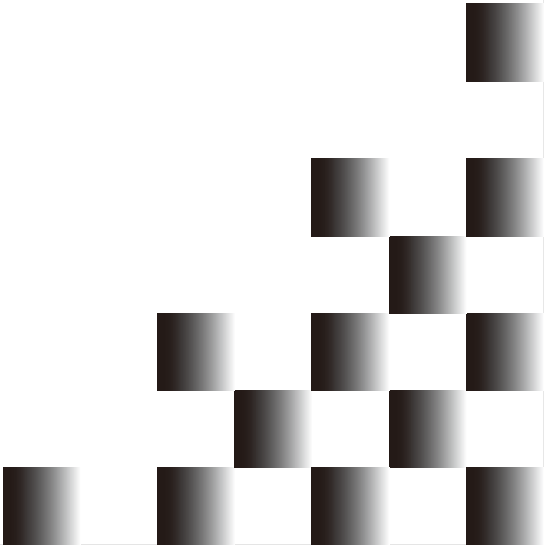
Outstanding quality makes outstanding achievements

High Performance Vector AC DRIVE

Debugging guide



Preface

Thank you for purchasing the series invertor developed by Our company.

For the users who use this product for the first time, read the manual carefully.

Contents

Warranty Agreement

1. The warranty period of the product is 18 months (refer to the bar code on the equipment body). During the warranty period , if the product fails or damaged under the condition of normal use by following the instruction, we will be responsible for free maintenance.

2. Within the warranty period , maintenance will be charged for the damages caused by the following reasons :

The damage caused by improper use or repair/modification without prior permission.

The damage caused by fire , flood , abnormal voltage , other natural disasters and second disaster.

The hardware damage caused by artificial falling or transportation after purchase.

The damage caused by the improper operation.

The damage or failure caused by the trouble out of the equipment (e.g. : External device)

3. If there is any failure or damage to the product, please fill in the information of the Product Warranty Card in details correctly.

4. The maintenance fee is charged according to the newly adjusted Maintenance Price List of our company .

5. In general , the warranty card will not be re-issued. Please keep the card and present it to the maintenance personnel when asking for maintenance .

6. If there is any problem during the service , please contact the agent of our company or our company directly .

7. The company reserves the right to interpret this agreement

Chapter 1 Safety and Cautions

1.1 Safety and Cautions Definition

Read this manual carefully so that you have a thorough understanding. Installation, commissioning or maintenance may be performed in conjunction with this chapter. Our company will assume no ability and responsibility for any injury or loss caused by improper operation.

Danger

Operations which are not performed comply with the requirements may cause severe hurt or even death.

Note

Operations which are not performed comply with requirements may cause personal injury or property damage.

1.2 Safety Cautions

Use Stage	Safety Grade	Precautions
Before Installation	Danger	✦ Do not install the equipment if you find water seepage, component missing or damage upon unpacking. ✦ Do not install the equipment if the packing list does not conform to the product you received.
	Danger	✦ Handle the equipment with care during transportation to prevent damage to the equipment. ✦ Do not use the equipment if any component is damaged or missing. Failure to comply will result in personal injury. ✦ Do not touch the components with your hands. Failure to comply will result in static electricity damage.
During Installation	Danger	✦ Install the equipment on incombustible objects such as metal, and keep it away from combustible materials. Failures to comply may result in a fire. ✦ Do not loosen the fixed screws of the components, especially the screws withe red marks.
	Note	✦ Do not drop wire end or screw into the AC drive. Failure it will result in damage to the AC drive. ✦ Install the AC drive in places free of vibration and direct sunlight. ✦ When two AC drives are laid in the same cabinet ,arrange the installation positions properly to ensure the cooling effect.

Use Stage	Safety Grade	Precautions
At wiring	Danger	✦ A circuit breaker must be used to isolate the power supply and the AC drive. Failure to comply may result a fire. ✦ Ensure that the power supply is cut off before wiring. Failure to comply may result in electric shock. ✦ Never connect the power cables to the output terminals(U,V,W) of the AC drive. Pay attention to the marks of the wiring terminals and ensure correct wiring. Failure to comply may result in damage to the AC drive. ✦ Ensure that the main cable line comply with the standard, the line meets the EMC requirements and the area safety standard. Failure to comply may result in risk or accident. ✦ Never connect the power cables the braking resistor between the DC bus terminals P+, P-. Failure to comply may result in a fire.
At wiring	Danger	✦ Use a shielded cable for the encoder, and ensure that the shielding layer is reliably grounded.
Before Power-on	Danger	✦ Please confirm the peripheral equipment and cable converter is configured in this manual of the recommended model, all the configuration line in accordance with the connection method of the manual provides the correct wiring. Failure to comply will result in accidents. ✦ Check that the voltage class of the power supply is consistent with the rated voltage class of the AC drive.
After Power-on	Danger	✦ Do not open the AC drive's cover after power-on. Failure to comply may result in electric shock. ✦ Do not touch the operation of AC drive during the hands is wet. Failure to comply will result in accident. ✦ Do not touch any I/O terminal of the AC drive. Failure to comply may result in electric shock. ✦ Do not change the default settings of the AC drive. Failure to comply will result in damage to the AC drive. ✦ Do not touch the rotating part of the motor during the motor auto-tuning or running. Failure to comply will result in accident.
During Operation	Danger	✦ Signal detection must be performed only by qualified personnel during operation. Failure to comply will result in personal injury or damage to the AC drive. ✦ Do not touch the fan or the discharging resistor to check the temperature. Failure to comply will result in personal burnt.

Use Stage	Safety Grade	Precautions
During Operation	Danger	✦ Avoid objects falling into the AC drive when it is running. Failure to comply will result in damage to the AC drive. ✦ Do not start or stop the AC drive by turning the contactor ON/OFF. Failure to comply will result in damage to the AC drive.
After Power-on	Danger	✦ Do not repair or maintain the AC drive at power-on. Failure to comply will result in electric shock. ✦ Ensure that the AC drive is disconnected from all power suppliers before staring repair or maintenance on the AC drive. ✦ Repair or maintenance of the AC drive may be performed only by qualified personnel. Failure to comply will result in personal injury or damage to the AC drive.
After Power-on	Danger	✦ Set and check the parameters again after the AC drive is replaced.

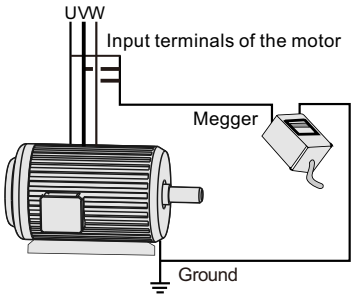
1.3 Cautions

1.3.1 Requirement on Residual Current Device(RCD)

The AC drive generates high leakage current during running, which flows earthing (PE) conductor. Thus install a type-B RCD at the transient and steady-state leakage current to ground that may be generated at startup and during running of the AC drive. You can select a specialized RCD with the function of suppressing high harmonics or general-purpose RCD with relatively large residual current.

1.3.2 Motor Insulation Test

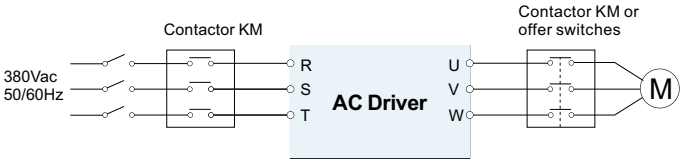
Perform the insulation test when the motor is used for the first time, or when it is reused after being stored for a long time, or in a regular check-up, in order to prevent the poor insulation of motor windings from damaging the AC drive during the insulation test. A 500-V mega-Ohm meter is recommended for the test. The insulation resistance must not be less than 5 MΩ.



1.3.8 Contactor at the I/O terminal of the AC drive

When a contactor is installed between the input side of the AC drive and the power supply, the AC drive must not be started or stopped by switching the contactor on or off. If the AC drive has to be operated by the contactor, ensure that the time interval between switching is at least one hour since frequent charge and discharge will shorten the service life of the capacitor inside the AC drive.

When a contactor is installed between the output side of the AC drive and the motor,do not turn off the contactor when the AC drive is active. Otherwise, modules inside the AC drive may be damaged.



Do not start/stop the AC drive by switching the contactor on/off. If the AC drive has to be operated by the contactor, ensure that the tiome interval is at least one hour.

Turn on /off the contactor when the AC drive has no output. Otherwise,modifies inside the AC drive may be damaged.

1.3.9 The Use Occasion of the External Voltage Out of Rated Voltage Rage

The AC drive must not be used outside the allowable voltage range specified in this manual. Otherwise, the AC drive's components may be damaged. If required, use a corresponding voltage step[-up or step-down device.

1.3.10 The Above Derating of the Default

Different power grade frequency converter has its default carrier frequency, when to run at a higher carrier frequency, the AC Drive must to reduce the amount when running.

1.3.11 Change Three Phase Input into Two Phase Input

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

1.3.12 The Protection of the Lighting Impulse

Although the AC drive has equipped with lightning overvoltage, overcurrent device, which has a certain protection function for the induction lightining. For the lightning prone areas, the user is necessary to install lightning protection device at the front of the AC drive, which will benefit to the service life of the transducer.

1.3.13 Ambient Temperature and De-rating

The normal use of the frequency converter ambient temperature is -10℃~40℃. Temperature exceeds 40℃, the equipment need to reduce the amount of use. The ambient temperature of each increase is reduced by 1.5%, the maximum use of the ambient temperature is 50℃.

1.3.14 Altitude and Derating

In places where the altitude is above 1000m and the cooling effect reduces due to thin airit is necessary to de-rate the AC drive. Contact Our company for technical support.

1.3.15 Some Special Usages

If writing that is not described in this manual, such as common DC bus is applied, contact the agent or Our company for technical support.

1.3.16 The Cautious of the AC drive Disposal

The electrolytic capacitors on the main circuits and PCB may explore when they are burnt. Poisonous gas is generated when the plastic parts are burn. Treat them as ordinary industrial refer to relevant national laws and regulations.

1.3.17 Adaptable Motor

1. The standard parameters of the adaptable motor is adaptable four-squirrel-cage asynchronous induction motor or PMSM. For other types of motor, select a proper AC drive according to the rated motor current.

2. The cooling fan and rotor shaft of general AC Drive are coaxial, which results in reduced cooling effect when the rotational speed declines. If variable speed is required, add a more powerful fan or replace.

3. The standard parameters of the adaptable motor have been configured inside the AC drive. It is still necessary to perform motor auto-tuning or modify the default values based on actual conditions. Otherwise, the running result and protection performance will be affected.

4. The AC drive may alarm or even be damaged when short-circuit exists on cables or inside the motor. Therefore, perform insulation short-circuit test when the motor and cables are newly installed or during routine maintenance. During the test, make sure that the AC drive is disconnected from the tested parts.

1.3.3 Thermal Protection of Motort

If the selected AC drive does not match the rated capacity of the motor , especially when the rated power of the AC drive is higher than that of the motor, adjust the parameters for motor protection in the AC drive or to install thermal relay to protect the motor .

1.3.4 Running Below and Above Rated Frequency

The AC drive provides frequency output of 0 to 600.00Hz. When the users use the frequency converter for a long time, please pay attention to the motor cooling or use of variable frequency motor. If the AC drive is required to run at over 50Hz, consider the capacity of the machine.

1.3.5 Vibration of mechanical device

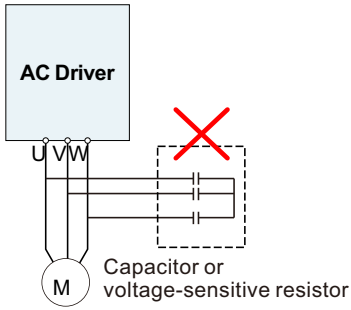
The AC drive may encounter the mechanical resonance point at some output frequencies, which can be avoided by setting the skip frequency. If the operating frequency of the customer coincide with the resonant frequency please modify the operating frequency or change the inherent resonance frequency of the mechanical system.

1.3.6 Motor heat and noise

The output of the AC drive is pulse width modulation (PWM) wave with certain harmonic frequencies, and therefore, the motor temperature, noise, and vibration are slightly greater than those when the AC drive runs at power frequency (50 Hz).

1.3.7 Voltage-sensitive device or capacitor on output side of the AC drive

Do not install the capacitor for improving power factor or lightning protection voltage sensitive resistor on the output side of the AC drive because the output of the AC drive is PWM wave. Otherwise, the AC drive may suffer transient overcurrent or even bedamaged.



DANGER

- Only trained and qualified professionals should perform the work that described in this chapter. Please follow the instructions in "Safety Precautions", ignoring these safety precautions may result in personal injury or damage to equipment.
- During the installation process, it must be ensured that the power supply of the inverter has been disconnected. If the inverter has been powered on, after the power is turned off, and the waiting time is not shorter than the time marked on the inverter, and confirm that the CHARGE light is off, it is recommended that the user directly use a multimeter to monitor that the DC bus voltage of the inverter below 36V.
- The installation design of the inverter must comply with the relevant laws and regulations of the installation site. If the installation of the inverter violates the requirements of local laws and regulations, our company does not assume any responsibility. In addition, if the user does not follow these recommendations, the VFD may experience some failures that are not covered by the warranty or quality assurance.

