parameter	Name	Range	Default value	Change
P02.03	Multi-point V/F frequency point 1	0.00Hz~P02-05	0	
P02.04	Multi-point V/F voltage point 1	0.0%~100.0%	0	
P02.05	Multi-point V/F frequency point 2	0.00Hz~P02-07	0	
P02.06	Multi-point V/F voltage point 2	0.0%~100.0%	0	
P02.07	Multi-point V/F frequency point 3	0.00Hz~P02-09	0	
P02.08	Multi-point V/F voltage point 3	0.0%~100.0%	0	

P02.03~P02.08 Six parameters define multi segment 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 the frequency point must be satisfied thatV1<V2<V3,F1<F2<F3.

If the voltage is set too high at low frequency, the motor may overheat or even burn down, and the inverter may stall or protect against over-current.

Parameter	Name	Range	Default value	Change
P02.15	Voltage source for V/F separation	0:Digital setting(P02-16) 1:VI 2:(Reserved) 4:Pulse input 5:Multi-reference 6:Simple PLC 7:PID,process closed loop 8:Communication	0	
P02.16	Voltage digital setting for V/F separation	0V~motor rated voltage	0	

V/F 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 P02.16, or from analog quantity, multi section instruction, PLC, PID or communication. When non digital setting is used, 100% of each setting corresponds to the rated voltage of the motor. When the percentage of analog output setting is negative, the absolute value set is taken as the effective setting value.

0: Digital Setting

Voltage set by P02.16 directly.

1: VI (Analog quantity setting)

2: AI (Analog quantity setting)

4: Pulse input

The voltage is given by terminal pulse.

Pulse given signal specification:Voltage range 9V~30V、frequency range 0kHz~100kHz.

5: Multi-reference

When the voltage source is multi segment command.

To set P6 group parameters to determine the corresponding relationship between the given signal and the given voltage.

6: Simple PLC

When the voltage source is simple PLC, it is necessary to set P06 parameters to determine the given output voltage.

7: PID,process closed loop

The output voltage is generated according to the PID closed loop. Refer to the introduction of PID for details.

8: Communication

The voltage is given by upper computer through communication.

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

Parameter	Name	Range	Default value	Change
P02.20	Automatic voltage stabilizing function	0:OFF 1:ON	1	

When the motor is operated under 12% - 20% of the rated voltage, the temperature of the motor will increase, the insulation capacity will be damaged, the torque output will be unstable, and the long-term operation will shorten the motor life.

The automatic voltage stabilizing function can automatically stabilize the output voltage at the rated voltage of the motor when the input power supply voltage exceeds the rated voltage of the motor. Turning off the automatic voltage stabilizing function can improve the deceleration ability during rapid deceleration, but you need to be careful when turning off this option. It will lead to different voltage output to the motor due to different grid voltage, which will increase the risk of motor heating and damage.This function can only be turned off in V / F mode.

Parameter	Name	Range	Default value	Change
P02.30	Low frequency compensation torques	0-199%	100	
P02.31	High frequency compensation torques	0-199%	100	

Load compensation means that the inverter automatically compensates the output voltage of the inverter according to the load compensation amount by detecting the load current, so as to improve the load carrying capacity of the inverter.   100% refers to complete compensation for voltage drop caused by stator resistance, motor loss, etc. Low frequency load compensation is used to set the load compensation amount of the inverter at low speed, and high speed load compensation is used to set the load compensation amount of the inverter at high speed.

Low, high-speed switching point is generally about 5Hz, converter power is different, switching point is different. Low load compensation also has effect on high speed, but the effect decreases with the increase of speed; High speed load compensation also has some effects on low speed, but its effect gradually decreases with the decrease of speed. The compensation process is automatically controlled by the inverter.

Most applications only need to set low speed load compensation. When adjusting this parameter, please adjust it within 100%. When the input voltage is low and the frequency converter is running above 10Hz, the high-speed load compensation can be increased to improve the load carrying capacity of the frequency converter. When the output current is too high, it is necessary to reduce the value.

Parameter	Name	Range	Default value	Change
P02.32	Slip Compensation	-400~399%	80	

When the motor drives the electric load, the motor speed will decrease with the increase of the load; When the motor drives the generating load, the motor speed will rise with the increase of the load. By setting the appropriate differential compensation, the output frequency of the converter can be dynamically adjusted so that the motor can keep running at constant speed without changing with the load.

In order to use the slip compensation function normally, the rated speed of p01.05 motor must be set correctly according to the motor nameplate parameters. P01.05 the rated speed of the motor refers to the speed when the motor drives the rated electric load, and the speed difference between it and the rotating magnetic field of the motor stator is the slip.

Slip compensation can reduce the influence of load change on motor speed by monitoring motor current in real time and automatically adjusting the output frequency of frequency converter according to slip and motor current.

Slip compensation adjustment method: please adjust within 100%. When the motor drives the motor load, if the motor speed is low, increase the compensation appropriately; If the motor speed is too high, reduce the compensation appropriately;When the motor drives the generating load, if the motor speed is low, reduce the compensation appropriately, if the motor speed is high, increase the compensation appropriately.

Parameter	Name	Range	Default value	Change
P02.33	Slip Compensation Time Constant	0.05~5.00s	0.1	

This parameter is used to control the corresponding speed of slip compensation. The larger the parameter value is, the slower the response is. The larger the value is, the faster the response is. If there is low frequency resonance problem, the parameter can be increased appropriately.

Parameter	Name	Range	Default value	Change
P02.34	Resonance Dampening	0-3000%	50	
P02.35	Resonance Dampening time Constant	0.001-0.05s	0.005	

The motor (especially the high-power motor) is disturbed by the load or oscillates in the speed and current at some frequencies, which will lead to the system unable to operate normally or even over-current protection when it is serious, especially when it is no-load or light load.The motor speed and current oscillation can be restrained by increasing the resonance attenuation value of p02.34; The larger the value is, the more obvious the suppression is.However, if the setting is too large, the control performance of the inverter will be affected. Therefore, when setting the resonance attenuation, please gradually increase the value, and try to reduce it as small as possible on the premise of effectively suppressing the oscillation, so as to avoid adverse effects on the control performance.Do not set resonance suppression when the motor has no oscillation.

The resonance suppression time constant is used to control the response speed of resonance suppression. The smaller the value is, the faster the response is; The larger the value is, the slower the response will be, but if the value is too small, there is a risk of restraining instability.

Parameter	Name	Range	Default value	Change
P02.36	Open Magnetisation	0-300%	100	
P02.37	Normal Magnetisation Switch point	0-10	1	

The zero speed excitation current of the motor is used to set the excitation current of the motor at the leading frequency, which is the percentage relative to the rated current of the motor. The normal excitation current frequency is used to set the frequency switching point of the normal excitation current. When the inverter output frequency is lower than the normal excitation current frequency, the excitation current increases or decreases linearly to 100% of the motor rated current; When the inverter output frequency is higher than the normal excitation current frequency, the motor excitation current is 100% of the motor rated current.

Through this group of parameters, different thermal loads can be realized on the motor when the motor is running at low speed. Increasing the zero speed excitation current of the motor can improve the starting torque of the inverter. For the occasion of insufficient starting torque, please gradually increase the value until it meets the starting requirements.

Note: setting the zero speed excitation current too low may reduce the output torque of the motor.

Parameter	Name	Range	Default value	Change
P02.40	Synchronous motor low speed compensation	0-120%	80	

If the output frequency is lower than 10Hz, the inverter will operate at this current. ncreasing this parameter is helpful to improve the motor torque at low speed.
100% to motor rated current.

Parameter	Name	Range	Default value	Change
P02.41	Synchronous motor load compensation	0-500%	120	

This parameter is used to control the dynamic performance of synchronous motor. The higher the parameter value is, the better the dynamic performance is, and vice versa. Dynamic performance depends on the type of load. But if the parameter value is too high or too low, the control may become unstable.

Parameter	Name	Range	Default value	Change
P02.42	Low speed synchronous motor compensation filtering	0.01-20s	0	

This parameter is used when the speed is less than 100% of the rated speed. The smaller filtering time can achieve faster control, but the parameter value is too small, which may lead to unstable control.

Parameter	Name	Range	Default value	Change
P02.43	High speed synchronous motor compensation filtering time	0.01-20s	0.8	

This parameter is used when the speed is 10% higher than the rated speed. The smaller filtering time can achieve faster control, but the parameter value is too small, which may lead to unstable control.

Parameter	Name	Range	Default value	Change
P02.44	Synchronous motor current filtering time	0.001-1s		0.5

This parameter is used to reduce the influence of high frequency pulsation and system resonance when calculating DC bus. If there is no filtering time, the fluctuation component in the current may distort the calculated voltage, thus affecting the stability of the system.

Parameter	Name	Range	Default value	Change
P02.50	Torque type	0:Constant torque 1:Adjustable torque 3:Optimize torque	0	

0: Constant torque
     Suitable for constant torque load, most of the mechanical load is constant torque load.
1: Adjustable torque
     Suitable for fans, pumps, etc.
3: Optimize torque
     Suitable for fans, pumps, etc.For such load changing according to the square rule, the torque optimization function not only sets v/f which changes according to the square rule, but also adjusts the voltage according to the current exact load condition, so as to reduce the motor energy consumption and noise.
     Note: if the application of constant torque is set to 1 variable torque or 3 automatic optimization, it may cause current oscillation.

Parameter	Name	Range	Default value	Change
P02.51	Adjust adjustable torque	40-90%	90	
P02.52	Automatic optimum energy consumption minimum flux	40-75%	66	

This parameter is used to set the minimum flux in the variable torque and automatic energy consumption optimization mode. It is the percentage of the normal flux. Setting a small value can reduce the energy consumption of the motor, but the load mutation will reduce the impedance of the motor and increase the output power.

P03 Input Terminals Parameter

Parameter	Name	Range	Default value	Change
P03.00	Terminal DI Filtering time	2-16ms	4	

When there is interference to digital input, the value of p03.00 can be increased to improve the anti-interference ability of digital input terminal. But the longer the filtering time is, the slower the response time to the digital terminal is. How to set it needs to be weighed according to the actual application.

Parameter	Name	Range	Default value	Change
P03.01	DI logic	0-65535	0	

This parameter is used to control the positive and negative logic of digital input terminal. Each digital input terminal corresponds to a weight, which is set to this parameter after adding the weights. Anti logic needs weights, while positive logic does not.

For example, X1 and X4 are set as anti logic inputs.

Terminals	X4	X3	X2	X1
Weight	8	4	2	1

When positive logic is selected for digital input, the digital input terminal is in on state (valid) when connected with GND and off state (invalid) when disconnected.

When reverse logic is selected for digital input, the digital input terminal will be in off state (invalid) when connected with GND and on state (valid) when disconnected.

Parameter	Name	Range	Default value	Change
P03.04	DI1(X1) Input	0:Invalid 1:Forward running 2:Reverse running 3:Change to Reverse running 4:JOG FWD 5:JOG REV 6:Terminal frequency up 7:Terminal frequency down 8:Slow down and stop 9:Free stop 10:Reset + Free stop 11:Reset 12:Reserved 13:Emergency stop (Free stop) 14:Multi- speed set value bit 0 15:Multi- speed set value bit 1 16:Multi- speed set value bit 2 17:Multi- speed set value bit 3 18:Acc and Dec time 0 19:Acc and Dec time 1 20:Pulse forward running 21:Pulse reverse running 22:Reserved 24:Frequency source switch 32:Command source swithch1 33:Command source swithch2 34:Outside failure	8	

Parameter	Name	Range	Default value	Change
P03.04	DI 1(X1) Input	35:Reserved 37:Reserved 38:Reserved 40:Reserved 41:PID pause 42:PID opposite direction 43:PID Integral to suspend 44:PID parameter switch 45:PLC reset condition 46:Input high-speed pulse(DI3)		0
P03.05	Terminal DI 2(X2)Input	Parameter as P03.04		2
P03.06	Terminal DI 3(X3)Input	Parameter as P03.04		14
P03.07	Terminal DI 4(X4)Input	Parameter as P03.04		15
P03.08	Terminal DI 5(X5)Input	Reserved		16
P03.09	Terminal DI 6(X6)Input	Reserved		17

0: Invalid
    set unused terminals to "invalid" to prevent incorrect actions.
1: Forward running
    Through the terminal control inverter forward operation. When the terminal is in on state, the inverter starts to rotate forward; When the terminal is in off state, the inverter stops.
2: Reverse running
    The DI terminal is used to control the forward or reverse operation of the VFD. When the terminal is in the closed state, VFD runs according to the given forward or reverse rotation . When the loop of the terminal is disconnected, the VFD stops running.
3: Change to Reverse running
    The DI terminal is used for reverse switchover. This function is only used for reverse switchover.
4: JOG FWD
5: JOG REV
    The DI terminal is used to control the forward or reverse motion of the VFD. Please see P00.47, P00.48, and P00.49 function codes for the dot motion frequency, dot motion acceleration and deceleration time.
6: Terminal frequency up
7: Terminal frequency down
    When the frequency source is set to a given digit (preset reference value), the DI terminal can be used to increase or decrease the given frequency.
8: Slow down and stop
    When the terminal is open, the vfdis allowed to be started.When the terminal is closed , the vfd decelerat stop , AS the function of the STOP key on the keyboard. If the three-wire stop function is required, use it with P03.01 (DI logic).
9: Free stop
    When this terminal is closed, the inverter stops output, and the stopping process of the motor is not controlled by the VFD. The method is the same as the free parking mentioned in P00.80/P00.81.
10: Reset + Free stop
    The function of this terminal is contrary to [9]. When the terminal is closed, the VFD   is allowed to start. When in the open state, the inverter stops output and state reset, and the motor parking process is not controlled by the VFD.
11: Reset
    Use the terminal for fault reset function. Same as the STOP function on the keyboard, the

terminal can achieve remote fault reset.

12: Reserved

13: Emergency stop (Free stop)

    Similar to [10] option, no reset function.

