SCK110 Series

Vector Frequency Inverter Instructions

SHANGHAI CHUANKEN ELECTRIC CO.,LTD.

Preface

This manual introduces the features and usage of the vector type universal inverter, including product selection Please read this manual carefully before use for installation and wiring, parameter setting, operation debugging, fault diagnosis, etc. Improper use may cause abnormal operation of the inverter, malfunctions, reduced service life, and even equipment damage, personal injury or death.

This manual is a random attachment. Please hand it over to the actual user and keep it in a safe place for future reference.

The company is committed to the continuous improvement and update of products. The product hardware and software will be continuously upgraded. The information provided is subject to change without notice.

Table of Contents

Table of Contents

Chapter One Security Information

1.1 Signs and definitions of safety information

The safety clauses described in this user manual are very important, which can ensure that you use the inverter safely, prevent yourself or the surrounding people from being injured and the property in the work area from being damaged. Please be fully familiar with the following icons and meanings, and be sure to observe the notices marked Matters, then continue reading this user manual。

Warning

This symbol indicates that if you do not follow the requirements, it may cause death or serious injury.

Danger

This symbol indicates that if you do not follow the requirements, it will cause a moderate degree of personal injury or minor injuries and certain material losses.

Be Careful

This symbol indicates matters needing attention in operation or use.

Tips

This symbol prompts the user some useful information.

The following two icons are supplementary explanations to the above signs:

Prohibit

Indicates something that must not be done.

Force

Indicates something that must be done.

1.2 Use range

Be Careful

This frequency converter is suitable for general industrial three-phase AC asynchronous motors.

Warning

- Do not use this inverter in equipment (nuclear power control equipment, aerospace equipment, transportation equipment, life support systems, safety equipment, weapon systems, etc.) that may threaten life or harm the human body due to inverter faults or work errors. For special purposes, please consult our company in advance.
- This product is manufactured under strict quality management system supervision, but when used in important equipment, safety protection measures must be taken to prevent the expansion of the accident scope when the inverter fails.

1.3 Installation Environment

- It should be installed indoors in a well-ventilated place. Generally, it should be installed vertically to ensure the best cooling effect. For horizontal installation, additional ventilation may be required.
- The ambient temperature is required to be within the range of -10~40℃. If the temperature exceeds 40℃, please remove the upper cover. If it exceeds 50℃, external forced heat dissipation or derating is required. It is recommended that users do not use the inverter in such a high temperature environment, because this will greatly reduce the service life of the inverter.
- Environmental humidity is required to be lower than 90%, and there is no condensation.
- Install in a place where the vibration is less than 0.5G to prevent fall damage. Do not allow the inverter to be subject to sudden impact.
- Install in an environment away from electromagnetic fields and no flammable and explosive materials.

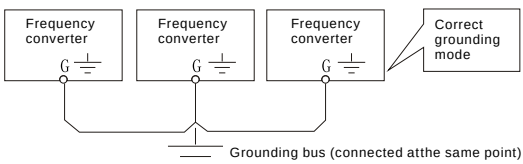
1.4 Installation safety matters

Danger

- Do not work with wet hands.
- It is strictly forbidden to carry out wiring work without completely disconnecting the power supply.
- When the inverter is powered on, please do not open the cover or perform wiring work, otherwise there is a danger of electric shock.
- When carrying out wiring, inspection, etc., it must be done 10 minutes after turning off the power, otherwise there is a danger of electric shock.

Warning

●Do not install the inverter with damaged or missing components to prevent personal accidents and property losses.
●The main circuit terminal and the cable must be firmly connected, otherwise the inverter may be damaged due to poor contact.
●For safety, the grounding terminal of the inverter must be reliably grounded. To avoid the influence of grounding common impedance interference, the grounding of multiple inverters should be grounded at one point, as shown in Figure 1-1.



1-1

Prohibit

●It is strictly forbidden to connect the AC power supply to the output terminals U, V, W of the inverter, otherwise the inverter will be damaged, as shown in Figure 1-2.

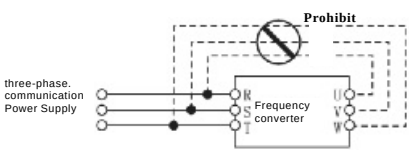


Figure 1-2

Force

●On the input power side of the inverter, be sure to configure a non-fuse circuit breaker for circuit protection to prevent the expansion of accidents caused by inverter failure.

Be Careful

●It is not advisable to install an electromagnetic contactor on the output side of the frequency converter. This is because the contactor is switched on and off when the motor is running, which will generate operating overvoltage and cause damage to the frequency converter. However, it is still necessary to configure for the following three situations: The frequency converter used for energy-saving control, the system often works at the rated speed, in order to realize economic operation, when the frequency converter needs to be cut off. Participate in important technological processes, can not stop for a long time, need to switch between various control systems to improve system reliability. When one inverter controls multiple motors. The user should pay attention to the contractors not to act when the inverter has output!

1.5 Use safety matters

Danger

●Do not operate with wet hands.
●For inverters stored for more than 1 year, use a voltage regulator to gradually increase the voltage to the rated value when powering on, otherwise there is a danger of electric shock and explosion.
●Do not touch the inside of the inverter after power-on, let alone put rods or other objects into the inverter, otherwise it will cause death by electric shock or the inverter cannot work normally.
●Do not open the cover when the inverter is energized, otherwise there is a danger of electric shock.
●Use the power-off restart function with caution, otherwise it may cause personal injury or death.

Warning

●If it runs above 50Hz, the speed range of the motor bearings and mechanical devices must be ensured.
●Mechanical devices such as gearboxes and gears that need lubrication should not be operated at low speed for a long time, otherwise their service life will be reduced or the equipment will be damaged.
●When ordinary motors are running at low frequencies, they must be derated for use due to po or heat dissipation. For constant torque loads, forced heat dissipation of the motor must be used or special frequency conversion motors must be used.
● For the inverter that is not used for a long time, please be sure to cut off the input power to avoid damage to the inverter due to foreign matter or other reasons, or even fire.
●Because the output voltage of the inverter is PWM pulse wave, please do not install capacitors or surge current absorbers (such as varistors) at its output end, otherwise it will cause the inverter to trip and even damage the power components. If it has been installed, be sure to remove it. See Figure 1-3.

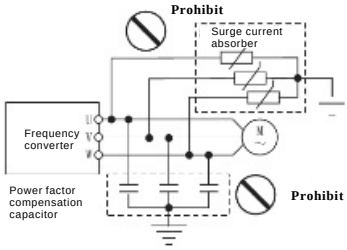


Figure 1-3

Be Careful

●Before using the motor for the first time or reusing it after being placed for a long time, check the motor insulation and ensure that the measured insulation resistance is not less than 5MΩ.

●If you need to use the inverter outside the allowable working voltage range, you need to configure a boost or step-down device for voltage transformation.

●In areas with an altitude of more than 1000 meters, due to the thin air, the heat dissipation effect of the inverter will be worse, so it needs to be derated for use. Generally, it needs to be derated by about 10% every 1000m. Refer to Figure 1-4 for the derating curve.

Chapter 2 Product Standard Specifications

2.1 Technical Specification

Enter	Rated voltage frequency	Three phase AC380V;50/60Hz Single phase AC220V;50/60Hz	
	Voltage allowable range	Three phase AC360V～450V Single phase AC190V～250V	
Output	Voltage	0～460V 0～260V	
	Rrequency	Low frequency mode：0～300Hz High frequency mode：0～3000Hz	
	Overload capacity	Model G: 110% long-term 150% 1 minute 200% 4 seconds P type machine: 105% long-term 120% 1 minute 150% 1 second	
Way to control		V/F control, advanced V/F control, V/F separation control, current vector control without PG	
Control characteristics	Frequency setting resolution	Analog input	0.1% of maximum output frequency
		Digital setting	0.01Hz
	Frequency accuracy	Analog input	Within 0.2% of the maximum output frequency
		Digital input	Set within 0.01% of output frequency
	V/F control	V/F curve (voltage frequency characteristic)	The reference frequency is arbitrarily set at 0.5～3000Hz, and the multi-point V/F curve is arbitrarily set. You can also choose constant torque, reduced torque 1, reduced torque 2, square torque and other fixed curves
		Torque boost	Manual setting: 0.0～30.0% of rated output Automatic boost: automatically determine the boost torque according to the output current combined with the motor parameters
		Automatic current limit and pressure limit	Whether in the process of acceleration, deceleration or stable operation, it can automatically detect the stator current and voltage of the motor, and suppress it within the allowable range according to a unique algorithm, minimizing the possibility of system fault tripping
Control characteristics	Sensorless vector control	Voltage frequency characteristics	Automatically adjust the output voltage-frequency ratio according to motor parameters and unique algorithms
		Torque characteristics	Starting torque: 150% rated torque at 3.0Hz(VF control) 150% rated torque at 1.0Hz(advanced VF control) 150% rated torque at 0.5Hz (no PG current vector control)Steady-state accuracy of operatin g speed: ≤ ±0.2% of rated synchronous speed Speed fluctuation: ≤ ±0.5% of rated synchrono us speed Torque response: ≤20ms (No PG current vector control)

		Self-determination of motor parameters	Without any restriction, the automatic detection of parameters can be completed under the static and dynamic conditions of the motor to obtain the best control effect
		Current and voltage suppression	Full-process current closed-loop control, completely avoid current impact, with perfect over-current and over-voltage suppression function
	Undervoltage suppression during operation	Especially for users with low grid voltage and frequent fluctu ations in grid voltage, the system can maintain the longest possible runn ing time according to the unique algorithm and residual energy distribution strategy even if the voltage is lower than the allowable voltage rang e.	
Typical function	Multi-speed and swing frequency operation	16-segment programmable multi-speed control, multiple operating modes are optional. Swing frequency operation: preset frequency, center frequency adjustable, state memory and recovery after power failure	
	PID control RS485 communication	Built-in PID controller (frequency can be preset). Standard configuration RS485 communication function, multiple communication protocols are optional, with linkage synchronization control function	
	Frequency setting	Analog input	DC voltage 0～10V, DC current 0～20mA (upper and lower limit optional)
		Digital input	Operation panel setting, RS485 interface setting, UP/DW terminal control, and multiple combination settings with analog input
output signal		Digital output	2 channels Y terminal open collector output and 2 channels programmable relay output (TA, TB, TC), up to 61 meaning options+
		Analog output	2 analog signal output, the output range can be flexibly set between 0～20mA or 0～10V, which can realize the output of physical quantities such as set frequency and output frequency
Automatic voltage regulation operation		Three modes of dynamic voltage regulation, static voltage regulation and unregulated voltage can be selected according to the needs to obtain the most stable operation effect	
Acceleration and deceleration time setting		0.1s～3600.0min can be set continuously, S type and linear mode are optional	
Brake	Dynamic braking	The initial voltage, hysteresis voltage and dynamic braking rate of dynamic braking are continuously adjustable	
	DC braking	Start frequency of stop DC braking: 0.00～【F00.13】Upper limit frequency Braking time: 0.0～100.0s; braking current: 0.0%～150.0% of rated current	
	Flux brake	0～100 0: invalid	
Low noise operation		The carrier frequency is continuously adjustable from 1.0KHz to 16.0KHz to minimize motor noise	
Speed tracking and restart function		It can realize the smooth restart and restart function of the motor in operation	

	Counter		One internal counter to facilitate system integration
	Run function		Upper and lower limit frequency setting, frequency jump operation, reverse operation limit, slip frequency compensation, RS485 communication, frequency increase and decrease control, fault self-recovery operation, etc.
Display	Operation panel display	Operating status	Output frequency, output current, output voltage, motor speed, set frequency, module temperature, PID setting, feedback quantity, analog input and output, etc.
		Alarm content	The last six fault records, the output frequency, set frequency, output current, output voltage, DC voltage, module temperature and other 6 operating parameter records at the time of the last fault trip
Protective function			Overcurrent, overvoltage, undervoltage, module failure, electronic thermal relay, overheating, short circuit, input and output phase loss, abnormal motor parameter tuning, internal memory failure, etc.
Surroundings	Ambient temperature		−10℃～+40℃ (the ambient temperature is between 40℃～50℃, please use with derating)
	Ambient humidity		5%～95%RH, no condensation
	Surroundings		Indoor (no direct sunlight, no corrosion, flammable gas, no oil mist, dust, etc.)
	Altitude		Derating for use above 1000 meters, derating 10% for every 1000 meters
Structure	Protection level		IP20
	Cooling method		Air cooling, with fan control
Installation method			Wall-mounted, cabinet

2.2 Inverter Model Description

G3R75/ P31R5

Suitable motor type	
G	General purpose
P	Fan pump type

Power level (kw)	
R75	0.75
1R5	1.5
2R2	2.2
4R0	4.0

2.3 Chassis and keyboard size

Chassis size:

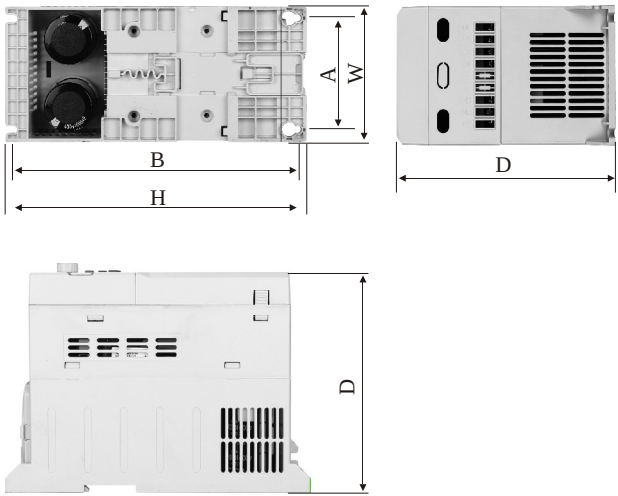
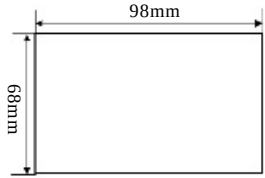


Figure D-1 Inverter 0.75KW~110KW size

Model	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Mounting holes (mm)
	Installation size		External dimensions			
0.75KW-4KW	78	200	212	95	154	5

Keyboard installation size:



Installation dimension of external keyboard

2.4 Rated current output table

Voltage	Single-phase	Three phase	
	220V	220V(240V)	380V(415V)
Power (KW)	Current (A)	Current (A)	Current (A)
0.4	2.3	2.3	-
0.75	4	4	2.1
1.5	7	7	3.8
2.2	9.6	9.6	5.1
4	17	17	8.5
5.5	25	25	13
7.5	-	-	16
11	-	-	24
15	-	-	32
18.5	-	-	36
22	-	-	44
30	-	-	58
37	-	-	70
45	-	-	90
55	-	-	110
75	-	-	152
93	-	-	172
1 10	-	-	205
132	-	-	253
160	-	-	304
200	-	-	380
220	-	-	426
250	-	-	465
280	-	-	520
315	-	-	585
355	-	-	650
400	-	-	725
450	-	-	820

2.5 Braking resistor selection table

Voltage(V)	Inverter power (KW)	Braking resistor specifications		Braking torque
		W	OHM	10%ED
Single phase 220 series	0.4	80	200	125
	0.75	80	150	125
	1.5	100	100	125
	2.2	100	70	125
	4.0	300	50	125
Three-phase 220 series	0.75	150	110	125
	1.5	250	100	125
	2.2	300	65	125
	4	400	45	125
	5.5	800	22	125
	7.5	1000	16	125
Three-phase 380 series	0.75	100	750	125
	1.5	300	400	125
	2.2	300	250	125
	4	400	150	125
	5.5	500	100	125
	7.5	1000	75	125
	11	3000	43	125
	15	3000	32	125
	18.5	3000	25	125
	22	4000	22	125
	30	5000	16	125
	37	6000	13	125
	45	6000	10	125
	55	6000	10	125
	75	7500	6.3	125
	93	9000	9.4/2	125
	110	11000	9.4/2	125
	132	13000	6.3/2	125
	160	16000	6.3/2	125
	200	20000	2.5	125
	220	22000	2.5	125
	250	25000	2.5/2	125
	280	28000	2.5/2	125
	315	32000	2.5/2	125
	355	34000	2.5/2	125
	400	42000	2.5/3	125
	450	45000	2.5/3	125

Note:
1. Please select the resistance value specified by our company.
2. If the use of brake resistors not provided by our company causes damage to the inverter or other equipment, our company will not bear any responsibility.
3. The installation of braking resistor must consider environmental safety, flammability, and be at least 100mm away from the inverter.
4. The parameters in the table are for reference only, not as a standard.

Chapter 3 Storage and Installation

3.1 Store

This product must be placed in the packaging box before installation. If it is not used temporarily, please pay attention to the following items when storing:

- It must be placed in a dust-free and dry location;
- The storage environment temperature is within the range of -20℃ to +65℃;
- The relative humidity of the storage environment is within the range of 0% to 95%, and there is no condensation;
- There is no corrosive gas or liquid in the storage environment;
- It is best to place it on a shelf and pack it for storage. It is better not to store the inverter for a long time. Long-term storage will cause the deterioration of the electrolytic capacitor. If long-term storage is required, it must be energized once within half a year for at least 5 hours. Above, the voltage must be slowly increased to the rated voltage with a voltage regulator during input.

3.2 Installation site and environment

Note: The environment of the installation site will affect the service life of the inverter. Please install the inverter in the following places:

- Ambient temperature: -5℃～40℃ and good ventilation;
- Places with no dripping water and low temperature;
- Places without sunlight, high temperature and severe dust;
- Places without corrosive gas and liquid;
- Places with less dust, oil and gas and metal dust;
- A place where there is no vibration and easy maintenance and inspection;
- Places without electromagnetic noise interference;

3.3 Installation space and direction

●For the convenience of maintenance, there must be enough space around the inverter. as the picture shows.

●In order to have a good cooling effect, the inverter must be installed vertically and ensure smooth air circulation.

●If the installation is not secure. Install a flat plate under the base of the inverter, and install it on a loose surface. Stress may cause damage to the main circuit parts, thus damaging the inverter;

●The installation wall should be made of non-combustible materials such as iron plates.

●When multiple inverters are installed in the same cabinet, when they are installed up and down, please pay attention to the spacing at the same time, add a baffle in the middle or install them up and down.

Chapter 4 Wiring

4.1 Main circuit wiring diagram

Power supply: please pay attention to whether the voltage level is consistent, so as not to damage the inverter.

No fuse switch: please refer to the corresponding table.
Leakage switch: please use the leakage switch with high order harmonic protection.

Electromagnetic contactor:
Note: please do not use the electromagnetic contactor as the power switch of the inverter.

AC reactor: when the output capacity is greater than 1000KVA, it is recommended to install - AC reactor to improve the power factor.

