FREQUENCY CONVERTER
SPECIFICATION





0.4KW~500KW
VECTOR FREQUENCY CONVERTER

UNIVERSAL VECTOR FREQUENCY CONVERTER

- Please read this manual carefully,before use for proper installation and use.
- Specifications of this product are subject to change without notice.

version number: V1.08

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Chapter 1 Safety Information

1.1 Symbols 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 to prevent yourself or the people around you from being hurt and the property in the working area from being damaged. Please be fully familiar with the following icons and their meanings, and be sure to follow the marked precautions items, then continue reading this user manual.



This symbol indicates that failure to operate as required may result in death or serious injury.



This symbol indicates that failure to perform operations as required will cause in moderate personal injury or minor injury or certain material loss.



This symbol indicates matters needing attention during operation or use.



This symbol prompts some useful information to the user.

The following two icons are supplementary instructions to the above symbols：



Indicates something absolutely not to be done.



Indicates something that must be done.

1.2 Scope of use



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



● Do not use this inverter in equipment that may threaten life or harm the human body due to inverter failure or work error (nuclear power control equipment, aerospace equipment, vehicle equipment, life support systems, safety equipment, weapon systems, etc.). For special purposes, please consult our company in advance.

● This product is manufactured under the supervision of strict quality management system, but when used for important equipment, there must be safety protection measures to prevent the inverter failure to expand the scope of the accident.

1.3 Installation Environment

●Installed indoors, in a well-ventilated place, generally should be installed vertically to ensure the best cooling effect. For horizontal installations, additional ventilation may be required.

●The ambient temperature is required to be within the range of -10 to 40°C. If the temperature

exceeds 40°C, please remove the upper cover. If the temperature exceeds 50°C, external heat dissipation or derating is required. It is recommended that users do not use the inverter in such a high temperature environment, because it will greatly reduce the service life of the inverter.

●The ambient humidity is lower than 90%, and no condensation occurs.

●Install in a place with vibration less than 0.5G to prevent falling damage. The inverter is not allowed to suffer from sudden impact.

●Install in an environment far away from electromagnetic fields and without flammable and explosive substances.

1.4 Installation Safety Precautions

Danger

●Do not work with wet hands。

●Do not wiring when the power supply is not completely disconnected。

●Do not open the cover or perform wiring work when the inverter is powered on, otherwise there is a risk of electric shock.

●When carrying out wiring, inspection and other operations, it must be carried out after turning off the power for 10 minutes, otherwise there is a risk of electric shock.

Warming

●Do not install inverters 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 the purpose of safety, the ground terminal of the inverter must be reliably grounded. In order to avoid the influence of grounding common impedance interference, multiple inverters should be grounded at one point, as shown in Figure 1-1.

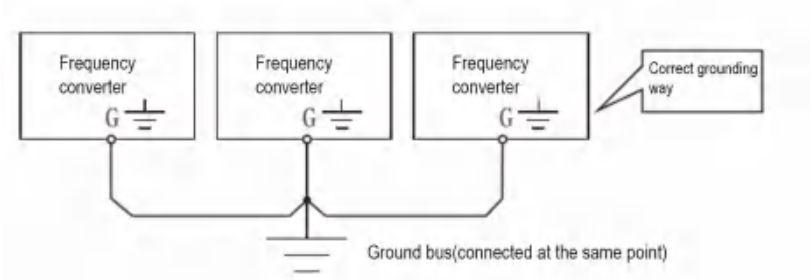


Figure 1-1

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

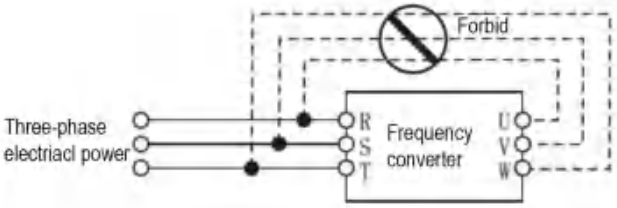


Figure 1-2

●On the input power side of the inverter, be sure to configure a no-fuse circuit breaker for circuit protection to prevent the expansion of the accident caused by the failure of the inverter.

●It is not suitable to install an electromagnetic contactor on the output side of the inverter, because the contactor is switched on and off when the motor is running, which will generate operating overvoltage and cause damage to the inverter. However, it is still necessary for the following three situations:

The inverter used for energy-saving control, the system often works at the rated speed, in order to achieve economical operation, when the inverter needs to be removed.

Participate in important technological processes,can not be out of service 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 that the contactor must not operate when the inverter has output!

1.5 Operation Safety Precautions

Danger

●Do not operate with wet hands.

●For inverters that have been stored for more than 1 year, the voltage should be gradually increased to the rated value with a voltage regulator when powering on, otherwise there is a risk 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 electric shock or the inverter cannot work normally.

●When the inverter is powered on, please do not open the cover, otherwise there is a risk of electric shock.

●Use the power failure restart function with caution, otherwise it may cause personal injury or death.

Warming

●If the operation exceeds 50Hz, the speed range of the motor bearing and mechanical device must be ensured.

●Mechanical devices that require lubrication, such as gearboxes and gears, should not be operated at low speed for a long time, otherwise their service life will be reduced or even the equipment will be damaged.

●When the ordinary motor is running at low frequency, it must be used with derating due to the poor cooling effect. If it is a constant torque load, it must adopt the forced cooling method of the motor or use a special variable frequency motor.

●If the inverter is not used for a long time, please be sure to cut off the input power supply to avoid damage to the inverter or even fire caused by foreign matter entering or other reasons.

●Since the output voltage of the inverter is a PWM pulse wave, please do not install capacitors or surge current absorbers (such as varistors) at the output end, otherwise it will cause fault tripping of the inverter or even damage to power components. If it is already installed, be sure to remove it. See Figure 1-3.

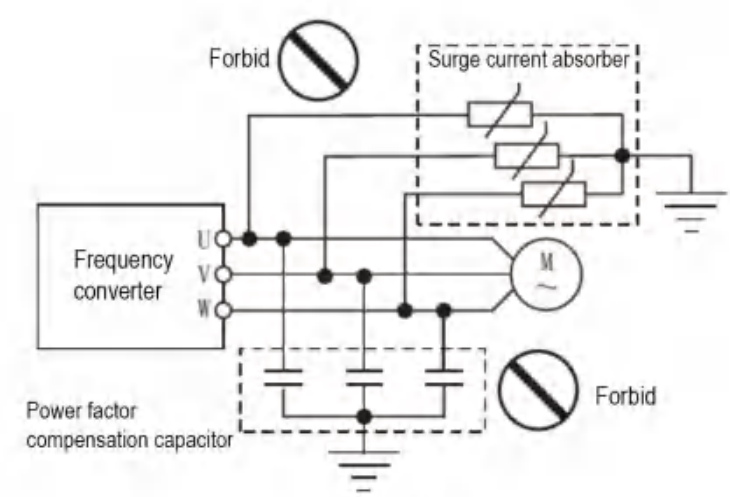


Figure 1-3

●Before the motor is used for the first time or reused after being placed for a long time, the insulation of the motor should be checked, and the measured insulation resistance should not be less than 5MΩ.

●If the inverter needs to be used outside the allowable operating voltage range, a step-up or step-down device is required for voltage transformation.

●In areas where the altitude exceeds 1000 meters, due to the thin air, the heat dissipation effect of the inverter will be deteriorated, so derating is required. Generally, about 10% derating is required for every 1000m increase. See Figure 1-4 for the derating curve.

Chapter 2 Product Standard Specifications

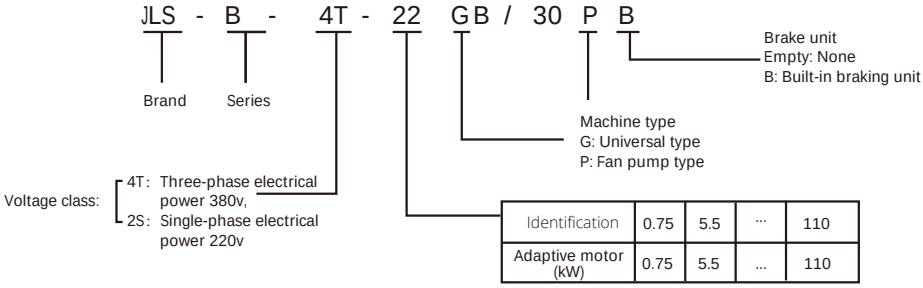
2.1 Technical Specification

Input	Rated Voltage,Frequency	3-phase AC380V;50/60Hz 1-phase AC220V;50/60Hz	
	Allowed Voltage Range	3-phase AC360V～450V 1-phase AC190V～250V	
Output	Voltage	0～460V 0～260V	
	Frequency	Low frequency mode：0～300Hz High frequency mode：0～3000Hz	
	Overload Capacity	G Type:110% for long-term, 150% for 1 min 200% for 4s P Type:105% for long-term 120% for 1 min 150% for 1s	
Control Mode		V/F control、Advanced V/F control、V/F separation control,、No PG current vector control	
Control Character	Frequency Setting Resolution	Analog Input	0.1% of maximum output frequency
		Digital Setting	0.01Hz
	Frequency Precision	Analog Input	Within 0.2% of maximum output frequency
		Digital Setting	Within 0.01% of set output frequency
	V/F Control	V/F Curve (voltage frequency character)	Reference frequency can be set arbitrarily from 0.5 to 3000Hz, multi-point V/F curve can be set arbitrarily, and various fixed curves such as constant torque, reduced torque 1, reduced torque 2, and square torque can also be selected
		torque boost	Manual setting: 0.0~30% of rated output Automatic boost: automatically determine the boost torque according to the output current and combined with the motor parameters
		Automatic Current-limiting and Voltage-limiting	During acceleration, deceleration or steady running, detect automatically the current and voltage of motor stator, and control it within boundsbased on unique algorithm, minimize fault-trip chance
Control Character	Senseless Vector Control	Voltage Frequency Character	Adjust pressure/frequency ratio according to motor parameter and unique algorithm
		Torque Character	Starting torque: 3.0Hz 150% rated torque (VF control) 1.0Hz 150％ rated torque（Advanced V/F control） 0.5Hz 150％ rated torque（No PG current vector control） Operating speed precision in steady state:：≤±0.2％ rated synchronous speed speed fluctuation ： ≤±0.5 ％ rated synchronous speed Torque response：≤20ms （No PG current vector control）
		Motor Parameter Self-measurement	Without any restrictions, 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 Restrain	Current closed-loop control, free from current impact, perfect restrain function of overcurrent and overvoltage
	Undervoltage Restrain during Running		Specially for users with a low or unsteady voltage power grid: even lower than the allowable voltage range, the system can maintain the longest possible operating time based on its unique algorithm and residual energy allocation strategy	
Typical Function	Multi-speed and swing frequency operation		16 segments programmable multi-segment speed control, a variety of 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 (able to preset frequency). Standard configuration RS485 communication function, multiple communication protocol for choice, synchronizing 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 various combination setting with analog input
	Output Signal		Digital Output	2-channel Y terminal open collector output and 2-channel programmable relay output (TA, TB, TC), up to 61 kinds of meaning options
			Analog Output	2-channel of 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 Steady voltage Operation		Dynamic steady state, static steady state, and unsteady voltage for choices to obtain the steadiest operation	
	Acceleration and Deceleration Time Setting		0.1s～3600.0min continuous setting, S type and linear type mode for choice	
	Braking	Dynamic braking	Dynamic braking initial voltage, backlash voltage and dynamic braking continuous adjustable	
		DC Braking	Halt DC braking initial frequency：0.00～【F00.13】upper limit frequency Braking time: 0.0~100.0s; Braking current: 0.0%~150.0% of rated current	
		Flux Braking	0～100 0：invalid	
	Low Noise Running		Carrier frequency 1.0kHz~16.0kHz continuous adjustable, minimize motor noise	
	Speed Tracking and Restart Function		Smooth restart during operation, instantaneous stop and restart	
	Counter		A built-in counter, facilitate system integration	
	Operation Function		Upper limit and lower limit frequency setting, frequency hopping operation, reversal running restraint, slip frequency compensation, RS485 communication, frequency control of progressive	

			increase and decrease, failure recovery aomatically, etc.
Display	Operation Panel Display	Running State	Output frequency, output current, output voltage, motor speed, set frequency, module temperature, PID setting, feedback, analog input and output, etc.
		Alarm	The latest 6 faults record; records 6 operating parameters such as output frequency, set frequency, output current, output voltage, DC voltage, and module temperature when the latest fault tripped
Protective Function			Overcurrent, overvoltage, undervoltage, module fault, electric thermal relay, overheat, short circuit, default phase of input and output, motor parameter adjustment abnormality, internal memory fault, etc.
Environment	Ambient Temperature		-10°C ~ +40°C (please run the VFD in derated capacity when ambient temperature is 40°C~50°C)
	Ambient Humidity		5%～95%RH，no condensation
	Surroundings		Indoors (without direct sunlight, corrosive or flammable gas, oil fog and dust)
	Altitude		Running in derated capacity above 1000m, derate 10% for every 1000m rise.
Structure	Protection Level		IP20
	Cooling Method		Air cooling with fan control
Installation Method			Wall-hanging type, cabinet type

2.2 VFD model description



2.3 VFD And Keypad Dimension

Product structure and Mounting size

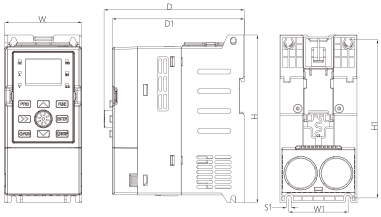


Figure1: JLS-B-2S-0.4GB ~1.5GB
JLS-B-4T-0.75GB ~2.2GB

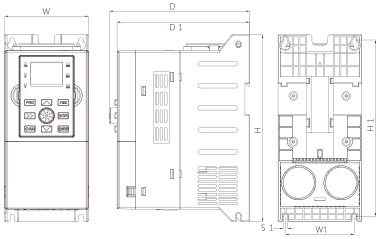


Figure2: JLS-B-2S-2.2GB
JLS-B-4T-4GB/5.5PB ~5.5B/7.5PB

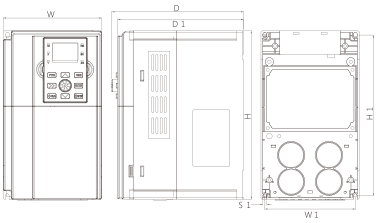


Figure3: JLS-B-4T-7.5GB/11PB ~11GB/15PB

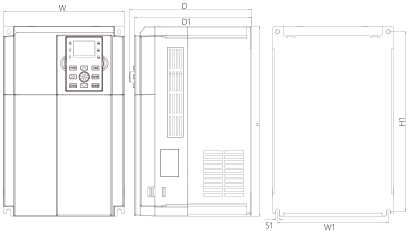


Figure4: JLS-B-4T-15GB/18.5PB ~30GB

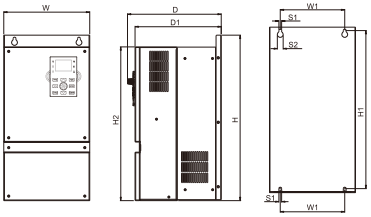


Figure5: JLS-B-4T-30G/37P ~37G/45P

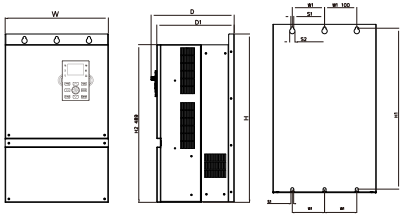


Figure6: JLS-B-4T-45G/55P ~55G/75P

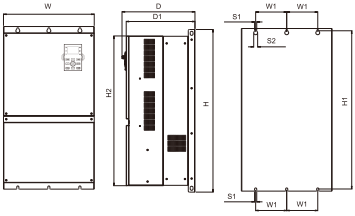


Figure7: J7LS-B-4T-75G/90P ~132G/160P

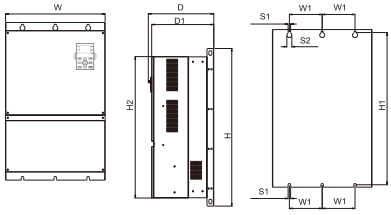


Figure8: JLS-B-4T-160G/185P ~200G/220P

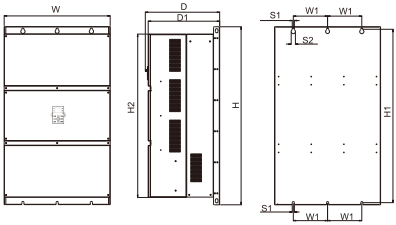


Figure9: JLS-B-4T-220G/250P ~315G/350P

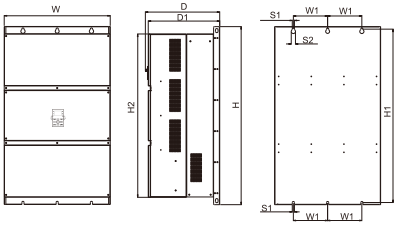
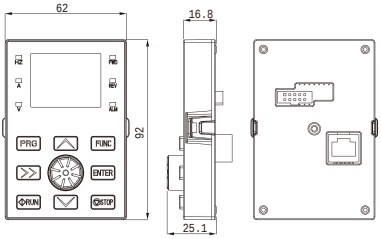
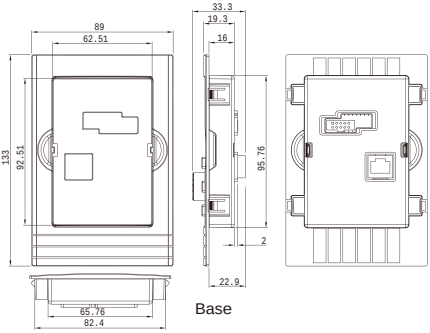


Figure10: JLS-B-4T-350G/375P ~450G/500P



Control keyboard



Base

Product structure and Mounting size

Model	W (mm)	H (mm)	D (mm)	W1 (mm)	H1 (mm)	H2 (mm)	D1 (mm)	S1 (mm)	S2 (mm)	Figure
JLS-B-2S-0.4GB	78	170	142	60	160.2	/	133.6	Ø5	/	1
JLS-B-2S-0.75GB										
JLS-B-2S-1.5GB										
JLS-B-4T-0.75GB										
JLS-B-4T-1.5GB										
JLS-B-4T-2.2GB										
JLS-B-2S-2.2GB	95	212	158.7	78	200	/	150.3	Ø5	/	2
JLS-B-4T-4GB/5.5PB										
JLS-B-4T-5.5GB/7.5PB										
JLS-B-4T-7.5GB/11PB	140	240	187.7	129	229.1	/	179.3	Ø5.5	/	3
JLS-B-4T-11GB/15PB										
JLS-B-4T-15GB/18.5PB	205	322	206.5	188	305	/	198.1	Ø6.5	/	4
JLS-B-4T-18.5GB/22PB										
JLS-B-4T-22GB/30PB										
JLS-B-4T-30GB										
JLS-B-4T-30G/37P	270	500	223.9	201.5	483	476.2	206.3	Ø6.5	Ø13.5	5
JLS-B-4T-37G/45P										
JLS-B-4T-45G/55P	320	522	257.6	100	499	489	240	Ø9	Ø16.5	6
JLS-B-4T-55G/75P										
JLS-B-4T-75G/90P	380	720	305.6	130	700.5	663	288	Ø9	Ø16.5	7
JLS-B-4T-90G/110P										
JLS-B-4T-110G/132P										
JLS-B-4T-132G/160P										
JLS-B-4T-160G/185P	520	850	342.1	171.5	821	763	324.5	Ø13	Ø26	8
JLS-B-4T-185G/200P										
JLS-B-4T-200G/220P										
JLS-B-4T-220G/250P	650	1090	455.6	210	1061.5	1000	438	Ø13	Ø26	9
JLS-B-4T-250G/280P										
JLS-B-4T-280G/315P										
JLS-B-4T-315G/350P										
JLS-B-4T-350G/375P	750	1280	435.6	300	1237	1160	418	Ø13	Ø24	10
JLS-B-4T-375G/400P										
JLS-B-4T-400G/450P										
JLS-B-4T-450G/500P										

2.4 Rated current output table

Voltage	1-phase	3-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)	VFD Power (KW)	Braking Resistor Specification		Braking Torque
		W	ohm	10%ED
1-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
3-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

3-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 braking resistor not provided by our company is used, resulting in damage to the inverter or other equipment, our company will not bear any responsibility.