2.1 Naming Rules

SD60 -4T -2.2 G C
① ② ③ ④ ⑤

Field	Mark	Explanation	Content
Ac drive series	①	Ac drive series	SD60 abbreviated
Voltage Level	②	Voltage Level	2S:single-phase 220V 4T:Three-phase 380V
Adaptive Power	③	Adaptive Power	0.7KW~5.5KW
Function Type	④	Function Type	G:General P:Fan pump
braking Unit	⑤	braking Unit	Null:None C:with braking unit

Figure 2-1 Name Designation Rules

2.2 Nameplate

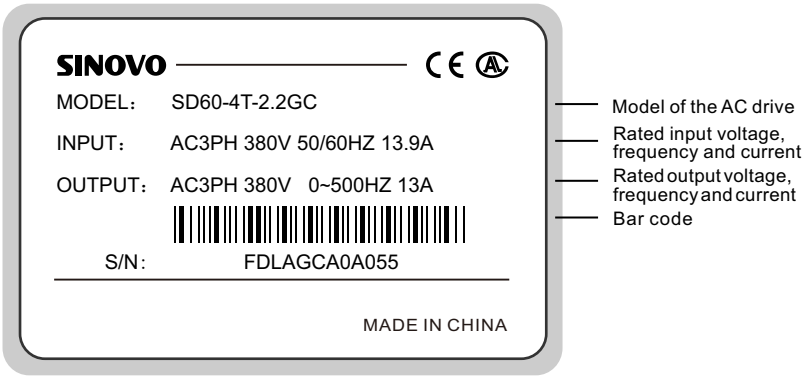


Figure 2-2 Name Designation Rules

2. 3 Basic Technical Specifications

Item		Specification			
Power Input	Input Voltage	AC,1PH,220V(-15%) ~ 240V(+10%)			
		AC,3PH,380V(-15%) ~ 440V(+10%)			
	Rated Frequencya	50HZ			
	Frequency Range	±5% (47.5 ~ 63Hz)			
Power Output	Output Voltage	0 ~ input voltage			
	Output Frequency	0.1HZ ~ 500.0HZ			
	Output Power	Please refer to "rated value"			
	Output Current	Please refer to "rated value"			
Basic Function	Max. Frequency	0 ~ 500Hz			
	Carrier Frequency	0.8kHz ~ 8.0kHz; the carrier frequency can be automatically adjusted according to the load characteristics			
	Input Frequency Resolution	Digital setting : 0.01Hz	Analog setting: max, frequency × 0.025%		
	Control Mode	V/F open loop speed control	Open Loop Vector Control (SVC)		
	Starting Torque	0.5Hz/150%(SVC)			
	Speed Range	1: 100(SVC)			
	Steady Speed Accuracy	±0.5%(SVC)			
	Overload Capacity	150% rated current 60s; 170% rated current 12s; 190% rated current 1.5s.			
	Torque	Automatic torque boost		Manual torque increase 0. 1%~30. 0%	
	V/F Curve	Linear type	Multipoint type	N th-power V/F	V/F separation
	Acce. and Dec. Curve	Linear or S-curve acceleration and deceleration methods. Four groups of switchable acceleration and deceleration time, acceleration and deceleration time range: 0.0 ~ 6500.0s			
	DC Braking	DC braking frequency: 0. 00Hz~max. frequency Braking time: 0. 0~1000. 0s Braking action current value: 0. 0~100. 0%			
	Jog Control	Jog frequency range: 0. 00Hz~Max. frequency: Jog frequency acc. and dec. time: 0. 0~6500. 0s			
	Simple PLC, multi-speed	Through the built-in PLC or control terminals to achieve up to 16-speed operation			
	Buit-in PID	It can easily realize the closed-loop PID control of the process control system			
	Automatic voltage adjustment (AVR)	When the grid voltage changes, it can automatically keep the output voltage constant			
	Overvoltage and overcurrent Stall Control	Automatically limit the output current and bus voltage of the AC Drive during operation to prevent frequent overcurrent and overvoltage tripping			
	Fast Current Limiting	Mini. overcurrent faults and protect the normal operation of the AC Drive			
	Torque Limiting and Control	During operation, the torque is automatically limited to prevent frequent overcurrent; the vector control mode can realize torque control.			
	Brake Unit	0.75~5.5KW standard built-in braking unit			
Special Function	Non stop function	Load feedback energy compensates the voltage reduction so that the AC drive can continue to run in a short time in case of power interruption.			
	Rapid current limit	Rapid software and hardware current limiting technology helps to avoid frequent over-current fault.			
	Bus Support	One Modbus communication,			

Product Information

Item		Specification
Running	Command Source	Given the control panel, control terminal, serial communication port given. It can be switched by a variety of ways.
	Frequency Source	Given the control panel, control terminal, serial communication port given. It can be switched by a variety of ways.
	Auxiliary Frequency source	8 auxiliary frequency source. Flexible implementation of auxiliary frequency tuning, frequency synthesis.
	Input Terminal	Standard: . 4 digital input terminals, one of which support to 100kHz high-speed pulse input . 1 analog input terminals, which supports 0V~10V voltage input or 0 ~ 20mAcurrent input
	Output Terminal	Standard: . 1 high-speed pulse output terminal (optional open collector type), support of 0 ~ 60kHz square wave signal output . 1 digital output terminal . 1 analog output terminals, support 0~20mA current output or 0~10V voltage output
Display and Operation	LED Display	Display each parameter of function code group
	The Key Lock and Function Selection	Achieve some or all of the keys locked and define the scope of partial keys to prevent misuse.
	Protection Function	Powered motor short circuit test; Input/output phase failure protection; Over current protection; Over voltage protection; Under voltage protection; Over heat protection ; Overload protection;
Environment	Application environment	In-door, free from direct sunlight, dust, corrosive gas, combustible ga , oil mist, steam , water drop and salt .
	Altitude	Lower than 1000m (1000m-3000m for derated use)
	Ambient temperature	-10℃+40℃(derated use in the ambient temperature of 40℃to 50℃)
	Humidity	Less than 95%RH, without condensation
	Vibration	Less than 5.9m/s(0.6g)
	Storage temperature	-20℃~+60℃

2.4 Series of AC drive

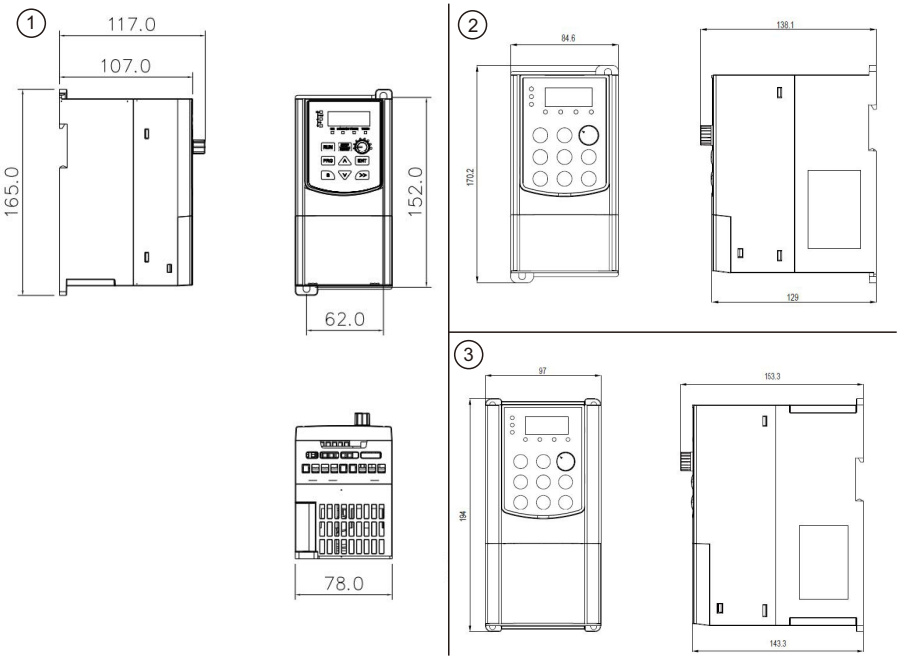
Model	Power Capacity (KVA)	Input Current (A)	Output Current (A)	Adaptable Motor (KW)	Recommended input side main circuit wire (mm^2)	Recommended output side main circuit wire (mm^2)
single-phase 220V Range:-15%~20%						
0.7G	1.5	8.2	4.0	0.7	2.5	2.5
1.5G	3.0	14.0	7.0	1.5	4.0	2.5
2.2G	4.0	23.0	9.6	2.2	6.0	4.0
three-phase 380V Range:-15%~20%						
0.7G	1.5	3.4	2.1	0.7	2.5	2.5
1.5G	3.0	5.0	3.8	1.5	2.5	2.5
2.2G	4.0	5.8	5.1	2.2	2.5	2.5
4.0G	5.9	10.5	9.0	4.0	4.0	4.0
5.5G	11	13.9	13	5.5	4.0	4.0

2.5 Selection of Reference

When the AC drive is driven by the control device requiring rapid braking, the braking unit needs to release the power of the motor braking feedback to the DC bus. 400V voltage level 0.75~5.5KW is equipped with built-in braking unit, if you need to rapid stop, please refer to the appropriate braking to select the unit and braking resistance, AC drive capacity, if need to stop, it can be directly connected to the braking resistance.

AC Drive Capacity(KW)	Braking Unit		Braking Resistor		
	Specification	Quantity(pcs)	Resistance	Power	Quantity(pcs)
0.7	Built-in as standard	1	⩾300Ω	150W	1
1.5		1	⩾220Ω	150W	1
2.2		1	⩾200Ω	250W	1
4.5		1	⩾130Ω	300W	1
5.5		1	⩾90Ω	400W	1

2. 6 **Product Outline, Installation Hole Size**



① 2S-0.7G/2S-1.5G structure diagram and dimension

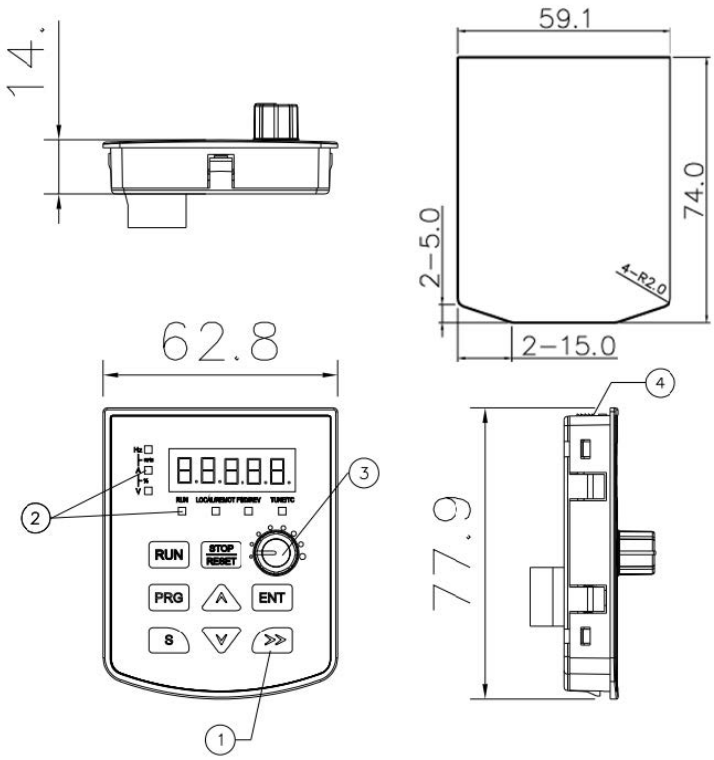
② 2S-2.2G/4T-0.7/1.5/2.2G structure diagram and dimension

③ 4T-4.0G/5.5G structure diagram and dimension

Model	inverter			Installation			GW(kg)
	H (mm)	W (mm)	D (mm)	H1 (mm)	W1 (mm)	Diameter (mm)	
2S-0.7G	165	78	117	152	62	Ø5.5	0.7
2S-1.5G							
2S-2.2G	170.2	84.6	138.1	157.5	67.3	Ø5	1
4T-0.7G							
4T-1.5G							
4T-2.2G							
4T-4.0G	194	97	153.3	184	85	Ø4	1. 5
4T-5.5G							

2. 7 **Dimensions of the keypad outline**

This section gives the dimension drawing of the inverter keyboard, the unit of dimension drawing is mm

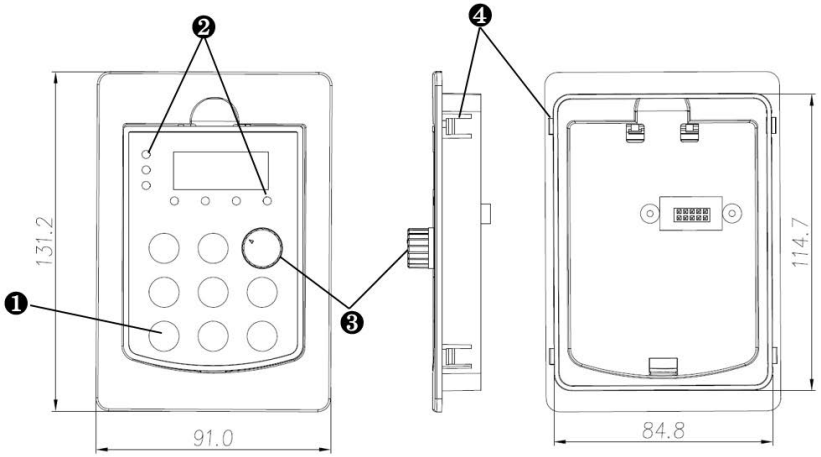


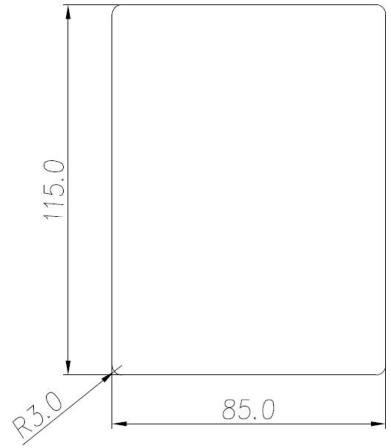
2S-0.7G/2S-1.5G
Dimensional drawing of keypad structure

1. Button 2. LED indicator
3. Knob 4. Install the clip

2.7.1 Dimensions of the keypad outline

This section gives the dimension drawing of the inverter keyboard, the unit of dimension drawing is mm

