Preface

Thank you for purchasing SINCR C10&C500 Series frequency inverter made by Shenzhen SINCREA Electrical Technology Co.,Ltd.

C10 series inverter is a universal mini multi-function frequency converter. It adopts open-loop vector and V/F control mode. It can realize asynchronous motor control with high-performance current vector control technology. The power range covers 0.75kW~4kW. Stable, reliable and easy to use are important features.

C500 series inverter is a general-purpose high-performance current vector inverter that perfectly controls three-phase AC asynchronous motors. Built-in PID, multi-speed, simple PLC, input and output terminals, pulse frequency reference, power off and shutdown parameter storage selection, frequency reference channel and running command channel binding, dual frequency source given control, swing frequency control, etc. To provide highly integrated, all-in-one solutions for industry customers,which are extremely valuable for reducing system costs and increasing system reliability.

In order to ensure the correct use of this series of inverters, to maximize the performance of the product and to ensure the safety of users and equipment, please read this manual carefully before using the inverter.

When the inverter is connected to the motor for the first time, please set the motor nameplate parameters: rated frequency, rated power, rated voltage, rated current, rated speed, rated power factor and motor connection.

As we are committed to continuous improvement of our products and product information, the information provided by the company is subject to change without notice.

For the latest changes and more, please visit: www.sincrea.com

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Chapter 1 Safety and precautions

Please read this operation manual carefully before installing, operating, maintaining and inspecting

1.1 Logo and definition of safety

In this manual, the safety precautions are sorted to “DANGER” ,“FORBID” and“CAUTION”.

DANGER Indicate if you do not use it properly, it may cause danger such as death or series injury

FORBID Indicate absolutely can not do.

CAUTION Indicate if you do not use it properly, it may cause danger such as slight injury or equipment broken

1.2 Safety requirement

DANGER
● This series of inverter is used to control the three-phase motor, cannot be used for single-phase motor or for other purposes, otherwise may cause the inverter failure or fire. ● This series of inverter cannot be simply applied to medical device or other devices which directly are related to the personal safety. ● This series of inverter is produced under strict quality control system, if the inverter fault may cause a big accident or loss, you will need to set up security measures such as re dundant or bypass, just in case.

Receiving inspection

CAUTION
● Do not use the damaged inverter or inverter with missing parts.Otherwise, there may be risk of injury. ● Check the inverter nameplate rating is consistent with your order.If not, please contact the manufacturer in a timely manner.

Install

CAUTION

- Mount the inverter on incombustible surface like metal, and keep away from flammable substances and heat souces.
- Install environment No rain shower,water drop,steam,dust,Oily dirt;No corrosion, flammable gas, liquid;No metal particles or metal powder, etc.
- When installing, don't let the drilling debris drop into the inverter， Otherwise it may cause inverter fault.
- When the inverter installed in electric closet,Should ensure that ventilation fluency for electric closet and the outside world.
- Control circuit wiring should be separated from the power circuit wiring,， in order to avoid interference.

Wiring

DANGER

- Operation shall be performed by the professional engineering technician. Otherwise there will be danger of electric shock.
- Make sure the power is disconnected before connecting.Otherwise there will be danger of electric shock.
- The earth terminal PE shall be earthed reliably. Otherwise there may be danger of electric shock.
- Do not touch the inverter terminals (including control terminal).Otherwise there will be danger of electric shock.
- The brake resistor should be connected to the terminals (+) and PB. Otherwise it may cause fire.
- The primary loop connection cable to the exposed part of the interface, Should bind up with insulation tape, otherwise there is a risk of damage to property.

Wiring

CAUTION

- Never connect AC power to output UVW terminals,otherwise may cause inverter fault.
- It is forbidden to connect capacitor or phase advance LC/RC noise filter to output side of inverter,Otherwise may cause inverter fault.
- Confirm the power phase number, rated voltage is consistent with the product nameplate, otherwise it may cause inverter fault.
- Inverter main circuit wiring and control circuit wiring should be separate wiring or vertical cross, otherwise it will cause control signal interference.
- When the cable length between the inverter and motor exceeds 100 meters, it is recommended to use output reactor, in order to avoid too much of the distributed capacitance current resulting in failure of the inverter.

Running

DANGER

- Do not touch the inverter and its surrounding circuit with wet hand, otherwise there is risk of electric shock.
- Inverter wiring is complete and mount plate before electricity, charged conditions are strictly forbidden to remove the cover plate, otherwise there is risk of electric shock.
- When setting the function of fault automatic reset or power failure after restarting, dealing with machinery and equipment security isolation measures, otherwise it may cause injuries.
- After confirming the run command is cut off, you could reset the fault and alarm signals, otherwise it may cause injuries.

1.3 Precautions

Motor Insulation Inspection

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

Thermal Protection of the Motor

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

Running with Frequency higher than Standard Frequency

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

Vibration of Mechanical Device

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

Lubrication of mechanical device

Reducer and gear need lubrication mechanism in the long times running at low speed, due to the lubrication effect may cause damage, customer should be sure to check in advance.

Motor Heating and Noise

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

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

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

Switching Devices like Contactors Used at the Input and Output terminal

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

Using it outside rated voltage

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

Lightning Impulse Protection

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

Altitude and Derating

In areas with altitude more than 1,000 meters, the heat sinking effect of the inverter may turn poorer due to rare air. Therefore, it needs to derate the inverter for use. Please contact our company for technical consulting in case of such condition.

Special Use

If the user needs to use the inverter beyond the recommended wiring diagram in this manual, such as shared DC bus, please consult our company.