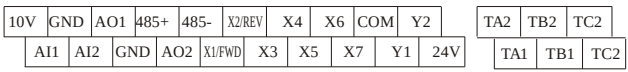
Frequency converter:
Be sure to connect the main circuit line and control signal line of frequency converter correctly.
Be sure to set the parameters of the inverter correctly.

4.2 Terminal diagram

4.2.1 The function description of the main circuit terminal is as follows:

Terminal name	Function description
R、S、T	Three phase power input terminal
P+、P-	Reserved terminal of external brake unit
P+、PB	Reserved terminal of external brake resistor (0.4kw-300kw)
P+、P1	Reserved terminal of external DC reactor
U、V、W	Three phase AC output terminal
⏚	Ground terminal

4.2.2 Control circuit terminal



Control circuit terminal function description

Category	Terminal label	Function Description	Specification
Multifunc-tional digital input terminal	X1	It is effective when X (X1, X2, X3, X4, X5, X6, X7) and COM are short-circuited, and their functions are respectively set by parameters F07.00 to F07.06 (common terminal: COM).	INPUT, 0~24V level signal, low level effective, 5mA.
	X2		
	X3		
	X4		
	X5		
	X6		
	X7	In addition to being used as an ordinary multi-function terminal, X7 can also be programmed as a high-speed pulse input port. For details, see F07.06 function description.	

Category	Terminal label	Function Description	Specification
Analog input and output terminals	AI1	AI1 receives analog voltage/ current input, voltage and current are selected by jumper JP3, the factory default input voltage, if you want to input current, just set the jumper cap to the Cin position; AI2 only accepts voltage input. See the description of function codes F06.01~F06.10 for the range setting. (Reference ground: GND)	INPUT, input voltage range: 0~10V (input impedance: 100KΩ), input current range: 0~20mA (input impedance: 500Ω).
	AI2		
	AO1	AO1 provides analog voltage/ current output, which can represent 14 physical quantities. The output voltage and current are selected by jumper JP4. The factory default output voltage. If you want to output current, just jump the jumper cap to the Co1 position; see details Function code F06.21, F06.22 description. (Reference ground: GND)	OUTPUT, 0~10V DC voltage. The output voltage of AO1 and AO2 terminals is the PWM waveform from the central processing unit. The output voltage is proportional to the width of the PWM waveform.
	AO2		
Relay output terminal	TA1	It is programmable to define as a multi-function relay output terminal, up to 62 kinds. For details, see F07.20 and F07.21 terminal function introduction.	TA-TB: normally closed; TA-TC: normally open. Contact capacity: 250VAC /2A (COSΦ=1); 250VAC/1A (COSΦ=0.4), 30VDC/1A.
	TB1		
	TC1		
	TA2		
	TB2		
	TC2		
Power connector	+24V	24V is the common power supply for the circuit of the digital signal input terminal	Maximum output current 200mA
	+10V	10V is the common power supply for the circuit of analog input and output terminals	Maximum output current 20mA
	COM	Digital signal and +24V power reference ground	Internally isolated from GND
	GND	Analog signal and +10V power reference ground	Internal isolation from COM
Commu-nication Interface	485+	RS485 signal + terminal	Standard RS485 communication interface, not isolated from GND, please use twisted pair or shielded wire.
	485-	RS485 signal - terminal	

4.2.3 Main control board jumper setting

JP2

OFF gear	Indicates that the matched resistance on the 485 communication is not connected
On gear	Indicates matching resistance access on 485 communication

JP3

Cin gear	Indicates AI1 input current signal, 4-20mA
Vin gear	Indicates AI1 input voltage signal, 0-10V

JP4

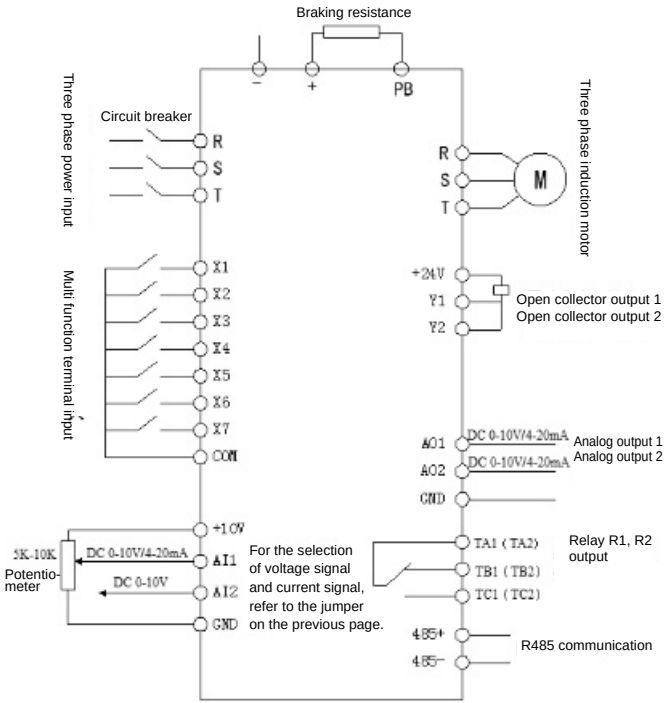
Vo1 gear	Indicates AO1 output voltage signal, 0-10V
Co1 gear	Indicates AO1 output current signal, 4-20mA

JP5

Vo2 gear	Indicates AO2 output voltage signal, 0-10V
Co2 gear	Indicates AO2 output current signal, 4-20mA

4.3 Basic wiring diagram

The inverter wiring part is divided into main circuit and control circuit. The user can lift the cover of the shell, and the main circuit terminal and control circuit terminal can be seen at t his time . The use r must accurately connect according to the following wiring cir cuit.



Basic operation wiring diagram

4.4 Wiring precautions

4.4.1Main circuit wiring

●When wiring, select the wire diameter and specifications, and perform wiring in accordance with the electrical regulations to ensure safety.
●It is better to use isolated wires or conduits for power wiring, and ground both ends of the isolation layer or conduit;
●Be sure to install an air cut-off switch NPB between the power supply and the input terminals (R, S, T). (If using a leakage circuit breaker, please use a circuit breaker with high frequency countermeasures).
●The power line and the control line should be arranged separately, not in the same wire duct.
●Do not connect AC power to the output terminals (U, V, W) of the inverter;
●The output wiring must not touch the metal part of the inverter enclosure, otherwise it may cause a short circuit to the ground.
●Do not use phase-shifting capacitors, LC, RC noise filters and other components at the output of the inverter.
●The main circuit wiring of the inverter must be far away from other control equi pment.
●When the wiring between the inverter and the motor exceeds 50 meters (220V series), (380V class 100 meters), high dv/dt will be generated inside the coil of the motor, which will cause interlayer insulation of the motor If it is damaged, please use an AC motor dedicated to the inverter or install a reactor on the inverter side.
●When the distance between the inverter and the motor is longer, please lower the carrier frequency, because the larger the carrier, the greater the leakage current of the higher harmonics on the cable, and the leakage current will adversely affect the inverter and other equipment.

4.4.2Control circuit wiring (signal wire)

The signal wire cannot be placed in the same wire slot as the main circuit wiring, otherwise interference may occur. Please use shielded wire for signal wire, and single-ended grounding, wire diameter size is 0.5-2mm2, control wire is recommended to use shielded wire 1. Correctly use the control terminals on the control panel as required.

4.4.3Ground wire

The grounding wire terminal E should be grounded in the third grounding method (below 100Ω); the grounding wire should be used in accordance with the basic length and size of the electrical equipment technology; absolutely avoid sharing the grounding pole with large power equipment such as electric welding machines and power machinery. The line should be as far away as possible from the power line of large power equipment; the grounding wiring method of multiple inverters, please use the following figure (a) to avoid causing the loop of (b) or (c).
●The grounding wiring must be as short as possible.
●The ground terminal E must be grounded correctly, and it must not be connected to the neutral wire.

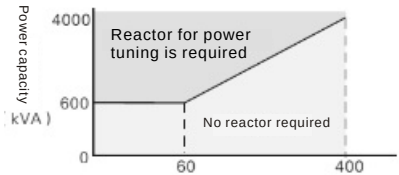
(a) Right (b) Wrong (c) Wrong

4.5 Specific application considerations

4.5.1 Selection

1)Installation of reactor

When connecting the inverter to a large-capacity power transformer (above 600kVA) or switching the phase-in capacitor, the power input circuit will generate excessive peak current, which may damage the components of the converter. To prevent this from happening, please install DC reactor or AC power Resistor. This also helps to improve the power factor on the power supply side. In addition, when a thyristor converter such as a DC drive is connected to the same power supply system, a DC reactor or AC reactor must be installed regardless of the power supply conditions.



Converter capacity (kVA)
Installation conditions of reactor

(2) Inverter capacity

When running a special motor, please make sure that the rated current of the motor is not higher than the rated output current of the inverter. In addition, when multiple induction motors are operated in parallel with one inverter, the capacity of the i nverter should be selected such that 1.1 times the total rated current of the motors is less than the rated output current of the inverter.

(3) Starting torque

The starting and acceleration characteristics of the motor driven by the inverter are limited by the overload rated current of the combined inverter. Compared with the start of general commercial power supply, the torque characteristic is small. If a larger starting torque is required, please increase the capacity of the inverter by one level or increase the capacity of the motor and the inverter at the same time.

(4) Emergency stop

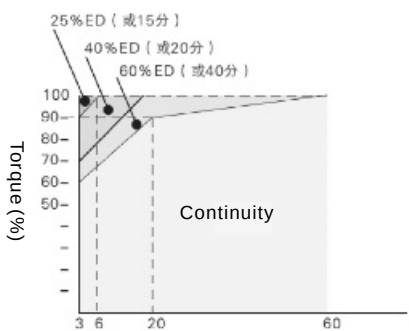
Although the protection function will act and the output will stop when the inverter fails, the motor cannot be stopped suddenly at this time. Therefore, please install a mechanical stop and hold structure on the mechanical equipment that requires emergency stop.

(5) Dedicated options

Terminals PB (+) and P1 (+) are terminals for connecting dedicated options. Do not connect equipment other than dedicated options.

(6) Precautions related to reciprocating load
When the inverter is used for reciprocating loads (cranes, elevators, presses, washing machines, etc.), if 150% or more current flows repeatedly, the IGBT inside the inverter will shorten its service life due to thermal fatigue. As a rough guideline, when the carrier frequency is 4kHz and the peak current is 150%, the number of starts/stops is approximately 8 million.
Especially when low noise is not required, please lower the carrier frequency. In addition, please reduce the peak current during reciprocating to less than 150% by reducing the load, extending the acceleration and deceleration time, or increasing the inverter capacity by one level. (When conducting a test run for these purposes, be sure to confirm the reciprocating Peak current, and adjust as needed). In addition, when used in a crane, since the start/stop action during inching is faster, the following selections are recommended to ensure the motor torque and reduce the inverter current. The capacity of the inverter should be able to ensure that its peak current is less than 150%. The capacity of the inverter should be at least one level larger than the capacity of the motor.

4.5.2 Precautions for motor use
(1)For existing standard motors
Low speed domain
Compared with using a commercial power supply to drive a standard motor using an inverter, there will be a slight increase in loss. In the low speed range, the cooling effect will be worse, and the temperature of the motor will increase. Therefore, in the low speed range, please reduce the load torque of the motor. The allowable load characteristics of our standard motors are shown in the figure. In addition, when 100% continuous torque is required in the low-speed range, please explore whether to use an inverter-specific motor.



Permissible load characteristics of our standard motors

(2)Precautions for special motors
The rated current of the pole-changing motor is different from that of the standard motor. Please confirm the maximum current of the motor and select the corresponding inverter. Be sure to switch the number of poles after the motor stops. If switching is performed during rotation, the regenerative overvoltage or overcurrent protection circuit will operate and the motor will stop freely.
Motor with brake
When using an inverter to drive a motor with a brake, if the brake circuit is directly connected to the output side of the inverter, the brake cannot be opened due to the low voltage during starting. Please use a motor with a brake independent of the brake power supply, and connect the brake power supply to the power supply side of the inverter. In general, when using a motor with a brake, the noise in the low speed range may increase.
(3) Power transmission structure (reducer, belt, chain, etc.)
When using oil-lubricated gearboxes, variators, reducers, etc. in the power transmission system, if you only operate continuously in the low-speed range, the oil lubrication effect will deteriorate, so please be aware. In addition, during high-speed operation above 60 Hz, problems such as noise of the power transmission structure, life, and strength due to centrifugal force may occur. Please pay attention to it.

Chapter 5 Operation and Display

5.1 Operation panel description

5.1.1 Operation panel icon

5.1.2 Key Description

Key symbol	Name	Function Description
PRG	Programming key	Menu entry or exit, parameter modification
ENTER	OK key	Enter the menu and confirm the parameter setting
▲	Increment key	Increment of data or function code
▼	Decrement key	Decrement of data or function code
▶▶	Shift key	Select parameter modification position and display content
RUN	Run key	Run operation in keyboard operation mode
STOP/RESET	Stop/reset button	Stop/reset operation
FUNC	Multifunctional shortcut keys	Switch selection according to function

5.1.3 Function indicator description

Indicator name	Description
REV	The inverter reversal indicator light, when the light is on, it indicates the reversing operation status.
FWD	Inverter forward rotation indicator, when the light is on, it indicates the forward running state
ALM	Fault indicator, the light flashes quickly to indicate a fault
Hz	Frequency unit
A	Current unit
V	Voltage unit

5.1.4 Function indicator combination description：

Indicator combination method	LED display meaning	Symbol
Hz+A	Motor speed	r/min
A+V	Time (seconds)	s
Hz+V	Percentage actual value	%
Hz+A+V	Temperature	℃

5.2 Operating procedures

5.2.1 Parameter settings

The three-level menus are:

1. Function code group number (first level menu);
2. Function code label (second-level menu);
3. Function code setting value (three-level menu).

Note: When operating in the third-level menu, press PRG or ENTER to return to the second-level menu. The difference between the two is: press ENTER to save the set parameters into the control panel, and then return to the secondary menu, and automatically transfer to the next function code; press PRG to directly return to the secondary menu without storing parameters, and keep staying Current function code. In the third level menu state, if the parameter has no flashing bit, it means that the function code cannot be modified. The possible reasons are:

1) This function code is an unmodifiable parameter. Such as actual test parameters, running record parameters, etc.

2) This function code cannot be modified in the running state, and can be modified only after stopping.

5.2.2 Fault reset

After the inverter fails, the inverter will prompt related fault information. The user can reset the fault through the STOP/RESET key on the keyboard or the terminal function. After the fault reset of the inverter, it is in the standby state. If the inverter is in a fault state and the user does not reset the fault, the inverter is in the running protection state and the inverter cannot run.

5.2.3 Motor parameter self-learning

Select the vector control operation mode. Before the inverter runs, the nameplate parameters of the motor must be accurately input. The inverter nameplate parameters match the standard motor parameters. The vector control mode is strongly dependent on the motor parameters. To obtain good control performance, Obtain accurate parameters of the controlled motor.

Chapter 6 Function Manual

The symbols in the function table are explained as follows
×: Indicates that the set value of this parameter can be changed when the inverter is in stop or running state;
○: Indicates that the set value of this parameter cannot be changed when the inverter is running;
◆: Indicates that the value of this parameter is the actual test record value and can not be changed;
◇: Indicates that the parameter is a "manufacturer parameter", which can only be set by the manufacturer, and users are prohibited from operating;

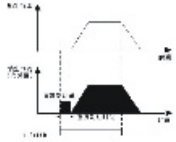
F00 group-basic operating parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F00.00	LCD language selection (only valid for LCD panel)	LCD language selection (only valid for LCD panel) LCD language selection (only valid for LCD panel)	0~1	0	○
F00.01	Function macro definition	0: general mode 1: Single pump constant pressure water supply mode 2:1: One change, two jobs (1 variable frequency pump + 2 power frequency pumps) water supply mode 3: Three-pump cycle soft start (3 inverter pumps) water supply mode 4: Photovoltaic pump water supply mode 5: CNC machine tool control mode 6: Fire inspection mode 7: EPS power mode 8~20: reserved	0~100	0	×
F00.02	Way to control	0: Ordinary V/F control (manual torque boost) 1: Advanced V/F control (automatic torque boost) 2: Open loop current vector control (SVC) 3: reserved 4: Separate V/F control Note: This parameter cannot be initialized, please modify it manually	0~4	Model setting	×
F00.03	Run command channel selection	0: Operation panel run command channel 1: Terminal run command channel 2: Communication operation command channel	0~2	0	○

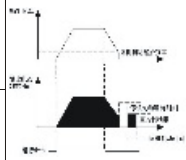
Function code	Name	Content	Predetermined area	Factory setting	Change
F00.04	Main frequency source A selection	0: Digital setting 1(panel ▲/▼ key, encoder + F00.10) 1: Digital setting 2 (terminal UP/DOWN adjustment + F00.10) 2: Digital setting 3 (communication setting) 3: AI1 analog setting (0～10V/20mA) 4: AI2 analog setting (0～10V) 5: Pulse setting (0～50KHZ) 6: Simple PLC setting 7: Multi-stage speed running setting 8: PID control setting 9: Panel potentiometer 10: MPPT setting (photovoltaic water pump)	0～10	9	○
F00.05	Auxiliary frequency source B selection	0: Digital setting 1 (panel ▲/▼ key, encoder + F00.10) 1: Digital setting 2 (terminal UP/DOWN adjustment + F00.10) 2: Digital setting 3 (communication setting) 3: AI1 analog setting (0～10V/20mA) 4: AI2 analog setting (0～10V) 5: Pulse setting (0～50KHZ) 6: Simple PLC setting 7: Multi-stage speed running setting 8: PID control setting 9: Panel potentiometer 10: MPPT setting (photovoltaic water pump)	0～10	3	○

Function code	Name	Content	Predetermined area	Factory setting	Change
F00.06	Frequency source setting method	0: Main frequency source A 1: A+K*B 2: A-K*B 3: | A-K*B | 4: MAX (A, K*B) 5: MIN (A, K*B) 6: Switch from A to K*B (A has priority over K*B) 7: Switch from A to (A+K*B) (A has priority over A+K*B) 8: Switch from A to (A-K*B) (A has priority over A-K*B) Note 1: Frequency switching needs to be realized through terminal coordination Note 2: Compared with the frequency source setting method, the swing frequency control has a higher priority.	0～8	0	○
F00.07	Digital set 1 control	LED units: power down storage 0: store 1: Do not store LED ten digits: keep off 0: keep 1: Do not keep Hundreds place of LED: ▲/▼ keys, UF/DOWN frequency negative adjustment 0: invalid 1: Effective LED Thousands: Reserved	000～111	000	○
F00.08	Digital set 2 control			000	○
F00.09	Frequency source digital 1 setting	The set value is the initial value of frequency digital setting 1	0.00Hz～【F00.13】	50.00	○

