High performance vector control frequency inverter

User manual

Preface

Thanks for purchasing our inverters.

This manual describes how to use this frequency inverter properly. Please read it carefully before installation, operation, maintenance and inspection. Besides, please use the product after understanding the safety precautions.

Precautions
● In order to describe the product's details, the drawings presented in this instruction are sometimes shown without covers or protective guards. When using the product, please make sure to install the cover or protective guard as specified firstly, and operate the products in accordance with the instructions. ● Since the drawings in this manual are represented examples, some are subject to differ from delivered products. ● This manual may be modified when necessary because of improvement of the product, modification or changes in specifications. Such modifications are denoted by a revised manual No. ● If you want to order the manual due to loss or damage, please contact our company agents in each region or our company customer service center directly. ● If there is still any problem during using the products, please contact our company customer service center directly.

Contents

Chapter 1 Safety and Precautions

Safety definition:

In this manual, safety precautions are classified as follows:

 Danger: Operations which are not performed according to requirements may cause serious equipment loss or personnel injury.

 Caution: Operations which are not performed according to requirements may cause medium hurt or light hurt or material loss.

During the installation, commissioning and maintenance of the system, please make sure to follow the safety and precautions of this chapter. In case of a result of illegal operations, caused any harm and losses is nothing to do with the company.

1.1 Safety Precautions

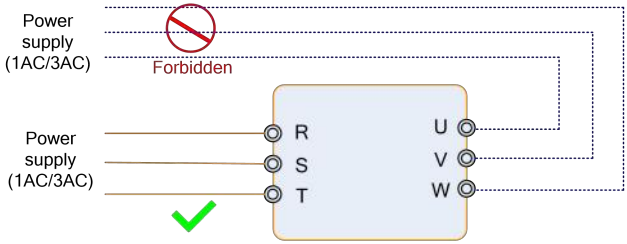
1.1.1 Before Installation:

 Danger	● Do not use the water-logged inverter, damaged inverter or inverter with missing parts. Otherwise, there may be risk of injury. ● Use the motor with Class B or above insulation. Otherwise, there may be risk of electric shock.
 Caution	● Carefully handled when loading, otherwise it may damage the inverter. ● Please don't use the damaged driver or inverter with missing parts, there may be risk of injury. ● Do not touch the electronic parts and components; otherwise it will cause static electricity.

1.1.2 During Installation:

 Danger	● Install the inverter on incombustible surface such as metal, and keep away from flammable substances. Otherwise it may cause fire. ● Do not loose the set screw of the equipment, especially the screws marked in RED.
 Caution	● Do not drop the cable residual or screw in the inverter. Otherwise it may damage the inverter. ● Please install the driver in the place where there is no direct sunlight or less vibratory. ● When more than two inverters are to be installed in one cabinet, due attention should be paid to the installation locations (refer to Chapter 3 Mechanical and Electrical Installation) to ensure the heat sinking effect.

1.1.3 During Wiring:

Danger	● Operation should be performed by the professional engineering technician. Otherwise there will be danger of electric shock! ● There should be circuit breaker between the inverter and power supply. Otherwise, there may cause fire! ● Make sure the power is disconnected prior to the connection. Otherwise there will be danger of electric shock! ● The ground terminal should be earthed reliably. Otherwise there may be danger of electric shock.
Caution	● Never connect AC power to output U, V, W terminals. Please note the remark of the wiring terminals, connect them correctly. Otherwise it will cause inverter be damaged.  ● Ensure the wiring circuit can meet the requirement of EMC and the area safety standard. Please follow the instructions in the manual before wiring. Otherwise may cause injury or electric shock. ● Never connect the braking resistor between DC Bus (+), (-) terminals. Otherwise may cause fire. ● Encoder must be used together with shielded wire, and ensure the single terminal of the shielded lay is connected with ground well.

1.1.4 Before Power-on:

Danger	● Please confirm whether the power voltage class is consistent with the rated voltage of the inverter and whether the I/O cable connecting positions are correct, and check whether the external circuit is short circuited and whether the connecting line is firm. Otherwise it may damage the inverter. The cover must be well closed prior to the inverter power-on. Otherwise electric shock may be caused. ● The inverter is free from dielectric test because this test is performed prior to the delivery. Otherwise accident may occur.
Caution	● The cover must be well closed prior to the inverter power-on. Otherwise electric shock may be caused! ● Whether all the external fittings are connected correctly in accordance with the circuit provided in this manual. Otherwise accident may occur!

1.1.5 After Power-on:

 Danger	● Do not open the cover of the inverter upon power-on. Otherwise there will be danger of electric shock! ● Do not touch the inverter and its surrounding circuit with wet hand. Otherwise there will be danger of electric shock! ● Do not touch the inverter terminals (including control terminal). Otherwise there will be danger of electric shock! ● At power-on, the inverter will perform the security check of the external heavy-current circuit automatically. Thus, at the moment please do not touch the terminals U, V and W, or the terminals of motor, otherwise there will be danger of electric shock.
 Caution	● If parameter identification is required, due attention should be paid to the danger of injury arising from the rotating motor. Otherwise accident may occur! ● Do not change the factory settings at will. Otherwise it may damage the equipment!

1.1.6 During Operation:

 Danger	● Do not touch the fan or discharge resistor to sense the temperature. Otherwise, you may get burnt! ● Detection of signals during the operation should only be conducted by qualified technician. Otherwise, personal injury or equipment damage may be caused!
 Caution	● During the operation of the inverter, keep items from falling into the equipment. Otherwise, it may damage the equipment! ● Do not start and shut down the inverter by connecting and disconnecting the contactor. Otherwise, it may damage the equipment!

1.1.7 During Maintain:

 Danger	● Do not repair and maintain the equipment with power connection. Otherwise there will be danger of electric shock! ● Be sure to conduct repair and maintenance after the charge LED indictor of the inverter is OFF. Otherwise, the residual charge on the capacitor may cause personal injury! ● The inverter should be repaired and maintained only by the qualified person who has received professional training. Otherwise, it may cause personal injury or equipment damage! ● Carry out parameter setting after replacing the inverter, all the plug-ins must be plug and play when power outage.

1.2 Precautions

1.2.1 Motor Insulation Inspection

When the motor is used for the first time, or when the motor is reused after being kept, or when periodical inspection is performed, it should conduct motor insulation inspection so as to avoid damaging the inverter because of the insulation failure of the motor windings. The motor wires must be disconnected from the inverter during the insulation inspection. It is recommended to use the 500V megameter, and the insulating resistance measured should be at least 5MΩ.

1.2.2 Thermal Protection of the Motor

If the ratings of the motor does not match those of the inverter, especially when the rated power of the inverter is higher than the rated power of the motor, the relevant motor protection parameters in the in the inverter should be adjusted, or thermal relay should be mounted to protect the motor.

1.2.3 Running with Frequency higher than Standard Frequency

This inverter can provide output frequency of 0Hz to 600Hz. If the user needs to run the inverter with frequency of more than 50Hz, please take the resistant pressure of the mechanical devices into consideration.

1.2.4 Vibration of Mechanical Device

The inverter may encounter the mechanical resonance point at certain output frequencies, which can be avoided by setting the skip frequency parameters in the inverter.

1.2.5 Motor Heat and Noise

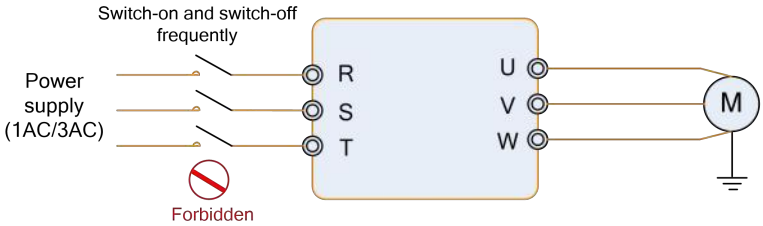
Since the output voltage of inverter is PWM wave and contains certain harmonics, the temperature rise, noise and vibration of the motor will be higher than those at power frequency.

1.2.6 Voltage-sensitive Device or Capacitor Improving Power Factor at the Output Side

Since the inverter output is PWM wave, if the capacitor for improving the power factor or voltage-sensitive resistor for lightning protection is mounted at the output side, it is easy to cause instantaneous over current in the inverter, which may damage the inverter. It is recommended that such devices not be used.

1.2.7 Switching Devices like Contactors Used at the Input and Output terminal

If a contactor is installed between the power supply and the input terminal of the inverter, it is not allowed to use the contactor to control the startup/stop of the inverter. If such contactor is unavoidable, it should be used with interval of at least one hour. Frequent charge and discharge will reduce the service life of the capacitor inside the inverter. If switching devices like contactor are installed between the output end of the inverter and the motor, it should ensure that the on/off operation is conducted when the inverter has no output. Otherwise the modules in the inverter may be damaged.



1.2.8 Use under voltage rather than rated voltage

If the inverter is used outside the allowable working voltage range as specified in this manual, it is easy to damage the devices in the inverter. When necessary, use the corresponding step-up or step-down instruments to change the voltage.

1.2.9 Change Three-phase Input to Two-phase Input

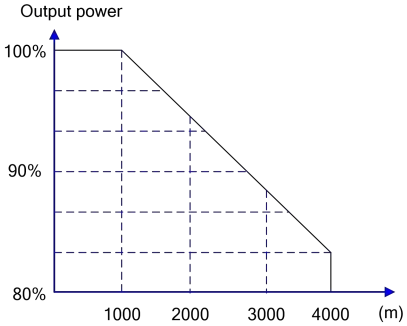
It is not allowed to change the three-phase inverter into two-phase one. Otherwise, it may cause fault or damage to the inverter.

1.2.10 Lightning Impulse Protection

The series inverter has lightning over current protection device, and has certain self-protection capacity against the lightning. In applications where lightning occurs frequently, the user should install additional protection devices at the front-end of the inverter.

1.2.11 Altitude and Derating

In areas with altitude of more than 1,000 meters, the heat sinking effect of the inverter may turn poorer due to rare air. Therefore, it needs to derate the inverter for using. Please make selection as the below derating diagram.



1.2.12 Certain Special Use

If the user needs to use the inverter with the methods other than the recommended wiring diagram in this manual, such as shared DC Bus, please consult our company.

1.2.13 Note of Inverter Disposal

The electrolytic capacitors on the main circuit and the PCB may explode when they are burnt. Emission of toxic gas may be generated when the plastic parts are burnt. Please dispose the inverter as industrial wastes.

1.2.14 Adaptable Motor

1) The standard adaptable motor is four-pole squirrel-cage asynchronous induction motor. If such motor is not available, be sure to select adaptable motors in according to the rated current of the motor. In applications where drive permanent magnetic synchronous motor is required, please consult our company;

2) The cooling fan and the rotor shaft of the non-variable-frequency motor adopt coaxial connection. When the rotating speed is reduced, the cooling effect will be poorer. Therefore, a powerful exhaust fan should be installed, or the motor should be replaced with variable frequency motor to avoid the over heat of the motor.

3) Since the inverter has built-in standard parameters of the adaptable motors, it is necessary to perform motor parameter identification or modify the default values so as to comply with the actual values as much as possible, or it may affect the running effect and protection performance;

4) The short circuit of the cable or motor may cause alarm or explosion of the inverter. Therefore, please conduct insulation and short circuit test on the newly installed motor and cable. Such test should also be conducted during routine maintenance. Please note that the inverter and the test part should be completely disconnected during the test.

Chapter 2 Product Information

2.1 Product Inspection

Checking the following items when receiving the inverter

Confirmation Items	Method
Confirm if the inverter is what you ordered	Check name plate
Damaged or not	Inspect the entire exterior of the inverter to see if there are any scratches or other damage resulting from shipping
Confirm if the fastening parts (screws, etc.) are loose or not	Check with a screw driver if necessary
User's manual, certification and other spares	User's manual and the relative spares

Please contact the local agent or our company directly if there is any damage on the inverter.

2.2 Selection Guide

Power	Suitable Motor (kW)	Rated Output Current (A)
3AC 380V -15%~+20%		
FD100-1R5G/2R2P	1.5/2.2	3.8/5.1
FD100-2R2G/4P	2.2/4	5.1/9
FD100-4G/5R5P	4/5.5	9/13
FD100-5R5G/7R5P	5.5/7.5	13/17
FD100-7R5G/11P	7.5/11	17/25
FD100-11G/15P	11/15	25/32
FD100-15G/18R5P	15/18.5	32/37
FD100-18R5G/22P	18.5/22	37/45
FD100-22G/30P	22/30	45/60
FD100-30G/37P	30/37	60/75
FD100-37G/45P	37/45	75/91
FD100-45G/55P	45/55	91/112
FD100-55G/75P	55/75	112/152
FD100-75G/90P	75/90	152/176
FD100-90G/110P	90/110	176/210
FD100-110G/132P	110/132	210/253
FD100-132G/160P	132/160	253/304

FD100-160G/185P	160/185	304/350
FD100-185G/200P	185/200	350/380
FD100-200G/220P	200/220	380/426
FD100-220G/250P	220/250	426/465
FD100-250G/280P	250/280	465/520
FD100-280G/315P	280/315	520/585
FD100-315G/355P	315/355	585/650
FD100-355G/400P	350/400	650/725
FD100-400G/450P	400/450	725/820

2.3 Technical Specifications

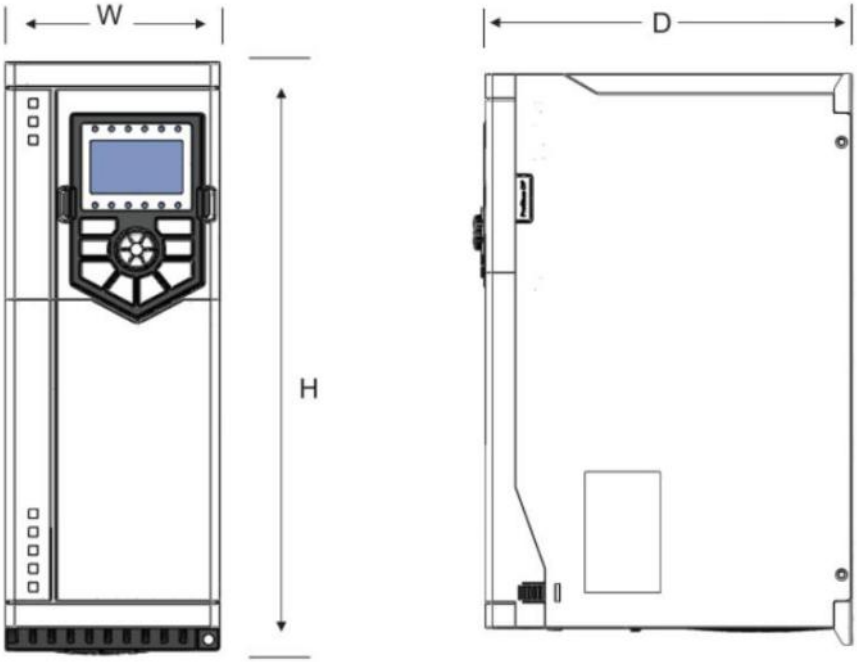
Item	Technical Index	Specification
Input	Input voltage	3AC 380~460V (-15%~+20%)
	Input frequency	50/60Hz±5%
Output	Output voltage	0～rated input voltage
	Output frequency	Vector control: 0~500Hz V/f control: 0~2000Hz
Control Features	Control mode	V/f control Sensorless vector control (SVC) Close-loop vector control (FVC)
	Operation command mode	Keypad control Terminal control Serial communication control (Modbus)
	Frequency setting mode	Digital setting, analog setting, pulse frequency setting, serial communication setting, multi-step speed setting & simple PLC, PID setting, etc. These frequency settings can be combined & switched in various modes.
	Overload capacity	G model: 150%/60s, 180%/3s P model: 120%/60s, 150%/3s
	Starting torque	0.25Hz/150% (SVC); 0.5Hz/150% (V/f), 0Hz/180% (FVC)
	Speed control precision	±0.5% (SVC)
	Carrier frequency	0.5~16.0kHz, automatically adjusted according to temperature and load characteristics
	Frequency accuracy	Digital setting: 0.01Hz Analog setting: maximum frequency ×0.025%
	Torque boost	Automatically torque boost; manually torque boost: 0.1%~30.0%

	V/f curve	Three types: linear, multiple point and square type (1.2 power, 1.4 power, 1.6 power, 1.8 power, square)
	Acceleration/decele ration mode	Straight line/S curve; four kinds of acceleration/deceleration time, range: 0.0~6500.0s
	Braking unit	1.5~22kW: standard build-in. 30~37kW optional for build-in >37kW, external braking unit..
	DC braking	DC braking when starting and stopping DC braking frequency: 0.0Hz~maximum frequency, braking time: 0.0s~36.0s
	Jog operation	Jog operation frequency: 0.0Hz~maximum frequency Jog acceleration/deceleration time: 0.1s~6500.0s
	Simple PLC & multi-step speed operation	It can realize a maximum of 16 multi-step speeds running via the built-in PLC or control terminal.
	Built-in PID	Built-in PID control to easily realize the close loop control of the process parameters (such as pressure, temperature, flow, etc.)
	Automatic voltage regulation	Keep output voltage constant automatically when input voltage fluctuating
Control Function	Torque limit	“Rooter” characteristics, limit the torque automatically and prevent frequent over-current tripping during the running process
	Wobble frequency control	Multiple triangular-wave frequency control, special for textile
	Timing/length/ counting control	Timing/length/counting control function
	Over-voltage & over-current stall control	Limit current & voltage automatically during the running process, prevent frequent over-current & over-voltage tripping
	Fault protection function	Comprehensive protections include over-current, over-voltage, under-voltage, overheating, default phase, overload, shortcut, etc., can record the detailed running status during failure & has fault automatic reset function
Input/out put terminals	Input terminals	**Programmable digital inputs**: DI1~DI6, DI5 can be used as high speed pulse input terminal. **Programmable analog inputs**: AI1, AI2 (compile with both 0～10V & 4～20mA).
	Output terminals	**Programmable digital outputs**: 2 relay outputs 2 open-collector outputs, FM can be set as high speed pulse output terminal (0~100kHz). **Programmable analog outputs**: AO1, AO2:(compile with both 0～10V & 4～20mA).
	Communication terminals	Standard RS485 communication interface, support MODBUS-RTU communication protocol
Human machine	LED display	Display frequency setting, output frequency, output voltage, output current, etc. Two lines display