Cautions of Inverter Disposal

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

Adaptable Motor

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

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

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

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Chapter 2 Product introduction

2.1 C10 Series

2.1.1 Inverter nameplate

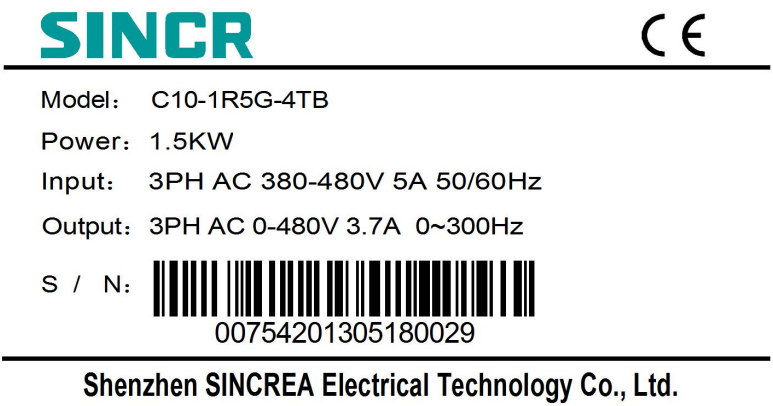


Fig.2-1 C10 Nameplate

2.1.2 Name rules

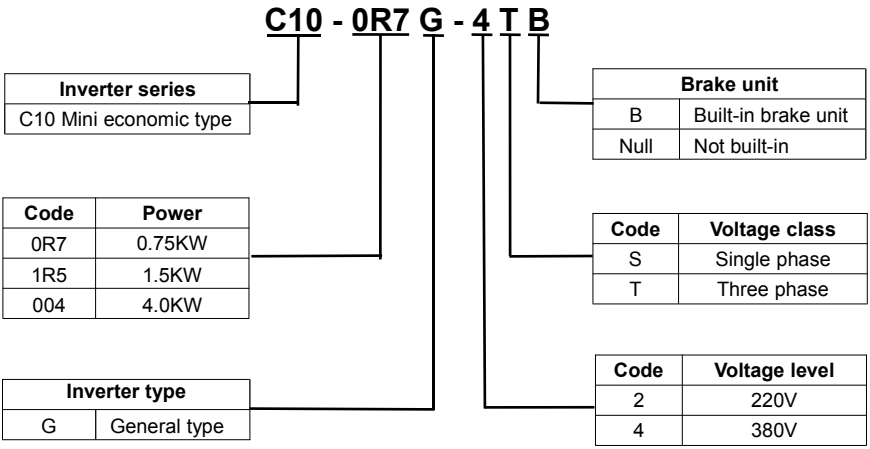


Fig.2-2 C10 Name rules

2.1.3 Selection Guide

Table 2-1 C10 series inverter models and Technical Data

Model	Input Voltage /V	Power /kW	Input current /A	Output current /A	Motor /KW	Brake unit
C10-0R7G-2SB	1PH 220~240	0.75	8.2	4.5	0.75	Built-in
C10-1R5G-2SB		1.5	14.2	7.0	1.5	
C10-2R2G-2SB		2.2	23.0	10	2.2	
C10-0R7G-2TB	3PH 220~240	0.75	5.0	4.5	0.75	
C10-1R5G-2TB		1.5	7.7	7.0	1.5	
C10-2R2G-2TB		2.2	11	10	2.2	
C10-0R7G-4TB	3PH 380~480	0.75	3.4	2.5	0.75	
C10-1R5G-4TB		1.5	5.0	3.7	1.5	
C10-2R2G-4TB		2.2	5.8	5	2.2	
C10-004G-4TB		4.0	10	9	4.0	

2.1.4 General technical specifications of products

Table 2-2 C10 Inverter Technical Specifications

Control	Control method	Closed loop vector	Open loop vector control	V/F control
	Starting torque	----	0.5Hz 150%	1.5Hz 150%
	Speed range	----	1:100	1:50
	Steady speed accuracy	----	±0.2%	±0.5%
	Torque control	----	with	without
	Torque accuracy	----	±10%	----
	Torque response time	----	<20ms	----
Function	Key function	Torque/speed control mode switching, multi-function input/output terminal, undervoltage regulation, three-ground switching, torque limit, multi-speed operation, slip compensation, PID adjustment, simple PLC, current limit control, manual/automatic torque Lift, current limit, AVR function		
	Frequency setting	Operation panel setting, terminal Up/Dn setting, PC setting, analog		
	Output frequency	0.00～3000.0Hz		
	Starting frequency	0.00～60.00Hz		
	Acceleration time	0.01～3600.0s		
	Energy consumption braking capability	400V voltage inverter: braking unit operating voltage: 650 ~ 750V; 200V voltage inverter: braking unit operating voltage: 360 ~ 390V;		

	DC braking capability	DC braking start frequency: 0.00 ~ 300.0Hz; DC braking current: 0.0~100.0%; no need for DC braking start waiting time for fast braking
	Flux braking function	The motor can be quickly decelerated by increasing the magnetic flux of the motor
Special function	Multi-function MFK button	The original multi-function button can be used to set frequently used operations: JOG, forward and reverse switching, running command setting mode switching, etc.
	Parameter copy	Parameter uploading and downloading; you can choose to prohibit uploading overlays for parameters that have already been uploaded.