Function code	Name	Content	Predetermined area	Factory setting	Change
F00.10	Frequency source digital 2 setting	The set value is the initial value of frequency digital setting 2	0.00Hz～【F00.13】	50.00	○
F00.11	Auxiliary frequency source weight coefficient K setting	K is the weight coefficient of the auxiliary frequency source	0.01～10.00	1.00	○
F00.12	Maximum output frequency	The maximum output frequency is the highest frequency that the inverter allows to output, and is the basis for the acceleration and deceleration time setting.	Low frequency band: MAX {50.00, 【F00.13】} ～300.00 High frequency band: MAX {50.0, 【F00.13】} ～3000.0	50.00	×
F00.13	Upper frequency	The operating frequency cannot exceed this frequency	【F00.14】～【F00.12】	50.00	×
F00.14	Lower limit frequency	The operating frequency cannot be lower than this frequency	0.00Hz～【F00.13】	0.00	×
F00.15	Frequency output mode selection	LED units: high and low frequency mode selection 0: Low frequency mode (0.00～300.00Hz) 1: High frequency mode (0.0～3000.0Hz) LED Hundreds: Acceleration and deceleration benchmark selection 0: Based on the maximum output frequency 1: Based on the target output frequency Hundreds of LEDs: reserved LED Thousands: Reserved Note: High frequency mode is only valid for VF control	00～11	00	×

Function code	Name	Content	Predetermined area	Factory setting	Change
F00.16	Acceleration time 1	The time required for the inverter to accelerate from zero frequency to the maximum output frequency	0.1～3600.0S 0.4～4.0KW 7.5S 5.5～30.0KW 15.0S 37～132KW 30.0S 160～630KW 60.0S	Model setting	○
F00.17	Deceleration time 1	The time required for the inverter to decelerat e from the maximum output frequency to zero frequency		Model setting	○
F00.18	Operation direction setting	0: forward 1: Reverse 2: Reversal prevention Note: This function code setting is valid for the running direction control of all running command channels.	0～2	0	×
F00.19	Carrier frequency setting	For occasions requiring silent operation, the carrier frequency can be appropriately increased to meet the requirements, but increasing the carrier frequency will increase the heat generation of the inverter.	1.0～16.0KHz 0.4～4.0KW 6.0KHz 5.5～30KW 4.5KHz 37～132KW 3.0KHz 160～630KW 1.8KHz	Model setting	○
F00.20	User password	0～65535 Note 1: 0～9: no password protection Note 2: The password is set successfully, it takes 3 minutes to take effect Note 3: Write protection is invalid for this parameter and cannot be initialized	0～65535	0	○

Group F01-Start and stop control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F01.00	Starting method	0: start frequency start 1: DC braking + starting frequency start 2: Speed tracking start	0～2	0	×
F01.01	Starting frequency		0.00～50.00Hz	1.00	○
F01.02	Starting frequency holding time		0.0～100.0s	0.0	○
F01.03	Starting DC braking current		0.0～150.0%*电机额定电流	0.0%	○
F01.04	Start DC braking time		0.0～100.0s	0.0	○
F01.05	Acceleration and deceleration method		0～1	0	×
F01.06	S-curve start time ratio		10.0～50.0%	20.0%	○
F01.07	S curve end time ratio		10.0～50.0%	20.0%	○
F01.08	Stop mode		0～1	0	×

Group F01-Start and stop control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F01.09	Start frequency of DC braking at stop	Stop DC braking current	0.00～【F00.13】Upper limit frequency	0.00	○
F01.10	DC braking waiting time at stop		0.0～100.0s	0.0	○
F01.11	Stop DC braking current		0.0～150.0%* rated current of motor	0.0%	○
F01.12	Stop DC braking current		0.0～100.0s	0.0	○
F01.13	Acceleration time 2	Set acceleration time 2		Model setting	○
F01.14	Deceleration time 2	Set deceleration time 2	0.1～3600.0S	Model setting	○
F01.15	Acceleration time 3	Set acceleration time 3	0.4～4.0KW 7.5S	Model setting	○
F01.16	Deceleration time 3	Set deceleration time 3	5.5～30KW 15.0S	Model setting	○
F01.17	Acceleration time 4	Set acceleration time 4	37～132KW 40.0S	Model setting	○
F01.18	Deceleration time 4	Set deceleration time 4	160～630KW 60.0S	Model setting	○

Group F01-Start and stop control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F01.19	Acceleration and deceleration time unit selection	0: second 1: minute 2: 0.1 second	0～2	0	○
F01.20	Jog forward running frequency setting	Set jog forward and reverse running frequency	0.00～【F00.13】	5.00	○
F01.21	Jog reverse running frequency setting		0.00～【F00.13】	5.00	○
F01.22	Jog acceleration time setting	Set jog acceleration time setting	0.1～3600.0S 0.4～4.0KW 7.5S 5.5～30.0KW 15.0S 37～132KW 40.0S 160～630KW 60.0S	Model setting	○
F01.23	Jog deceleration time setting	Set jog deceleration time setting		Model setting	○
F01.24	Jog interval time setting	Set the jog interval time setting	0.0～100.0s	0.1	○
F01.25	Hop frequency 1		0.00～upper limit frequency	0.00	○
F01.26	Jump frequency 1 range		0.00～upper limit frequency	0.00	○
F01.27	Hop frequency 2		0.00～upper limit frequency	0.00	○
F01.28	Jump frequency 2 range		0.00～upper limit frequency	0.00	○
F01.29	Hop frequency 3		0.00～upper limit frequency	0.00	○
F01.30	Hop frequency 3 range		0.00～upper limit frequency	0.00	○

Group F01-Start and stop control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F01.31	Action when the set frequency is lower than the lower limit frequency	0: Run at the lower frequency limit. 1: Zero frequency operation after the delay time (no delay when starting). 2: Stop after delay time (no delay when starting).	0～2	0	×
F01.32	Stop delay time when the frequency is lower than the lower limit frequency (simple sleep)	Set the stop delay time when the frequency is lower than the lower limit frequency (simple sleep).	0.0～3600.0s	10.0	○
F01.33	Zero frequency braking current	This parameter is the percentage of the rated current of the motor.	0.0～150.0%* motor rated current	0.0	×
F01.34	Forward and reverse dead time	The waiting time for the inverter to transition from forward operation to reverse operation, or from reverse operation to forward operation.	0.0～100.0s	0.0	○
F01.35	Forward and reverse switching mode	0: Zero frequency switching 1: Over-start frequency switch	0～1	0	×
F01.36	Emergency stop standby deceleration time	It is only valid for the No. 10 function of the digital input terminals (F07.00～F07.06).	0.1～3600.0s	1.0	○
F01.37	Maintenance time of stop DC braking current	Set the maintenance time of the stop DC braking current.	0.0～100.0s	0.0	○

Group F02-Motor Parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F02.00	Motor type selection	0: AC asynchronous motor 1: Permanent magnet synchronous motor (reserved) Note 1: This parameter cannot be initialized, please modify it manually	0～1	0	×
F02.01	Motor rated power	Set according to the motor nameplate parameters. Please configure the corresponding motor according to the power of the inverter. If the power difference is too large, the control performance of the inverter will be significantly reduced.	0.4～999.9KW	Model setting	×
F02.02	Motor rated frequency		0.01Hz～【F00.13】	50.00	×
F02.03	Motor rated speed		0～60000RFM	Model setting	×
F02.04	Motor rated voltage		0～999V	Model setting	×
F02.05	Motor rated current		0.1～6553.5A	Model setting	×
F02.06	Stator resistance of asynchronous motor	If the motor is tuned, the set value of F02.06～F02.10 will be updated after the tuning is over.	0.001～20.000Ω	Model setting	×
F02.07	Induction motor rotor resistance		0.001～20.000Ω	Model setting	×
F02.08	Asynchronous motor stator and rotor inductance		0.1～6553.5mH	Model setting	×
F02.09	Asynchronous motor stator and rotor mutual inductance		0.1～6553.5mH	Model setting	×
F02.10	Asynchronous motor no-load current		0.01～655.35A	Model setting	×
F02.11-F02.15	Retain	—	—	0	◆
F02.16	Motor tuning options	0: No action 1: Static tuning 2: No-load complete tuning	0～2	0	×

Group F02-Motor Parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F02.17	Asynchronous motor pre-excitation hold time	Note: This parameter is invalid for VF control	0.00～10.00S	Model setting	×

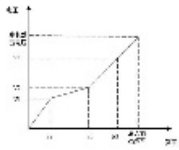
Group F03-reserved Group F04-Speed loop andtorque control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F04.00	Speed (ASR1) proportional gain	The function codes F01.00～F01.07 are valid inthe vector control mode without PG. Inthe vector control mode, the speed response characteristics of the vector control can be changed by setting the proportional gain P and theintegral time I ofthe speed regulator.	0.000～12.500	3.0	○
F04.01	Speed (ASR1) integration time		0.000～25.000S	0.50	○
F04.02	ASR1 filter time constant		0.000～0.100S	0.000	○
F04.03	Switch low frequency		0.00Hz～【F04.07】	5.00	○
F04.04	Speed (ASR2) proportional gain		0.000～12.500	2.0	○
F04.05	Speed (ASR2) integration time		0.000～25.000S	1.00	○
F04.06	ASR2 filter time constant		0.000～0.100S	0.000	○
F04.07	Switch high frequency		F04.03】～【F00.13】	10.00	○

Group F03-reserved Group F04-Speed loop andtorque control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F04.08	Vector control positive slip compensation coefficient (electric state)	In the vector control mode, this function code parameter is used to adjust the speed stability accuracy of the motor. When the motor is heavily loaded and the speed is low, increase this parameter; otherwise, decrease this parameter. Among them, the positive slip coefficient compensates for the speed when the motor slip is positive, and on the contrary, the negative slip coefficient compensates for the speed when the motor slip is negative. The set value is the percentage of the rated slip frequency of the motor.	50.0%～ 200.0%	100.0%	○
F04.09	Vector control negative slip compensation coefficient (brake state)		50.0%～ 200.0%	100.0%	○
F04.10	Speed and torque control options	0: speed 1: Torque 2: The condition is valid (terminal switching)	0～2	0	×
F04.11	Speed and torque s witching delay	Set the speed and torque switching delay	0.01～ 1.00S	0.05	×
F04.12	Torque command selection	0: Keyboard number setting 1: AI1 2: AI2 3: Communication setting	0～3	0	○
F04.13	Keyboard digital setting torque	The set value is the percentage of the rated current of the motor	200.0%～ 200.0%	0.0%	○
F04.14	Speed limit channel selection 1 in torque control mode (forward)	0: keyboard number given 1 1: AI1 2: Ai2	0～2	0	○
F04.15	Speed limit channel selection 1 in torque control mode (reverse)	0: keyboard number given 2 1: AI1 2: Ai2	0～2	0	○
F04.16	Keyboard number limit speed 1	The keyboard number limits the limit value of speed 1 relative to the maximum output frequency. This function code corre sponds to the limit value of the forward speed when F04.14=0.	0.0～ 100.0%	100.0%	○

Group F03-reserved Group F04-Speed loop and torque control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F04.17	Keyboard number limit speed 2	The keyboard number limits the speed 2 limit value relative to the maximum output frequency. This function code corresponds to the reverse speed limit value when F04.15=0.	0.0～100.0%	100.0%	○
F04.18	Torque rise time	The torque rise/fall time defines the time when the torque rises from 0 to the maximum value or decreases from the maximum value to 0.	0.0～10.0S	0	○
F04.19	Torque down time		0.0～10.0S	0	○
F04.20	Electric torque limit in vector mode	Set the electric torque limit of the vector mode, the set value is the percentage of the rated current of the motor。	G型：0.0%～200.0% 160.0%　P型：0.0%～200.0% 120.0%		○
F04.21	Braking torque limit in vector mode	Set the braking torque limit of the vector mode. The set value is the percentage of the rated current of the motor.	G型：0.0%～200.0% 160.0%　P型：0.0%～200.0% 120.0%		○
F04.22	Torque detection action selection	0: Invalid detection 1: Continue to run after the torque is detected in constant speed 2: Continue to run after the torque is detected during running 3: Cut off the output after the torque is detected in constant speed 4: Cut off the output after the torque is detected during operation 5: Continue running after detecting insufficient torque at constant speed 6: Continue to run after insufficient torque is detected during running 7: Cut off the output after detecting insufficient torque at constant speed 8: Cut off the output after detecting insufficient torque during operation	0～8	0	×

Group F03-reserved Group F04-Speed loop andtorque control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F04.23	Torque detection level	When the actual torque is continuously greater than F04.23 (torque detection level) within F04.24 (torque detection time), the inverter will take corresponding actions according to the setting of F04.22. When the torque detection level setting value is 100%, it corresponds to the rated torque of the motor.	G型： 0.0%～ 200.0% 150.0% P型：0.0% ～200.0% 110.0%	Model setting	×
F04.24	Torque detection time		0.0～ 100.0S	0.0	×
F04.25	Cutoff frequency of static friction coefficient	Since the motor starting torque is not enough, increasing the setting value of F04.26 can increase the starting torque. When the speed exceeds the setting value of F04.25, the increased torque will be slow within the setting time of F04.27 Slowly decrease to the given torque.	0.00～ 300.00Hz	10.00	○
F04.26	Static friction coefficient setting		0.0～ 200.0	0.0	○
F04.27	Static friction coefficient maintenance time		0.00～ 600.00s	0.00	×

F05 group-VF control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F05.00	V/F curve setting	0: linear curve 1: Reduce torque curve 1 (1.3 power) 2: Decreasing torque curve 2 (1.5 power) 3: Decreasing torque curve 3 (1.7 power) 4: Square curve 5: User set V/F curve (determined by F05.03～F05.08)	0～5	0	×

F05 group-VF control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F05.01	Torque boost setting	Manual torque boost, this setting is relative to the percentage of motor rated voltage.	0.0～30.0%	Model setting	×
F05.02	Torque boost cut-off frequency	Set torque boost cut-off frequency	0.00～rated frequency of motor	25.0%	×
F05.03	V/F frequency value F1		0.00～ frequency value F1	25.00	×
F05.04	V/F voltage value V1		0.0～Voltage value V2	50.0%	×
F05.05	V/F frequency value F1		Frequency value F1～ frequency value F3	37.50	×
F05.06	V/F voltage value V2		Voltage value V1～Voltage value V3	75.0%	×
F05.07	V/F frequency value F3		Frequency value F1～ 【F02.02】		×
F05.08	V/F voltage value V3		Voltage value V2～100.0%* motor rated voltage	15.00	×
F05.09	V/F control slip frequency compensation	After the asynchronous motor is loaded, the speed will decrease. The use of slip compensation can make the motor speed close to its synchronous speed, so that the motor speed control accuracy is higher.		0.0%	○
F05.10	V/F control slip compensation filter coefficient	This parameter is used to adjust the response speed of slip frequency compensation. The larger the value setting, the slower the response speed and the more stable the motor speed.	1～10	3	○

F05 group-VF control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F05.11	V/F control torque compensation filter coefficient	When free torque is increased, this parameter is used to adjust the response speed of torque compensation. The larger the value setting, the slower the response speed and the more stable the motor speed.	0～10	Model setting	○
F05.12	Separate V/F control option	0: VF semi-separated mode, voltage open loop output 1: VF semi-separated mode, voltage closed loop output 2: VF complete separation mode, voltage open loop output 3: VF complete separation mode, voltage closed loop output Note 1: When VF separation control is selected, please turn off the dead zone compensation function of the inverter Note 2: The concept of semi-separation is that the frequency and voltage of the inverter still maintain the relationship of variable frequency and voltage during the starting process. When the frequency reaches the set frequency, the voltage and frequency are separated	0～3	0	×
F05.13	Voltage given channel	0: number given 1: AI1 2: Ai2	0～2	0	○
F05.14	Voltage feedback channel of voltage closed loop output	0: Ai1 1: AI2 Note: This parameter is only valid for closed loop output mode	0～1	0	×
F05.15	Digital setting output voltage value	In the open loop output mode, the maximum output voltage is 100.0% of the rated motor voltage.	0.0～200.0%* motor rated voltage	100.0%	○
F05.16	Deviation limit of voltage closed loop adjustment	It is used to limit the maximum deviation range of voltage regulation in closed-loop mode, so as to limit the voltage within a safe range to ensure reliable operation of the equipment.	0.0～5.0%* rated voltage of motor	2.0%	×

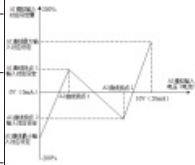
F05 group-VF control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F05.17	Maximum voltage of VF curve in semi-separated mode	This voltage represents the output voltage of the inverter	0.0~100.0%* rated voltage of motor	80.0%	×
F05.18	Controller adjustment period of voltage closed loop output	This function code represents the speed of voltage adjustment. If the voltage response is slow, this parameter value can be appropriately reduced.	0.01~10.00s	0.10	×
F05.19	Voltage rise time	F05.19~F05.20 are only valid for the voltage open loop output mode after complete separation.	0.1~3600.0S	10.0	○
F05.20	Voltage drop time		0.1~3600.0S	10.0	○
F05.21	Voltage feedback disconnection processing	0: Alarm and maintain operation with voltage at the time of disconnection 1: Alarm and reduce the voltage to limit voltage operation 2: Protection action and free stop	0~2	0	×
F05.22	Voltage feedback disconnection detection value	Take the maximum value of the given voltage as the upper limit of the feedback disconnection detection value. During the feedback disconnection detection time, when the voltage feedback value is continuously smaller than the feedback disconnection detection value, the inverter will make corresponding protection actions according to the setting of F05.21.	0.0~100.0%* motor rated voltage	2.0%	○
F05.23	Voltage feedback disconnection detection time	The duration before the protection action after the voltage feedback disconnection occurs.	0.0~100.0S	10.0	○
F05.24	Limiting voltage of voltage feedback disconnection	This voltage represents the output voltage of the inverter. A reasonable setting of this parameter can prevent equipment damage caused by voltage overshoot at the time of disconnection.	0.0~100.0%* rated voltage of motor	80.0%	○
F05.25	Bus voltage undervoltage detection value	0 is invalid, and the bus voltage is lower than the parameter value, and it will report "E-34".	0~1000V	0	○
F05.26	Bus undervoltage fault reset value	If the bus voltage reaches the set value, the undervoltage fault "E-34" will automatically reset and start.	0~1000V	0	○