3、The installation of the braking resistor must consider the safety of the environment, and its flammability, and the distance from the inverter should be at least 100mm.

4、The parameters in the table are for reference only, not as a standard.

Chapter 3 Storage And Installation

3.1 Storage

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

●Must be placed in a dust-free, dry place;

●The storage environment temperature ranges from -20°C to +65°C;

●The relative humidity of the storage environment is in the range of 0% to 95%, and there is no condensation;

●The storage environment does not contain corrosive gas and liquid;

●It is best placed on a shelf and packaged to store the inverter. It is best not to store for a long time, which will lead to the deterioration of electrolytic capacitors. If long-term storage is needed, it must be ensured that the power is on once in half a year, and the power-on time is at least 5 hours or more. The voltage must be slowly increased to the rated voltage value with the voltage regulator when input.

3.2 Installation Places and environment

Note: The environmental conditions 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 without dripping water and low temperature;

●Places without sunlight, high temperature and severe dust fall;

●Places without corrosive gases and liquids;

●Places with less dust, oil gas and metal powder;

●Places without vibration, easy maintenance and inspection;

●Places without electromagnetic noise interference;

3.3 Installation space and direction

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

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

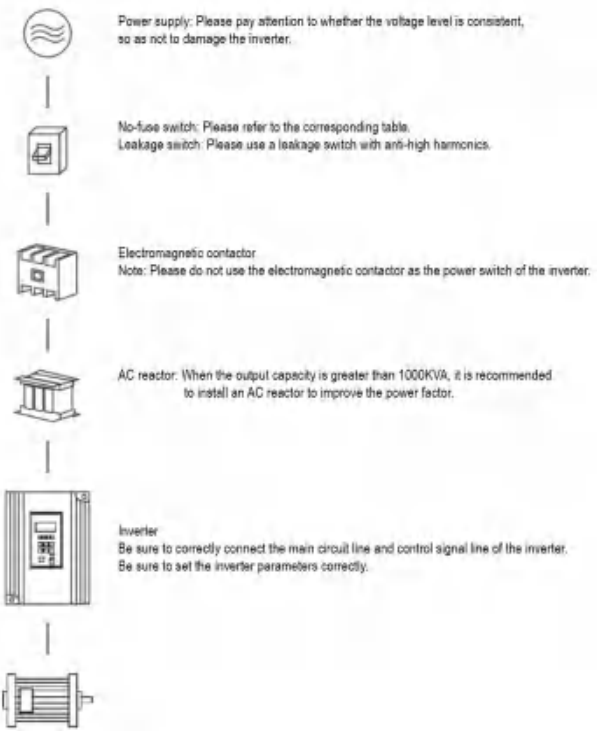
●If the installation is not firm, place a flat plate under the base of the inverter before installing. Installed on a loose plane, the stress may cause damage to the main circuit parts, thus damaging the inverter;

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

●Multiple inverters are installed in the same cabinet. When the up-down installation is adopted,pay attention to the spacing,add a diversion plate in the middle or install them in a up-down dislocation.

Chapter 4 Wiring

4.1 Main Circuit Wiring Diagram

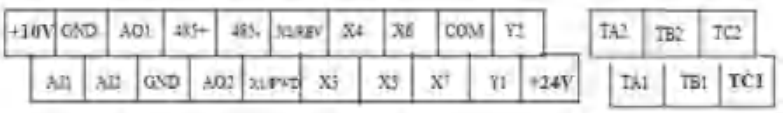


4.2 Wiring Terminals Diagram

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 for external braking unit
P+ 、PB	Reserved terminal for external braking resistor (04KW~30.0KW)
P+、P1	Reserved terminals for external DC reactor
U、V、W	Three-phase AC output terminal
⏚	Ground terminal

4.2.2 Control Loop Terminals



Control loop terminals function description

Type	Terminal	Function Description	Specification
Multifunctional digital input terminal	X1	It is valid when X (X1, X2, X3, X4, X5, X6, X7) ~ COM are short-circuited, and their functions are set by parameters F07.00 ~ F07.06 respectively (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, see F07.06 function description for details.	
Analog Input / Output Terminal	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 adjust the jumper cap to Cin position; AI2 only accepts voltage input. For the range setting, see the description of function codes F06.01~F06.10. (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,can represent 14 kinds of physical quantities.The output voltage and current are selected by jumper JP4. The factory default output voltage. If you want to output current, you only need to jump the jumper cap to the Co1 position; see Description of function codes F06.21 and F06.22. (Reference ground: GND)	OUTPUT, 0～10V DC voltage. Output voltage of AO1, AO2 came from PMW waveform of CPU. Output voltage is in direct proportion to the width of PWM waveform.
	AO2		
Relay Output Terminal	TA1	Programmable and defined as multi-functional relay output terminals, up to 62 types. See F07.20, F07.21 output terminal function introduction for details.	TA1-TB1、TA2-TB2 normal close；TA1-TC1、TA2-TC2 normal open。Contact compacity：250VAC/2A(COSΦ=1);250VAC/1A(COSΦ=0.4),30VDC/1A.
	TB1		
	TC1		
	TA2		
	TB2		
	TC2		
Power Ports	+24V	+24V is the circuit common power supply of the digital signal input terminal	Maximum output current 200mA

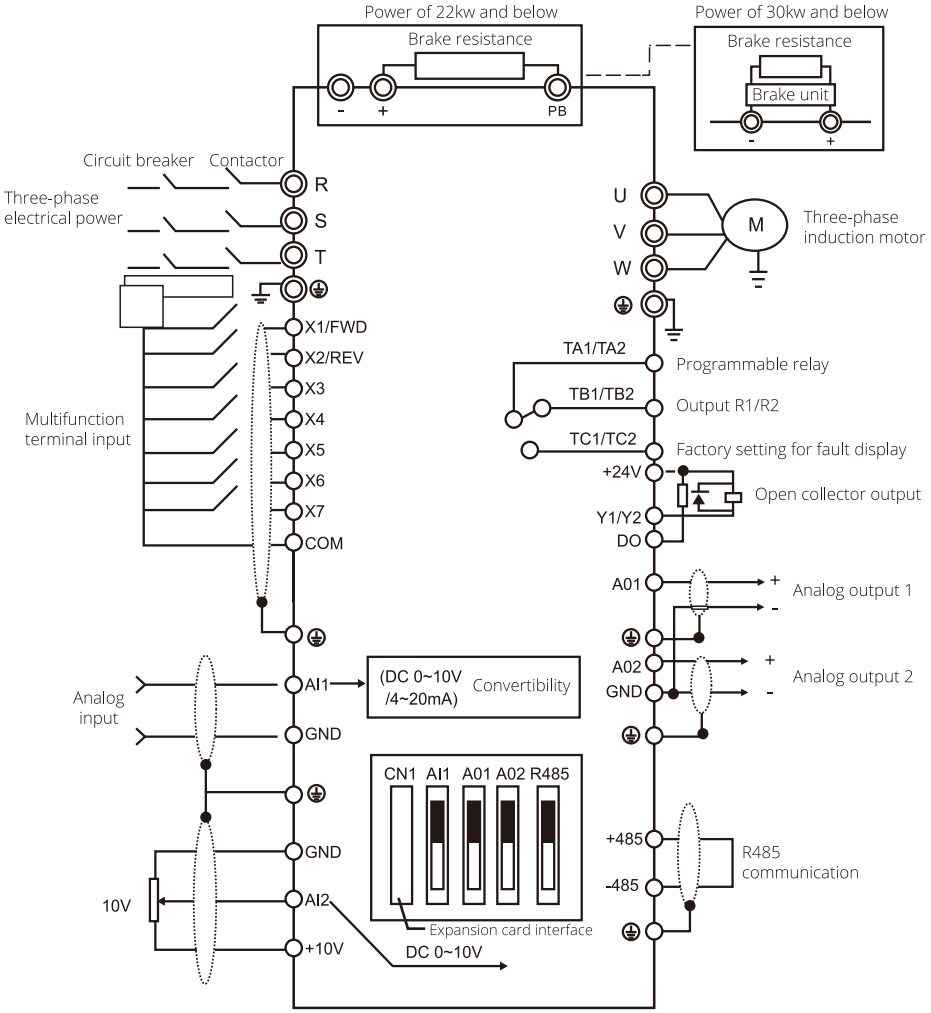
	+10V	+10V is the circuit common power supply of analog input and output terminals	Maximum output current 20mA
	COM	Digital signal and +24V power reference ground	Internal isolation from GND
	GND	Analog signal and +10V power reference ground	Internal isolation from COM
Communication Ports	485+	RS485 Signal+Terminal	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	Non-connecting for matched resistance of 485 communication
ON	Connecting for matched resistance of 485 communication
JP3	
Cin	AI1 input current signal，4-20mA
Vin	AI1 input voltage signal,0-10V
JP4	
Vo1	AO1 output voltage signal, 0-10V
Co1	AO1 output current signal, 4-20mA
JP5	
Vo2	AO2 output voltage signal, 0-10V
Co2	AO2 output current signal, 4-20mA

4.3 Basic Wiring Diagram

The wiring parts of VFD include main circuit and control loop. Open the cover of I/O terminals, users can see the main circuit terminal and control loop terminal, and must conduct the wiring according to the following diagram.



4.4 Wiring Precautions

4.4.1Main Circuit Wiring

●When wiring, the selection of wiring diameter specifications, please implement wiring in accordance with the provisions of electrical regulations to ensure safety.

●It is best to use isolated wires or wire tubes for power wiring, and ground the isolation layer or both ends of the wire tubes;

●Be sure to install an air circuit breaker NPB between the power supply and the input terminals (R, S, T).(If using an earth leakage breaker, please use a breaker with high frequency countermeasures).

●Power wires and control wires should be arranged separately and not in the same slot.

●Do not connect the AC power supply to the inverter output terminals (U, V, W);

●The output wiring should not touch the metal part of the inverter casing, otherwise it may cause a grounding short circuit.

●Phase-shifting capacitors, LC, RC noise filters and other components cannot be used at the output terminals of the inverter.

●The main circuit wiring of the inverter must be far away from other control equipment.

●When the wiring between the inverter and the motor exceeds 50 meters (220V series), (380V series 100 meters), a high dv/dt will be generated inside the motor coil, which will damage the interlayer insulation of the motor , please use a dedicated AC motor for the inverter or install a reactor on the inverter side.

●When the distance between the inverter and the motor is long, please reduce the carrier frequency, because the larger the carrier, the greater the leakage current of high harmonic wave on the cable, and the leakage current will have adverse effects on the inverter and other equipment.

4.4.2 Control Loop Wiring (Signal Wire)

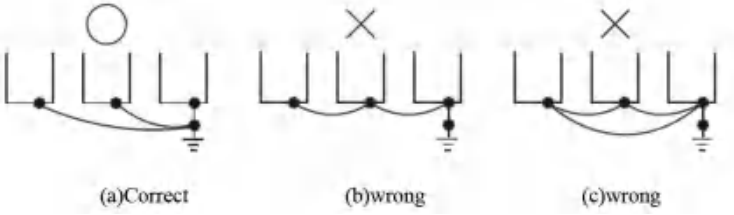
The signal wire and the main circuit wiring cannot be placed in the same wire slot, otherwise interference may occur. Please use shielded wires for signal wires and ground them at one end with a wire diameter of 0.5-2mm². It is recommended to use 1 shielded wires for control wires. Use the control terminals on the control panel correctly as required.

4.4.3 Grounding wire

Please use the third grounding method (below 100Ω) for grounding wire terminal E; use the grounding wire according to the basic length and size of electrical equipment technology; absolutely avoid sharing the grounding electrode with welding machines, power machinery and other large power equipment, and the grounding wires should be as far away as possible from the power wires of large power equipment; for the grounding wiring method of multiple inverters, please use the method (a) in the following figure to avoid the loop of (b) or (c).

●The ground wire must be as short as possible.

●The ground terminal E must be grounded correctly and must not be connected to the neutral wire.

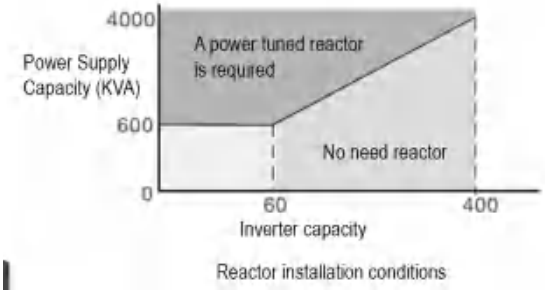


4.5 Specific Application Precautions

4.5.1 Model Selection

(1)Reactor installation

When the converter is connected to a large capacity power transformer (above 600kVA) or when the phase capacitor is switched, the power input loop will generate excessive peak current, which may damage the components of the converter. To prevent this from happening, install a DC or AC reactor. This also helps to improve the power factor on the power side. In addition, when the same power supply system is connected to a thyristor converter such as a DC driver, a DC or AC reactor must be set up regardless of the power supply condition



(2)Inverter Capacity

When running a special motor, ensure 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 run in parallel with one frequency inverter, the capacity of the inverter should be 1.1 times of the total rated current of the motor and less than the rated output current of the inverter.

(3)Starting torque

The starting and accelerating characteristics of the motor driven by the inverter are limited by the overload rated current of the combined inverter. Compared with the starting of general commercial power supply, the torque characteristics are smaller. If large 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 operate and the output will stop when the inverter fails, the motor cannot be stopped suddenly at this time. Therefore, install a mechanical stop and hold structure on machinery that requires an emergency stop.

(5) Special option

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

(6)Precautions related to reciprocating loads

When the inverter is used for reciprocating loads (cranes, elevators, presses, washing machines, etc.), if a current of 150% or more flows repeatedly, the life of the IGBT inside the inverter will be shortened due to thermal fatigue. As a rough standard, when the carrier frequency is 4kHz and the peak current is 150%, the number of starts/stops is about 8 million times.

Especially if low noise is not required, please lower the carrier frequency. In addition, please reduce the peak reciprocating current to less than 150% by reducing the load, extending the acceleration and deceleration time, or increasing the inverter capacity by 1 level, etc. (When conducting test runs for these purposes, please be sure to confirm the peak reciprocating current and adjust it as necessary). In addition, when used for cranes, due to the faster start/stop action during fretting, it is recommended to make the following choices to ensure the motor torque and reduce the current of the inverter.The capacity of the inverter should ensure that its peak current is less than 150%. The capacity of the inverter should be more than 1 level larger than that of the motor.

4.5.2 Precautions For Motor Use

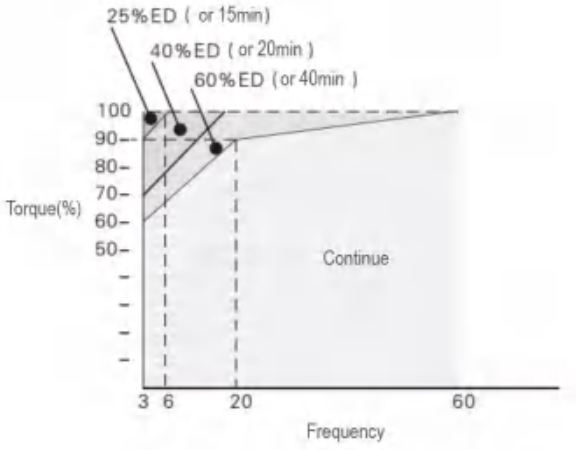
(1) For existing standard motors

low speed range

Using an inverter to drive a standard motor will result in a number of increased losses compared to using a commercial power source to drive.

In the low-speed range, the cooling effect will be deteriorated, 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 consider whether to use an inverter-specific motor.



Allowable load characteristics of our standard motors

(2)**Precautions when use 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 loop will operate, and the motor will stop running freely.

motor with brake

When using an inverter to drive a motor with a brake, if the brake loop is directly connected to the output side of the inverter, the brake cannot be opened due to the low voltage at startup.Use a motor with a brake that has a separate 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 may become louder in the low speed range.

(3) **Power transmission structure (reducer, belt, chain, etc.)**

When using oil-lubricated gearboxes, transmissions, and reducers in the power transmission system, please note that the oil lubrication effect will deteriorate if the operation is continued only in the low-speed range. In addition, when performing high-speed operation above 60 Hz, there will be problems in terms of noise, life, and strength due to centrifugal force of the power transmission structure, so please pay sufficient attention.

Chapter 5 Operation And Display

5.1 Operation Panel Description

5.1.1 Operation Panel Illustration



5.1.2 Operation Panel Keys Description

Key	Name	Function Description
PRG	programming key	Menu entry or exit, parameter modification
ENTER	Enter Key	Enter the menu, confirm the parameter setting
▲	Increase key	Data or function code increase
▼	Decrease key	Data or function code decrease
▶▶	shift key	Select parameter modification bit and display content
RUN	Run key	Enter into run mode under keypad model.
STOP/RESET	stop/reset key	stop/reset operation
FUNC	Multi-function shortcut key	Select according to function switching

5.1.3 Function Indicators Description

Item	Function Description
REV	This indicator light turns red when the VFD is in reverse running status.
FWD	This indicator light turns green when the VFD is in forward running status.
ALM	Alarm indicator light，Fast blinking indicates a fault state.
Hz	Frequency unit
A	Current unit
V	Voltage unit

5.1.4 Function Indicators Combination Description：

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

5.2 Operation Process

5.2.1 Operation Process

The three-level menus are:

1、Function code group number (Level 1 menu)；

2、Function code label (Level 2 menu)；

3、Function code setting value (level 3 menu)。

Note: When operating in the level 3 menu, press PRG or ENTER to return to the level 2 menu. The difference between the two is: press ENTER to save the set parameters into the control panel, then return to the level 2 menu, and automatically transfer to the next function code; press PRG to return directly to the level 2 menu without storing parameters, and stay at current function code.