14: Multi- speed set value bit 0

15: Multi- speed set value bit 1

16: Multi- speed set value bit 2

17: Multi- speed set value bit 3

    Through the Di of the terminal, the 16 states of the four terminals can realize the setting of 16 section speed or 16 other commands.

18: Acc and Dec time 0

19: Acc and Dec time 1

    Through the four states of the two terminals, four kinds of acceleration and deceleration time can be selected.

20: Pulse forward running

    When the terminal receives the pulse signal (the pulse width is not less than 4ms, that is, the terminal switches from OFF to ON, keeps the ON state not less than 4ms, and then switches to OFF state), it starts to start forward rotation.

21: Pulse reverse running

22-23:Reserved

24: Frequency source switch

    Used to switch and select different frequency sources.

    According to the setting of frequency source selection function code, the terminal is used to realize the switching between two frequencies when the switching between two frequency sources is set as the frequency source.

32: Command source switch1

33: Command source switch 2

34: Outside failure

    When the external fault input terminal is on, the inverter stops working.

35-40: Reserved

41: PID pause

42: PID opposite direction

    When the terminal is effective, the PID action direction is opposite to the set direction.

43: PID Integral to suspend

    When the terminal is effective, the integral adjustment function of PID is suspended, but the proportional and differential adjustment functions of PID are still valid.

44: PID parameter switch

    When the switch condition of PID parameter is di (x) terminal and the terminal is invalid, the PID parameter uses P05.05-P05.07; When the terminal is valid, use P05.15-P05.17.

45: PLC reset condition

    The PLC pauses in the process of execution, the frequency converter maintains the current output frequency, and the PID adjustment of the frequency source is not in progress.

46: Input high-speed pulse(DI3)

Parameter	Name	Range	Default value	Change
P03.10	Terminal DI 3 (X3)Input min frequency	0-99.99kHz	0.02	
P03.11	Terminal DI3(X3) Input max frequency	0.01-100kHz	50	
P03.12	Terminal DI 3 Input min corresponding reference /feedback value	Reference / feedback value -200-+200%	0	
P03.13	Terminal DI 3 Input max corresponding reference /feedback value	Reference / feedback value -200-+200%	100	
P03.14	Terminal DI 3 Filtering time	1-1000ms	100	

   X3 terminal is a programmable multiplex terminal, which can be used as high-speed pulse input terminal or ordinary digital input terminal. When parameter p0.36 is selected as pulse input, X3 is used as high-speed pulse input terminal; When other options are selected for parameter p0.36, X3 is used as a common digital input terminal. Other digital input terminals do not have this function.
   This group of parameters is used to set the relationship between the pulse frequency of X4 terminal and its representative setting value. This method is applied to analog input terminal VI.

Parameter	Name	Range	Default value	Change
P03.20	Interrupt signal detection time	1-99s	10	

   The frequency converter has the function of analog input signal interrupt detection. When analog input terminal VI selects voltage input, P03.31 ≥ 1.00v; Or VI select the current input, when P03.31 ≥ 2.00ma, the analog input signal interrupt detection function will automatically start. If the VI input signal is lower than 50% of the set value in P03.31 and P03.33, and the duration exceeds the interruption detection time of P03.20 analog input signal, the system will judge that the analog input signal is interrupted.
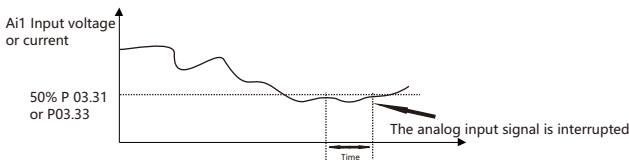
   The interrupt detection function of analog input signal is also effective for analog input terminal AI, but the corresponding parameters are AI related parameters.

Parameter	Name	Range	Default value	Change
P03.21	Interrupt signal action	0:Invalid 2:Stop 3:Inching running 4:Running with MAX frequency 5:Stop then warning	0	

   This parameter is used to set the action of the inverter after the analog input signal is interrupted.
0：Invalid
1: The output frequency is frozen, and the frequency converter continues to operate at the output frequency before signal interruption.
2: Stop，The frequency converter stops running.
3: Inching running，Frequency converter operates at jog frequency.
4: Running with MAX frequency，Frequency converter operates at maximum frequency.
5: Stop then warning，The inverter stops output and reports "E.96" fault.

Parameter	Name	Range	Default value	Change
P03.30	Reserved			

Parameter	Name	Range	Default value	Change
P03.31	Terminal VI Min current	0-9.99V	0.20	
P03.32	Terminal VI Max current	0.01-10V	10	
P03.33	(Reserved)			
P03.34	(Reserved)			
P03.35	Terminal VI Min reference /feedback value	-200~200%	0	
P03.36	Terminal VI Max reference /feedback value	-200~200%	100	

The above parameters are used to set the relationship between the input voltage or current of terminal VI and the set value represented by it, and the input voltage or current of VI is linear with the set value represented by the VI input.However, when the input voltage of terminal VI is greater than the set maximum input voltage of P03.32 VI, the upper and lower key values corresponding to the input voltage of VI are calculated according to the set value corresponding to the maximum input of P03.36 VI;

Similarly, when VI input voltage is less than P03.31 VI minimum input voltage, the upper and lower key values corresponding to VI input voltage are calculated according to the setting value corresponding to P03.35 VI minimum input. When the VI input is current, the situation is similar.

Parameter	Name	Range	Default value	Change
P03.37	Terminal VI Filtering time	0.001-10s	0.01	

VI filtering time refers to the software filtering time of analog input terminal VI. When the onsite analog quantity is easy to interfere, please increase the filtering time to make the detected analog quantity tend to be stable. However, the longer the filtering time is, the slower the response speed to the detection of analog quantity is. How to set it will take a long time to balance the actual application situation.

Parameter	Name	Range	Default value	Change
P03.38	Terminal VI Zero Dead Band	0-20V/mA	0	

When the change of VI input value is less than VI dead zone, it is considered that VI input value has no change. This parameter can prevent VI input value fluctuation or set value change caused by interference.

P04 Output Terminals Parameters

Parameter	Name	Range	Default value	Change
P04.00	Relay 1 Function (KA KB KC)	0:invalid 1:Running 2:Failure 3:Frequency horizontal detect FDT1 output 4:Frequency arrived 5:0 speed running 6:Motor overload protection 7:Converter overload protection 8:Reserved 9:Reserved 10:Reserved 11:PLC circulation 12:Total power on time arrived 13:Frequency limiting 14:Torque limiting 15:Converter ready 16:VI>AI 17:Limited frequency arrived 18:Floor frequency arrived 19:Under-voltage condition output 20:Communication set 21:Position approaching 22:Completed to Locate 23:0Speed Running 2 24:Total power on time arrived 25:Frequency Horizontal Detect FDT 2 Output 26:Frequency 1 Arrived 27:Frequency 2 Arrived 28:Current 1 Arrived 29:Current 2 Arrived 30:Timing arrived 31:VI Output Over Limited 32:Drop Loading 33:REV Running 34:0 Current 35:Module temperature arrived 36:Output current over limited 37:Still output even floor frequency arrived 38:Failure or warning 39:Over temperature warning 40:Running time arrived 41:Failure no under-voltage 42:High pressure 43:Low pressure 44:Pressure arrived		2

P04.00 Relay Output 1 (KA.KB.KC)

0: Invalid

　　The unused terminals can be set as "invalid" to prevent misoperation.

1: Running

　　It indicates that the frequency converter is in operation and has output frequency (can be zero). At this time, the ON signal is output.

2: Failure (Fault of free stop)

　　When the inverter fails and stops, the ON signal is output.

3: Frequency horizontal detect FDT1 output

4: Frequency arrived

5: 0 speed running (No output when stopped)

　　When the frequency converter runs and the output frequency is 0, the ON signal is output. When the frequency converter is in the shutdown state, the signal is OFF.

6: Motor overload protection

　　Before the motor overload protection action, judge according to the overload pre alarm threshold, and output ON signal after exceeding the pre alarm threshold.

7: Converter overload protection

　　The ON signal is output 10 seconds before the overload protection of frequency converter.

8: Reserved

9: Reserved

10: Reserved

11: PLC circulation

　　When the simple PLC completes a cycle, it outputs a pulse signal with a width of 250ms.

12: Total power on time arrived

　　When the accumulated running time of the inverter exceeds the set time, the ON signal is output.

13: Frequency limiting

　　When the set frequency exceeds the upper limit or lower limit frequency, and the frequency of the inverter reaches the upper or lower limit frequency, the ON signal is output.

14: Torque limiting

　　In the speed control mode, when the output torque reaches the torque limit value, the frequency converter is in the stall protection state, and the ON signal is output at the same time.

15: Converter ready

　　When the power supply of the inverter main loop and control loop is stable, and the transducer does not detect any fault information, the frequency converter is in the running state, and outputs the ON signal.

16: VI>AI

　　When the input value of the analog input VI is greater than the input value of AI, output the ON signal.

17: Limited frequency arrived

　　When the operating frequency reaches the upper limit frequency, the ON signal is output.

18: Floor frequency arrived(Operation related)

　　When the operating frequency reaches the lower limit frequency, the ON signal is output, and the information is OFF at the downtime state.

19: Under-voltage condition output

When the inverter is in an under voltage state, it outputs ON signal.

20: Communication set

23: 0 Speed Running 2 (Keep output when stopped)

　　When the inverter output frequency is zero, the on signal is output. The signal is also on in the shutdown state.

24: Total power on time arrived

When the output frequency of the inverter is zero. the ON signal is output, and the signal is also ON at the downtime state.

25: Frequency Horizontal Detect FDT 2 Output

26: Frequency 1 Arrived

27: Frequency 2 Arrived

28: Current 1 Arrived

29: Current 2 Arrived

30: Timing arrived

When the timing function selection is effective, the ON signal is output after the operation time of the converter reaches the set time.

31: VI Output Over Limited

When the value of the analog output VI is greater than the VI output protection upper limit or less than the VI protection output lower limit, output the ON signal.

32: Drop Loading

When the inverter is in the off load state, it outputs ON signal.

33: REV Running

When the inverter is in reverse operation, it outputs ON signal.

34: 0 Current

35: Module temperature arrived

When the temperature of the radiator of the inverter module reaches the temperature value of the module set, it outputs the ON signal.

36: Output current over limited

37: Still output even floor frequency arrived

When the operating frequency reaches the lower limit frequency, the ON signal is output, and the output of the signal is also ON at the downtime state.

38: Failure or warning

When the operating frequency reaches the lower limit frequency, the ON signal is output, and the output of the signal is also ON at the downtime state.

39: Over temperature warning

When the motor temperature reaches the overheating alarm threshold, the A.14 fault is displayed.

40: Running time arrived

When the frequency of the inverter starts to exceed the set time, the ON signal is output.

41: Failure no under-voltage（Fault of free shutdown and no output under voltage）

When the frequency converter fails and the output voltage is not output, output the ON signal.

42: High pressure

When the PID feedback pressure reaches the high voltage value, the ON signal is output.

43：Low pressure

When PID feedback pressure reaches low voltage, output ON signal.

44: Pressure arrived

When the PID feedback pressure reaches the target value, the ON signal is output.

Parameter	Name	Range	Default value	Change
P04.10	Relay 1 On Delay Time	0-600s	0	
P04.11	Relay 2 On Delay Time	0-600S,(Reserved)	0	

Set the output terminals FMR, relay 1, relay 2, DO1 and DI2, and change the delay time from the change of state to the actual output.

Parameter	Name	Range	Default value	Change
P04.20	VO (AMO) output type	0:0-20mA (Reserved) 1:4-20mA (Reserved) 3:0-10V	3	

This parameter is used to set the type of the output signal of the analog output terminal VO.

Parameter	Name	Range	Default value	Change
P04.21	VO (AMO) output type	0:None 10:Output frequency* 11: Feference value 12:Feedback value 13:Motor current 16:Output power 17:Motor Rotational Speed 18:Voltage output 20:Communication control 21:Pulse input22: Input VI 23:Input AI 26:Busbar voltage 30:Torsional moment output 80:Application control	10	

The proportional relationship between the AMO output function and its counterpart is as follows:

Option	Function	Proportional relationships
0	Digital output	
10	Output frequency	Torque open-loop and process closed-loop modes : 0%=0Hz,100%= P00.10 Speed open-loop mode : 0%=0Hz,100%=P00.12
11	Set value	0 ~ maximum frequency
12	Feedback value	0~2 times the rated current of the motor
13	Motor current	0~2 times the rated torque of the motor
16	Output power	0~2 times the rated torque of the motor
17	Motor speed	0~2 times the rated power
18	Output voltage	0~1.2 times the rated voltage of the inverter
20	Bus-mastering	
21	Pulse input	0.01kHz~100.00kHz
22	Enter a value for the VI	0V~10V
23	Enter a value for the AI	0~20mA
26	DC bus voltage	0%=0V，100%=1000V
30	Output torque	0%=0N·m，100%=P01.06
38	Communication control	

The ratio of the VO output function and its counterpart is as follows

Parameter	Name	Range	Default value	Change
P04.22	Terminal AMO Min output proportion	0-200%	0	
P04.23	Terminal AMO Max output proportion	0-200%	100	
P04.24	Terminal AMO Min output	0-20	0	
P04.25	Terminal AMO Max output	0.01-20	10	

Parameters P04.24 and P04.25 are used to set the minimum and maximum values of AMO output, respectively; Parameters P04.22 and P04.23 are used to set the functional ratios corresponding to the minimum and maximum outputs of AMO, respectively.