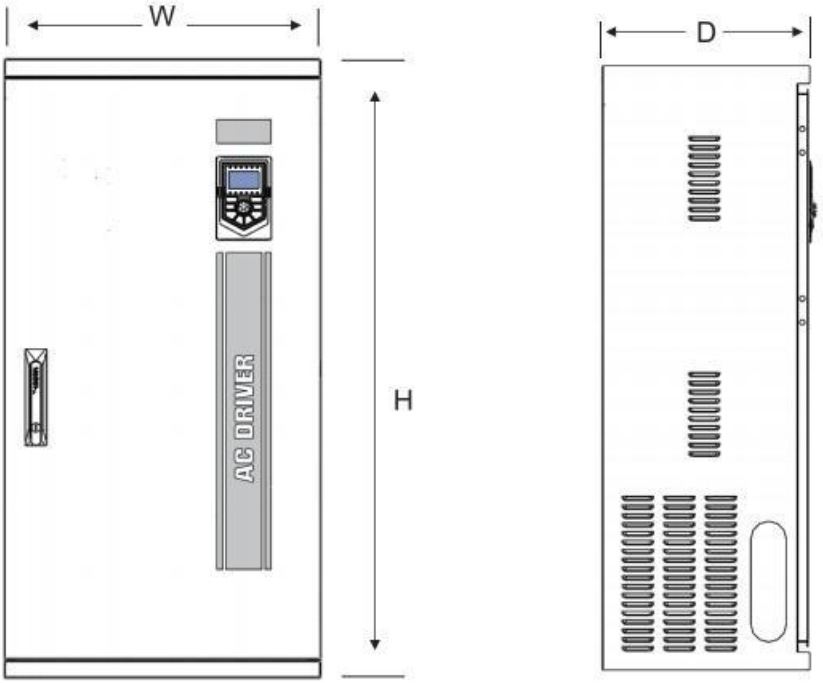
interface	Multi-function key	MF.K key, can be used as multi-function key
Environ-ment	Ambient temperature	-10℃～40℃ (>40℃, output derated), without direct sunshine.
	Humidity	95%RH or less (non-condensing)
	Altitude	≤1000M: output rated power, ＞1000M: output derated
	Storage temperature	-20℃～60℃

2.4 External and keypad dimensions

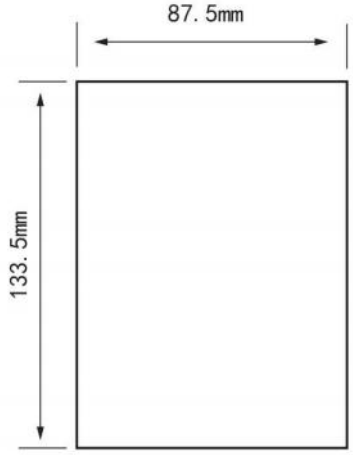
A: Product outlook (1.5~132kW):



B: Product outlook (≥160kW):



C: Extension keypad bracket hole size



Power (kW)	Outlook dimensions (mm)		
	H	W	D
1.5~2.2	200	86	185
4~5.5	238	97	185
7.5~11	320	116	210
15 ~ 22	383	142	257
30 ~ 37	445	189	252
45 ~ 75	565	240	315
90 ~ 110	638	268	350
132 ~ 160	738	350	405
185 ~ 220	1025	525	350
250 ~ 315	1150	555	355
355 ~ 450	1450	650	390
500 ~ 560	1800	800	550
630 ~710	1800	800	700

2.5 Selection Guide of the external electrical parts

(1) Selection guide of electric cable

Inverter Model	Circuit Breaker (MCCB) (A)	Recommended Contactor A	Recommended Conducting Wire of Main Circuit at Input Side (mm^2)	Recommended Conducting Wire of Main Circuit at Output Side (mm^2)	Recommended Conducting Wire of Control Circuit (mm^2)
3AC 380V±15%					
1.5kW	16	10	2.5	2.5	1.0
2.2kW	16	10	2.5	2.5	1.0
4.0kW	25	16	4.0	4.0	1.0

5.5kW	32	25	4.0	4.0	1.0
7.5kW	40	32	4.0	4.0	1.0
11kW	63	40	4.0	4.0	1.0
15kW	63	40	6.0	6.0	1.0
18.5kW	100	63	6.0	6.0	1.5
22kW	100	63	10	10	1.5
30kW	125	100	16	10	1.5
37kW	160	100	16	16	1.5
45kW	200	125	25	25	1.5
55kW	200	125	35	25	1.5
75kW	250	160	50	35	1.5
90kW	250	160	70	35	1.5
110kW	350	350	120	120	1.5
132kW	400	400	150	150	1.5
160kW	500	400	185	185	1.5
185kW	600	600	150*2	150*2	1.5
200kW	600	600	150*2	150*2	1.5
220kW	600	600	150*2	150*2	1.5
250kW	800	600	185*2	185*2	1.5
280kW	800	800	185*2	185*2	1.5
315kW	800	800	150*3	150*3	1.5
350kW	800	800	150*4	150*4	1.5
400kW	1000	1000	150*4	150*4	1.5
500kW	1200	1200	180*4	180*4	1.5
560kW	1200	1200	180*4	180*4	1.5
630kW	1500	1500	180*4	180*4	1.5
710kW	1500	1500	180*4	180*4	1.5

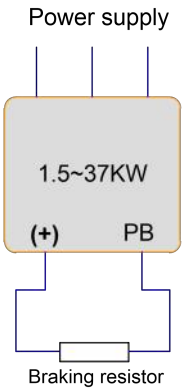
(2) Selection guide of braking system

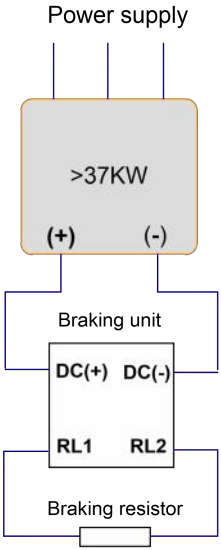
Inverter Model	Braking unit		Braking unit (100% of the braking torque, 10% of the utilization rate)	
	Specification	Quantity	Equivalent braking resistor	Equivalent braking power
1.5	Build-in	1	⩾220Ω	150W
2.2		1	⩾200Ω	250W

Inverter Model	Braking unit		Braking unit (100% of the braking torque, 10% of the utilization rate)	
	Specification	Quantity	Equivalent braking resistor	Equivalent braking power
4.0		1	≥130Ω	300W
5.5		1	≥90Ω	400W
7.5		1	≥65Ω	500W
11		1	≥43Ω	800W
15		1	≥32Ω	1000W
18.5		1	≥25Ω	1300W
22		1	≥22Ω	1500W
30	Optional for build-in	1	≥16Ω	2500W
37		1	≥16Ω	3.7kW
45	DBU-030G-T4	1	≥16Ω	4.5kW
55		1	≥8Ω	5.5kW
75	DBU-055G-T4	1	≥8Ω	7.5W
90		1	≥8Ω*2	4.5kW*2
110		1	≥8Ω*2	5.5kW*2
132		1	≥8Ω*2	6.5kW*2
160	DBU-110G-T4	1	≥2.5Ω	16kW
185		1	≥2.5Ω	18.5kW
200	DBU-220G-T4	1	≥2.5Ω	20kW
220		1	≥2.5Ω	22kW
250		1	≥2.5Ω*2	12.5kW*2
280	DBU-315G-T4	1	≥2.5Ω*2	14kW*2
315		1	≥2.5Ω*2	16kW*2
355		1	≥2.5Ω*2	17kW*2
400		1	≥2.5Ω*3	14kW*3
450	DBU-400G-T4	1	≥2.5Ω*3	15kW*3

Inverter Model	Braking unit		Braking unit (100% of the braking torque, 10% of the utilization rate)	
	Specification	Quantity	Equivalent braking resistor	Equivalent braking power
500		1	⩾2.5Ω*3	17kW*3

d. Wiring connection of braking system





2.6 Routine Maintenance of Inverter

2.6.1 Routine Maintenance

The influence of the ambient temperature, humidity, dust and vibration will cause the aging of the devices in the inverter, which may cause potential fault of the inverter or reduce the service life of the inverter. Therefore, it is necessary to carry out routine and periodical maintenance on the inverter.

Routine inspection Items include:

1) Whether there is any abnormal change in the running sound of the motor;

2) Whether the motor has vibration during the running;

3) Whether there is any change to the installation environment of the inverter;

4) Whether the inverter cooling fan works normally;

5) Whether the inverter has over temperature.

Routine cleaning:

1) The inverter should be kept clean all the time.

2) The dust on the surface of the inverter should be effectively removed, so as to prevent the dust entering the inverter. Especially the metal dust is not allowed.

3) The oil stain on the inverter cooling fan should be effectively removed.

2.6.2 Periodic Inspection

Please perform periodic inspection on the places where the inspection is a difficult thing.

Periodic inspection Items include:

1) Check and clean the air duct periodically;

2) Check if the screws are loose;

3) Check if the inverter is corroded;

4) Check if the wire connector has arc signs;

5) Main circuit insulation test.

Remainder: When using the megameter (DC 500V megameter recommended) to measure the insulating resistance, the main circuit should be disconnected with the inverter. Do not use the insulating resistance meter to test the insulation of control circuit. It is not necessary to conduct the high voltage test (which has been completed upon delivery).

2.6.3 Storage of Inverter

Upon acquiring the inverter, the user should pay attention to the following points regarding the temporary and long-term storage of the inverter:

1) Pack the inverter with original package and place back into the packing box of our company.

2) Long-term storage will degrade the electrolytic capacitor. Thus, the product should be powered up once every 2 years, each time lasting at least five hours. The input voltage should be increased slowly to the rated value with the regulator.

Chapter 3 Installation and wiring

3.1 Mechanical Installation

3.1.1 Installation environment

1) Ambient temperature: The ambient temperature exerts great influences on the service life of the inverter and is not allowed to exceed the allowable temperature range (-10℃ to 40℃).

2) The inverter should be mounted on the surface of incombustible articles, with sufficient spaces nearby for heat sinking. The inverter is easy to generate large amount of heat during the operation. The inverter should be mounted vertically on the base with screws.

3) The inverter should be mounted in the place without vibration or with vibration of less than 0.6G, and should be kept away from such equipment as punching machine.

4) The inverter should be mounted in locations free from direct sunlight, high humidity and condensate.

5) The inverter should be mounted in locations free from corrosive gas, explosive gas or combustible gas.

6) The inverter should be mounted in locations free from oil dirt, dust, and metal powder.

3.1.2 Heat dissipation should be taken into account during the mechanical installation. Please pay attention the following items:

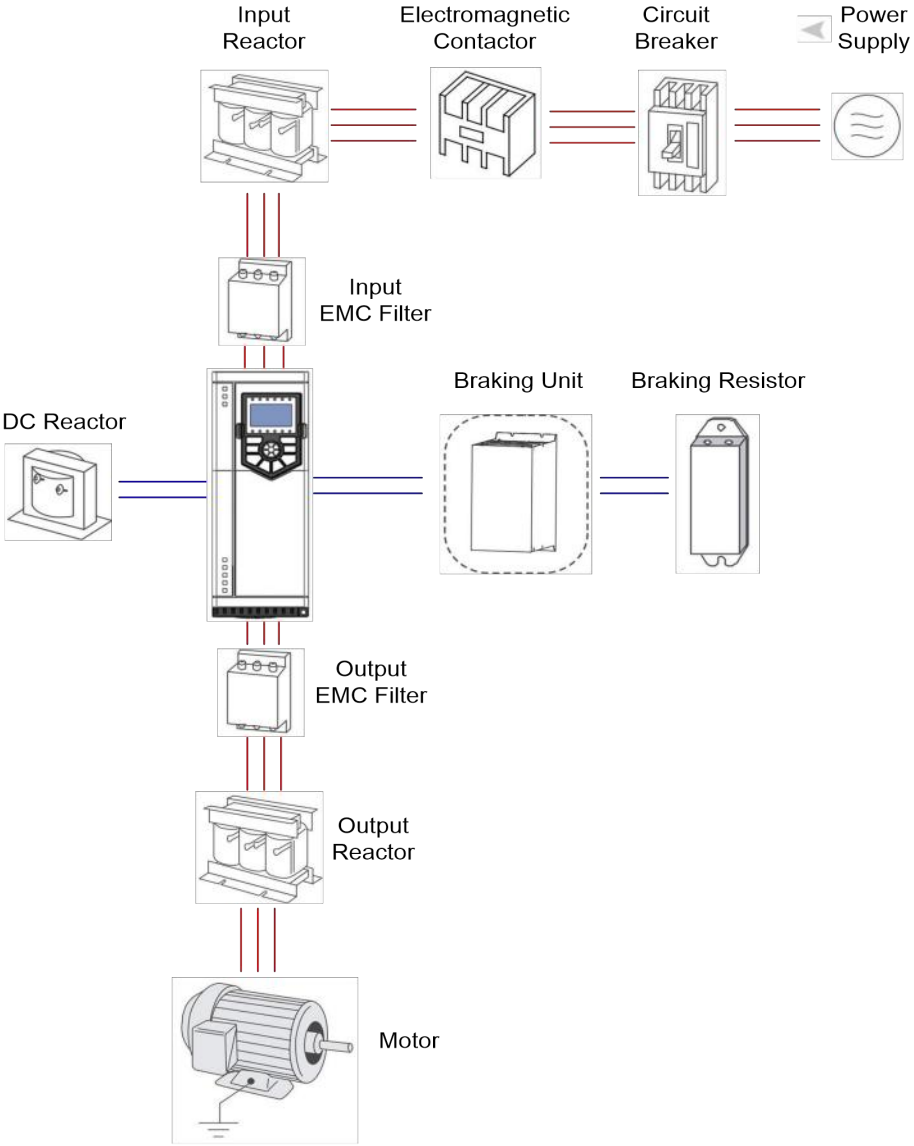
1) Install the inverter vertically so that the heat may be expelled from the top. However, the equipment cannot be installed upside down. If there are multiple inverters, parallel installation is a better choice. In applications where the upper and lower inverters need to be installed, please refer to 3.1.2 “Inverter Installation Diagram” and install an insulating splitter.

2) The mounting space should be as indicated as 3.1.2, so as to ensure the heat dissipation space of the inverter. However, the heat dissipation of other devices in the cabinet should also be taken into account.

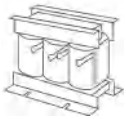
3) The installation bracket must be flame retardant.

4) In the applications where there are metal dusts, it is recommended to mount the radiator outside the cabinet. In this case, the space in the sealed cabinet should be large enough.

3.2 Configuration of Peripheral Devices



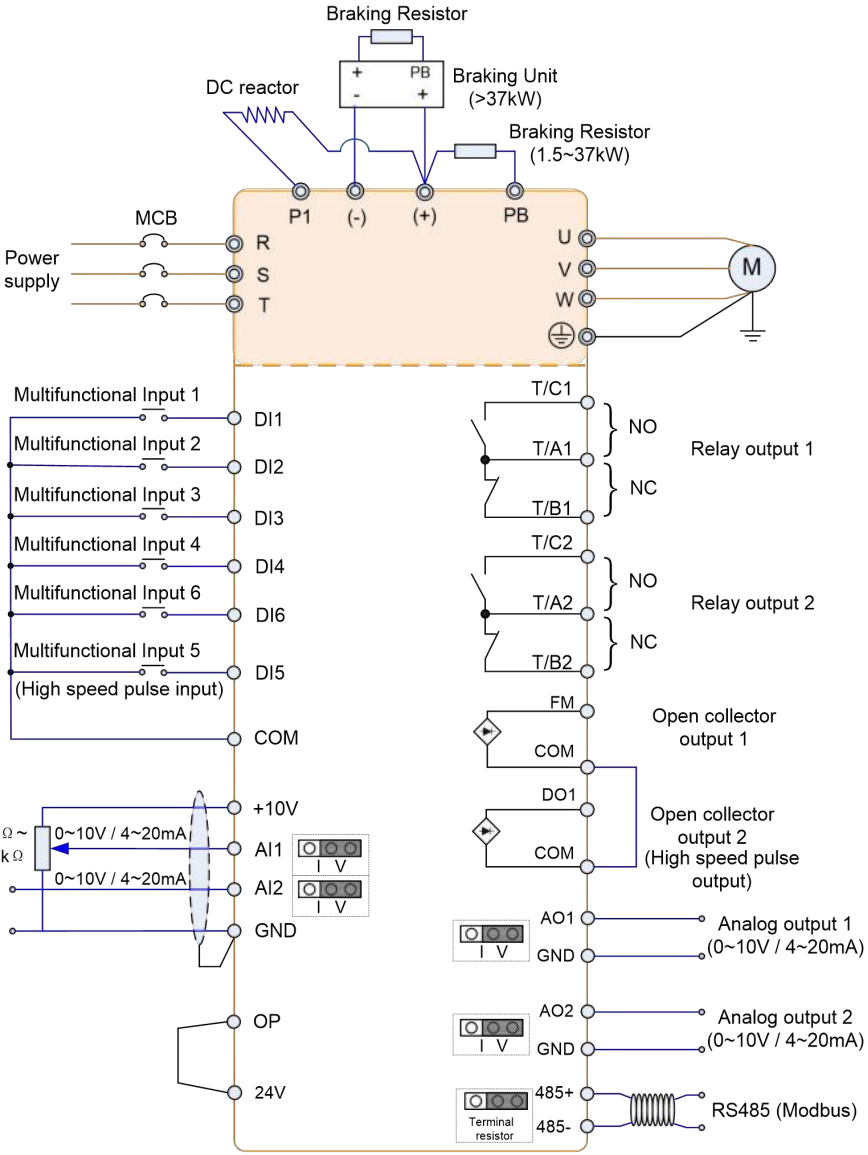
Instructions of peripheral devices

Picture	Device	Instructions
	Circuit breaker	Purpose: disconnect power supply and protect the equipment in case of abnormal over current occurs Type selection: breaking current of circuit breaker is defined to be 1.5～2 times the rated current of the drive
	Input reactor	Improve power factor Reduce the impact of imbalanced three-phase input AC power supply on the system Suppress higher harmonics and reduce the conducted and radiated interference to peripheral devices Restrict the impact of impulse current on rectifier bridges
	Input EMC filter	Reduce conducted interference from power supply to the drive, improve the immunity of the drive from noise Reduce conducted and radiated interference of the drive to peripheral device
	Braking resistor	Purpose: consume motor feedback energy to realize quick brake
	Output EMC filter	Output filter and radiated interference of the drive to peripheral devices
	Output reactor	Avoid the motor insulation damage result from harmonic voltage Reduce frequent protection from the drive caused by leakage current In case the cable connecting drive and motor is over 100 meters, output AC reactor recommended

- Do not install the capacitor or surge suppressor at the output side of the inverter, otherwise it may cause inverter failure or capacitor and surge suppressor damaged.