In the level 3 menu state, if the parameter has no flashing bit, it means that the function code cannot be modified, and the possible reasons are as follows:

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

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

5.2.2 Fault Reset

When the inverter fails, the inverter displays related fault information. The user can reset the fault through the STOP/RESET key on the keypad or the terminal function. After the fault is reset, the inverter 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 a running protection state and cannot run.

5.2.3 Motor Parameter Self-learning

Select the vector control operation mode, before the operation of the inverter, the nameplate parameter of the motor must be accurately input, and the inverter matches the standard motor parameter according to the nameplate parameter; The vector control mode is highly dependent on the motor parameters. In order to obtain good control performance, the accurate parameters of the controlled motor must be obtained.

Chapter 6 Functions manual

The symbols in the function table are explained as follows

×：Indicates that the setting value of this parameter can be changed when the inverter is in stop or running state；

○：Indicates that the setting value of this parameter cannot be changed when the inverter is running;

◆：Indicates that the value of this parameter is the actual detection record value and cannot be changed;

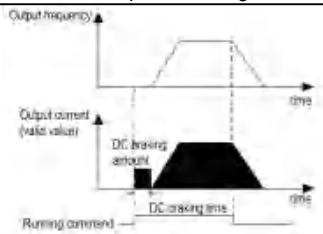
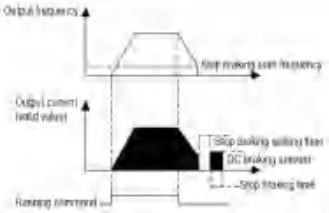
◇：Indicates that the parameter is “Manufacturer Parameter”, which can be set only by manufacturer and cannot be operated by users.

F00 Group-Basic Running Parameters					
Function Code	**Name**	**Contents**	**Set Range**	**Factory Default**	**Modification**
F00.00	LCD language selection (valid for LCD panel only)	0：Chinese 1：English	0～1	0	○
F00.01	Macro Function Definition	0：common mode 1：Single pump constant pressure water supply mode 2：1 variable 2 power(1 variable frequency pump + 2 power frequency pumps) water supply mode 3：Three-pump circulation soft start (3 variable frequency pumps) water supply mode 4：solar water pump water supply mode 5：CNC machine control mode 6：Fire inspection mode 7：EPS power mode 8～100：Reserved Note: Initialize parameters before setting macro function.	0～100	0	×
F00.02	Control mode	0：common V/F control (manually torque boost) 1：advanced V/F control (automatically torque boost) 2：open loop current vector control (SVC) 3：Reserved 4：separated type V/F control Note: this parameter can not be	0～4	0	×

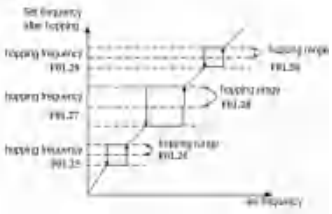
		initialized, please modify it manually.			
F00.03	run command channel selection	0： operation panel run command channel 1：terminal run command channel 2： communication run command channel	0～2	0	○
F00.04	Main frequency source A selection	0：digital set 1 (keypad ▲/▼ key, encoder+F00.10) 1： digital set 2 (terminal UP/DOWN adjust+F00.10) 2： digital set 3 (communication set) 3：AI1 analog set（0～10V/20mA） 4：AI2 analog set（0～10V） 5：pulse set（0～50KHZ） 6：Simple PLC Set 7：Multistage speed run set 8：PID Control Set 9:panel potentiometer (compatible encoder) 10：MPPT set（Solar pump） 11：panel potentiometer	0～11	9	○
F00.05	Auxiliary frequency source B selection	0：digital set 1 (keypad ▲/▼ key, encoder+E00.10) 1：digital set 2 (terminal UP/DOWN adjust+E00.10) 2：digital set 3 (communication set) 3：AI1 analog set（0～10V/20mA） 4：AI2 analog set（0～10V） 5：pulse set （0～50KHZ） 6：Simple PLC Set 7：Multistage speed run set 8：PID Control Set 9:panel potentiometer (compatible encoder) 10：MPPT set（Solar pump） 11：panel potentiometer	0～11	3	○

F00.06	Frequency source	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 prior to K*B) 7： switch form A to (A+K*B) (A prior to A+K*B) 8：switch form A to (A-K*B) (A prior to A-K*B) Note 1: Frequency switching needs to be realized through terminal coordination Note 2: Compared with this frequency source setting method, swing frequency control has a higher priority.	0～8	0	○
F00.07	Digital set 1 control	LED ones digit: power down storage 0：storage 1： not storage LED tens digit: hold when stop 0：hold 1：not hold LED hundred digit: ▲/▼ key, UP/DOWN frequency negative regulation 0： invalid 1：valid LED thousands digit: reserved	000～111	000	○
F00.08	Digital set 2 control			000	○
F00.09	Frequency source digital setting 1	This setting value is the initial value of frequency digital set 1	0.00Hz～【F00.13】	50.00	○
F00.10	Frequency source digital setting 2	This setting value is the initial value of frequency digital set 2	0.00Hz～【F00.13】	50.00	○
F00.11	Auxiliary frequency source weight coefficient K setting	K is the auxiliary frequency source weight coefficient	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, it is the basis for setting the acceleration and deceleration time.	Low frequency range： MAX｛50.00, 【F00.13】｝～ 300.00 High frequency range： MAX｛50.0, 【F00.13】｝～ 3000.0	50.00	×
F00.13	Upper limit 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 ones place: high and low frequency mode selection 0：Low frequency mode(0.00～300.00Hz) 1：High frequency mode(0.0～3000.0Hz) LED ten: acceleration and deceleration reference selection 0：based on the maximum output frequency 1：based on the target output frequency LED Hundreds: Reserved LED Thousands: Reserved Note: High frequency mode is only valid for VF control	00～11	00	×
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	Depending on model	○
F00.17	Deceleration time 1	The time required for the inverter to decelerate from the maximum output frequency to zero frequency		Depending on model	○
F00.18	Running direction setting	0：forward 1：reverse 2：prevent reverse 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 that require silent operation, the carrier frequency can be appropriately increased to meet the requirements, but increasing the carrier frequency will increase the heat generated by 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	Depending on model	○
F00.20	User password	0～65535 Note 1：0～9：without password protect Note 2：it takes 3 minutes to take effect of the successfully set password Note 3：invalid for write-protect, and can not be initialized	0～65535	0	○
F01 Group-Start-stop control parameters					
Function code	**name**	**Contents**	**Set Range**	**Factory Default**	**modifi**

					cation
F01.00	Start mode	0：start at start frequency 1：DC braking + start at start frequency 2：start with speed tracking	0～2	0	×
F01.01	Start frequency		0.00～50.00Hz	1.00	○
F01.02	Start frequency hold time		0.0～100.0s	0.0	○
F01.03	DC braking current at startup		0.0 ～ 150.0 % * motor rated current	0.0%	○
F01.04	DC braking time at startup		0.0～100.0s	0.0	○
F01.05	Accelerating and decelerating mode	0： linear Acc / Dec mode 1： S curve Acc / Dec mode	0～1	0	×
F01.06	Time ratio of Initial segment in S curve	Set the time ratio of the initial segment in S curve	10.0～50.0%	20.0 %	○
F01.07	Time ratio of ending segment in S curve	Set the time ratio of ending segment in S curve	10.0～50.0%	20.0 %	○
F01.08	Stop mode	0：Decelerate to stop 1：coast to stop	0～1	0	×
F01.09	Start frequency of DC braking at stop		0.00～【F00.13】upper limit frequency	0.00	○
F01.10	Stop DC braking waiting time		0.0～100.0s	0.0	○
F01.11	Stop DC braking current		0.0 ～ 150.0 % * motor rated current	0.0%	○

F01.12	Stop DC braking time		0.0～100.0s	0.0	○
F01.13	Acc time 2	Set Acc time 2	0.1～3600.0S 0.4～4.0KW 7.5S 5.5～30KW 15.0S 37～132KW 40.0S 160～630KW 60.0S	Depending on model	○
F01.14	Dec time 2	Set Dec time 2		Depending on model	○
F01.15	Acc time 3	Set Acc time 3		Depending on model	○
F01.16	Dec time 3	Set Dec time 3		Depending on model	○
F01.17	Acc time 4	Set Acc time 4		Depending on model	○
F01.18	Dec time 4	Set Dec time 4		Depending on model	○
F01.19	Acc/Dec time unit selection	0：second 1：minute 2：0.1s	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 Acc 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	Depending on model	○
F01.23	Jog dec time setting	Set jog deceleration time setting		Depending on model	○
F01.24	Jog interval time setting	Set jog interval time setting	0.0～100.0s	0.1	○

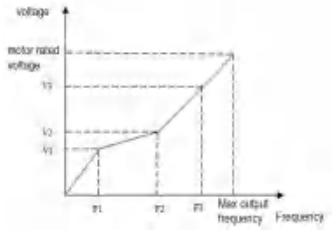
F01.25	Hopping frequency 1		0.00 ～ upper limit frequency	0.00	○
F01.26	Hopping frequency 1 range		0.00 ～ upper limit frequency	0.00	○
F01.27	Hopping frequency 2		0.00 ～ upper limit frequency	0.00	○
F01.28	Hopping frequency 2 range		0.00 ～ upper limit frequency	0.00	○
F01.29	Hopping frequency 3		0.00 ～ upper limit frequency	0.00	○
F01.30	Hopping frequency 3 range		0.00 ～ upper limit frequency	0.00	○
F01.31	Set frequency below the lower limit frequency action	0：run at lower limit frequency 1： run at zero frequency after delay time (start without delay) 2：stop after delay time (start without delay)	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 a percentage of the rated current of the motor.	0.0 ～ 150.0%*motor rated current	0.0	×
F01.34	FWD/REV transition 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	FWD/REV switch mode	0： over zero frequency switch 1：over start frequency switch	0～1	0	×
F01.36	Standby deceleration time when emergency brake	This parameter is valid only for function 10 in the switch input terminals (F07.00 to F07.06).	0.1～3600.0s	1.0	○
F01.37	Stop DC braking current maintenance time	Set stop DC braking current maintenance time	0.0～100.0s	0.0	○
F02 Group-Motor Parameters					
Function	**name**	**Contents**	**Set Range**	**Factory**	**Mo**

code				Default	dification
F02.00	Motor type	0: AC asynchronous motor 1: PMSM (reserved) Note 1: this parameter can not be initialized, please modify it manually.	0～1	0	×
F02.01	Motor rated power	Set according to the parameters on the motor nameplate. 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 drop significantly.	0.4～999.9KW	Depending on model	×
F02.02	Motor rated frequency		0.01Hz～【F00.13】	50.00	×
F02.03	Motor rated speed		0～60000RFM	Depending on model	×
F02.04	Motor rated voltage		0～999V	Depending on model	×
F02.05	Motor rated current		0.1～6553.5A	Depending on model	×
F02.06	Asynchronous motor stator resistance	If the motor is tuned, the set values of F02.06~F02.10 will be updated after the tuning is completed。	0.001～20.000Ω	Depending on model	×
F02.07	Asynchronous motor rotor resistance		0.001～20.000Ω	Depending on model	×
F02.08	Asynchronous motor stator and rotor inductance		0.1～6553.5mH	Depending on model	×
F02.09	Asynchronous motor stator and rotor mutual inductance		0.1～6553.5mH	Depending on model	×
F02.10	Asynchronous motor no-load		0.01～655.35A	Depending on	×

	current			mode l	
F02.11 -F02.1 5	Reserved	—	—	0	◆
F02.16	Motor tuning	0：no action 1：static tuning 2：no-load complete tuning	0～2	0	×
F02.17	Asynchrono us motor pre-excitatio n holding time	Note: This parameter is invalid for VF control	0.00～10.00S	Depe nding on mode l	×
F03 Group-Reserved					
F04 Group-Speed Loop, Torque and Flux Control Parameters					
Functi on code	**name**	**Contents**	**Set Range**	**Facto ry Defau lt**	**M o d i f i c a t i o n**
F04.00	Speed loop (ASR1) proportional gain	Function codes F01.00~F01.07 are valid in the vector control mode without PG. In vector control mode, the speed response characteristics of vector control can be changed by setting the proportional gain P and integral time I of the speed regulator.	0.000～6.000	3.0	○
F04.01	Speed loop (ASR1) integral time		0.000～32.000S	0.50	○
F04.02	ASR1 filter time constant		0.000～0.100S	0.000	○
F04.03	Switch low point frequency		0.00Hz～【F04.07】	5.00	○
F04.04	Speed loop (ASR2) proportional gain		0.000～6.000	2.0	○
F04.05	Speed loop (ASR2) integral time		0.000～32.000S	1.00	○
F04.06	ASR2 filter time constant		0.000～0.100S	0.000	○
F04.07	Switch high point frequency		F04.03】～【F00.13】	10.00	○
F04.08	Vector control of positive slip compensatio n factor (electric	In the vector control mode, this function code parameter is used to adjust the steady speed accuracy of the motor. When the motor is heavily loaded and the speed is low, increase this parameter, otherwise	50.0%～200.0%	100.0 %	○

	state)	decrease this parameter. Among them, the positive slip coefficient compensates the speed when the motor slip rate is positive, and the negative slip coefficient compensates the speed when the motor slip rate is negative. The setting value is the percentage of the rated slip frequency of the motor.			
F04.09	Vector control of negative slip compensation factor (braking state)		50.0%～200.0%	100.0 %	○
F04.10	Speed and torque control	0：speed 1：torque 2：valid conditionally (terminal switch)	0～2	0	×
F04.11	Speed and torque switching delay	Set the speed and torque switching delay	0.01～1.00S	0.05	×
F04.12	Torque command	0：keypad set 1：AI1 2：AI2 3: communication set	0～3	0	○
F04.13	Torque set by keypad	The set value is the percentage of the rated current of the motor	—200.0%～200.0%	0.0%	○
F04.14	Speed limit channel 1of torque control mode (forward)	0：keypad set 1 1：AI1 2：AI2	0～2	0	○
F04.15	Speed limit channel 1of torque control mode (reverse)	0：keypad set 2 1：AI1 2：AI2	0～2	0	○
F04.16	Keypad limit speed 1	The limit value of keypad limit speed 1 is relative to the maximum output frequency. This function code corresponds to the positive speed limit value when F04.14=0。	0.0～100.0%	100.0 %	○
F04.17	Keypad limit speed 2	The limit value of keypad limit speed 2 is 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/decline time defines the time when the torque rises from 0 to the maximum value or decline from the maximum value to 0.	0.0～10.0S	0.1	○
F04.19	Torque decline time		0.0～10.0S	0.1	○

F04.20	Electric torque limit of vector mode	Set the electric torque limit of the vector mode, the setting value is the percentage of the rated current of the motor.	G type：0.0％～200.0％160.0% P type：0.0％～200.0％120.0%	Depending on model	○
F04.21	Braking torque limit of vector mode	Set the braking torque limit of vector mode, the setting value is the percentage of the rated current of the motor.	G type：0.0％～200.0％160.0% P type：0.0％～200.0％120.0%	Depending on model	○
F04.22	Torque detection action	0：detect invalid 1： keep running after over torque detected during constant speed 2：keep running after over torque detected during Running 3：cut off output after over torque detected during constant speed 4：cut off output after over torque detected during Running 5：keep running after torque shortage detected during constant speed 6：keep running after torque shortage detected during running 7：cut off output after torque shortage detected during constant speed 8：cut off output after torque shortage detected during running	0～8	0	×
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 type：0.0％～200.0％150.0% P type：0.0％～200.0％110.0%	be scrapped.	×
F04.24	Torque detection time		0.0～10.0S	0.0	×
F04.25	Cut off frequency of static friction coefficient	Due to insufficient starting torque of the motor, increasing the set value of F04.26 can increase the starting torque, when the speed exceeds the set value of F04.25, the increased torque slowly drops to the given torque within the set time of F04.27.	0.00～300.00Hz	10.00	○
F04.26	Static friction coefficient set		0.0～200.0	0.0	○
F04.27	Hold time of static friction coefficient		0.00～600.00s	0.00	×
F05 Group-VF Control Parameters					
Function code	**name**	**Contents**	**Set Range**	**Factory Default**	**Modif**

					ication
F05.00	V/F curve set	0：linear curve 1：decreasing 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	×
F05.01	Torque boost setting	Manual torque boost, the setting is the percentage relative to the rated voltage of the motor.	0.0～30.0％	Depending on model	×
F05.02	Torque boost cut-off frequency	Set the torque boost cut-off frequency	0.00 ～ motor rated frequency	15.00	×
F05.03	V/F frequency value F1		0.00～frequency value F1	12.50	×
F05.04	V/F voltage value V1		0.0 ～ voltage value V2	25.0 %	×
F05.05	V/F frequency value F1		Frequency value F1～ Frequency value F3	25.00	×
F05.06	V/F Voltage value V2		Voltage value V1 ～ Voltage value V3	50.0 %	×
F05.07	V/F Frequency value F3		Frequency value F1～【F02.02】	37.50	×
F05.08	V/F voltage value V3		Voltage value V2 ～ 100.0 % * motor rated voltage	75.0 %	×
F05.09	V/F control slip frequency compensation	After the asynchronous motor is loaded, the speed will drop, and 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 ～ 200.0 % * Motor rated slip	0.0%	○

F05.10	V/F control slip compensation filtering coefficients	This parameter is used to adjust the response speed of slip frequency compensation. The larger the value is set, the slower the response speed and the more stable the motor speed.	1～10	3	○
F05.11	V/F control torque compensation filtering coefficients	During free torque boost, this parameter is used to adjust the response speed of torque compensation. The larger the value is set, the slower the response speed and the more stable the motor speed.	0～10	Depending on model	○
F05.12	Separated type V/F control	0：VF half separated mode, voltage open-loop output 1：VF half separated mode, voltage closed-loop output 2：VF complete separated mode, voltage open-loop output 3：VF complete separated mode, voltage closed-loop Output Note 1: when choose VF separated control, please close the dead-time compensation function Note 2: half separated concept is based on that during start-up the frequency and voltage of VFD remains the VVVF relation, but get separated after the reaching of set frequency	0～3	0	×
F05.13	Voltage setting channel	0：digital setting 1：AI1 2：AI2	0～2	0	○
F05.14	Voltage feedback channel of voltage close-loop output	0：AI1 1：AI2 Note: only valid for closed loop output mode	0～1	0	×
F05.15	Output voltage of digital setting	Note: in open loop output mode, the maximum output voltage is 100.0% of rated voltage of motor	0.0 ～ 200.0 % * motor rated voltage	100.0 %	○
F05.16	Deviation limit of voltage closed loop regulation	It is used to limit the maximum deviation range allowed for voltage regulation in closed-loop mode, thereby limiting the voltage within a safe range to ensure reliable operation of the device.	0.0 ～ 5.0 % * motor rated voltage	2.0%	×
F05.17	VF curve max. voltage of half separation mode	Note: this voltage represents output voltage of VFD	0.0 ～ 100.0 % * motor rated voltage	80.0 %	×