For example, set P04.21=10, P04.22=0.00% (0.0Hz), P04.23=100.00% (50.0Hz), P04.24=2V, P04.65=8V. The relationship between the output frequency of the frequency converter and the output voltage of the AMO is shown in the following figure:
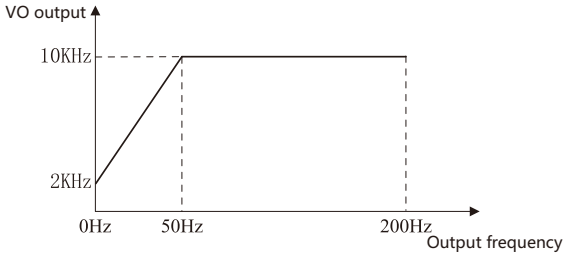
If P04.22=80.00% (40.0Hz) and P04.23=10.00% (5.0Hz), the relationship between the output frequency of the frequency converter and the output voltage of the AMO is shown in the following figure:
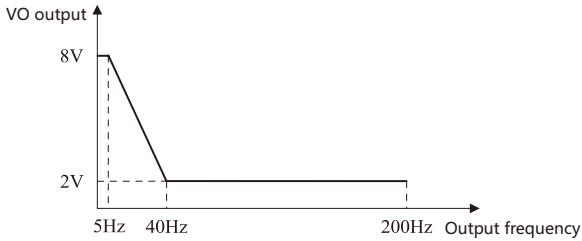
P05 PID Parameters

Parameter	Name	Range	Default value	Change
P05.00	PID setting source	0:Set P05.01 parameter 1:VI 2:AI 3:Panel Coder 4:Pulse Input 5:Communication given 6:Multistage speed 7:P05.01 add Up/Down	0	

Parameter	Name	Range	Default value	Change
P05.01	PID value given	-3000~3000	3	

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

The target volume of the process PID is the true value, the set range is -3000 to 3000., and the feedback quantity of the same PID is also valid value. The function of PID is to make the two relative quantities equal.

Parameter	Name	Range	Default value	Change
P05.02	Feedback source of process control	0:VI 1:AI 2:Coder 3:VI-AI (Reserved) 4:Pulse input Di4 5:Communication given 6:VI+AI (Reserved) 7:VI AI Max(Reserved) 8:VI AI Min(Reserved)	0	

This parameter is used to select the feedback signal channel of the process PID.

The feedback value of the process PID is also the effective value, and the setting range is 0.0.

Parameter	Name	Range	Default value	Change
P05.03	Positive and negative logic of process PI	0:Forward 1:Reverse	0	

Positive effect: when the feedback signal of PID is smaller than the quantity given, the output frequency of the inverter rises.

Reaction: when the feedback signal of PID is smaller than the quantity given, the output frequency of the inverter decreases.

This function is affected by the reverse action direction of multi-function terminal PID (function 35). Please pay attention to it in use.

Parameter	Name	Range	Default value	Change
P05.04	PID Feedback basic value given	0.1-6553.5	10	

PID the given feedback range is a dimensionless unit, used for PID feedback display P11.16.

PID Given feedback range is the actual rms value of the pressure gauge, for example the range of the pressure gauge is: 1.6Mp, then P05.04 is set to 16, when the PID is given 16 (P05.01=10), the PID reference value is displayed as 10 (P11.15=10).

Parameter	Name	Range	Default value	Change
P05.05	Process PI Proportional Gain	0-1000	20	
P05.06	Process PI Integral Time	0.01-655.35s	2	
P05.07	Process PI Differential Time	0-10.000s	0	

Proportional Gain Kp1:
        The adjustment speed of the whole PID regulator is decided. The greater the Kp1, the greater the adjustment intensity. The parameter 100 indicates that when the deviation between PID feedback and the determined quantity is 100%, the PID regulator adjuster the output frequency instruction to the maximum frequency.
Integral timeTi1:
        PID determines the intensity of integral adjustment. The shorter the integration time, the greater the intensity of regulation. Integral time refers to the deviation between PID feedback quantity and the determined quantity 100%. When the integral regulator adjusts continuously through this time, the adjustment reaches the maximum frequency.
Differential time Td1:
        Determine the strength of PID regulator to adjust the deviation change rate. The longer the differential time is, the stronger the regulation is. Differential time means that the feedback value changes by 100.0% in this decade, and the adjustment value of differential regulator is the maximum frequency.

Parameter	Name	Range	Default value	Change
P05.08	PID Reverse stop frequency	0-655.35Hz	0	

In some cases, only when the PID output frequency is negative (inverter inversion), PID can control the given quantity and feedback quantity to the same state, but too high inversion frequency is not allowed in some cases. P05.08 is used to determine the upper limit of inversion frequency.

Parameter	Name	Range	Default value	Change
P05.09	Deviation Limit	0-200%	0	

When the deviation between the given quantity of PID and the feedback value is less than P05.09, the PID stops adjusting. In this way, the output frequency is stable when the deviation between given and feedback is small, which is very effective for some closed-loop control situations.

Parameter	Name	Range	Default value	Change
P05.10	Process PID Differential limit	0.1-100	0.1	

In PID regulator, the function of differential is more sensitive, and it is easy to cause system oscillation. Therefore, the function of PID differential is generally limited to a small range. P05.10 is used to set the output range of PID differential.

Parameter	Name	Range	Default value	Change
P05.11	PID Changing time given	0-650s	0.1	

The given change time of PID refers to the time required for the given value of PID to change from 0.0 to p05.04.

When the given time of PID changes, the given value of PID changes linearly according to the given time of change to reduce the adverse impact of the given mutation on the system.

Parameter	Name	Range	Default value	Change
P05.12	PID time of filter feedback	0-60s	0	
P05.13	PID time of filter output	0-60s	0	

P05.12 is used to filter the PID feedback, which is helpful to reduce the influence of disturbance on the feedback, but will bring about the response performance of the process closedloop system.

P05.13 is used to filter the PID output frequency, which will weaken the mutation of the inverter output frequency, but also bring about the response performance of the process closedloop system.

Parameter	Name	Range	Default value	Change
P05.15	PID time of filter output	0-10 s		
P05.16	Process PI Integration time	0.1-65535		
P05.17	Process PI Calculus time	0-10		
P05.18	PID parameter switchover condition	0:No switch 2:Deviation switch 3:Frequency switch		
P05.19	Process PID Parameter Switchover Deviation 1	0-100%		
P05.20	Process PID Parameter Switchover Deviation 2	0-100%		

In some applications, a group of PID parameters can not meet the needs of the whole motion process, so different PID parameters are needed in different situations.

This set of function codes is used to switch two groups of PID parameters. The setting of adjusting parameter P05.15-P05.17 is similar to that of parameter P05.05-P05.07.

The two groups of PID parameters can be switched through the multi-function digital DI (x) terminal, and can also be switched automatically according to the deviation of PID.

When the multi kinetic DI (X) terminal is switched, the function selection of the multi-function terminal must be set to 43 (PID parameter switching terminal). Of course, when the terminal is invalid, the parameter group 1 (P05.05-P05.07) is selected, and the parameter group 2 (P05.15-P05.17) is selected when the terminal is valid.

When automatic switching is selected, the absolute value of deviation between given and feedback is less than PID parameter switching deviation 1. When P05.19, PID parameter selection parameter group 1. When the absolute value of deviation between given and feedback is greater than PID switching deviation 2, when P05.20, PID parameter selection parameter group 2. When the deviation between given and feedback is between switching deviation 1 and switching deviation 2, PID parameter is linear difference compensation value of two groups of PID parameters.

Parameter	Name	Range	Default value	Change
P05.21	PID Starting value	0-10.00	0	
P05.22	PID Time of starting value keeping	0-650.00s	0	

When the frequency converter starts, the PID output is fixed to PID initial value P05.21, and the PID PID initial holding time P05.22.

This function is used to limit the difference between the PID output two hundred (2ms/beat), so that the PID output changes too fast, so that the frequency converter runs steadily.

Parameter	Name	Range	Default value	Change
P05.23	Output FOR deviation MAX value	0-100%	1	
P05.24	Output REV deviation MAX value	0-100%	1	

P05.23 and P05.24 correspond to the maximum value of the absolute value of the output deviation respectively when the forward and reverse turns.

Parameter	Name	Range	Default value	Change
P05.25	PID Integral attribute	00-11	0	

Individual bit: integral separation.

If the integral separation is set to be effective, when the multi-function digital DI (x) integral pause (function 22) is effective, the PID integral operation stops, and at this time, only the proportional and differential functions of PID are effective.

When the integral separation selection is invalid, the integral separation is invalid no matter whether the multi-function digital DI (x) is valid or not.

Ten: whether to stop the integral when the input reaches the limit.

Ten: output to limit whether to stop integration.

After the PID operation output reaches the maximum or minimum value, you can choose whether to stop the integral action. If stop integral is selected, PID integral calculation will stop at this time, which may help to reduce the overshoot of PID.

Parameter	Name	Range	Default value	Change
P05.26	PID Detection value of feedback lost	0-100%	0	
P05.27	PID Detection time of feedback lost	0-20s	0	

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

When the PID feedback quantity is less than the feedback loss detection value P05.26, and the duration is longer than the PID feedback loss time P05.27, the frequency converter alarm fault serial number 31=E.PID, and is processed according to the selected fault handling mode.

Parameter	Name	Range	Default value	Change
P05.28	PID Run out and operation	0:Run out but no operation 1:Run out and operation	0	

It is used to select whether the PID continues to calculate in PID shutdown state. In general application, PID should stop operation in shutdown state.

Parameter	Name	Range	Default value	Change
P05.29	Wake up pressure	0-6500	2	
P05.30	Wake up delayed time	0-6500s	0	
P05.31	Dormant pressure	0-6500	4	
P05.32	Dormant delayed time	0-6500s	60	
P05.33	Dormant mode set	0:Forbid dormant 1:Pressure arrived 2:Frequency arrived 3:Pressure and frequency arrived at same time	1	
P05.34	Dormant frequency	0-655.35Hz	30	

P05.29-P05.34 this set of parameters is used to achieve sleep and wake up functions in water supply applications.

When the sleep mode P05.33=0 and PID are adjusted, the sleep and wakeup function is invalid.

When the sleep mode is P05.33=1, during the operation of the frequency converter, when the PID is adjusted, the feedback pressure is greater than or equal to P05.29, when the wake-up pressure is applied, after the time P05.30 delay time, the frequency converter starts to start.Under normal circumstances, please set wake-up pressure > set pressure > sleep pressure.

When the sleep mode P05.33=2 and PID are adjusted, the frequency is low to the dormancy setting frequency (P05.34).

When the sleep mode P05.33=3 and PID are adjusted, the feedback pressure reaches the dormancy pressure, and the frequency is low to the dormancy setting frequency (P05.34).

When the sleep function is enabled, if the frequency source uses PID, then the sleep state PID is calculated and affected by the function code P05.28. At this time, PID downtime operation must be selected (P05.28=1).

Parameter	Name	Range	Default value	Change
P05.35	Pressure proportion linkage	0:Valid 1:Invalid	1	
P05.36	Wake up pressure linkage setting value	0-6500	1	
P05.37	Dormant pressure linkage setting value	0-6500	0	

The pressure proportional linkage setting is on. The user can set the target pressure directly according to the difference between the wake-up pressure and sleep pressure of P05.36 and P05.37, and follow it automatically;

Of course, users can not choose to activate the linkage following function, P05.35=0.

Parameter	Name	Range	Default value	Change
P05.38	High pressure alarm difference set	0-6500	0	
P05.39	High pressure alarm delay time	0-6500s	0	
P05.40	Low pressure alarm difference set	0-6500	0	
P05.41	Low pressure alarm delay time	0-6500s	0	

After setting the high pressure alarm function, when the feedback pressure reaches the set value of high pressure alarm (P05.38), the delay time (P05.39), the inverter will alarm and stop, and the fault e.46 will be displayed. When the feedback pressure is lower than the high pressure alarm, the fault will reset automatically, and when the feedback pressure reaches the wakeup pressure (the starting signal of inverter is still in the given state), the inverter will wake up and start automatically;

When the low pressure alarm function is set, when the feedback pressure reaches the low pressure alarm setting point (P05.40), the delay time (P05.41), the inverter alarm stops, and the fault is displaye.

Parameter	Name	Range	Default value	Change
P05.50	MPPT function select	0: Variable frequency drive control 1: MPPT function1 2: MPPT function2 3: MPPT function3	0	

0: Variable frequency drive control
AC grid input
1: MPPT function1
The linear relationship between the upper limit and lower limit setting of the bus bar can automatically adjust the frequency; through the two parameters P05.33 and P05.34
2: MPPT function2
According to the set bus voltage point, that is, the parameter P05.58, then the PID algorithm is similar
3: MPPT function3
The internal operation of the frequency converter does not need the support of our parameters at all, and it can be adjusted internally by itself.

Parameter	Name	Range	Default value	Change
P05.51	MPPT Min Ref	0-100%	20	
P05.52	MPPT Max Ref	0-100%	100	

Set the lower limit and upper limit of the inverter output frequency.

Parameter	Name	Range	Default value	Change
P05.53	MPPT Min DC voltage	0-800	380	
P05.54	MPPT Max DC voltage	0-800	600	

Set the minimum voltage for the inverter to run and the highest voltage for the inverter to reach the maximum frequency

Parameter	Name	Range	Default value	Change
P05.55	MPPT search time	0.1-500	1.0	
P05.56	MPPT search threshold	0.01-20	0.2	

When the MPPT function is used, these two parameters set the voltage change detection time and voltage change detection range. The setting range of MPPT function1 is 0.01-20V, the setting range of MPPT function2 is 0.01-20%, and the setting range of MPPT function3 is 0.01-20%.

Parameter	Name	Range	Default value	Change
P05.57	MPPT start delay time	0.1-500	240	
P05.58	MPPT target DC voltage	0.01-20	450	

When the inverter power on or low voltage, when the voltage reaches the rated value, the inverter will run after the time set by P05.57. P05.58 refer to P05.50.

Parameter	Name	Range	Default value	Change
P05.59	MPPT Water Lack Current	1-500%	240	
P05.60	MPPT Water Lack Time	0-6000s	0	

In MPPT control mode, if the inverter runs above the Minimum operating frequency of PV water pump, and the output current is less than the motor no-load current* the water shortage detection current of photovoltaic water pump corresponds to the proportion of no-load current , after water shortage detection time of PV water pump, the inverter reports lack water fault.