2.1.5 Product size

2.1.5.1 Machine overall size

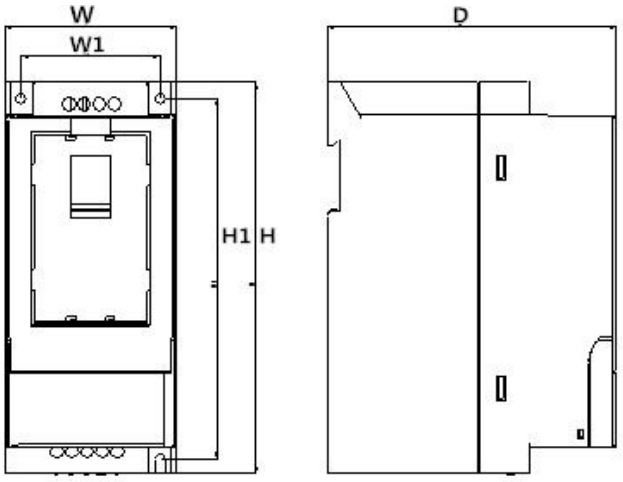


Fig.2-3 C10 Overall size(0.75~4KW)

C10 series(0.75-4KW)					
Product size			Installation size		
W (mm)	H (mm)	D (mm)	W1 (mm)	H1 (mm)	Installation Hole F(mm)
85	190	149	69	175	Φ5

2.1.5.2 The keyboard shape size

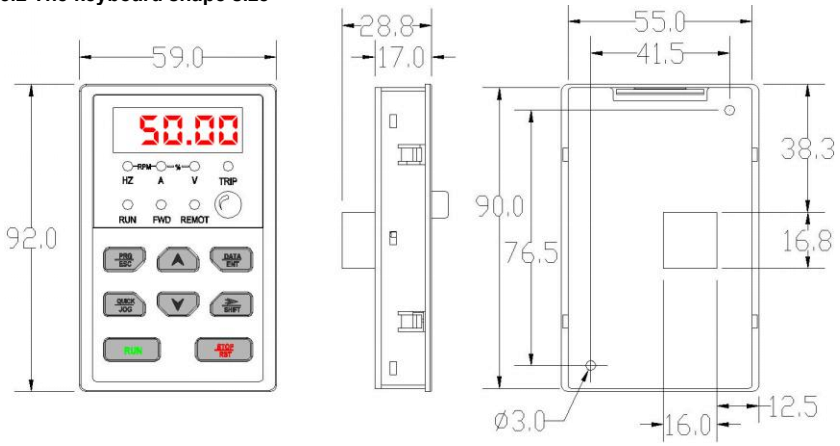


Fig.2-4 C10 Keyboard dimension C10 series(0.75-4KW)（mm）

Keyboard installed base dimension

According to the size of keyboard, keyboard installed base has two kinds of specifications, It is convenient for customers install and fix while operating remote control.