F05.18	Controller adjustment cycle of voltage closed loop output	This function code represents the speed of voltage adjustment, if the voltage response is slow, the value of this parameter can be appropriately reduced.	0.01～10.00s	0.10	×
F05.19	Voltage rising time	F05.19～F05.20 only valid for open loop output mode of complete separated voltage	0.1～3600.0S	10.0	○
F05.20	Voltage declining time		0.1～3600.0S	10.0	○
F05.21	Voltage feedback disconnection treatment	0：alarm and keep running with the voltage of disconnection moment 1：alarm and keep running with decreased voltage of amplitude limiting value 2：protection action and free stop	0～2	0	×
F05.22	Detection value of voltage feedback disconnection	The maximum value of the given voltage is used as the upper limit of the feedback disconnection detection value. During the feedback disconnection detection time, when the voltage feedback value is continuously lower than the feedback disconnection detection value, the inverter will take corresponding protection actions according to the setting of F05.21.	0.0～100.0%* motor rated voltage	2.0%	○
F05.23	Detection time of voltage feedback disconnection	After the voltage feedback disconnection occurs, the duration before the protection action.	0.0～100.0S	10.0	○
F05.24	Limit voltage of voltage feedback disconnection	This voltage represents the output voltage of the inverter. Setting this parameter reasonably can prevent equipment damage caused by voltage overshoot at the time of disconnection.	0.0～100.0％* motor rated voltage	80.0 %	○
F05.25	Busbar voltage undervoltage detection value	Note: 0 is invalid, and the busbar voltage is lower than the value of this parameter, will report “E-34".	0～1000V	0	○
F05.26	Busbar undervoltage fault reset value	Note: If the busbar voltage reaches this set value, the undervoltage fault "E-34" will automatically reset and start.	0～1000V	0	○

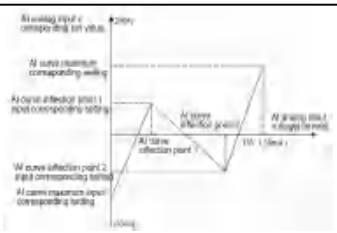
F06 Group-Analog Quantity and Pulse Input and Output Parameters

Function Code	Name	Contents	Set Range	Factory Default	Modifica

					tion
F06.00	AI1 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	×
F06.01	AI1 input lower-limit	Set AI1 lower limit	0.00V/0.00mA～10.00V/20.00mA	0.00	○
F06.02	AI1 lower limit corresponding physical Quantity setting	Set the corresponding setting of the lower limit of AI1, 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 corresponding physical quantity setting	Set the setting corresponding to the upper limit of AI1, 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 corresponding 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%	○
F06.09	AI2 input upper limit	Set AI2 upper limit	0.00V～10.00V	10.00	○
F06.10	AI2 upper limit corresponding physical quantity setting	Set the setting corresponding to the upper limit of AI2, 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, the frequency fluctuation caused by this fluctuation can be suppressed by setting F06.12.	0.00V～10.00V	0.00	○
F06.13	Threshold of zero frequency operation	When F00.15=1 （ high frequency mode），upper limit of this parameter is 500.0Hz。	zero frequency hysteresis～50.00Hz	0.00	○
F06.14	zero frequency hysteresis	Set zero frequency hysteresis	0.00～Zero frequency operation threshold	0.00	○
F06.15	External pulse input corresponding physical quantity	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 physical quantity set	Set the corresponding setting of the lower limit of external pulse X7, which is the percentage relative to the maximum output frequency.	-200.0%～200.0%	0.0%	○
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 impulse upper limit corresponding physical quantity set	Set the corresponding setting of the upper limit of external pulse X7, which is the 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-function analog output Terminal function	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: busbar voltage 7: PID specified value 8: PID feedback value 9: AI1 10: AI2 11: input pulse frequency 12: torque current 13: flux current 14: communication setting	0～14	0	○
F06.22	AO2 multi-function analog output Terminal function		0～14	4	○
F06.23	DO multi-function pulse output terminal function		0～14	11	○

F06.24	AO1 output lower limit corresponding physical quantity	Set AO1 output lower limit corresponding physical quantity	-200.0%～200.0%	0.0%	○
F06.25	AO1 output lower limit	Set AO1 output limit	0.00～10.00V	0.00	○
F06.26	AO1 output upper limit corresponding physical quantity	Set AO1 output upper limit corresponding physical quantity	-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 corresponding physical quantity	Set AO2 output lower limit corresponding physical quantity	-200.0%～200.0%	0.0%	○
F06.29	AO2 output lower limit	Set AO2 output lower limit	0.00～10.00V	0.00	○
F06.30	AO2 output upper limit corresponding physical quantity	Set AO2 output upper limit corresponding physical quantity	-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	DO output lower limit corresponding Physical quantity（Reserved）	Set DO output lower limit corresponding Physical quantity	-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	DO output upper limit corresponding Physical quantity（Reserved）	Set DO output upper limit corresponding Physical quantity（Reserved）	-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 ones digit: AI1 multi-point curve selection 0: Disable 1: Valid LED ten: AI2 multi-point curve selection 0: Disable 1: Valid LED hundred digits: analog input signal selection 0: AI1 and AI2 input signal 0～10V 1: AI1 input signal 4～20mA, AI2 input signal 0～10V 2: AI2 input signal 4～20mA, AI1 input signal 0～10V 3: AI1 and AI2 input signals 4～20mA LED Thousands: Reserved	000～311	000	×
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	○
F06.50	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 the analog input AI1 is greater than F06.53, or the AI1 input is less than F06.54, the Y terminal of the inverter or the relay R outputs the ON signal of "AI1 input over limit", which is used to indicate whether the input voltage of AI1 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	○

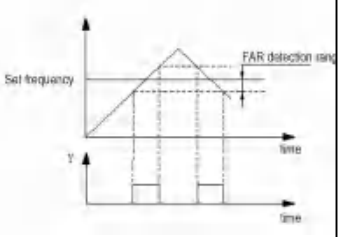
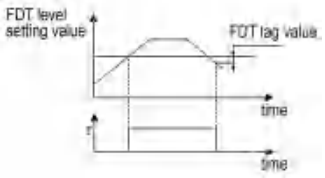
F07 Group-Digital Input and Output Parameters

Function Code	Name	Contents	Set Range	Factory Default	Modification
F07.00	Input terminal X1 function （when F00.01 is 2 or 3，default as function NO.58）	0: control terminal idle 1: forward run (FWD) 2: reverse run (REV) 3: three-wire running control 4: forward jog control 5: reverse jog control 6: free shutdown control 7: external reset signal input (RST) 8: external device fault	0～65	1	×

F07.01	Input terminal X2 function （when F00.01 is 2 or 3，default as function NO.59）	normally-open input 9: external device fault normally-close input 10: emergency stop function (brake with fastest speed) 11: External stop control 12: frequency increase 13: frequency decrease 14: UP/DOWN terminal frequency zero clearing 15：multi-speed 1 16: multi-speed 2 17: multi-speed 3 18: multi-speed 4 19: ACC/DEC time TT1 20: ACC/DEC time TT2 21: run command channel 1 22: run command channel 2 23: VFD ACC/DEC prohibit 24: VFD operation prohibiting 25: run command switch to keypad 26: run command switch to terminal 27: run command switch to communication 28: auxiliary frequency zero clearing 29: frequency source A and K*B switch 30: frequency source A and A+K*B switch 31: frequency source A and A-K*B switch 32: reserved 33: PID control input 34: PID control pause 35:swing frequency control input 36: pause swing frequency control 37: swing frequency status reset 38: PLC control input 39: PLC pause 40: PLC reset 41: clear the counter to zero 42: input signal to trigger the counter 43: timing triggering input 44: timing clearing input 45: input external pulse frequency (only valid for X7) 46: clear the length information 47: input the signal of length (only valid for X7) 48: switch speed and torque control 49: prohibit torque control 50～57: reserved	0～65	2	×
F07.02	Input terminal X3 function （when F00.01 is 2 or 3，default as function NO.60）		0～65	4	×
F07.03	Input terminal X4 function （when F00.01 is 2 or 3，default as function NO.61）		0～65	7	×
F07.04	Input terminal X5 function （when F00.01 is 2 or 3，default as function NO.62）		0～65	8	×
F07.05	Input terminal X6 function （when F00.01 is 2 or 3，default as function NO.63）		0～65	0	×

F07.06	Input terminal X7 function （ High speed pulse input）	58: start/stop 59: running allowed 60: interlock1 61: interlock2 62: interlock3 63: PFC start/stop 64: A frequency switch B and run 65: The first group PID is switched to the second group PID	0～65	45	×
F07.07	Reserved	—	—	0	◆
F07.08	Switching value filtering times	1：Represents 2MS scan time unit	1～10	5	○
F07.09	Terminal function detection when power on	0: terminal operation command invalid when power on 1: terminal operation command valid when power on	0～1	0	○
F07.10	Effective logic setting of input terminal (X1～X7)	0 is positive logic, i.e. terminal Xi is enabled when it connects with common terminal and disabled if disconnected. 1 is negative logic, i.e. terminal Xi is disabled when it connects with common terminal and enabled when disconnected.	0～7FH	00	×
F07.11	FWD/REV terminal control mode	0: two-wire control mode 1 1: two-wire control mode 2 2: three-wire control mode 1 3: three-wire control mode 2	0～3	0	×
F07.12	UF/DOWN terminal frequency modifying rate	When F00.15=1(high frequency mode), upper limit of this parameter is 500.0Hz/s.	0.01～50.00Hz/S	1.00	○
F07.13	Reserved	—	—	0	◆
F07.14	Y1 output delay time	This function code defines the delay from the change of state of switching quantity output terminals Y1 and Y2 and relays R1 and R2 to the change of output.	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	0: no output 1: VFD forward running 2: VFD reverse running 3: fault output 4: frequency/speed level detection signal (FDT1) 5: frequency/speed level detection signal (FDT2) 6: frequency/speed arrival signal (FAR) 7: VFD zero-speed running 8: upper limit arrival of output frequency 9: lower limit arrival of output frequency 10: lower limit arrival of preset frequency during running 11: pre-alarm signal of overload 12: counter detection signal output 13: counter detection reset signal output 14: driver ready 15: one cycle finished of programmable MS running 16: stage finished of pogrammable MS running 17: upper and lower limit of traverse frequency 18: current limiting action 19: stall over voltage 20: low voltage lock-up 21: dormancy state 22: VFD alarm signal (PID disconnection, RS485 communication failure, panel communication failure, EEPROM read-write failure, encoder disconnection, etc.) 23: AI1＞AI2 24: preset length arrival 25: preset operation time out 26: dynamic braking action 27: DC braking action 28: flux braking action 29: torque limiting 30: over torque signal 31: auxiliary motor 1 32: auxiliary motor 2 33: accumulated operation time out 34 ～ 49: segment of MS or simple PLC operation 50: running indication signal 51: temperature arrival Indication 52: indication when VFD stops or during zero-speed running 53: reserved 54: reserved 55: Communication settings 56: The inverter is ready for operation 2	0～62	0	×
F07.19	Open collector output terminal Y2		0～62	0	×
F07.20	Programmable relay R1 output		0～62	3	×
F07.21	Programmable relay R2 output		0～62	0	×

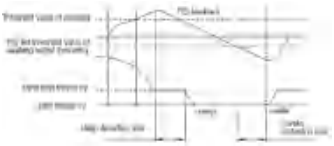
		57: AI1 input over pressure 58: Output current overrun 59: Interlock 1 output 60: Interlock 2 output 61: Interlock 3 output 62: Frequency and current detection level reach the output at the same time			
F07.22	Logic setting of output terminal (Y1～Y2)	0: positive logic, i.e. terminal Yi is enabled when it connects with common terminal, and disabled if disconnected. 1: negative logic, i.e. terminal Yi is disabled when it connects with common terminal, and enabled if disconnected.	0～3H	0	×
F07.23	Frequency arrival detection range (FAR)		0.0～100.0%* 【F00.13】	10.0 %	○
F07.24	FDT1 detection method	0: speed set value 1: speed detected value	0～1	0	○
F07.25	FDT1 level setting		0.00Hz～【F00.13】	50.00	○
F07.26	FDT1 Lag value		0.0～100.0%* 【F07.25】	2.0%	○
F07.27	FDT2 detection method	0: speed set value 1: speed detected 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 lag value		0.0～100.0%* 【F07.28】	4.0%	○

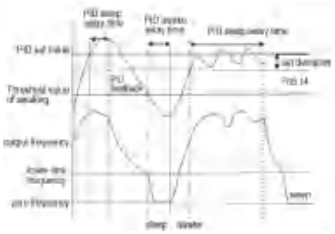
F07.30	Counting value arrival processing	0: stop counting, stop output 1: stop counting, resume output 2: cycle count, stop output 3: cycle count, resume output	0～3	3	×
F07.31	Counting start condition	0: always count since power on 1: count in operation status, stop counting in stop status	0～1	1	×
F07.32	Counter reset value	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 function code F11.21, the corresponding multi-function output terminal (counter reset signal output) outputs a valid signal and clears the counter.	【F07.33】～65535	0	○
F07.33	Counter detection value		0～【F07.32】	0	○
F07.34	Time out processing	0: stop timing, stop output 1: stop timing, resume output 2: cycle timing, stop output 3: cycle timing, resume output	0～3	3	×
F07.35	Timing start condition	0: Always start when power on 1: Start when running, stop when stopping	0～1	1	×
F07.36	Timing setting	set timing setting	0～65535S	0	○
F07.37	Y1 turn off delay time	This function code defines the delay from the change of state of switching quantity output terminals Y1 and Y2 and relays R1 and R2 to the change of output.	0.0～100.0s	0.0	×
F07.38	Y2 turn off delay time		0.0～100.0s	0.0	×
F07.39	R1 turn off delay time		0.0～100.0s	0.0	×
F07.40	R2 turn off delay time		0.0～100.0s	0.0	×

F08 Group-PID Control Parameters

Function Code	Name	Contents	Set Range	Factory Default	Modification
F08.00	PID operation input mode	0: auto 1: manually input via defined multi-function terminal	0～1	0	×
F08.01	PID input channel	0: digital setting 1: AI1 2: AI2 3: pulse setting 4: RS485 communication 5:Pressure given (MPa、Kg) 6: Panel potentiometer given	0～6	0	○

F08.02	Digital reference input setting	When using analog quantity feedback, this function code realizes setting the given amount of closed-loop control by the operation panel, and this function is valid only when the closed-loop given channel selects digital given (F08.01 is 0).	0.0～100.0%	50.0 %	○
F08.03	PID feedback channel	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 setting	LED one's place: PID sign 0: positive 1: negative LED ten's place: proportion regulation (reserved) 0: integral regulation of constant proportion 1: integral regulation of auto changing proportion LED hundred's place: integral regulation 0: stop integral regulation when the frequency reaches the upper or lower limits 1: continue the integral regulation when the frequency reaches the upper or lower limits LED thousand's place: reserved	000～111	000	×
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, the proportional gain should be increased and the integral time should be reduced. If the adjustment speed is slow, the proportional gain should be reduced and the integral time should be increased. Generally, the differential time is not set; 0.0: no differential.	0.01～100.00	2.50	○
F08.06	Integral time Ti1		0.01～10.00s	0.10	○
F08.07	Derivative time Td1		0.01～10.00s	0.00	○
F08.08	Sampling cycle T	Sampling period is the sampling period of the feedback quantity. The regulator operates once in each sampling period. The larger the sampling period, the slower the response, but the better the suppression effect on interference signals. Generally, it does not need to be set; 0.00: Automatic.	0.01～10.00s	0.10	○
F08.09	Deviation limit	The deviation limit is the ratio of the absolute value of the deviation between the system feedback amount and the given amount to the	0.0～100.0%	0.0%	○

		given amount. When the feedback amount is within the range of the deviation limit, the PID adjustment will not act.			
F08.10	Close-loop preset frequency	This function code defines the running 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 quickly reach the predetermined value, the inverter will forcefully output a certain frequency value F08.10 and frequency holding time F08.11 according to the setting of this function code. That is, when the control object is close to the control target, the PID controller is used to improve the response speed.	0.00～上限频率	0.00	○
F08.11	Preset frequency hold time		0.0～3600.0s	0.0	×
F08.12	Sleep mode	0: disabled 1: sleep when feedback pressure exceeding or lower than sleep threshold 2: sleep when feedback pressure and output frequency are stable 3：Reserved	0～3	1	×
F08.13	Stop method of sleep mode	0: decelerate to stop 1: coast to stop	0～1	0	○
F08.14	Deviation limit of feedback when entering sleep state compared with set pressure		0.0～10.0%	0.5%	○
F08.15	Threshold value of sleeping		0.0 ～ 200.0 % *set pressure	100.0 %	○
F08.16	Threshold value of awaking	F08.12=1 schematic diagram（sleeping method 1）	0.0 ～ 200.0 % *set pressure	90.0 %	○

F08.17	Delay time of sleep	 F08.12=2 schematic diagram （sleeping method 2）	0.0～3600.0s	100.0	○
F08.18	Delay time of awaking		0.0～3600.0s	5.0	○
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, the proportional gain should be increased and the integral time should be reduced. If the adjustment speed is slow, the proportional gain should be reduced and the integral time should be increased. Generally, the differential time is not set; 0.0: no differential.	0.01～100.00	1.00	○
F08.20	Integration time Ti2		0.01～10.00s	0.10	○
F08.21	Derivative time Td2		0.01～10.00s	0.00	○
F08.22	PID upper limit cutoff 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	×

F09 Group-Simple PLC, Multi-speed

Function Code	Name	Contents	Set Range	Factory Default	Modification
F09.00	PLC running mode	0：stop after single cycle 1：Keep final value running after single cycle 2: continuous cycle of limited times 3: continuous cycle	0～3	0	×
F09.01	Input mode of PLC running	0: auto 1: manually input via defined multi-function terminal	0～1	0	×
F09.02	PLC running state saving after power off	0: not save 1: save the stage and frequency when power off	0～1	0	×