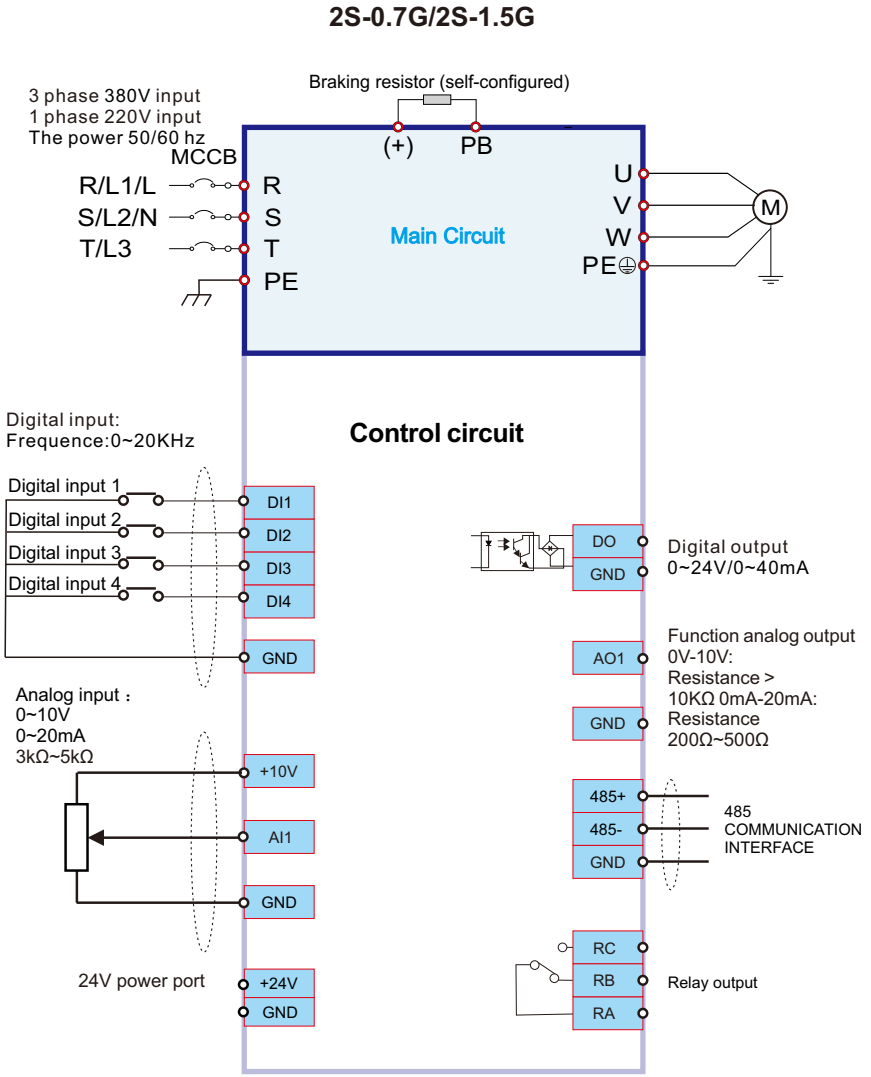




1. Button
2. LED indicator
3. Knob
4. Install the clip

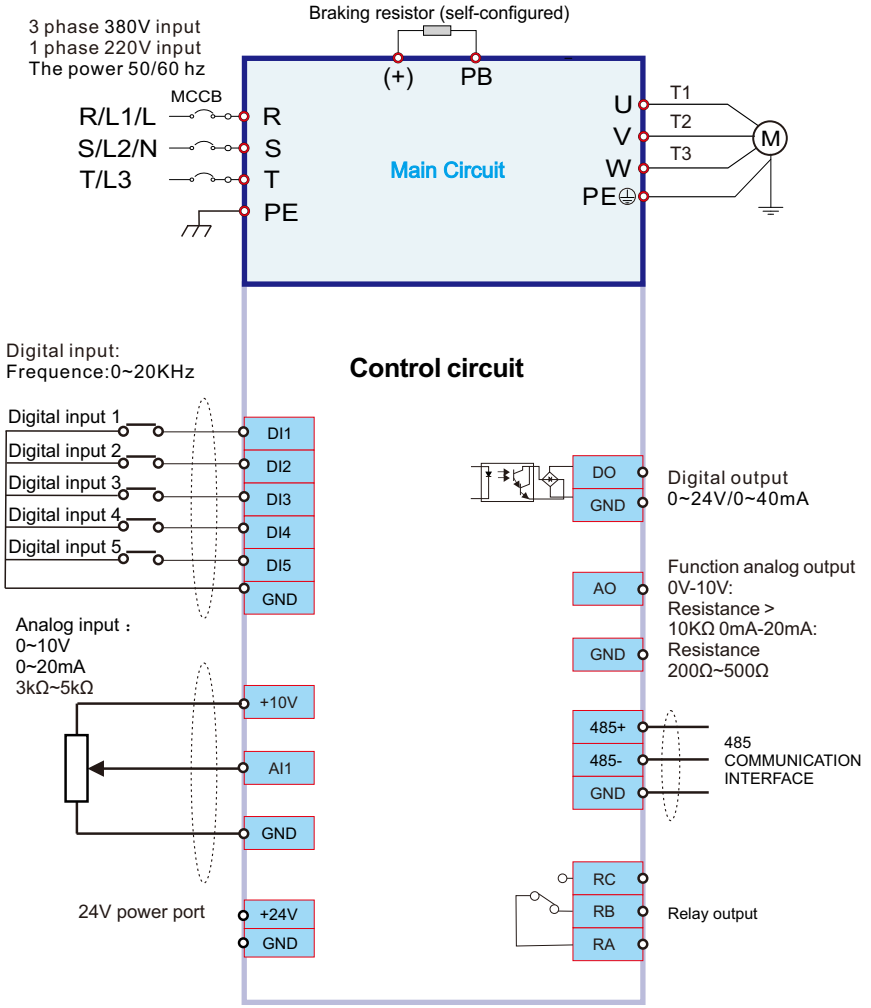
2S-2.2G/4T-0.7/1.5/2.2G/4.0G/5.5G Dimensional drawing of keypad structure

2.8 Control Circuit Wiring Diagram



2.8.1 Control Circuit Wiring Diagram

2S-2.2G/4T-0.7/1.5/2.2G/4.0G/5.5G



Note:

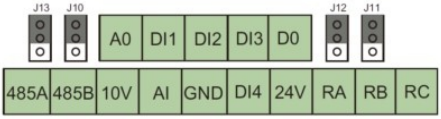
1. DC reactor, braking unit and braking resistor are optional accessories".

2. P1 and(+) are short circuited in factory, if need to connect with the DC reactor, please remove the contact tag between P1 and (+).

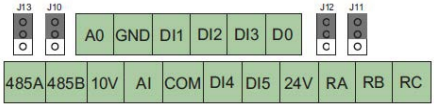
3. Do not install capacitor or surge suppressor on the output side of the AC drive. Otherwise, it may cause faults to the AC drive or damage to the capacitor and surge suppressor;

4. Input/output (main circuit) of the AC drive include harmonic components, which may interfere with the AC drive attachment communications equipment. Therefore, install an anti-aliasing filter to minimize the interference;

2.9 Control Panel Terminal Instructions



2S-0.7G/2S-1.5G



2S-2.2G/4T-0.7/1.5/2.2G/4.0G/5.5G

Control circuit terminal

Type	Terminal	Terminal Name	Specification
RS485	485A	485 differential signal +	Speedrate1200/2400/4800/9600/19200/38400 Use twisted pair or shielded wire, the longest distance is 300 meters
	485B	485 differential signal -	
Analog input	AI1	Analog Input 1	0~20mA: Input resistance 500Ω, max input current is 25mA 0~10V: Input resistance 100KΩ, max input voltage 12.5V The switch between 0~20mA and 0~10V analog is realized through the J13 jumper, and the factory default is voltage input.
Analog output	AO1	Analog Input 1	0~20mA:Input resistance 200 Ω ~500 Ω 0~10V: Input resistance >10K Ω The switch between 0~20mA and 0~10V analog output is realized through the J10 jumper, and the factory default voltage output.
Digital input	DI1	Digital input terminal 1	Ordinary digital input
	DI2	Digital input terminal 2	Ordinary digital input
	DI3	Digital input terminal 3	Ordinary digital input
	DI4	Digital input terminal 4	Ordinary digital input/High frequency pulse input (2S-0.7/2S-1.5)
	DI4	Digital input terminal 4	Ordinary digital input(Except 2S-0.7/2S-1.5)
	DI5	Digital input terminal 5	Ordinary digital input/High frequency pulse input (Except 2S-0.7/2S-1.5)
Digital output	DO	Digital output terminal 1	Open collector output： High-speed pulse output （0.0~20.0kHz）
Power Supply	10V	＋10V power supply	Provide 10V power supply, can be used as the reference voltage of AI
	GND	＋10V power supply ground	10V power supply ground
	+24V	power supply	Provide +24V power supply externally Maximum output current: 200mA
	COM	Digital input common end	The interior is isolated from GND(Except 2S-0.7/2S-1.5)
Relay output	RA/RB	Relay output	often OFF terminal
	RA/RC		often ON terminal

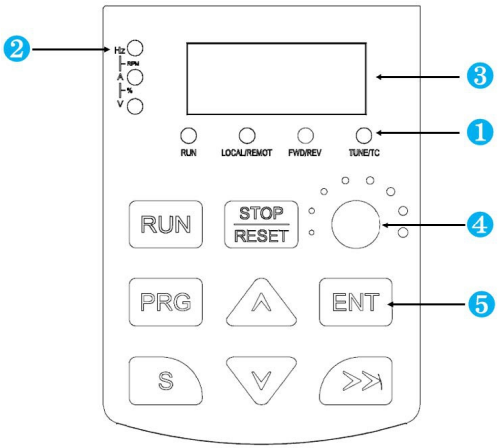
Switching Dial Code Switch Function Description

Terminals	Name	Jumpers Figure	Function	Factory Setting
J13	AI1		1--2: voltage output (0 10V) 2--3: current output (0 20mA)	0~10V
J10	AO1		1--2: voltage output (0 10V) 2--3: current output (0 20mA)	0~10V
J12	PW		1-2：Source pattern wiring method 2-3:leakage pattern wiring method	Source pattern
J11	CME		Photocoupler isolation, bipolar open collector output; output voltage range: 0V - 24V; Output current range: 0mA ~ 50mA; Note: The digital output ground CME is internally isolated from the digital input ground GND. By default, it is internally connected through J11. When DO wants to be driven by an external power supply, J11 must be disconnected.	Connect GND

Chapter 3 Operation And Display

3.1 Introduction of the keypad

The keypad is used to control the AC drive, read the state data and adjust parameters.



No.	Name	Instructions		
1	Status indicator	RUN/TUNE	OFF	The AC drive is in the stopping state;
			ON	The AC drive is in the running state.
		FWD/REV	OFF	The AC drive is in the forward rotation state
			ON	The AC drive is in the reverse rotation state.
		LOCAL/REMOT	OFF	The AC drive is running from reverse to forward
			ON	Terminals control
			Flash	Communication control
		TUNE/TC	ON	Torque control mode
			Flash quickly	The AC drive is in the fault state
			Flash slowly	The AC drive is in the parameter autotuning state;
2	Unit indicato	It represents the current display of the Keypad		
		Hz RPM A % V	Hz	Frequency unit
		Hz RPM A % V	A	Current unit
		Hz RPM A % V	V	Voltage unit
		Hz RPM A % V	RPM	Speed unit
		Hz RPM A % V	%	Percentage

2.9.1 Analog input terminal：

Weak analog voltage signals are easy to suffer external interference, and therefore the shielded cable must be used and the cable length must be less than 20 m, as shown in following figure2-1.In applications where the analog signal suffers severe interference, install filter capacitor or ferrite magnetic core at the analog signal source, as shown in the following figure 2-2

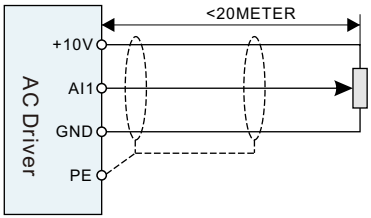


Figure2-1 Analog input and output terminal wiring diagram

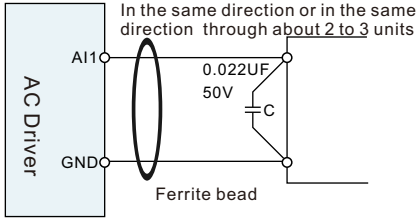


Figure2-2 Analog input terminal process wiring diagram

2.9.2 Digital Input Terminals：

Generally, select shielded cable no longer than 20 m. When active driving is adopted,necessary filtering measures shall be taken to prevent the interference to the power supply. It is recommended to use the contact control mode

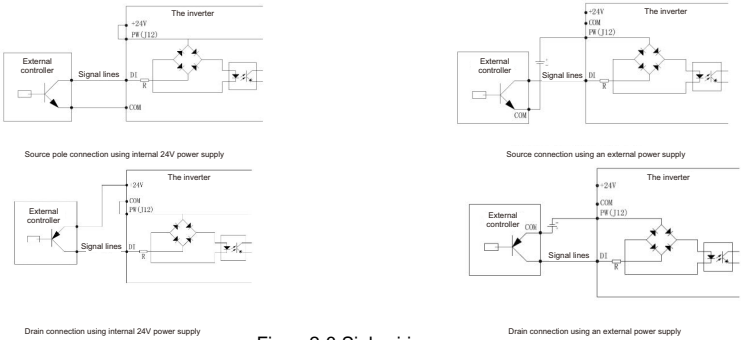


Figure2-3 Sink wiring

2.9.3 Digital Output Terminals：

When the digital output terminal needs to drive the relay, an absorption diode shall be installed between two sides of the relay coil. Otherwise, it may cause damage to the 24 VDC power supply. The driving capacity is not more than 50 mA.