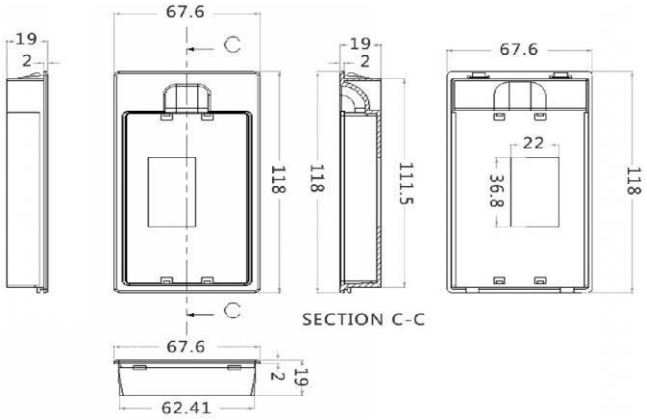


Fig.2-5 C10 Keyboard installed base dimension

2.2 C500 Series

2.2.1 Inverter nameplate

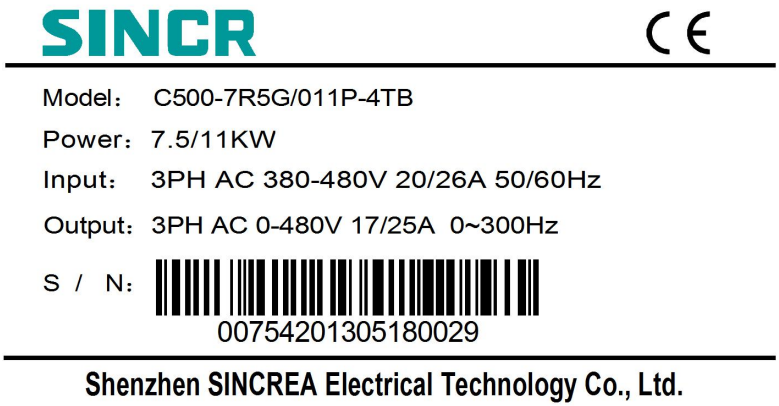


Fig.2-6 C500 Nameplate

2.2.2 Name rules

C500 - 7R5 G/ 011 P - 4 T B

Inverter series
C500 High performance vertor type

Code	Power
0R7	0.75KW
7R5	7.5KW
011	11KW
110	110KW

Inverter type	
G	General type
P	Fans and pump

Brake unit	
B	Built-in brake unit
Null	Not built-in

Code	Voltage class
S	Single phase
T	Three phase

Code	Voltage level
2	220V
4	380V

Fig.2-7 C500 Name rules

2.2.3 Selection Guide

Table 2-3 C500 series inverter models and Technical Data

Model	Input Voltage /V	Power /kW	Input current /A	Output current /A	Motor /KW	Brake unit
C500-0R7G-2SB	1PH 220~240	0.75	8.2	4.5	0.75	Built-in
C500-1R5G-2SB		1.5	14.2	7.0	1.5	
C500-2R2G-2SB		2.2	23.0	10	2.2	
C500-0R7G-2TB	3PH 220~240	0.75	5.0	4.5	0.75	
C500-1R5G-2TB		1.5	7.7	7.0	1.5	
C500-2R2G-2TB		2.2	11	10	2.2	
C500-0R7G-4TB	3PH 380~480	0.75	3.4	2.5	0.75	
C500-1R5G-4TB		1.5	5.0	3.7	1.5	
C500-2R2G-4TB		2.2	5.8	5	2.2	
C500-004G/5R5P-4TB		4.0/5.5	10/15	9/13	4.0/5.5	
C500-5R5G/7R5P-4TB		5.5/7.5	15/20	13/17	5.5/7.5	
C500-7R5G/011P-4TB		7.5/11.0	20/26	17/25	7.5/11.0	
C500-011G/015P-4TB		11.0/15.0	26/35	25/32	11.0/15.0	
C500-015G/018P-4TB		15.0/18.5	35/38	32/37	15.0/18.5	
C500-018G/022P-4TB		18.5/22.0	38/46	37/45	18.5/22.0	
C500-022G/030P-4T		22.0/30.0	46/62	45/60	22.0/30.0	Optional
C500-030G/037P-4T		30.0/37.0	62/76	60/75	30.0/37.0	
C500-037G/045P-4T		37.0/45.0	76/90	75/90	37.0/45.0	Outside
C500-045G/055P-4T		45.0/55.0	90/105	90/110	45.0/55.0	
C500-055G/075P-4T		55.0/75.0	105/140	110/150	55.0/75.0	
C500-075G/090P-4T		75.0/90.0	140/160	150/176	75.0/90.0	
C500-090G/110P-4T		90.0/110.0	160/210	176/210	90.0/110.0	
C500-110G/132P-4T		110.0/132.0	210/240	210/250	110.0/132.0	
C500-132G/160P-4T		132.0/160.0	240/290	250/300	132.0/160.0	
C500-160G/185P-4T		160.0/185.0	290/330	300/340	160.0/185.0	
C500-185G/200P-4T		185.0/200.0	330/370	340/380	185.0/200.0	
C500-200G/220P-4T		200.0/220.0	370/410	380/415	200.0/220.0	
C500-220G/250P-4T		220.0/250.0	410/460	415/470	220.0/250.0	
C500-250G/280P-4T		250.0/280.0	460/500	470/520	250.0/280.0	
C500-280G/315P-4T		280.0/315.0	500/580	520/600	280.0/315.0	
C500-315G/355P-4T		315.0/355.0	580/650	600/640	315.0/355.0	
C500-355G-4T		355.0	650	640	355.0	
C500-400G-4T		400.0	740	730	400.0	
C500-450G-4T		450.0	850	840	450.0	
C500-500G-4T		500.0	900	880	500.0	
C500-560G-4T		560.0	960	950	560.0	
C500-630G-4T		630.0	1170	1160	630.0	
C500-710G-4T		710.0	1310	1300	710.0	
C500-800G-4T		800.0	1460	1450	800.0	

2.2.4 General technical specifications of products

Table 2-4 C500 Inverter Technical Specifications

Item		Specifications
Power Input	Rated input voltage	3 phase: 380V~480V, ±10%, short-term fluctuation -15%~+10%, ie 323V~528V; voltage imbalance rate <3%, distortion rate meets IEC61800-2 requirements
	Rated input current	Reference Table 2-3
	Rated input frequency	50Hz/60Hz, fluctuation range ±5%
Power Output	Adaptable Motor	Reference Table 2-3
	Rated power	Reference Table 2-3
	Rated output current	Reference Table 2-3
	Output voltage	Output 3 phase under rated input condition, 0~rated input voltage, error less than ±3%
Basic Function	Max output frequency	0~300Hz, 0~3000Hz can be customized according to customer needs
	Carrier frequency	1.0kHz~16.0kHz, automatic adjustment of carrier frequency
	Input frequency resolution	Digital setting: 0.01Hz; analog setting: 0.1Hz
	Control mode	No PG vector control, no PG vector control 1, V/F control, torque control, PG vector control.
	Start torque	0.5Hz/150%
	Overload capacity	G type:150% rated current 1 min,180% rated current 10s; P type:120% rated current 1 min,150% rated current 10s;
	Torque boost	Automatic torque boost; manual torque boost 0.1%~30.0%
	Accel/Decel curve	Linear or S-curve acceleration and deceleration. Four acceleration and deceleration time, range 0.0~3600.0s
	DC brake	DC braking frequency: 0.00Hz~maximum frequency, braking time: 0.0s~50.0s, braking action current value: 0.0%~100.0%
	Jog control	Jog frequency range: 0.00Hz~50.00Hz. Jog acceleration/deceleration time 0.0s~3600.0s
	Simple PLC and multi-speed running	Up to 16 speeds via built-in PLC or control terminals
	Built-in PID	Process control closed-loop control system
	Auto voltage regulation（AVR）	Automatically keeps the output voltage constant when the grid voltage changes
	Current suppression	When the VF running load changes, the output current is automatically limited to prevent overcurrent trip and realize the "excavator" characteristics.
	Quick current limit	Minimize overcurrent faults and protect the inverter from normal operation
	Dynamic over-voltage suppression	Automatically suppress energy feedback when operating frequency changes to prevent bus overvoltage trip
	Oscillation suppression	Optimize VF oscillation suppression algorithm to achieve stable operation of VF