F09.03	PLC restart mode	0: restart from the first stage 1: start from the stage where the driver stops (fault) 2: start from the stage where the driver stops (fault) at the recorded frequency	0～2	0	×
F09.04	Limited times of continuous cycle	Set PLC limited times of continuous cycle	1～65535	1	○
F09.05	Unit of PLC running time	0：s 1: m	0～1	0	×
F09.06	MS frequency 0	Set MS frequency 0	-upper limit frequency～upper limit frequency	5.00	○
F09.07	MS frequency 1	Set MS frequency 1	-upper limit frequency～upper limit frequency	10.00	○
F09.08	MS frequency 2	Set MS frequency 2	-upper limit frequency～upper limit frequency	15.00	○
F09.09	MS frequency 3	Set MS frequency 3	-upper limit frequency～upper limit frequency	20.00	○
F09.10	MS frequency 4	Set MS frequency 4	-upper limit frequency～upper limit frequency	25.00	○
F09.11	MS frequency 5	Set MS frequency 5	-upper limit frequency～upper limit frequency	30.00	○
F09.12	MS frequency 6	Set MS frequency 6	-upper limit frequency～upper limit frequency	40.00	○
F09.13	MS frequency 7	Set MS frequency 7	-upper limit frequency～upper limit frequency	50.00	○
F09.14	MS frequency 8	Set MS frequency 8	-upper limit frequency～upper limit frequency	0.00	○
F09.15	MS frequency 9	Set MS frequency 9	-upper limit frequency～upper limit frequency	0.00	○
F09.16	MS frequency 10	Set MS frequency 10	-upper limit frequency～upper limit frequency	0.00	○
F09.17	MS frequency 11	Set MS frequency 11	-upper limit frequency～upper limit frequency	0.00	○
F09.18	MS frequency 12	Set MS frequency 12	-upper limit frequency～upper limit frequency	0.00	○
F09.19	MS frequency 13	Set MS frequency 13	-upper limit frequency～upper limit frequency	0.00	○
F09.20	MS frequency	Set MS frequency 14	-upper limit frequency～upper limit	0.00	○

	14		frequency		
F09.21	MS frequency 15	Set MS frequency 15	-upper limit frequency～upper limit frequency	0.00	○
F09.22	Acc/Dec time of segment 0	Set Acc/Dec time of stage 0	0～3	0	○
F09.23	Run time of segment 0	Set run time of segment 0	0.0～6553.5S(）	0.0	○
F09.24	Acc/Dec time of segment 1	Set Acc/Dec time of segment 1	0～3	0	○
F09.25	Run time of segment 1	Set Run time of segment 1	0.0～6553.5S(M）	0.0	○
F09.26	Acc/Dec time of segment 2	Set Acc/Dec time of segment 2	0～3	0	○
F09.27	Run time of segment 2	Set Run time of segment 2	0.0～6553.5S(M）	0.0	○
F09.28	Acc/Dec time of segment 3	Set Acc/Dec time of segment 3	0～3	0	○
F09.29	Run time of segment 3	Set Run time of segment 3	0.0～6553.5S(M）	0.0	○
F09.30	Acc/Dec time of segment 4	Set Acc/Dec time of segment 4	0～3	0	○
F09.31	Run time of segment 4	Set Run time of segment 4	0.0～6553.5S(M）	0.0	○
F09.32	Acc/Dec time of segment 5	Set Acc/Dec time of segment 5	0～3	0	○
F09.33	Run time of segment 5	Set Run time of segment 5	0.0～6553.5S(M）	0.0	○
F09.34	Acc/Dec time of segment 6	Set Acc/Dec time of segment 6	0～3	0	○
F09.35	Run time of segment 6	Set Run time of segment 6	0.0～6553.5S(M）	0.0	○
F09.36	Acc/Dec time of segment 7	Set Acc/Dec time of segment 7	0～3	0	○
F09.37	Run time of segment 7	Set Run time of segment 7	0.0～6553.5S(M）	0.0	○
F09.38	Acc/Dec time of segment 8	Set Acc/Dec time of segment 8	0～3	0	○
F09.39	Run time of segment 8	Set Run time of segment 8	0.0～6553.5S(M）	0.0	○
F09.40	Acc/Dec time of segment 9	Set Acc/Dec time of segment 9	0～3	0	○

F09.41	Run time of segment 9	Set Run time of segment 9	0.0～6553.5 S(M)	0.0	○
F09.42	Acc/Dec time of segment 10	Set Acc/Dec time of segment 10	0～3	0	○
F09.43	Run time of segment 10	Set Run time of segment 10	0.0～6553.5 S(M)	0.0	○
F09.44	Acc/Dec time of segment 11	Set Acc/Dec time of segment 11	0～3	0	○
F09.45	Run time of segment 11	Set Run time of segment 11	0.0～6553.5 S(M)	0.0	○
F09.46	Acc/Dec time of segment 12	Set Acc/Dec time of segment 12	0～3	0	○
F09.47	Run time of segment 12	Set Run time of segment 12	0.0～6553.5 S(M)	0.0	○
F09.48	Acc/Dec time of segment 13	Set Acc/Dec time of segment 13	0～3	0	○
F09.49	Run time of segment 13	Set Run time of segment 13	0.0～6553.5 S(M)	0.0	○
F09.50	Acc/Dec time of segment 14	Set Acc/Dec time of segment 14	0～3	0	○
F09.51	Run time of segment 14	Set Run time of segment 14	0.0～6553.5 S(M)	0.0	○
F09.52	Acc/Dec time of segment 15	Set Acc/Dec time of segment 15	0～3	0	○
F09.53	Run time of segment 15	Set Run time of segment 15	0.0～6553.5 S(M)	0.0	○
F09.54	Reserved	—	—	0	◆
F09.55	Swing frequency control	0: disabled 1: enabled	0～1	0	×
F09.56	Swing frequency operation input mode	0: auto 1: manually input via defined multi-function terminal	0～1	0	×
F09.57	Swing control	0: fixed swing 1: varied swing	0～1	0	×
F09.58	Swing frequency stop start mode selection	0: Start according to the state of memory before stop 1: Restart the startup	0～1	0	×
F09.59	Swing frequency state power off storage	0:storage 1：no storage	0～1	0	×

F09.60	Swing frequency Preset frequency	The running frequency of the inverter before entering the swing frequency operation mode or when leaving the swing frequency operation mode and the running time at this frequency point.If the function code F09.61≠0 (waiting time for swing frequency preset frequency) is set, then the inverter will directly enter the swing frequency preset frequency operation after starting, and enter the swing frequency mode after the swing frequency preset frequency waiting time has elapsed.	0.00Hz～上限频率	10.00	○
F09.61	Swing frequency preset frequency waiting time		0.0～3600.0s	0.0	×
F09.62	swing frequency amplitude	The swing frequency amplitude is determined by F09.62 as its reference value, and the swing frequency operating frequency is restricted by the upper and lower limit frequencies. If the setting is improper, the swing frequency will not work normally.	0.0～100.0％	0.0%	○
F09.63	Suddenly jump frequency	This function code refers to the range of rapid drop after the frequency reaches the upper limit of the swing frequency during the swing process, and of course it also refers to the range of rapid rise after the frequency reaches the lower limit of the swing frequency. If it is set to 0.0%, there is no suddenly jump frequency.	0.0～50.0％（Relative swing frequency amplitude）	0.0%	○
F09.64	Swing frequency rising time	This function code defines the running time from the lower limit of the swing frequency to the upper limit of the swing frequency during swing operation and the running time from the upper limit of the swing frequency to the lower limit of the swing frequency during swing operation.	0.1～3600.0s	5.0	○
F09.65	Swing frequency falling time		0.1～3600.0s	5.0	○
F09.66	Reserved	—	—	0	◆
F09.67	Length control	0: disabled 1: enabled	0～1	0	×
F09.68	Preset length	This group of functions is used to realize the fixed-length stop 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 shaft (F09.73) and the circumference of the shaft (F09.72). Calculation length = number of counting pulses ÷ number of pulses per revolution × circumference of the measuring shaft.	0.000～65.535(KM)	0.000	○
F09.69	Actual length		0.000～65.535(KM)	0.000	○
F09.70	Length factor		0.100～30.000	1.000	○
F09.71	Length calibration factor		0.001～1.000	1.000	○

F09.72	Measure shaft circumference	And the calculated length is corrected by length magnification (F09.70) and length calibration factor (F09.71) to obtain the actual length. Actual length = Calculated length × Length magnification ÷ length calibration factor . When the actual length (F09.69) ≥ the set length (F09.68), the inverter will automatically send a stop command to stop. Before running again, it is necessary to clear the actual length (F09.69) or modify the actual length (F09.69) < the set length (F09.68), otherwise it cannot start.	0.10～100.00CM	10.00	○
F09.73	Shaft pulses per revolution （X7）		1～65535	1024	○

F10 Group-Protective Parameters

Function Code	Name	Contents	Set Range	Factory Default	Modification
F10.00	Motor overload protection	LED units: motor overload protection selection 0: prohibited 1：Ordinary motor overload protection 2：Inverter motor overload protection 3 ： Self-defined motor overload protection LED ten bits: inverter overload protection selection 0: prohibited 1: General inverter overload protection 2: Self-defined inverter overload protection LED Hundreds bits: Overload pre-alarm selection 0: prohibited 1: Effective LEDs Thousands bits: reserved Note: See F10.29 ～ F10.32 details about self-defined overload protection	000～123	11	×
F10.01	Motor overload protection factor	20.0%～120.0%	20.0%～120.0%	100.0%	×
F10.02	Undervoltage protection action selection	0: forbid 1: Allowed (undervoltage regarded as fault)	0～1	0	×

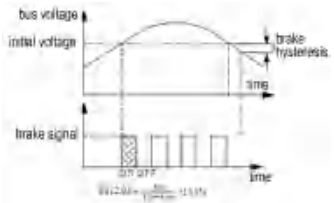
F10.03	Undervoltage protection level	This function code specifies the allowable lower limit voltage of the DC bus when the inverter is working normally.	220V：180～280V 200V 380V：330～480V 350V	Depending on model	×
F10.04	Overvoltage limit level	The overvoltage limit level defines the action voltage for overvoltage stall protection.	220V：350～390V 370V 380V：600～780V 660V	Depending on model	×
F10.05	Voltage limit factor in decelerating	During deceleration, the larger this value is, the stronger the ability to suppress overvoltage; 0: Overvoltage stall protection is invalid.	0～100	Depending on model	×
F10.06	Current limiting level (only valid for VF mode)	The overvoltage limit level defines the action voltage for voltage stall protection.	80％～200％* inverter rated current	Depending on model	×
F10.07	Current limiting in the field weakening region	0: limited by the current limit level of F10.06 1: Limit by the current limit level converted by F10.06	0～1	0	×
F10.08	Current limiting factor in accelerating	During the acceleration process, the larger the value, the stronger the ability to suppress overcurrent; 0: The acceleration current limit is invalid.	0～100	Depending on model	×
F10.09	Current limiting factor in constant speed running	0~100 means automatic frequency reduction, the larger the coefficient, the faster the frequency reduction rate; 101~5000 is manual frequency reduction, 101 means 0.01Hz/S, and so on, 5000 means 50.00/S.	0～5000	40	×
F10.10	Off load detection time	The load loss detection time (F10.10) defines the output of the load loss signal after the output current of the inverter is continuously lower than the load loss detection level (F10.11) for a certain period of time; 0: The load loss detection is invalid.	0.1S～60.0S	5.0	○
F10.11	load loss detection level		0 ～ 100%*inverter rated current	0%	○
F10.12	Overload pre-alarm level	Through the setting of parameters F10.12 and F10.13, when the output current of the inverter is greater than the overload pre-alarm level (F10.12), after delay (F10.13) processing, the inverter outputs a pre-alarm signal, that is The operation panel displays "A–09".	1％～200％*inverter rated current	Depending on model	○
F10.13	Overload pre-alarm delay time		0.0～30.0s	10.0	○
F10.14	Temperature detection threshold	By setting the No. 51 function in function codes F07.18~F07.21, when the temperature reaches this setting, an indication signal will be output.	0.0℃～90.0℃	65.0℃	×
F10.15	Phase loss protection of input and output	00: disabled 1: disabled for input, enabled for output 2: enabled for input, disabled for	0～3	Depending on mod	×

		output 3: enabled		el	
F10.16	Delay time of input phase loss protection	When the input phase loss protection is selected to be valid and an input phase loss fault occurs, after the time defined by F10.16, the inverter will take the protection action "E-12" and coast to stop.	0.0～30.0s	1.0	○
F10.17	Detection reference of output phase loss protection	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 take protection action [E-13] and coast to stop.	0 % ～ 100 % *inverter rated current	25%	×
F10.18	Detection factor of output current imbalance	If the ratio of the maximum value to the minimum value of the three-phase output current is greater than this coefficient and lasts for more than 10 seconds, the inverter will report output current imbalance fault E-13.	0.01～50.00	10.00	×
F10.19	Reserved	—	—	0	◆
F10.20	PID feedback disconnection processing	0: disabled 1: alarm and maintain the operation at the frequency of disconnection moment 2: protection action and coast to stop 3: alarm and decelerate to zero-speed operation according to preset mode	0～3	0	×
F10.21	Feedback disconnection detection value	The maximum value of the PID given value is used as the upper limit of the feedback disconnection detection value. During the feedback disconnection detection time, when the PID feedback value is continuously lower than the feedback disconnection detection value, the inverter will take 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 disconnection occurs, the duration before the protection action.	0.0～3600.0S	10.0	○
F10.23	Reserved	—	—	0	◆
F10.24	Action of RS485 communication error	0: protection action and coast to stop 1: alarm and maintain the current operation 2: alarm and stop according to the preset mode	0～2	1	×

F10.25	RS485 communication timeout detection time	If the RS485 communication fails to receive the correct data signal within the time interval defined by this function code, it will be considered that the RS485 communication is abnormal, and the inverter will take corresponding actions according to the setting of F10.24. When this value is set to 0.0, no RS485 communication timeout detection will be performed.	0.0～100.0s	0.0	○
F10.26	Action of operation panel communication error	0: protection action and coast to stop 1: alarm and maintain the current operation 2: protection action and stop according to the preset stop mode	0～2	1	×
F10.27	Operation 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, it is considered that the panel communication is abnormal, and the inverter will take corresponding actions according to the setting of F10.26.	0.0～100.0s	1.0	○
F10.28	Action of EEFROM read-write error	0: protection action and coast to stop 1: alarm and maintain the current operation	0～1	0	×
F10.29	Motor overload protection threshold	When the unit digit of F10.00 is 3, after the output current reaches the motor overload protection threshold (F10.29), delay the motor overload protection detection time (F10.30) and report motor overload "E-08".	0～200%* motor rated current	150 %	×
F10.30	Motor overload protection detection time		0～60000S	100	○
F10.31	Inverter overload protection threshold	When the tens place of F10.00 is 2, after the output current reaches the inverter overload protection threshold (F10.31), delay the inverter overload protection detection time (F10.32) and then report the inverter overload "E-09".	0 ～ 200%* inverter rated current	150 %	×
F10.32	Inverter overload protection detection time		0～60000S	60	○
F10.33	OC and module fault limit reset times	When the number of OC and module faults exceeds the set value, it needs to be powered on again to reset.	0～9999	5	○
F10.34	Encoder FM start bit selection	LED units 1: LED tens 2: LED hundreds digit 3: LED thousands digit	0～3	1	○
F10.35	Reserved	—	—	0	◆
F11 Group-RS485 Communication Parameters					
Functi	**Name**	**Contents**	**Set Range**	**Fact**	**M**

on Code				ory Defa ult	o di fi c at io n
F11.00	Protocol	0：MODBUS 1：user-defined	0～1	0	×
F11.01	Local address	0: broadcast address 1～247: slave	0～247	1	×
F11.02	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	×
F11.04	Response delay	This function code defines the intermediate time interval between the inverter receiving the data frame and sending the response data frame 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 must wait for a delay until the response delay time is up before sending the data to the host computer.	0～200ms	5	×
F11.05	Transmissio n response	0: response for write operation 1: no response for write operation	0～1	0	×
F11.06	Ratio correlation 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 linkage control, this function code can set the ratio of operating frequency of multiple inverters.	0.01～10.00	1.00	○

F11.07	Communication mode selection	LED units: communication mode selection 0: common mode 1: MD380 mode 2: BD600 mode 3: CHF100A mode 4: GD20 mode LED ten digit: broadcast frequency source selection 0: Host set frequency 1: host frequency source A 2: host frequency source B LED hundreds: reserved LED thousand digit: reserved	00～24	00	×
F11.08	Communication display selection	LED ones digit: communication bus voltage display selection 0: normal display 1: 10 times magnification 2: Magnification 100 times 3: 10 times smaller 4: Reduce 100 times LED ten digits: communication current display selection 0: normal display 1: 10 times magnification 2: Magnification 100 times 3: 10 times smaller 4: Reduce 100 times LED Hundreds: Run frequency display selection 0: Normal display 1: 10 times magnification 2: Magnification 100 times 3: 10 times smaller 4: Reduce 100 times LED Thousands: Reserved	000～444	000	×
F12 Group-Advanced Function and Performance Parameters					
Function Code	**Name**	**Contents**	**Set Range**	**Factory Default**	**Modification**
F12.00	Dynamic braking	0: disabled 1: always enabled 2: only enabled when decelerating	0～2	1	×
F12.01	Initial voltage of dynamic braking		220V：340～380V 360V 380V：660～760V 680V	Depending on model	○