- The Inverter input / output (main circuit) contains harmonic components, it may interfere with inverter accessories communications equipment. Therefore, please install anti-interference filter to minimize interference.
- The details of external devices and accessories selection refer to the manual of external devices.

3.3 Wiring diagram



Note:

1. Terminal ◎ refers to the main circuit terminal, terminal O refers to the control circuit terminal.
2. Braking resistor is optional for user.

3.3.1 Main circuit terminals and connections

Danger

- Make sure that the power switch is at OFF status prior to perform wiring connection. Otherwise there may be danger of electric shock!
- Only the qualified and trained personnel can perform wiring connection. Otherwise it may cause equipment and human injuries!
- It should be earthed reliably. Otherwise there may be danger of electric shock or fire!

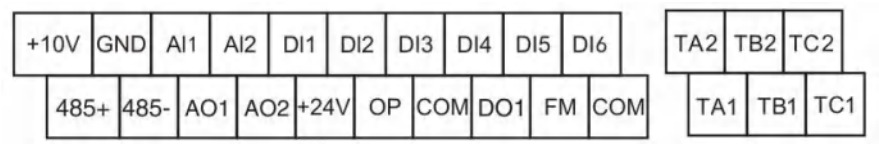
Caution

- Make sure that the rated value of the input power supply is consistent with that of the inverter. Otherwise it may damage the inverter!
- Make sure that the motor matches the inverter. Otherwise it may damage the motor or generate inverter protection!
- Do not connect the power supply to the terminals of U, V and W. Otherwise it may damage the inverter!
- Do not directly connect the brake resistor between the DC Bus terminals (+) and (-). Otherwise it may cause fire!

Instructions of main circuit terminals

Terminal	Description
R, S, T	Connect to three-phase AC power
(+), (-)	Reserved terminals for external brake unit (>37kW)
(+), PB	Reserved terminals for braking resistor (15kW~37kW)
P1, (+)	Reserved terminals for external DC reactor **(132~710kW, standard build-in DC reactor)**
U, V, W	Connect to three phase motor
	Ground connection terminal

3.3.2 Control terminals and connections



3.3.3 Description of Control Terminals Function

Type	Terminal Symbol	Terminal Name	Function Description
Power Supply	+10V-GND	+10V power supply	1. Provide +10V power supply for external units, and the maximum output current is 100mA. 2. It is generally used as the operating power supply for the external potentiometer. The potentiometer resistance range is 1kΩ~10kΩ.
	+24V-COM	+24V power supply	1. Provide +24V power supply for external units. 2. It is generally used as the operating power supply for digital input/output terminals and the external sensor. The maximum output current is 200mA.
	OP	External 24V power input terminal	1. Short connect with 24V as default. 2. When external signal is used to drive MI1 ~ MI5, OP needs to connect to the external power supply and disconnect from the +24V power terminal
Analog Input	AI1~GND	Analog input terminal 1	1. Input range: DC 0~10V/4~20ma, which is controlled by jumper of JP3 on the control board. 2. Current input impedance: 500Ω. 3. Voltage input impedance: 22kΩ.
	AI2~GND	Analog input terminal 2	1. Input range: DC 0~10V/4~20mA, which is controlled by jumper of JP2 on the control board. 2. Current input impedance: 500Ω. 3. Voltage input impedance: 22kΩ.
Digital Input	DI1	Digital input 1	1. Optical coupling isolation, compatible with both PNP and NPN input 2. Input impedance: 2.4kΩ 3. Voltage range for level input: 9V～30V 4. DI5 terminal can work at both digital input and high speed pulse (maximum input frequency is 50kHz) input.
	DI2	Digital input 2	
	DI3	Digital input 3	
	DI4	Digital input 4	
	DI5	Digital input 5	
	DI6	Digital input 6	

Analog Output	AO1~GND	Analog output 1	Output range: DC 0~10V/4~20mA, which is controlled by jumper of JP4 on the control board.
	AO2~GND	Analog output 2	Output range: DC 0~10V/4~20mA, which is controlled by jumper of JP5 on the control board.
Digital Output	FM-COM	open collector output (High speed pulse output)	1. Output signal type is set by F07.00 2. When set as high speed pulse, the maximum output frequency is 100kHz. 3. When set as open-collector output, the specifications are same as DO1
	DO1-24V	Digital output	1. Optical coupling isolation, open-collector output. 2. External connection voltage range: 0~24V 3. Output current range: 0~50mA
Relay Output 1	T/B1-T/A1	Normally close output	Driving capacity: AC 250V/3A, DC 30V/1A
	T/C1-T/A1	Normally open output	
Relay Output 2 (extension card)	T/B2-T/A2	Normally close output	
	T/C2-T/A2	Normally open terminal	
RS485	485+	Modbus terminals	Communication interface of Modbus, it is suggested to use twisted-pair cable or shielded cable.
	485-		

3.3.4 Principle of wiring connection

(1) Power cables

◆ Please select the cables size (diameter) properly based on the power rating, current and electrician standard.

◆ It is suggested to install a MCB (Main Circuit Breaker) between power supply and R, S, T terminals, and the MCB should not be interfered by high frequency signals.

◆ The power cables must keep safe distance with control cables, don't put them in one wire casing.

◆ Never connect the power supply to U, V, W terminals.

◆ The output power cables cannot touch any point of frequency inverter's metal case, otherwise it will cause grounding short-circuited.

◆ The power cables must keep safe distance with other devices.

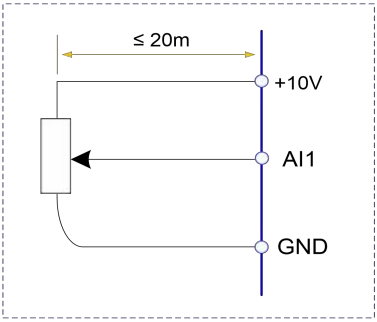
◆ If the cables' length between motor and frequency inverter is longer than 50 meters (220V inverter) or 100 meters (380V inverter), it must install an additional output reactor in the system.

◆ If the cables' length between motor and frequency inverter is long, please reduce the carrier frequency,

if the carrier frequency is bigger, the leakage current of higher harmonic on the cable will be bigger, which will bring bad effect to frequency inverter and other devices.

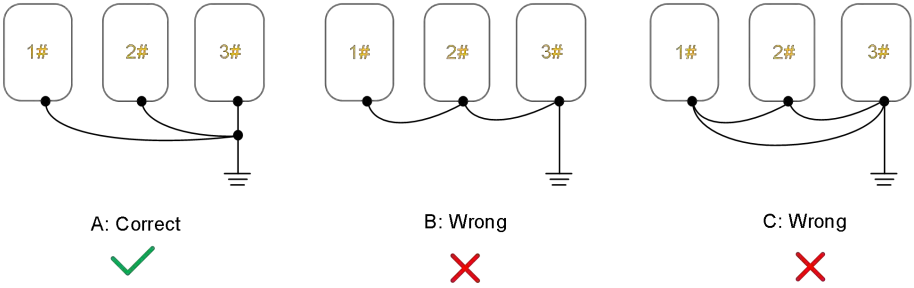
(2) Control cables

- Don't put the power cables and control cables in one wire casing, otherwise it will cause interferences.
- Please use shield cables for control circuit, and it is suggested to use 1mm^2 shield cables.
- Don't make the analog signal cables' length longer than 20 meters.



(3) Ground connection

- The grounding resistor should be less than 100.
- The grounding cables length is the shorter the better.
- Please don't make frequency inverters' grounding point separated with other big power equipment (like electric welder and other large-scale mechanical devices)
- Please make correct grounding as below diagram



A: Correct

B: Wrong

C: Wrong

Chapter 4 Operation and Display

4.1 Keypad Description

With the operation keypad, it can perform such operations on the inverter as function parameter modification, working status monitor and running control (start and stop).

1) Functional indicators description

Functional indicator	Description
RUN	Indication of inverter is running
FWD/REV	Indication of inverter is forward or reverse running Light off: forward running Light on: reverse running
L/R	Indication of inverter start/stop command source Light off: Keypad command Light on: Terminal command Light flickers: Modbus command
ARM	Indication of inverter under fault

2) Unit indicators description

Functional indicator	Description
Hz	Frequency unit
A	Current unit
V	Voltage unit
s	Time unit (second)

3) Keypad push-button description

Button	Name	Function
PRG	Programming key	Entry and exit of primary menu
ENTER	Confirmation key	Progressively enter menu, and confirm parameters
	Increment key	Progressively increase of data or function codes
	Decrement key	Progressively decrease of data or function codes
	Shift key	Select the displayed parameters in turn on the stop display interface and running display interface, and select the modification bit of parameters when modifying parameters.
RUN	Running key	Start to run inverter under keyboard control mode
STOP	Stop / Reset	Stop inverter in running status and reset operation in fault alarm status. The reactions are controlled by P08.02.
MF.K	Multi-function selection key	The corresponding functions are defined by P08.01.
Potentiometer	Increase or decrease	Frequency or data increase or decrease

4.2 Function Code Checking and Modification Methods Description

The operation keypad of the Inverter adopts three-level menu structure to carry out operations such as parameter setting.

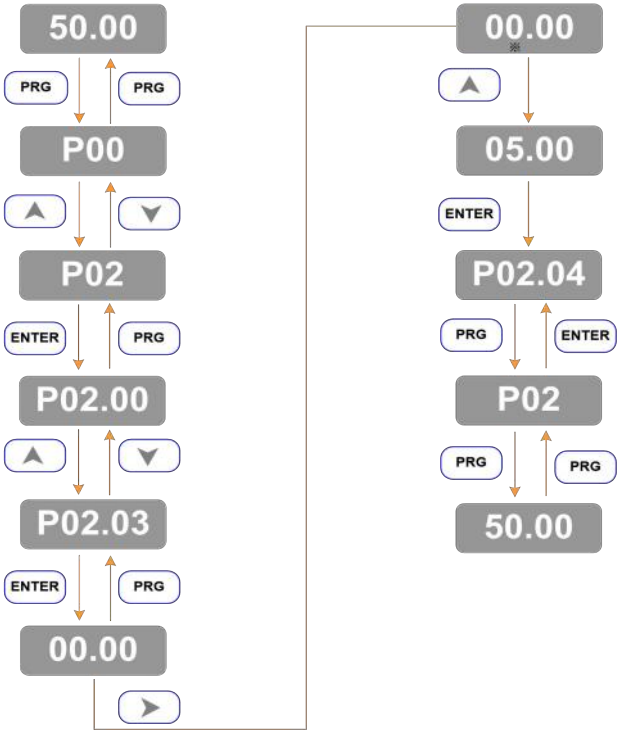
1） Function parameter group (level 1 menu)
2） Function code (level 2 menu)
3） Function code setting value (level 3 menu)

Description: When operating on level 3 menu, press **PRG** key or **ENTER** key to return to level 2 menu. The difference between **PRG** key and **ENTER** key is described as follows:

1） Pressing **ENTER** key will save the setup parameter and return to the level 2 menu and then automatically shift to the next function code.

2） Pressing **PRG** key will directly return to level 2 menu without saving the parameter, and it will return to the current function code.

Example: Modify the function code P02.03 from 00.00Hz to 05.00Hz.



In level 3 menu, if there is no flashing bit, it means this function code cannot be modified. The possible reasons are:

1) The function code is an unchangeable parameter, such as actual detection parameter, running record parameter, etc.

2) The function code cannot be modified in running status. It can be modified only when the inverter is stopped.

4.3 Power-on Initialization

Firstly the system initializes during the inverter power-on, and LED displays “8.8.8.8.8.8”. After initialization, the inverter is in fault protection status if a fault happens, or the inverter is in stand-by status

4.4 Fault Protection

In fault status, inverter will display fault code & record output current, output voltage, etc. For details, please refer to P10 (fault and protection) parameter group. Fault can be reset via STOP key or external terminals.

4.5 Stand By

In stop or stand by status, parameters of multi-status can be displayed. Whether or not to display this parameter can be chosen through function code P08.08 (Stop status display parameter) according to binary bits.

The displaying of the chosen parameters can be switched in sequence by pressing button.

4.6 Running

In running status, there are thirty two parameters can be chosen to display or not through function code P08.06 and P08.07 (running status display parameter) according to binary bits.

The displaying of the chosen parameters can be switched in sequence by pressing button.

4.7 Password Setting

The inverter provides user password protection function. When P18.00 is set to non-zero value, it indicates the user password, and the password protection turns valid after exiting the function code editing status. When pressing **PRG** key again, "------"will be displayed, and common menu cannot be entered until user password is input correctly.
To cancel the password protection function, enter with password and set P18.00 to "0".

4.8 Motor Parameters Auto-tuning

To select the vector control running mode, it must input the nameplate parameter of the motor accurately prior to the running of the inverter. The Inverter will select standard motor parameters matching the nameplate parameter. Since the vector control mode relies highly on the motor parameters, it must acquire the accurate parameters of the controlled motor to ensure the good control performance.

The procedures for the automatic tuning of motor parameters are described below:

First, select the command source (P01.05) as the command channel of the operation keypad. Second, input the following parameters in accordance with the actual motor parameters:
P04.01: Rated motor power
P04.02: Rated motor voltage
P04.03: Rated motor current
P04.04: Rated motor frequency
P04.05: Rated rotation speed of motor

If the motor is completely disconnected from the load, set P04.37 to "2" (complete tuning), and press **RUN** key on the keypad, it will display "RUN", motor will rotate, and it will stop automatically while auto-tuning finish, the keypad will display "END". After auto-tuning the following parameters will be updated :
P04.06: Stator resistance
P04.07: Rotor resistance
P04.08: Leakage inductance

P04.09: Mutual inductance
P04.10: Current without load

Finally, complete the automatic tuning of motor parameters.

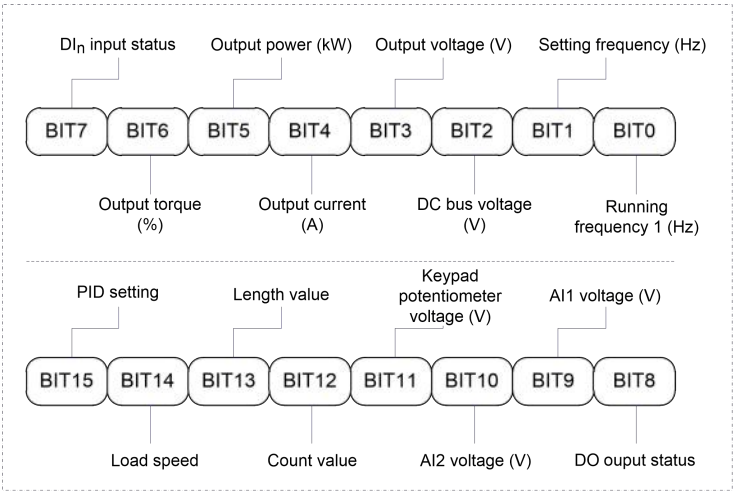
If the motor cannot be completely disconnected with the load, set P04.37 to “1” (static tuning), and then press **RUN** key on the keyboard panel, wait until the auto-tuning finish.

The following motor parameters will be updated automatically:
P04.06: Stator resistance
P04.07: Rotor resistance
P04.08: Leakage inductive reactance

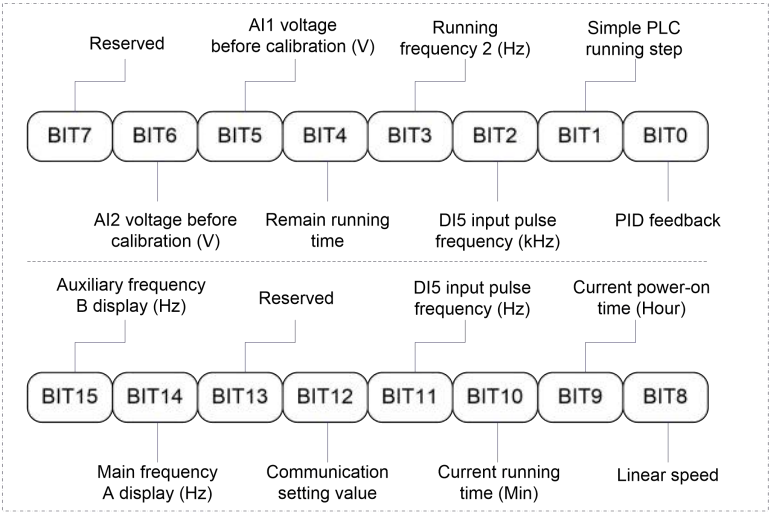
4.9 Display setting for P08.06 and P08.07

If some of P08.06 and P08.07 parameters need to be displayed when running, **set the corresponding position to 1**, **and change every four bits of binary numbers into one hexadecimal number**, **and then enter the four hexadecimal numbers intoP08.06 and P08.07.**

Running status display 1:



Running status display 2:



For example, if user wants to display output voltage, DC Bus voltage, setting frequency, running frequency, output current, output torque, AI1 voltage, AI2 voltage, output terminal status, the value of each bit is as the following table:

BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
0	0	1	1	1	1	1	1
3				**F**			
BIT15	BIT14	BIT13	BIT12	BIT11	BIT10	BIT9	BIT8
0	0	0	0	0	1	1	1
0				**7**			

The value of F7-03 is **073F**.