F06 group-output terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F06.00	AI1 input corresponding physical quantity	0: Speed command (out put frequency, -100.0%~100.0%) 1: Torque command (output torque, -200.0%~200.0%) 2: Voltage command (output voltage, 0.0%~200.0%* motor rated voltage)	0~2	0	×
F06.01	AI1 input lower limit	Set AI1 lower limit	0.00V/0.00mA~ 10.00V/20.00mA	0.00	○
F06.02	AI1 lower limit corresponds to physical quantity setting	AI1 lower limit corresponds to the setting, which corresponds to the percentage of the upper limit frequency.	-200.0%~200.0%	0.0%	○
F06.03	AI1 input upper limit	Set AI1 upper limit	0.00V/0.00mA~ 10.00V/20.00mA	10.00	○
F06.04	AI1 upper limit corresponds to physical quantity setting	Set the AI1 upper limit corresponding setting, which corresponds to the percentage of the upper limit frequency.	-200.0%~200.0%	100.0%	○
F06.05	AI1 input filter time	Set AI1 input filter time	0.00S~10.00S	0.05	○
F06.06	AI2 input corresponding physical quantity	0: Speed command (output frequency, -100.0%~100.0%) 1: Torque command (output torque, -200.0%~200.0%) 2: Voltage command (output voltage, 0.0%~200.0%*motor rated voltage)	0~2	0	×
F06.07	AI2 input lower limit	Set AI2 lower limit	0.00V~10.00V	0.00	○
F06.08	AI2 lower limit corresponds to physical quantity setting	Set the AI2 lower limit corresponding setting, which corresponds to the percentage of the upper limit frequency.	-200.0%~200.0%	0.0%	○

F06 group-output terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F06.09	AI2 input upper limit	Set AI2 upper limit	0.00V～10.00V	10.00	○
F06.10	AI2 upper limit corresponds to physical quantity setting	Set the AI2 upper limit corresponding setting, which corresponds to the percentage of the upper limit frequency.	-200.0% ～200.0%	100.0%	○
F06.11	AI2 input filter time	Set AI2 input filter time	0.00S～ 10.00S	0.05	○
F06.12	Analog input anti-shake deviation limit	When the analog input signal fluctuates frequently near the given value, you can set F06.12 to suppress the frequency fluctuation caused by this fluctuation.	0.00V～ 10.00V	0.00	○
F06.13	Zero frequency operation threshold	When F00.15=1 (high frequency mode), the upper limit of the value of this function code is 500.0Hz.	Zero frequency return difference ～ 50.00Hz	0.00	○
F06.14	Zero frequency hysteresis	Set zero frequency hysteresis	0.00～ Zero frequency operation Threshold	0.00	○
F06.15	Physical quantity corresponding to external pulse input	0: Speed command (output frequency, -100.0%～100.0%) 1: Torque command (output torque, -200.0%～200.0%)	0～1	0	×
F06.16	External pulse input lower limit	Set the lower limit frequency of external pulse X7 input	0.00～ 50.00kHz	0.00	○
F06.17	External pulse lower limit corresponding to physical quantity setting	Set the corresponding setting of the lower limit of external pulse X7, which is a percentage relative to the maximum output frequency.	-100.0% ～100.0%	0.0%	○

F06 group-output terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F06.18	External pulse input upper limit	Set the upper limit frequency of external pulse X7 input	0.00～50.00kHz	50.00	○
F06.19	External pulse upper limit corresponding to physical quantity setting	Set the corresponding setting of the external pulse X7 upper limit, which is a percentage relative to the maximum output frequency.	-200.0%～200.0%	100.0%	○
F06.20	External pulse input filter time	Set external pulse input filter time	0.00S～10.00S	0.05	○
F06.21	AO1 multi-functional analog output terminal function selection	0: Output frequency (before slip compensation) 1: Output frequency (after slip compensation) 2: Set frequency 3: Motor speed (estimated value) 4: Output current 5: Output voltage 6: Bus voltage 7: PID given amount 8: PID feedback amount 9: AI1 10: AI2 11: Input pulse frequency 12: Torque current 13: Flux current 14: Communication settings	0～14	0	○
F06.22	AO2 multi-functional analog output terminal function selection		0～14	4	○
F06.23	DO multifunctional pulse output terminal function selection		0～14	11	○
F06.24	AO1 output lower limit corresponds to the physical quantity	Set the corresponding physical quantity of Ao1 output lower limit	-200.0%～200.0%	0.0%	○
F06.25	AO1 output lower limit	Set the lower limit of Ao1 output	0.00～10.00V	0.00	○
F06.26	AO1 output upper limit corresponds to the physical quantity	Set the corresponding physical quantity of Ao1 output upper limit	-200.0%～200.0%	100.0%	○
F06.27	AO1 output upper limit	Set AO1 output upper limit	0.00～10.00V	10.00	○
F06.28	AO2 output lower limit corresponds to the physical quantity	Set the corresponding physical quantity of AO2 output lower limit	-200.0%～200.0%	0.0%	○

F06 group-output terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F06.29	AO2 output lower limit	Set AO2 output lower limit	0.00～10.00V	0.00	○
F06.30	AO2 output upper limit corresponds to the physical quantity	Set the corresponding physical quantity of Ao2 output upper limit	-200.0%～200.0%	100.0%	○
F06.31	AO2 output upper limit	Set AO2 output upper limit	0.00～10.00V	10.00	○
F06.32	The corresponding physical quantity of DO output lower limit (reserved)	Set the corresponding physical quantity of DO output lower limit	-200.0%～200.0%	0.0%	○
F06.33	DO output lower limit (reserved)	Set DO output lower limit	0.00～50.00kHz	0.00	○
F06.34	Physical quantity corresponding to DO output upper limit (reserved)	Set the corresponding physical quantity of DO output upper limit	-200.0%～200.0%	100.0%	○
F06.35	DO output upper limit (reserved)	Set DO output upper limit	0.00～50.00kHz	50.00	○
F06.36	AI related parameter selection	LED units: AI1 multi-point curve selection 0: forbidden 1: valid Tens place of LED: AI2 multi-point curve selection 0: Prohibited 1: Valid Hundreds place of LED: analog input signal selection 0: AI1 and AI2 input signal 0～10V 1: AI1 input signal 4～20mA, AI2 input signal 0～10V2: AI2 input signal 4～20mA, AI1 input signal 0～10V3: AI1 and AI2 input signal 4～20mALED Thousands: Reserved	000～311	000	×

F06 group-output terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F06.37	AI1 curve minimum input		0.00 ~ 【F06.39】	0.00	○
F06.38	AI1 curve minimum input corresponding setting		-200.0% ~ 200.0%	0.0%	○
F06.39	AI1 curve inflection point 1 input		【F06.37】 ~ 【F06.41】	3.00	○
F06.40	AI1 curve inflection point 1 input corresponding setting		-200.0% ~200.0%	30.0%	○
F06.41	AI1 curve inflection point 2 input		【F06.39】 ~ 【F06.43】	6.00	○
F06.42	AI1 curve inflection point 2 input corresponding setting		-200.0% ~200.0%	60.0%	○
F06.43	AI1 curve maximum input		【F06.41】 ~ 10.00	10.00	○
F06.44	AI1 curve maximum input corresponding setting		-200.0% ~200.0%	100.0%	○
F06.45	AI2 curve minimum input		0.00 ~ 【F06.47】	0.00	○
F06.46	AI2 curve minimum input corresponding setting		-200.0% ~200.0%	0.0%	○
F06.47	AI2 curve inflection point 1 input		【F06.45】 ~ 【F06.49】	3.00	○
F06.48	AI2 curve inflection point 1 input corresponding setting		-200.0% ~200.0%	30.0%	○
F06.49	AI2 curve inflection point 2 input		【F06.47】 ~ 【F06.51】	6.00	○

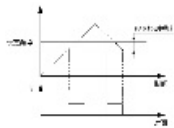
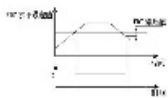
F06 group-output terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F06.50	AI2 curve inflection point 2 input corresponding setting		-200.0% ~200.0%	60.0%	○
F06.51	AI2 curve maximum input		【F06.49】 ~10.00	10.00	○
F06.52	AI2 curve maximum input corresponding setting		-200.0% ~200.0%	100.0%	○
F06.53	Ai1 input voltage protection upper limit	When the value of analog input AI1 is greater than F06.53, or AI1 input is less than F06.54, the inverter Y terminal or relay R outputs "AI1 input over run" ON signal to indicate whether the AI1 input voltage is within the set range Inside.	0.00V/ 0.00mA~ 10.00V/ 20.00mA	6.80	○
F06.54	AI1 input voltage protection lower limit		0.00V/ 0.00mA~ 10.00V/ 20.00mA	3.10	○

F07 group-input terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F07.00	Input terminal X1 function (when F15.00 is non-zero value, the default function number 58)	0: The console is idle 1: Forward running (FWD) 2: Reverse operation (REV) 3: Three-line operation control 4: Forward jog control 5: Reverse jog control 6: Free stop control 7: External reset signal input (RST) 8: External equipment failure normally open input 9: External equipment failure normally closed input 10: Emergency stop function (brake at the fastest speed) 11: External shutdown control 12: Frequency increment command 13: Frequency decreasing command 14: UP/DOWN terminal frequency clear 15: Multi-speed selection 1 16: Multi-speed selection 2 17: Multi-speed selection 3 18: Multi-speed selection 4 19: Acceleration and deceleration time selection TT1 20: Acceleration and deceleration time selection TT2 21: Run command channel selection 1 22: Run command channel selection 2 23: Inverter acceleration and deceleration prohibition command 24: Inverter operation prohibition command 25: Run command to switch to panel 26: Run command switch to terminal 27: Run command to switch to communication 28: Clear auxiliary frequency	0～65	1	×
F07.01	Input terminal X2 function (when F15.00 is a non-zero value, the default function number 59)		0～65	2	×
F07.02	Input terminal X3 function (when F15.00 is a non-zero value, default 60 function)		0～65	4	×
F07.03	Input terminal X4 power (when F15.00 is a non-zero value, default 61 function)		0～65	7	×

F07 group-input terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F07.04	Input terminal X5 function (when F15.00 is a non-zero value, the default function Number 62)	29: Frequency sourceA and K*B switch 30: Frequency sourceA and A+K*B switch 31: Frequency sourceA and A-K*B switch 32: reserved 33: PID control input 34: PID control pause 35: Swing frequency control input 36: Swing frequency control pause 37: Wobble frequency status reset 38: PLC control input 39: PLC pause 40: PLC reset 41: Counter clear signalinput 42: Counter trigger signalinput 43: Timing triggerinput 44: Timing clearinput 45: External pulse frequency input (only valid forX7) 46: Clear the length 47: Length counting input (only valid for X7) 48: Speed and torque control switch 49: Torque control prohibited 50～57: reserved 58: start/stop 59: Operation allowed 60: Interlock 1 61: Interlock 2 62: Interlock 3 63: PF12 start/stop 64: Afrequency cuts B and runs 65: The first groupof PID is switched to the second group of PID	0～65	8	×
F07.05	Input terminal X6 function (when F15.00 is a non-zero value, the default function Number 63)		0～65	0	×
F07.06	Input terminal X7 function (high-speed pulse input)		0～65	45	×
F07.07	Keep	—	—	0	◆
F07.08	Switch filter times	1: Represents the 2MS scan time unit	1～10	5	○
F07.09	Terminal function detection selection at power-on	0: Terminalrunning command is invalid when power on 1: Terminalrunning command is valid when power is on	0～1	0	○
F07.10	Input terminal valid logic setting (X1～X7)	0 means positive logic,that is, the connection between the Xi terminal andthe common terminal is valid, and the disconnection isinvalid 1 means inverse logic,that is, the connection between the Xi terminal andthe common terminal is invalid, and the disconnection isvalid	0～7FH	00	×

F07 group-input terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F07.11	FWD/REV terminal control mode	0: Two-line controlmode 1 1: Two-line controlmode 2 2: Three-wire control mode1 3: Three-wire control mode2	0～3	0	×
F07.12	UF/DOWN terminal frequency modification rate	When F00.15=1 (high frequency mode), the upper limit of the valueof this function code is 500.0Hz/S.	0.01～ 50.00Hz/S	1.00	○
F07.13	Keep	—	—	0	◆
F07.14	Y1 output delay time	This function code defines the delay from thestatus change of the switchoutput terminals Y1, Y2 andthe relay R1, R2 tothe output change.	0.0～100.0s	0.0	×
F07.15	Y2 output delay time		0.0～100.0s	0.0	×
F07.16	R1 output delay time		0.0～100.0s	0.0	×
F07.17	R2 output delay time		0.0～100.0s	0.0	×
F07.18	Open collector output terminal Y1 setting	0: no output 1: The inverter isrunning forward 2: The inverter runsin reverse 3: Fault output 4: Frequency/speed level detection signal (FDT1) 5: Frequency/speed level detection signal (FDT2) 6: Frequency/speed arrival signal (F10R) 7: Indication of inverter running at zero speed 8: The output frequency reaches the upper limit 9: The output frequency reaches the lower limit 10: The lower limitof the set frequency reached during running 11: Inverter overloadalarm signal 12: Counter detection signal output 13: Counter reset signal output 14: The inverter isready for operation 1 15: Programmable multi-speed operation is completed in one cycle 16: Programmable multi-speed stage operation completed	0～61	0	×
F07.19	Open collector output terminal Y2 setting		0～61	0	×

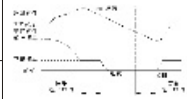
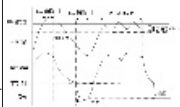
F07 group-input terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F07.20	Programmable relay R1 output	17: Swing frequency upper and lower limits 18: Current limiting action 19: Overvoltage stall action 20: Undervoltage lockout shutdown 21: Sleeping 22: Inverter alarm signal (PID disconnection, RS485 communication failure, panel communication failure, EEFROM read and write failure, encoder disconnection alarm, etc.) 23: AI1>AI2 24: Length reaches the output 25: Time arrives 26: Dynamic braking action 27: DC braking action 28: Flux braking inaction 29: Torqueis being limited 30: Over torque indication 31: auxiliary motor 1 32: auxiliary motor 2 33: Accumulated running time reached 34~49: Multi-stage speed or simple PLC operation stage number indication 50: Running indicator signal 51: Temperaturereached indication 52: Indication when the inverter is stopped or running at zero speed 53: reserved 54: reserved 55: Communication settings 56: The inverter isready for operation 2 57: AI1 inputlimit exceeded 58: The output current exceeds the limit 59: Interlock 1 output 60: Interlock 2 output 61: Interlock 3 output	0~61	3	×
F07.21	Programmable relay R2 output		0~61	0	×
F07.22	Output terminal valid logic setting (Y1~Y2)	0: indicates positive logic, that is, the connection between Yi terminaland the common terminal is valid, and the disconnection is invalid 1: Represents the inverse logic, that is, theconnection between the Yiterminal and the common terminal is invalid, and the disconnection is valid	0~3H	0	×

F07 group-input terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F07.23	Frequency reaches F10R detection width		0.0～100.0%*【F00.13】	10.0%	○
F07.24	FDT1 detection method	0: Speed setting value 1: Speed detection value	0～1	0	○
F07.25	FDT1 level setting		0.00Hz～【F00.13】	50.00	○
F07.26	FDT1 hysteresis value		0.0～100.0%*【F07.25】	2.0%	○
F07.27	FDT2 detection method	0: Speed setting value 1: Speed detection value	0～1	0	○
F07.28	FDT2 level setting	Refer to the schematic diagram of F07.25～F07.26.	0.00Hz～【F00.13】	25.00	○
F07.29	FDT2 hysteresis value		0.0～100.0%*【F07.28】	4.0%	○
F07.30	Count arrival processing	0: stop counting, stop output 1: Stop counting and continue output 2: Cycle counting, stop output 3: Cycle count, continue to output	0～3	3	×
F07.31	Counting start condition	0: Always start after power-on 1: Start when running, stop when stopping	0～1	1	×

F07 group-input terminal					
Function code	Name	Content	Predetermined area	Factory setting	Change
F07.32	Counter reset value setting	This function code defines the counting reset value and detection value of the counter. When the count value of the counter reaches the value set by the function code F11.21, the corresponding multi-function output terminal (counter reset signal output) outputs an effective signal, and the counter is cleared.	【F07.33】～65535	0	○
F07.33	Counter detection value setting		0～【F07.32】	0	○
F07.34	Timed arrival processing	0: Stop timing, stop output 1: Stop timing and continue output 2: Cycle timing, stop output 3: Cycle timing, continue to output	0～3	3	×
F07.35	Timing start condition	0: Always start after power-on 1: Start when running, stop when stopping	0～1	1	×
F07.36	Timing time setting	Set timing time setting	0～65535S	0	○
F07.37	Y1 off delay time	This function code defines the delay from the status change of the switch output terminals Y1, Y2 and the relay R1, R2 to the output change.	0.0～100.0s	0.0	×
F07.38	Y2 off delay time		0.0～100.0s	0.0	×
F07.39	R1 off delay time		0.0～100.0s	0.0	×
F07.40	R2 off delay time		0.0～100.0s	0.0	×

Group F08-PID control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F08.00	PID operation input method	0: automatic 1: Manual input through the defined multi-function terminal	0～1	0	×
F08.01	PID given channel selection	0: number given 1: Ai1 2: AI2 3: Pulse setting 4: RS485 communicat ion 5: Pressure setting (MPa, Kg) 6: Panel potentiometer setting	0～6	0	○
F08.02	Set digital quantity	When analog feedback is used, this function code realizes the setting of the closed-loop control setting with the operation panel. This function is valid only when the closed-loop setting channel selects digital setting (F08.01 is 0).	0.0 ～ 100.0%	50.0%	○
F08.03	PID feedback channel selection	0: AI1 1: AI2 2: AI1+AI2 3: AI1-AI2 4: MAX{AI1, AI2} 5: MIN{AI1, AI2} 6: Pulse setting 7: RS485 communication	0～7	0	○
F08.04	PID controller advanced feature settings	LED units: PID polarity selection 0: positive 1: negative LED tens place: proportional adjustment feature (reserved) 0: constant proportional integral adjustment 1: Automatic variable proportional integral adjustment LED hundreds place: integral adjustment t feature (reserved) 0: when the frequency reaches the upper and lower limits, stop integral adjustment 1: When the frequency reaches the upper and lower limits, continue integral adjustment LED Thousands: Reserved	0～1	0	×

Group F08-PID control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F08.05	Proportional gain KP1	The speed of PID adjustment is set by the two parameters of proportional gain and integral time. If the adjustment speed is fast, it needs to increase the proportional gain and reduce the integral time. If the adjustment speed is slow, it needs to reduce the proportional gain and increase the integral time. Under normal circumstances, the derivative time is not set; 0.0: no derivative.	0.01 ~ 100.00	2.50	○
F08.06	Integration time Ti1		0.01 ~ 10.00s	0.10	○
F08.07	Differential time Td1		0.00 ~ 10.00s	0.00	○
F08.08	Sampling period T	The sampling period is the sampling period of the feedback value. The regulator calculates once in each sampling period. The larger the sampling period, the slower the response, but the better the suppression of interference signals. Generally, it is not necessary to set; 0.00: Automatic.	0.00 ~ 10.00s	0.10	○
F08.09	Deviation limit	The deviation limit is the ratio of the absolute value of the deviation between the system feedback quantity and the given quantity to the given quantity. When the feedback quantity is within the deviation limit, PID adjustment does not act.	0.0 ~ 100.0%	0.0%	○
F08.10	Closed loop preset frequency	This function code defines the frequency and running time of the inverter before PID is put into operation when PID control is valid. In some control systems, in order to make the controlled object reach	0.00 Upper limit frequency	0.00	○
F08.11	Preset frequency hold time		0.0 ~ 3600.0s	0.0	×