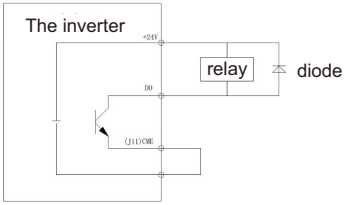


Figure 2-4 DO Terminal Wiring diagram

<table>
<tr><th>No.</th><th>Name</th><th colspan="3">Instructions</th></tr>
<tr><td>3</td><td>Code Display Zone</td><td colspan="3">5-figure LED display displays various monitoring data and alarm code such as set frequency and output frequency
<table>
<tr><th>Display letter</th><th>Correspo-nding letter</th><th>Display letter</th><th>Correspo-nding letter</th><th>Display letter</th><th>Correspo-nding letter</th></tr>
<tr><td>0</td><td>0</td><td>1</td><td>1</td><td>2</td><td>2</td></tr>
<tr><td>3</td><td>3</td><td>4</td><td>4</td><td>5</td><td>5</td></tr>
<tr><td>6</td><td>6</td><td>7</td><td>7</td><td>8</td><td>8</td></tr>
<tr><td>9</td><td>9</td><td>A</td><td>A</td><td>b</td><td>b</td></tr>
<tr><td>C</td><td>C</td><td>d</td><td>d</td><td>E</td><td>E</td></tr>
<tr><td>F</td><td>F</td><td>H</td><td>H</td><td>I</td><td>I</td></tr>
<tr><td>L</td><td>L</td><td>n</td><td>N</td><td>n</td><td>n</td></tr>
<tr><td>o</td><td>o</td><td>P</td><td>P</td><td>r</td><td>r</td></tr>
<tr><td>S</td><td>S</td><td>t</td><td>t</td><td>U</td><td>U</td></tr>
<tr><td>v</td><td>v</td><td>.</td><td>.</td><td>-</td><td>—</td></tr>
</table></td></tr>
<tr><td>4</td><td>Digital potent iomete</td><td colspan="3">When the frequency source X or Y is set to 1, the setting of the frequency source is determined by the analog potentiometer input voltage . The maximum output voltage corresponding to the maximum frequency, minimum voltage corresponding to 0 Hz</td></tr>
<tr><td rowspan="8">5</td><td rowspan="8">Keypad button zone</td><td>PRG</td><td>Program key</td><td>Enter or escape from the first level menu and remove the parameter quickly</td></tr>
<tr><td>ENTER</td><td>Entry key</td><td>Enter the menu step-by-step confirm parameters</td></tr>
<tr><td>∧</td><td>Up key</td><td>Increase data or function code progressively</td></tr>
<tr><td>∨</td><td>Down key</td><td>Decrease data or function code progressively</td></tr>
<tr><td>>></td><td>Right-Shift key</td><td>Move right to select the displaying parameter circularly in stopping and running mode. Select the parameter modifying digit during the para meter modification</td></tr>
<tr><td>RUN</td><td>Run key</td><td>The key is used to operate on the AC drive in key operation mode</td></tr>
<tr><td>STOP RESET</td><td>Stop/Reset</td><td>This key is used to stop in running state; This key is used to reset all control modes in the fault alarm state..</td></tr>
<tr><td>S</td><td>S Key</td><td>Corresponding to F10.00</td></tr>
</table>

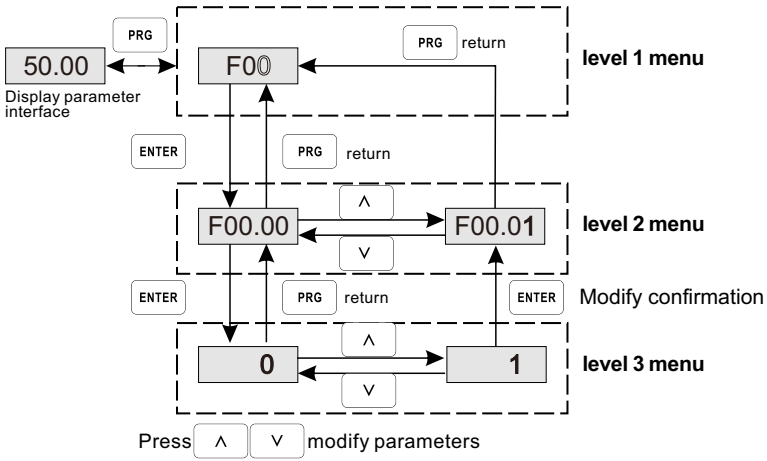
3. 2 Display of Keypad

Operate the AC drive via operations panel. See the detailed structure description of function code in the brief diagram of function codes.

The AC drive has three-level menus, they are:

1. Group number of function code(first-level menu))
2. Tab of function code(second-level menu)
3. Set value of function code(third-level menu)

Operation procedure on the operation panel:

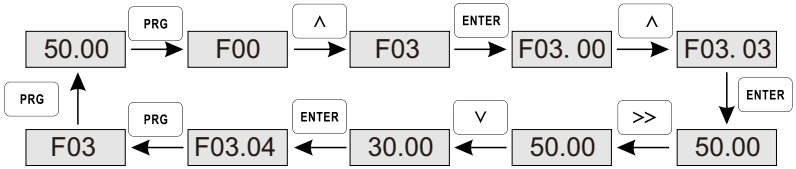


Note:
Press both the "PRG" and the "ENT" key to return to level2 menu from the level3 menu. The difference is: pressing "ENT" will save the set parameters into the control panel, and then return to the level2 menu with shifting to the next function code automatically; while pressing "PRG" will directly return to the level 2 menu without saving the parameters, and keep staying at the current function code.

In Level 3 menu, if the parameter has no blinking digit, it means that the parameter cannot be modified. This may be because:

a. Such a function code is only readable, such as, AC drive model, actually detected parameter and running record parameter;

b. Such a function code cannot be modified in the running state and can only be changed to stop.



Chapter 4 Function Parameters Table

The function parameters of the AC drive have been divided according to the function. Each function group contains certain function codes applying3-level menus.

1. Below is the instruction of the function lists:

The first line "Function code":codes of function parameter group and parameters;

The second line "Name":full name of function parameters;

The third line "Setting range":effective setting value of the function parameters;

The fourth line "Default value":the original factory values of the function parameter;

The fifth line"Modify":the modifying character of function codes(the parameters can be modified or not and the modifying conditions), below is the instruction:

"○": means the set value of the parameter can be modified on stop and running state;

"X": means the set value of the parameter can not be modified on the running state;

"*": means the value of the parameter is the real detection value which can not be modified.

The sixth line "Address": The address of the function parameter in the communication.

Function code	Name	Setup range	Default Value	Modifi-cation	Add. (H)
Group F00 Basic Function Group					
F00.00	Motor selection	0: Motor 1. Reserve	0	X	0x000
F00.01	Motor control technique	Ones: motor 1control parameter 0: V/F control 1: SVC control 2. Reserve Tens: reserved	00	X	0x001
F00.02	Type of drive	0: Type G (applicable to constant-torque load) 1: Type P (applicable to light-duty load)	0	X	0x002
F00.03	Reserved	-	-	*	-
F00.04	Reserved	-	—	*	—
F00.05	Reserved	-	-	*	-
F00.06	Parameters protection	0: All parameter programming allowed 1: Only this parameter programming allowed	0	○	0x006
F00.07	Software version	XXXXX	Model de-pendent	*	0x007
F00.08	User's password	0: No password Other: Password protection	0	○	0x008
F00.09	Supplier's password	XXXXX	0	○	0x009
F00.10	Parameter restoration	0: No operation 1: Restore all parameters to factory default (excluding motor parameters) 2: Clear fault record 3: Restore all parameters to factory default (including motor parameters)	0	X	0x00A

Function code	Name	Setup range	Default Value	Modification	Add.
Group F01 Basic Function Group					
F01.00	X frequency command	0: Keypad digital setting 1: Keypad potentiometer setting 2: Analog AI1 setting 3: Reserve 4: Reserve 5: High-speed pulse DI5 setting 6: Multi-step Freq running setting 7: Simple PLC setting 8: PID control setting 9: Communication setting	1	X	0x100
F01.01	Y frequency command		3	X	0x101
F01.02	Y frequency command reference	0: MAX. output frequency(F01.07) 1: X frequency command	0	○	0x102
F01.03	Y frequency range	0.0~100.0%	100.0%	○	0x103
F01.04	Combination of the setting codes	Ones: Frequency reference selection 0: X 1: X and Y calculation (based on tens position) 2: Switchover between X and Y 3: Switchover between X and "X&Y calculation" 4: Switchover between Y and "X&Y calculation" Tens: X and Y calculation formula 0: X + Y 1: X - Y 2: Max. (X, Y) 3: Min. (X, Y)	00	○	0x104
F01.05	Digital setting UP, DOWN preset frequency	0. 00Hz～Max. frequency	50.00Hz	○	0x105
F01.06	Retentive of digital setting frequency	Ones: Retentive selection of digital setting frequency upon stop 0: Not retentive 1: Retentive Tens: Retentive selection of digital setting frequency upon power-off 0: Not retentive 1: Retentive	11	○	0x106

Function code	Name	Setup range	Default Value	Modification	Add.
F01.07	Max. output frequency	50.00Hz~500.00Hz	50.00Hz	×	0x107
F01.08	Upper limit frequency source selection	0: F01.09 1: Ai1 2: Reserve 3: Reserve 4: Pluse	0	○	0x108
F01.09	Lower limit frequency~Max. frequency	F01.10~F01.07(Max. frequency)	50.00Hz	○	0x109
F01.10	0.00Hz~upper limit frequency	0.00Hz~F01.09 (Upper limit frequency)	0.05Hz	○	0x10A
F01.11	0.00Hz~Max. frequency	0.00Hz~F01.07(Max. frequency)	5.00Hz	○	0x10B
F01.12	Jog selection in running state	0:allowed 1:prohibited	0	○	0x10C
F01.13	Action if running frequency<lower limit frequency	0: Operating frequency lower limit 1: Zero speed operation 2: Stop	0	○	0x10D
F01. 14	Reserved				
F01. 15	Hopping frequency1	0.00Hz-Maximum frequency	0.00Hz	○	0x10F
F01. 16	Jump frequency 1 range	0.00Hz-Maximum frequency	0.00Hz	○	0x110
F01. 17	Hopping frequency2	0.00Hz-Maximum frequency	0.00Hz	○	0x111
F01. 18	Jump frequency 2 range	0.00Hz-Maximum frequency	0.00Hz	○	0x112

Function code	Name	Setup range	Default Value	Modification	Add.
Group F02 Startup and stop Control					
F02.00	Run command channel	0: Keypad run command channel 1: Terminal command channel (Keypad STOP disabled) 2: Terminal command channel (Keypad STOP enable) 3:Communication command (Keypad STOP disabled) 4:Communication command (Keypad STOP enabled)	0	○	0x200
F02.01	Binding command source to frequency source	Ones: Binding keyboard command to frequency source 0: No function 1: Keypad digital setting 2: Keypad potentiometer setting 3: Analog AI1 setting 4: Reserve 5: Reserve 6: High-speed pulse DI5 setting 7: Multi-speed running setting 8: Simple PLC program setting 9: PID control setting A: Communication setting Tens: Binding terminal command to frequency source 0–9, same as Ones Hundreds: Binding communication command to frequency source 0–9, same as Ones	000	○	0x201
F02-02	Rotation direction	0: Same direction 1: Reverse direction	0	○	0x202
F02.03	Start-up mode	0: Start-up directly 1: Start-up after Speed tracking 2: Start-up after DC braking/Pre excitation	0	○	0x203
F02.04	Starting frequency of direct start	0.00~10.00Hz	0.00Hz	×	0x204
F02.05	Retention time of the starting frequency	0.0~100.0s	0.0s	×	0x205

Function code	Name	Setup range	Default Value	Modification	Add.
F02.06	DC injection braking level/ Pre excitation level	0.0~100.0%	50.0%	×	0x206
F02.07	DC injection braking active time/ Pre-excitation active time	0.0~1000.0s	0.0s	×	0x207
F02.08	Reserved			*	—
F02.09	Stop Mode	0: Decelerate to stop 1: Coast to stop	0	○	0x209
F02.10	Starting frequency of DC braking	0.00~F01.07(Max. frequency)	0.00Hz	○	0x20A
F02.11	Waiting time of DC braking	0.0~1000.0s	0.0s	○	0x20B
F02.12	Stopping DC braking current	0.0~100.0%	50.0%	○	0x20C
F02.13	Stopping DC braking time	0.0~1000.0s	0.0s	○	0x20D
F02.14	Reverse disabled	0: Reverse enabled 1: Reverse disabled	0	○	0x20E
F02.15	Dead time of FWD/REV rotation	0.0~3000.0s	0.0s	○	0x20F
F02.16	The protection of the electric terminals	0: Invalid operation command on terminal 1: valid operation command on terminal	0	○	0x210
F02. 17~ F02. 18	Reserved				—
F02.19	Energy braking seclection	0: Disable 1: Enable	1	○	0x213
F02.20	Energy braking threshold voltage	single phase: 200.0V ~410.0V three phase: 600.0V~800.0V	Model de-pendent	○	0x214
F02.21	Brake use ratio	0.0%~100.0%	100.0%	○	0x215
F02.22	The coefficient of Magnetic flux braking	0~200	0.0%	○	0x216

Function code	Name	Setup range	Default Value	Modification	Add.
Group F03 Acc/Dec Parameters					
F03.00	Acc-time 1	0.0~6500.0s	Model dependent	○	0x300
F03.01	Dec-time 1	0.0~6500.0s	Model dependent	○	0x301
F03.02	ACC time2	0.0~6500.0s	Model dependent	○	0x302
F03.03	DEC time2	0.0~6500.0s	Model dependent	○	0x303
F03.04	ACC time3	0.0~6500.0s	Model dependent	○	0x304
F03.05	DEC time3	0.0~6500.0s	Model dependent	○	0x305
F03.06	ACC time4	0.0~6500.0s	Model dependent	○	0x306
F03.07	DEC time4	0.0~6500.0s	Model dependent	○	0x307
F03.08	Jogging ACC time	0.0~6500.0s	20.0s	○	0x308
F03.09	Jogging DEC time	0.0~6500.0s	20.0s	○	0x309
F03.10	Switching frequency of ACC time 1, 2	0.00~F01.07(Max. frequency)	0.00Hz	○	0x30A
F03.11	Switching frequency of DEC time 1, 2	0.00~F01.07(Max. frequency)	0.00Hz	○	0x30B
F03.12	ACC/DEC selection	0: Linear type 1: S-curve type	0	×	0x30C
F03.13	S curve start ratio	0.0~(100.0~F03.14)%	30.0%	×	0x30D
F03.14	S curve end ratio	0.0~(100.0~F03.13)%	30.0%	×	0x30E

Function code	Name	Setup range	Default Value	Modification	Modification
Group F04 V / F Control Group					
F04.00	Motor 1V / F curve setting	0: Straight line V/F curve 1: Multi-dots V/F curve 2: 2.0en power V/F curve 3: V/F separation	0	X	0x400
F04.01	V/F frequency 1 of motor 1	0.00Hz~F04.03	0.00Hz	X	0x401
F04.02	V/F Voltage 1 of motor 1	0.0%~100.0%(motor1 rated voltage)	0.0%	X	0x402
F04.03	V/F frequency 2 of motor 1	F04.01~F04.05	25.00Hz	X	0x403
F04.04	V/F Voltage 2 of motor 1	0.0%~100.0%(motor1 rated voltage)	50.0%	X	0x404
F04.05	V/F frequency 3 of motor 1	F04.03~F02.02 (motor1 rated frequency)	50.00Hz	X	0x405
F04.06	V/F Voltage 3 of motor 1	0.0%~100.0%(motor1 rated voltage)	100.0%	X	0x406
F04.07	Torque boost of motor 1	0.0%(automatic torque boost) 0.1%~30.0%(Manual torque boost)	Model dependent	○	0x407
F04.08	Frequency limit of torque boost of motor1	0.00~F01.07(Max. frequency)	10.00Hz	X	0x408
F04.09	V/F oscillation suppression gain of motor 1	0~100	Model dependent	○	0x409
F04.10~ F04.21	Reserved				—