4.10 Multi-step speed function

(1) start/stop by keypad

Parameters setting: P01.05=0, P01.06=6, P06.02=12 (DI3=K1, multi-step speed terminal 1), P06.03=13 (DI4=K2, multi-step speed terminal 2), P06.04=14 (DI5=K3, multi-step speed terminal 3), P06.05=15 (DI6=K4, multi-step speed terminal 4), P13.00~P13.15, 16 steps speed can be set.

Start, stop: press “RUN” button to make inverter run forward, press “STOP” to stop inverter.

Speed adjusts: by different combinations of DI input (shown as below list).

(2) start/stop by external digital signal

Parameters setting: P01.05=1, P01.06=6, P06.00=1, P06.01=2, P06.02=12 (DI3=K1, multi-step speed

terminal 1), P06.03=13 (DI4=K2, multi-step speed terminal 2), P06.04=14 (DI5=K3, multi-step speed terminal 3), P06.05=15 (DI6=K4, multi-step speed terminal 4), P13.00~P13.15, 16 steps speed can be set.

Start, stop: "DI1--COM" close, inverter run forward; "DI2--COM" close, inverter run reverse.

Speed adjusts: by different combinations of DI input (shown as below list).

※ **Different combination means different speeds:**

K4	K3	K2	K1	Command setting	Corresponding parameter
OFF	OFF	OFF	OFF	Multi-step command 0	P13.00
OFF	OFF	OFF	ON	Multi-step command 1	P13.01
OFF	OFF	ON	OFF	Multi-step command 2	P13.02
OFF	OFF	ON	ON	Multi-step command 3	P13.03
OFF	ON	OFF	OFF	Multi-step command 4	P13.04
OFF	ON	OFF	ON	Multi-step command 5	P13.05
OFF	ON	ON	OFF	Multi-step command 6	P13.06
OFF	ON	ON	ON	Multi-step command 7	P13.07
ON	OFF	OFF	OFF	Multi-step command 8	P13.08
ON	OFF	OFF	ON	Multi-step command 9	P13.09
ON	OFF	ON	OFF	Multi-step command 10	P13.10
ON	OFF	ON	ON	Multi-step command 11	P13.11
ON	ON	OFF	OFF	Multi-step command 12	P13.12
ON	ON	OFF	ON	Multi-step command 13	P13.13
ON	ON	ON	OFF	Multi-step command 14	P13.14
ON	ON	ON	ON	Multi-step command 15	P13.15

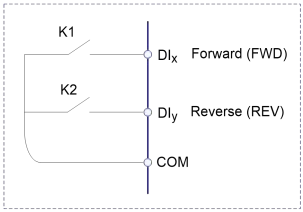
4.11 Terminal command mode

P06.09=0: Two-line running mode 1:

This is the most common mode. The forward/reverse rotation of the motor is decided by the commands of FWD and REV terminals.

Terminal	Setting value	Description
DI_x	1	Forward running (FWD)
DI_y	2	Reverse running (REV)

K1	K2	Run command
OFF	OFF	Stop
OFF	ON	Reverse
ON	OFF	Forward
ON	ON	Stop

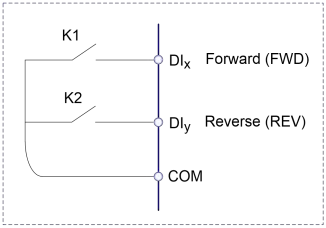


P06.09=1: Two-line running mode 2:

When this mode is adopted, REV is enabled terminal. The direction is determined by the status of FWD.

Terminal	Terminal	Description
DI_x	1	Run enable
DI_y	2	Forward / Reverse run control

K1	K2	Run command
OFF	OFF	Stop
OFF	ON	Stop
ON	OFF	Forward
ON	ON	Reverse



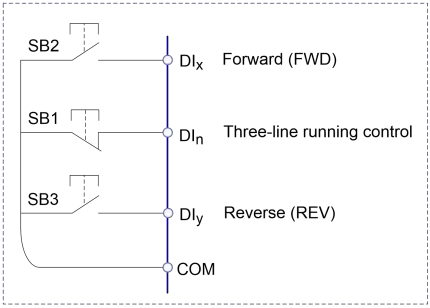
P06.09=2: Three-line running mode 1:

In this mode, DI_n is enabled terminal, and the direction is controlled by FWD and REV respectively. However, the pulse is enabled through disconnecting the signal of DI_n terminal when the inverter stops.

Terminal	Setting value	Description
DI_x	1	Forward running (FWD)
DI_y	2	Reverse running (REV)
DI_n	3	Three-line running control

To make the inverter run, users must close DI_n terminal firstly. It can achieve the motor forward or reverse control via pulse rising of DI_x or DI_y.

It can achieve the inverter stop via cutting off DI_n terminal signal. DI_x. DI_y. DI_n are DI1～DI6, the valid input of DI_x (DI_y) is pulses signal, and the valid input of DI_n is level signal.



SB1: Stop button

SB2: Forward rotation button

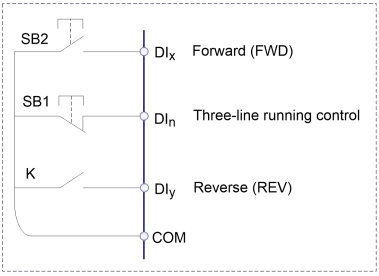
SB3: Reverse rotation button

P06.09=3: Three-line running mode 2:

In this mode, DI_N is enabled terminal, and the running command is given by FWD, while the direction is determined by the status of REV. Stop command is performed through disconnecting the MI_N signal.

Terminal	Setting value	Description
DI_x	1	Run enable
DI_y	2	Forward / Reverse run control
DI_n	3	Three-line running control

K	Running direction
OFF	Forward
ON	Reverse



Chapter 5 Function Parameter List

The detailed functional parameters are listed in below table.

The instruction of the symbols in function parameter list is as following:

"○" Means the parameter can be modified at stop and running status.

"◎" Means the parameter cannot be modified at the running status.

"●" Means the parameter is the real detection value which cannot be modified.

5.1 Basic Function Parameter Table

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P01 Group: Basic Function					
P01.00	Reserved		0	◎	F000
P01.01	G/P model selection	1: G model (constant torque load model) 2: P model (fan and pump load model)	1	◎	F001
P01.02	Motor control mode	0: Sensorless Vector Control (SVC) 1: Close-loop vector control (FVC) 2: V/f control	2	◎	F002
P01.03	Parameters initialization	0: No action 1: Initialize basic parameters (Not includes the motor parameters) 2: Initialize completely 3: Clear the record 4: Recover user backup parameters	0	◎	F003
P01.04	Reserved				F004
P01.05	Running command source	0: Keypad 1: Terminal 2: Communication 3: By the inlet water pressure 4: Auto-start after power-on	0	○	F005

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P01.06	Main frequency source A selection	0: Keypad (set by P01.11 adjustable by UP and DOWN buttons, non-recorded after power off) 1: 0: Keypad (set by P01.11 adjustable by UP and DOWN buttons, recorded after power off) 2: AI1 3: AI2 4: Keypad potentiometer 5: DI5 (High speed pulse) 6: Multi-step speed 7: Simple PLC 8: PID 9: Communication (Modbus)	4	◎	F006
P01.07	Auxiliary frequency source B selection	Same as P01.06	0	◎	F007
P01.08	Reference of Frequency source B	0: Relative to maximum frequency 1: Relative to frequency source A	0	○	F008
P01.09	Range of Auxiliary Frequency source B	0%～100%	100%	○	F009
P01.10	Frequency source selection	**Units bit**: frequency source selection 0: Main frequency source A 1: Calculation result of frequency A and B (determined by tens place) 2: Switching between A and B 3: Switching between A and calculation result 4: Switching between B and calculation result **Tens bit**: calculation relationship between frequency A and B 0: A + B 1: A - B 2: Max (A, B) 3: Min (A, B)	00	○	F00A

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		4: A*B / Max. frequency			
P01.11	Keypad reference frequency	0.00Hz ~ maximum frequency (P01.13)	50.00Hz	○	F00B
P01.12	Running direction selection	0: Same direction 1: Reverse direction	0	○	F00C
P01.13	Maximum frequency	50.00Hz ~ 500.00Hz	50.00Hz	◎	F00D
P01.14	Frequency source of upper limit	0: P01.15 1: AI1 2: AI2 3: Keypad potentiometer 4: DI5 (High speed pulse) 5: Communication (Modbus)	0	◎	F00E
P01.15	Frequency upper limit	P01.17 (frequency lower limit) ~ P01.13 (max. frequency)	50.00Hz	○	F00F
P01.16	Frequency upper limit offset	0.00Hz ~ P01.13 (max. frequency)	0.00Hz	○	F010
P01.17	Frequency lower limit	0.00Hz ~ P01.15 (frequency upper limit)	0.00Hz	○	F011
P01.18	Carrier frequency	0.5kHz ~ 16.0kHz	Model depend	○	F012
P01.19	Carrier frequency adjusting according to temperature	0: No 1: Yes	1	○	F013
P01.20	Acceleration time 1	0.0s ~ 6500.0s	Model depend	○	F014
P01.21	Deceleration time 1	0.0s ~ 6500.0s	Model depend	○	F015
P01.22	ACC/DEC time unit	0: 1s 1: 0.1s 2: 0.01s	1	◎	F016
P01.23	Delay time set for F01.05=4	0.0s ~ 3600.0s	Model depend	○	F017
P01.24	Auxiliary frequency source offset frequency when combination	0.00Hz ~ P01.13(max. frequency)	0.00Hz	○	F018
P01.25	Frequency command resolution	1: 0.1Hz 2: 0.01Hz	2	◎	F019
P01.26	Digital setting frequency storage selection when stop	0: Not store 1: store	0	○	F01A

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P01.27	ACC/DEC time reference frequency	0: P01.10 (max. frequency) 1: Setting frequency 2: 100Hz	0	◎	F01B
P01.28	Running frequency command UP/DOWN reference	0: Running frequency 1: Setting frequency	0	◎	F01C
P01.29	Command source combination with frequency source	**Units bit:**: Operation keypad command combine with frequency source 0: No combination 1: Keypad Potentiometer 2: AI1 3: AI2 4: Keypad potentiometer 5: DI5 (High speed pulse) 6: Multi-step speed 7: Simple PLC 8: PID 9: Communication **Tens bit:** Terminal command combine with frequency source **Hundreds bit:** Communication command combine with frequency source **Thousands bit**: Auto running combine with frequency source	0000	○	F01D
P01.30	User password	0 ~ 65535	0	○	F01E
P01.31~ P01.34	Reserved				
P02 Group: Start and Stop control					
P02.00	Start mode	0: Direct start 1: Speed tracking and restart 2: Pre-excitation start	0	○	F100
P02.01	Speed tracking mode	0: Begin from stop frequency 1: Begin from zero speed 2: Begin from maximum frequency	0	◎	F101
P02.02	Speed tracking speed	1 ~ 100	20	○	F102

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P02.03	Start frequency	0.00Hz ~ 10.00Hz	0.00Hz	○	F103
P02.04	Start frequency holding time	0.0s ~ 100.0s	0.0s	◎	F104
P02.05	DC braking current before start/pre-excitation current	0% ~ 100%	0%	◎	F105
P02.06	DC braking time before start/pre-excitation time	0.0s ~ 100.0s	0.0s	◎	F106
P02.07	ACC/DEC mode	0: Linear ACC/DEC 1: S-curve ACC/DEC A 2: S-curve ACC/DEC B	0	◎	F107
P02.08	Time of S curve's start part	0.0% ~ (100.0% - P02.09)	30.0%	◎	F108
P02.09	Time of S curve's end part	0.0% ~ (100.0% - P02.08)	30.0%	◎	F109
P02.10	Stop mode	0: Deceleration to stop 1: Coast to stop	0	○	F10A
P02.11	DC braking start frequency while stopping	0.00Hz ~ P01.10 (maximum frequency)	0.00Hz	○	F10B
P02.12	DC braking delay time while stopping	0.0s ~ 100.0s	0.0s	○	F10C
P02.13	DC braking current while stopping	0% ~ 100%	0%	○	F10D
P02.14	DC braking time while stopping	0.0s ~ 100.0s	0.0s	○	F10E
P02.15	Braking usage ratio	0% ~ 100%	100%	○	F10F
P02.21	Demagnetization time	0.00 ~ 5.00s	Model depend	○	F115
P03 Group: 1# motor Vector Control Parameters					
P03.00	Speed-loop proportional gain 1	1 ~ 100	30	○	F200
P03.01	Speed-loop integration time 1	0.01s ~ 10.00s	0.50s	○	F201
P03.02	Switching frequency 1	0.00 ~ P03.05	5.00Hz	○	F202

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P03.03	Speed loop proportional gain 2	1 ~ 100	20	○	F203
P03.04	Speed loop integration time 2	0.01s ~ 10.00s	1.00s	○	F204
P03.05	Switching frequency 2	P03.02 ~ F0-10 (max. frequency)	10.00Hz	○	F205
P03.06	Vector control slip compensation coefficient	50% ~ 200%	100%	○	F206
P03.07	Speed loop filter time	0.000s ~ 0.100s	0.015s	○	F207
P03.08	Vector control over-excitation gain	0 ~ 200	64	○	F208
P03.09	Torque upper limit source selection in speed control mode	0: P03.10 1: AI1 2: AI2 3: Keypad potentiometer 4: DI5 (High speed pulse) 5: Communication (%) 6: Min (AI1, AI2) 7: Max (AI1, AI2) The full range of 1~7 corresponds to P03.10	0	◎	F209
P03.10	Torque control mode upper limit setting	0.0% ~ 200.0%	150.0%	○	F20A
P03.13	Excitation regulation proportion gain	0 ~ 60000	2000	○	F20D
P03.14	Excitation regulation integration gain	0 ~ 60000	1300	○	F20E
P03.15	Torque regulation proportion gain	0 ~ 60000	2000	○	F20F
P03.16	Torque regulation integration gain	0 ~ 60000	1300	○	F210
P03.17	Speed-loop Integral attribute	Integral separation 0: Invalid 1: Valid	0	○	F211
P03.18~ P03.22	Reserved				
P04 Group: 1# Motor Parameters					

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P04.00	Motor type	0: Common asynchronous motor 1: Variable frequency asynchronous motor 2: Reserved	0	◎	F300
P04.01	Motor rated power	0.1kW ~ 1000.0kW	Model depend	◎	F301
P04.02	Motor rated voltage	1V ~ 2000V	Model depend	◎	F302
P04.03	Motor rated current	0.01A ~ 655.35A (Inverter power ≤ 55kW) 0.1A ~ 6553.5A (Inverter power > 55kW)	Model depend	◎	F303
P04.04	Motor rated frequency	0.01Hz ~ P01.13 (max. frequency)	Model depend	◎	F304
P04.05	Motor rated speed	1 ~ 66635RPM	Model depend	◎	F305
P04.06	Asynchronous motor stator resistance	1mΩ ~ 65535mΩ (Inverter power ≤ 55kW) 0.1mΩ ~ 6553.5mΩ (Inverter power > 55kW)	Motor parameter	◎	F306
P04.07	Asynchronous motor rotor resistance	1mΩ ~ 65535mΩ (Inverter power ≤ 55kW) 0.1mΩ ~ 6553.50mΩ (Inverter power > 55kW)	Motor parameter	◎	F307
P04.08	Asynchronous motor leakage inductance	0.01mH ~ 655.35mH (Inverter power ≤ 55kW) 0.001mH ~ 65.535mH (Inverter power > 55kW)	Motor parameter	◎	F308
P04.09	Asynchronous motor mutual inductance	0.1mH ~ 6553.5mH (Inverter power ≤ 55kW) 0.01mH ~ 655.35mH (Inverter power > 55kW)	Motor parameter	◎	F309
P04.10	Asynchronous motor no-load current	0.01A ~ P04.03 (Inverter power ≤ 55kW) 0.1A ~ P04.03 (Inverter power > 55kW)	Motor parameter	◎	F30A
P04.16~ P04.36	Reserved				

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P04.37	Auto-tuning	0: No action 1: Asynchronous motor static auto-tuning 1 2: Asynchronous motor rotary auto-tuning 3: Asynchronous motor static auto-tuning 2	0	◎	F325
P05 Group: V/f Control Parameters					
P05.00	V/f curve setting	0: Linear 1: Multiple-points 2: Square 3: 1.2th power 4: 1.4th power 6: 1.6th power 8: 1.8th power 9: Reserved 10: V/f separate completely 11: V/f separate partially	0	◎	F400
P05.01	Torque boost	0.0: auto 0.1% ~ 30.0%	Model depend	○	F401
P05.02	Torque boost cutoff frequency	0.00Hz ~ P01.10 (max. frequency)	50.00Hz	◎	F402
P05.03	V/f frequency point 1	0.00Hz ~ P05.05	0.00Hz	◎	F403
P05.04	V/f voltage point 1	0.0% ~ 100.0%	0.0%	◎	F404
P05.05	V/f frequency point 2	P05.03 ~ P05.07	0.00Hz	◎	F405
P05.06	V/f voltage point 2	0.0% ~ 100.0%	0.0%	◎	F406
P05.07	V/f frequency point 3	P05.05 ~ P04.04 (motor rated frequency)	0.00Hz	◎	F407
P05.08	V/f voltage point 3	0.0% ~ 100.0%	0.0%	◎	F408
P05.09	V/f slip compensation gain	0.0% ~ 200.0%	0.0%	○	F409
P05.10	V/f over excitation gain	0 ~ 200	64	○	F40A
P05.11	V/f oscillation suppression gain	0 ~ 100	Model depend	○	F40B
P05.13	Voltage source of V/f separation	0: Digital setting (P05.14) 1: AI1 2: AI2 3: Keypad potentiometer	0	○	F40D