Group F08-PID control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
		a predetermined value quickly, the inverter is set according to this function code to force a certain frequency value F08.10 and frequency holding time F08.11 to be output. That is, when the control object is close to the control target, the PID controller is put into impro ve the response speed.			
F08.12	Sleep mode	0: invalid 1: Sleep when the feedbac k pressure exceeds or falls below the sleep threshold 2: Sleep when feedback pressure and output frequency are stable 3: reserved	0～3	1	×
F08.13	Sleep shutdown mode selection	0: Decelerate to stop 1: Free stop	0～1	0	○
F08.14	Deviation between feedback and set pressure when entering sleep		0.0～ 10.0%	0.5%	○
F08.15	Sleep threshold		100～ 100.0%* Set pressure	100.0%	○
F08.16	Wake up threshold	F08.12=1 schematic diagram (sleep mode 1)	0～ 100.0%* Set pressure	90.0%	○
F08.17	Sleep delay time		0.0～ 3600.0s	100.0	○
F08.18	Wake up delay time	F08.12=2 schematic diagram (sleep mode 2)	0.0～ 3600.0s	5.0	○

Group F08-PID control parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F08.19	Proportional gain KP2	The speed of PID adjustment is set by the two parameters of proportional gain and integral time. If the adjustment speed is fast, it needs to increase the proportional gain and reduce the integral time. If the adjustment speed is slow, it needs to reduce the proportional gain and increase the integral time. Generally, the derivative time is not set; 0.0: no derivative.	0.01~100.00	1.00	○
F08.20	Integration time Ti2		0.01~10.00s	0.10	○
F08.21	Differential time Td2		0.01~10.00s	0.00	○
F08.22	PID upper limit cut-off frequency	Set PID upper limit cutoff frequency	【F08.23】~300.00Hz	50.00	×
F08.23	PID lower limit cutoff frequency	Set PID lower limit cutoff frequency	300.00Hz~【F08.22】	0.00	×
F08.24	Sleep frequency	Set sleep frequency	0.00Hz~【F00.13】	0.00	×

Group F09-Simple PLC, Multi-speed					
Function code	Name	Content	Predetermined area	Factory setting	Change
F09.00	PLC operation mode selection	0: stop after single cycle 1: Keep the final value running after a single cycle 2: Limited continuous loop 3: Continuous loop	0~3	0	×
F09.01	PLC operation input mode	0: automatic 1: Manual input through the defined multi-function terminal	0~1	0	×
F09.02	PLC running power down memory	0: no memory 1: Memorize the stage and frequency at the moment of power failure	0~1	0	×

Group F09-Simple PLC, Multi-speed					
Function code	Name	Content	Predetermined area	Factory setting	Change
F09.03	PLC start mode	0: restart from the first segment 1: Start from the stage at the moment of shutdown (fault) 2: Starting from the stage and frequency at the time of shutdown (fault)	0～2	0	×
F09.04	Limited number of consecutive cycles	Set PLC limited continuous cycle times	1～65535	1	○
F09.05	PLC running time unit selection	0: s 1: m	0～1	0	×
F09.06	Multi-speed frequency 0	Set multi-speed frequency 0	-Upper limit frequency ~ upper limit frequency	5.00	○
F09.07	Multi-speed frequency 1	Set multi-speed frequency 1	-Upper limit frequency ~ upper limit frequency	10.00	○
F09.08	Multi-speed frequency 2	Set multi-speed frequency 2	-Upper limit frequency ~ upper limit frequency	15.00	○
F09.09	Multi-speed frequency 3	Set multi-speed frequency 3	-Upper limit frequency ~ upper limit frequency	20.00	○
F09.10	Multi-speed frequency 4	Set multi-speed frequency 4	-Upper limit frequency ~ upper limit frequency	25.00	○
F09.11	Multi-speed frequency 5	Set multi-speed frequency 5	-Upper limit frequency ~ upper limit frequency	30.00	○
F09.12	Multi-speed frequency 6	Set multi-speed frequency 6	-Upper limit frequency ~ upper limit frequency	40.00	○
F09.13	Multi-speed frequency 7	Set multi-speed frequency 7	-Upper limit frequency ~ upper limit frequency	50.00	○
F09.14	Multi-speed frequency 8	Set multi-speed frequency 8	-Upper limit frequency ~ upper limit frequency	0.00	○
F09.15	Multi-speed frequency 9	Set multi-speed frequency 9	-Upper limit frequency ~ upper limit frequency	0.00	○
F09.16	Multi-speed frequency 10	Set multi-speed frequency 10	-Upper limit frequency ~ upper limit frequency	0.00	○
F09.17	Multi-speed frequency 11	Set multi-speed frequency 11	-Upper limit frequency ~ upper limit frequency	0.00	○
F09.18	Multi-speed frequency 12	Set multi-speed frequency 12	-Upper limit frequency ~ upper limit frequency	0.00	○
F09.19	Multi-speed frequency 13	Set multi-speed frequency 13	-Upper limit frequency ~ upper limit frequency	0.00	○

Group F09-Simple PLC, Multi-speed					
Function code	Name	Content	Predetermined area	Factory setting	Change
F09.20	Multi-speed frequency 14	Set multi-speed frequency 14	-Upper limit frequency ~ upper limit frequency	0.00	○
F09.21	Multi-speed frequency 15	Set multi-speed frequency 15	-Upper limit frequency ~ upper limit frequency	0.00	○
F09.22	0th stage speed acceleration and deceleration time	Set the 0th stage speed acceleration and deceleration time	0~3	0	○
F09.23	0th stage speed running time	Set the 0th stage speed running time	0.0~6553.5 S(M)	0.0	○
F09.24	1st stage speed acceleration and deceleration time	Set the first stage speed acceleration and deceleration time	0~3	0	○
F09.25	1st speed running time	Set the first speed running time	0.0~6553.5 S(M)	0.0	○
F09.26	2nd stage speed acceleration and deceleration time	Set 2nd stage speed acceleration and deceleration time	0~3	0	○
F09.27	2nd speed running time	Set 2nd stage speed running time	0.0~6553.5 S(M)	0.0	○
F09.28	3rd speed acceleration and deceleration time	Set the 3rd stage speed acceleration and deceleration time	0~3	0	○
F09.29	3rd speed running time	Set the 3rd speed running time	0.0~6553.5 S(M)	0.0	○
F09.30	4th speed acceleration and deceleration time	Set the 4th speed acceleration and deceleration time	0~3	0	○
F09.31	4th speed running time	Set the 4th speed running time	0.0~6553.5 S(M)	0.0	○
F09.32	5th speed acceleration and deceleration time	Set 5th speed accelerati on and deceleration time	0~3	0	○
F09.33	5th speed running time	Set 5th speed running time	0.0~6553.5 S(M)	0.0	○
F09.34	6th speed acceleration and deceleration time	Set the 6th speed acceleration and deceleration time	0~3	0	○
F09.35	6th speed running time	Set the 6th speed running time	0.0~6553.5 S(M)	0.0	○
F09.36	7th speed acceleration and deceleration time	Set the 7th speed acceleration and deceleration time	0~3	0	○

Group F09-Simple PLC, Multi-speed					
Function code	Name	Content	Predetermined area	Factory setting	Change
F09.37	7th speed running time	Set the 7th speed running time	0.0~6553.5 S(M)	0.0	○
F09.38	8th speed acceleration and deceleration time	Set the 8th speed acceleration and deceleration time	0~3	0	○
F09.39	8th speed running time	Set the 8th speed running time	0.0~6553.5 S(M)	0.0	○
F09.40	9th speed acceleration and deceleration time	Set the 9th speed acceleration and deceleration time	0~3	0	○
F09.41	9th speed running time	Set the 9th speed running time	0.0~6553.5 S(M)	0.0	○
F09.42	10th speed acceleration and deceleration time	Set the 10th speed acceleration and deceleration time	0~3	0	○
F09.43	10th speed running time	Set 10th speed running time	0.0~6553.5 S(M)	0.0	○
F09.44	11th speed acceleration and deceleration time	Set the 11thspeed acceleration and deceleration time	0~3	0	○
F09.45	11th speed running time	Set the 11thspeed running time	0.0~6553.5 S(M)	0.0	○
F09.46	12th speed acceleration and deceleration time	Set the 12th speed acceleration and deceleration time	0~3	0	○
F09.47	12th speed running time	Set the 12th speed running time	0.0~6553.5 S(M)	0.0	○
F09.48	13th speed acceleration and deceleration time	Set the 13th speed acceleration and deceleration time	0~3	0	○
F09.49	13th speed running time	Set the 13th speed running time	0.0~6553.5 S(M)	0.0	○
F09.50	14th speed acceleration and deceleration time	Set the 14th speed acceleration and deceleration time	0~3	0	○
F09.51	14th speed running time	Set the 14th speed running time	0.0~6553.5 S(M)	0.0	○
F09.52	15th speed acceleration and deceleration time	Set the 15th speed acceleration and deceleration time	0~3	0	○
F09.53	15th speed running time	Set 15th speed running time	0.0~6553.5 S(M)	0.0	○

Group F09-Simple PLC, Multi-speed					
Function code	Name	Content	Predetermined area	Factory setting	Change
F09.54	Keep	—	—	0	○
F09.55	Swing frequency control	0: prohibited 1: Effective	0～1	0	○
F09.56	Swing frequency operation input method	0: automatic 1: Manual input through the defined multi-function terminal	0～1	0	○
F09.57	Swing control	0: fixed swing 1: Variable swing	0～1	0	○
F09.58	Swing frequency stop start mode selection	0: Start according to the state memorized before stopping 1: Restart	0～1	0	○
F09.59	Swing frequency state power down storage	0: store 1: Do not store	0～1	0	○
F09.60	Wobble preset frequency	The operating frequency of the inverter before entering the swing frequency operation mode or when itleaves the swing frequency operation mode and the operating time at this frequency point. If the function code F09.61≠0 (waiting time for swing frequency preset frequency) is set, the inverterwill directly enter the swing frequency preset frequency operation after starting, and after the swingfrequency preset frequency waiting time has passed, itwill enter the swing frequency preset frequency waiting time. Frequency mode.	0.00Hz ～ Upper limit frequency	10.00	○
F09.61	Wobble frequency preset frequency waiting time		0.0 ～ 3600.0s	0.0	○
F09.62	Swing frequency amplitude	The swing frequency amplitud e is determined by F09.62. The swing frequency operation frequency is restricted by the upper and lower limit frequencies. If the setting is improper, the swing frequency will work abnormally.	0.0 ～ 100.0%	0.0%	○
F09.63	Kick frequency	This function code refers to the amplitude of the rapid decrease when the frequency reaches the upper limit frequency of the traverse frequency during the swing frequency process. Of course, it also refers to the amplitude of the rapid increase after the frequency reaches the lower limit frequency of the traverse frequency. Set as 0.0%,there is no sudden jump frequency.	0.0～ 50.0% (相对摆频幅值) Relative swing amplitude	0.0%	○

Group F09-Simple PLC, Multi-speed					
Function code	Name	Content	Predetermined area	Factory setting	Change
F09.64	Swing frequency rise time	This function code defines the running time from the lower limit frequency of the swing frequency to the upper limit frequency of the swing frequency during swing frequency operation and the running time from the upper limit frequency of the swing frequency to the lower limit frequency of the swing frequency during swing frequency operation.	0.1 ~ 3600.0s	5.0	○
F09.65	Swing frequency fall time		0.1 ~ 3600.0s	5.0	○
F09.66	Keep	—	—	0	◆
F09.67	Fixed length control	0: prohibited 1: Effective	0~1	0	×
F09.68	Set length	This group of functions is used to realize the fixed-length shutdown function. The inverter inputs counting pulses from the terminal (X7 is defined as function 47), and calculates the length according to the number of pulses per revolution of the speed measuring axis (F09.73) and the axis circumference (F09.72).Calculated length = count pulse number ÷ pulse number per revolution x measuring shaft circumference. And through the length magnification (F09.70) and length correction coefficient (F09.71) to correct the calculated length to obtain the actual length.Actual length = calculated length × length magnification ÷ length correction coefficient.When the actual length (F09.69) ⩾ the set length (F09.68), the inverter will automatically send a stop command to stop. Before running again, the actual length (F09.69) needs to be cleared or modified actual length (F09.69) <set length (F09.68), otherwise it will not start.	0.000 ~ 65.535 (KM)	0.000	○
F09.69	Actual length		0.000 ~ 65.535 (KM)	0.000	○
F09.70	Length magnification		0.100 ~ 30.000	1.000	○
F09.71	Length correction factor		0.001 ~ 1.000	1.000	○
F09.72	Measuring shaft circumference		0.10 ~ 100.00 CM	10.00	○
F09.73	Number of pulses per revolution of shaft (X7)		1~65535	1024	○

Group F09-Simple PLC, Multi-speed					
Function code	Name	Content	Predetermined area	Factory setting	Change
F10.00	Motor overload protection selection	0: prohibited 1: Ordinary motor (electronic thermal relay mode, low speed with compensation) 2: Frequency conversion motor (electronic thermal relay mode, low speed without compensation)	0～1	1	×
F10.01	Motor overload protection factor		20.0%～120.0%	100.0%	×
F10.02	Undervoltage protection action selection	0: prohibited 1: Allowed (undervol tage is regarded as a fault)	0～1	0	×
F10.03	Undervoltage protection level	This function code specifies the allowable lower limit voltage of the DC bus when the in verter is working normally。	220V： 180～280V 200V 380V： 330～480V 350V	Model setting	×
F10.04	Overvoltage limit level	The overvoltage limit level defines the operating voltage of the overvoltage stall protection.	220V： 350～390V 370V 380V： 600～780V 660V	Model setting	×
F10.05	Deceleration voltage limit coefficient	During deceleration, the larger the value, the stronger the over voltage suppression capability; 0: The over voltage stall protection is invalid.	0～100	Model setting	×
F10.06	Current limit level (valid only in VF mode)	The overvoltage limit level defines the operating voltage of the voltage stall protection.	80%～250%* rated current of inverter	Model setting	×
F10.07	Current limit selection in weak magnetic area	0: limited by the current limit level of F10.06 1: Limit by the current limit level converted by F10.06	0～1	0	×

Group F10 group-protection parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F10.08	Accelerating current limit coefficient	During acceleration, the larger the value, the stronger the over current suppression capability; 0: the acceleration current limit is invalid.	0～100	Model setting	×
F10.09	Constant speed current limit enable	0: invalid 1: Effective	0～1	1	×
F10.10	Offload detection time	The load-off detection time (F10.10) defines that the inverter output current is continuously lower than the load-off detection level (F10.11) for a certain period of time, and the load-off signal is output; 0: the load-off detection is invalid.	0.1S ～ 60.0S	5.0	○
F10.11	Offload detection level		0～100%* rated current of inverter	0%	○
F10.12	Overload pre-alarm level	By setting parameters F10.12 and F10.13, when the output current of the inverter is greater than the overload pre-alarm level (F10.12), after a delay (F10.13) processing, the inverter will output a pre-alarm signal, namely The operation panel displays "A-09".	20%～ 180%* rated current of inverter	Model setting	○
F10.13	Overload pre-alarm delay		0.0 ～ 30.0s	10.0	○
F10.14	Temperature detection threshold	By setting function No.51 in the function code F07.18～ F07.21, when the temperature reaches this setting, an indication signal is output.	0.0℃ ～ 90.0℃	65.0℃	×
F10.15	Input and output phase loss protection options	0: all prohibited 1: Input prohibited, output allowed 2: Input allowed, output prohibited 3: Both allowed	0～3	Model setting	×
F10.16	Input phase loss protection delay time	When the input phase loss protection is selected to be valid and an input phase loss fault occurs, the inverter will perform the protection action "E-12" after the time defined by F10.16 and stop freely.	0.0 ～ 30.0s	1.0	○
F10.17	Output phase loss protection detection standard	When the actual output current of the motor is greater than the rated current* [F10.17], if the output phase loss protection is valid, after a delay time of 5S, the inverter will protect [E-13] and stop freely.	0%～ 100%* rated current of inverter	50%	×

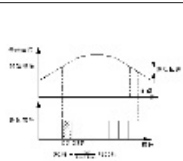
Group F10 group-protection parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F10.18	Output current unbalance detection coefficient	If the ratio of the maximum value to the minimum value of the three-phase output current is greater than this coefficient, and the duration exceeds 10 seconds, the inverter will report the output current imbalance fault E-13. When F10.18=1.00, the output current unbalance detection is invalid.	1.00 ~ 10.00	1.00	×
F10.19	Keep	—	—	0	◆
F10.20	PID feedback disconnection processing	0: No action 1: Alarm and maintain operation at the frequency of disconnection time 2: Protection action and free stop 3: Alarm and deceleratето zero speed according to the set mode	0~3	0	×
F10.21	Feedback disconnection detection value	Take the maximumvalue of PID given value as the upper limit of the feedback disconnection detection value. During the feedback disconnection detection time, when the PID feedback value is continuously smaller than the feedback disconnection detection value, the inverter will make corresponding protection actions according to the setting of F09.20.	0.0 ~ 100.0%	0.0%	○
F10.22	Feedback disconnection detection time	After the feedback is disconnected, the duration before the protection action.	0.0 ~ 3600.0S	10.0	○
F10.23	Keep	—	—	0	◆
F10.24	RS485 communication abnormal action selection	0: Protection action and free stop 1: Alarm and maintainthe status quo to continue operation 2: Alarm and stopaccording to the set stop mode	0~2	1	×
F10.25	RS485 communication time out detection time	If the RS485 communication does not receive the correct data signal within the time interval defined by this function code, it is considered that the RS485 communication is abnormal, and the inverter will take the corresponding action according to the setting of F10.24. When this value is set to 0.0, RS485 communication timeout detection will not be performed.	0.0 ~ 100.0s	5.0	○

Group F10 group-protection parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F10.26	Panel communication abnormal action selection	0: Protection action and free stop 1: Alarm and maintain the status quo to continue operation 2: Protection action and stop according to the set stop mode	0～3	1	×
F10.27	Panel communication timeout detection time	If the panel communication fails to receive the correct data signal within the time interval defined by this function code, then the panel communication is considered abnormal, and the inverter will act accordingly according to the setting of F10.26.	0.0 ～ 100.0s	1.0	○
F10.28		0: Protection action and free stop 1: Alarm and continue to run	0～1	0	×
F10.29 - F10.35	Keep	—	—	0	◆