P06 Multistage Command Parameter

Parameter	Name	Range	Default value	Change
P06.00	Multistage speed commands 0	-100~100%	0	
P06.01	Multistage speed commands 1	-100~100%	0	
P06.02	Multistage speed commands 2	-100~100%	0	

Parameter	Name	Range	Default value	Change
P06.03	Multistage speed commands 3	-100~100%	0	
P06.04	Multistage speed commands 4	-100~100%	0	
P06.05	Multistage speed commands 5	-100~100%	0	
P06.06	Multistage speed commands 6	-100~100%	0	
P06.07	Multistage speed commands 7	-100~100%	0	
P06.08	Multistage speed commands 8	-100~100%	0	
P06.09	Multistage speed commands 9	-100~100%	0	
P06.10	Multistage speed commands 10	-100~100%	0	
P06.11	Multistage speed commands 11	-100~100%	0	
P06.12	Multistage speed commands 12	-100~100%	0	
P06.13	Multistage speed commands 13	-100~100%	0	
P06.14	Multistage speed commands 14	-100~100%	0	
P06.15	Multistage speed commands 15	-100~100%	0	

Multi-speed instruction can be used in three situations: as frequency source, as voltage source of VF separation, as setting source of process PID.In the three applications, the dimension of multi segment instruction is relative value, ranging from - 100% to 100%. When it is used as frequency source, it is the percentage of relative maximum frequency; When VF is used as voltage source, multi-stage instruction as PID setting source does not need dimensional conversion. According to the different states of multi-function digital DI (x), multi segment instruction needs to be switched.

Parameter	Name	Range	Default value	Change
P06.16	Simple PLC running way	0:Running single time then stop 1:Running single time then stop and keep final digital 2:Circulating all the time	1	

Simple PLC function has two functions: as frequency source or VF separated voltage source. When simple PLC is used as frequency source, the positive and negative values of P06.00-P06.1 5 determine the operation direction. If the value is negative, it means the inverter runs in the opposite direction. As a frequency source, PLC has three modes of operation. As VF separation voltage, there are no three ways.
0: Shutdown at the end of single operation
      The inverter stops automatically after a single cycle and needs to give the operation command again to start.
1: Keep the final value at the end of single operation
      After the inverter completes a cycle, the operation frequency and direction of the last section will be maintained automatically.
2: Cycle all the time
      After the inverter completes a cycle, the next cycle will start automatically, and stop when the stop command is known.

Parameter	Name	Range	Default value	Change
P06.17	Simple PLC option of drop power memory	Unit:option of drop power memory 0:drop power no memory 1:drop power memory Decade:option of drop power memory 0:drop power no memory 1:drop power memory	0	

PLC power down memory refers to memorizing the operation stage and frequency of PLC before power down, and continuing to run from the memory stage when next power on. If no memory is selected, the PLC process will be restarted every time the power is on.

PLC shutdown memory is to record the previous PLC operation stage and frequency during shutdown, and continue to run from the memory stage during the next operation. If no memory is selected, the PLC process will be restarted every time.

Parameter	Name	Range	Default value	Change
P06.18	Simple PLC running time unit	0: S, Second 1: H,Hour	0	
P06.19	Simple PLC0 running time	0-6500	0	
P06.20	Simple PLC0 variable speed time option	0-3	0	
P06.21	Simple PLC1 running time	0-6500	0	
P06.22	Simple PLC1 variable speed time option	0-3	0	
P06.23	Simple PLC2 running time	0-6500	0	
P06.24	Simple PLC2 variable speed time option	0-3	0	
P06.25	Simple PLC3 running time	0-6500	0	
P06.26	Simple PLC3 variable speed time option	0-3	0	
P06.27	Simple PLC4 running time	0-6500	0	
P06.28	Simple PLC4variable speed time option	0-3	0	
P06.29	Simple PLC5 running time	0-6500	0	
P06.30	Simple PLC5variable speed time option	0-3	0	
P06.31	Simple PLC6 running time	0-6500	0	
P06.32	Simple PLC6variable speed time option	0-3	0	
P06.33	Simple PLC7 running time	0-6500	0	
P06.34	Simple PLC7variable speed time option	0-3	0	
P06.35	Simple PLC8 running time	0-6500	0	
P06.36	Simple PLC8variable speed time option	0-3	0	

Parameter	Name	Range	Default value	Change
P06.37	Simple PLC9 running time	0-6500	0	
P06.38	Simple PLC9variable speed time option	0-3	0	
P06.39	Simple PLC10 running time	0-6500	0	
P06.40	Simple PLC10variable speed time option	0-3	0	
P06.41	Simple PLC11 running time	0-6500	0	
P06.42	Simple PLC11variable speed time option	0-3	0	
P06.43	Simple PLC12 running time	0-6500	0	
P06.44	Simple PLC12variable speed time option	0-3	0	
P06.45	Simple PLC13 running time	0-6500	0	
P06.46	Simple PLC13variable speed time option	0-3	0	
P06.47	Simple PLC14 running time	0-6500	0	
P06.48	Simple PLC14variable speed time option	0-3	0	
P06.49	Simple PLC15 running time	0-6500	0	
P06.50	Simple PLC15variable speed time option	0-3	0	
P06.51	Multistage speed 0 given way	0:Parameter P06.00 is set 1:Analog VI 2:(Reserved) 3:Pulse input 5:Preset values 7:Encoder	0	

This parameter determines the given channel for multi segment instruction 0.

In addition to selecting P06.00, there are many other options for multistage instruction 0, which facilitates switching between multiple count instructions and other given modes. When multi segment instruction is used as frequency source or simple PLC is used as frequency source, it is easy to switch between two kinds of frequency sources.

P07 Communication Parameter

Parameter	Name	Range	Default value	Change
P07.03	Communication Timeout Time	0.1-650.00s	1	

When this parameter is set to 0.0, the communication interrupt function is invalid.

When the grade parameter is set to a valid value, if the interval between the first communication and the next communication exceeds the communication interruption time, the inverter will judge the communication interruption. In the continuous communication system, setting this parameter can monitor the communication status.

Note: after receiving the correct communication message, the frequency converter starts to time the communication interruption. If the inverter does not receive the correct communication message after power on, the communication interruption will not be reported.

Parameter	Name	Range	Default value	Change
P07.04	Communication Timeout Function	0:Invalid 2:Stop 3:Inching operation 4:Max operation frequency 5:Stop then warn 6:Warning	0	

This parameter is used to set the action of frequency converter when communication is interrupted.
0: Invalid.
1: The output frequency is frozen, and the frequency converter continues to operate at the output frequency before signal interruption.
2: Stop, inverter stop output.
3: Inching operation，inverter runs with inching frequency.
4: Max operation frequency，inverter runs with max frequency.
5: Stop then warn，inverter stop out and display E.97 error.

Parameter	Name	Range	Default value	Change
P07.06	Reset Communication Timeout	0:Invalid 1:Reset communication cut	0	

After communication interruption occurs, there will be communication interruption mark inside the frequency converter. The user must set this parameter to restore the communication interruption and clear the mark. Otherwise, even if the communication is restored or e.97 fault is cleared, the frequency converter will continue to report communication interruption.

Parameter	Name	Range	Default value	Change
P07.30	Communication Protocol	0:MODBUS-RTU 2:Reserved	0	

This parameter is used to set the communication protocol type. When the communication protocol is changed, the value of the parameter P07.31 P07.32 P07.33 will return to the default value.

Parameter	Name	Range	Default value	Change
P07.31	Address	1-247	1	

This parameter is used to set the communication address of the inverter. The address range of FC protocol is 1-126, and the address range of Modbus RTU protocol is 1-247.

Parameter	Name	Range		Default value	Change
P07.32	Baud Rate	0:300b 1:600b 2:1200b 3:2400b 4:4800b 5:9600b	6:19200b 7:38400b	5	

This parameter is used to set the baud rate of communication between PC and inverter.

Note: the baud rate set by the upper computer and the frequency converter must be consistent, otherwise, the communication cannot be carried out. The higher the baud rate, the faster the communication speed.

Parameter	Name	Range	Default value	Change
P07.33	Digital Form	0:No parity (1Position Stop) 1:Even parity (1Position Stop) 2:Odd parity (1Position Stop) 3:No parity (2Position Stop)	0	

This parameter is used to set the communication data format between the host computer and the inverter. The data format set by the upper computer and the frequency converter must be consistent, otherwise, communication cannot be carried out.

Parameter	Name	Range	Default value	Change
P07.35	Min. Response Delay	0-0.5s	0.002	
P07.36	Max. Response Delay	0.1-10s	5	

Response delay refers to the interval between the end of data receiving and the sending of data to the host computer.

Min. Response Delay:If the minimum response delay is less than the system processing time, the response delay is subject to the processing time of the west system, that is, the system sends the data to the upper computer immediately after processing the data; If the minimum response delay is greater than the system processing time, the system will delay and wait until the minimum response delay time arrives, and then send data to the upper computer.

Max. Response Delay:If the frequency converter processing time exceeds the maximum response delay, the frequency converter will not respond to the received data.

Parameter	Name	Range	Default value	Change
P07.38	Message Response	0:Every time 1:Only response abnormal message 2:No response	0	

0: Reply, every message sent by the host computer, the inverter will reply.

1: Only reply to abnormal message, every message sent by upper computer, inverter only reply to abnormal message.

2: No reply, the inverter will not reply to every message sent by the upper computer.

Note: that the broadcast message and frequency converter do not need to reply, and the read message still responds normally.

Parameter	Name	Range	Default value	Change
P07.39	Programme control	0:Parameter do not save when power off 1:Parameter save when power off	1	

This parameter is used to control whether the parameters changed by communication are saved after power off.

P08 Auxiliary Parameter

Parameter	Name	Range	Default value	Change
P08.01	Over Modulation Function	90-105.5%	100	

The over modulation function can make the output voltage greater than the input voltage at the rated frequency.

Parameter	Name	Range	Default value	Change
P08.02	Dead band Compensation	0-200	100	

In order to prevent the upper and lower tubes of the inverter bridge from conducting at the same time, a fixed dead time is usually set in the driving signal sent by the single chip microcomputer. The existence of this dead time will cause the distortion of the motor control voltage and the current distortion, which is more significant at low frequency and may lead to the risk of system oscillation.However, due to the discreteness of the device characteristics, there is a certain difference between the actual dead time and the theoretical dead time.

The dead time compensation adjustment system coefficient is used to adjust the difference between the actual dead time and the theoretical dead time. 100% represents compensation according to the theoretical dead time, and less than 100% represents that the actual dead time is less than the theoretical dead time. In debugging, it can be judged according to the sinusoidal degree of current at low frequency.

Parameter	Name	Range	Default value	Change
P08.07	Max Dead band Compensation	20-1000Hz	500	

When the motor runs at high frequency, the influence of dead time on the control voltage can be ignored. After P08.07 is set up, the dead time compensation will not be carried out when the motor running frequency is higher than the P08.07 setting value. It should be noted that the compensation coefficient decreases linearly from 0Hz to P08.07, so adjusting P08.07 has certain effect on the compensation effect at low frequencies. Usually, there is no need to adjust the P08.07 setting value.

Parameter	Name	Range	Default value	Change
P08.10	DC Circuit Voltage Compensation	0:No compensation 1:Compensation1 2:Compensation2	0	

Turning on the DC bus voltage compensation function can ensure that the output voltage is not affected by bus voltage fluctuation (such as fast reading fluctuation of input power supply voltage), and can obtain very stable torque (low torque fluctuation) under most main power supply conditions. But in the case of silent writing, this kind of dynamic compensation will cause DC bus oscillation and should be disabled. Mode 2 has better compensation effect on DC bus voltage of single inverter.

Parameter	Name	Range	Default value	Change
P08.20	Switching Frequency	2-16kHZ	5	

This parameter is used to adjust the carrier frequency of frequency converter. The influence of carrier frequency on frequency converter and motor is as follows.

carrier frequency	Low to high
Motor noise	Big to small
Temperature rise of frequency converter	Low to high
Output leakage current	Small to big
Output current harmonics	Big to small
External radiation interference	Small to big
Temperature rise of frequency converter	High to low

Carrier frequency setting method：
1: When the motor line is too long, reduce the carrier frequency.
2: When the low frequency torque is unstable,reduce the carrier frequency.
3: When the external interference of frequency converter is large， reduce the carrier frequency.
4: When the leakage current of frequency converter is large,reduce the carrier frequency.
5: When the temperature rise of frequency converter is high,reduce the carrier frequency.
6: When the motor is noisy, please increase the carrier frequency.
      Note: if the carrier frequency is set high, the temperature of the converter will be increased.
At this point, users need to reduce the frequency converter, otherwise the inverter will be overheated.

Parameter	Name	Range	Default value	Change
P08.30	Operating mode	0:Normal operating 2:Reset the parameters to default 3: Backup user parameters 4: Restore user parameters	0	

0: Normal operating
2: Reset
      All the parameters except the output frequency converter information and recorded parameters are restored to the factory values. After setting this option, you need to turn on the power and power on. The frequency converter displays "E.98", and press the "STOP" key to remove the hints.
3: Backup user parameters
4: Restore user parameters

Parameter	Name	Range	Default value	Change
P08.40	Frequency detected value	0-655.35Hz	50	
P08.41	Frequency detected value 1 hysteresis of instrument	0-100%	5	

When the operation frequency is higher than the frequency detection value, the frequency converter outputs DO (Y) output ON signal, while the frequency is lower than the detection value, then the DO (Y) output ON signal cancels.