Item		Specifications
Individualized function	Non-stop instantaneous power failure	When the instantaneous power failure occurs, the load compensation energy is reduced by the load feedback, and the inverter is kept running for a short time.
	V/F individual control	Individual voltage and frequency can be adjusted
	Multiple fieldbus support	Support for multiple fieldbuses: Modbus, Profibus-DP, CANopen
	Fan control	Control fan operation to increase fan life
Run	Running command channel	Operation panel reference, control terminal setting, communication setting, can be switched in various ways
	Frequency source	9 kinds of frequency sources: digital reference, analog voltage reference, analog current reference, pulse reference, communication given, can be switched in a variety of ways
	Auxiliary frequency source	9 auxiliary frequency sources for flexible auxiliary frequency fine tuning and frequency synthesis
	Input terminal	standard: 8 digital input terminals, one of which supports high speed pulse input up to 50kHz 2 analog input terminals, support 0~10V voltage input or 0/4~20mA current input;
	Output terminal	standard: 2 analog output terminals, support 0~10V voltage output or 0/4~20mA current output 2 open-collector output terminals, one of which supports high-speed pulse output of square wave signals from 0 to 50 kHz 2 relay output terminals
Display and Keyboard Operation	LED display	Reference to display parameter
	Parameter copy	Fast copying of parameters via LED operator panel
	Key lock and selection function	Realize partial or full locking of the button, define the range of the button to prevent misoperation
	Fault alarm	Power-on motor short-circuit detection, input and output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection, etc.
Environment	Using place	Indoor, free from direct sunlight, no dust, corrosive gases, flammable gases, oil mist, water vapor, dripping or salt, etc.
	Altitude	Less than 1000m (above 1000m, please derate)
	Ambient temperature	-10° C~+40 ° C (the ambient temperature is 40° C~50 ° C, please derate)
	Humidity	Less than 95% RH, anhydrous beads condensation
	Vibration	Less than 5.9m/s2 (0.6g)
	Storage temperature	－20℃~＋60℃

2.2.5 Product size

2.2.5.1 Machine overall size

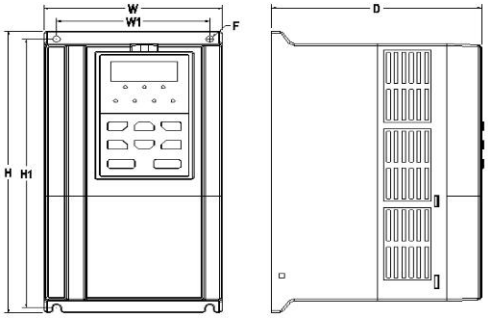
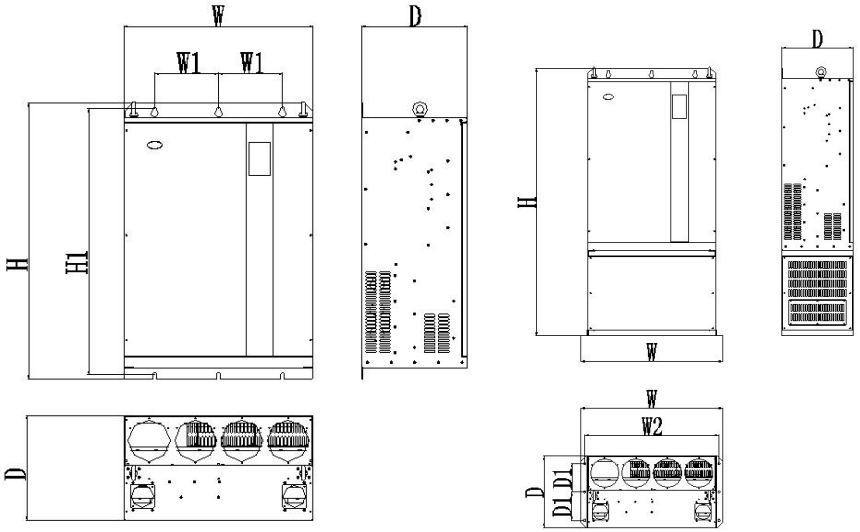


Fig.2-8 Standard dimension for C500 series inverter(0.75KW~110KW)

Table 2-5 Mounting Hole Dimensions of C500 Series Inverter（0.75~110KW model）

0.75~110KW						
Model	W (mm)	H (mm)	D (mm)	W1 (mm)	H1 (mm)	Installation hole F(mm)
C500-0R7G-2SB/2TB	120	200	163	96	191	Φ5
C500-1R5G-2SB/2TB						
C500-2R2G-2SB/2TB						
C500-0R7G-4TB						
C500-1R5G-4TB						
C500-2R2G-4TB						
C500-004G/5R5P-4TB	140	268	173	120	256	Φ6
C500-5R5G/7R5P-4TB						
C500-7R5G/011P-4TB						
C500-011G/015P-4TB	180	340	185	120	331	Φ6
C500-015G/018P-4TB						
C500-018G/022P-4TB	225	365	219	147	350	Φ7
C500-022G/030P-4T						
C500-030G/037P-4T	253	425	213	150	408	Φ7
C500-037G-4T						
C500-045P-4T	270	555	279	170	537	Φ7
C500-045G/055P-4T						
C500-055G/075P-4T						
C500-075G/090P-4T	325	680	373	200	661	Φ10
C500-090G/110P-4T						
C500-110G/132P-4T						



（no base） （with base）

Fig.2-9 Standard dimension for C500 series inverter(132KW~800KW)

Table 2-6 Mounting Hole Dimensions of C500 Series Inverter（132~800KW model）

132~800KW								
Model	D（mm）	H（mm）	W（mm）	W1（mm）	W2（mm）	D1（mm）	H1（mm）	Installation hole F(mm)
C500-132G/160P-4T（no base）	418	870	500	180			850	Φ11
C500-160G/185P-4T（no base）								
C500-185G/200P-4T（no base）								
C500-200G/220P-4T（no base）								
C500-132G/160P-4T（with base）	418	1290	570		534	160		Φ12
C500-160G/185P-4T（with base）								
C500-185G/200P-4T（with base）								
C500-200G/220P-4T（with base）								
C500-220G/250P-4T（no base）	390	1000	680	230			965	Φ12
C500-250G/280P-4T（no base）								