F11 group-RS485 communication parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F11.00	Protocol selection	0: MODBUS 1: Custom	0～3	0	×
F11.01	Local address	0: Broadcast address 1～247: Slave station	0～247	1	×
F11.02	Communication baud rate setting	0：2400BPS 1：4800BPS 2：9600BPS 3：19200BPS 4：38400BPS 5：115200BPS	0～5	3	×
F11.03	Data Format	0: No parity (N,8, 1) for RTU 1: Even parity (E,8, 1) for RTU 2: Odd parity (0,8, 1) for RTU 3: No parity (N,8, 2) for RTU 4: Even parity (E,8, 2) for RTU 5: Odd parity (0,8, 2) for RTU ASCII mode is temporarily reserved	0～5	1	×

F11 group-RS485 communication parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F11.04	Local answer delay	This function code defines the intermediate time interval when the inverter data frame is received and the response data frame is sent to the upper computer. If the response time is less than the system processing time, the system processing time shall prevail. If the delay is greater than the system processing time, after the system processes the data, it will wait for a delay until the response delay time expires before sending the data to the upper computer.	0～200ms	5	×
F11.05	Transmission response processing	0: Write operation has response 1: Write operation does not respond	0～1	0	×
F11.06	Proportional linkage coefficient	This function code is used to set the weight coefficient of the frequency command received by the inverter as a slave through the RS485 interface. The actual operating frequency of the machine is equal to the value of this function code multiplied by the frequency setting command value received through the RS485 interface. In linked control, this function code can set the ratio of the running frequency of multiple inverters.	0.01 ～ 10.00	1.00	○
F11.07	Communication mode selection	LED units: communication mode selection 0: general mode 1: MD380 mode LED ten digits: broadcast frequency source selection 0: host set frequency 1: Host frequency source A 2: Host frequency source B Hundreds place of LED: reserved Thousands place of LED: reserved	00～21	00	×

F11 group-RS485 communication parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F11.08	Communication display selection	LED units: communication bus voltage display selection 0: normal display 1: magnify 10 times 2: zoom in 100 times 3: Shrink 10 times 4: Reduce by 100 times LED ten digits: communication current display selection 0: normal display 1: magnify 10 times 2: zoom in 100 times 3: Shrink 10 times 4: Reduce 100 times LED hundreds place: Operation frequency display selection 0: Normal display 1: magnify 10 times 2: zoom in 100 times 3: Shrink 10 times 4: Shrink 100 times LED thousands: reserved	000～444	000	×

F12 group-RS485 communication parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F12.00	Dynamic braking function setting	0: invalid 1: Valid throughout 2: Only valid during deceleration	0～2	1	×
F12.01	Energy consumption braking initial voltage		220V： 340～380V 360V 380V： 660～760V 680V	Model setting	○
F12.02	Dynamic braking hysteresis voltage		220V： 10～100V 5V 380V： 10～100V 10V	Model setting	○
F12.03	Dynamic braking action ratio		10～100%	100%	○

F12 group-RS485 communication parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F12.04	Restart after power failure setting	0: prohibited 1: Start from the starting frequency 2: Speed tracking start	0～2	0	×
F12.05	Waiting time for restart after power failure	During the waiting time of restart, any running command input is invalid. If the stop command is input, the inverter will automatically release the speed tracking and restart state and return to the normal stop state.	0.0～60.0s	5.0	×
F12.06	Automatic fault reset times	The number of automatic fault reset is set by F12.06. When the fault reset times is set to 0, there is no automatic reset function and can only be reset manually. When F12.06 is set to 100, it means that the number of times is unlimited, that is, countless times.	0～100	0	×
F12.07	Automatic fault reset interval time	After a fault occurs during operation, the inverter stops output and displays the fault code. After the reset interval set by F12.07, the inverter automatically resets the fault and restarts operation according to the set starting mode.	0.1～60.0s	3.0	×
F12.08	Cooling fan control	0: automatic control mode 1: Always running during power-on 2. The fan operates when the temperature is higher than 50℃, and the fan does not operate when the temperature is lower than 45℃。	0～3	0	○
F12.09	Operation restriction function password	By default, the password is 0, and F12.10 and F12.11 can be set; when there is a password, the password must be verified correctly before F12.10 and F12.11 can be set.	0～65535	0	○
F12.10	Operation limit function selection	0: prohibited 1: Effective	0～1	0	○
F12.11	limited time	Set time limit	0～65535(h)	0	×

F12 group-RS485 communication parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F12.12	Instantaneous power down frequency reduction point	If the inverter bus voltage drops below the F12.12* rated bus voltage value and the instantaneous stop non-stop control is valid, the instantaneous stop non-stop starts to act.	220V: 180～330V 250V 380V: 300～550V 450V	Model setting	×
F12.13	Momentary power down frequency reduction factor	The larger the value, the faster the frequency reduction rate; 0: The instantaneous stop function is invalid.	0～100	0	○
F12.14	Droop control	0.00: The droop control function is invalid. When multiple frequency converters drive the same load, the load distribution is unbalanced due to different speeds, which makes the frequency converter with higher speed bear heavier load. The droop control characteristic is that the speed droop changes as the load increases, which can make the load balance distribution; this parameter adjusts the frequency change of the inverter with droop speed.	0.00 ～ 10.00Hz	0.00	×
F12.15	Speed tracking waiting time	Before the inverter speed tracking starts, the tracking starts after the delay.	0.1～5.0S	1.0	×
F12.16	Speed tracking current limit level	In the process of speed tracking, this function code plays the role of automatic current limiting. When the actual current reaches the threshold (F12.16), the inverter will reduce the frequency and limit the current, and then continue to track and accelerate; its set value is Relative to the percentage of inverter rated current.	80% ～ 200%* 变频器额定电流	100%	×
F12.17	Speed tracking	When speed tracking restarts, select the speed of speed tracking. The smaller the parameter, the faster the tracking speed. But too fast may cause unreliable tracking.	1～125	25	×

F12 group-Advanced functions andperformance parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F12.18	PWM mode	LED units: PWM synthesis mode 0: full frequency seven segments 1: Seven segments to five segments LED tens digit: PWM temperature correlation 0: invalid 1: Valid LED hundreds: PWM frequency correlati on 0: All invalid 1: Low frequency adjustment, high frequency adjustment 2: Low frequency is not adjusted, high frequency is adjusted 3: Low frequency adjustment, high frequency does not adjust LED Thousands: Flexible PWM function 0: invalid 1: Effective	0000 ～ 1311	0001	×
F12.19	Voltage control function	LED units: AVR function 0: invalid 1: Valid throughout 2: Invalid only during deceleration. LED tens digit: over modulation selection 0: invalid 1: valid LED hundreds digit: dead zone compensation selection 0: invalid 1: valid Thousands of LED: Oscillation suppression selection 0: Invalid 1: Oscillation suppression mode 1 2: Oscillation suppression mode 2 3: Oscillation suppression mode 3	0000 ～ 3122	1102	×
F12.20	Oscillation suppression start frequency	Set oscillation suppression start frequency	0.00 ～ 300.00Hz	Model setting	○

F12 group-Advanced functions andperformance parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F12.21	Flux brake selection	This parameter is used to adjust the magnetic flux braking ability of the inverter during deceleration. The larger the value, the stronger the magnetic flux braking ability. To a certain extent, the shorter the deceleration time, this parameter generally does not need to be set. When this value is 0, it means that the function is invalid.When the over voltage limit level is set low, turning on thisfunction can appropriately shorten the deceleration time. When the over voltage limit level is set high, this function does not need to be turned on.	0～100	0	○
F12.22	Energy saving control coefficient	0: invalid 1: Automatic energy-saving operation Note: Energy-saving operation is only valid for ordinary V/F control	0～100	0	○
F12.23	Multi-speed priority enable	0: Invalid 1: Multi-stage speed has priority over the setting of F00.07	0～1	0	×
F12.24	Jog priority enable	0: Invalid 1: When the inverter is running, the jog has the highest priority	0～1	0	×
F12.25	Jog priority enable	LED units: AO2 and DO output selection 0: AO2 is valid 1: DO is valid (reserved) LED ten digits: IPM fault setting 0: Shield the fault 1: The fault is valid LED hundreds place: Input phase loss fault reset selection 0: Cannot be reset 1: Can be reset after the power is normal LED Thousands: Reserved	000～110	010	×

F12 group-Advanced functions andperformance parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F12.26	Oscillation suppression upper limit frequency	Set the upper limit frequency of oscillation suppression	0.00 ~ 300.00Hz	50.00	○
F12.27	Oscillation suppression coefficient	When F12.19 thousand place=1 (oscillation suppression mode 1), PWM mode is forced to five-stage; when F12. 19 thousand place=2 (oscillation suppression mode 2), keep the original mode unchanged, these two modes It can be adjusted by the oscillation suppression coefficient (F12.27). In special occasions, if the first two modes cannot suppress the oscillation, use the oscillation suppression mode 3 (F12.19 thousand digit = 3), pass theparam ete r F12.27 (oscillation suppression coefficient) and F12.28 (oscillation suppression voltage) together adjust.	1～500	50	○
F12.28	Oscillation suppression voltage		0.0 ~ 25.0%* motor rated voltage	5.0	○
F12.29	Wave-by-wave current limiting and anti-overvoltage action options	LED Units: Selected during wave-by-wave current limiting acceleratio n 0: Invalid 1: Valid LED tens: Selected during wave-by-wave current limiting deceleration 0: Invalid 1: Valid LED Hundreds: Choose from wave-by-wave current limiting and constant speed 0: Invalid 1: Valid LED Thousands: Anti-overvoltag e action selection 0: invalid 1: valid	0000 ~ 1111	0011	○
F12.30	Dedicated function selection	LED Units: Straight-up function selection 0: Invalid 1: Valid LED Tens: Overtorque alarm code "A-07" display selection 0: Display 1: No display LED hundreds: reserved LED thousands: reserved	00～00	Model setting	○

F13 group-reserved parameters					
Group F14-Panel function setting and parameter management					
Function code	Name	Content	Predetermined area	Factory setting	Change
F14.00	M-FUNC key function selection	0: JOG (jog control) 1: Forward and reverse switching 2: Clear panel ▲/▼ key to set frequency 3: Local operation and remote operation switch (reserved) 4: Reverse	0～4	0	×
F14.01	STOP/RST key function selection	0: Only valid for panel control 1: Effective for bothpanel and terminal control 2: Effective for both pan el and communication control 3: Valid forall control modes	0～3	3	○
F14.02	STOF key + RUN key emergency stop function	0: invalid 1: Free parking	0～1	1	○
F14.03	Closed loop display coefficient	This function code is used to correct the display error between the actual physical quantity (pressure, flow, etc.) and the given or feedback quantity (voltage, current) during closed-loop control, and has no effect on closed-loop adjustment.	0.01 ～ 100.00	1.00	○
F14.04	Load speed display coefficient	This function code is used to correct the display error of the speed scale and has no effect on the actual speed.	0.01 ～ 100.00	1.00	○
F14.05	Linear velocity coefficient	This function code is used to correct the linear speed scale display error and has no effect on the actual speed.	0.01 ～ 100.00	1.00	○
F14.06	Encoder adjustment rate	The larger the value, the faster the encoder adjustment speed	1～100	70	○

F13 group-reserved parameters					
Group F14-Panel function setting and parameter management					
Function code	Name	Content	Predetermined area	Factory setting	Change
F14.07	Operation status monitoring parameter selection 1 (main display)	By changing the setting values of the above function codes, the monitoring items of the main monitoring interface can be changed, for example: set F14.07=5, that is, select the output current d-05, then the default display item of the main monitoring interface is the current Output current value.	0～57	0	○
F14.08	Operation status monitoring parameter selection 2 (auxiliary display)		0～57	5	○
F14.09	Stop state monitoring parameter s election 1 (main display)	By changing the setting values of the function codes of the above items, the monitoring items of the main monitoring interface can be changed, for example: set F14.09=6, that is, select the output voltage d-06, and the default display item of the main monitoring interface will be The current output voltage value.	0～57	1	○
F14.10	Stop state monitoring parameter selection 2 (auxiliary display)		0～57	13	○
F14.11	Parameter display mode selection	LED units: function parameter display mode selection 0: display all function parameters 1: only display the parameters different from the factory value 2: only display the parameters modified after the last power-on (reserved) LED ten digits: monitor parameter display mode selection 0: only display main monitor parameters 1: Main and auxiliary display alternately (interval time 1S) LED hundreds: adjust frequency display selection 0: display frequency1: Only display status monitoring parameters Thousands of LED: Panel ▲/▼ key adjustment enable 0: Valid 1: invalid	0000 ～ 1111	0000	○

F13 group-reserved parameters					
Group F14-Panel function setting and parameter management					
Function code	Name	Content	Predetermined area	Factory setting	Change
F14.12	Parameter initialization	0: No operation 1: All user parameters except motor parameters are restored to factory settings 2: Restore all user parameters to factory settings 3: Clear fault record	0~3	0	×
F14.13	Parameter write protection	0: Allow all parameters to be modified (some parameters cannot be modified during operation) 1: Only allow to modify the frequency setting F00.07, F00.10 and this function code 2: All parameters except this function code cannot be modified Note: The above restrictions are invalid for this function code and F14.13	0~2	0	○
F14.14	Parameter copy function	0: No operation 1: Upload parameters to the panel 2: Download all function code parameters to the inverter 3: Download all function code parameters except motor parameters to the inverter Note 1: When selecting parameter download, the software will judge whether the inverter power specifications are consistent. If not, the parameters related to the model will not be modified. Note 2: Only the external keyboard KB2 has the copy function, and the normal keyboard copy will raise the error.	0~3	0	×

F13 group-reserved parameters					
Group F14-Panel function setting and parameter management					
Function code	Name	Content	Predetermined area	Factory setting	Change
F14.15	Control software version number	F14.15～F14.16 can only be viewed and cannot be modified.	1.00～99.99	4.12	◆
F14.16	Panel software version number		1.00～99.99	1.00	◆
F14.17	Inverter rated power	This parameter can only be viewed and cannot be modified.	0.4～999.9KW (G/P)		◆
F14.18	G/P type display	0: G type (constant torque load model) 1: P type (fan, pump load type) Note 1: After setting as P-type machine, the motor parameters will be refreshed automatically, and it can be used as a larger fan and water pump inverter without changing any parameters. Note 2: This parameter cannot be initialized, please modify it manually	0～1	0	×

Group F15-Multi-pump water supply parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F15.00	Terminal access disconnection delay	The water pump is switched on and off delay time.	0.0～6000.0s	0.1	0.0
F15.01	Polling time	The polling time is the time to switch the variable frequency pump regularly, and this time is only valid when a single pump is working.	0.0～6000.0h	48.0	0
F15.02	Reduce pump lower limit frequency	When the feedback pressure is higher than the set pressure and the frequency drops to the lower limit frequency of the pump reduction, the pump is reduced after the delay time of the pump reduction.	0.0～600.00HZ	35.00	10.0
F15.03	Main pump start delay	This parameter is used in "one drive three const ant pressure water supply", after the main and auxiliary pumps are switched, the main pump will start delay.	0.0～3600.0s	0.0	10.0

Group F15-Multi-pump water supply parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F15.04	Selection of auxiliary pump starting mode	0: straight start 1: Soft start	0～1	0	×
F15.05	Pump delay time	Set pump delay time	0.0～3600.0s	10.0	○
F15.06	Reduce pump delay time	Set the pump down delay time	0.0～3600.0s	10.0	○
F15.07	Sensor range	If F08.01=5, select the sensor range (F15.07) and the given pressure (F15.08) according to the site conditions.	0.00～60.00 (Mpa、Kg)	10.00	○
F15.08	Pressure setting		0.00～【F15.07】(MPa、Kg)	5.00	○

F16 group-PV pump parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
F16.00	Photovoltaic pump water shortage detection time	If the bus voltage (d-12) is higher than the set value of MPPT high point working voltage (F16.02), it runs at the maximum frequency; if it is lower than the set value of MPPT high point working voltage (F16.01), press (Bus voltage/MPPT high point working voltage)* Maximum frequency obtained frequencyIf the bus voltage reaches the lowest operating voltage of MPPT (F16. 01), run at the lowest water output frequency (F16.04). If the inverter runs above the lowest water frequency and the output current is less than the motor no-load current* Photovoltaic water pump water shortage detection current corresponds to the ratio of no-load current (F16.03). After the photovoltaic water pump water shortage detection time (F16.00), the inverter reports water shortage fault Err32.	0～250s	10	○
F16.01	MPPT low operating voltage		0～MPPT high working voltage	350/200V	○
F16.02	MPPT high point working voltage		【F16.01】～1000 / 【F16.01】～500	537/311V	○
F16.03	Photovoltaic pump water shortage detection current corresponds to the ratio of no-load current		80.0～300.0%* motor no-load current	150.0	○
F16.04	Minimum operating frequency of photovoltaic water pump		0.00Hz～upper limit frequency	20.00	○

FFF group-manufacturer parameters					
Function code	Name	Content	Predetermined area	Factory setting	Change
FFF.00	Factory password	Note: The password setting is successful, it takes 3 minutes to take effect	0～65535	0	○

Group D-monitoring parameter groupand fault record				
Function code	Name	Content	Factory setting	Change
d-00	Output frequency	0.00～Maximum output frequency【F00.13】	0	◆
d-01	Set frequency	0.00～Maximum output frequency【F00.13】	0	◆
d-02	Motor estimated frequency	0.00～Maximum output frequency【F00.13】Note: motor operating frequency converted from motor estimated speed	0	◆
d-03	Main set frequency	0.00～Maximum output frequency【F00.13】	0	◆
d-04	Auxiliary setting frequency	0.00～Maximum output frequency【F00.13】	0	◆
d-05	Output current	0.0～6553.5A	0	◆
d-06	The output voltage	0～999V	0	◆
d-07	Output torque	-200.0～+200.0%	0	◆
d-08	Motor speed (RPM/min)	0～36000（RPM/min）	0	◆
d-09	Motor power factor	0.00～1.00	0	◆
d-10	Running line speed (m/s)	0.01～655.35(m/s)	0	◆
d-11	Set line speed (m/s)	0.01～655.35(m/s)	0	◆
d-12	Bus voltage (V)	0～999V	0	◆
d-13	Input voltage (V)	0～999V	0	◆
d-14	PID setting value (V)	0.00～10.00V	0	◆
d-15	PID feedback value (V)	0.00～10.00V	0	◆
d-16	Analog input Ai1 (V/mA)	0.00～10.00V	0	◆
d-17	Analog input Ai2 (V)	0.00～10.00V	0	◆