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		4: DI5 (High speed pulse) 5: Multi-step speed 6: Simple PLC 7: PID 8: Communication (Modbus) Note: 100% corresponds to motor rated voltage.			
P05.14	Voltage setting of V/f separation	0V~ Motor rated voltage	0V	○	F40E
P05.15	Voltage rise up time of V/f separation	0.0s~1000.0s Note: means voltage rise up time from 0 to motor rated voltage	0.0s	◎	F40F
P05.16	Voltage fall time of V/f separation	0.0s~1000.0s Note: means voltage fall time from motor rated voltage to 0	0.0s	◎	F410
P05.17	Stop mode selection of V/f separation	0: Frequency / voltage decrease to 0 separately 1: Voltage falls to 0 then frequency start to decrease	0	◎	F411
P05.18	Stall over-current point	50% ~ 200%	150%	◎	F412
P05.19	Stall over-current restrain enable	0: Invalid 1: Valid	1	◎	F413
P05.20	Stall over-current restrain gain	0~100	20	◎	F414
P05.21	Stall over-current point	50% ~ 200%	50%	◎	F415
P05.22	Stall over-voltage point / Braking threshold	200.0V ~ 2000.0V	Model depend	◎	F416
P05.23	Stall over-voltage restrain enable	0: Invalid 1: Valid	1	◎	F417
P05.24	Stall over-voltage restrain frequency gain	0 ~ 100	30	◎	F418
P05.25	Stall over-voltage restrain voltage gain	0 ~ 100	20	◎	F419
P05.26	Stall over-voltage maxi. Frequency rise up limitation	0 ~ 50Hz	5Hz	◎	F41A

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P05.27	Time constant of slip compensation	0.1 ~ 10.0s	0.5s	◎	F41B
P06 Group: Input Terminals					
P06.00	DI1 terminal function	0: No function 1: Forward (FWD) 2: Reverse (REV) 3: Three-line running control 4: Forward Jog (FJOG) 5: Reverse Jog (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Coast to stop 9: Fault reset (RESET) 10: Pause running 11: External fault (normal open) input 12: Multi-step speed terminal 1 13: Multi-step speed terminal 2 14: Multi-step speed terminal 3 15: Multi-step speed terminal 4 16: ACC/DEC selection terminal 1 17: ACC/DEC selection terminal 2 18: Main frequency source switching 19: UP and DOWN setting clear (terminal and keypad) 20: Running command switching terminal 21: ACC/DEC invalid 22: PID pause 23: PLC status reset 24: Wobble frequency pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control invalid 30: DI5 (high speed pulse)	1	◎	F500
P06.01	DI2 terminal function		4	◎	F501
P06.02	DI3 terminal function		9	◎	F502
P06.03	DI4 terminal function		12	◎	F503
P06.04	DI5 terminal function		13	◎	F504
P06.05	DI6 terminal function		0	◎	F505

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		frequency input 31: Reserved 32: DC braking command 33: External fault (normal closed) input 34: Frequency modification enabled 35: PID action direction reverse 36: External stop terminal 1 37: Control command switching terminal 2 38: PID integration stop 39: Switch frequency source A to preset frequency 40: Switch frequency source B to preset frequency 41: Reserved 42: Reserved 43: PID parameters switching 44: User self-defined fault 1 45: User self-defined fault 2 46: Speed control / torque control switching 47: Emergency stop 48: External stop terminal 2 49: Deceleration DC braking 50: The running time reset 51: Force running at under-voltage status 52: Deceleration to stop, valid only for jog running 53~59: Reserved			
P06.06 ～ P06.07	Reserved				
P06.08	DI terminals filter time	0.000s ~ 1.000s	0.010s	○	F50A
P06.09	Terminal command mode	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	0	◎	F50B
P06.10	UP/DOWN change rate	0.001Hz/s ~ 65.535Hz/s	1.00Hz/s	○	F50C

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P06.11	AI1 minimum input	0.00V ~ P06.13	0.10V	○	F50D
P06.12	AI1 minimum input corresponding setting	-100.0% ~ +100.0%	0.0%	○	F50E
P06.13	AI1 maximum input	P06.11 ~ 10.00V	10.00V	○	F50F
P06.14	AI1 maximum input corresponding setting	-100.0% ~ +100.0%	100.0%	○	F510
P06.15	AI1 input filter time	0.00s ~ 10.00s	0.10s	○	F511
P06.16	AI2 minimum input	0.00V ~ P06.18	0.1V	○	F512
P06.17	AI2 minimum input corresponding setting	-100.0% ~ +100.0%	0.0%	○	F513
P06.18	AI2 maximum input	P06.16~ 10.00V	10.00V	○	F514
P06.19	AI2 maximum input corresponding setting	-100.0% ~ +100.0%	100.0%	○	F515
P06.20	AI2 input filter time	0.00s ~ 10.00s	0.10s	○	F516
P06.21	Keypad potentiometer minimum input	-10.00V ~ P06.23	1.5V	○	F517
P06.22	Keypad potentiometer minimum input corresponding setting	-100.0% ~ +100.0%	0.0%	○	F518
P06.23	Keypad potentiometer maximum input	P06.21~ 10.00V	7.6V	○	F519
P06.24	Keypad potentiometer maximum input corresponding setting	-100.0% ~ +100.0%	100.0%	○	F51A
P06.25	Keypad potentiometer input filter time	0.00s ~ 10.00s	0.10s	○	F51B

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P06.26	DI5 (High sped pulse) minimum input	0.00kHz ~ P06.28	0.00kHz	○	F51C
P06.27	DI5 (High sped pulse) minimum input corresponding setting	-100.0% ~ +100.0%	0.0%	○	F51D
P06.28	DI5 (High sped pulse) maximum input	P06.26~ 100.00kHz	50.00kHz	○	F51E
P06.29	DI5 (High sped pulse) maximum input corresponding setting	-100.0% ~ +100.0%	100.0%	○	F51F
P06.30	DI5 (High sped pulse) input filter time	0.00s ~ 10.00s	0.10s	○	F520
P06.31	Reserved				
P06.32	Reaction select while AI signal is lower than minimum frequency set	**Unit bit:** Select for AI1 **Tens bit**: Select for AI2 **Hundreds bit**: Select for keypad potentiometer 0: Correspond to minimum input set 1: 0.0%	000	○	F522
P06.33	DI1 delay time	0.0s ~ 3600.0s	0.0s	◎	F523
P06.34	DI2 delay time	0.0s ~ 3600.0s	0.0s	◎	F524
P06.35	DI3 delay time	0.0s ~ 3600.0s	0.0s	◎	F525
P06.36	DI terminals valid mode selection 1	0: Active-high level signal 1: Active-low level signal **Units bit**: DI1 **Tens bit**: DI2 **Hundreds bit:** DI3 **Thousands bit**: DI4 **Ten thousands bit**: DI5	00000	◎	F526
P06.39	DI terminals valid mode selection 2	0: Active-high level signal 1: Active-low level signal **Units bit**: DI6 **Tens bit**: Reserved **Hundreds bit:** Reserved **Thousands bit**: Reserved **Ten thousands bit**: Reserved	00000	◎	F527

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P07 Group: Output Terminal					
P07.00	FM terminal output mode selection	0: High speed pulse output 1: open collector output	0	○	F600
P07.01	FM output function selection (open collector output)	0: No output 1: Inverter is running 2: Fault output (fault stop) 3: FDT1 output 4: Frequency arrival 5: Zero-speed running (no output when stop) 6: Motor overload pre-alarm 7: Inverter overload pre-alarm 8: Setting count value arrival 9: Designated count value arrival 10: Length arrival 11: Simple PLC circulate running completed 12: Accumulated running time arrival 13: Frequency limiting 14: Torque limiting 15: Ready for running 16: AI1>AI2 17: Frequency upper limit arrival 18: Frequency lower limit arrival 19: Under voltage status output 20: Communication setting 21: Position fixed (reserved) 22: Position approach (reserved) 23: Zero-speed running 2 (output when stop) 24: Accumulated power-on time arrival 25: FDT2 output 26: Frequency 1 arrival output 27: Frequency 2 arrival output 28: Current 1 arrival output 29: Current 2 arrival output 30: Timing arrival output	0	○	F601
P07.02	Relay 1 output selection (T/A1, T/B1, T/C1)		2	○	F602
P07.03	Extension relay card output selection (TA2, TB2, TC2)		0	○	F603
P07.04	DO1 output function selection (open collector output)		1	○	F604
P07.05	Reserved				

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		31: AI1 input over limit 32: Off load 33: Reverse running 34: Zero-current status 35: Module temperature arrival 36: Output current over limit 37: Lower limit frequency arrival (output when stop) 38: Warning output (keep running) 39: Motor over temperature pre-alarm 40: This running time arrival 41: Fault output (no output for under voltage) 42~48: Reserved			
P07.06	FM output function selection (High speed pulse output)	0: Running frequency 1: Setting frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: DI5 input (100% corresponds to 100.0kHz) 7: AI1 8: AI2 9: Keypad potentiometer 10: Length 11: Count value 12: Communication setting frequency 13: Motor speed 14: Output current (100.0% corresponds to 1000.0A) 15: Output voltage (100.0% corresponds to 1000.0V) 16: Output torque (actual value, corresponds to the percentage of motor rated torque)	0	○	F606
P07.07	AO1 output function selection		0	○	F607
P07.08	AO2 output function selection		1	○	F608
P07.09	FM output upper limit (High speed pulse)	0.01kHz~100.00kHz	50.00 kHz	○	F609

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P07.10	AO1 offset coefficient	-100.0% ~ +100.0%	0.0%	○	F60A
P07.11	AO1 gain	-10.00V ~ +10.00	1.00	○	F60B
P07.12	AO2 offset coefficient	-100.0% ~ +100.0%	0.0%	○	F60C
P07.13	AO2 gain	-10.00V ~ +10.00	1.00	○	F60D
P07.14	AO1 filter time	0.00s ~ 10.00s	0.0s	○	F60E
P07.15	AO2 filter time	0.00s ~ 10.00s	0.0s	○	F60F
P07.16	FM filter time (High speed pulse)	0.00s ~ 10.00s	0.0s	○	F610
P07.17	FM output delay time (Open collector)	0.0s ~ 3600.0s	0.0s	○	F611
P07.18	Relay 1 output delay time	0.0s ~ 3600.0s	0.0s	○	F612
P07.20	Relay 2 output delay time (on extension card)	0.0s ~ 3600.0s	0.0s	○	F613
P07.20	DO1 output delay time	0.0s ~ 3600.0s	0.0s	○	F614
P07.21	Reserved				
P07.22	Output terminal valid status selection	0: Positive logic 1: Negative logic Units place: FM Tens place: Relay 1 Hundreds place: Relay 2 Thousands place: DO1 Ten thousands Reserved	00000	○	F616
P08 Group: Keypad and Display					
P08.00	LCD display language select	0: Chinese 1: English	0	◎	F700
P08.01	MF.K function selection	0: Invalid 1: Switching between keypad command and remote command (terminal command or communication command) 2: FDW/REV Switching 3: Forward Jog	0	◎	F701

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		4: Reverse Jog 5: Reverse run			
P08.02	STOP/RESET operation selection	0: Valid under keypad control mode 1: Always valid	1	○	F702
P08.03	Parameters display selection	**Unit bit:** P00 group parameters **Tens bit**: P18~P30 group parameters 0: No display 1: Display	11	○	F703
P08.04	Customized groups parameters display selection	**Unit bit:** user defined parameters **Tens bit**: under changed parameters 0: No display 1: Display	00	○	F704
P08-05	Parameters modification selection	0: Parameter can be modified 1: Parameter cannot be modified	0	○	F705
P08.06	Running status display 1 (LED keypad upper line)	0000 ~ FFFF Bit00: Running frequency 1 (Hz) Bit01: Setting frequency (Hz) Bit02: DC Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: DI input status Bit08: Digital output terminals status Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: Keypad potentiometer voltage (V) Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	401F	○	F706
P08.07	Running status display 2 (LED keypad upper line)	0000 ~ FFFF Bit00: PID feedback Bit01: Simple PLC running step Bit02: DI5 input pulse (kHz)	0000	○	F707

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		Bit03: Running frequency 2 (Hz) Bit04: Remain running time Bit05: AI1 voltage before calibration (V) Bit06: AI2 voltage before calibration (V) Bit07: Keypad potentiometer voltage before calibration (V) Bit08: Linear speed Bit09: Current power-on time (Hour) Bit10: Current running time (Min) Bit11: DI5 input pulse correspond frequency (Hz) Bit12: Communication setting frequency Bit13: Reserved Bit14: Main frequency A display (Hz) Bit15: Auxiliary frequency B display (Hz)			
P08.08	Stop status display (LED keypad upper line)	0000 ~ FFFF Bit00: Setting frequency (Hz) Bit01: DC Bus voltage (V) Bit02: DI input status Bit03: Digital output terminals status Bit04: AI1 voltage(V) Bit05: AI2 voltage(V) Bit06: Reserved Bit07: Count value Bit08: Length value Bit09: Simple PLC running step Bit10: Load speed Bit11: PID setting Bit12: DI5 input frequency (kHz)	0033	○	F708
P08.09	Parameters display selection (LED keypad lower line)	0 ~ 32 0: Running frequency 1 (Hz) 1: Setting frequency (Hz) 2: DC Bus voltage (V) 3: Output voltage (V)	4	○	F709

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		4: Output current (A) 5: Output power (kW) 6: Output torque (%) 7: DI input status 8: Digital output terminals status 9: AI1 voltage (V) 10: AI2 voltage (V) 11: Keypad potentiometer voltage (V) 12: Count value 13: Length value 14: Load speed display 15: PID setting 16: PID feedback 17: Simple PLC running step 18: DI5 input pulse (kHz) 19: Running frequency 2 (Hz) 20: Remain running time 21: AI1 voltage before calibration (V) 22: AI2 voltage before calibration (V) 23: Keypad potentiometer voltage before calibration (V) 24: Linear speed 25: Current power-on time (Hour) 26: Current running time (Min) 27: Radiator temperature 28: Communication setting frequency 29: Reserved 30: Main frequency A display (Hz) 31: Auxiliary frequency B display (Hz)			
P08.10	Load speed display coefficient	0.0001 ~ 6.5000	1.0000	○	F70A
P08.11	IGBT module radiator temperature	0.0℃~ 100.0℃	-	●	F70B
P08.12	Rectifier radiator	0.0℃~ 100.0℃	-	●	F70C

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
	temperature				
P08.13	Accumulated running time	0h ~ 65535h	-	●	F70D
P08.14	Model No.	-	-	●	F70E
P08.15	Software version No.	-	-	●	F70F
P08.16	Load speed display decimal place	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	1	○	F710
P08.17	Accumulated Power-on time	0h ~ 65535h	-	●	F711
P08.18	Accumulated power consumption	0kWh ~ 65535kWh	-	●	F712
P09 Group: Enhanced Function					
P09.00	Jog running frequency	0.00Hz ~ Max. frequency	2.00Hz	○	F800
P09.01	Jog acceleration time	0.0s ~ 6500.0s	20.0s	○	F801
P09.02	Jog deceleration time	0.0s ~ 6500.0s	20.0s	○	F802
P09.03	Acceleration time 2	0.0s ~ 6500.0s	Model depend	○	F803
P09.04	Deceleration time 2	0.0s ~ 6500.0s	Model depend	○	F804
P09.05	Acceleration time 3	0.0s ~ 6500.0s	Model depend	○	F805
P09.06	Deceleration time 3	0.0s ~ 6500.0s	Model depend	○	F806
P09.07	Acceleration time 4	0.0s ~ 6500.0s	Model depend	○	F807
P09.08	Deceleration time 4	0.0s ~ 6500.0s	Model depend	○	F808
P09.09	Jump frequency 1	0.00Hz ~ Max. frequency	0.00Hz	○	F809
P09.10	Jump frequency 2	0.00Hz ~ Max. frequency	0.00Hz	○	F80A
P09.11	Jump frequency amplitude	0.00Hz ~ Max. frequency	0.01Hz	○	F80B
P09.12	FWD/REV dead time	0.0s ~ 3000.0s	0.0s	○	F80C

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P09.13	Reverse control	0: Enable 1: Disable	0	○	F80D
P09.14	Action when setting frequency lower than frequency lower limit	0: Running at frequency lower limit 1: Stop 2: Zero-speed running	0	○	F80E
P09.15	Droop control	0.00Hz ~ 10.00Hz	0.00Hz	○	F80F
P09.16	Set accumulated power-on arrival time	0h ~ 65000h	0h	○	F810
P09.17	Set accumulated running arrival time	0h ~ 65000h	0h	○	F811
P09.18	Terminal start signal valid selection when power-on	0: Terminal start signal is valid after power-on 1: Terminal start signal is invalid after power-on	1	○	F812
P09.19	Frequency detection value (FDT1)	0.00Hz ~ Max. frequency	50.00Hz	○	F813
P09.20	Frequency detection lagging value (FDT1)	0.0% ~ 100.0% (P09.19)	5.0%	○	F814
P09.21	Frequency arrival detection amplitude	0.0% ~ 100.0% (Max. frequency)	0.0%	○	F815
P09.22	Jump frequency control valid selection during ACC/DEC	0: Invalid 1: Valid	1	○	F816
P09.23~ P09.24	Reserved				
P09.25	Acceleration time 1 and acceleration time 2 switching frequency point	0.00Hz ~ P01.13 (maximum frequency)	0.00Hz	○	F819
P09.26	Deceleration time 1 and deceleration time 2 switching frequency point	0.00Hz ~ P01.13 (maximum frequency)	0.00Hz	○	F81A
P09.27	Terminal jog priority	0: Invalid 1: Valid	0	○	F81B