132~800KW								
Model	D（mm）	H（mm）	W（mm）	W1（mm）	W2（mm）	D1（mm）	H1（mm）	Installation hole F(mm)
C500-280G/315P-4T（no base）								
C500-315G/355P-4T（no base）								
C500-220G/250P-4T（with base）	390	1410	750		714	150		Φ12
C500-250G/280P-4T（with base）								
C500-280G/315P-4T（with base）								
C500-315G/355P-4T（with base）								
355KW~500KW（no base）	526	1110	784	200			1077	Φ13
355KW~500KW（with base）	526	1669	864		824	150		Φ13
550-800kw	1010	1875	498		965	140		Φ22

2.2.5.2 The keyboard shape size

C500 series high-performance vector inverter has two kinds of specifications of the keyboard.

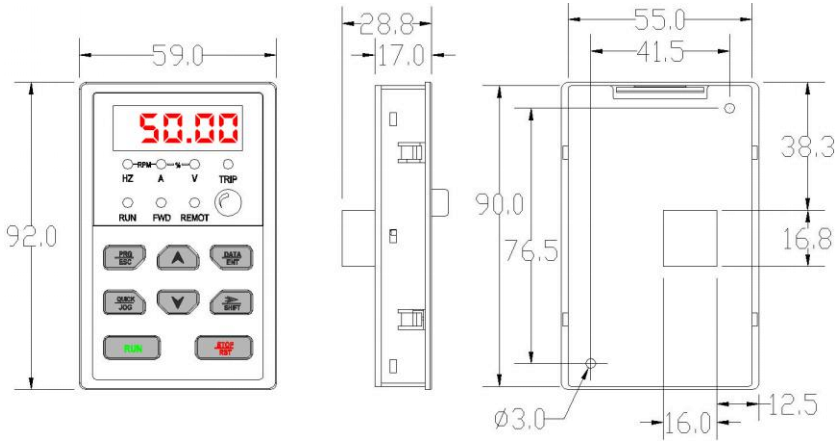


Fig.2-10 Little keyboard dimension(0.7~2.2KW)（mm）

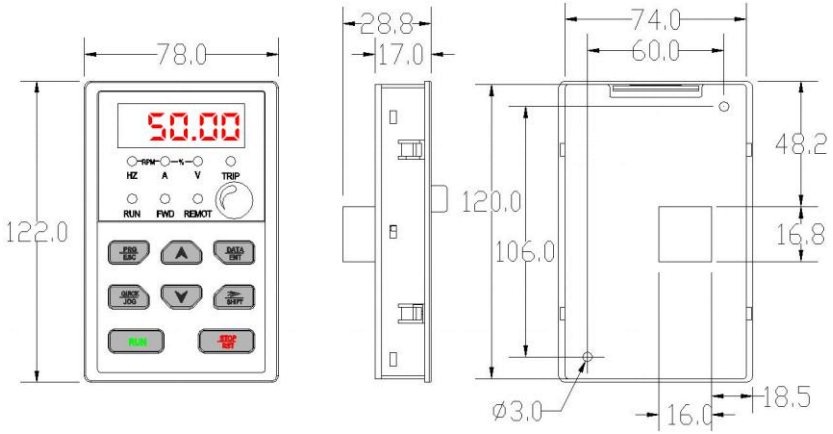


Fig.2-11 Large keyboard dimension(4~800KW)（mm）

Keyboard installed base dimension

According to the size of keyboard, keyboard installed base has two kinds of specifications, It is convenient for customers install and fix while operating remote control.

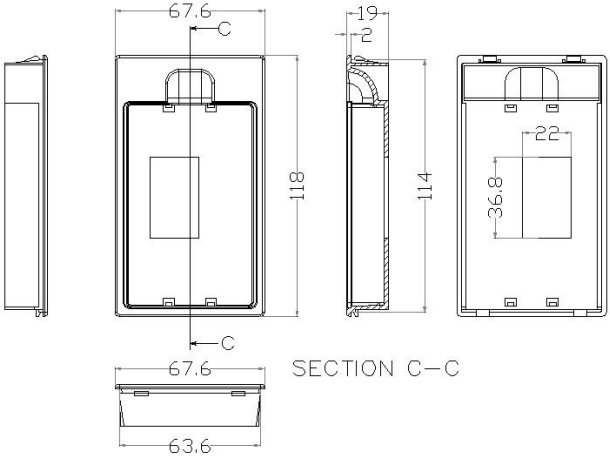


Fig.2-12 Little keyboard installed base dimension

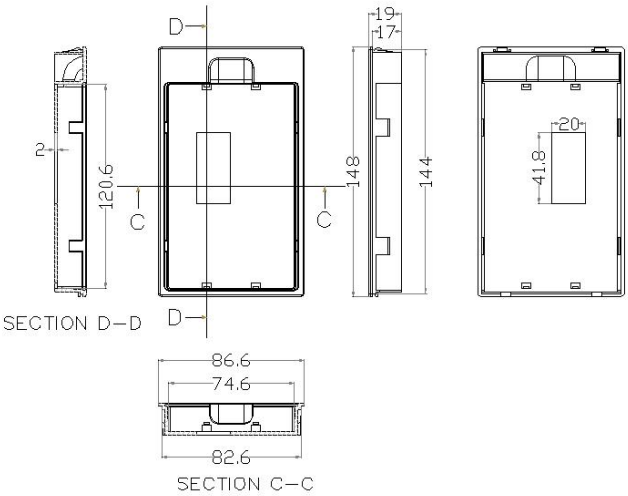


Fig.2-13 Large keyboard installed base dimension

2.3 Daily maintenance for inverter

2.3.1 Daily maintenance

In order to prevent the fault of inverter to make it operate smoothly in high-performance for a long time, user must inspect the inverter periodically (within half year).