Function code	Name	Setup range	Default Value	Modification	Add.
F04.22	Voltage setting on V/F separated pattern	0: Keypad digital setting(F04.23) 1: Keypad potentiometer setting 2: Analog AI1 setting 3: Reserve 4: Reserve 5: High-speed pulse DI5 setting 6: Multi-step Freq running setting 7: Simple PLC program setting 8: PID control setting 9: Communication setting	0	○	0x416
F04.23	Keypad setting voltage	0.0~Motor rated voltage	0.0v	○	0x417
F04.24	Voltage ACC time	0.0~1000.0s	0.0s	○	0x418
F04.25	Voltage DEC time	0.0~1000.0s	0.0s	○	0x419
F04.26	Automatic current limit action selection	0: Disable 1: Enable	1	X	0x41A
F04.27	Automatic current limit	50.0~200.0%	150%	X	0x41B
F04.28	Reserved				—
F04.29	Reserved				—
F04.30	Over-voltage stall protection	0: Invalid 1: Stall protection mode 1 2: Reserved	1	X	0x41E
F04.31	Voltage protection of over-voltage stall	Single phase vfd:160.0V~410.0V 3 phase vfd:200.0V~800.0V	Model dependent	X	0x41F

Function code	Name	Setup range	Default Value	Modification	Add.
Group F05 Motor 1 Parameter Group					
F05.00	Motor 1 type	0: Ordinary asynchronous motor (with low frequency compensation) 1: AC drive motor (without low frequency compensation)	0	×	0x500
F05.01	Rated power of motor 1	0.1~1000.0kW	Model dependent	×	0x501
F05.02	Rated voltage of motor 1	0~1200V	Model dependent	×	0x502
F05.03	Rated current of motor 1	0.1~6000.0A	Model dependent	×	0x503
F05.04	Rated frequency of motor 1	0.01~F01.07(Max. frequency)	50.00Hz	×	0x504
F05.05	Rated speed of motor1	1~36000rpm	Model dependent	×	0x505
F05.06	Stator resistance of motor 1	0.001~65.535Ω	Model dependent	×	0x506
F05.07	rotor resistance of motor 1	0.001~65.535Ω	Model dependent	×	0x507
F05.08	leakage inductance of motor 1	0.01~655.35mH	Model dependent	×	0x508
F05.09	Mutual inductance of motor 1	0.01~655.35mH	Model dependent	×	0x509
F05.10	Non-load current of motor 1	0.1A~F05.03	Model dependent	×	0x50A
F05.16~ F05.25	Reserved				
F05.26	Motor 1 parameter autotuning	0: No operation 1: Rotation autotuning 2: Static autotuning	0	×	0x51A

Function code	Name	Setup range	Default Value	Modification	Add.
Group F06: Motor 1 Vector Control Parameters					
F06.00	Speed loop proportional gain 1	1~100	30	○	0x600
F06.01	Speed loop integral time 1	0.01~10.000s	0.50s	○	0x601
F06.02	Low switching frequency	0.00Hz~F06.05	5.00Hz	○	0x602
F06.03	Speed loop proportional gain 2	1~100	20	○	0x603
F06.04	Speed loop integral time 2	0.01~10.00s	1.0s	○	0x604
F06.05	High switching frequency	F06.02~F01.07（Max. frequency）	10.00Hz	○	0x605
F06.06	ASR feedback input filtering time	0.000~0.100s	0.015s	○	0x606
F06.07	Current loop percentage coefficient KP1	0~60000	Model dependent	○	0x607
F06.08	Current loop integral coefficient KI1	0~60000	Model dependent	○	0x608
F06.09	Current loop percentage coefficient KP2	0~60000	Model dependent	○	0x609
F06.10	Current loop integral coefficient KI2	0~60000	Model dependent	○	0x60A
F06.11	Electric torque upper limit setting source selection	0: Keypad digital setting(F06.13) 1: Keypad potentiometer setting 2: Analog AI1 setting 3: Reserve 4: Reserve 5: High-speed pulse DI5 setting 6: Communication setting Note: Full range of values 1~6 corresponds to the digital setting of F06.13.	Model dependent	○	0x60B
F06.12	Braking torque upper limit setting source selection	0: Keypad digital setting(F06.14) 1: Keypad potentiometer setting 2: Analog AI1 setting 3: Reserve 4: Reserve 5: High-speed pulse DI5 setting 6: Communication setting Note: Full range of values 1~6 corresponds to the digital setting of F06.14.	Model dependent	○	0x60C

Function code	Name	Setup range	Default Value	Modification	Add.
F06.13	Keypad digital setting of electric torque	0.0~200.0% (Motor rated current)	150.0%	○	0x60D
F06.14	Keypad digital setting of braking torque	0.0~200.0% (Motor rated current)	150.0%	○	0x60E
F06.15	Torque limit coefficient influx weakening	50~200	100	○	0x60F
F06.16	Compensation coefficient of slip	50%~200%	100%	○	0x610

Function code	Name	Setup range	Default Value	Modification	Add.
Group F09: Torque Control Parameters					
F09.00	Speed/Torque control selection	0: Speed control 1: Torque control	0	X	0x900
F09.01	Torque setting source in torque control	0: Keypad digital setting(F09.02) 1: Keypad potentiometer setting 2: Analog AI1 setting 3: Reserve 4: Reserve 5: High-speed pulse DI5 setting 6: Communication setting	0	○	0x901
F09.02	Torque digital setting in torque control	-200.0%~200.0%	150.0%	○	0x902
F09.03	ACC time in torque control	0.00~650.00s	0.00s	○	0x903
F09.04	DEC time in torque control	0.00~650.00s	0.00s	○	0x904
F09.05	Reserved				
F09.06	Torque control forward rotation upper limit frequency keyboard limit value	0.00Hz~Max. frequency	50.0Hz	○	0x906
F09.07	Reserved				
F09.08	Torque control reverse upper limit frequency keyboard limit value	0.00Hz~Max. frequency	50.0Hz	○	0x908
F09.09~ F09.11	Reserved				

Function code	Name	Setup range		Default Value	Modification	Add.
Group F10: Keypad Operation and LED Display						
F10.00	The key of S function selection	0: No function 1: Forward jog 2: Reverse jog 3: Forward/reverse switchover 4: Run command sources shifted 5: Clear the date of exact stop		1	×	0x0A00
F10.01	Display parameter setting 1 on run status	0~65535 BIT0: Running frequency(Hz ON) BIT1: Setting frequency(Hz flash) BIT2: Bus voltage(V ON) BIT3: Output voltage(V ON) BIT4: Output current(A ON) BIT5: Motor speed(rpm ON) BIT6: Output power(% ON) BIT7: Output torque(% ON) BIT8: PID reference (% ON) BIT9: PID feedback(% ON) BIT10: Input terminal state BIT11: Output terminal state BIT12: AI1(V on) BIT13: Reserve BIT14: Reserve BIT15: Linear speed Note: If you want to display the above parameters, add the corresponding decimal to enter this parameter	2^0=1 2^1=2 2^2=4 2^3=8 2^4=16 2^5=32 2^6=64 2^7=128 2^8=256 2^9=512 2^{10}=1024 2^{11}=2048 2^{12}=4096 2^{13}=8192 2^{14}=16384 2^{15}=32768	53	○	0x0A01
F10.02	Display parameter setting 2 on run status	0~65535 BIT0: PLC current stage BIT1: Pulse count value BIT2: Length value BIT3: Torque setting value(% ON) BIT4: Pulse Di5 frequency BIT5: Load speed BIT6: IGBT temperature BIT7: AC input voltage BIT8: Encoder feedback speed BIT9~BIT15: Reserve Note: If you want to display the above parameters, add the corresponding decimal to enter this parameter	2^0=1 2^1=2 2^2=4 2^3=8 2^4=16 2^5=32 2^6=64 2^7=128 2^8=256	0	○	0x0A02
F10.03	Reserved					—

Function code	Name	Setup range		Default Value	Modification	Add.
F10.04	Display parameter setting on stop status	0~65535 BIT0: Setting frequency(Hz ON) BIT1: Motor speed(rpm ON) BIT2: Bus voltage(V ON) BIT3: AC input voltage BIT4: Input terminal state BIT5: Output terminal state BIT6: PID reference (% ON) BIT7: PID feedback(% ON) BIT8: AI1(V on) BIT9: Reserve BIT10: Reserve BIT11: Length value BIT12: Pulse count value BIT13: PLC current stage BIT14: Load speed BIT15: Pulse Di5 frequency Note: If you want to display the above parameters, add the corresponding decimal to enter this parameter	2^0=1 2^1=2 2^2=4 2^3=8 2^4=16 2^5=32 2^6=64 2^7=128 2^8=256 2^9=512 2^{10}=1024 2^{11}=2048 2^{12}=4096 2^{13}=8192 2^{14}=16384 2^{15}=32768	7	○	0x0A04
F10.05	Reserved					0x0A05
F10.06	Reserved				○	0x0A06
F10.07	Reserved					—
F10.08	Reserved					—
F10.09	Load speed display coefficient	0.0001 ~ 6.5000		1.000	○	0x0A09
F10.10	Number of decimal places for loadspeed display	0.Zero decimal point 1.One decimal point 2.Two decimal points 3.Three decimal points		0	○	0x0A0A

Function code	Name	Setup range	Default Value	Modification	Modification
Group F11 Digital Input Terminal Group					
F11.00	DI1 terminals function selection	0: No function 1: Forward 2: Reverse 3: Three-wire control operation 4: Forward Jogging 5: Reverse Jogging 6: Coast to stop 7: External STOP terminal 1 8: External STOP terminal 2(DEC time4) 9: Immediate DC injection braking 10: DEC DC injection braking 11: Run Pause 12: Fault reset 13: Shift the command 1 14: Shift the command 2 15: Shift frequency command 16: Terminal UP 17: Terminal DOWN 18: Clear UP/DOWN (including∧/∨ key) adjustment 19: Multi-step speed terminal K1 20: Multi-step speed terminal K2 21: Multi-step speed terminal K3 22: Multi-step speed terminal K4 23: PLC status reset 24: PID parameters switching 25: Reserve 26: PID action direction reverse 27: PID pause 28: Pulse input (valid only for DI5) 29: Swing pause 30: Counter input 31: Counter reset 32: Length count input 33: Length reset 34: Clear the current running time 35: Reverse prohibited 36: DEC/ACC time 1 37: DEC/ACC time 2 38: DEC/ACC disabling 39: External fault input 1 40: External fault input 2 41: Reserve 42: Speed control/Torque control switchover 43: Torque control prohibited	1	×	0x0B00
F11.01	DI2 terminals function selection		2	×	0x0B01
F11.02	DI3 terminals function selection		4	×	0x0B02
F11.03	DI4 terminals function selection		12	×	0x0B03
F11.04	DI5 terminals function selection (Except 2S-0.7/2S-1.5)				
F11.05	Reserved				
F11.06	Reserved				
F11.07	Reserved				
F11.08	Reserved				
F11.09	Reserved				

Function code	Name	Setup range	Default Value	Modification	Add.
F11.10	Filtering time of digital input terminal	0.000~1.000s	0.010s	○	0x0B0A
F11.11	DI active mode selection 1	0:Positive logic 1:Negative logic Units position: DI1 active mode Tens position: DI2 active mode Hundreds position: DI3 active mode Thousand position: DI4 active mode Ten thousands position: reserved	00000	X	0x0B0B
F11.12	Reserved				
F11.13	Terminals control running mode	0: 2-wire control 1 1: 2-wire control 2 2: 3-wire control 1 3: 3-wire control 2	0	X	0x0B0D
F11.14	Terminal UP/DOWN rate	0.001Hz/s ~ 65.000Hz/s	1.000Hz	○	0x0B0E
F11.15	Switch-on delay of DI1 terminal	0.0~3600.0s	0.0s	X	0x0B0F
F11.16	Switch-off delay of DI1 terminal	0.0~3600.0s	0.0s	X	0x0B10
F11.17	Switch-on delay of DI2 terminal	0.0~3600.0s	0.0s	X	0x0B11
F11.18	Switch-off delay of DI2 terminal	0.0~3600.0s	0.0s	X	0x0B12
F11.19	Switch-on delay of DI3 terminal	0.0~3600.0s	0.0s	X	0x0B13
F11.20	Switch-off delay of DI3 terminal	0.0~3600.0s	0.0s	X	0x0B14

Function code	Name	Setup range	Default Value	Modification	Add.
Group F12 Digital Output Terminal Group					
F12.00	HDO output	0: Open collector pole high speed pulse output(See F15.02 for detailed information of the related function) 1: Open collector pole output (See F12.02 for detailed information of the related function)	0	○	0x0C00
F12.01	DO1 output	0: Invalid 1: AC drive running 2: Forward running 3: Reverse running 4: Jogging running 5: Zero-speed running 6: Ready for operation 7: AC drive fault 8: AC drive overload pre-alarming 9: Motor overload pre-alarming 10: AC drive underload pre-alarming 11: Frequency arrival 12: Upper limit Freq attained 13: Lower limit Freq attained 14: Frequency detection FDT1 15: Frequency detection FDT2 16: Frequency 1 reached 17: Frequency 2 reached 18: Reserved 19: Completion of PLC stage 20: Completion of PLC Circle 21: PID sleeping 22: Current 1 reached 23: Current 2 reached 24: Reserve 25: Setting count value attained 26: Designated count value attained 27: Setting length attained 28: Designated length attained 29: Setting running time reached 30: Communication setting 31: Output DI1 32: Output Di2 33: Limit the output Di1 34: AI1 input limit exceeded 35: Reserve 36: PID feedback offline 37: Motor overheat warning	0	○	0x0C01
F12.02	Reserved				
F12.03	Relay T1 output		1	○	0x0C03
F12.04	Reserved				
F12.05	Reserved				
F12.06	Polarity of output terminals	0:Positive logic 1:Negative logic Units position: D01 active mode Tens position: HDO active mode Hundreds position: T1 active mode Thousand position: Reserved Ten thousands position: Reserved	0	○	0xC06

Function code	Name	Setup range	Default Value	Modification	Add.
F12.07	DO1 switch-on delay time	0.0~3600.0s	0.0s	○	0x0C07
F12.08	DO1 switch-off delay time	0.0~3600.0s	0.0s	○	0x0C08
F12.09	Reserved				
F12.10	Reserved				
F12.11	T1 switch-on delay time	0.0~3600.0s	0.0s	○	0x0C0B
F12.12	T1 switch-off delay time	0.0~3600.0s	0.0s	○	0x0C0C
F12.13	Reserved				
F12.14	Reserved				
F12.15	Reserved				—
F12.16	Reserved				—
F12.17	Frequency arrival detection value	0.0%~100.0%	0.0%	○	0x0C11
F12.18	FDT1 frequency detection value	0.00Hz~F01.07(Max. frequency)	50.00Hz	○	0x0C12
F12.19	FDT1 frequency detection hysteresis	0.0%~100.0%	5.0%	○	0x0C13
F12.20	FDT2 frequency detection value	0.00Hz~F01.07(Max. frequency)	50.00Hz	○	0x0C14
F12.21	FDT2 frequency detection hysteresis	0.0%~100.0%	5.0%	○	0x0C15
F12.22	Detection of any frequency 1	0.00Hz~F01.07(Max. frequency)	50.00Hz	○	0x0C16
F12.23	Detection width of any frequency 1	0.0%~100.0%(Max. frequency)	0	○	0x0C17
F12.24	Detection of any frequency 2	0.00Hz~F01.07(Max. frequency)	50.00Hz	○	0x0C18
F12.25	Detection width of any frequency 2	0.0%~100.0%(Max. frequency)	0	×	0x0C19