Group D-monitoring parameter groupand fault record				
Function code	Name	Content	Factory setting	Change
d-18	Pulse frequency input (KHz)	0.00～50.00kHz	0	◆
d-19	Analog output Ao1 (V/mA)	0.00～10.00V	0	◆
d-20	Analog output AO2(V)	0.00～10.00V	0	◆
d-21	Input terminal status	0～7FH Note: After expanded into binary, it means X7/X6/X5/X4/X3/X2/X1 from high to low	0	◆
d-22	Output terminal status	0～FH Note: After expanded into binary, it means R2/R1/Y2/Y1 from high to low	0	◆
d-23	Frequency inverter	0～FFFFH BIT0: run/stop BIT1: reverse/forward BIT2: Zero speed operation BIT3: reserved BIT4: accelerating BIT5: Decelerating BIT6: Constant speed running BIT7: Pre-excitation BIT8: Motor parameter tuning is in progress BIT9: Over current limiting BIT10: Overvoltage limit is in progress BIT11: Torque limiting BIT12: Speed limiting BIT13: Speed control BIT14: Torque control BIT15: reserved	0	◆
d-24	Multi-speed current segment number	0～15	0	◆
d-25	Pulse frequency output (Hz)	0～50000Hz	0	◆
d-26	Keep	—	0	◆
d-27	Current count value	0～65535	0	◆
d-28	Set count value	0～65535	0	◆
d-29	Current timing value (S)	0～65535S	0	◆
d-30	Set timing value (S)	0～65535S	0	◆

Group D-monitoring parameter groupand fault record				
Function code	Name	Content	Factory setting	Change
d-31	Current length	0.000～65.535(KM)	0	◆
d-32	Set length	0.000～65.535(KM)	0	◆
d-33	Radiator temperature 1	0.0℃～+110.0℃	0	◆
d-34	Radiator temperature 2	0.0℃～+110.0℃	0	◆
d-35	The cumulative running time of the machine (hours)	0～65535H	0	◆
d-36	Accumulated power-on time of the machine (hours)	0～65535H	0	◆
d-37	Fan cumulative running time (hours)	0～65535H	0	◆
d-38	Cumulative power consumption (low level)	0～9999KWH	0	◆
d-39	Cumulative power consumption (high)	0～9999KWH（*10000）	0	◆
d-40	PID pressure feedback	0.00～60.00（MPa、Kg）	0	◆
d-41	Output Power	0.0～6553.5KW	0	◆
d-42	PID pressure setting	0.00～60.00（MPa、Kg）	0	◆
d-43	Special model monitoring parameters (reserved）	—	0	◆
d-44	Special model monitoring parameters (reserved)	—	0	◆

Group D-monitoring parameter groupand fault record				
Function code	Name	Content	Factory setting	Change
d-45	Special model monitoring parameters (reserved)	—	0	◆
d-46	Special model monitoring parameters (reserved)	—	0	◆
d-47	Special model monitoring parameters (reserved)	—	0	◆
d-48	The first three failure types	0～27	0	◆
d-49	Types of the first two failures	0～27	0	◆
d-50	Type of previous failure	0～27	0	◆
d-51	Current fault type	0～27	0	◆
d-52	Operating frequency at current fault	0.00～【F00.13】Upper limit frequency	0	◆
d-53	Output current at current fault	0.0～6553.5A	0	◆
d-54	Bus voltage at current fault	0～999V	0	◆
d-55	Input terminal status at current fault	0～7FH Note: After expandedinto binary, it means X7/X6/X5/X4/X3/X2/X1 from high to low	0	◆
d-56	Output terminal status at current fault	0～FH Note: After expandedinto binary, it means R2/R1/Y2/Y1 from high tolow	0	◆
d-57	Inverter running status at current fault	0～FFFFH	0	◆

Chapter 7 EMC (Electromagnetic Compatibility)

7.1 Definition

Electromagnetic compatibility refers to the ability of electrical equipment to operate in an electromagnetic interference environment without interfering with the electromagnetic environment and stable achieving its functions.

7.2 EMC standard introduction

According to the requirements of the national standard GB/T12668.3, the inverter needs to meet the requirements of electromagnetic interference and anti-electromagnetic interference.

Our existing products implement the latest international standards: IEC / EN 61800-3: 2004 (Adjustable speed electrical power drive systems part 3: EMC requirements and specific test methods), which is equivalent to the national standard GB/T12668.3 .

IEC/EN61800-3 mainly inspects the inverter from the aspects of electromagnetic interference and anti-electromagnetic interference. Electromagnetic interference mainly tests the radiated interference, conduction interference and harmonic interference of the inverter (corresponding to the inverter for civil use. Item requirements). Anti-electromagnetic interference mainly affects the frequency converter's conduction immunity, radiation immunity, surge immunity, rapid mutation pulse group immunity, ESD immunity and power supply low-frequency end immunity (specific test items include:

1. Immunity test for input voltage dips, interruptions and changes;
2. Commutation gap immunity test;
3. Harmonic input immunity test;
4. Input frequency change test;
5. Input voltage unbalance test;
6. Input voltage fluctuation test) for testing. According to the strict requirements of IEC/EN61800-3 mentioned above, our products are installed and used according to the instructions shown in 7.3, and they will have good electromagnetic compatibility in general industrial environments.

7.3 EMC guidance

7.3.1 Influence of harmonics:

The high-order harmonics of the power supply will damage the inverter. Therefore, in some places where the quality of the power grid is relatively poor, it is recommended to install an AC input reactor.

7.3.2 Electromagnetic interference and installation precautions:

There are two kinds of electromagnetic interference, one is the interference of the electromagnetic noise of the surrounding environment to the inverter, and the other is the interference of the inverter to the surrounding equipment.

Installation Precautions:

1) The grounding wire of the inverter and other electrical products should be well grounded;

2) The power input and output lines of the inverter and the weak current signal lines (such as control lines) should not be arranged in parallel as far as possible, and arranged vertically when possible;

3) It is recommended to use shielded cables for the output power lines of the inverter, or use steel pipe shielded power lines, and the shielding layer must be reliably grounded. For the lead wires of the interfered equipment, it is recommended to use twisted-pair shielded control lines and the shielding layer must be reliably grounded;

4) For motor cables longer than 100m, output filters or reactors are required.

7.3.3 Treatment method of interference caused by surrounding electromagnetic equipment to inverter:

Generally, the reason for the electromagnetic influence on the inverter is that a large number of relays, contactors or electromagnetic brakes are installed near the inverter. When the inverter malfunctions due to interference, the following solutions are recommended:

1) Install a surge suppressor on the disturbing device;

2) Install a filter at the input end of the inverter, refer to 7.3.6 for details;

3) Use shielded cables for the leads of the control signal lines and detection lines of the inverter, and reliably ground the shielding layer.

7.3.4 Solutions to the interference caused by the inverter to the peripheral equipment:

This part of the noise is divided into two types: one is the inverter radiation interference, and the other is the inverter conduction interference. These two kinds of interference make the surrounding electrical equipment subject to electromagnetic or electrostatic induction. In turn, the equipment has malfunctioned. For several different interference situations, refer to the following solutions:

1) The instruments, receivers and sensors used for measurement generally have weak signals. If they are close to the inverter or in the same control cabinet, they are susceptible to interference and malfunction. The following solutions are recommended: try to stay away Interference source; do not arrange the signal line and the power line in parallel, especially do not bundle them together in parallel; use shielded wire for the signal line

and power line, and have a good grounding; add a ferrite magnetic ring on the output side of the inverter (select a suppression frequency of 30～1000MHz), and wind 2～3 turns in the same direction. For bad conditions, you can choose to install EMC output filter;
2) When the interfered device and the inverter use the same power supply, conduction interference will be caused. If the interference cannot be eliminated by the above measures, an EMC filter should be installed between the inverter and the power supply (refer to 7.3.5 Leakage current and treatment.
There are two forms of leakage current when using the inverter: one is the leakage current to the ground; the other is the leakage current between lines.
1) Factors affecting ground leakage current and solutions:
There is distributed capacitance between the wire and the ground. The larger the distributed capacitance, the greater the leakage current; effectively reduce the distance between the inverter and the motor to reduce the distributed capacitance. The greater the carrier frequency, the greater the leakage current. The carrier frequency can be reduced to reduce leakage current. But reducing the carrier frequency will increase the noise of the motor. Please note that installing a reactor is also an effective way to solve the leakage current.
The leakage current will increase as the loop current increases, so when the motor power is high, the corresponding leakage current will be large.
2) Factors and solutions that cause leakage current between lines:
There is distributed capacitance between the output wiring of the inverter. If the current through the line contains high-order harmonics, it may cause resonance and cause leakage current. If the thermal relay is used at this time, it may cause it to malfunction.
The solution is to reduce the carrier frequency or install an output reactor. When using the inverter, it is recommended not to install a thermal relay between the inverter and the motor and use the electronic overcurrent protection function of the inverter.
7.3.6 Precautions for installing EMC input filter at power input:
1) Note: When using the filter, please use it in strict accordance with the rated value; because the filter is a Class I electrical appliance, the metal shell of the filter should be in good contact with the metal ground of the installation cabinet on a large area, and it must have good conductivity continuity, otherwise there will be Risk of electric shock and seriously affect EMC effect;
2) It is found through EMC test that the filter ground must be connected to the same common ground as the PE terminal ground of the inverter, otherwise the EMC effect will be seriously affected.
3) Install the filter as close as possible to the power input end of the inverter.

Chapter 8 Fault Diagnosis and Countermeasures

8.1 Fault alarm and countermeasures

During operation, if an abnormality occurs, the inverter will immediately block the PWM output and enter the fault protection state. At the same time, the fault code displayed on the keyboard indicates the current fault information. At the same time, the fault indicator ALM lights up. At this time, you need to check the cause of the fault and the corresponding treatment method according to the method in this section. If the problem still cannot be solved, please contact our company directly. For corresponding solutions, please refer to Table 9-1 for troubleshooting and troubleshooting.

Error code	Name	Possible cause of failure	Troubleshooting
E-01	Overcurrent during accelerated operation	The acceleration time is too short (including the tuning process)	Increase acceleration time
		Restart the rotating motor	Set to start after DC braking or speed tracking start
		Inverter power is too small	Choose a frequency converter with a large power rating
		Improper setting of V/F curve or torque boost	Adjust V/F curve or torque boost
E-02	Overcurrent during deceleration	Deceleration time is too short (including tuning process)	Extend the deceleration time
		Inverter power is too small	Choose a frequency converter with a large power rating
		Load inertia is too large	External braking resistor or braking unit
E-03	Overcurrent in constant speed operation	Grid voltage is low	Check input power
		Abrupt or abnormal load	Check load or reduce load mutation
		Inverter power is too small	Choose a frequency converter with a large power rating

Error code	Name	Possible cause of failure	Troubleshooting
E-04	Overvoltage during acceleration	Abnormal input voltage (including tuning process)	Check input power
		Restart the rotating motor	Set to start after DC braking or speed tracking start
		Special potential energy load	External braking resistor or braking unit
E-05	Overvoltage during deceleration	Deceleration time is too short (including tuning process)	Extend the deceleration time
		Load inertia is too large	External braking resistor or braking unit
		Abnormal input voltage	Check input power
E-06	Overvoltage during constant speed operation	Abnormal input voltage	Check input power
		Special potential energy load	External braking resistor or braking unit
E-07	Bus undervoltage	The input voltage is abnormal or the contactor (relay) is not closed	Check the power supply voltage or seek service from the manufacturer
E-08	Motor overload	Improper setting of V/F curve or torque boost	Adjust V/F curve and torque boost
		Grid voltage is too low	Check the grid voltage
		The motor is blocked or the load sudden change is too large	Check load
		The motor overload protection coefficient is not set correctly	Correctly set the motor overload protection coefficient
E-09	Inverter overload	Improper setting of V/F curve or torque boost	Adjust V/F curve and torque boost
		Grid voltage is too low	Check the grid voltage
		Acceleration time is too short	Increase acceleration time
		Motor load is too heavy	Choose a more powerful inverter

Error code	Name	Possible cause of failure	Troubleshooting
E-10	Inverter off load	The output current is less than the drop detection value	Check load
E-11	Power module failure	The inverter output is short -circuited or grounded	Check motor wiring
		Inverter instantaneous overcurrent	See overcurrent countermeasures
		Blocked air duct or damaged fan	Drain the air duct or replace the fan
		Abnormal control board or serious interference	Seek service from manufacturers
		Power device is damaged	Seek service from manufacturers
E-12	Phase loss on the input side	Power input phase loss	Check power supply and connection
E-13	Phase loss or current imbalance on the output side	Output U, V, W has phase loss	Check output wiring
E-14	Output short circuit to ground malfunction	Keep	Keep
E-15	Radiator overheating 1	The ambient temperature is too high	Lower the ambient temperature
		Broken fan	Replace the fan
E-16	Radiator overheating 2	Air duct blocked	Dredge
E-17	RS485 communication failure	Does not match the baud rate of the host computer	Adjust the baud rate
		RS485 channel interference	Check whether the communication connection is shielded, whether the wiring is reasonable, and if necessary, consider connecting the filter capacitor in parallel
		Communication timeout	Retry
E-18	Keyboard communication failure	The keyboard and control board connection line is damaged	Replace the connection line between the keyboard and the control board
E-19	External device failure	External device fault input terminal is closed	Disconnect the external equipment fault input terminal and clear the fault (pay attention to check the reason)
E-20	Current detection error	Hall device or amplifier circuit failure	Seek service from manufacturers
		Auxiliary power failure	
		Bad connection of Hall or power board	

Error code	Name	Possible cause of failure	Troubleshooting
E-21	Motor tuning failure	Motor parameter setting error	Reset motor parameters
		Inverter and motor power specifications are serious Mismatch	Seek service from manufacturers
		Tuning timeout	Check motor wiring
E-22	EEPROM read and write failure	EEPROM failure	Seek service from manufacturers
E-23	Parameter copy error	Data error when uploading inverter parameters to the operation panel	Check the connection of the operation panel
		Data error when downloading parameters from the operation panel to the inverter	Check the connection of the operation panel
		Parameter download without parameter copy upload	Upload parameters first, then download
E-24	PID feedback disconnection	The PID feedback circuit is loose	Check the feedback connection
		The feedback amount is less than the disconnection detection value	Adjust the detection input threshold
E-25	Voltage feedback disconnection	The feedback amount is less than the disconnection detection value	Adjust the detection input threshold
E-26	Run time limit Arrivals	Operation limit time reached	Seek services from agents
E-27	Coprocessor communication malfunction	Keep	Keep
E-28	Encoder disconnection fault	Keep	Keep
E-29	Excessive speed deviation fault	Keep	Keep
E-30	Overspeed fault	Keep	Keep

8.2 Exception handling

Common abnormal phenomena and countermeasures of the inverter during operation are shown in Table 9-2:

Unusual phenomenon		Possible causes and countermeasures
The motor does not rotate	No keyboard display	Check whether there is a power failure, whether the input power is missing phase, and whether the input power cord is connected incorrectly
	The keyboard has no display, but the charging indicator inside the machine is on	Check whether there are problems with the wiring and sockets related to the keyboard, and measure the voltage of each control power supply in the machine to confirm whether the switching power supply is working properly. If the switching power supply is not working properly, check whether the switching power supply inlet (+, -) socket is connected Good, whether the starting vibration is damaged or whether the voltage regulator tube is normal.
	The motor is buzzing	The motor load is too heavy, try to reduce the load
	No abnormality found	Confirm whether it is in the trip state or not reset after the trip, whether it is in the power-off and restart state, whether the keyboard has been reset, whether it is in the program running state, multi-speed running state, specific running state or non-running state, you can try to restore the factory Value approach.
		Confirm whether the run command is given
		Check whether the operating frequency is set to 0
The motor cannot accelerate or decelerate smoothly		The motor cannot accelerate or decelerate smoothly The acceleration/deceleration time setting is inappropriate, increase the acceleration/deceleration time
		The current limit value is set too small, increase the limit value
		Overvoltage protection action during deceleration, increase deceleration time
		Improper carrier frequency setting, overload or oscillation
		The load is too heavy and the torque is not enough. Increase the torque boost value in the V/F mode. If it still does not meet the requirements, you can switch to the automatic torque boost mode. At this time, note that the motor parameters must conform to the actual values. If the requirements still cannot be met, it is recommended to switch to advanced V/F control mode. At this time, you should still pay attention to whether the motor parameters are consistent with the actual values. At the same time, it is best to tune the motor parameters.
		The motor power does not match the inverter power. Please set the motor parameters to actual values
		One tow multiple motors. Please change the torque boost mode to manual boost mode
Although the motor can rotate but cannot adjust the speed		Frequency upper and lower limit setting is inappropriate
		The frequency setting is too low, or the frequency gain setting is too small
		Check whether the speed control mode used is consistent with the set frequency reference
		Check whether the load is too heavy, whether it is in an overvoltage stall or overcurrent limit state
Motor speed changes during operation		Frequent load fluctuations, minimize its changes
		The rated value of the inverter and the motor are seriously in consistent. Please set the motor parameters to actual values
		Poor contact of the frequency setting potentiometer or fluctuation of the given frequency signal. Change to digital frequency setting mode or increase the filter time constant of analog input signal
The direction of rotation of the motor is opposite		Adjust the phase sequence of output terminals U, V, W
		Set the running direction (F00.18=1) to reverse
		Uncertainty of direction caused by output phase loss, please check motor wiring immediately

Appendix: Modbus communication protocol

1、RTU mode and format

When the controller communicates on the Modbus bus in RTU mode, each 8-bit byte in the message is divided into two 4-bit hexadecimal characters. The main advantage of this mode is the density of characters transmitted under the same baud rate. Above the ASCII mode, each message must be transmitted continuously.

（1）Format of each byte in RTU mode

Coding system: 8-bit binary, hexadecimal 0-9, A-F.