The above parameters are used to set the detection value of the output frequency and the hysteresis value of the output action cancellation. where P08.41 is the percentage of hysteresis frequency relative to the frequency detection value P08 40. The figure below shows a schematic diagram of the FDT function.
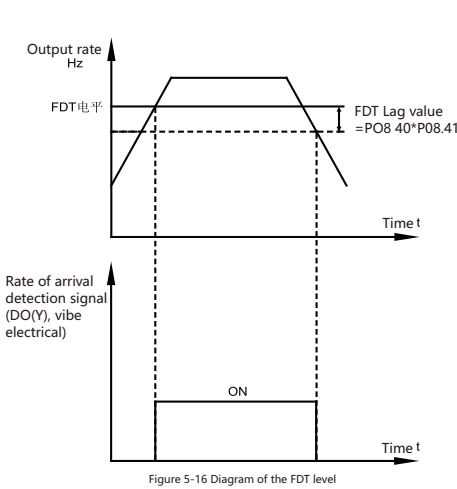

Figure 5-16 Diagram of the FDT level
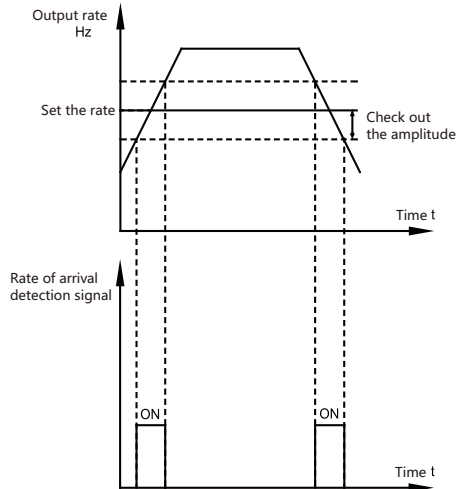
Figure 5-17 Schematic diagram of detection amplitude of frequency arrival

Parameter	Name	Range	Default value	Change
P08.42	Frequency reach to detection width	0-100%	0	

When the operating frequency of the inverter is within a certain range of the target frequency, the multifunction DO (y) of the inverter outputs on signal. This parameter is used to set the detection range of frequency, which is the percentage of relative maximum frequency.

Parameter	Name	Range	Default value	Change
P08.43	Frequency detected value 2	0-655.35Hz	50	
P08.44	Frequency detected value 2 hysteresis of instrument	0-100%	5	

The function of frequency detection is exactly the same as that of FDT1. Please refer to the related instructions of FDT1, that is, the description of function code P08.40 and P08.41.

Parameter	Name	Range	Default value	Change
P08.45	Any reach frequency detected value 1	0-655.35Hz	50	
P08.46	Any reach frequency detected width 1	0-100%	0	
P08.47	Any reach frequency detected value 2	0-655.35Hz	50	
P08.48	Any reach frequency detected width 2	0-100%	0	

When the output frequency of the frequency converter is within the positive and negative detection range of the detected frequency of any incoming frequency, the multi-function DO (Y) outputs the ON signal.
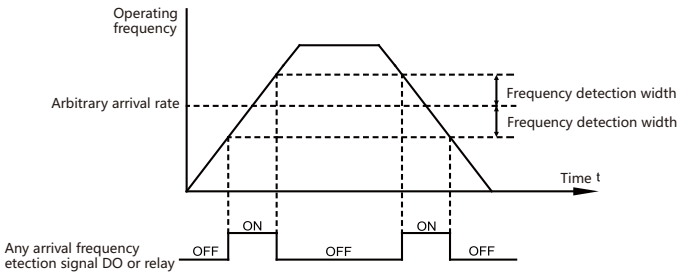
Figure 5-20 Schematic diagram of detecting any arrival frequency

Parameter	Name	Range	Default value	Change
P08.49	0 current detection level	0-300%	5	
P08.50	0 current detection delayed time	0-600s	0.1	

When the output current of the inverter is less than or equal to the zero current detection level, and the duration is longer than the zero current detection delay time, the frequency converter DO (Y) outputs the ON signal.

Figure 5-21 shows the zero-current detection diagram
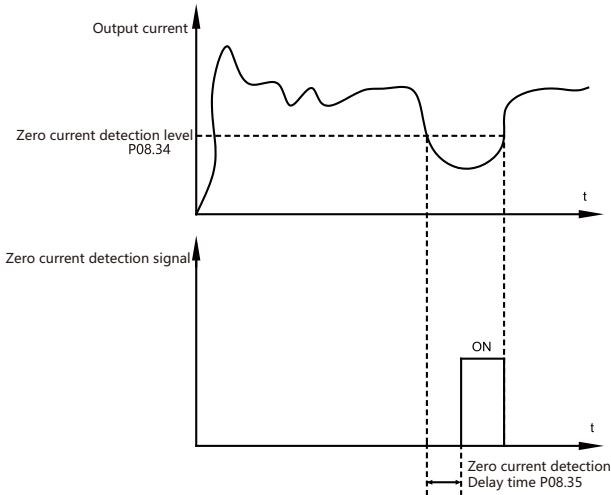
Figure 5-21 Zero-current detection diagram

Parameter	Name	Range	Default value	Change
P08.51	Output current over limited	0-300%	200	
P08.52	Output current over limited detection delayed	0-600s	0	

When the output current of the frequency converter exceeds or exceeds the monitoring point, and the duration exceeds the software over current detection delay time, the frequency converter DO (Y) outputs the ON signal.

Figure 5-22 shows the output current overload function
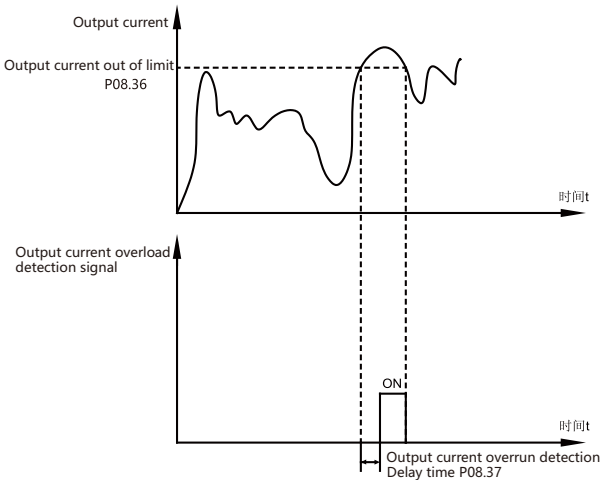

Figure 5-22 Schematic diagram of detecting output current overload

Parameter	Name	Range	Default value	Change
P08.53	Any arrived electron flow 1	0-300%	100	
P08.54	Width of any arrived electron flow 1	0-300%	0	
P08.55	Any arrived electron flow 2	0-300%	100	
P08.56	Width of any arrived electron flow 2	0-300%	0	

When the output current of the frequency converter is within the set positive and negative detection width of any arriving current, the multi-function Do (y) of the frequency converter outputs on signal.
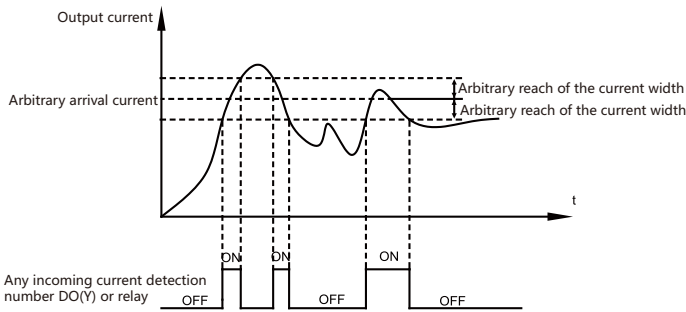
Figure 5-23 Schematic diagram of arbitrary arrival current detection

Parameter	Name	Range	Default value	Change
P08.57	Module temperature	0-200℃	75	

When the inverter radiator reaches the temperature, the DO (Y) output of the frequency converter "module temperature reaches" ON signal.

Parameter	Name	Range	Default value	Change
P08.58	Running time	0-6500min	0	

When the running time of this start-up reaches this time, the inverter multi-function digital DO (Y) outputs the "run-time arrival" ON signal.

Parameter	Name	Range	Default value	Change
P08.59	Cumulative power on time	0-6500min	0	

It is used to set the running time of frequency converter.

When the total power up time reaches the set running time, the inverter multi-function digital DO (Y) outputs the ON signal.

P09 Fault and Protect Parameter

Parameter	Name	Range	Default value	Change
P09.00	Limited value prevent over current losing speed	0-300%	200	

This parameter is used to set the upper limit of the motor current, and 100% corresponds to the rated current of the P01.04 motor. When the output current exceeds the P09.00 motor current limit, the frequency converter will report the A.25 warning and limit the current through the P09.01 current controller.

Note: if the setting value is changed in parameter P01.01-P01.05, this parameter will not be automatically reset to the factory setting value.

Parameter	Name	Range	Default value	Change
P09.01	Current controller 1 proportion	0-300%	100	
P09.02	Current controller 1integral	0.005-2s	0.02	

The inverter has two PI current controllers, which will be enabled when the output current is higher than the upper limit of p09.00. The current controller 1 controls the current by reducing the output frequency, and the current controller 2 controls the output current by controlling the output voltage. In general, it is recommended to use current controller 1.

By setting the proportional coefficient and integral time of the current controller, the dynamic response characteristics of the current controller can be adjusted.

Increasing the proportional gain and decreasing the integration time can accelerate the dynamic response of the current controller. However, too much proportional gain or too little integration time may make the current control unstable.

Note: when the current controller is activated, the inverter can only be stopped by setting a digital input terminal to 2 free running stop or 3 reset and free running stop. Unless the frequency converter is no longer near the current limit, any signal on the digital input terminal will be invalid.

Since the frequency converter is set to run freely and stop, the motor will not use the deceleration time. If you want to perform the fast stop, please use it together with the external electro-mechanical system equipped in the application to realize the mechanical braking control function.

Parameter	Name	Range	Default value	Change
P09.04	Torque limited when motor on	0-1000%	150	
P09.05	Torque limited when generate electricity	0-1000%	150	

This set of parameters is used to set the torque limit on the shaft to protect the mechanical system. 100% corresponding to the rated torque of the motor. When the motor shaft torque exceeds P09.04 and P09.05 setting value, the frequency converter will report A.12 warning.

Parameter	Name	Range	Default value	Change
P09.08	Over current losing speed alarm delayed	0-60s	60	

When the inverter reaches the limit of A.25 current and reaches the P09.08 current limit protection time, the inverter will report the E.25 current limit fault. Set to 60 to turn off the fault.

Parameter	Name	Range	Default value	Change
P09.09	Torque reached to limited alarm delayed	0-60s	60	

When the inverter reaches A.24 torque limit and the duration reaches P09.09 torque limit protection time, the inverter reports E.24 torque limit failure. Set to 60 to turn off the fault.

Parameter	Name	Range	Default value	Change
P09.20	Braking function	0:Invalid 1:Resistance braking 2:Alternating braking	0	

0：Invalid
1：Resistance braking
    The resistance braking transforms the power generation energy in the deceleration process into the heat energy of the braking resistance, so as to realize the rapid deceleration. It is suitable for high inertia load braking or frequency fast braking
    For the built-in brake unit, the P09.21=1 must be set up, and the resistance braking will take effect. The colleagues need to set the external brake resistor value at P09.21. For external brake units, the resistance is braking, and the P09.20 holds the default value of 0.
2：Alternating braking
    By increasing the magnetic flux of the motor, part of the energy in the deceleration process is consumed on the motor stator, so as to achieve rapid deceleration. After choosing AC motor braking, the deceleration time can be reduced, but the current will increase during deceleration, and the motor heating will increase. It is suitable for heavy inertia load braking with less frequent braking. The effect of AC braking is not as good as resistance braking. AC braking only works in vector mode.

Parameter	Name	Range	Default value	Change
P09.21	The resistance braking threshold depends on the voltage specifications	Depend to voltage specification		Depends on the model

After braking with resistance, when the DC bus voltage of frequency converter reaches the threshold voltage of resistance braking, the built-in braking unit is on, and the energy can be released quickly through the braking resistance, so as to realize fast braking and shutdown. This value allows the brake effect of the built-in brake unit to be adjusted.

The following table shows the setting range and factory value of Resistance Braking threshold voltage.

Grid type	Setting range	Factory value
200~240V	360~395V	390V
380~440V	680~780V	700V
440~480V	750~780V	770V

Note: this parameter has no effect on the external brake unit.

Parameter	Name	Range	Default value	Change
P09.24	The over-voltage stall prevent threshold depends on the specifications	Depend to voltage specification		Depends on the model

When the converter DC bus voltage reaches the overvoltage control threshold voltage, the over voltage control begins to work. Through this value, the starting time of over voltage control can be adjusted.

The following table shows the setting range and factory value of Resistance Braking threshold voltage.

Grid type	Setting range	Factory value
200~240V	360~395V	395V
380~440V	680~780V	710V
440~480V	750~780V	780V

Parameter	Name	Range	Default value	Change
P09.25	Over voltage control	0:Invalid 2:Model 1 3:Model 2	2	

Over voltage control (OVC) can reduce the risk of converter tripping due to the increase of bus voltage caused by load feedback energy.
0: Invalid
2: Mode 1
3: Mode 2

It is suitable for over voltage control under extremely short deceleration:

Note: over voltage control only works when mode 1 or mode 2 is selected. By default, because the Resistance Braking threshold voltage is lower than the over voltage control threshold voltage, the resistance braking takes effect first. If the set over voltage control threshold voltage is lower than the Resistance Braking threshold voltage, the over voltage control will work first.

Parameter	Name	Range	Default value	Change
P09.26	Over voltage control integral coefficient	0.01-0.1s	0.05	
P09.27	Over voltage control proportion coefficient	0-200%	100	

Parameters p09.26 and p09.27 are PI controller parameters of overvoltage control, which work when DC bus voltage of inverter is higher than overvoltage control threshold voltage. By setting different proportional gain and integration time, the dynamic response characteristics of overvoltage controller can be adjusted. Increasing the proportional gain and decreasing the integration time can accelerate the dynamic response of the over-voltage controller. However, too large proportional gain or too small integration time may make the overvoltage control unstable. Generally, no adjustment is required.

Note: parameters P09.26 and P09.27 are valid only in P09.25 overvoltage control select mode 1(2) or mode 2(3).

Parameter	Name	Range	Default value	Change
P09.28	Alternating braking integral coefficient	1.0-2.0	1.4	

The larger the value of this parameter, the faster the AC braking response, but too high setting will make the controller unstable.

Note: generally no adjustment is required.