> ☞CAUTION:
>
> Before opening the inverter for repairing, please cut off power supply of all related equipments. Please ensure main DC voltage is under 36V or the charger lamp is off. And please do operation after power off more than 10 mins.

Daily check items:

1） Check whether the noise of MOTOR is abnormal .

2） Check whether the vibration of MOTOR is abnormal .

3） Check whether the environment of inverter changes.

4） Check whether the fan of inverter is normal.

5） Check whether inverter is overheating.

Daily cleaning:

1）Always keep inverter in clean condition.

2）Effectively remove the surface dust of inverter, prevent dust to enter the inside of the

invert er, especially the metal dust.

3）Effectively remove oil contamination of cooling fan.

2.3.2 Periodic maintenance

Customer should check the drive every 3 months or 6 months according to the actual environment.

☞CAUTION:

1.Maintenance, inspection and replacement of parts must be performed only by authorized personnel.

2.Don't leave screw, gaskets and other metal objects in the machine, otherwise there is a risk of damage to the equipment

Periodic Maintenance items:

1） Clean the dust on PCBs and air ducts with a vacuum cleaner.

2） Check whether the screws of control terminals are loose.

3） Check whether inverter is corrosion.

4） Check if there is a poor contact terminals.

5） Main circuit insulation test.

6） Check whether the insulating tapes around the cable lugs are stripped.

☞CAUTION:

1.It is not necessary to conduct the high voltage test (which has been completed upon delivery),In order to avoid damage due to improper testing device.

2.When using the megameter (DC 500V megameter recommended) to measure the insulating resistance, the main circuit shall be disconnected with the inverter. Do not use the insulating resistance meter to test the insulation of the control circuit.

2.3.3 Replacement of wearing Parts

Fans and electrolytic capacitors are wearing parts; please make periodic replacement to ensure long term, safety and failure-free operation. The replacement periods are as follows:

Device name	Lifetime
Fan	30,000 hours
Electrolytic Capacitor	40,000 hours
Relay	100,000 times

According to the running time, user can determine the replacement of fixed number of year.

1.Cooling Fan

Possible causes for damage:bearing wear,leaf aging.

Discriminating standard:if there is a crack on fan blades,If there's any abnormal vibration sound when the inverter is power on.

2.Filter electrolytic capacitors

Possible causes for damage:The poor quality of the input power supply,high environmental temperature, frequent load jump,electrolyte aging.

Discriminating standard:liquid leakage,whether the safe valve has bulgy, measure the static capacitance,and measure the insulating resistance.

3.Relay

Possible causes for damage:corrosion,frequent action

Discriminating standard:open and close are failure.

2.3.4 Storage of Inverter

Attention shall be paid to the following points for the temporary and long-term storage for the inverter:

1) Place the inverter back into the packing box following the original package.

2) Long-term storage will degrade the electrolytic capacitor. The product shall be powered up once every 2 years, and the power-up time shall be no less than 5 hours. The input voltage shall be increased slowly to the rated value with the regulator.

2.3.5 Instructions on warranty of Inverter

Please refer to the warranty card in the warranty agreement for the specific warranty term

Chapter 3 Installation and wiring

3.1 Installation of inverter

3.1.1 Installation conditions

The inverter shall be mounted vertically on the base,and ventilated places:

（1）Ambient temperature: The ambient temperature is not allowed to exceed the allowable temperature range temperature range: -10°C ~ +40°C. Inverter will be derated if ambient temperature exceeds 40°C.

（2）The humidity of installation place should be less than 95% RH, without dewfall.

（3）Place without metal dust, oil mist, water and etc.

（4）Place without corrosive gases, flammable gases and etc.

（5）The maximum swing should less than 5.8m/S2 (0.6g).

（6）Place without direct sunshine.

（7）Don't install on flammable objects like wood.

If there are any special installation requirements, please consult with manufacturer in advance

3.1.2 Installation and space requirement

The installation of the inverter should ensure adequate ventilation,as shown in figure 3-1;Multiple inverter's parallel installation as shown in figure 3-2(a),When two inverters need to install up and down, please consider setting partition plate as shown in figure 3-2 (b).

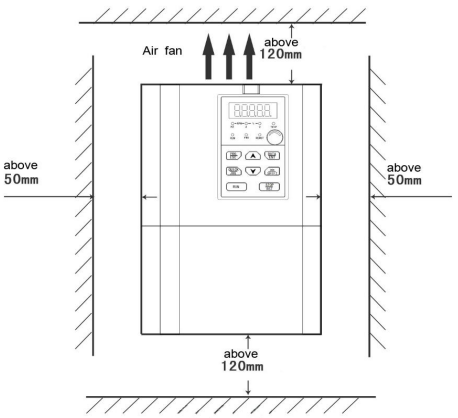


Fig.3-1 Spacing distance for installation

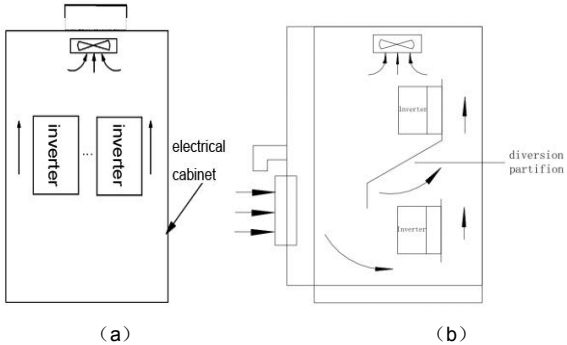


Fig.3-2 Installation dimensions of multiple inverters

3.1.3 Operation panel dismantlement and installation

A.Dismantlement

Put fingers on the slot at front part of the panel and then simply raise the panel,as shown in figure 3-3(a).