Data bit: 1 start bit, 8 data (low bit is sent first), stop bit occupies 1 bit, parity bit can be selected. (Refer to RTU data frame for sequence diagram)

Error check area: cyclic redundancy check (CRC)。

（2）RTU data frame bit sequence diagram

Parity check

Start	1	2	3	4	5	6	7	8	Far	Stop

No Parity

Start	1	2	3	4	5	6	7	8	Stop

2、Register address and function code of series inverter

（1）Supported function codes

function code	Function Description
03	Read multiple registers
06	Write a single register
10	Write multiple registers consecutively
13	Read a single parameter

（2）**Register address**

Register function	Address
Control command input	0x2000
Monitoring parameter reading	0xD000(0x1D00)～0xD039(0x1D39)
MODBUS frequency setting	0x2001
MODBUS torque setting	0x2002
MODBUS PID frequency setting	0x2003
MODBUS PID feedback setting	0x2004
MODBUS analog output AO1 control	0x2005(0～7FFF means 0%～100%)
MODBUS analog output AO2 control	0x2006(0～7FFF means 0%～100%)
MODBUS pulse DO output control	0x2007(0～7FFF means 0%～100%)
MODBUS digital output terminal control	0x2008
Parameter settings	0x0000～0xFF16

（3）**03H Read multiple parameters (read up to 8 items continuously**）

Inquiry information frame format(Send frame):

Address	01H
Function	03H
Starting data address	00H
	01H
Number of Data(Byte)	00H
	02H
CRC CHK High	95H
CRC CHK Low	CBH

Data analysis of this section:

01H is the inverter address

03H is read function code

0001H is the start address similar to the F00.01 item of the control panel

0002H is the number of menu items, and F00.01 and F00.02

95CBH is a 16-bit CRC verification code

Response information frame format (return frame)

Address	01H
Function	03H
DataNum*2	04H
Data1[2Byte]	00H
	00H
Data2[2Byte]	00H
	01H
CRC CHK High	3BH
CRC CHK Low	F3H

Data analysis of this section:

01H is the inverter address
03H is read function code
04H is the product of the read item*2
0000H is to read the data of F00.01
0001H is to read the data of F00.02
3BF3H is a 16-bit CRC check code

Examples:

Name	Frame format
Read the data of F00.01 and F00.02	Send frame: 01H 03H 0001H 0002H 95CBH
	Return fram: 01H 03H 04H 0000H 0001H 3BF3H
Read the data of F02.01	Send frame: 01H 03H 0201H 0001H D472H
	Return fram: 01H 03H 02H 000FH F840H
Read the monitoring parameters of item d-00 (address D000H and 1D00H are common)	Send frame: 01H 03H D000H 0001H BCCAH
	Return fram: 01H 03H 02H 1388H B512H
	Send frame: 01H 03H 1D00H 0001H 8266H
	Return fram: 01H 03H 02H 1388H B512H

Name	Frame format
Read the status ofthe inverter when it stops (addressA000H and 1A00H are common,refer to the description ofinverter running status later)	Send frame：01H 03H A000H 0001H A60AH
	Return fram：01H 03H 02H 0040H B9B4H
	Send frame：01H 03H 1A00H 0001H 8312H
	Return fram：01H 03H 02H 0040H B9B4H
Read fault code E-19(address E000H and 1E00H arecommon, refer to the inverterfault code table below)	Send frame：01H 03H E000H 0001H B3CAH
	Return fram：01H 03H 02H 0013H F989H
	Send frame：01H 03H 1E00H 0001H 8222H
	Return fram：01H 03H 02H 0013H F989H
Read the pre-alarm codeA-18 (address E001H and 1E01are common, refer to theinverter pre-alarm code table behind)	Send frame：01H 03H E001H 0001H E20AH
	Return fram：01H 03H 02H 0012H 3849H
	Send frame：01H 03H 1E01H 0001H D3E2H
	Return fram：01H 03H 02H 0012H 3849H

（4）06H write a single parameter

Inquiry information frame format（Send frame）:

Address	01H
Function	06H
Starting data address	20H
	00H
Data(2Byte)	00H
	01H
CRC CHK Low	43H
CRC CHK High	CAH

Data analysis ofthis section:

01H is theinverter address
06H is writingfunction code
2000H is thecontrol command address
0001H is forward rotation command
43CAH is a16-bit CRC verificationcode

Response information frame format（Return frame）:

Address	01H
Function	06H
Starting data address	20H
	00H
Number of Data(Byte)	00H
	01H
CRC CHK High	43H
CRC CHK Low	CAH

Data analysis in this section: If the settings are correct, return the same input data

Examples:

Name	Frame format
Forward	Send frame：01H 06H 2000H 0001H 43CAH
	Return frame：01H 06H 2000H 0001H 43CAH
Reverse	Send frame：01H 06H 2000H 0009H 420CH
	Return frame：01H 06H 2000H 0009H 420CH
Shutdown	Send frame：01H 06H 2000H 0003H C20BH
	Return frame：01H 06H 2000H 0003H C20BH
Free shutdown	Send frame：01H 06H 2000H 0004H 83C9H
	Return frame：01H 06H 2000H 0004H 83C9H
Reset	Send frame：01H 06H 2000H 0010H 43CAH
	Return frame：01H 06H 2000H 0010H 43CAH
Forward jog	Send frame：01H 06H 2000H 0002H 03CBH
	Return frame：01H 06H 2000H 0002H 03CBH
Reverse jog	Send frame：01H 06H 2000H 000AH 020DH
	Return frame：01H 06H 2000H 000AH 020DH
Set the parameter of F08.00 to 1	Send frame：01H 06H 0800H 0001H 4A6AH
	Return frame：01H 06H 0800H 0001H 4A6AH

Name	Frame format
MODBUS given frequency is 40HZ	Send frame：01H 06H 2001H 0FA0H D642H
	Return frame：01H 06H 2001H 0FA0H D642H
MODBUS PID given value is 5V	Send frame：01H 06H 2003H 01F4H 721DH
	Return frame：01H 06H 2003H 01F4H 721DH
MODBUS PID feedback value is 4V	Send frame：01H 06H 2004H 0190H C237H
	Return frame：01H 06H 2004H 0190H C237H
MODBUS torque is set to 80%z	Send frame：01H 06H 2002H 0320H 22E2H
	Return frame：01H 06H 2002H 0320H 22E2H
Verify user password (address AD00H and 1C00H are common)	Send frame：01H 06H AD00H 0001H 68A6H
	Return frame：01H 06H AD00H 0001H 68A6H
	Send frame：01H 06H 1C00H 0001H 4F9AH
	Return frame：01H 06H 1C00H 0001H 4F9AH
Validation operation restriction function password (address AD01H and 1C01HGeneral)	Send frame：01H 06H AD01H 0002H 7967H
	Return frame：01H 06H AD01H 0002H 7967H
	Send frame：01H 06H 1C01H 0002H 5E5BH
	Return frame：01H 06H 1C01H 0002H 5E5BH
MODBUS analog output Ao1 control output 5V	Send frame：01H 06H 2005H 3FFFH C3BBH
	Return frame：01H 06H 2005H 3FFFH C3BBH
MODBUS analog output Ao2 control output 10V	Send frame：01H 06H 2006H 7FFFH 027BH
	Return frame：01H 06H 2006H 7FFFH 027BH
MODBUS pulse DO output control output 25KHz	Send frame：01H 06H 2007H 3FFFH 627BH
	Return frame：01H 06H 2007H 3FFFH 627BH
MODBUS digital output terminal Y1 control output	Send frame：01H 06H 2008H 0001H C208H
	Return frame：01H 06H 2008H 0001H C208H

（5）10H Write multiple parameters continuously

Inquiry information frame format（Send frame）:

Address	01H
Function	10H
Starting data address	01H
	00H
Number of Data(Byte)	00H
	02H
DataNum*2	04H
Data1(2Byte)	00H
	01H
Data2(2Byte)	00H
	02H
CRC CHK High	2EH
CRC CHK Low	3EH

Data analysis of this section:

01H is the inverter address
10H is writing function code
0100H is the start address similar to the F01.00 item of the control panel
0002H is the number of registers
04H is the total number of bytes(2*number of registers)
0001H is the data of F01.00
0002H is the data of F01.01
2E3EH is a 16-bit CRC verification code

Response information frame format（Return frame）:

Address	01H
Function	10H
Starting data address	01H
	00H
Number of Data(Byte)	00H
	02H
CRC CHK High	40H
CRC CHK Low	34H

Data analysis of this section:

01H is the inverter address
10H is writing function code
0100H is to write the data of F01.00
0002H is the number of items in the write menu, and F01.00 and F01.01
4034H is a 16-bit CRC check code

Instance:

Name	Frame format
Set the parameters of F01.00 and F01.01 to1 and 0.02	Send frame: 01H 10H 0100H 0002H 04H 0001H 0002H 2E3EH
	Return frame: 01H 10H 0100H 0002H 4034H
Forward rotation and communication set frequency is 50HZ	Send frame: 01H 10H 2000H 0002H 04H 0001H 1388H 36F8H
	Return frame: 01H 10H 2000H 0002H 4A08H
Set the parameter of F01.00 to 1	Send frame: 01H 10H 0100H 0001H 02H 0001H 7750H
	Return frame: 01H 10H 0100H 0001H 0035H

（6）13H Read a single parameter (including attributes, minimum and maximum values)

Inquiry information frame format（Send frame）:

Address	01H
Function	13H
Starting data address	00H
	0CH
Number of Data(Byte)	00H
	04H
CRC CHK High	45H
CRC CHK Low	CBH

Data analysis of this section:

01H is the inverter address
13H is read function code
000CH is the start address similar to F00.12 item of the control panel
0004H is the number of registers
45CBH is a 16-bit CRC verification code

Inquiry information frame format（Return frame）:

Address	01H
Function	13H
Starting data address	08H
Data1(2Byte)	13H
	88H
Data2(2Byte)	03H
	22H
Data3(2Byte)	00H
	00H
Data4(2Byte)	13H
	88H
CRC CHK High	28H
CRC CHK Low	31H

Data analysis of this section:

01H is the inverter address
13H is write function code
08H is the total number of bytes(2*number of registers)
1388H is the parameter value
0322H is the attribute value
0000H is the minimum value
1388H is the maximum
2831H is a 16-bit CRC check code

Instance:

Name	Frame format
Read the parameter value of F00.12	Send frame: 01H 13H 000CH 0001H 85CAH
	Return frame: 01H 13H 02H 1388H B1D2H
Read parameter value + attribute value of F00.12	Send frame: 01H 13H 000CH 0002H C5CBH
	Return frame: 01H 13H 04H 1388H 0322H FCF0H
Read parameter value + attribute value + minimum value of F00.13	Send frame: 01H 13H 000CH 0003H 040BH
	Return frame: 01H 13H 06H 1388H 0322H 0000H 628BH
Read parameter value + attribute value + minimum value + maximum value of F00.13	Send frame: 01H 13H 000CH 0004H 45CBH
	Return frame: 01H 13H 08H 1388H 0322H 0000H 1388H 2831H

3、Other register address function description:

<table>
<tr><th>Function Description</th><th>Address definition</th><th colspan="3">Data meaning description</th></tr>
<tr><td rowspan="10">Inverter running status</td><td rowspan="18">A000H (1A00H)</td><td>Byte</td><td>Bit</td><td>Meaning</td></tr>
<tr><td rowspan="6">Byte1</td><td>Bit7</td><td>0: No action
1: Overload pre-warning</td></tr>
<tr><td>Bit6～Bit5</td><td>0:INV_220V
1:INV_380V
2:INV_660V
3:INV_1140V</td></tr>
<tr><td>Bit4</td><td>0: No action
1: Power-down storage</td></tr>
<tr><td>Bit3</td><td>0: No action
1: reset</td></tr>
<tr><td>Bit2～Bit1</td><td>0: No action
1: static tuning
2: Dynamic tuning</td></tr>
<tr><td>Bit0</td><td rowspan="2">0: Operation panel run command channel
1: Terminal run command channel
2: Communication operation command channel
3: reserved</td></tr>
<tr><td rowspan="8">Byte0</td><td>Bit7</td></tr>
<tr><td rowspan="8">Inverter running status</td><td>Bit6</td><td>0: No action
1: The bus voltage is normal</td></tr>
<tr><td>Bit5</td><td>0: No action
1: Undervoltage</td></tr>
<tr><td>Bit4</td><td>0: No action
1: Jog</td></tr>
<tr><td>Bit3</td><td>0: Forward
1: reverse</td></tr>
<tr><td>Bit2～Bit1</td><td>1: Speed up operation
2: Reduced speed
3: Run at a constant speed</td></tr>
<tr><td>Bit0</td><td>0: stop state
1: Running status</td></tr>
<tr><td>Read inverter fault code</td><td>E000H (1E00H)</td><td colspan="3">Address E000H and 1E00Hare common (see faultcode table, read function code 03Hexample))</td></tr>
<tr><td>Read inverter fault alarm code</td><td>E001H (1E01H)</td><td colspan="3">Address E001H and 1E01Hare common (see thepre-alarm code table, read function code03H example)</td></tr>
<tr><td>User password verification</td><td>AD00H (1C00H)</td><td colspan="3">Address AD00H and1C00H are common (seethe example of writing function code 06H)</td></tr>
<tr><td>Run restricted password verification</td><td>AD01H (1C01H)</td><td colspan="3">Address AD00H and1C00H are common (seethe example of writing function code 06H)</td></tr>
</table>

4、Inverter fault code table:

Error code	Keyboard display	Accident details
0000H	——	No trouble
0001H	E-01	Overcurrent during accelerated operation
0002H	E-02	Overcurrent during deceleration
0003H	E-03	Overcurrent in constant speed operation
0004H	E-04	Overvoltage during acceleration
0005H	E-05	Overvoltage during deceleration
0006H	E-06	Overvoltage during constant speed operation
0007H	E-07	Bus undervoltage
0008H	E-08	Motor overload
0009H	E-09	Inverter overload
000AH	E-10	Inverter off load
000BH	E-11	Power module failure
000CH	E-12	Phase loss on the input side
000DH	E-13	Phase loss or current imbalance on the output side
000EH	E-14	Output short to ground fault
000F15	E-15	Radiator overheating 1
0010H	E-16	Radiator overheating 2
0011H	E-17	RS485 communication failure
0012H	E-18	Keyboard communication failure
0013H	E-19	External device failure
0014H	E-20	Current detection error
0015H	E-21	Motor tuning failure
0016H	E-22	EEPROM read and write failure
0017H	E-23	Parameter copy error
0018H	E-24	PID feedback disconnection
0019H	E-25	Voltage feedback disconnection
001AH	E-26	Operation limit time reached
001BH	E-27	Coprocessor communication failure
001CH	E-28	Encoder disconnection fault
001DH	E-29	Excessive speed deviation fault
001EH	E-30	Overspeed fault

5、Inverter pre-warning code table:

Error code	Keyboard display	Accident details
0000H	——	No trouble
0009H	A-09	Inverter overload pre-warning
0011H	A-17	RS485 communication failure alarm
0012H	A-18	Keyboard communication failure alarm
0015H	A-21	Motor tuning warning
0016H	A-22	EEPROM read and write failure alarm
0018H	A-24	PID feedback disconnection alarm

6、Control command word format (see the example of writing function code 06H):

Error code	Keyboard display	Accident details
2000H	Bit7～Bit5	Keep
	Bit4	0: No action
		1: Reset
	Bit3	0: forward
		1: Reverse
	Bit2～Bit0	100: Free stop
		011: shutdown
		010: Jog operation
		001: Run
2008H (press position 1 to output, press position 0 to close)	Bit7～Bit4	Keep
	Bit3	Programmable relay R2 output
	Bit2	Programmable relay R1 output
	Bit1	Open collector output terminal Y2
	Bit0	Open collector output terminal Y1

7、Parameter attribute table:

Bit	Meaning
Bit15	Keep
Bit14	Menu
Bit13	Base
Bit12	Restore factory value coverage
Bit11	EEPROM

Bit	Meaning		
Bit10~Bit9	"○":01 "×":10 "◆":11 "◇":00		
Bit8	Symbol		
Bit7~Bit3	1:00000	KHZ:01100	us:10001
	V:00001	KW:01010	HZ/S:10000
	A:00010	om:01110	mh:10010
	rpm:00011	ms:01001	C:10011
	HZ:00100	MA:01011	m/s:10100
	%:00110	KM:01101	H:10101
	S:01000	CM:01111	KWH:10110
Bit2~Bit0	Decimal point		

8、Meaning of error code in response to abnormal information from slave:

Error code	Description
01H	Illegal function code
02H	Illegal address
03H	Illegal data
04H	Illegal register length
05H	CRC check error
06H	Parameters cannot be modified during operation
07H	Parameters cannot be modified
08H	The host computer control command is invalid
09H	Parameters are protected by password
0AH	Wrong password

9、Corresponding communication address for all parameters of the series inverter:

Function code	Mailing address
F00.00～F00.20	0000H～0014H
F01.00～F01.36	0100H～0124H
F02.00～F02.17	0200H～0211H
F03.00～F03.08	0300H～0308H
F04.00～F04.27	0400H～041BH
F05.00～F05.24	0500H～0518H
F06.00～F06.52	0600H～0634H
F07.00～F07.40	0700H～0728H
F08.00～F08.24	0800H～0818H
F09.00～F09.73	0900H～0949H
F10.00～F10.35	0A00H～0A23H
F11.00～F11.08	0B00H～0B08H
F12.00～F12.30	0C00H～0C1EH
F14.00～F14.18	0E00H～0E12H
F15.00～F15.08	0F00H～0F08H
F16.00～F16.04	1000H～1004H
FFF.00～FFF.22	FF00H～FF16H
d-00～d-57	D000H（1D00H）～D039H（1D39H）

1. In the above example, the address of the inverter is 01 for convenience of explanation; when the inverter is a slave, the address is set in the range of 1～247. If any data in the frame format is changed, check The code must be recalculated. You can download the CRC16-bit check code calculation tool online.
2. The starting address of the monitoring item is D000, and each item is offset by the corresponding hexadecimal value based on this address, and then added to the starting address. For example: the monitoring start item is d00, the corresponding start The address is D000H (1D00H), now read the monitoring item d-18, 18-00=18, 18 is converted to hexadecimal 12H, then the read address of d-18 is D000H+12H = D012H(1D00H+12H = 1D12H), addresses D000H and 1D00H are common.
3. The frame format when the response information from the slave is abnormal: inverter address + (80H+function code) + error code + 16-bit CRC check code; if the return frame from the slave is 01H + 83H + 04H + 40F3H; 01H is the slave Machine address, 83H is 80H+03H, which means read error, 04H means illegal data length, 40F3H is 16-bit CRC check code.

Warranty Agreement

1、The warranty period of this product is twelve months (subject to the barcode information of the fuselage). During the warranty period, if the product fails or is damaged under normal use according to the instruction manual, our company is responsible for free maintenance.

2、During the warranty period, a certain repair fee will be charged for damage caused by the following reasons:

A. Damage to the machine caused by mistakes in use and unauthorized repair and transformation;
B. Machine damage caused by fire, flood, abnormal voltage, other natural disasters and secondary disasters;
C. Hardware damage caused by artificial drop and transportation after purchase;
D. Damage to the machine caused by operation not in accordance with the user manual provided by our company;
E. Failure and damage caused by obstacles other than the machine (such as external equipment factors);

3、When the product fails or is damaged, please fill in the contents of the "Product Warranty Card" correctly and in detail.

4、The maintenance fee shall be collected in accordance with the "Maintenance Price List" newly adjusted by our company.

5、This warranty card will not be reissued under normal circumstances. Please keep this card and show it to the maintenance personnel during the warranty period.

6、If you have any questions during the service, please contact our agent or our company in time.

Warranty Card

<table>
<tr><td></td><td colspan="2">Unit address:</td></tr>
<tr><td rowspan="2">Customer Information</td><td>Company name:</td><td>Contact:</td></tr>
<tr><td>Postal Code:</td><td>Contact number:</td></tr>
<tr><td rowspan="3">Product information</td><td colspan="2">Product number:</td></tr>
<tr><td colspan="2">Body barcode (pasted here):</td></tr>
<tr><td colspan="2">Agent name:</td></tr>
<tr><td>Accident details</td><td colspan="2">(Maintenance time and content):

Repair man:</td></tr>
</table>