Parameter	Name	Range	Default value	Change
P09.29	Maximum current of alternating braking	0-150%		100

The maximum current allowed in deceleration process when AC braking is used to avoid overheating of motor bypass resistance. This value is a percentage of the rated current of the motor. The larger the ratio is, the stronger the AC braking effect is, but the greater the motor heating is.

Parameter	Name	Range	Default value	Change
P09.40	Motor phases detection	0:Off 1:On	1	

The lack of phase of motor will lead to the decrease of motor torque and the risk of motor overheating. It is recommended to turn off the motor open phase protection in case of short acceleration and deceleration time, heavy load or motor power far less than the inverter power. In these two cases, the inverter can protect the motor through over-current protection even if the phase loss really occurs.

Parameter	Name	Range	Default value	Change
P09.41	Power imbalance option	0:Failure stop 1:Warning 2:Invalid 4:Warning mid-sensitivity 5:Failure stop mid-sensitivity 6:Failure stop high-sensitivity	0	

This parameter is used to set the response action of the inverter when the input power supply is out of phase. The detection of the input power by the inverter depends on the load. In order to meet the needs of different customers for the sensitivity of open phase detection; This parameter sets different sensitivity options.
0: Failure stop
    When the inverter detects the missing phase of the input power, it sends out the E.12 fault and stops.
1: Warning
    When the inverter detects the missing phase of the input power, it sends out the A.12 warning and continues to run.
    Option 0-1, the sensitivity of the phase loss detection method is low, even if the input power supply is seriously unbalanced, if the load remains unchanged, the inverter can still bear the load output, and the inverter will not report the phase loss warning or fault, which will not cause damage to the inverter and motor. Only when the load is large and beyond the range of the inverter, the phase loss warning or fault will be reported.
2: Invalid
    When the inverter detects that the input power supply is lack of phase, it will not take any action and continue to run. Caution is required to select this.
4: Warning mid-sensitivity
    When the inverter detects the missing phase of the input power, it sends out the E.12 fault and stops.
5: Failure stop mid-sensitivity
    When the inverter detects the missing phase of the input power, it sends out the A.12 warning and continues to run.

Option 4-5, the phase missing detection method adopted is of medium sensitivity, and a phase shortage warning or fault will be reported in case of low frequency and heavy load or light high frequency load.
6: Failure stop high-sensitivity

When the inverter detects the missing phase of the input power, it sends out the E.12 fault and stops.

In option 6, the phase loss detection method is very sensitive, and can be detected immediately in case of phase loss. But there is little risk of false alarm (generally occurs in the presence of other abnormalities in the power grid or frequency converter frequent over-current protection).

Parameter	Name	Range	Default value	Change
P09.42	Voltage net drop function	0:Invalid 1:Speed cut 2:Speed cut failure 3:Free revolve stop motor 4:Instantaneous power lost non-stop 5:Instantaneous power lost non-stop failure 6:Failure	0	

This parameter is used in the case of an instantaneous power failure or a sudden decrease in the main power supply (as judged by P09.34).
0: Invalid

The inverter will not compensate for the interruption of the main power supply. The DC bus voltage will drop rapidly and lose control of the motor in the range of milliseconds to seconds.
1: Speed cut

When the frequency converter decelerates, the output frequency will always obey the motor speed. When the power supply is restored, the output frequency will accelerate the motor to the reference speed. If the power grid is interrupted for a long time, the deceleration function may reduce the output frequency to 0Hz, and after the power supply of the power grid is restored, it will accelerate from 0Hz to the previous reference value through normal acceleration. If the energy in the DC circuit disappears before the motor decelerates to zero, the motor will stop inertia.
2: Speed cut failure

Similar to option 1, the difference is if the deceleration to 0Hz, the frequency converter will jump off (A.95 fault), regardless of whether the main power is restored.
3: Free revolve stop motor

The frequency converter performs free operation and stops, and frequency tracking starts when the power grid is restored.
4: Instantaneous power lost non-stop

When the inverter detects the missing phase of the input power, it sends out the E.12 fault and stops.
5: Instantaneous power lost non-stop failure

When the inverter detects the missing phase of the input power, it sends out the E.12 warning and continues to stop.

Option 4-5. The phase failure detection method adopted is of medium sensitivity. In case of low frequency and heavy load, or high frequency load is light, phase failure warning or fault will be reported.
6: Failure

When the inverter detects the missing phase of the input power, it sends out the E.12 fault and stops.

In option 6, the phase loss detection method is very sensitive, and can be detected immediately in case of phase loss. But there is little risk of false alarm (generally occurs in the presence of other abnormalities in the power grid or frequency converter frequent over-current protection).

Parameter	Name	Range	Default value	Change
P09.43	Judge voltage from power grid failure	100-800V (Reserved)	Depends on the model	

When the DC bus voltage is lower than this parameter set, the frequency converter operates according to P09.42.

Parameter	Name	Range	Default value	Change
P09.50	Motor overload protection option	0:Prohibition 1:Warning after motor overload 2:Alarm after motor overload	0	
P09.51	Motor Overload Protection Factor	0.2-60	1	

1: Under the condition that the motor operating current reaches 175% of the rated current of the motor, report the motor overload after 2 minutes of continuous operation (E.45);

Under the condition that the motor operating current reaches 115% of the motor's rated current, a motor overload (E.45)i is reported after 80 minutes of continuous operation

For example: Rated motor current 100A if FB-01 is set to 1.00, then when the motor running current reaches 125% (125A) of 100A, after 40 minutes, the inverter will report motor overload fault; If FB-01 is set to 1.20,; Then, when the motor running current reaches 125% (125A) of 100A, lasting 40X1.2 =48 minutes, the inverter reported motor overload fault; The maximum overload time is 80 minutes, the minimum overload time is 10 seconds

2: Motor overload protection adjustment example: the motor is required to run for 2 minutes in the case of 150% of the motor current to report overload, through the motor overload graph to know, 150% (I) of the current is located in the current range of 145% (I) and 155% (I2), 145% of the current 6 minutes (T1) overload, 155% of the current 4 minutes (T2) overload, you can get the default setting of 150% of the motor rated current 5 minutes overload calculation is as follows:

T=T1+(T2-T1)*(I-I1)/(I2-I1)=4+(6-4)*(150%-145%0/(155%- 145%0=5(minute)

Thus, it can be concluded that the motor is required to report overload in 150% motor current for 2 minutes and the motor overload protection gain

F9-01=2/5=0.4

Note: The user needs to correctly set the value of F9-01 according to the actual overload capacity of the motor, the parameter setting is too large to easily cause motor overheating damage and the inverter is not timely alarm protection danger!

3: Motor overload early warning coefficient indicates: When the motor overload detection level reaches the set value of this parameter, the multi-function output terminal DO or fault relay outputs the electric shock overload pre-alarm signal, which is calculated according to the percentage of time that the motor continues to run under an overload point without reporting overload fault. For example, when the motor overload protection gain is set to 1.00, the motor overload warning coefficient is set to 80%, such as the motor current reaches 145% of the rated motor current for 4.8 minutes (80% x6 minutes), the multi-function output terminal DO or fault relay output motor overload warning signal.

Parameter	Name	Range	Default value	Change
P09.52	Motor Overheating Protection Warning Factor	50-100%	80	

This function is used to give the control system an early warning signal through DO (Y) before the overload fault is protected. The warning signal coefficient is used to determine the degree of warning before motor overload protection. The larger the value is, the smaller the warning advance is. When the accumulative output of the inverter output current is larger than the overload inverse time curve and the product of P09.52, the inverter multi-function digital DO (Y) outputs the "motor overload warning" ON signal.

Parameter	Name	Range	Default value	Change
P09.61	Malfunction locked	0:Unlocked 1:Locked	0	

The fault indicates that the frequency converter has exceeded the set limit for some reason. After the fault is sent, the frequency converter will trip off and must be reset before it can run again.

The fault that has a great influence on the inverter will be locked after the inverter trips. This kind of fault is called the trip lock fault. The fixed type fault of trip lock has additional protection. By default, the fault can be reset only after being powered on again.You can set the parameter P09.61=0 to make the tripping and fixing fault happen, and you can reset it without power down. However, there is a risk of accidents. Before setting up, please be familiar with the system where the inverter is located, and do well in protective measures.

If the fault belongs to trip lock type, please refer to the fault table.

Parameter	Name	Range	Default value	Change
P09.62	Actions when converter breakdown	0:Display fault and Stop motor 1:Sop motor after warning	1	

This parameter is used to set the response action of frequency converter in case of output short circuit, over-current, grounding fault, over-current and other faults.
0: Display fault and Stop motor
When the frequency converter detects the above fault, it sends out E.XX fault indication and stops.
1: Sop motor after warning
When the frequency converter detects the above fault, A.xx warning indication is issued, the colleague turns off the PWM output, and then tries to turn on PWM normally several times. If the fault still cannot be eliminated, send out E.xx fault indication and stop motor.

Parameter	Name	Range	Default value	Change
P09.70	Time of automatic reset	0:Manual reset 1:Automatic reset1 time 2:Automatic reset 2 times 3:Automatic reset 3 times 4:Automatic reset 4 times 5:Automatic reset 5 times 6:Automatic reset 6 times 7:Automatic reset 7 times 8:Automatic reset 8 times 9:Automatic reset 9 times 10:Automatic reset 10 times 11:Automatic reset 15 times 12:Automatic reset 20 times 13:Automatic reset unlimited times	0	

0: Manual reset

After the frequency converter fails, the user shall power down and power on after trouble-shooting. Reset by pressing the off button key or the "reset" function of digital input terminal.
1-10: After the fault occurs, it will reset automatically for 1-10 times.
11: After the fault occurs, it will reset automatically for 15 times.
12: After the fault occurs, it will reset automatically for 20 times.
13: After the fault occurs, it will automatically reset infinitely

When it is set to 1-13, the frequency converter will reset automatically after the fault is reported. If the reset is successful and the operation signal is invalid, the frequency converter will start to run automatically. For 1-12, if the fault cannot be eliminated after the automatic reset of the set number of times, the inverter will maintain the fault state. At this time, the user needs to remove the fault, power down and power on to reset the fault.

Note: be careful when setting it to 13. This setting may cause the inverter to reset all the time.

Parameter	Name	Range	Default value	Change
P09.71	Automatic reset time	0-600s	10	

Set the time from the warning or fault of the inverter to the automatic reset. During the automatic reset, the inverter remains stopped. This parameter is valid when parameter p09.70 is set to 1-13.

P10 Failure Record Parameter

Parameter	Name	Range	Default value	Change
P10.00	LCP menu options	1:Motor voltage 2:Motor rotational peed 4:DC voltage 8:Temperature 16:Process PID feedback digital 32:Counter A 64:Counter B 128:Input VI 256:Input AI 512:Input pulse 1024:Output pulse 2048:Custom physical quantities (reserved) 4096:Output power 8192:Process PID given digital	6	

By default, the inverter operation panel only displays the output frequency, reference value and motor current (switched by shift key ◁◁).

This parameter can choose to display a variety of other state parameters of the inverter, and each state parameter corresponds to a weight, which is set to this parameter after adding the weight.

For example, set the display contents: operating frequency, target frequency, DC voltage, motor voltage, detection current, actual speed, process PID feedback value, then the corresponding parameters are set as follows:

P10.00 = 23 (1 + 2 + 4 + 16) (motor voltage + motor speed + DC voltage + process PID feedback value).

Parameter	Name	Range	Default value	Change
P10.01	RUN button	0:Invalid 1:Valid	1	

0: Invalid: cannot enter the run state by pressing the run key.
1: Valid: enter the run state by pressing the run key.

Parameter	Name	Range	Default value	Change
P10.02	OFF button	0:Invalid 1:Valid 2:Reset valid	1	

0: Invalid："OFF"is invalid on the panel.
1: Valid:"OFF"can stop fault and reset fault on the panel.
2: Reset valid:"OFF"only can reset fault but stop on the panel.

Parameter	Name	Range	Default value	Change
P10.04	Parameter locked	0:Invalid 1:Protect		

This function is used to prevent non debugging personnel from modifying parameters.
0: Invalid
1: Valid
Except this parameter can be changed, other parameters cannot be changed;
Note: parameter locking is only valid for panel modification parameters, but not for communication modification parameters.

Parameter	Name	Range	Default value	Change
P10.10	Copy parameter	0-9999d		

Check the power on flag of the inverter. After power on, start timing. When power is off, it will be saved automatically. Add 1 every 24 hours, and it cannot be reset.

Parameter	Name	Range	Default value	Change
P10.11	Hours of running	0-60000h		
P10.12	Total power	0-65535kwh		
P10.13	Time of electricity on	0-65535		
P10.14	Number of overheating	0-65535		
P10.15	Number of over voltage	0-65535		

Parameter	Name	Range	Default value	Change
P10.16	Number of reset power	0:No reset 1:Reset		

This parameter is used to reset P10.12 power consumption.
Note: this parameter cannot be modified by communication.

Parameter	Name	Range	Default value	Change
P10.17	Hours of reset running	0:No reset 1:Reset		

This parameter is used to reset P10.11 operating time.
Note: this parameter cannot be modified by communication.

Parameter	Name	Range	Default value	Change
P10.35	Power-up time at first failure			

Current power-on time of the last fault.

Parameter	Name	Range	Default value	Change
P10.36	Run time on first failure			

Current running time of the last failure.

Parameter	Name	Range	Default value	Change
P10.40	Frequency of second failure			

Frequency at the time of the last failure.

Parameter	Name	Range	Default value	Change
P10.41	Current at second failure			

Current at the time of last failure.

Parameter	Name	Range	Default value	Change
P10.42	Voltage at second failure			

Bus voltage at the time of last failure.

Parameter	Name	Range	Default value	Change
P10.43	DI during the second failure			

The status of the digital input terminals at the time of the most recent failure, in the following order:

BIT9	BIT8	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
DI0(X10)	DI9(X9)	DI8(X8)	DI7(X7)	DI6(X6)	DI5(X5)	DI4(X4)	DI3(X3)	DI2(X2)	DI1(X1)

When the input terminal is ON, its corresponding two-level system is 1, and OFF is 0. All DI (X) states are displayed as decimal numbers.