F12.02	Hysteresis voltage of dynamic braking		220V：10～100V 5V 380V：10～100V 10V	Depending on model	○
F12.03	Action ratio of dynamic braking		10～100%	100 %	○
F12.04	Restart after power failure	0: disabled 1: start at start frequency 2: start in speed tracking mode	0～2	0	×
F12.05	Restart waiting time after power failure	During the waiting time of restart, inputting any running command is invalid. If a stop command is input, the inverter will automatically cancel the speed tracking and restart state, and return to the normal stop state.	0.0～60.0s	5.0	×
F12.06	Fault automatic reset times	The times of automatic fault reset are set by F12.06. When the number of fault resets is set to 0, there is no automatic reset function, and only manual reset is possible. When F12.06 is set to 100, it means that the number of times is not limited, that is, countless times.	0～100	0	×
F12.07	Fault automatic reset interval time	When a fault occurs during operation, the inverter stops outputting and displays the fault code. After the reset interval set by F12.07, the inverter automatically resets the fault and restarts to run according to the set start mode.	0.1～60.0s	3.0	×
F12.08	Cooling fan control	0: auto control mode 1: always running when power on 2: The fan is operated at a temperature higher than 50 °C, and the fan does not operate below 45 °C.	0～2	0	○
F12.09	Password of operation limiting function	By default, the password is 0, and the settings of F12.10 and F12.11 can be performed; when there is a password, the settings of F12.10 and F12.11 can only be performed after the password is verified correctly.	0～65535	0	○
F12.10	Operation limiting function	0: disabled 1: enabled	0～1	0	○
F12.11	Limiting time	Set limiting time	0～65535(h)	0	×
F12.12	Frequency decreasing point of instantaneous power failure	If the bus voltage of the inverter drops below the F12.12* rated bus voltage value and the instantaneous stop non-stop control is valid, the instantaneous stop non-stop action will start.	220V:180～330V 250V 380V:300～550V 450V	Depending on model	×
F12.13	Frequency decreasing	The larger the value, the faster the frequency decreasing rate; 0: The	0～100	0	○

	factor of instantaneous power failure	function of non-stop at instantaneous stop is invalid.			
F12.14	Droop control	0.00: The droop control function is invalid. When multiple frequency inverter drive the same load, the load distribution will be unbalanced due to different speeds, so that the frequency inverter with higher speed bears a heavier load. The characteristic of droop control is to change the speed droop as the load increases, which can make the load evenly distributed; this parameter adjusts the frequency change of the frequency inverter with the drooping speed.	0.00～10.00Hz	0.00	×
F12.15	Rotating speed tracking waiting time	Before the speed tracking of the inverter starts, the tracking will start after the delay.	0.1～5.0S	1.0	×
F12.16	Current amplitude limiting of rotating speed tracking	During the speed tracking process, this function code plays the role of automatic current limiting. When the actual current reaches the threshold (F12.16), the frequency inverter will reduce the frequency and limit the current, and then continue to track the acceleration; its setting value is The percentage relative to the rated current of the inverter.	80％～200％* inverter rated current	100 %	×
F12.17	Speed of rotating speed tracking	When the speed tracking restarts, select the speed of the speed tracking. The smaller the parameter, the faster the tracking speed. But too fast may cause tracking to be unreliable.	1～125	25	×
F12.18	PWM mode	LED one's place: PWM synthesize method 0: 7 segments of full band 1: switch from 7 segments to 5 segments LED ten's place: PWM temperature correlation 0: disabled 1: enabled LED hundred's place: PWM frequency correlation 0: disabled 1: low frequency adjustment, high frequency adjustment 2: no adjustment for low frequency, high frequency adjustment 3: low frequency adjustment, no adjustment for high frequency LED thousand's place: flexible PWM	0000～1311	0001	×

		function 0: disabled 1: enabled			
F12.19	Voltage control function	LED one's place: AVR function 0: disabled 1: always enabled 2: only disabled when decelerating LED ten's place: overmodulation 0: disabled 1: enabled LED hundred's place: dead-time compensation 0: disabled 1: enabled LED thousand's place: Oscillation Suppression Selection 0: disabled 1: oscillation suppressing mode 1 2: oscillation suppressing mode 2 3: oscillation suppressing mode 3	0000～3112	1102	×
F12.20	Oscillation suppressing initial frequency	Set the oscillation suppression start frequency	0.00～300.00Hz	Depending on model	○
F12.21	Flux braking	This parameter is used to adjust the magnetic flux braking capability of the inverter during deceleration. The larger the value, the stronger the flux braking capability. To a certain extent, the shorter the deceleration time, the parameter generally does not need to be set. When the value is 0, it means that the function is invalid. When the overvoltage limit level is set low, turning on this function can shorten the deceleration time appropriately. When the overvoltage limit level is set higher, it is not necessary to enable this function.	0～100	0	○
F12.22	Energy saving control factor	0: disabled 1: automatic energy-saving running Note: energy saving is only valid to common V/F control	0～100	0	○

F12.23	MS priority	0：disabled 1：MS prior to F00.07 setting	0～1	0	×
F12.24	Jog priority	0: disabled 1: the jog has the highest priority during the inverter operation	0～1	0	×
F12.25	Special function	LED one's place: A02 and D0 output selection 0: A02 enabled 1: D0 enabled(Reserved) LED ten: IPM fault setting 0: Shield the fault 1: The fault is valid LED hundred digits: Input phase loss fault reset selection 0: Cannot reset 1: Can be reset after the power is normal LED thousand's place: reserved	000～110	010	×
F12.26	Oscillation suppression upper limit frequency	Set the Oscillation suppression upper limit frequency	0.00～300.00Hz	50.00	○
F12.27	Oscillation suppressing coefficient	When F12.19 thousand bit=1 (oscillation suppression mode 1), the PWM mode is forced to be five-segment; when F12.19 thousand bit=2 (oscillation suppression mode 2), the original mode remains unchanged. The two modes can be adjusted through the oscillation suppression coefficient (F12.27). In special occasions, if the first two modes cannot suppress the vibration, the oscillation suppression mode 3 (F12.19 thousand =3) will be used, and the parameters F12.27 (oscillation suppression mode) and F12.28 (Oscillation suppressing voltage) will be adjusted together	1～500	50	○
F12.28	Oscillation suppressing voltage		0.0 ～ 25.0%* motor rated voltage	5.0	○
F12.29	Wave-by-wave current limiting and anti-overvoltage action selection	LED ones: selection by wave-by-wave current limiting acceleration 0: Invalid 1: Valid LED tens: Wave-by-wave current-limit deceleration selection 0: Invalid 1: Valid LED Hundreds: Selection by Wave-by-wave Current Limiting and Constant Speed 0: Invalid 1: Valid LED Thousand: Anti-overvoltage action selection 0: Invalid 1: Valid	0000～1111	0011	○

F12.30	Dedicated function selection	LED one's place: straight up function selection 0: invalid 1: valid LED ten's place: over torque alarm "A-05" display selection 0: display 1: not display LED hundred's place: reserved LED thousand's place: reserved	00～11	Depending on model	○
F13 Group-Reserved Parameter					
F14 Group- Panel Function Setting and Parameter Management					
Function Code	**Name**	**Contents**	**Set Range**	**Factory Default**	**Modification**
F14.00	Key M-FUNC function	0: JOG (jog control) 1: FWD/REV switch 2: clear frequency set by ▲/▼ 3: switch between local operation and remote control (reserved) 4: reverse	0～4	0	×
F14.01	Key STOP/RST function	0: only effective to panel control 1: effective to both panel and terminal control 2: effective to both panel and communication control 3: effective to all control modes	0～3	3	○
F14.02	STOP+RUN emergency stop	0: disabled 1: coast to stop	0～1	1	○
F14.03	Close-loop display factor	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	Display factor of load rotating speed	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 speed factor	This function code is used to correct the display error of the linear speed scale, and has no effect on the actual speed.	0.01～100.00	1.00	○
F14.06	Encoder regulation speed (served)	The larger the value, the faster the encoder adjustment speed	1～100	70	○
F14.07	Running	By changing the Settings of the	0～57	0	○

	status monitoring parameter selection 1 (main display)	above function codes, you can change the monitoring items on the main monitoring interface. For example, if F14.07=5 is set, that is, output current d-05 is selected, the current output current is displayed on the main monitoring interface by default during running.			
F14.08	Running status monitoring parameter selection 2 (auxiliary display)		0～57	5	○
F14.09	Stop status monitoring parameter selection 1 (main display)	By changing the values of the preceding function codes, you can change the monitoring items on the main monitoring interface.For example: set F 14.09=6, that is, select the output voltage d-06, then when the inverter stops, the default display item on the main monitoring interface is the current output voltage value.	0～57	1	○
F14.10	Stop status monitoring parameter selection 2 (auxiliary display)		0～57	13	○
F14.11	Parameter display mode	LED one's place: function parameters display mode 0: display all function parameters 1: only display parameters different from default value 2: only display parameters modified after power on of the last time (reserved) LED ten's place: monitoring parameters display mode 0: only display main monitoring parameters 1: alternate display of main and auxiliary parameters (interval time 1s) LED hundred's place: Adjust frequency display 0: display frequency 1: only display monitoring parameters LED Thousands: Panel ▲/▼ button adjustment enable 0: Valid 1: invalid	0000～1112	0100	○
F14.12	Parameter initialization	0: disabled 1: restore to factory defaults (all user parameters except motor parameters) 2: restore to factory defaults (all user parameters) 3: clear fault record	0～3	0	×

F14.13	Write-protect	0：allow all parameters to be modified (some are not during operation) 1: Only the frequency setting F00.07, F00.10 and this function code are allowed to be modified 2: All parameters except this function code are forbidden to be modified Note: The above restrictions are invalid for this function code and F14.13	0～2	0	○
F14.14	Parameter copy function	0: disabled 1: parameters upload to operation panel 2: all function code parameters download to the driver 3: download all function code parameters except motor parameters to the driver Note1: when selecting parameters to download, the software will check if it is in accordance with the driver power specification; if not, all the parameters relevant to model will not be changed. Note2: only keyboard KB2 has copy function, copy with normal keyboard will increase fault.	0～3	0	×
F14.15	Control software version number	F14.15~F14.16 can only be viewed, not 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, not modified.	0.4～999.9KW（G/P)	Depending on model	◆
F14.18	G/P type display	0: G type (constant torque load type) 1: P type (fan, water pump type load model) Note 1: After setting as a P-type machine, the motor parameters will be refreshed automatically, and it can be used as a special inverter for fans and pumps with a higher gear without changing any parameters. Note 2: This parameter cannot be initialized, please modify it manually	0～1	0	×
F15 Group-Multi-pump Water Supply Parameters					
Function Code	**Name**	**Contents**	**Set Range**	**Multi-pump water**	**Modific**

				supply parameters	ation
F15.00	Terminal access disconnect delay	Pump input disconnection delay time.	0.0～6000.0s	0.1	○
F15.01	Polling time	The polling time is the time for regularly switching the variable frequency pump, and this time is only valid when a single pump is working.	0.0～6000.0h	48.0	○
F15.02	Reduce pump lower limit frequency	When the feedback pressure is higher than the set pressure, the frequency drops to the lower limit frequency of the pump, and the pump is reduced after the delay time of the pump.	0.0～600.00HZ	35.00	×
F15.03	Main pump start delay	This parameter is used in "one drive three constant pressure water supply", after the main and auxiliary pumps switch, the main pump start delay.	0.0～3600.0s	0.0	○
F15.04	Auxiliary pump start mode selection	0: direct start 1: soft start	0～1	0	×
F15.05	Delay time for adding pump	Set the delay time for adding pump	0.0～3600.0s	10.0	○
F15.06	Reduce pump delay time	Set reduce pump delay time	0.0～3600.0s	10.0	○
F15.07	Sensor range	If F08.01=5, select sensor range (F15.07) and 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-Solar Pump Parameters					
Function Code	**Name**	**Contents**	**Set Range**	**Factory Default**	**Modification**
F16.00	Solar pump water shortage detection time	If the bus voltage (d-12) is higher than the set value of MPPT high point operating voltage (F16.02), it will run at the maximum frequency; If it is lower than the set value of MPPT high point operating voltage (F16.01), it will run at the frequency obtained by (bus voltage/MPPT high	0～250s	10	○
F16.01	MPPT low point working		0 ～ MPPT high point working voltage	350/200V	○

	voltage	point operating voltage)*maximum frequency.If the bus voltage reaches the MPPT low point operating voltage (F16.01), it will run at the minimum water outlet frequency (F16.04). If the inverter runs above the minimum water outlet frequency,and the output current is less than the no-load current of the motor * solar pump water shortage detection current corresponds to the no-load current ratio (F16.03), after the solar pump water shortage detection time (F16.00), the inverter reports water shortage fault E-32			
F16.02	MPPT high point working voltage		【F16.01】～1000 / 【F16.01】～500	537/ 311V	○
F16.03	Solar pump water shortage detection current corresponds to no-load current ratio		80.0 ～ 300.0%*Motor no-load current	150.0	○
F16.04	The minimum operating frequency of solar pump water output		0.00Hz ～ upper limit frequency	20.00	○

FFF Group-Manufacturer parameters

Function Code	Name	Contents	Set Range	Factory Default	Modification
FFF.00	Factory password	Note: The password is set successfully, it takes 3 minutes to take effect	0～65535	0	○

D Group-Monitoring parameter group and fault record

Function Code	Name	Set Range	Factory Value	Modification
d-00	Output frequency	0.00～Max output frequency【F00.13】	0	◆
d-01	Set frequency	0.00～Max output frequency【F00.13】	0	◆
d-02	Motor estimated frequency	0.00 ～ Max output frequency [F00.13] Note: The operating frequency of the motor is converted from the estimated speed of the motor	0	◆
d-03	Main set frequency	0.00～Max output frequency【F00.13】	0	◆
d-04	Auxiliary setting frequency	0.00～Max output frequency【F00.13】	0	◆
d-05	Output current	0.0～6553.5A	0	◆
d-06	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 linear speed(m/s)	0.01～655.35(m/s)	0	◆
d-11	Set linear speed	0.01～655.35(m/s)	0	◆

	(m/s)			
d-12	Busbar voltage(V)	0～999V	0	◆
d-13	Input Voltage(V)	0～999V	0	◆
d-14	PID Set 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	◆
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 to 7FH Note: When expanded as binary, it indicates X7/X6/X5/X4/X3/X2/X1 in descending order	0	◆
d-22	Output terminal status	0 to FH Note: When expanded as binary, it indicates R2/R1/Y2/Y1 in descending order	0	◆
d-23	Inverter running status	0～FFFFH BIT0: run/stop BIT1: reverse/forward BIT2: Zero speed running BIT3: reserved BIT4: accelerating BIT5: Decelerating BIT6: running at constant speed BIT7: Pre-excitation BIT8: Motor parameter tuning BIT9: In overcurrent limit BIT10: overvoltage limit BIT11: Torque limiting BIT12: speed limit BIT13: speed control BIT14: Torque control BIT15: Reserved	0	◆
d-24	Multi-segment speed current segment number	0～15	0	◆
d-25	Pulse frequency output(Hz)	0～50000Hz	0	◆
d-26	Reserved	—	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	◆

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	Machine cumulative running time (hours)	0～65535H	0	◆
d-36	Machine cumulative power-on time (hours)	0～65535H	0	◆
d-37	Cumulative running time of fans (hours)	0～65535H	0	◆
d-38	Cumulative power consumption (low order)	0～9999KWH	0	◆
d-39	Cumulative power consumption (high order)	0～9999KWH（*10000）	0	◆
d-40	PID pressure feedback	0.00～60.00（MPa、Kg）	0.00	◆
d-41	Output frequency	0.0～6553.5KW	0.0	◆
d-42	PID pressure setting	0.00～60.00（MPa、Kg）	0.00	◆
d-43	Special model monitoring parameters (reserved)	—	0	◆
d-44	Special model monitoring parameters (reserved)	—	0	◆
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 fault	0～34	0	◆

	type			
d-49	The first two fault type	0～34	0	◆
d-50	Type of previous fault	0～34	0	◆
d-51	current fault type	0～34	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 state at current fault	0～7FH Note: After expanding into binary, it means X7/X6/X5/X4/X3/X2/X1 from high to low	0	◆
d-56	Output terminal state at current fault	0～FH Note: After expanding into binary, it means R2/R1/Y2/Y1 from high to low	0	◆
d-57	The running state of the inverter at the time of the current fault	0～FFFFH	0	◆

Chapter 7 EMC（Electromagnetic Compatibility)

7.1 Definition

Electromagnetic compatibility (EMC) refers to the ability of electrical equipment to operate in an electromagnetic interference environment without interfering with the electromagnetic environment and to realize its function stably.

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: I E C / E N 6 1 8 0 0 - 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 frequency converter from two aspects of electromagnetic interference and anti-electromagnetic interference. Electromagnetic interference mainly tests the radiated interference, conduction interference and harmonic interference of the frequency inverter (this requirement is required for frequency inverters used in civilian use).Anti-electromagnetic interference mainly affects the conduction immunity, radiation immunity, surge immunity, fast mutation pulse group immunity, ESD immunity and low-frequency power supply immunity (specific test items are):

1. Immunity test for input voltage sags, interruptions and changes;

2. Commutation notch immunity test;

3. Harmonic input immunity test;

4. Input frequency change test;

5. Input voltage unbalance test;

6. Input voltage fluctuation test) for testing. Tested in accordance with the strict requirements of IEC/EN61800-3 above, our products are installed and used in accordance with the guidance shown in 7.3, and will have good electromagnetic compatibility in general industrial environments.

7.3 EMC Guide

7.3.1 Harmonic Wave Effect：

The higher harmonics of the power supply will cause damage to the inverter. Therefore, in some places where the power grid quality 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 on the inverter, and the other is the interference generated by the inverter on the surrounding equipment.

Installation Precautions:

1) The grounding wires of inverters 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 much as possible, but vertically if possible;

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

4) For motor cables longer than 100m, it is required to install an output filter or reactor.

7.3.3 How to deal with the interference caused by peripheral electromagnetic equipment on inverter:

Generally, the reason for the electromagnetic impact on the frequency inverter is that there are a large number of relays, contactors or electromagnetic brakes installed near the frequency inverter. When the frequency inverter is disturbed and malfunctions, it is recommended to adopt the following solutions:

1) Install a surge suppressor on the device that generates interference;
2) Install a filter at the input end of the frequency inverter, refer to 7.3.6 for details;
3) Use shielded cables for the lead wires of inverter control signal lines and detection lines, and ground the shielding layer reliably.

7.3.4 How to deal with the interference caused by frequency converter to peripheral equipment:

The noise in this part is divided into two types: one is the radiated interference of the frequency inverter, and the other is the conducted interference of the frequency inverter. These two kinds of interference cause the surrounding electrical equipment to be subjected to electromagnetic or electrostatic induction. Thus causing the equipment to malfunction. For several different interference situations, refer to the following solutions:

1) The instruments, receivers and sensors used for measurement generally have relatively weak signals. If they are close to the frequency inverter or in the same control cabinet, they are susceptible to interference and malfunction. It is recommended to adopt the following solutions: keep away from Interference source; do not arrange signal lines and power lines in parallel, especially do not bundle them together in parallel; use shielded lines for signal lines and power lines, and have good grounding; add ferrite magnetic rings on the output side of the inverter (select the suppression frequency at 30 ~1000MHz range), and wind 2~3 turns in the same direction, for bad conditions, you can choose to install an EMC output filter;

2） When the disturbed equipment and the inverter use the same power supply, it will cause conduction interference. If the above methods cannot eliminate the interference, an EMC filter should be installed between the inverter and the power supply (refer to 7.3.6 for type selection) ;

3） The peripheral equipment is grounded separately, which can eliminate the interference caused by the leakage current of the ground wire of the inverter when it is common ground.

7.3.5 Leakage Current And Treatment:

There are two forms of leakage current when using a frequency inverter: one is leakage current to ground; the other is 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 lowered to reduce leakage current. However, reducing the carrier frequency will increase the noise of the motor. Please note that adding a reactor is also an effective way to solve the leakage current.

The leakage current will increase with the increase of the loop current, so when the motor power is large, the corresponding leakage current is 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 passing through the line contains high-order harmonics, it may cause resonance and generate leakage current. At this time, if a thermal relay is used, it may malfunction.

The solution is to reduce the carrier frequency or install an output reactor. When using a frequency inverter, it is recommended not to install a thermal relay between the frequency inverter and the motor, and use the electronic overcurrent protection function of the frequency inverter.

7.3.6 Precautions for installing an EMC input filter at the power input terminal：

1） Note: When using the filter, please use it strictly according to the rated value; since the filter belongs to Class I electrical appliances, the metal shell of the filter should be in good contact with the metal ground of the installation cabinet in a large area, and it is required to have good conductive continuity, otherwise there will be a risk of electric shock And seriously affect the EMC effect;

2）Through the EMC test, it is found that the ground of the filter must be connected to the same common ground as the PE terminal of the inverter, otherwise the EMC effect will be seriously affected.

3） The filter should be installed as close as possible to the power input end of the inverter.

Chapter 8 Fault Diagnosis And Countermeasures

8.1 Fault Alarm And Countermeasures

Any abnormity occurs during operation, the inverter will lock PWM output immediately and enter the fault protection status.

Meanwhile,the flashing fault code 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 methods

in this section. If the problem still cannot be solved, please contact our company directly. For the corresponding solutions, see

Table 9-1 for fault diagnosis and troubleshooting.