Function code	Name	Setup range	Default Value	Modification	Add.
F12.26	Reserved				
F12.27	Reserved				
F12.28	Any current reaching 1 value	0.0%~300.0%(Motor rated current)	100.0%	○	0x0C1C
F12.29	Any current reaching 1 amplitude	0.0%~300.0%(Motor rated current)	0.0%	○	0x0C1D
F12.30	Any current reaching 2 value	0.0%~300.0%(Motor rated current)	100.0%	○	0x0C1E
F12.31	Any current reaching 2 amplitude	0.0%~300.0%(Motor rated current)	0.0%	○	0x0C1F
F12.32	AI1 input voltage lower limit	0.0V~F12.33	3. 0V	○	0x0C20
F12.33	AI1 input upper limit voltage	F12.32~10.00V	7.0V	○	0x0C21
F12.34~ F12.40	Reserved				

Function code	Name	Setup range	Default Value	Modification	Add.
Group F14 Analog Curve And Pulse Input Setting Function Group					
F14.00	Lower limit of AI1	0.00V~ F14.02	0.00V	○	0x0E00
F14.01	Corresponding setting of the lower limit of AI1	-100.0%~100.0%	0.0%	○	0x0E01
F14.02	Ai1 inflexion 1 input	F14.00~F14.04	10.00V	○	0x0E02
F14.03	Corresponding percentage of AI1 inflexion 1 input	-100.0%~100.0%	100.0%	○	0x0E03
F14.04	Ai1 inflexion 2 input	F14.02~F14.06	10.00V	○	0x0E04
F14.05	Corresponding percentage of AI1 inflexion 2 input	-100.0%~100.0%	100.0%	○	0x0E05
F14.06	Upper limit of AI1	F14.04~10.00V	10.00V	○	0x0E06
F14.07	Corresponding setting of the upper limit of AI1	-100.0%~100.0%	100.0%	○	0x0E07
F14.08	AI1 input filter time	0.00s~10.00s	0.100s	○	0x0E08
F14.09~ F14.26	AI2 min. input	0.00V~F14.11	0.00V	○	0x0E09

Function code	Name	Setup range	Default Value	Modification	Add.
F14.27	AI lower than Min. input setting selection	Ones: AI1 lower than minimum input setting selection 0: Corresponding percentage of min. input 1：0. 0% Tens:Reserved Hundreds: Reserved	0x000	○	0x0E1B
F14. 28	Lower limit frequency of pulse DI5	0.00KHz~F14.30	0.00 KHz	○	0x0E1C
F14. 29	Corresponding setting of lower limit frequency of pulse DI5	-100.0%~100.0%	0.0%	○	0x0E1D
F14. 30	Upper limit frequency of pulse DI5	F14.28~100.00KHz	50.00 KHz	○	0x0E1E
F14. 31	Corresponding setting of upper limit frequency of pulse DI5	-100.0%~100.0%	100.0%	○	0x0E1F
F14. 32	Input filter time of pulse DI5	0.00s~10.00s	0.10s	○	0x0E20

Function code	Name	Setup range	Default Value	Modification	Add.
Group F15 Analog Curve And Pulse Output Setting Function Group					
F15.00	AO1 output	0: Running frequency 1: Setting frequency 2: Output current (relative to twice rated current of the motor) 3: Output voltage 4: High speed pulse DI5 input value 5: Analog AI1 input value 6: Reserve 7: Reserve 8: Length 9: Count value 10: Running time 11: Output torque 12: Output power 13: Communication setting 14: Keypad potentiometer setting	0	○	0x0F00
F15.01	Reserved				
F15.02	DO output selection		0	○	0x0F02
F15.03	Ao1 output lower limit	0.0%~F15-05	0.0%	○	0x0F03
F15.04	AO1 output lower limit corresponding output	0.00V~10.00V	0.00V	○	0x0F0
F15.05	Ao1 output upper limit	F15.03~100.0%	100.0%	○	0x0F0
F15.06	AO1 output upper limit corresponding output	0.00V~10.00V	10.00V	○	0x0F0
F15.07~ F15.10	Reserve				
F15.11	HDO output lower limit	0.0%~F15.13	0.0%	○	0x0F0B
F15.12	The lower limit corresponds to the HDO output	0.00kHz~60.00kHz	0.00kHZ	○	0x0F0C
F15.13	HDO output upper limit	F15.11~100.0%	100.0%	○	0x0F0D
F15.14	The upper limit corresponds to the HDO output	0.00kHz~60.00kHz	10.00kHz	○	0x0F0

Function code	Name	Setup range	Default Value	Modification	Add.
Group F16 AI/AO Correction Group					
F16.00	Reserved		Correction before delivery		
F16.01	AI1 measured voltage1	0.000V~10.000V		○	0x1001
F16.02	AI1 display voltage1	0.000V~10.000V		○	0x1002
F16.03	AI1 measured voltage2	0.000V~10.000V		○	0x1003
F16.04	AI1 display voltage 2	0.000V~10.000V		○	0x1004
F16.05~ F16.12	Reserved				
F16.13	AO1 measured voltage 1	0.000V~10.000V		○	0x100D
F16.14	AO1 display voltage 1	0.000V~10.000V		○	0x100E
F16.15	AO1 measured voltage 2	0.000V~10.000V		○	0x100F
F16.16	AO1 display voltage 2	0.000V~10.000V		○	0x1010
F16.17~ F16.20	Reserved				

Function code	Name	Setup range	Default Value	Modification	Modification
Group F18 Serial Communication Function Group					
F18.00	Local communication address	0~247 0: Reserve 1-247: slave address	1	○	0x1200
F18.01	Communication baud rate	Units position : Modbus Communication baud rate 0:300BPS 1:600BPS 2:1200BPS 3:2400BPS 4:4800BPS 5:9600BPS 6:19200BPS 7:38400BPS 8:57600BPS 9:115200BPS Tens position :Reserved	45	○	0x1201
F18.02	Data format symbol	0: No check (8-N-2) 1: Even parity check (8-E-1) 2: Odd parity check (8-O-1) 3: No check, data format (8-N-1) （MODBUS communication setting)	0	○	0x1202
F18.03	Answer delay	0~20ms	2ms	○	0x1203
F18.04	Fault time of communication overtime	0.0s (Invalid); 0.1~60.0s	0.0s	○	0x1204
F18.05	Reserved				
F18.06	Current resolution readby communication	0: 0.01A 1: 0.1A	0	○	0x1206
F18.07~ F18.31	Reserved	—	—	*	—

Function code	Name	Setup range	Default Value	Modification	Add.
		Group F19 PID Control Group			
F19.00	PID reference source	Units position: PID reference source 0: Keypad potentiometer setting 1: PID digital setting(F19.02) 2: AI1 3: Reserve 4: Reserve 5: Pulse DI5 6: Communication setting Tens position: PID feedback source 0: AI1 1: Reserve 2: Reserve 3: Reserve 4: Reserve 5: Reserve 6: Reserve 7: Pulse DI5 8: Communication setting	01	○	0x1300
F19.01	PID range	0~65535	1000	○	0x1301
F19.02	PID digital 1 setting	0~F19.01	500	○	0x1302
F19.03	Reserved				
F19.04	PID operation direction	0: PID output is positive 1: PID output is negative	0	○	0x1304
F19.05	Proportional gain(P1)	0.0~1000.0	20.0	○	0x1305
F19.06	Intergal time(I1)	0.01s~10.00s	2.00s	○	0x1306
F19.07	Differential time(D1)	0.000s~10.000s	0.000s	○	0x1307
F19.08	PID offse limit	0.00~50.0%	0.0%	○	0x1308
F19.09	PID differential limit	0.0%~100.0%	1.0%	○	0x1309
F19.10	PID reference change time	0.00~650.00s	0.00s	○	0x130A
F19.11	PID feedback filter time	0.00~60.00s	0.00s	○	0x130B
F19.12	PID output filter time	0.00~60.00s	0.00s	○	0x130C
F19.13	Proportional gain(P2)	0.0~1000.0	20.0	○	0x130D
F19.14	Intergal time(I2)	0.01s~10.00s	2.00s	○	0x130E
F19.15	Differential time(D2)	0.000s~10.000s	0.000s	○	0x130F

Function code	Name	Setup range	Default Value	Modification	Add.
F19.16	Upper limit Freq when opposite to rotary set direction	0.00Hz~F01.07(max. frequency)	0.00Hz	○	0x1310
F19.17	PID Preset Value	0.0%~100.0%	0.0%	○	0x1311
F19.18	PID Preset Value Keeping time	0.0~650.0s	0.00s	○	0x1312
F19.19	PID Hibernate Frequency	0.00Hz~F19.21	0.00Hz	○	0x1313
F19.20	PID Hibernate Delay Time	0.0~6500.0s	0.0s	○	0x1314
F19.21	PID Awaken Value	0.0~100.0%	0.0%	○	0x1315
F19.22	PID Awaken Value delay time	0.0~6500.0s	0.5S	○	0x1316
F19.23~ F19. 26	Reserved				
F19.27	Detection value of feedback offline	0.0~100.0%	0.0%	○	0x131B
F19.28	Detection time of feedback offline	0.0~6500.0s	0.0s	○	0x131C
F19.29	PID feedback offline processing	0: Alarm and stop freely 1: Alarm and stop according to the stop mode 2: No alarm and continue to run	0	○	0x131D
F19.30	Reserved				

Function code	Name	Setup range	Default Value	Modification	Add.
Group F20 Swing Frequency, Fixed Length, Count and Timing					
F20.00	Swing Frequency setting mode	0: Relative to center frequency 1: Relative to Max. frequency	0	○	0x1400
F20.01	Swing frequency amplitude	0.0~100.0%	0.0%	○	0x1401
F20.02	Kick frequency amplitude	0.0~50.0%	0.0%	○	0x1402
F20.03	Cycle of swing frequency	0.1s~3000.0s	10.0s	○	0x1403
F20.04	Triangular wave ramp-up time coefficient	0.1%~100.0%	50.0%	○	0x1404
F20.05	Setup length	0~65535m	1000m	○	0x1405
F20.06	Reserved				
F20.07	The number of pulses of each meter	0.1~6553.5	100.0	○	0x1407
F20.08	Reserved		1000	○	0x1408
F20.09	Designated count value	1~65535	1	○	0x1409
F20.10	Running time setting	0.0~65535min	0.0Min	○	0x140A
F20.11	Reserved				

Function code	Name	Setup range	Default Value	Modification	Add.
Group F21 Simple PLC and Multi-step Freq Control Group					
F21.00	Multi-step Freq 0	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x1500
F21.01	Multi-step Freq 1	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x1501
F21.02	Multi-step Freq 2	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x1502
F21.03	Multi-step Freq 3	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x1503
F21.04	Multi-step Freq 4	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x1504
F21.05	Multi-step Freq 5	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x1505
F21.06	Multi-step Freq 6	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x1506
F21.07	Multi-step Freq 7	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x1507
F21.08	Multi-step Freq 8	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x1508
F21.09	Multi-step Freq 9	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x1509
F21.10	Multi-step Freq 10	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x150A
F21.11	Multi-step Freq 11	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x150B
F21.12	Multi-step Freq 12	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x150C
F21.13	Multi-step Freq 13	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x150D
F21.14	Multi-step Freq 14	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x150E
F21.15	Multi-step Freq 15	0.0Hz~F01.07(Max.Freq)	0.00Hz	○	0x150F
F21.16	Simple PLC running method	Ones : PLC runmode 0: Stop after running once 1: Run at the final value after running once 2: Cycle running Tens : Unit of simple PLC runtime 0: Second (s) 1: Minute (min)	00	○	0x1510
F21.17	Simple PLC memory selection when in power loss	Ones: Power loss memory 0:No memory on power loss 1: Memorized on power loss Tens: Stop memory 0:No memory on stop 1: Memorized on stop	00	○	0x1511
F21.18	The running time of step 0	0.0~6553.5s(min)	0.00s (Min)	○	0x1512

Function code	Name	Setup range	Default Value	Modification	Modification
F21.19	Setting of multi-step 0	Ones :Run direction 0: Forward 1: Reverse Tens: Accel/Decel time 0: Accel/Decel time 1 1: Accel/Decel time 2 2: Accel/Decel time 3 3: Accel/Decel time 4 Hundreds : Freq setting 0: Multi-step Freq 0 (F21.00) 1: Keypad digital setting 2: Keypad potentiometer setting 3: AI1 setting 4: Reserve 5: Reserve 6: DI5 pulse input 7: Process PID output 8: Communication setting	000	○	0x1513
F21.20	The running time of step 1	0.0~6553.5s(min)	0.0s	○	0x1514
F21.21	Setting of multi-step 1	Same as F21-19	000	○	0x1515
F21.22	The running time of step 2	0.0~6553.5s(min)	0.0s	○	0x1516
F21.23	Setting of multi-step 2	Same as F21-19	000	○	0x1517
F21.24	The running time of step 3	0.0~6553.5s(min)	0.0s	○	0x1518
F21.25	Setting of multi-step 3	Same as F21-19	000	○	0x1519
F21.26	The running time of step 4	0.0~6553.5s(min)	0.0s	○	0x151A
F21.27	Setting of multi-step 4	Same as F21-19	000	○	0x151B
F21.28	The running time of step 5	0.0~6553.5s(min)	0.0s	○	0x151C
F21.29	Setting of multi-step 5	Same as F21-19	000	○	0x151D
F21.30	The running time of step 6	0.0~6553.5s(min)	0.0s	○	0x151E
F21.31	Setting of multi-step 6	Same as F21-19	000	○	0x151F