Parameter	Name	Range	Default value	Change
P10.20	First failure type refer to failure form	Refer to Failure list		
P10.21	Second failure type refer to failure form	Refer to Failure list		
P10.22	Third failure type refer to failure form	Refer to Failure list		

Record the latest three fault types of frequency converter, 0 is no fault. For the possible causes and solutions of each fault code, please refer to the relevant fault description.

Parameter	Name	Range	Default value	Change
P10.30	First failure frequency			

Frequency of last failure.

Parameter	Name	Range	Default value	Change
P10.31	First failure current			

Current at last fault.

Parameter	Name	Range	Default value	Change
P10.32	First failure voltage			

Bus voltage at last fault.

Parameter	Name	Range	Default value	Change
P10.33	First failure DI			

The status of all input terminals in the latest fault is as follows:

BIT9	BIT8	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
DI0(X10)	DI9(X9)	DI8(X8)	DI7(X7)	DI6(X6)	DI5(X5)	DI4(X4)	DI3(X3)	DI2(X2)	DI1(X1)

When the input terminal is ON, its corresponding two level system is 1, OFF is 0, and the state of all DI (X) is converted to decimal number display.

Parameter	Name	Range	Default value	Change
P10.34	First failure DO			

The status of all input terminals in the latest fault is as follows:

BIT4	BIT3	BIT2	BIT1	BIT0
DO2	DO1(Y1)	REL2	REL1	FMP

When the input terminal is ON, its corresponding two level system is 1, OFF is 0, and the state of all DI (X) is converted to decimal number display.

Parameter	Name	Range	Default value	Change
P10.44	Second failure DO			

The status of all input terminals in the latest fault is as follows:

BIT4	BIT3	BIT2	BIT1	BIT0
DO2	DO1(Y1)	REL2	REL1	FMP

When the input terminal is ON, its corresponding two level system is 1, OFF is 0, and the state of all DI (X) is converted to decimal number display.

Parameter	Name	Range	Default value	Change
P10.45	Power on time of second failure			

Current power on time of the latest fault.

Parameter	Name	Range	Default value	Change
P10.46	Running time of second failure			

Current running time of the latest failure.

Parameter	Name	Range	Default value	Change
P10.50	Third failure frequency			

Frequency of last failure.

Parameter	Name	Range	Default value	Change
P10.51	Third failure current			

Current at last fault.

Parameter	Name	Range	Default value	Change
P10.52	Third failure voltage			

Bus voltage at last fault.

Parameter	Name	Range	Default value	Change
P10.53	Third failure DI			

The status of digital input terminal in the latest fault, in the order of.

BIT9	BIT8	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
DI0(X10)	DI9(X9)	DI8(X8)	DI7(X7)	DI6(X6)	DI5(X5)	DI4(X4)	DI3(X3)	DI2(X2)	DI1(X1)

When the input terminal is ON, its corresponding two level system is 1, OFF is 0, and the state of all DI (X) is converted to decimal number display.

Parameter	Name	Range	Default value	Change
P10.54	Third failure DO			

The status of all input terminals in the latest fault, in the order of.

BIT4	BIT3	BIT2	BIT1	BIT0
DO2	DO1(Y1)	REL2	REL1	FMP

When the input terminal is ON, its corresponding two level system is 1, OFF is 0, and the state of all DI (X) is converted to decimal number display.

Parameter	Name	Range	Default value	Change
P10.55	Power on time of third failure			

Current power on time of the latest fault.

Parameter	Name	Range	Default value	Change
P10.56	Running time of third failure			

Current running time of the latest fault.

P11 Data Monitoring Parameter

Parameter	Name	Range	Default value	Change
P11.00	Frequency output			
P11.01	Set digital			
P11.02	DC voltage			
P11.03	Motor voltage			
P11.04	Motor current			

Parameter	Name	Range	Default value	Change
P11.05	Frequency output			
P11.06	Torsional moment output %			
P11.07	DI input condition			
P11.08	DO output condition			
P11.09	VI digital input			
P11.10	AI digital input			
P11.11	AI digital input 3			
P11.12	Counter A			
P11.13	Counter B			
P11.14	Motor rotational speed			
P11.15	PID reference value			
P11.16	Feedback value			
P11.17	PLC stage			
P11.18	Pulse frequency input			
P11.19	Frequency feedback (Hz)			
P11.20	Rest of running time			
P11.21	VI voltage before emended			
P11.22	AI voltage before emended			
P11.23	AI voltage before emended 3			
P11.25	Current time of power on			
P11.26	Total time of power on			
P11.27	Current running time			
P11.29	Set communication value			
P11.30	Coder feedback speed P11.31 display main frequency X			
P11.31	Display main frequency X			
P11.32	Display main frequency Y			
P11.34	Synchronous motor rotor Angle P11- 35 converter temperature			
P11.35	Inverter Temperature			

Chapter 7 Fault alarm and treatment

7.1 Fault list

inverter fault is divided into two types: warning and fault. They indicate in code on the inverter panel.

The warning indicates that the working state of the inverter is close to the design limit due to some reason, but it can still continue to work. If the cause no longer exists, the warning will disappear; If the cause is persistent or even more serious, the inverter will report a fault. When the warning is generated, the panel displays "A.XX" (XX refers to the figure, as shown in the table below).

The fault indicates that the frequency converter has exceeded the design limit for some reason. After the fault occurs, the frequency converter trips and must be reset before it can run again. When the fault occurs, the panel displays "E.XX (XX refers to the number, see the table below)".

If the fault has a great influence on the frequency converter, the frequency converter will be locked after tripping. This kind of fault is called tripping locking fault. The trip lock fault has additional protection. By default, the fault must be powered off before it is reset, and it can be reset after it is powered on again.

Warning	Fault	Fault name	Treatment
–	E.01	Output short circuit	Check the wiring and insulation of the motor
A.02	E.02	Acceleration over current	1.Increase acceleration time 2.Manual torque lifting 3.Remove peripheral faults 4.Carry out self-learning of motor parameters 5.Select speed tracking start or start after motor stop 6.Cancel sudden loading 7.Choose a converter with higher power level
A.03	E.03	Deceleration over current	1.Remove peripheral faults 2.Carry out self-learning of motor parameters 3.Increase deceleration time 4.Cancel sudden loading 5.Add brake unit and resistor
A.04	E.04	Constant speed over current	1.Remove peripheral faults 2.Carry out self-learning of motor parameters 3.Cancel sudden loading 4.Use bigger power model
A.05	E.05	Acceleration over voltage	1.Check the power supply and adjust thevoltage to normal 2.Increase the acceleration time appropriately 3.Cancel sudden loading 4.Identification of motor parameters orselection of larger frequency converter
A.06	E.06	Deceleration over voltage	1.Check the power supply and adjust the voltage to normal 2.Cancel external power or add braking unit and resistance 3.Increase acceleration time 4.free stop
A.07	E.07	Constant speed over voltage	1.Check the power supply and adjust the voltage to normal 2.Cancel sudden loading or add braking unit and resistor 3.Identification of motor parameters or selection of larger frequency converter
A.09	E.09	Under voltage	Ensure the normal operation of power grid

Warning	Fault	Fault name	Treatment
A.10	E.10	Overload	1.Choose higher power products 2.Set correctly according to the motor nameplate
A.12	E.12	Input phase loss	Check the connection of the input power line
-	E.13	Motor phase loss	1.Check motor wiring 2.Check motor
A.14	E.14	IGBT temperature too high	1.Clean fan duct 2.Replace the cooling fan
-	E.16	Internal alarm	Return to factory for maintenance
-	E.19	Motor parameter self learning failure	Correct setting of motor name plate parameters
-	E.23	Ground alarm	1.Motor short circuit to ground 2.Replace the motor wire or motor
A.24	E.24	Torque limit	Set motor parameters correctly or adjust P09.04 parameters.
A.25	E.25	Current limit	Set motor parameters correctly or adjust P09.05 parameters.
A.27	E.27	External alarm	Correct set the terminals parameters
A.31	E.31	Feedback alarm	Check feedback or feedback source
A.45	E.45	Motor overload	1.choose bigger power model 2.correctly set parameter based on motor parameter
A.46	E.46	High pressure alarm	Check the water pressure or pressure gaug
A.47	E.47	Low pressure alarm	Check for air and water leakage
-	E.48	Fault that Cumulative time toarrive	Use parameter initialization function to record information clearly
	E.88	Abnormal communication between control board and drive board	Return to factory for maintenance
-	E.89	Button disable	Set the P10.01.02.03 parameters correctly according to the actual situation
	E.91	Parameter error	The parameters are not set correctly according to the regulations
	E.92	Parameter over limit	The parameters are not set correctly
A.95	E.95	Power alarm	Check grid voltage
A.96	E.96	Disconnection alarm	Check whether the terminal analog wiring or signal is normal
A.97	E.97	Communication control word timeout	1.Check the upper computer program 2.Check the communication cable 3.Set communication parameters correctly 3.Using shielded wire
-	E.98	Restore factory settings	Press"STOP" button to reset.
-	E.99	Turn on the brake resistor brake	Set P00.72 correctly according to actual situation
-	E.100	Drive voltage alarm	Reserved
-	E.101	Locked rotor	Locked rotor of synchronous motor

If the above operation is not solved, please find technical support.

Chapter 8 Daily maintenance

Due to the influence of environmental temperature, humidity, salt spray, dust and vibration, the internal components of the inverter will be aging, leading to the potential failure of the inverter or reducing the service life of the inverter. Therefore, in the process of use and storage, the inverter should be maintained daily and regularly.

8.1 Daily inspection and maintenance

Daily inspection items：
1. Is there any abnormal change of sound during motor operation；
2. Does the sound vibrate when the motor is running；
3. Whether the installation environment of frequency converter changes；
4. Whether the cooling fan of frequency converter works normally；
5. Is the frequency converter overheated；
6. Inverter output voltage, output current, output frequency, monitoring display is greater than the usual value；
7. Is there any dust, scrap iron and corrosive liquid inside the inverter.

8.2 Regular maintenance

According to the working conditions of the environment, the user can check the inverter regularly in a short time or 3-6 months to eliminate the hidden trouble.
Note：
1. Please confirm that the inverter has been powered off and fully discharged before maintenance；
2. Do not leave metal objects such as screws, gaskets, wires and tools in the inverter, otherwise there is a risk of equipment damage；
3. It is forbidden to carry out any transformation inside the frequency converter, otherwise the normal operation of the frequency converter will be affected, and even the equipment may be damaged.

Inspection item	Measures
Is the screw of control terminal loose	Tighten with a screwdriver
Is the main circuit terminal screw loose	Tighten with a screwdriver or sleeve
Is the ground terminal screw loose	Tighten with a screwdriver or sleeve
Is the mounting screw of frequency converter loose	Tighten with a screwdriver or sleeve
Whether the power cable and control cable are damaged	Replace the damaged cable
Is the circuit board dusty	Clean up
Is the air duct blocked	Clean up

Appendix A RS485 Communication protocol

The inverter provides RS-485 communication interface and adopts standard Modbus-RTU format protocol to carry out master slave communication.Users can realize centralized control through PC/PLC and control host computer (setting control command, operation frequency, modification of relevant function code parameters, monitoring of inverter working status and fault information, etc.) to adapt to specific application requirements.

1.1Content of the protocol

The Modbus serial communication protocol defines the frame content and format of asynchronous transmission in serial communication. Including: host polling and broadcast frame, slave response frame format; The frame content of host organization includes: slave address (or broadcast address), execution command, data and error checking, etc.The slave's response uses the same structure, including action confirmation, returned data and error checking. If the slave makes an error when receiving the frame, or fails to complete the action required by the host, it will organize a fault frame as a response to the host.

1.2 Application mode

inverter can be connected to the "single main multi slave" control network with RS-485 bus.

1.3 Bus structure

1) Interface mode: RS-485 hardware interface.
2) transmission mode
Asynchronous serial, half duplex transmission mode. At the same time, only one master and slave can send data and the other can receive data. In the process of serial asynchronous communication, data is sent frame by frame in the form of message.
3) topological structure
Single host multi slave system. The setting range of slave address is: 1-247, 0 is the broadcast address. The address of each slave in the network is unique. This is the basis of Modbus serial communication.

1.4 Protocol instructions

inverter communication protocol is an asynchronous serial master-slave Modbus communication protocol. Only one device (host) in the network can establish the protocol (called "query /command"). Other devices (slaves) can only respond to the "query / command" of the host by providing data, or make corresponding actions according to the "query / command" of the host.Host here refers to personal computer PC, industrial equipment control or programmable logic controller PLC, etc. The host can not only communicate with one slave independently, but also release broadcast information to all slaves. For the "query / command" of the single access host, the slave must return a message (called response). For the broadcast information sent by the host, the slave does not need to feedback the response information to the host.

1.5 Communication frame structure

The Modbus protocol communication data format of inverter is divided into RTU (remote terminal unit) mode.
In RTU mode, the number of each byte is as follows：
Encoding system: 8 bit binary, each 8 bit frame field, contains two sixteen character characters, sixteen hexadecimal 0-9, A-F.

8.3 Replacement of vulnerable parts

The wearing parts of frequency converter mainly include cooling fan, electrolytic capacitor, relay or contactor, etc. its service life is closely related to the use environment and maintenance. Maintaining a good working environment is conducive to improving the service life of parts. In order to improve the overall service life of the inverter, the cooling fan, electrolytic capacitor, relay or contactor and other vulnerable parts need to be inspected daily according to the requirements in the table below. If there is any abnormality, please replace them in time.