Fault Code	Name	Possible Reasons	Actions
E-01	Over-current in Acc process	Too short Acc time (including tuning process)	Prolong the Acc time
		Restart the rotating motor	Start after setting as DC brake, or rotational speed tracking start
		Drive power is too small	Select a higher power drive
		Improper setting of V/F curve or torque boost	Adjust V/F curve or torque boost
E-02	Over-current in Dec process	Too short Dec time (including tuning process)	Prolong the Dec time
		Too low driver’s power	Select the drive with large capacity
		The load inertia is too high	Connect external suitable braking resistor or braking unit
E-03	Over-current in constant speed operation	Grid voltage is low	Check the power supply
		Sudden change or abnormal of load	Check the load or reduce the change of the load
		Too low driver’s power	Select the driver with larger capacity
E-04	Over voltage in Acc process	Abnormal input voltage (including tuning process)	**Check the power supply**

Fault Code	Name	Possible Reasons	Actions
		Restart a rotating motor	Start after setting as DC brake, or rotational speed tracking start
		Special potential energy load	Connect external suitable braking resistor or braking unit
E-05	Over voltage in Dec process	Too short Dec time (including tuning process)	**Prolong the Dec time**
		The load inertia is too high	Connect external suitable braking resistor or braking unit
		Abnormal of input voltage	Check the power supply
E-06	Over voltage in constant-speed operating	Abnormal of input voltage	Check the power supply
		Special potential energy load	Connect external suitable braking resistor or braking unit
E-07	Bus undervoltage	Abnormal of input voltage or disconnecting of contactor (relay)	Check supply voltage or seek help from manufacturer
E-08	**Motor overload**	Improper setting of V/F curve or torque boost	Adjust V/F curve and torque boost value
		Grid voltage is too low	Check Grid voltage
		Motor stall or load sudden change is too large	Check load
		Incorrect setting of motor overload protection factor	Correct the setting
E-09	Driver overload	Improper setting of V/F curve or torque boost	Adjust V/F curve and torque boost value
		Grid voltage is too low	Check Grid voltage
		Too short Acc time	Prolong Acc time
		Too heavy load	Select the driver with larger power
E-10	Off load	Output current lower than off-load detection	Check load
E-11	Function module fault	Short circuit or grounded of driver output	Check motor wiring
		Instantaneous over current of driver	Refer to actions of over current
		Obstruction of damage of ventilation channel	Clear the ventilation channel or replace the fan
		Control board abnormal or interference serious	Seek help from manufacturer
		Power device damage	Seek help from manufacturer
E-12	Input phase loss	Phase loss of power supply	Check power supply and wiring
E-13	Output phase loss or current imbalance	Output phase failure among phase U, V, W	Check the driver's output wiring
E-14	Output short circuit fault to ground	Reserved	Reserved

Fault Code	Name	Possible Reasons	Actions
E-15	Heatsink overheat 1	Ambient over-temperature	Lower the ambient temperature
		Fan damage	Replace the fan
E-16	Heatsink overheat 2	Obstruction of ventilation channel	Clear the ventilation channel
E-17	RS485 communication Fault	Mismatching with baud rate of host PC	Adjust the baud rate
		RS485 channel interference	Check whether the communication wiring is shield, whether the wiring is correct; consider connecting filter capacitor if necessary.
		Communication timeout	Retry
E-18	Keypad communication fault	Connecting line between keypad and control board is damaged.	Replace the connecting line.
E-19	External device fault	Input terminal of external device fault is closed	Disconnect the terminal and clear the faults (check the fault cause)
E-20	Current detection fault	Hall device or amplification circuit fault	Seek help from manufacturer
		Auxiliary power supply is damaged	
		Hall or power board wiring is bad contact	
E-21	Motor tuning fault	Wrong setting of motor parameters	Reset the motor parameter
		Mismatching of power specification between driver and motor	Seek help from manufacturer
		Tuning timeout	Check motor wiring
E-22	EEPROM R/W fault	EEPROM fault	Seek help from manufacturer
E-23	Parameter copy fault	Upload fault of the driver parameter to operation panel	Check wiring of operation panel
		Data error when downloading parameters from the operation panel to the inverter	Check wiring of operation panel
		Parameter download without upload in advance	Upload parameters first, then download
E-24	PID feedback disconnecting	PID feedback wire is loosen	Check feedback wiring
		Feedback value lower than disconnection detection value	Adjust detection input threshold
E-25	Voltage feedback disconnecting	Feedback value lower than disconnection detection value	Adjust detection input threshold
E-26	Arrival of operation limit time	Arrival of operation limit time	Seek help from agent
E-27	EEPROM detection fault	EEPROM detection fault	Seek help from manufacturer

Fault Code	Name	Possible Reasons	Actions
E-32	Water shortage detection fault	Solar pump water shortage detection fault	See F16.00 ～ F16.04 description for details
E-34	Bus undervoltage automatic reset fault	DC bus voltage is too low	See F05.25 ～ F05.26 description for details

8.2 Abnormal Phenomena Solution

During the driver operation, the common abnormal phenomena and solving actions are as showed in following table.9-2：

Phenomena		Possible Reasons of Fault and Actions to Take
Motor not running	LED no display	Check whether there is power failure, or phase loss of input power, check if the power line is connected correctly.
	LED no display, but the internal charging indicator is on	Check whether there is any problem with the wiring and socket related to the keypad. Measure the voltage of each control power supply in the machine to confirm whether the switching power supply works normally. If the switching power supply does not work normally, check whether the inlet line (+, -) socket of the switching power supply is connected properly, whether the vibration is damaged or whether the voltage regulator tube is normal.
	Motor droning	The motor load is too much. Reduce the load.
	No abnormal phenomena	Check if it is in trip status or hasn't reset after tripping, check whether it is in restart status after power down, whether the keypad is reset, whether it is in program running status, multi-speed operation status, some specific operation status or non-operation status. Try recovering factory set.
		Check whether the running command is sent.
		Check whether the operation frequency is set at 0.
The motor can not Acc / Dec successfully		Improper setting of Acc/Dec time. Increase the value of Acc/Dec time.
		The current limit is set too low. Increase the value.
		Over-voltage protection action during decelerating. Increase the decelerating time.
		Improper setting of carrier frequency, too much load may cause oscillation.
		The load is too heavy, and the torque is not enough. Increase torque boost value in V/F mode. If not working, switch to auto torque boost mode, and the motor parameters should be in consistent with the actual value. If still not working, switch to advanced V/F control mode, and check the motor parameters and actual values to see if they are matched, meanwhile tune the motor parameters.
		Mismaching of motor power and driver power. Set the motor parameters at actual value.
		One driver for several motor. Please change the torque boost mode to manual mode.
The motor can rotate, but speed		Improper setting of upper and lower limit of frequency.
		The frequency is set too low, or the frequency gain is set too low.

regulation can't be realized.	Check whether the speed adjustment mode is in consistent with frequency setting.
	Check whether the load is too heavy, whether it is in overvoltage stalled state or overcurrent limiting state.
Speed changing during motor running	Frequent fluctuation of load. Decrease the changing.
	Serious mismatching of rated value of the driver and motor. Set the motor parameters as actual value.
	Frequency setting potentiometer is in bad connect or the frequency setting signal is in fluctuation. Switch to digit setting mode or increase filter time constant of analog input signal.
The rotation direction of motor is in reverse	Adjust phase sequence of output terminal U, V, W.
	Set the running direction as reverse（F00.18=1）
	Caused by phase loss of output. Check the motor wiring immediately.

Appendix I： 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 information is divided into two 4-bit hexadecimal characters. The main advantage of this mode is the density of the characters it transmits at the same baud rate is above ASCII mode, each message must be transmitted consecutively.

（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 bits (lower bit send first), 1 stop bit, parity bit can be selected. (Refer to the sequence diagram of the RTU data frame)

Error check area: cyclic redundancy check (CRC).

（2）RTU Data frame bit-order diagram

With parity check

Start	1	2	3	4	5	6	7	8	far	Stop

No parity check

Start	1	2	3	4	5	6	7	8	Stop

2、Register addresses and function codes of series inverters

（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 addresses

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 given	0x2003
MODBUS PID feedback setting	0x2004
MODBUS Analog output AO1 control	0x2005（0～7FFF represents 0%～100%）
MODBUS Analog output AO2 control	0x2006（0～7FFF represents 0%～100%）
MODBUS Pulse DO output control	0x2007（0～7FF represents 0%～100%）
MODBUS Digital output terminal control	0x2008
parameter settings	0x0000～0xFF16

（3）03H Read multiple parameters (up to 8 consecutive reads)

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

Analysis of this segment of data：

01H is the inverter address
03H is reading function code
0001H is the starting address similar to the F00.01 item of the control panel
0002H is the number of items in the read menu, F00.01 and F00.02
95CBH is 16-bit CRC check 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

Analysis of this segment of data：

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

Example：

Name	frame format
Read the data of F00.01 and F00.02	Send frame：01H 03H 0001H 0002H 95CBH
	Return frame：01H 03H 04H 0000H 0001H 3BF3H
Read the data of item F02.01	Send frame：01H 03H 0201H 0001H D472H
	Return frame：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 frame：01H 03H 02H 1388H B512H
	Send frame：**01H 03H 1D00H 0001H 8266H**
	Return frame：**01H 03H 02H 1388H B512H**
Read the status of the inverter when it is stopped (addresses A000H and 1A00H are common, refer to the description of the inverter running status)	Send frame：01H 03H A000H 0001H A60AH
	Return frame：01H 03H 02H 0040H B9B4H
	Send frame：**01H 03H 1A00H 0001H 8312H**
	Return frame：**01H 03H 02H 0040H B9B4H**
Read fault code E-19 (addresses E000H and 1E00H are common, refer to the inverter fault code table)	Send frame：01H 03H E000H 0001H B3CAH
	Return frame：01H 03H 02H 0013H F989H
	Send frame：**01H 03H 1E00H 0001H 8222H**
	Return frame：**01H 03H 02H 0013H F989H**
Read alarming code A-18 (address E001H is common to 1E01, refer to the inverter warning code table)	Send frame：01H 03H E001H 0001H E20AH
	Return frame：01H 03H 02H 0012H 3849H
	Send frame：**01H 03H 1E01H 0001H D3E2H**
	Return frame：**01H 03H 02H 0012H 3849H**

（4）06H write a single parameter

Inquiry information frame format（send frame）:0

Address	01H
Function	06H

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

Analysis of this segment of data：

01H is the inverter address
06H is write function code
2000H is the control command address
0001H is forward command
43CAH is 16-bit CRC check code

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 segment: If the settings are correct, return the same input data
Example：

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
Stop	Send frame： 01H 06H 2000H 0003H C20BH
	Return frame： 01H 06H 2000H 0003H C20BH
coast to stop	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
	返回帧：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 item F08.00 to 1	Send frame： 01H 06H 0800H 0001H 4A6AH

	Return frame： 01H 06H 0800H 0001H 4A6AH
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 set to 80%	Send frame： 01H 06H 2002H 0320H 22E2H
	Return frame： 01H 06H 2002H 0320H 22E2H
Verify user password (address AD00H and 1C00H 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**
Verify operation restriction function password (address AD01H and 1C01H common)	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 Consecutively write multiple parameters

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

Analysis of this segment of data：

01H is the inverter address
10H is write function code
0100H is the starting address is 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 item F01.00
0002H is the data of item F01.01
2E3EH is 16-bit CRC check 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

Analysis of this segment of data：

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

Example：

Name	Frame Format
Set F01.00 、F01.01 parameter is 1 and 0.02	Send frame：01H 10H 0100H 0002H 04H 0001H 0002H 2E3EH
	Return frame：01H 10H 0100H 0002H 4034H
Forward and communication given frequency is 50HZ	Send frame：01H 10H 2000H 0002H 04H 0001H 1388H 36F8H
	Return frame：01H 10H 2000H 0002H 4A08H
Set the parameter of item 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 attribute, minimum value, maximum value)

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

Analysis of this segment of data：

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

Analysis of this segment of data：

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 attribute value
0000H is **minimum value**
1388H is **maximum value**
2831H is 16-bit CRC check code

Example：

Name	Frame Format
Read the parameter value of item F00.12	Send frame：01H 13H 000CH 0001H 85CAH
	Return frame：01H 13H 02H 1388H B1D2H
Read the parameter value + attribute value of item F00.12	Send frame：01H 13H 000CH 0002H C5CBH
	Return frame：01H 13H 04H 1388H 0322H FCF0H
Read the 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 the 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="15">Inverter running status

Inverter running status</td><td rowspan="15">A000H(1A00H)</td><td>byte</td><td>Bit</td><td>meaning</td></tr>
<tr><td rowspan="7">Byte1</td><td>Bit7</td><td>0:no action
1:Overload 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 off 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 run command channel
3:Reserved</td></tr>
<tr><td rowspan="8">Byte0</td><td>Bit7</td></tr>
<tr><td>Bit6</td><td>0:No action
1: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:Acc running
2:Dec running
3:uniform speed running</td></tr>
<tr><td>Bit0</td><td>0:Stop status
1:Running status</td></tr>
<tr><td>Read inverter fault code</td><td>E000H(1E00H)</td><td colspan="3">Addresses E000H and 1E00H are common (see fault code table, example of reading function code 03H))</td></tr>
<tr><td>Read the inverter fault pre-alarm code</td><td>E001H(1E01H)</td><td colspan="3">Addresses E001H and 1E01H are common (see alarm code table, example of reading function code 03H)</td></tr>
<tr><td>User Password Validation</td><td>AD00H(1C00H)</td><td colspan="3">The addresses AD00H and 1C00H are common (see the example of writing function code 06H)</td></tr>
<tr><td>Run Restricted Password Verification</td><td>AD01H(1C01H)</td><td colspan="3">The addresses AD00H and 1C00H are common (see the example of writing function code 06H)</td></tr>
</table>

4、Fault Code：

Fault Code	Displayed Code	Fault Information
0000H	——	No fault
0001H	E-01	Overcurrent when accelerating
0002H	E-02	Overcurrent when decelerating
0003H	E-03	Overcurrent at constant speed
0004H	E-04	Overvoltage when accelerating
0005H	E-05	Overvoltage when decelerating
0006H	E-06	Overvoltage at constant speed
0007H	E-07	Bus undervoltage
0008H	E-08	Motor overload
0009H	E-09	Driver overload
000AH	E-10	Driver off load
000BH	E-11	Power module fault
000CH	E-12	Input phase loss
000DH	E-13	Output phase loss or current unbalance
000EH	E-14	Short circuit of output to earth
000FH	E-15	Heatsink overheat 1
0010H	E-16	Heatsink overheat 2
0011H	E-17	RS485 communication fault
0012H	E-18	Keypad communication fault
0013H	E-19	External device fault
0014H	E-20	Current detection fault
0015H	E-21	Motor tuning fault
0016H	E-22	EEPROM read-write fault
0017H	E-23	Parameters copy fault
0018H	E-24	PID feedback disconnection
0019H	E-25	Voltage feedback disconnection
001AH	E-26	Arrival of operation limit time
001BH	E-27	EEPROM detection fault
0020H	E-32	Water shortage detection fault
0022H	E-34	Bus undervoltage automatic reset fault

5、Pre-alarm Code of the Driver：

Alarm Code	Displayed Code	Fault Information
0000H	——	No fault
0009H	A-09	Driver overload alarm
0011H	A-17	RS485 communication fault alarm
0012H	A-18	Keypad communication fault alarm
0015H	A-21	Motor tuning alarm
0016H	A-22	EEPROM read-write fault alarm
0018H	A-24	PID feedback disconnection alarm

6、Control Command Format (See Function Code 06H Example)：

Address	Bit	Meaning
2000H	Bit7～Bit5	Reserved
	Bit4	0： no action 1：reset
	Bit3	0：forward 1：reverse

	Bit2～Bit0	100：coast to stop 011：stop 010：jog run 001：run
2008H（output by position 1, closed by position 0	Bit7～Bit4	Reserved
	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：

Bit	Meaning		
Bit15	Reserved		
Bit14	Menu		
Bit13	Base system		
Bit12	Reset to factory defaults		
Bit11	EEPROM		
Bit10~Bit9	"○":01 "×":10 "◆":11 "◇":00		
Bit8	Sign		
Bit7~Bit3	1:00000 V:00001 A:00010 rpm:00011 HZ:00100 %:00110 S:01000	KHZ:01100 KW:01010 om:01110 ms:01001 MA:01011 KM:01101 CM:01111	us:10001 HZ/S:10000 mh:10010 C:10011 m/s:10100 H:10101 KWH:10110
Bit2~Bit0	Decimal point		

8、 Error Code from Slave Response of Abnormal Information：

Error code	Description
01H	Invalid function code
02H	Invalid address
03H	Invalid data
04H	Invalid register length
05H	CRC validation error
06H	Parameters can't be changed during running
07H	The changes of parameters are invalid
08H	Control command of host is invalid
09H	Parameter protected by password
0AH	Password error

9、Communication Address of all Parameters：

Function code	Communication Address
F00.00～F00.20	6000H～6014H
F01.00～F01.36	6100H～6124H
F02.00～F02.17	6200H～6211H
F03.00～F03.08	6300H～6308H
F04.00～F04.27	6400H～641BH
F05.00～F05.24	6500H～6518H

F06.00～F06.52	6600H～6634H
F07.00～F07.40	6700H～6728H
F08.00～F08.24	6800H～6818H
F09.00～F09.73	6900H～6949H
F10.00～F10.35	6A00H～6A23H
F11.00～F11.08	6B00H～6B08H
F12.00～F12.30	6C00H～6C1EH
F14.00～F14.18	6E00H～6E12H
F15.00～F15.08	6F00H～6F08H
F16.00～F16.04	7000H～7004H
FFF.00～FFF.22	7100H～7116H
d-00～d-57	D000H（1D00H）～D039H（1D39H）

Notice:
(1) In the above examples, the driver address is 01, which makes it better for illustration; when the driver is slave, the address
setting range is 1 ~ 247, and if any data of frame format is changed, the check code needs to be recalculated. The calculating tools
of 16bit CRC check code can be download from internet.
(2) Initial address of monitor item is D000, each item offset corresponding hexadecimal value based on this address, then plus it
with the initial address. For example: the monitor initial item is d—00, the corresponding initial address is D000H (1D00H), now
read monitor item d—18, 18-00=18, the corresponding hexadecimal of 18 is 12H, then the read address of d—18 is D000H+12H
= D012H (1D00H+12H = 1D12H). Address D000H and 1D00H are interchangeable.
(3) Frame format when the slave response information is abnormal: driver address + (80H+function code) + 16bit CRC check code;
if the salve return frame is 01H + 83H + 04H + 40F3H, then 01H is slave address, 83H is 80H+03H indicating read error, 04H is
invalid data length, 40F3H is 16bit CRC check code.

Appendix II： Macro Parameter Settings Description.