Function code	Name	Setup range	Default Value	Modification	Modification
F21.32	The running time of step 7	0.0~6553.5s(min)	0.0s	○	0x1520
F21.33	Setting of multi-step 7	Same as F21-19	000	○	0x1521
F21.34	The running time of step 8	0.0~6553.5s(min)	0.0s	○	0x1522
F21.35	Setting of multi-step 8	Same as F21-19	000	○	0x1523
F21.36	The running time of step 9	0.0~6553.5s(min)	0.0s	○	0x1524
F21.37	Setting of multi-step 9	Same as F21-19	000	○	0x1525
F21.38	The running time of step 10	0.0~6553.5s(min)	0.0s	○	0x1526
F21.39	Setting of multi-step 10	Same as F21-19	000	○	0x1527
F21.40	The running time of step 11	0.0~6553.5s(min)	0.0s	○	0x1528
F21.41	Setting of multi-step 11	Same as F21-19	000	○	0x1529
F21.42	The running time of step 12	0.0~6553.5s(min)	0.0s	○	0x152A
F21.43	Setting of multi-step 12	Same as F21-19	000	○	0x152B
F21.44	The running time of step 13	0.0~6553.5s(min)	0.0s	○	0x152C
F21.45	Setting of multi-step 13	Same as F21-19	000	○	0x152D
F21.46	The running time of step 14	0.0~6553.5s(min)	0.0s	○	0x152E
F21.47	Setting of multi-step 14	Same as F21-19	000	○	0x152F
F21.48	The running time of step 15	0.0~6553.5s(min)	0.0s	○	0x1530
F21.49	Setting of multi-step 15	Same as F21-19	000	○	0x1531
F21.50	Reserved				

Function code	Name	Setup range	Default Value	Modification	Modification
Group F28 Strengthen Function Groups					
F28.00	Carrier frequency setting	0.8~8.0K	Model dependent	○	0x1C00
F28.01	Carrier frequency adjusted with temperature	0: Invalid 1: Valid	1	○	0x1C01
F28.02	PWM mode	0: Three-phase modulation 1: Three-phase and two-phase modulation switching	0	×	0x1C02
F28.03	Random PWM	0: Fixed PWM 1~10: Random PWM coefficient	0	×	0x1C03
F28.04	Voltage over modulation coefficient	100~110	105	×	0x1C04
F28.05	Cooling FanQ Control	0: Fan runs when running 1: The fan keeps running	0	×	0x1C05

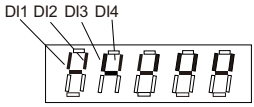
Function code	Name	Setup range	Default Value	Modification	Add.
Group F29 Protection Parameters Group					
F29.00	Input/Output Phase loss protection	0x00~0x11 Ones: Input phase loss protection 0: Disable 1: Enable Tens: Output phase loss protection 0: Disable 1: Enable	0x11	×	0x1D00
F29.01	Detection of short-circuit to ground	0x00~0x11 Ones: Detection of short-circuit to ground upon power-on 0: Disable 1: Enable Tens: Reserve	0x01	×	0x1D01
F29.02	Motor overload protection	0: Invalid 1: Valid	1	×	0x1D02
F29.03	Motor overload protection gain	50~300	100	×	0x1D03
F29.04	Reserved				
F29.05	Overload pre-alarm detection	50.0%~200%	150%	○	0x1D05
F29.06	Reserved				
F29.07	Motor underload protection	0: Invalid 1: Valid	0	×	0x1D07
F29.08	Underload pre-alarm detection	0.0%~100%	25%	○	0x1D08
F29.09	Underload pre-alarm detection time	0.1s~60.0s	1.0s	○	0x1D09

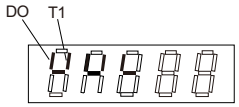
Function code	Name	Setup range	Default Value	Modification	Add.
F29.10	Reserved				
F29.11	Fault reset times	0~20	0	○	0x1D0B
F29.12	Selection of DO action during auto reset	0: Not act 1: Act	0	○	0x1D0C
F29.13	Delay time of auto reset	0.0s~100.0s	1.0s	○	0x1D0D
F29.14	Detection level of speed error	0.0%~50.0%	20.0%	○	0x1D0E
F29.15	Detection time of speed error	0.0:Don't detection 0.1s~60.0s	5.0s	○	0x1D0F
F29.16	Overspeed detection level	0.0%~50.0%	20.0%	○	0x1D10
F29.17	Overspeed detection time	0.0:Don't detection 0.1s~60.0s	1.0s	○	0x1D11
F29.18	Power dip ride-through function selection	0: Disabled 1: Bus voltage constant control 2: Decelerate to stop	0	×	0x1D12
F29.19	Threshold of power dip ride-through function disabled	80.0%~100.0%	85.0%	×	0x1D13
F29.20	Judging time of bus voltage recovering from power dip	0.0s~100.0s	0.5s	×	0x1D14
F29.21	Threshold of power dip ride-through function enabled	60.0%~100.0%	80.0%	×	0x1D15
F29.22~ F29.24	Reserved				

Function code	Name	Setup range	Default Value	Modification	Add.
Group F30 User-Defined Parameters Group					
F30. 00	User-Defined Parameter 0	F00. 00~F99.XX	F00.01	○	0x1E00
F30. 01	User-Defined Parameter 1	F00. 00~F99.XX	F02.00	○	0x1E01
F30. 02	User-Defined Parameter 2	F00. 00~F99.XX	F01.00	○	0x1E02
F30. 03	User-Defined Parameter 3	F00. 00~F99.XX	F01.04	○	0x1E03
F30. 04	User-Defined Parameter 4	F00. 00~F99.XX	F01.05	○	0x1E04
F30. 05	User-Defined Parameter 5	F00. 00~F99.XX	F03.00	○	0x1E05
F30. 06	User-Defined Parameter 6	F00. 00~F99.XX	F03.01	○	0x1E06
F30. 07	User-Defined Parameter 7	F00. 00~F99.XX	F04.00	○	0x1E07
F30. 08	User-Defined Parameter 8	F00. 00~F99.XX	F04.07	○	0x1E08
F30. 09	User-Defined Parameter 9	F00. 00~F99.XX	F11.00	○	0x1E09
F30. 10	User-Defined Parameter 10	F00. 00~F99.XX	F11.01	○	0x1E0A
F30. 11	User-Defined Parameter 11	F00. 00~F99.XX	F11.02	○	0x1E0B
F30. 12	User-Defined Parameter 12	F00. 00~F99.XX	F12.03	○	0x1E0C
F30. 13	User-Defined Parameter 13	F00. 00~F99.XX	F15.00	○	0x1E0D
F30. 14	User-Defined Parameter 14	F00. 00~F99.XX	F02.03	○	0x1E0E
F30. 15	User-Defined Parameter 15	F00. 00~F99.XX	F02.09	○	0x1E0F
F30. 16	User-Defined Parameter 16	F00. 00~F99.XX	F28.00	○	0x1E10
F30. 17	User-Defined Parameter 17	F00. 00~F99.XX	F00.00	○	0x1E11
F30. 18	User-Defined Parameter 18	F00. 00~F99.XX	F00.00	○	0x1E12
F30. 19	User-Defined Parameter 19	F00. 00~F99.XX	F00.00	○	0x1E13
F30. 20	User-Defined Parameter 20	F00. 00~F99.XX	F00.00	○	0x1E14
F30. 21	User-Defined Parameter 21	F00. 00~F99.XX	F00.00	○	0x1E15
F30. 22	User-Defined Parameter 22	F00. 00~F99.XX	F00.00	○	0x1E16
F30. 23	User-Defined Parameter 23	F00. 00~F99.XX	F00.00	○	0x1E17
F30. 24	User-Defined Parameter 24	F00. 00~F99.XX	F00.00	○	0x1E18
F30. 25	User-Defined Parameter 25	F00. 00~F99.XX	F00.00	○	0x1E19
F30. 26	User-Defined Parameter 26	F00. 00~F99.XX	F00.00	○	0x1E1A
F30. 27	User-Defined Parameter 27	F00. 00~F99.XX	F00.00	○	0x1E1B
F30. 28	User-Defined Parameter 28	F00. 00~F99.XX	F00.00	○	0x1E1C
F30. 29	User-Defined Parameter 29	F00. 00~F99.XX	F00.00	○	0x1E1D
F30. 30	User-Defined Parameter 30	F00. 00~F99.XX	F00.00	○	0x1E1E
F30. 31	User-Defined Parameter 31	F00. 00~F99.XX	F00.00	○	0x1E1F

Function code	Name	Setup range	Default Value	Modification	Modification
Group F98 History Fault					
F98.00	Current fault type	0: No fault 1: Inverter module protection(E.OUT) 2: Current detection fault(E.ICE) 3: Short circuit to ground(E.ERH) 4: Input phase loss(E.SPI) 5: Output phase loss(E.SPO) 6: Overcurrent during acceleration(E.OC1) 7: Overcurrent during deceleration(E.OC2) 8: Overcurrent at constant speed(E.OC3) 9: Overvoltage during acceleration(E.OU1) 10: Overvoltage during deceleration(E.OU2) 11: Overvoltage at constant speed(E.OU3) 12: Undervoltage(E.LU) 13: AC drive overload(E.OL1) 14: Motor overload(E.OL2) 15: Motor overload prealarm(E.OL3) 16: Motor underload(E.LL) 17: AC drive overheated(E.OH) 18: Motor auto-tuning fault(E.TUNE) 19: EEPROM read-write fault(E.EEP) 20: External fault 1(E.EF1) 21: External fault 2(E.EF2) 22: Port communication fault(E.CE) 23: PID feedback loss(E.PID) 24: Speed feedback fault(E.EDU) 25: Imbalance fault(E.STO) 26: Encoder fault(E.ECD) 27: Motor overheated fault(E.PTC) 28: Reserve 29: Magnetic pole initial position detection falut(E.PLR) 30: Motor switchover fault during running(E.CH) 31: RESERVE	-	*	0x2200
F98.01	Previous fault type		-	*	0x2201
F98.02	Previous 2 fault type		-	*	0x2202
F98.03	Running frequency at current fault	----	----	*	0x2203
F98.04	Output current at current fault	----	----	*	0x2204
F98.05	Output voltage at current fault	----	----	*	0x2205
F98.06	Bus voltage at current fault	----	----	*	0x2206
F98.07	IGBT temperature at current fault	----	----	*	0x2207
F98.08	Input terminals state at current fault	----	----	*	0x2208
F98.09	Output terminals state at current fault	----	----	*	0x2209

Function code	Name	Setup range	Default Value	Modification	Modification
F98.10	AC drive state at current fault	----	----	*	0x220A
F98.11	Power-on time at current fault	----	----	*	0x220B
F98.12	Running time at current fault	----	----	*	0x220C
F98.13	Running frequency at previous fault	----	----	*	0x220D
F98.14	Output current at previous fault	----	----	*	0x220E
F98.15	Output voltage at previous fault	----	----	*	0x220F
F98.16	Bus voltage at previous fault	----	----	*	0x2210
F98.17	IGBT temperature at previous fault	----	----	*	0x2211
F98.18	Input terminals state at previous fault	----	----	*	0x2212
F98.19	Output terminals state at previous fault	----	----	*	0x2213
F98.20	AC drive state at previous fault	----	----	*	0x2214
F98.21	Power-on time at previous fault	----	----	*	0x2215
F98.22	Running time at previous fault	----	----	*	0x2216
F98.23	Running frequency at previous 2 fault	----	----	*	0x2217
F98.24	Output current at previous 2 fault	----	----	*	0x2218
F98.25	Output voltage at previous 2 fault	----	----	*	0x2219
F98.26	Bus voltage at previous 2 fault	----	----	*	0x221A
F98.27	IGBT temperature at previous 2 fault	----	----	*	0x221B
F98.28	Input terminals state at previous 2 fault	----	----	*	0x221C
F98.29	Output terminals state at previous 2 fault	----	----	*	0x221D
F98.30	AC drive state at previous 2 fault	----	----	*	0x221E
F98.31	Power-on time at previous 2 fault	----	----	*	0x221F
F98.32	Running time at previous 2 fault	----	----	*	0x2220

Function code	Name	Setup range	Default Value	Modification	Add.
Group F99 Monitoring Function Group					
F99.00	Output frequency	0.00Hz~F01.08(Upper limit Freq)	----	*	0x2100
F99.01	Setting frequency	0.00Hz~F01.08(Upper limit Freq)	----	*	0x2101
F99.02	Output current	0.01~5000.0A	----	*	0x2102
F99.03	Motor speed	0~65535rpm	----	*	0x2103
F99.04	Load speed display	0~65535	----	*	0x2104
F99.05	Output power	0.1~6553.5KW	----	*	0x2105
F99.06	Output torque	-300.0%~300.0%	----	*	0x2106
F99.07	Output voltage	0~1000V	----	*	0x2107
F99.08	DC bus voltage	0.0~2000.0V	----	*	0x2108
F99.09	AC input voltage	0.0~2000.0V	----	*	0x2109
F99.10	AC drive status	1: Forward 2: Reverse 3: Forward Jogging 4: Reverse Jogging 5: AC drive Fault 6: Under-voltage 7: AC drive stop	----	*	0x210A
F99.11	Fault information	0~33(Corresponding to F98.00)	----	*	0x210B
F99.12	AI1 input voltage	0.00~10.00V	----	*	0x210C
F99.13~ F99.16	Reserved				
F99.17	DI state	0x00~0xFFF	----	*	0x2111
F99.18	DI state display	The state of each function end is indicated by the on-off of the specified section of the LED digital tube. The on-off of the digital tube segment means that the corresponding terminal state is valid, while the off-off means that the corresponding terminal state is invalid. 	----	*	0x2112

Function code	Name	Setup range	Default Value	Modification	Modification
F99.19	DO state	0x00~0xFFF	----	*	0x2113
F99.20	DO state display	Same as F99. 18. 	----	*	0x2114
F99.21	Pulse Input Frequency	0. 01kHz~100. 00kHz	----	*	0x2115
F99.22	Reserved				
F99.23	PID reference	0~65000	----	*	0x2117
F99.24	PID feedback	0~65000	----	*	0x2118
F99.25	Counting value	0~65535	----	*	0x2119
F99.26	Length value	0~65535	----	*	0x211A
F99.27	Linear speed	0~65535	----	*	0x211B
F99.28	Target torque	-300.0%~300.0%	----	*	0x211C
F99.29	Remaining running time	0.1Min~6553.5Min	----	*	0x211D
F99.30	PLC step	0~15	----	*	0x211E
F99.31	Feedback frequency	0. 01Hz~F01. 07(MAX. Freq)	----	*	0x211F
F99.32	Feedback speed of encode	0. 01Hz~F01. 07(MAX. Freq)	----	*	0x2120
F99.33	Reserved				
F99.34	AC drive temperature	-30~200℃	----	*	0x2122
F99.35	Current Power-on time	1Min~65535Min	----	*	0x2123
F99.36	Current Running time	0.1Min~6553.5Min	----	*	0x2124
F99.37	G/P type	0: G type 1: P type	----	*	0x2125
F99.38	AC drive power	0.7~500.0KW	----	*	0x2126
F99.39	Motor seletion	1: Motor 1 2: Motor 2	----	*	0x2127
F99.40	Accumulative power-on time	1Min~65535Min	----	*	0x2128
F99.41	Accumulative running time	0.1Min~6553.5Min	----	*	0x2129

Chapter 5 Troubleshooting

Danger

✦ Only qualified electricians are allowed to maintain the AC drive. Read the safety instruction in chapter safety precaution before working on the AC drive.