The service life indicated in the table below is only for good service environment:

Part	Service life	Cause of damage	Situation requiring replacement
Cooling fan	4~5years	Bearing wear; Leaf aging;	1.Whether there are cracks in fan blades, etc; 2.Whether there isabnormal vibration sound during operation;
Electrolytic capacitor	4~5years	1.The quality of input power is poor; 2.The environment tempera-ture is high; 3.Frequent load jump; 4.Electrolyte aging;	1.Whether there is liquid leakage; 2.Whether the safety valve has protruded; 3.Determination of electrostatic capacitance; 4.Measurement of insulation resistance;
Relay or contactor	5~10 Ten thousand times	1.Corrosion and dust affect the contact effect; 2.The contact action is too frequent;	Opening and closing failure

8.4 Storage and transportation

This product must be placed in the packing box before installation. If it is not used for the time being, please pay attention to the following items during storage:
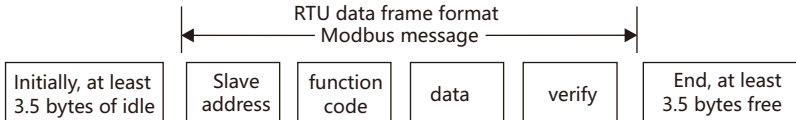
1 Must be placed in a dust-free, dry environment;

2.Storage ambient temperature：-25°C~60°C；

3.The relative humidity of storage environment is within 5% to 95%, and there is no condensation;

4. No corrosive gas or liquid in storage environment；

5.It's better to put it on the shelf and pack it properly.

6.Transportation environment temperature： -25°C~70°C；

7.The relative humidity of transportation environment is less than 95% (the ambient temperature is 40 ℃);

Note: it is better not to store the inverter for a long time, which will lead to the deterioration of the electrolytic capacitor. If it needs to be stored for a long time, it must be powered on once a year for at least 5 hours, and the input voltage must be slowly increased to the rated voltage value with a voltage regulator.

8.5 Scrapping of frequency converter

The raw materials used in the drive unit of frequency converter are recyclable, which can save energy and natural resources. Packaging materials are degradable and recyclable. Generally, all metal parts (such as steel, aluminum, copper and their alloys) can be recycled. Plastic, rubber, cardboard and other packaging materials can also be recycled. Printed circuit boards and DC capacitors should be treated selectively according to ec62635 standard. For more detailed environmental and recycling guidance, please contact us. The treatment must comply with nationality and local regulations. No burning

Data format:Start bit, 8 data bits, check bit and stop bit. The data format is described in the following table: in RTU mode, a new frame always starts with a transmission time silence of at least 3.5 bytes.The transmission time of 3.5 bytes can be easily controlled on the network where the baud rate is used to calculate the transmission rate.The data domains immediately followed by transmission are: slave address, operation command code, data and CRC check word, and each domain transfer byte is sixteen binary 0-9, A-F.Network devices always monitor the activity of communication bus. When the first domain (address information) is received, each network device confirms the byte. With the transmission of the last byte completed, there is a similar 3.5-byte transmission interval to indicate the end of this frame. After that, a new frame will be transmitted.

RTU data frame format
Modbus message

| Initially, at least 3.5 bytes of idle | Slave address | function code | data | verify | End, at least 3.5 bytes free |

The information of a frame must be transmitted as a continuous data. If there is an interval of more than 3.5 bytes before the end of the whole frame transmission, the receiving device will understand the incomplete information and mistakenly think that the next byte is the address domain of the new frame. Similarly, if the interval between the beginning of a new frame and the previous frame is less than 3.5 bytes, The receiving device will think it is the continuation of the previous frame. Due to the frame disorder, the final CRC check value is incorrect, leading to communication failure.

Standard structure of RTU frame:

Frame header START	T1-T2-T3-T4(Transmission time of 3.5 bytes)
Slave address field ADDR	Communication address (decimal system) (0 is the broadcast address)
Functional domain CMD	03H:Read slave parameter 06H:Write salve parameter
Data field(DATA N-1)...DATA(0)	2*N byte data, which is the main content of communication, and also the core of data exchange in communication.
CRC CHK Low	Detection value: CRC check value (16bit)
CRC CHK High	
Frame tail END	T1-T2-T3-T4(Transmission time of 3.5 bytes)

1.6 Command code and communication data description

1.6.1 Command code：03H（00000011），Read N words（WORD）

For example, if the slave address is 01, the starting address of memory is 1001h (operation frequency address), and five consecutive bytes (operation frequency, bus voltage, output voltage, output current and output power) are read, the frame structure is described as follows：

Host command information

START	T1-T2-T3-T4
ADDR	01H
CMD	03H
Start address high order	10H
Start address low order	01H

Data bit high	00H
Data bit low	05H
CRC CHK Low	The CRC CHK value needs to be calculated
CRC CHK High	
END	T1-T2-T3-T4

Slave response information:

P07-30=0

START	T1-T2-T3-T4
ADDR	01H
CMD	03H
Number of bytes	10H
Operating frequency low	xxH
Operating frequency high	xxH
Bus voltage high	xxH
Bus voltage low	xxH
Output voltage high	xxH
Output voltage low	xxH
Output current high	xxH
Output current low	xxH
Output power high	xxH
Output power low	xxH
CRC CHK Low	The CRC CHK value needs to be calculated
CRC CHK High	
END	T1-T2-T3-T4

1.6.2 Command code:06H(00000110),write one word(Word)

For example, the frequency requirement of sending 30.00Hz to the frequency converter is about 3000 (0BB8H) to write slave address 01H converter 1000H (communication setting address). The structure of the frame is described as follows:

Host command information：

START	T1-T2-T3-T4
ADDR	01H

CMD	06H
Write data address high bit	10H
Write data address low bit	00H
Data content high	0BH
Data content low	B8H
CRC CHK Low	8AH
CRC CHK High	48H
END	T1-T2-T3-T4

Slave response information:

START	T1-T2-T3-T4
ADDR	01H
CMD	06H
Write data address high bit	10H
Write data address low bit	00H
Data content high	0BH
Data content low	B8H
CRC CHK Low	97H
CRC CHK High	36H
END	T1-T2-T3-T4

1.6.3 Communication frame error check mode

The error checking method of the frame mainly consists of two parts, that is, byte check (odd / even check) and the whole data CRC check of the frame.

1.6.3.1 Byte bit check

Users can choose different bit check methods or no check according to their needs, which will affect the check bit setting of each byte.

Meaning of even check: an even check bit is added before data transmission to indicate whether the number of transmitted data "1" is odd or even. When it is even, the check position is "0", otherwise it is "1", so as to keep the parity of data unchanged.

Meaning of odd check: add a bit of odd check before data transmission to indicate whether the number of "1" in the data transmitted is odd or even. If it is odd, the check position is "0", otherwise it is "1", so as to keep the parity of data unchanged.

1.6.3.2 CRC check

Using RTU frame format, the frame includes the frame error check domain based on CRC method. CRC domain detects the content of the whole frame. The CRC field is a two byte, 16 bit binary value. It is calculated by the transmission device and added to the frame. The receiving device recalculates the CRC of the received frame and compares it with the value in the received CRC field. If the two CRC values are different, it indicates that there is an error in the transmission.

CRC is first stored in 0xFFFF, and then invoked a process to process the values of more than 6 consecutive bytes in the current register in the frame. Only 8bit data in each character is valid for CRC, and start bit, stop bit and parity bit are invalid.

In the process of CRC generation, each 8-bit character is different from or (XOR) in the register content. As a result, the least significant direction is moved and the most significant bit is filled with 0. LSB is extracted to detect. If LSB is 1, the register is different from the preset value or if LSB is 0, it is not detected. The whole process is repeated eight times. After the last bit (the 8th bit) is completed, the next 8-bit byte is different from or different from the current value of the register. The value in the final register is the CRC value after all bytes in the frame are executed.

This calculation method of CRC adopts the international standard CRC check rule. When editing CRC algorithm, users can refer to the relevant standard CRC algorithm to write a CRC calculation program that really meets the requirements.

Now provide a simple function of CRC calculation for users from the reference (with C language programming).

```
unsigned int crc_chk_value (unsigned char*data_value, unsigned char
*data_length)
{
    int i;
    unsigned int crc_value=0xffff;
    while (data_length--)
    {
        crc_value^=*data_value++;
        for (i=0; i<8; i++)
        {
            if (crc_value&0x0001)
            {
                crc_value= (crc_value>>1)^0xa001;
            }
            else
            {
                crc_value=crc_value>>1 ;
            }
        }
    }
    return (crc_value) ;
}
```

In ladder logic, CKSM calculates the CRC value according to the frame content, and uses the look-up table method. This method has simple program and fast operation speed, but the ROM space occupied by the program is large. Please use it carefully when there is a requirement for the program space.

1.6.4 Definition of communication data address

This part is the communication content, which is used to control the operation of the frequency converter, the status of the frequency converter and the setting of relevant parameters. Read and write function code parameters (some function codes cannot be changed and are only used by manufacturers).

Function code parameter address identification rules:

For example: P00.10,Address expressed as 000A

Group P11: can only read parameters, can not be modified

Some parameters cannot be changed when the inverter is in operation; Some parameters can not be changed no matter what state the inverter is in; To change the function code parameters, pay attention to the range, unit and relevant description of the parameters.

Shutdown / operation parameters:

Communication address	Communication content	Read write properties (R/W)
1000H	Communication settings (decimal)	W
1001H	Operating frequency	R
1002H	DC bus voltage	R
1003H	Output voltage	R
1004H	Output current	R
1005H	Output power	R
1006H	Output torque %	R
1007H	DI Input sign	R
1008H	DO output sign	R
1009H	VI Voltage	R
100AH	Reserved	R
100BH	Reserved	R
100CH	Counter A	R
100DH	Counter B	R
100EH	Overload speed	R
100FH	PID reference value	R
1010H	PID feedback value	R
1011H	PLC step	R
1012H	Pulse input frequency (0.01KHz)	R
1013H	Feedback speed (0.1Hz)	R
1014H	Remaining running time	R
1015H	VI voltage before correction	R

Communication address	Communication content	Read write properties (R/W)
1016H	Reserved	R
1017H	Reserved	R
1018H	Linear velocity	R
1019H	Current power on time	R
101AH	Cumulative power on time	R
101BH	Current operating time	R
101DH	Communication set point	R
101EH	Actual feedback speed	R
101FH	Main frequency X display	R
1020H	Secondary frequency Y display	R
1022H	Rotor angle of synchronous motor	R
1023H	Inverter temperature	R

Note: the actual given value of target frequency of 1000h communication setting value is two decimal places; For example, 50.00Hz corresponds to the given requirement of 5000 (decimal).

Control command input to inverter: (write only).

Command word address	Command function
2000H	0001H:FOR run
	0002H:REV run
	0003H:FOR inching
	0004H:REV inching
	0005H:Free stop
	0006H:Deceleration stop
	0007H:Fault reset
	0008H:Emergency stop

Read converter status: (read only).

Status word address	Status function
3000H	0001H:FOR run
	0002H:REV run
	0003H:Stop
	0101:All parameter self learning
	0202:Self learning of stator resistance

Digital output terminal control: (write only).

Command address	Command function
2001H	BIT0:RELAY 1 output control BIT1:RELAY 2 output control BIT2:DO1（Y1）output control BIT3:DO2 output control BIT4:Reserved BIT5:Reserved BIT6:Reserved BIT7:Reserved BIT8:Reserved BIT9:Reserved

Note: some models only have relay1 output control.

Analog output terminal AM0 control: (write only).

Command address	Command function
2002H	0-7FFF means 0%-100%

Analog output terminal AO0 control: (write only).

Command address	Command function
2003H	0-7FFF means 0%-100%

Note: some models only have AM0 output control.

Pulse output control:(Write only).

Command address	Command function
2004H	0-7FFF means 0%-100%

Frequency converter fault description：

Frequency converter fault address	Frequency converter fault information
8000H	0000:NO fault 0001:output short circuit 0002:acceleration over current 0003:deceleration over current 0004:constant over current 0005:acceleration over voltage 0006:deceleration over voltage 0007:constant over voltage 0009:under voltage protection 000A:inverter overload 000B:motor overload 000C:input phase loss 000D:motor phase loss 000E:IGBT temperature high 0010:inverter internal fault 0013:Motor parameter self learning failure 0017:Motor grounding alarm 0018:torque limit 0019:current limit 001B:external alarm 001F:feedback alarm 002D:motor temperature high OO2E:High pressure alarm 002F:Low pressure alarm 0030:Cumulative working hours arrive 0058:Communication failure between control board and drive board 0059:Button disabled 005B:parameter error 005C:parameter over limit 005F:power alarm 0060:Disconnection alarm 0061:Communication control word timeout 0062:reset parameter factory value 0063:Starting braking resistance braking 0064:Drive voltage alarm 0065:Locked rotor (locked rotor of synchronous motor)

1.6.5 Error message response

In the process of communication, there may be wrong operation. For example, if some parameters are read-only and a single host computer sends a write instruction, the inverter will reply to an error message.

The error message format is as follows:

	Error message		
Slave address	Function code	Error code	Check
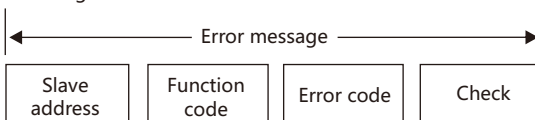
Error message function code = request function code+0x80

Error code	Error code
0x01	Illegal function code, which is not implemented in the inverter
0x02	Illegal data address. The requested data address is not allowed
0x03	Illegal number range. The number of registers or coils requested for operation is out of range
0x04	operation failed

Description of common communication parameters (please refer to group P07 parameters for details).

P07-30	Communication protocol	Default value:0
	Setting range	0:standard Modbus-RTU 2:reserved

P07-31	Local address	Default value:1
	Setting range	1-247,0 is Broadcast address

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

P07-32	Baud rate	Default: 5
	Setting range: (Individual position: Modubs baud rate)	0000:300bps; 0001:600bps; 0002:1200bps; 0003:2400bps; 0004:4800bps; 0005:9600bps;

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

P07-33	Data form	Default:0
	Setting range:	0:No check:data form <8-N-1>; 1:Pair check:data form<8-E-1>; 2:Odd parity check:data form<8-O-1>; 3:No check:data form<8-N-2>;

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