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P09.28	Frequency detection value (FDT2)	0.00Hz ~ P01.13 (maximum frequency)	50.00Hz	○	F81C
P09.29	Frequency detection lagging value (FDT2)	0.0% ~ 100.0% (P09.28)	5.0%	○	F81D
P09.30	Any arrival frequency detection value 1	0.00Hz ~ P01.13 (maximum frequency)	50.00Hz	○	F81E
P09.31	Any arrival frequency detection amplitude 1	0.0% ~ 100.0% (maximum frequency)	0.0%	○	F81F
P09.32	Any arrival frequency detection value 2	0.00Hz ~ P01.13 (maximum frequency)	50.00Hz	○	F820
P09.33	Any arrival frequency detection amplitude 2	0.0% ~ 100.0% (maximum frequency)	0.0%	○	F821
P09.34	Zero-current detection level	0.0% ~ 300.0% 100.0% corresponds to motor rated current	5.0%	○	F822
P09.35	Zero-current detection delay time	0.10s ~ 600.00s	0.10s	○	F823
P09.36	Output current over limit value	0.0% (No detection) 0.1% ~ 300.0% (motor rated current)	180.0%	○	F824
P09.37	Output current over limit detection delay time	0.00s ~ 600.00s	0.00s	○	F825
P09.38	Any arrival current 1	0.0% ~ 300.0% (motor rated current)	100.0%	○	F826
P09.39	Any arrival current 1 amplitude	0.0% ~ 100.0% (motor rated current)	0.0%	○	F827
P09.40	Any arrival current 2	0.0% ~ 300.0% (motor rated current)	100.0%	○	F828
P09.41	Any arrival current 2 amplitude	0.0% ~ 100.0% (motor rated current)	0.0%	○	F829
P09.42	Timing function selection	0: Invalid 1: Valid	0	○	F82A
P09.43	Timing running duration source selection	0: P09.44 1: AI1 2: AI2 3: Keypad potentiometer	0	○	F82B

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		(Analog input scale corresponds to P09.44)			
P09.44	Timing running duration	0.0Min ~ 6500.0Min	0.0Min	○	F82C
P09.45	AI1 input voltage protection lower limit	0.00V ~ P09.46	3.10V	○	F82D
P09.46	AI1 input voltage protection upper limit	P09.45 ~ 10.00V	6.80V	○	F82E
P09.47	Module temperature arrival	0℃ ~ 100℃	75℃	○	F82F
P09.48	Cooling fan control	0: Start the cooling fan while start the frequency inverter 1: Start the cooling fan while switch on the power supply	0	○	F830
P09.49	Present running arrival time setting	0.0~6500.0Min	0.0Min	○	F831
P10 Group: fault and Protection					
P10.00	Motor overload protection selection	0: Disable 1: Enable	1	○	F900
P10.01	Motor overload protection gain	0.20 ~ 10.00	1.00	○	F901
P10.02	Motor overload pre-alarm coefficient	50% ~ 100%	80%	○	F902
P10.03	Stall over-voltage gain	0 ~ 100	0	○	F903
P10.04	Stall over-voltage point / Braking threshold	120% ~ 150%	130%	○	F904
P10.05	Stall over current gain	0 ~ 100	20	○	F905
P10.06	Stall over-current protection current	100% ~ 200%	150%	○	F906
P10.07	Short-circuit to ground protection selection when power-on	0: Invalid 1: Valid	1	○	F907
P10.08	Braking unit reaction voltage	200.0 ~ 2000.0V	690V	○	F908

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P10.09	Fault auto-reset times	0 ~ 20	0	○	F909
P10.10	DO terminal output selection during fault auto-reset	0: No action 1: Action	0	○	F90A
P10.11	Fault auto-reset interval	0.1s ~ 100.0s	1.0s	○	F90B
P10.12	Input phase failure protection selection	10: Disable 11: Enable	11	○	F90C
P10.13	Output phase failure protection selection	0: Disable 1: Enable	1	○	F90D
P10.14	The first fault type	0: No fault 1: Reserved 2: ACC over current 3: DEC over current	—	●	F90E
P10.15	The second fault type		—	●	F90F

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P10.16	The third (latest) fault type	4: Over current in constant speed 5: Over voltage in ACC process 6: Over voltage in DEC process 7: Over voltage in constant speed 8: Buffer resistor overload 9: Under voltage 10: Inverter overload 11: Motor overload 12: Input phase failure 13: Output phase failure 14: IGBT Module overheat 15: External fault 16: Communication fault 17: DC contactor fault 18: Current detection fault 19: Motor auto-tuning fault 20: Encoder / PG card abnormal 21: Parameter R/W fault 22: Inverter hardware fault 23: Motor short-circuit to ground 24: Reserved 25: Reserved 26: Running time arrival 27: User self-defined fault 1 28: User self-defined fault 2 29: Power-on time arrival 30: Off load 31: PID feedback lost when running 40: Fast current limiting over time 41 ~51: Reserved	—	●	F910
P10.17	Frequency at the third (latest) fault	—	—	●	F911
P10.18	Current at the third (latest) fault	—	—	●	F912
P10.19	DC Bus voltage at the third (latest) fault	—	—	●	F913

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P10.20	Input terminal's status at the third (latest) fault	—	—	●	F914
P10.21	Output terminal's status at the third (latest) fault	—	—	●	F915
P10.22	Inverter status at the third (latest) fault	—	—	●	F916
P10.23	Power-on time at the third (latest) fault	—	—	●	F917
P10.24	Running time at the third (latest) fault	—	—	●	F918
P9 -25 ~ P10.26	Reserved				
P10.27	Frequency at the second fault	—	—	●	F91B
P10.28	Current at the second fault	—	—	●	F91C
P10.29	DC Bus voltage at the second fault	—	—	●	F91D
P10.30	Input terminal's status at the second fault	—	—	●	F91E
P10.31	Output terminal's status at the second fault	—	—	●	F91F
P10.32	Inverter status at the second fault	—	—	●	F920
P10.33	Power-on time at the second fault	—	—	●	F921
P10.34	Running time at the second fault	—	—	●	F922
P9 -35 ~ P10.36	Reserved				
P10.37	Frequency at the first fault	—	—	●	F925
P10.38	Current at the first fault	—	—	●	F926
P10.39	DC Bus voltage at the first fault	—	—	●	F927

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P10.40	Input terminal's status at the first fault	—	—	●	F928
P10.41	Output terminal's status at the first fault	—	—	●	F929
P10.42	Inverter status at the first fault	—	—	●	F92A
P10.43	Power-on time at the first fault	—	—	●	F92B
P10.44	Running time at the first fault	—	—	●	F92C
P10.47	Inverter reaction select 1 while fault happen	**Unit bit**: Motor overload (11) **Tens bit**: Input phase failure (12) **Hundreds bit**: output phase failure (13) **Thousands bit**: external fault (15) **Ten thousands bit**: Communication abnormal (16) 0: Coast to stop 1: Stop according to the set of P02.10 2: Keep running	00000	○	F92F
P10.48	Inverter reaction select 2 while fault happen	**Unit bit**: Reserved **Tens bit**: Parameters R/W error (21) **Hundreds bit**: Reserved **Thousands bit**: Reserved **Ten thousands bit**: Running time arrival (26) 0: Coast to stop 1: Stop according to the set of P02.10	00000	○	F930
P10.49	Inverter reaction select 3 while fault happen	**Unit bit**: User self-defined fault 1(27) **Tens bit**: User self-defined fault 2 (28) **Hundreds bit**: Power on time arrival (29)	00000	○	F931

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		Ten thousands bit: PID feedback signal lost during running (31) 0: Coast to stop 1: Stop according to the set of P02.10 2: Keep running **Thousands bit**: Off-load (30) 0: Coast to stop 1: Decelerate to stop 2: Keep running when the speed drops to 7% of inverter rated frequency. And recover to the set frequency if the load becomes normal.			
P10.50	Reserved				
P10.54	Running speed selection while fault happen	0: Keep running at present speed 1: Keep running at set frequency 2: Keep running at upper limit frequency 3: Keep running at lower limit frequency 4: Keep running at abnormal standby frequency (P10.55)	0	○	F936
P10.55	Abnormal standby frequency	60.0% ~100.0% (100.0% correspond to maximum frequency P01.10)	100.0%	○	F937
P10.56 ~ P10.58	Reserved				
P10.59	Instantaneous power-off action selection	0: Invalid 1: Deceleration 2: Deceleration-to-stop	0	○	F93B
P10.60	Reserved				
P10.61	Recover judgment time when Instantaneous power-off	0.00s ~ 100.00s	0.50s	○	F93D

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P10.62	Recover judgment voltage when Instantaneous power-off	60 ~ 100.0% (Standard DC BUS voltage)	80.0%	○	F93E
P10.63	Off-load protection selection	0: Disable 1: Enable	0	○	F93F
P10.64	Off-load detection level	0.0 ~ 100.0%	10.0%	○	F940
P10.65	Off-load detection time	0.0 ~ 60.0s	1.0s	○	F941
P10.66	Inverter overheat pre-alarm value	0 ~ 150℃	95℃	◎	F942
P10.67~ P10.70	Reserved				
P11 Group: PID Function					
P11.00	PID set channel	0: P11.01 1: AI1 2: AI2 3: Keypad potentiometer 4: DI5 (High speed pulse) 5: Communication (Modbus) 6: Multi-step command 7: Set by UP/DOWN buttons on the keypad	0	○	FA00
P11.01	PID set through keypad	0.0~100.0bar	3.0bar	○	FA01
P11.02	PID feedback source	0: AI1 1: AI2 2: Reserved 3: AI1-AI2 4: DI5 (High speed pulse) 5: Communication (Modbus) 6: AI1+AI2 7: MAX (|AI1|, |AI2|) 8: MIN (|AI1|, |AI2|)	0	○	FA02
P11.03	PID action direction	0: Positive 1: Negative	0	○	FA03
P11.04	PID given feedback range	0~100.0bar	10.0bar	○	FA04
P11.05	Proportional gain Kp1	0.0 ~ 100.0	10.0	○	FA05
P11.06	Integration time Ti1	0.01s ~ 10.00s	0.1s	○	FA06

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P11.07	Differential time Td1	0.000s ~ 10.000s	0.000s	○	FA07
P11.08	Cutoff frequency of PID reverse	0.00 ~ P01.13 (maximum frequency)	0.00Hz	○	FA08
P11.09	PID deviation limit	0.0% ~ 100.0%	0.0%	○	FA09
P11.10	PID differential amplitude	0.00% ~ 100.00%	0.10%	○	FA0A
P11.11	PID given filter time	0.00 ~ 650.00s	0.00s	○	FA0B
P11.12	PID feedback filter time	0.00 ~ 60.00s	0.00s	○	FA0C
P11.13	PID output filter time	0.00 ~ 60.00s	0.00s	○	FA0D
P11.14	Dormancy pressure deviation percentage	0.0 ~ 5.0%	0.0%	○	FA0E
P11.15	Proportional gain Kp2	0.0 ~ 100.0	20.0	○	FA0F
P11.16	Integration time Ti2	0.01s ~ 10.00s	2.00s	○	FA10
P11.17	Differential time Td2	0.000s ~ 10.000s	0.000s	○	FA11
P11.18	PID parameter switching condition	0: No switching 1: Switching via DIn terminals 2: Automatic switching according to the deviation	0	○	FA12
P11.19	PID parameter switching deviation 1	0.0% ~P11.20	20.0%	○	FA13
P11.20	PID parameter switching deviation 2	P11.19 ~ 100.0%	80.0%	○	FA14
P11.21	PID initial value	0.0% ~ 100.0%	0.0%	○	FA15
P11.22	PID initial value holding time	0.00 ~ 650.00s	0.00s	○	FA16
P11.23	Forward maximum value between two output deviation	0.00% ~ 100.00%	1.00%	○	FA17
P11.24	Reverse maximum value between two output deviation	0.00% ~ 100.00%	1.00%	○	FA18

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P11.25	PID integration attribute	Units place: Integration separate 0: Invalid 1: Valid Tens place: Whether Stop integrating after output reach the limitation 0: Keep integrating 1: Stop integrating	00	○	FA19
P11.26	PID feedback lost detection value	0.0%: No judgment for feedback lost 0.1% ~ 100.0%	0.0%	○	FA1A
P11.27	PID feedback lost detection time	0.0s ~ 20.0s	0.0s	○	FA1B
P11.28	PID stop calculation	0: No calculation when stop 1: Calculation when stop	1	○	FA1C
P12 Group: Wobble Frequency, Fixed Length, Counting					
P12.00	Wobble frequency setting mode	0: Relative to center frequency 1: Relative to maximum frequency	0	○	FB00
P12.01	Wobble frequency amplitude	0.0% ~ 100.0%	0.0%	○	FB01
P12.02	Sudden Jump frequency amplitude	0.0% ~ 50.0%	0.0%	○	FB02
P12.03	Wobble frequency cycle	0.1s ~ 3000.0s	10.0s	○	FB03
P12.04	Triangular wave rise time coefficient	0.1% ~ 100.0%	50.0%	○	FB04
P12.05	Setting length	0m ~ 65535m	1000m	○	FB05
P12.06	Actual length	0m ~ 65535m	0m	○	FB06
P12.07	Number of pulses per meter	0.1 ~ 6553.5	100.0	○	FB07
P12.08	Setting count value	1 ~ 65535	1000	○	FB08
P12.09	Designated count value	1 ~ 65535	1000	○	FB09
P13 Group: Multi-step Command and Simple PLC					
P13.00	Multi-step speed 0	-100.0% ~ 100.0%	0.0%	○	FC00

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P13.01	Multi-step speed 1	-100.0% ~ 100.0%	0.0%	○	FC01
P13.02	Multi-step speed 2	-100.0% ~ 100.0%	0.0%	○	FC02
P13.03	Multi-step speed 3	-100.0% ~ 100.0%	0.0%	○	FC03
P13.04	Multi-step speed 4	-100.0% ~ 100.0%	0.0%	○	FC04
P13.05	Multi-step speed 5	-100.0% ~ 100.0%	0.0%	○	FC05
P13.06	Multi-step speed 6	-100.0% ~ 100.0%	0.0%	○	FC06
P13.07	Multi-step speed 7	-100.0% ~ 100.0%	0.0%	○	FC07
P13.08	Multi-step speed 8	-100.0% ~ 100.0%	0.0%	○	FC08
P13.09	Multi-step speed 9	-100.0% ~ 100.0%	0.0%	○	FC09
P13.10	Multi-step speed 10	-100.0% ~ 100.0%	0.0%	○	FC0A
P13.11	Multi-step speed 11	-100.0% ~ 100.0%	0.0%	○	FC0B
P13.12	Multi-step speed 12	-100.0% ~ 100.0%	0.0%	○	FC0C
P13.13	Multi-step speed 13	-100.0% ~ 100.0%	0.0%	○	FC0D
P13.14	Multi-step speed 14	-100.0% ~ 100.0%	0.0%	○	FC0E
P13.15	Multi-step speed 15	-100.0% ~ 100.0%	0.0%	○	FC0F
P13.16	0^{th} step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC12
P13.17	0^{th} step ACC/DEC time selection	0 ~ 3	0	○	FC13
P13.18	1^{st} step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC14
P13.19	1^{st} step ACC/DEC time selection	0 ~ 3	0	○	FC15
P13.20	2^{nd} step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC16
P13.21	2^{nd} step ACC/DEC time selection	0 ~ 3	0	○	FC17

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P13.22	3rd step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC18
P13.23	3rd step ACC/DEC time selection	0 ~ 3	0	○	FC19
P13.24	4th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC1A
P13.25	4th step ACC/DEC time selection	0 ~ 3	0	○	FC1B
P13.26	5th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC1C
P13.27	5th step ACC/DEC time selection	0 ~ 3	0	○	FC1D
P13.28	6th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC1E
P13.29	6th step ACC/DEC time selection	0 ~ 3	0	○	FC1F
P13.30	7th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC20
P13.31	7th step ACC/DEC time selection	0 ~ 3	0	○	FC21
P13.32	8th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC22
P13.33	8th step ACC/DEC time selection	0 ~ 3	0	○	FC23
P13.34	9th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC24
P13.35	9th step ACC/DEC time selection	0 ~ 3	0	○	FC25
P13.36	10th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC26
P13.37	10th step ACC/DEC time selection	0 ~ 3	0	○	FC27
P13.38	11th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC28
P13.39	11th step ACC/DEC time selection	0 ~ 3	0	○	FC29
P13.40	12th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC2A
P13.41	12th step ACC/DEC time selection	0 ~ 3	0	○	FC2B
P13.42	13th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC2C

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P13.43	13th step ACC/DEC time selection	0 ~ 3	0	○	FC2D
P13.44	14th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC2E
P13.45	14th step ACC/DEC time selection	0 ~ 3	0	○	FC2F
P13.46	15th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○	FC30
P13.47	15th step ACC/DEC time selection	0 ~ 3	0	○	FC31
P13.48	Timing unit under simple PLC mode	0: s (second) 1: h (hour)	0	○	FC32
P13.49	Simple PLC running mode	0: Stop after one cycle 1: Keep last frequency after one cycle 2: Circular running	0	○	FC10
P13.50	Simple PLC status memory selection	**Units bit:** Memory selection when power-off 0: Not memory 1: Memory **Tens bit:** Memory selection when stop 0: Not memory 1: Memory	00	○	FC11
P13.51	Multi-step speed 0 given channel	0: P13.00 1: AI1 2: AI2 3: Keypad potentiometer 4: DI5 (High speed pulse) 5: PID control 6: Keypad setting frequency (P01.11), can be modified via UP/DOWN	0	○	FC33
P14 Group: Communication Parameters					
P14.00	Baud rate	**Unit bit**: Modbus 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS	6005	○	FD00

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS **Tens bi**t: Reserved **Hundreds bit**: Reserved **Thousands bit**: Reserved			
P14.01	Data format	0: No parity check (8-N-2) 1: Even parity check (8-E-1) 2: Odd parity check (8-O-1) 3: No parity check (8-N-1)	0	○	FD01
P14.02	Inverter address	1 ~ 247, 0 is broadcast address	1	○	FD02
P14.03	Communication delay time	0ms ~ 20ms	2ms	○	FD03
P14.04	Communication timeout time	0.0 (invalid) 0.1s ~ 60.0s	0.0	○	FD04
P14.05	Communication protocol selection	**Unit bit**: Modbus **Tens bit**: Reserved 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol	31	○	FD05
P14.06	Communication read current resolution	0: 0.01A 1: 0.1A	0	○	FD06
P14.07	Master or slave communication selection	0: Slave communication 1: Master communication	0	○	FD07
P15 Group: Special Parameters for Constant Pressure Water Supply					
P15.00	Simple Macro Debugging function	0: No function 1: One VFD drives two pumps 2: Community water supply 3; Hotel water supply 4: Fire water supply 5: Water supply by pressurized water pump 6: Water supply by deep-well pump	0	○	FE00
P15.01	Wake up pressure	0 ~P15.03	2.5bar	○	FE01