No.	Code	Fault	Cause	Solution
1	E.OUT	IGBT protection	♦ The acceleration is too fast . ♦ There is damage to the intern-al to IGBT of the phase. ♦ The connection of the driving wires and the grounding is not good.	♦ Increase Acc time. ♦ Change the power unit. ♦ Check the driving wires. ♦ Check if there is strong interference to the external equipment
2	EICE	Current-detecting fault	♦ The connection of the control board is not good. ♦ Hoare components is broken ♦ The modifying circuit is abnormal.	♦ Check the connector and repatch. ♦ Change the hoare. ♦ Change the main panel.
3	E.ERH	Grounding shortcut fault	♦ The output of the AC drive is short circuited with the ground. ♦ There is fault in the current detection circuit.	♦ The output of the AC drive is short circuited with the ground. ♦ There is fault in the current detection circuit.
4	E.SPI	Input phase loss	♦ Phase loss or fluctuation of input R,S,T.	♦ Check input power
5	E.SPO	Output phase loss	♦ U,V,W phase loss input (or serious asymmetrical three phase of the load)	♦ Check input power
6	E.OC 1	Accelerating overcurrent	♦ The acceleration or deceleration is too fast. ♦ The voltage of the grid is too low. ♦ The power of the AC drive is too low. ♦ The load transient or abnormal. ♦ The grounding is short circuited or the output is phase loss. ♦ There is strong external interference.	♦ Increase the Acc time. ♦ Check the input power. ♦ Select the AC drive with a large power. ♦ Check if the load is short circuited(the grounding short circuited) or the rotation is not smooth. ♦ Check the output configuration. ♦ Check if there is strong interference.
7	E.OC 2	Decelerating overcurrent		
8	E.OC 3	Constant overcurrent		
9	E.OU 1	Accelerating overvoltage	♦ The input voltage is abnormal. ♦ There is large energy feedback.	♦ Check the input power. ♦ Check if the DEC time of the load is too short or the AC drive starts during the rotation of the motor or it needs to increase the energy consumption components.
10	E.OU 2	Decelerating overvoltage		
11	E.OU 3	Constant overvoltage		

No.	Code	Fault	Cause	Solution
12	E.LU	Under-voltage fault	♦ The voltage of the power supply is too low.	♦ Check the input power of the supply line.
13	E.OL1	AC drive overload	♦ The acceleration is too fast. ♦ Reset the rotating motor. ♦The voltage of the power supply is too low. ♦ The load is too heavy.	♦ Increase the Acc time. ♦ Avoid the restarting after stopping. ♦ Check the power of the supply line, ♦ Select an AC drive with bigger power, ♦ Select a proper motor.
14	E.OL2	Motor overload	♦ The voltage of the power supply is too low.	♦ Check the input power of the supply line.
15	E.oL3	Motor overload prealarm	♦ The AC drive will report the overload pre-alarm according to the set value.	♦ Check the load and the overload pre-alarm point.
16	E.LL	Motor underload fault	♦ The AC drive will report the underload pre-alarm according to the set value.	♦ Check the load and the underload pre-alarm point.
17	E.OH	AC drive overheated	♦ Air duct jam or fan damage. ♦ Ambient temperature is too high. ♦ The time of overload running is too long	♦ Lower the ambient temperature. ♦ Clean the ventilation. ♦ Replace the cooling fan. ♦ Replace the damaged thermally sensitive resistor. ♦ Replace the AC Drive IGBT.
18	E.TUE	Motor-autotuning fault	♦ The motor capacity does not comply with the AC drive capability. ♦ The rated parameter of the motor does not set correctly. ♦ The offset between the parameters from autotune and the standard parameter is huge. ♦ Autotune overtime.	♦ Check the connector and repatch. ♦ Change the hoare. ♦ Change the main panel.
19	E.EEP	EEPROM operation fault	♦ Error of controlling the write and read of the parameters. ♦ Damage to EEPROM.	♦ Press STOP/RESET to reset. ♦ Change the main control panel.
20	E.EF1	User-defined fault 1	User-defined fault 1 is input via DI.	Reset the operation.
21	E.EF2	User-defined fault 2	User-defined fault 2 is input via DI.	Reset the operation.
22	E.CE	Communication fault	♦ The baud rate setting is incorrect. ♦ Fault occurs to the communication wiring. ♦ The communication address is wrong. ♦ There is strong interference to the communication.	♦ Set proper baud rate. ♦ Check the communication connection distribution. ♦ Set proper communication address. ♦ Change or replace the connection distribution or improve the anti-interference capability.

No.	Code	Fault	Cause	Solution
23	E.PID	PID feedback outline fault	♦ PID feedback offline. ♦ PID feedback source disappear.	♦ Check the PID feedback signal. ♦ Check the PID feedback source.
24	E.EDU	Speed deviation fault	♦ Encoder parameters are set improperly. ♦ Motor auto-tuning is not performed. ♦ F29. 14 (detection level of speed error) and F29. 15 (detection time of speed error) are setincorrectly.	♦ Set encoder parameters properly. ♦ Perform motor auto-tuning. ♦ Set F9-69 and F9-70 correctly based on actual condition.
25	E.STO	Maladjustment fault	♦The control parameters of the synchronous motors not set properly. ♦ The autoturn parameter is not right. ♦ The AC drive is not connected to the motor.	♦ Check the load and ensure it is normal. ♦ Check whether the control parameter is set properly or not. ♦ Increase the maladjustment detection time.
26	E.ECD	Encoder fault	♦ Encoder is not matched. ♦ Encoder wiring is incorrect. ♦ Encoder is damaged. ♦ PG card is abnormal.	♦ Set the type of encoder correctly. ♦ Check the PG card power supply and phase sequence. ♦ Replace encoder. ♦ Replace PG card.
27	E.PTC	Motor overheat	♦ Cable connection of temperature sensorbecomes loose ♦ The motor temperature is too high.	♦ Check cable connection of temperature sensor. ♦ Check cable connection of temperature sensor.
28	RESERVE			
29	E.PLR	Motor overheat		
30	E.CH	Motor switchover fault	Motor switchover via terminal during drive running of the AC drive	Perform motor switchover after the AC drive stops

Chapter 6 MODBUS Communication Protocol

The AC Drive provides RS485 communication interface and adopts the international standard ModBus communication protocol for master-slave communication. Users can realize centralized control through PC/PLC, control host computer, etc. (setting inverter control commands, operating frequency, modification of relevant function code parameters, monitoring of inverter working status and fault information, etc.) to meet specific application requirements .

6.1 Function Protocol

1.Read a single or multiple data（0x03）

Read data command frame:

ADDR	xx
CMD	0x03
High bit of the start	xx
Low bit of the start	xx
High bit of data number	xx
Low bit of data number	xx
Check low bit of CRC	xx
Check high bit of CRC	xx

Read data: Slave responding frame

ADDR	xx
CMD	0x03
Byte number N*2	N*2
High bit of data 1	xx
Low bit of data 1	xx
……	xx
High bit of data N	xx
Low bit of data N	xx
Check low bit of CRC	xx
Check high bit of CRC	xx

2. Write a single data（0x06）

Read data command frame:

ADDR	xx
CMD	0x06
High bit of register Add.	xx
Low bit of the start	xx
High bit of data number	xx
Low bit of data number	xx
Check low bit of CRC	xx
Check high bit of CRC	xx

Write data response:

ADDR	xx
CMD	0x06
High bit of register Add.	xx
Low bit of the start	xx
High bit of data number	xx
Low bit of data number	xx
Check low bit of CRC	xx
Check high bit of CRC	xx

3. compound Command （0x08）

ADDR	xx
CMD	0x08
High bit of start/ stop command	xx
Low bit of start/ stop command	xx
High bit of Setting frequency value	xx
Low bit of Setting frequency value	xx
Check low bit of CRC	xx
Check high bit of CRC	xx

Slave no response

4.The error message response

Sometimes, errors occurs during the process of the communication. For example, reading or writing data to an illegal address, etc., then the slave will not work as a normal read-write response to reply the host, but send a wrong message frame. Error message frame format is as follows, where the command code is the result of the operation between highest-bit (Bit 7) of host operation and 1 (read error is 0x83 / write error is 0x86).

ADDR	xx
CMD	0x83或0x86
Error code	xx
Check low bit of CRC	xx
Check high bit of CRC	xx

The error code define as follows:

Error Code	Descriptions
01H	Illegal function code
02H	Illegal Data Add
03H	Illegal Data Value Reasons: 1: Limit exceeded 2: Write operation to read-only parameters 3: In running state, parameter write operation is prohibited 4: The slave is busy, mainly when storing data to the EEPROM

6.2 Communication Parameters Address

MODBUS communication includes read and write functions of the parameters of the operation of some special registers read and write operations, which include the control register, set register, state register and factory information.

1. The Definition of Function Parameter Add.

The group number of the AC Drive function code is mapped to the high byte of the register address, and the parameter number in the group is mapped to the low byte of the register address. For example, to access F01.12, the access address of the parameter is 0x010C.

Function code group	Absolute Add.	Function code group	Absolute Add.
F00 Group	0x00	F01Group	0x01
F02 Group	0x02	F03Group	0x03
F04 Group	0x04	F05Group	0x05
F06 Group	0x06	F07Group	0x07
F08 Group	0x08	F09Group	0x09
F10 Group	0x0A	F11Group	0x0B
F12 Group	0x0C	F13Group	0x0D
F14 Group	0x0E	F15Group	0x0F
F16 Group	0x10	F18Group	0x12
F19 Group	0x13	F20Group	0x14
F21 Group	0x15	F28Group	0x1C
F29 Group	0x1D	F30Group	0x1E
F98 Group	0x22	F99Group	0x21

Note:

Because EEPROM is frequently stored, it will reduce the life of EEPROM. Therefore, some parameters in the mode of communication don't need to store as long as change the value of RAM. Absolute address in the table corresponds to the high byte of RAM address, to achieve this function, simply add 0X40 to all high bytes in the table.

For example:

The parameter F01.12 is stored in EEPROM , and the address is represented as 0x010C;

The parameter F01.12 is not stored in the EEPROM, and the address is represented as 0x410C;

Read of both EEPROM address and RAM address are valid.

When read the function code parameters, user can only read the maximum of 16 consecutive address parameters.more than 16, the AC drive will return the illegal data.

When writing function parameter, each can only write a parameter. Users should pay attention to the setting value that cannot exceed the set range of function parameters.

Function parameters set permissions and function code attributes related parameters, such as read-only parameter is not writable, the operation cannot be changed in the running also cannot be written.

The password is set by the user, in the case without decryption, all of the parameters cannot write.

User password and parameter autotune cannot via communication to write. Otherwise, the AC drive will return the fault information.

2.The Definition of the Status Parameters

Add.	Number	Setting instruction	R/W
2100H	F99.00	Output frequency	R
2101H	F99.01	Setting frequency (R/W,Write command will change the communication set frequency value)	W/R
2102H	F99.02	Output current	R
……	……	……	R
210AH	F99.10	AC drive status 1: Forward running 2: Reverse running 3: Forward jogging 4: Reverse jogging 5: AC drive fault 6: Under-voltage status 7: AC drive stop	R
210BH	F99.11	AC Drive Current Fault 0: No fault 1: IGBT protection 2: Current detecting fault 3: Grounding shortcut fault 4: Input phase loss 5: Output phase loss 6: Accelerating over-current 7: Decelerating over-current 8: Constant over-current 9: Accelerating over-voltage 10: Decelerating over-voltage 11: Constant over-voltage 12: Under-voltage fault 13: AC drive overload 14: Motor overload 15: Motor overload prealarm 16: Motor underload fault 17: AC drive overheating 18: Motor self-learning fault 19: Parameter reading and writing fault 20: External fault 1 21: External fault 2 22: Communication error 23: PID feedback disconnection 24: Speed deviation fault 25: Offset fault 26: Encoder fault 27: Motor over temperature fault 28: Output signal feedback error 29: Magnetic pole initial position detection failed 30: Switch the motor while running 31: Reserved 32: Power-on time arrives 33: Running time arrives	R
……	……	……	R
2117H	F99.23	PID reference (R/W,Write command will change the communication PID setting value)	W/R
2118H	F99.24	PID feedback (R/W,Write command will change the communication PID feedback value)	W/R
……	……	……	R

3.The Definition of the Special Register Address

Register	Function instruction	Add	Setting instruction	R/W
Control Register	Control register	2000H	0001H: Forward running 0002H: Reverse running 0003H: Forward jogging 0004H: Reverse jogging 0005H: Dcclerate stop 0006H: Coast to stop(emergency stop) 0007H: Fault reset	W
Setting Register	Torque setting value	2001H	-10000~10000 （Corresponding to-200.0%~200.0%）	W
	Forward upper limit frequency	2002H	0 ~ 10000 （Corresponding to 0~Fmax）	W
	Reverse upper limit frequency	2003H	0 ~ 10000 （Corresponding to 0~Fmax）	W
	Electric torque upper limit value	2004H	0 ~ 10000	W
	Brake torque upper limit value	2005H	0 ~ 10000	W
	Voltage setting on VF separated pattern	2006H	0 ~ 1000 （Corresponding to 0~Motor rated voltage）	W
	Docontrol	2007H	0 ~ 0x000F	W
	Ao1control	2008H	0 ~ 0x7FFF	W
	Ao2control	2009H	0 ~ 0x7FFF	W
	HDOcontrol	200AH	0 ~ 0x7FFF	W

Note:

1. R is read-only, invalid write and error reporting address;

2. W for write only, invalid read and error reporting address.

Product Warranty Card

Customer information	**Add. of corporation：**	
	Name of corporation：	**Contact person：**
	P.C.：	**Tel.：**
Product information	**Product model：**	
	Body bar code：	
	Name of agent：	
Failure information	**(maintenance time and content)：** **Maintenance personnel：**	

version：V1.0