Function macro definition	Setting parameters	Automatically modify the parameter list	Debugging steps
Single pump constant pressure water supply mode	F00.01=1	F00.04=8；F08.01=5；F14.07=42；F14.08=40；F14.09=42；F14.10=40。	Step1: Determine the sensor feedback type, AI1, AI2 factory default input voltage feedback signal, you can also select AI1 input current feedback signal through jumper JP3; Step2: Terminal wiring, if the pressure gauge is 0~10V output, connect the signal wire of the pressure gauge to AI1, and connect the other two wires to +10V and GND; if the output is 0~20mA, short COM and GND, Connect the pressure gauge signal wire to AI1, and the other wire to 24V. Step3: Parameter initialization (F14.12=2); Step4: Set the sensor range (F15.07); Step5: Function macro selection (F00.01=1); Step6: Set the target pressure, which can be set by parameter F15.08, or by the up and down keys on the keypad
One variable two-power (1 variable frequency pump + 2 power frequency pumps) water supply mode	F00.01=2	F00.03=1；F00.04=8；F08.01=5；F14.07=42；F14.08=40；F14.09=42；F14.10=40；F07.00=58；F07.01=59；F07.02=60；F07.03=61；F07.04=62；F07.05=63；F07.18=59；F07.19=60；F07.20=61。	Step1: Determine the sensor feedback type, AI1, AI2 factory default input voltage feedback signal, you can also select AI1 input current feedback signal through jumper JP3; Step2: Terminal wiring, if the pressure gauge is 0~10V output, connect the signal wire of the pressure gauge to AI1, and connect the other two wires to +10V and GND; if the output is 0~20mA, short connect COM and GND, Connect the pressure gauge signal wire to AI1, and the other wire to 24V. For other terminal wiring details, refer to the V200-C three-pump circulation soft start water supply instructions. Step3: Parameter initialization (F14.12=2); Step4: Set the sensor range (F15.07); Step5: Function macro selection (F00.01=2 or 3) Step6: Set the target pressure, which can be set by parameter F15.08, or by the up and down keys on the keypad
Three-pump circulation soft start (3 variable frequency pumps) water supply mode	F00.01=3		
Solar pump water supply mode	F00.01=4	F00.03=1；F00.04=10；F07.09=1；F16.00=0；F16.04=0.00；F12.13=80。	Step1: Terminal wiring, switch (control start and stop) two wires connected to X1 and COM; Step2: Parameter initialization (F14.12=2); Step3: Function macro selection (F00.01=4).

CNC machine control mode	F00.01=5	F00.02=2；F00.03=1；F00.04=3；F00.12=80.00；F00.13=80.00；F00.16=0.5；F00.17=2.0。	Step1: Terminal wiring, connect the analog signal wire to AI1, and the other wire to GND; then connect the two wires of the switch (control start and stop) to X1 and COM; Step2: Parameter initialization (F14.12=2); Step3: Function macro selection (F00.01=5).
Fire inspection mode	F00.01=6	F00.02=0；F00.03=1；F00.16=80.00；F01.08=1；F02.03=2950；F05.00=5；F05.01=2.0；F05.03=1.25；F05.04=2.0；F05.05=5.00；F05.06=15.0；F05.07=50.00；F05.08=100.0；F10.01=120.0；F10.06=200；F10.12=180。	Step1: Terminal wiring, switch (control start and stop) two wires connected to X1 and COM; Step2: Parameter initialization (F14.12=2); Step3: Function macro selection (F00.01=6).
EPS power mode	F00.01=7	F00.02=4；F05.12=0；F05.17=100.0；F12.19=0002。	Step1: Parameter initialization (F14.12=2); Step2: Function macro selection (F00.01=7).

Appendix III： Three-pump circulation soft start water supply parameter description

Function code	Name	Set range	Min Unit	factory default	Modification
F00.01	Multi-pump water supply mode selection	0:invalid 2：(1 variable frequency pump + 2 power frequency pumps) 3：Three-pump cycle soft start (3 variable frequency pumps)	1	0	×
F00.03	run command channel selection	1：Terminal run command channel	1	0	×
F00.04	Main frequency source selection	8：PID control setting	1	0	×
F07.00	Input terminal X1 function	33: PID control input 58: Start/Stop (Manual) 59: Run Allowed 60: Interlock 1 61: Interlock 2 62: Interlock 3 63: PFC start/stop	1	58	×
F07.01	Input terminal X2 function		1	59	×
F07.02	Input terminal X3 function		1	60	×
F07.03	Input terminal X4 function		1	61	×
F07.04	Input terminal X5 function		1	62	×
F07.05	Input terminal X6 function		1	63	×
F07.06	Input terminal X7 function		1	0	×
F07.18	Open collector output terminal Y1 setting	59: Interlock 1 output 60: Interlock 2 output 61: Interlock 3 output	1	59	×
F07.19	Open collector output terminal Y2 setting		1	60	×
F07.20	Programmable relay R1 output		1	61	×
F07.21	Programmable relay R2 output		1	0	×
F08.00	PID operation input mode	0: auto 1: Manual input through the defined multi-function terminal	1	0	×
F08.01	PID given channel selection	0: digital given 1: AI1 2: AI2 3: pulse given 4: RS485 communication	1	0	○
F08.02	given digital setting	0.0～100.0%	0.1%	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 given 7: RS485 communication	1	0	○
F08.04	PID controller advanced feature settings	LED units: PID polarity selection 0: Positive 1: Negative LED tens: proportional adjustment feature 0: constant proportional integral adjustment 1: Automatic variable proportional integral adjustment LED hundreds: integral adjustment feature 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 thousand digit: reserved	1	000	×
F08.05	proportional gain KP	0.01～100.00	0.01	1.00	○
F08.06	Integration time Ti	0.01～10.00s	0.01s	0.10	○
F08.07	differential time Td	0.01～10.00s 0.0：no differential	0.01s	0.00	○
F08.08	Sampling period T	0.01～10.00s 0.00：auto	0.01s	0.10	○
F08.09	deviation limit	0.0～100.0%	0.1%	0.0%	○
F08.10	Closed loop preset frequency	0.00～upper limit frequency	0.01Hz	0.00	○
F08.11	Preset frequency hold time	0.0～3600.0s	0.1s	0.0	×
F08.12	sleep mode	0: invalid 1: Sleep when the feedback pressure exceeds or falls below the sleep threshold 2: Sleep when the feedback pressure and output frequency are stable	1	1	×
F08.13	Sleep Stop Mode Selection	0：Dec stop 1：coast to stop	1.00	0	○
F08.14	Feedback and set pressure deviation limit when going to sleep	0.0～20.0% Note: This function parameter is only valid for the second sleep mode	0.1%	5.0%	○
F08.15	Sleep threshold	0.0～200.0% Note: The threshold is the percentage of the given pressure, this function parameter is only valid for the first sleep mode	0.1%	100.0%	○
F08.16	Awake Threshold	0.0～200.0% Note: The threshold is a percentage	0.1%	90.0%	○

		of the given pressure			
F08.17	Sleep delay time	0.0～3600.0s	0.1S	100.0	○
F08.18	Awake delay time	0.0～3600.0s	0.1S	5.0	○
F15.00	Terminal access and disconnection delay	0.0～6000.0s	0.1S	0.1	○
F15.01	polling time	0.0～6000.0h	0.1h	48.0	○
F15.02	Reduce pump lower limit frequency	0.0～600.00HZ	0.01HZ	0.00	×
F15.05	Increase pump delay time	0.0～3600.0s	0.1S	10.0	○
F15.06	Reduce pump delay time	0.0～3600.0s	0.1S	10.0	○
F08.24	Sleep frequency	0.00Hz～upper limit frequency	0.01HZ	0.00	×

一、one variable two-power and three-pump circulation soft start use instruction：

1. One variable two-power means that the inverter only starts the first frequency conversion speed regulation, and the others are directly connected to the power grid.
2. The three-pump circulation soft start means that the inverter starts each pump, and after the start, it is connected to the power grid with a delay; the first start is connected to the power grid, and the second start is used for speed regulation.

二、Use of external terminals and description of the working process of the adding and subtracting pumps：

1、The functions of input terminals X1~X6 have been fixed at the factory。

When F00.01 selects 2 or 3, the input terminals X1~X6 have fixed their water supply functions.

2. Correspondence between X terminal, Y terminal and relay

After X3 is short connect with COM, it corresponds to No. 59 interlock 1 output in F07.18-F07.21,say as No. 1 pump for convenience; after X4 is short connect with COM, it corresponds to No. 60 Interlock 2 outpu in F07.18-F07.21,say as pump No. 2; after X5 is short connect to COM, it corresponds to No. 61 interlock 3 output in F07.18~F07.21, say as No. 3 pump.

3、The difference between X1 and X6

X1 and X6 cannot be switched on at the same time. X1 is manually controlled to start and stop, and only one pump can be turned on at a time. The frequency is given by AI1, without PID adjustment; X6 is controlled to start and stop in multi-pump water supply mode, and PID adjustment is performed. 。

4、Manually control the start and stop pump working process

After X1 and COM are short-connected, the pump starts in the order of put in first, start first, start the small No. pump if input together. For example, if only X5 is connected, only pump No. 3 will be turned on; if X4 and X5 are connected at the same time, only pump No. 2 will be turned on; if X3, X4 and X5 are connected at the same time, only pump No. 1 will be turned on.

5、Multi-pump water supply mode working process

After X6 and COM are short-connected, the order of starting the pumps is that the pumps that are put in first start first, and the ones that are put in together start from the small No., and PID control is performed.

(1) When F00.01=2 (one variable and two-power are valid), if all three water pumps are put into operation, after the system is powered on, first connect the No. 1 pump and start the No. 1 variable pump to work. When the working frequency of the No. 1 variable pump reaches 50Hz, delay the increase pumping time (F15.05). If the measured pressure does not reach the system set pressure, the No. 2 power frequency pump will be connected. When the working frequency of the No. 1 variable pump reaches 50Hz again, delay the increase pumping time (F15.05). If the measured pressure still does not reach the system set pressure, the No. 3 power frequency pump will be connected.
At this time, the No. 1 pump is in the working state of frequency conversion, No. 2 and No. 3 pumps are in the working state of power frequency. If the measured pressure is greater than or equal to the system set pressure, the working frequency of the No. 1 variable pump drops to the lower limit frequency of pump reduction (F15.02), and after the delay of pump reduction (F15.06), the No. 3 power frequency pump will be disconnected. If the measured pressure is still greater than or equal to the system set pressure, and the working frequency of the No. 1 variable pump is less than or equal to the lower limit frequency of the reduced pump (F15.02), after the delay of the reduced pump (F15.06), the No. 2 pump will be disconnected. In the end, only No. 1 pump was left to work.

（2）connect the No. 1 pump and start the No. 1 pump to work with frequency conversion.When the frequency conversion of No. 1 pump works at 50Hz, if the measured pressure does not reach the system set pressure after the increase pump delay (F15.05), disconnect No. 1 frequency conversion pump, connect the No.2 pump and No.1 pump, at this time, the No. 1 pump is converted from the frequency conversion state to the power frequency state, and the No. 2 pump is in the frequency conversion state. When the frequency conversion of the No. 2 pump works at 50Hz, after the increase pump delay (F15.05), if the measured pressure still does not reach the system set pressure, disconnect the No. 2 pump, connect the No. 3 and No. 2 pump, at this time, the No. 2 pump is converted from the variable frequency pump to the power frequency state, the No. 3 pump is in the power frequency state, and the No. 1 pump is still in the power frequency state. When the working frequency of the No. 3 pump drops to the lower limit frequency of pump reduction (F15.02), after the pump reduction delay (F15.06), if the measured pressure is greater than or equal to the system set pressure,disconnect the No. 1 pump. When the working frequency of the No. 3 pump is less than or equal to the lower limit frequency of pump reduction (F15.02), after the pump reduction delay (F15.06), if the measured pressure is still greater than or equal to the system set pressure, disconnect the No. 2 pump; finally only No. 3 variable frequency pump is left to work.

Note: If you need one to drive three, all three pumps are put into operation; if you need one to drive two, choose two pumps to put in; if you need to put in one, choose any one pump to put in; The order are all are in the rules of put in first, start first, start the small No. pump if put in together.

6. Terminal access and disconnection delay

Since there is a delay in the connection and disconnection of the contactor terminal, the signal is not synchronized, and it needs to be adjusted by the terminal input disconnection delay (F15.00).

7、X2 terminal description

X2 is the operation permission terminal. This terminal is connected to the normally closed point of the external fault relay. Generally, it is connected to the external water shortage or high voltage signal control. If there is no external fault detection, it needs to be short connect to COM.

三、STOP/RST key application

1. The factory default of F 14.01 is 3, that is, the STOP/RST key is valid when the terminal controls the operation mode. If the keypad is used to stop the machine, it needs to be re-connected to the X2 and X6 terminals or re-powered on to work normally.

2. When F14.01=0, the STOP/RST key is invalid under terminal control, and only resets the fault of the inverter. Generally, F14.01 is set to 0 to prevent from keypad stop by misoperation. It is necessary to reconnect the X2, X6 terminals or It can work normally only after power on again.

三、The working process when there is a failure in water supply

1. If the variable frequency pump has an external fault, stop the faulty pump first, and then switch the

larger power frequency pump to the variable frequency pump. For example, No. 1, No. 2 and No. 3 pumps are all turned on, No. 2 is the variable frequency pump, No. 1 and No. 3 are power frequency pumps. If there is a frequency inverter failure, stop No. 2 pump first, then switch No. 3 power frequency pump to variable frequency pump, and No. 1 continues to power frequency; if the external fault of No. 3 pump is removed, it can be normal put into use.

2. If the variable frequency pump has an internal fault, stop all the pumps, and after the frequency inverter fault is reset with the keypad, it will return to normal working status.

四、Function setting

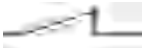
1、If you want to turn on the water supply function, you need to set F00.01 to 2 or 3. For details, please refer to the manual.
2. If need to start the PID function, you need to set F00.04=8, and then set the required PID parameters in Group F08, see the manual for details.
3. F14.01 is set to 0, that is, the stop key on the keypad is invalid.

五、Water supply wiring diagram (refer to ABB inverter ACS510 constant pressure water supply wiring diagram).

open collector Y1, Y2 connect to relay schematic diagram



2、Introduction of symbols on the wiring diagram

In Figure 1 and Figure 2 below, L1 and L2 represent the coil power supply， represents normally closed terminal， represents normally open terminal， represents coil。

represents the normally open point of relay KA1 (controlled by Y1 on the main board) ，

represents the normally open point of relay KA2 (controlled by Y2 on the main board), 

represents the normally open point of relay KA3 (R1 on the main board)；KM1, KM2 and KM3 are contactors that control No. 1, No. 2 and No. 3 variable frequency pumps, respectively KM11、

KM21 and KM31 are contactors that control No. 1, No. 2 and No. 3 power frequency pumps respectively. (Note: Figures 1 and 2 below are only sketch logic diagrams, if you need fault relays or indicators, add them by yourself)

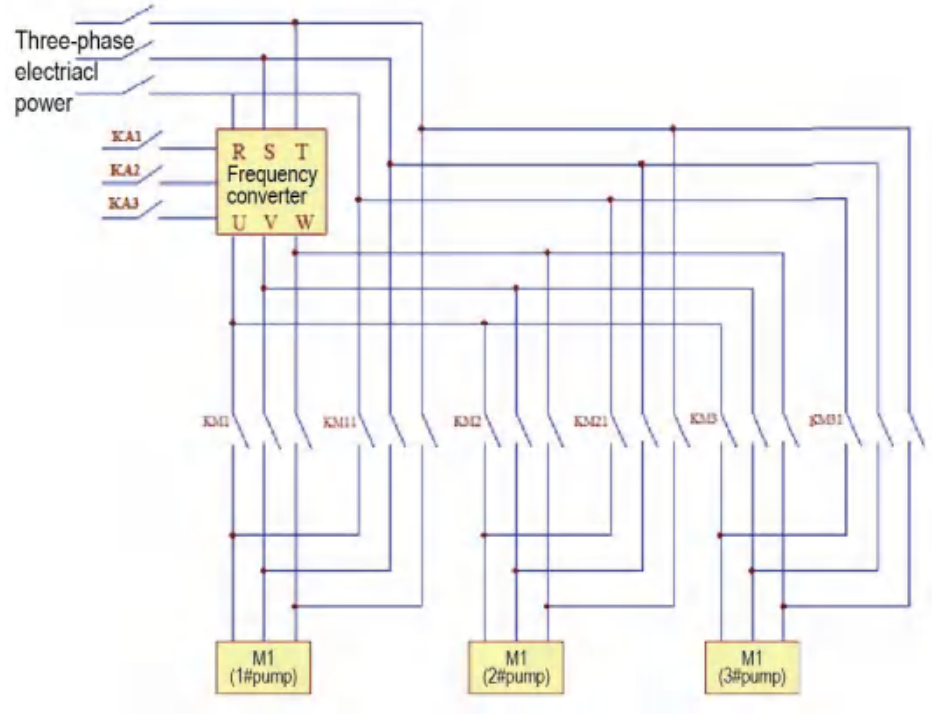
3、Interlocking and self-locking of contactor (as shown in Figure 1)

When KM1 is connected, KM11, KM2 and KM3 cannot be connected.
When KM11 is connected, KM1 cannot be connected.
When KM2 is connected, KM21, KM1 and KM3 cannot be connected.
When KM21 is connected, KM2 cannot be connected.
When KM3 is connected, KM31, KM1 and KM2 cannot be connected.
When KM31 is connected, KM3 cannot be connected.

Figure 1：



Figure 2：



Warranty Agreement：

1 The warranty period of this product is 12 months (subject to the barcode information on the fuselage). During the warranty period, under normal use according to the instruction manual, if the product fails or is damaged, our company is responsible for free maintenance.

2 During the warranty period, if the damage is caused by the following reasons, a certain maintenance fee will be charged：

A、Machine damage caused by mistakes in use and unauthorized repairs and modifications；
B、Machine damage caused by fire, flood, abnormal voltage, other natural disasters and secondary disasters;
C、Hardware damage caused by human fall and transportation after purchase;
D、Machine damage caused by not following the user manual provided by our company;
E、Failure and damage caused by obstacles other than the machine (such as external equipment factors);

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

4 The collection of maintenance fees shall be in accordance with the latest adjustment of our company's "Maintenance Price List".

5 This warranty card will not be reissued under normal circumstances, please be sure to keep this card and show it to the maintenance personnel during warranty.

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

warranty card

<table>
<tr><td rowspan="3">Customer data</td><td colspan="2">Company address：</td></tr>
<tr><td>Company name：</td><td>Contact person：</td></tr>
<tr><td>Zip code：</td><td>Tel：</td></tr>
<tr><td rowspan="3">Product Information</td><td colspan="2">Product model：</td></tr>
<tr><td colspan="2">Product barcode (paste here)：</td></tr>
<tr><td colspan="2">Distributor name：</td></tr>
<tr><td>Fault details</td><td colspan="2">(Maintenance time and content)：

Maintenance person：</td></tr>
</table>