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P15.02	Wake up delay time	0.0s ~ 6500.0s	0.0s	○	FE02
P15.03	Dormancy pressure	P15.01 ~ Measure range of feedback pressure	3.5bar	○	FE03
P15.04	Dormancy delay time	0.0s ~ 6500.0s	60.0s	○	FE04
P15.05	Enable of dormancy and wake up by the set difference	**0: Disable** (Wake up and dormancy by set of P15.01~P15.04) **1: Enable** (Wake up and dormancy by set of P15.06~P15.07)	1	○	FE05
P15.06	Difference value set for wake up pressure	0 ~ 100.0bar	0.5	○	FE06
P15.07	Difference value set for dormancy pressure	0 ~ 100.0bar	0.5	○	FE07
P15.08	High pressure alarm value	0 ~ Measure range of pressure sensor	0	○	FE08
P15.09	High pressure alarm delay time	0 ~ 6500.0s	0.0s	○	FE09
P15.10	Low pressure alarm value	0 ~ Measure range of pressure sensor	0	○	FE0A
P15.11	Low pressure alarm delay time	0 ~ 6500.0s	0.0s	○	FE0B
P15.12	Start pressure for the water inlet	0 ~ Measure range of pressure sensor (P01.05=3, and it must use AI2 terminal to connect the sensor)	3.0bar	○	FE0C
P15.13	Stop pressure for the water inlet	0 ~ Measure range of pressure sensor	3.2bar	○	FE0D
P15.14	Number of auxiliary pumps	0~3	0	○	FE0E
P15.15	Auxiliary pumps start wait time	0 ~ 1000.0s	0.0s	○	FE0F
P15.16	Auxiliary pump circuit breaker wait time	0 ~ 1000.0s	0.0s	○	FE10
P15.17	Relay 1 action frequency set	0~50Hz When the inverter reach to this set frequency, output ON signal	50.00Hz	○	FE11

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P15.18	Relay 1 disconnect frequency set	0~50Hz When the inverter reach to this set frequency, output OFF signal	30.00Hz	○	FE12
P15.19	Water level control channel	0: Invalid 1: AI1 2: AI2 3: Keypad potentiometer When select 0, water level control is invalid. After selecting 1, 2, 3, the settings of P15.20~P15.23 will be valid.	0	○	FE13
P15.20	Water level threshold	0~100.0% If the detected water level is lower than this value, and after the delay time of P15.21, it will give full-water alarm (A-tF), and inverter enter into dormancy status. In another condition, during the delay time, the feedback signal is bigger than the threshold, the delay time will be clear, system recover to normal water status.	25.0%	○	FE14
P15.21	Full water delay time	0 ~ 1000.0s	60.0s	○	FE15
P15.22	Lack of water delay time	0 ~ 1000.0s	6.0s	○	FE16
P15.23	Damaged point of liquid level probe	0.0~100.0% 0.0 means this function is invalid For none 0 set value, when the detected water level control analog signal is bigger than this set value, it give alarm of (E.tSF) and inverter stops	0.0	○	FE17
P15.24	Lack of water protection function	0: Close 1: Make judgement by frequency and pressure	0	○	FE18
P15.25	Detection pressure for lack of water	0.00~Set pressure value (bar) It is valid when P15.19=1 When the feedback pressure is	0.5bar	○	FE19

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
		lower than this value, it will judge whether it lack of water or not			
P15.26	Detection frequency for lack of water	0~50.00Hz It is valid when P15.19=1 When the running frequency is bigger or equal this frequency and the lack of water detection pressure is lower than P15.20, it means the system is under lack of water status.	50.00Hz	○	FE1A
P15.27	Lack of water detection delay time	0~6553.5s	1	○	FE1B
P15.28	Water comes detection pressure	0～Measure range of pressure sensor	3.0bar	○	FE1C
P15.29	Water comes detection time	0~9999s	20.0s	○	FE1D
P15.30~P15.32	Reserved			○	
P15.33	Dormancy mode	0: Invalid 1: When the feedback pressure is bigger than the dormancy pressure, inverter enter into dormancy status; 2: then the running frequency is lower than the dormancy output frequency (P15.34), inverter enter into dormancy status; 3: Feedback pressure is bigger than the dormancy pressure, and the running frequency is lower than the dormancy output frequency, inverter enter into dormancy status.	0	○	FE21
P15.34	Dormancy output frequency	0~P01.15	20.00Hz	○	FE22
P15.35	Dormancy stop mode	0: Deceleration to stop 1: Coast to stop	0	○	FE23
P15.36	Percentage of dormancy frequency	0~100.0%	0	○	FE24
P18 Group: Torque Control Parameters					

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P18.00	Speed/torque control mode selection	0: Speed control 1: Torque control	0	○	A000
P18.01	Torque setting source selection under torque control mode	0: Keypad (P18.03) 1: AI1 2: AI2 3: Keypad potentiometer 4: High speed pulse (DI5) 5: Communication 6: Min (AI1,AI2) 7: Max (AI1,AI2) The full range of 1~7, corresponds to the set of P18.03	0	○	A001
P18.03	Torque setting through keypad	-200.0% ~ 200.0%	150.0%	○	A003
P18.04	The upper limit frequency setting source selection under torque control mode	0: Keypad (P18.05 or P18.06) 1: AI1 2: AI2 3: Keypad potentiometer 4: High speed pulse (DI5) 5: Communication 6: Min (AI1,AI2) 7: Max (AI1,AI2)	0	○	A004
P18.05	Forward maximum frequency in torque control mode	0.00Hz ~ Maximum frequency	50.00Hz	○	A005
P18.06	Reverse maximum frequency in torque control mode	0.00Hz ~ Maximum frequency	50.00Hz	○	A006
P18.07	ACC time in torque control mode	0.00s ~ 650.00s	0.00s	○	A007
P18.08	DEC time in torque control mode	0.00s ~ 650.00s	0.00s	○	A008
P19 Group: Reserved					
P23 Group: Control Optimized Parameters					
P23.00	DPWM switching upper limit frequency	0.00Hz ~ 50.00Hz	8.00Hz	○	A500
P23.01	PWM regulation mode	0: Asynchronous mode 1: Synchronous mode	0	○	A501

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P23.02	Dead zone compensation mode selection	0: no compensation 1: compensation mode 1 2: compensation mode 2	1	○	A502
P23.03	Depth of random PWM	0: Random PWM invalid 1~10: depth of random PWM	0	○	A503
P23.04	Fast current limitation enable	0: Disable 1: Enable	1	○	A504
P23.05	Maximum output voltage	100% ~ 110%	105%	○	A505
P23.06	Under voltage level setting	200.0V ~ 2500.0V	350.0V	○	A506
P23.07	SVC optimized mode selection	0: No optimized 1: Optimized mode 1 2: Optimized mode 2	1	○	A507
P23.08	Dead time adjustment	100% ~ 200%	150%	○	A508
P23.09	Over voltage level setting	200.0V ~ 2500.0V	810.0V	○	A509
P23.10	Enable of change the carrier frequency automatically at low frequency	0: Disable 1: Enable	1	○	A50A
P23.11	Enable of zero speed output	0: Disable 1: Enable	1	○	A50B
P23.12	Sensitivity adjustment of input phase failure protection	0 .0 ~ 30.0%	13.0%	○	A50C
P24 Group: Reserved					
P27 Group: Special Parameters for Lift Application					
P27.00	Enable of brake control	0: Disable 1: Enable	1	○	A900
P27.01	Brake release frequency	0.00 ~ 10.00Hz	2.00Hz	○	A901
P27.02	Brake release current	0.0~150.0A	30.0A	○	A902
P27.03	Brake release time	0.00 ~ 10.00S	0.5s	○	A903
P27.04	Brake release delay time	0.00 ~ 10.00S	1.0s	○	A904

Function code	Name	Detailed instruction	Factory default	Modify	COM. ADD
P27.05	Brake hold frequency	0.00 ~ 10.00Hz	2.00Hz	○	A905
P27.06	Brake hold time	0.00 ~ 10.00S	0.50s	○	A906
P27.07	Brake hold delay time	0.00 ~ 10.00S	0.00s	○	A907
P30 Group: Reserved					

5.2 Monitoring Parameter Table (P00 group)

Function code	Name	Display range	Modify	COM. ADD
P00.00	Running frequency (Hz)	0 ~ 500.00Hz	●	7000
P00.01	Set frequency (Hz)	0 ~ 500.00Hz	●	7001
P00.02	DC Bus voltage (V)	0 ~ 3000V	●	7002
P00.03	Output voltage (V)	0 ~ 1140V	●	7003
P00.04	Output current (A)	0 ~ 655.35A	●	7004
P00.05	Output power (kW)	0 ~ 32767KW	●	7005
P00.06	Output torque (%)	-200.0% ~ 200.0%	●	7006
P00.07	DI input status	0 ~ 32767	●	7007
P00.08	Output digital terminals status	0 ~ 1023	●	7008
P00.09	AI1 voltage (V)	0 ~ 10.57V	●	7009
P00.10	AI2 voltage (V)	0 ~ 10.57V	●	700A
P00.11	Keypad potentiometer voltage (V)	0 ~ 10.57V	●	700B
P00.12	Count value	0 ~ 65535	●	700C
P00.13	Length value	0 ~ 65535	●	700D
P00.14	Load speed	0 ~ 65535	●	700E
P00.15	PID set value	0 ~ 100.0bar	●	700F
P00.16	PID feedback value	0 ~ 100.0bar	●	7010
P00.17	Simple PLC present running step	0 ~ 16	●	7011

Function code	Name	Display range	Modify	COM. ADD
P00.18	DI5 (High speed pulse) input frequency (Hz)	0 ~ 100.00kHz	●	7012
P00.19	Feedback speed (unit 0.1Hz)	-500.00Hz ~ 500.00Hz	●	7013
P00.20	Remain running time	0 ~ 65535Min	●	7014
P00.21	AI1 voltage before calibration	0 ~ 10.57V	●	7015
P00.22	AI2 voltage before calibration	0 ~ 10.57V	●	7016
P00.23	Reserved	0 ~ 10.57V	●	7017
P00.24	linear speed	0 ~ 65535m/Min	●	7018
P00.25	Current power-on time	0 ~ 65535Min	●	7019
P00.26	Current running time	0 ~ 65535Min	●	701A
P00.27	DI5 input pulse frequency	0 ~ 65535Hz	●	701B
P00.28	Communication setting value	-100.0% ~ 100.0%	●	701C
P00.29	Reserved		●	701D
P00.30	Main frequency A display	0 ~ 500.00Hz	●	701E
P00.31	Auxiliary frequency B display	0 ~ 500.00Hz	●	701F
P00.32	Check any memory address value	--	●	7020
P00.33	Reserved		●	7021
P00.34	Reserved		●	7022
P00.35	Target torque (%)	-200.0% ~ 200.0%	●	7023
P00.36	Reserved		●	7024
P00.37	Angle of power factor		●	7025
P00.38	Reserved		●	7026
P00.39	Target voltage of V/f separate	0 ~ motor rated voltage	●	7027
P00.40	Output voltage of V/f separate	0 ~ motor rated voltage	●	7028
P00.41	DI terminals input status	--	●	7029
P00.42	Output digital terminals status	--	●	702A

Function code	Name	Display range	Modify	COM. ADD
P00.43	Reserved		●	702B
P00.44	Reserved		●	702C
P00.45	Fault information	--	●	703A
P00.59	Set frequency (%)	-100.0% ~ 100.0%	●	703B
P00.60	Running frequency (%)	-100.0% ~ 100.0%	●	703C
P00.61	Inverter status	0 ~ 65535	●	703D
P00.62	Present error code	0 ~ 99	●	703E
P00.63	Reserved		●	703F
P00.64	Reserved		●	7040

Chapter 6 Trouble Shooting

6.1 Fault and Trouble Shooting

Fault Name	Converter short circuit protection
Fault Code	**E.OCX**
Reason	1. Short-circuit or ground fault occurred at inverter output side 2. The cable connecting the motor with the inverter is too long 3. The module is over-heat 4. The cable connections inside the inverter are loosen 5. The control board is abnormal 6. The power board is abnormal 7. The IGBT module is abnormal
Solution	1. Inspect whether motor damaged, insulation worn or cable damaged 2. Install a reactor or output filter 3. Check if the air duct is blocked and if the fan is in normal status, and resolve the existing problems 4. Make sure the cables are connected well 5, 6, 7. Ask for technical support

Fault Name	Over current when acceleration
Fault Code	**E.OC1**
Reason	1. Short-circuit or ground fault occurred at inverter output side 2. Control mode is vector control but don't perform auto-tuning 3. The acceleration time is too short 4. The manual torque boost or V/f curve is not proper 5. The voltage is too low 6. Start the running motor 7. Load is added suddenly during the acceleration 8. Power selection of inverter is too small
Solution	1. Inspect whether motor damaged, insulation worn or cable damaged 2. Identify the motor parameters 3. Increase the acceleration time 4. Adjust the manual torque boost or V/f curve 5. Make the voltage in the normal range 6. Select speed tracking start or start the motor till it stops 7. Cancel the sudden added load 8. Select bigger power inverter

Fault Name	Over-current when deceleration
Fault Code	**E.OC2**
Reason	1. Short-circuit or ground fault occurred at inverter output side 2. Control mode is vector control but don't perform auto-tuning 3. The deceleration time is too short 4. The voltage is too low 5. Load is added suddenly during the deceleration 6. Have not installed braking unit and braking resistor
Solution	1. Inspect whether motor damaged, insulation worn or cable damaged 2. Identify the motor parameters 3. Increase the deceleration time 4. Make the voltage in the normal range 5. Cancel the sudden added load 6. Install braking unit and braking resistor

Fault Name	Over-current when constant speed running
Fault Code	**E.OC3**
Reason	1. Short-circuit or ground fault occurred at inverter output 2. Control mode is vector control but don't perform auto-tuning 3. The voltage is too low 4. Load is added suddenly during running 5. Power selection of inverter is too small
Solution	1. Inspect whether motor damaged, insulation worn or cable damaged 2. Identify the motor parameters 3. Make the voltage in the normal range 4. Cancel the sudden added load 5. Select bigger power inverter

Fault Name	Over-voltage when acceleration
Fault Code	**E.OU1**
Reason	1. The input voltage is too high 2. There is external force driving the motor to run during acceleration 3. The acceleration time is too short 4. Have not installed braking unit and braking resistor
Solution	1. Make the voltage in the normal range 2. Cancel the external force 3. Increase the acceleration time 4. Install braking unit and braking resistor

Fault Name	Over-voltage when deceleration
Fault Code	**E.OU2**
Reason	1. The input voltage is too high 2. There is external force driving the motor to run during deceleration 3. The deceleration time is too short 4. Have not installed braking unit and braking resistor
Solution	1. Make the voltage in the normal range 2. Cancel the external force 3. Increase the deceleration time 4. Install braking unit and braking resistor

Fault Name	Over-voltage when constant speed running
Fault Code	**E.OU3**
Reason	1. The input voltage is too high 2. There is external force driving the motor to run during the inverter running
Solution	1. Make the voltage in the normal range 2. Cancel the external force or install braking resistor

Fault Name	Power-supply fault
Fault Code	**E.BR**
Reason	1. The input voltage is out of range
Solution	1. Make the voltage in the normal range

Fault Name	Under-voltage
Fault Code	**E.LU**
Reason	1. Instantaneous power-off 2. The input voltage is out of range 3. DC Bus voltage is abnormal 4. The rectifier bridge and buffer resistor are abnormal 5. The power board is abnormal 6. The control board is abnormal
Solution	1. Fault Reset 2, 3. Make the voltage in the normal range 4, 5, 6. ask for technical support

Fault Name	Inverter over load
Fault Code	**E.OL1**
Reason	1. The load is too heavy or motor blockage occurs 2. Power selection of inverter is too small
Solution	1. Reduce the load, check the status of motor & machinery 2. Select bigger power inverter

Fault Name	Motor over load
Fault Code	**E.OL2**
Reason	1. P10.00 and P11.01 is set improperly 2. The load is too heavy or motor blockage occurs 3. Power selection of inverter is too small
Solution	1. Set P10.00 and P11.01 properly 2. Reduce the load, check the status of motor & machinery 3. Select bigger power inverter

Fault Name	Input phase failure
Fault Code	**E.PHI**
Reason	1. The input power supply is abnormal 2. The power board is abnormal 3. The control board is abnormal
Solution	1. Check the power supply and eliminate the troubles 2, 3: ask for technical support

Fault Name	Output phase failure
Fault Code	**E.PHO**
Reason	1. The connection between inverter and motor is abnormal 2. Output voltage unbalance during the motor running 3. The power board is abnormal 4. The IGBT module is abnormal
Solution	1. Inspect whether motor damaged, insulation worn or cable damaged 2. Make sure the motor three phase winding is normal 3, 4. Ask for technical support

Fault Name	IGBT module over-heat
Fault Code	**E.OH1**
Reason	1. Ambient temperature is too high 2. Air duct is blocked 3. Cooling fans are broken 4. Thermal resistor(temperature sensor) of the module is broken 5. IGBT module is broken
Solution	1. Reduce the ambient temperature 2. Clear the air duct 3. Replace cooling fans 4, 5. Ask for technical support

Fault Name	External device fault
Fault Code	**E.SET**
Reason	MI terminal receives an external fault signal generated by peripheral device
Solution	Find out the fault source, solve it and reset the inverter

Fault Name	Communication fault
Fault Code	**E.CE**
Reason	1. Master computer works abnormal 2. Communication cable is abnormal 3. Pd group parameters are set improperly
Solution	1. Check the connection of master computer 2. Check the communication connection 3. Set Pd group parameters properly

Fault Name	DC contactor fault
Fault Code	**E.CON**
Reason	1. Power board or power supply board are abnormal 2. DC contactor is abnormal
Solution	1. Replace power board or power supply board 2. Replace DC contactor

Fault Name	Current detection fault
Fault Code	**E.OCC**
Reason	1. Hall sensor is abnormal 2. The power board is abnormal
Solution	1. Check hall sensor and connection 2. Replace the power board

Fault Name	Motor auto-tuning fault
Fault Code	**E.TE**
Reason	1. Motor parameters are set improperly 2. Parameter identification process is delayed
Solution	1. Set parameters according to the motor nameplate 2. Check the cables connecting inverter with motor

Fault Name	Reserved
Fault Code	**Err20**

Fault Name	EEPROM read/write fault
Fault Code	**E.EEP**
Reason	1. EEPROM chip is broken
Solution	1. Replace the control board

Fault Name	Inverter hardware fault
Fault Code	**E.INV**
Reason	1. Over voltage 2. Over current
Solution	1. Handle as over voltage fault 2. Handle as over current fault

Fault Name	Motor short-circuit to ground
Fault Code	**E.STG**
Reason	1. The motor is short-circuit to ground
Solution	1. Replace cables or motor

Fault Name	Accumulated running time arrival
Fault Code	**E.TIO**
Reason	1. The accumulated running time reaches the setting value
Solution	1. Clear the record information via parameter initialization function

Fault Name	User self-defined fault 1
Fault Code	**E.USE1**
Fault Name	User self-defined fault 1
Fault Code	**E.USE2**
Reason	1. DI terminal input the user self-defined fault signal
Solution	1. Check the signal and reset it.

Fault Name	Accumulated power-on time arrival
Fault Code	**E.PUTO**
Reason	1. The accumulated power-on time reaches the setting value
Solution	1. Clear the record information via parameter initialization function

Fault Name	Off-load fault
Fault Code	**E.LOAD**
Reason	1. The inverter running current is smaller than P10.64
Solution	1. Confirm if the load breaks away and P10.64 & P10.65 are set properly

Fault Name	PID feedback lost when running
Fault Code	**E.PID**
Reason	1. PID feedback is smaller than P11.26
Solution	1. Check PID feedback signal or set P11.26 properly

Fault Name	The liquid level probe is damaged
Fault Code	**E.TSF**
Reason	1. The detected water level control signal is bigger than the set value of P15.18
Solution	1. Check the feedback water level signal and the sensor

Fault Name	Pre-alarm for lack of water
Fault Code	**A-LL**
Reason	1. The detected water level signal is lower than the set value of P15.25
Solution	1. Check the real water level

Fault Name	Pre-alarm for full water
Fault Code	**A.TF**
Reason	1. The detected water level control signal is lower than the set value of P15.20
Solution	1. Check the real water level

Fault Name	Current-limiting fault
Fault Code	**E.CBC**
Reason	1. Whether the load is heavy or the motor is blocked 2. Power selection of inverter is too small.
Solution	1. Reduce the load and detect the motor & machinery condition 2. Select bigger power inverter

Fault Name	High water pressure
Fault Code	**E.HP**
Reason	1:The feedback pressure is higher than the setting value of P15.08
Solution	2: Check the feedback pressure

Fault Name	Low water pressure
Fault Code	**E.LP**
Reason	1:The feedback pressure is higher than the setting value of P15.10
Solution	2: Check the feedback pressure

Chapter 7 MODBUS Communication Protocol

This series inverter provides RS485 communication interface, and adopts MODBUS communication protocol. User can realize centralized monitoring through PC/PLC, host computer, and also can set inverter's operating commands, modify or read function parameters, read operating status and fault information, etc.

7.1 About Protocol

This serial communication protocol defines the transmission information and use format in the series communication. It includes the formats of master-polling, broadcast and slave response frame, and master coding method with the content including slave address (or broadcast address), command, transmitting data and error checking. The response of slave adopts the same structure, including action confirmation, returning the data and error checking etc. If slave takes place the error while it is receiving the information or cannot finish the action demanded by master, it will send one fault signal to master as a response.

7.2 Application Method

The inverter could be connected into a "Single-master & Multi-slaves" PC/PLC control network with RS485 bus.

7.3 Bus Structure

(1) Interface mode

RS485

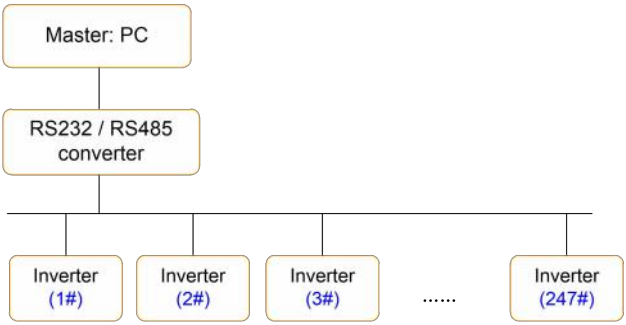
(2) Transmission mode

There provide asynchronous series and half-duplex transmission mode. At the same time, just one can send the data and the other only receives the data between master and slave. In the series asynchronous communication, the data is sent out frame by frame in the form of message.

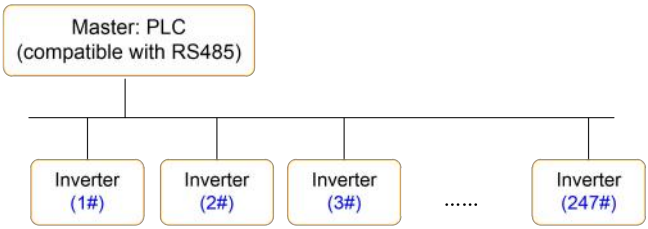
(3) Topological structure

In Single-master Multi-slave system, the setup range of slave address is 0 to 247. 0 refers to broadcast communication address. The address of slave must be exclusive in the network. That is basic condition of MODBUS communication.

a. Connect with PC



b. Connect with PLC

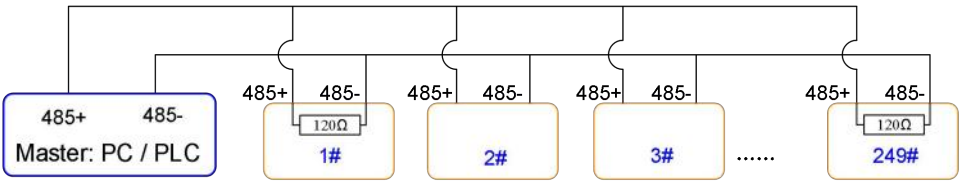


7.4 Interfaces and wiring connection

This series inverter provides 485+ and 485- interfaces for Modbus communication.

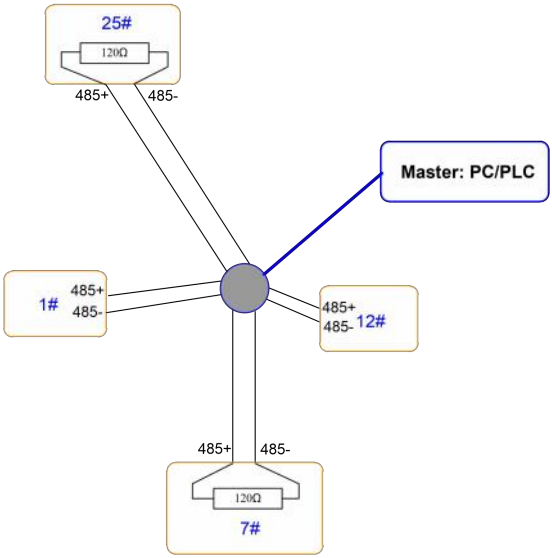
There are two kinds of communication type suitable for Modbus connection;

(1) Daisy chain connection



Notice: the **first one** and **last one inverters** should connect the terminal resistor.

(2) star connection



Notice: the **furthest one (25#)** and **second furthest one (7#)** inverters should connect the terminal resistor.

7.5 Protocol Description

This series inverter communication protocol is a kind of asynchronous serial master-slave communication protocol. In the network, only one equipment (master) can build a protocol (Named as “Inquiry/Command”). Other equipment (slave) response “Inquiry/Command” of master only by providing the data, or doing the action according to the master’s “Inquiry/Command”. Here, master is Personnel Computer, Industrial control equipment or Programmable logical controller, and the slave is inverter or other communication equipment with the same communication protocol. Master not only can visit some slave separately for communication, but also sends the broadcast information to all the slaves. For the single “Inquiry/Command” of master, all of slaves will return a signal that is a response; for the broadcast information provided by master, slave needs not feedback a response to master.

7.6 Communication Data Structure

MODBUS protocol communication data format of this inverter is shown as below:

In RTU mode, the Modbus minimum idle time between frames should be no less than 3.5 bytes. The checksum adopts CRC-16 method. All data except checksum itself sent will be counted into the calculation. Please refer to section: CRC Check for more information. Note that at least 3.5 bytes of Modbus idle time should be kept and the start and end idle time need not be summed up to it.

The entire message frame must be transmitted as a continuous data stream. If a idle time is more than 1.5 bytes before completion of the frame, the receiving device flushes the incomplete message and assumes

that the next byte will be the address field of a new message. Similarly, if a new message begins earlier than 3.5 bytes interval following a previous message, the receiving device will consider it as a continuation of the previous message. Because of the frame's confusion, at last the CRC value is incorrect and communication fault will occur.

RTU frame format:

START	Transmission time of 3.5 bytes
Slave Address	Communication address : 0 to 247
Command Code	03H: Read slave parameters 06H: Write slave parameters
DATA (N-1)	Data: Function code parameter address, the number of function code parameter, Function code parameter, etc.
DATA (N-2)	
……	
DATA 0	
CRC Low byte	Detection Value: CRC value
CRC High byte	
END	Transmission time of 3.5 bytes

7.7 Command Code and Communication Data Description

7.7.1 Command code: 03H, reads N words. (There are 12 characters can be read at the most.)

For example: The inverter start address P01.02 of the slave 01 continuously reads two consecutive values.

Master command information

Address	01H
Command Code	03H
Start Address High byte	P0H
Start Address Low byte	02H
Register Number High byte	00H
Register Number Low byte	02H
CRC Low byte	56H
CRC High byte	CBH

Slave responding information

Address	01H
Command Code	03H
Byte Number	04H
Data P002H High byte	00H
Data P002H Low byte	00H
Data P003H High byte	00H
Data P003H Low byte	01H
CRC Low byte	3BH
CRC High byte	P2H

7.7.2 Command code: 06H, write a word

For example: Write 5000(1388H) into address P00AH, slave address 02H.

Master command information

Address	02H
Command Code	06H
Data Address High byte	P0H
Data Address Low byte	0AH
Data Content High byte	13H
Data Content Low byte	88H
CRC Low byte	97H
CRC High byte	ADH

Slave responding information

Address	02H
Command Code	06H
Data Address High byte	P0H
Data Address Low byte	0AH
Data Content High byte	13H

Data Content Low byte	88H
CRC Low byte	97H
CRC High byte	ADH

7.7.3 CRC checking

In RTU mode, messages include an error-checking field that is based on a CRC method. The CRC field checks the contents of the entire message. The CRC field is two bytes, containing a 16-bit binary value. The CRC value is calculated by the transmitting device, which appends the CRC to the message. The receiving device recalculates a CRC during receipt of the message, and compares the calculated value to the actual value received in the CRC field. If the two values are not equal, an error results.

The CRC is started by 0xFFFF. Then a process begins of applying successive eight-bit bytes of the message to the current contents of the register. Only the eight bits of data in each character are used for generating the CRC. Start and stop bits, and the parity bit, do not apply to the CRC.

During generation of the CRC, each eight-bit character is exclusive ORed with the register contents. Then the result is shifted in the direction of the least significant bit (LSB), with a zero filled into the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB was a 1, the register is then exclusive ORed with a preset, fixed value. If the LSB was a 0, no exclusive OR takes place. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next eight-bit byte is exclusive ORed with the register's current value, and the process repeats for eight more shifts as described above. The final contents of the register, after all the bytes of the message have been applied, is the CRC value.

When the CRC is appended to the message, the low byte is appended first, followed by the high byte. The following are C language source code for CRC-16.

```
unsigned int crc_cal_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);
    }
```

7.7.4 Address definition of communication parameter

Here is about address definition of communication parameter. It's used to control the inverter operation, status and related parameter setting.

The mark rules of function code parameters address:

The group number and mark of function code is the parameter address for indicating the rules.

High byte: P0 ~PF (P group), A0~AF (A group),70~7F (U group)

Low byte: 00 to FF

For example:

P03.12, address indicates to 0xF20C

P14.05, address indicates to 0xFC05

P00.03, address indicates to 0x7003

Note:

1. Group PF: Either the parameter cannot be read, nor be changed.
2. Group U0: Only for reading parameter, cannot be changed parameters.
3. Some parameters cannot be changed during operation; some parameters regardless of what kind of status the inverter in, the parameters cannot be changed. Change the function code parameters, pay attention to the scope of the parameters, units, and relative instructions.

Besides, due to EEPROM be frequently stored, it will reduce the lifetime of EEPROM. So in the communication mode, some function codes needn't be stored, only change the RAM value.

For P group parameters, to achieve this function, just change high bit P of the function code into 0.

For A group parameters, to achieve this function, just change high bit A of the function code into 4.

Corresponding function code addresses are indicated below:

(1) P group parameter address:

High byte: 00 to FF,

Low byte: 00 to FF

(2) A group parameter address:

High byte: 40H,

Low byte: 00 to FF

For example:

P05.12, address indicates to 030C

A0-05, address indicates to 4005

These addresses can only act writing RAM, it cannot act reading. When act reading, it is an invalid address.

(2) Stop/start parameter address

Parameter Address	Parameter Description
1000H	* Communication setting frequency (-10000 ~ 10000) (Decimal)
1001H	Running frequency
1002H	DC Bus voltage
1003H	Output voltage
1004H	Output current
1005H	Output power
1006H	Output torque
1007H	Running speed
1008H	DIn input status
1009H	DO output status
100AH	AI1 voltage
100BH	AI2 voltage
100CH	Keypad potentiometer voltage
100DH	Counting value input
100EH	Length value input
100FH	Load speed
1010H	PID setting
1011H	PID feedback
1012H	Simple PLC running step
1013H	High speed input pulse frequency setting (kHz)
1014H	Feedback speed, unit is 0.1Hz

Parameter Address	Parameter Description
1015H	Remain running time
1016H	AI1 voltage before calibration
1017H	AI2 voltage before calibration
1018H	Reserved
1019H	Linear speed
101AH	Current power on time
101BH	Current running time
101CH	DI5 setting (High speed pulse input) (Hz)
101DH	Communication setting value
101EH	Actual feedback speed
101FH	Main frequency A display
1020H	Auxiliary frequency B display

Note:

Communication setting value is the percentage of relative value, and 10,000 corresponds to 100.00%, -10000 corresponds to -100.00%.

To the data of frequency, the percentage is the percentage of relative maximum frequency (P01.10).

To the data of torque, the percentage is P03.10 (torque upper limit).

(3) Control command input to inverter (write only)

Command Word Address	Command Function
2000H	0001: Forward running
	0002: Reverse running
	0003: Forward jog
	0004: Reverse jog
	0005: Coast to stop
	0006: Deceleration to stop
	0007: Fault reset

(4) Read inverter status: (read only)

Status Word Address	Status Word Function
3000H	0001: Forward running
	0002: Reverse running
	0003: Stop

(5) Parameters locking password check: (If the return is 8888H, it means the password check passes.)

Password Address	Content of Input password
1F00H	*****

(6) Parameters initialization via communication by the address of 1F01H

Password Address	Command functions
1F01H	1: Recover to factory settings
	2: Clear all the record information
	3: Recover user backup parameters
	4: Backup present parameters

(7) Digital output terminal control: (write only)

Command Address	Command Content
2001H	BIT0: DO1 output control
	BIT1: FM output control
	BIT2: RELAY1 output control
	BIT3: RELAY2 output control
	BIT4 ~ BIT9: Reserved

(8) Analog output AO1 control: (write only)

Command Address	Command Content
2002H	0～7FFF refers to 0%～100%

(9) Analog output AO2 control: (write only)

Command Address	Command Content
2003H	0～7FFF refers to 0%～100%

(10) Pulse output control: (write only)

Command Address	Command Content
2004H	0～7FFF refers to 0% ～100%

(11) Inverter fault code description:

Inverter Fault Address	Inverter Fault Information
8000H	0000: No fault
	0001: Reserved
	0002: Over current when acceleration
	0003: Over current when deceleration
	0004: Over current when constant speed running
	0005: Over voltage when acceleration
	0006: Over voltage when deceleration
	0007: Over voltage when constant speed running
	0008: Buffer resistor overload
	0009: Under voltage
	000A: Inverter overload
	000B: Motor overload
	000C: Reserved
	000D: Output phase failure
	000E: Module overheat
	000F: External fault
	0010: Communication fault
	0011: Contactor fault
	0012: Current detection fault
	0013: Motor auto-tuning fault

	0014: Reserved
	0015: Parameter R/W fault
	0016: Inverter hardware fault
	0017: Motor short circuit to ground
	0018: Reserved
	0019: Reserved
	001A: Running time arrival
	001B: User self-defined fault 1
	001C: User self-defined fault 2
	001D: Power on time arrival
	001E: Off load
	001F: PID feedback lost when running
	0028: Fast current limiting over time
	0029: Switch the running motor
	002A: Reserved
	002B: Reserved
	002D: Reserved
	005A: Reserved
	005B: Reserved
	005C: Reserved
	005E: Reserved

(12) Communication fault information:

Inverter Fault Address	Communication Fault Information
8001H	0000: No fault
	0001: Password is wrong
	0002: Command code is wrong
	0003: CRC check is wrong
	0004: Invalid address

	0005: Parameter modification is invalid
	0006: System lock
	0007: EEPROM is under operation