B.Installation

First the operation panel at the bottom of the fixed hook butt on the base installation groove at the bottom of the claw,Then slightly press the operation panel downward,as shown in figure 3-3(b).

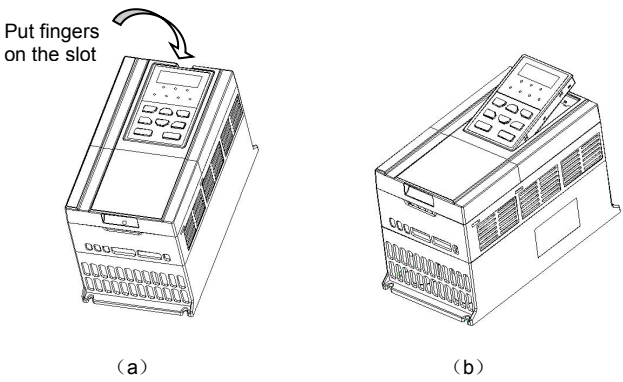


Fig.3-3 Operation panel dismantlement and installation

3.1.4 Cover plate dismantlement and installation

C500-4.0/5.5KW model is consisted of two plastic cover plates,Refer to Fig.3-4 for the dismantlement and installation of the cover plate.Before going dismantlement and installation of the cover plate,please remove the operation panel.

A.Cover plate dismantlement

First take the bottom cover plate,Then take the upper cover plate,The specific steps are as follows:

1）Inward press fixed hook for bottom cover plate,as shown in figure 3-4(a).

2）Open bottom cover plate,as shown in figure 3-4(b).

3）Remove bottom cover plate,as shown in figure 3-4(c).

4）Remove screw for upper cover plate,and inward press fixed hook,as shown in figure 3-4(d).

5）Open upper cover plate,as shown in figure 3-4(e).

6）Remove upper cover plate,as shown in figure 3-4(f).

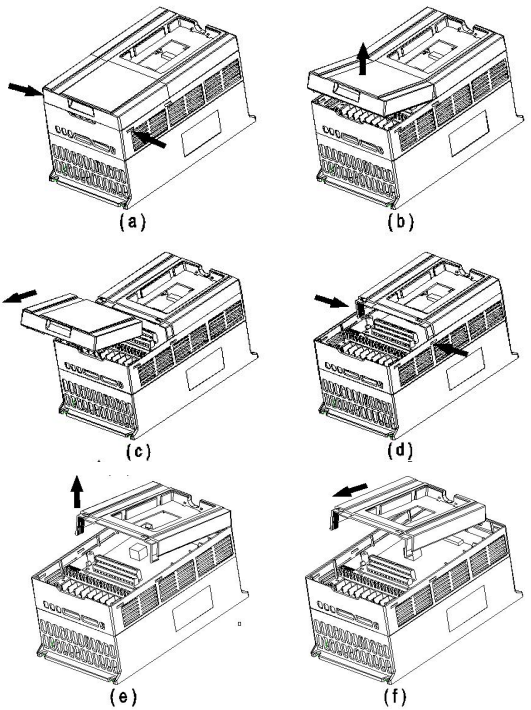


Fig.3-4 C500－4.0/5.5KW cover plate dismantlement and installation

B.Cover plate installation

First installation the upper cover plate,Then installation the bottom cover plate,The specific steps are as follows:

1）Insert the fixed hook at the upper cover plate into fixed hole on shell.

2）Press the upper cover plate down until heard a click, which means the cover plate has been in place.

3）Install the upper cover plate at the bottom of the screw hole aligning, fixed screw.

4）Insert the fixed hook at the bottom cover plate into fixed hole on upper cover plate.

5）Press the bottom cover plate down until heard a click, which means the cover plate has been in place.

3.1.5 Connected to the inverter and peripheral devices

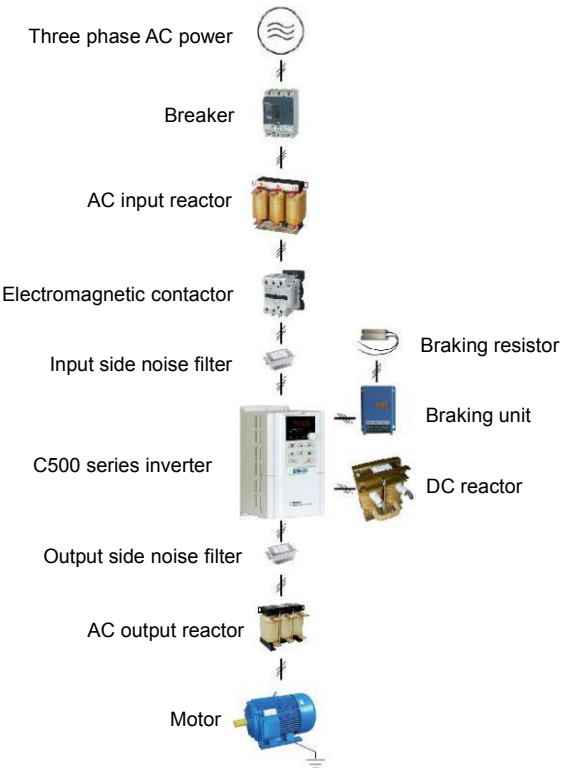


Fig.3-5 Connect the inverter to peripheral devices

3.2 C10 Series Wiring

3.2.1 Standard wiring diagram

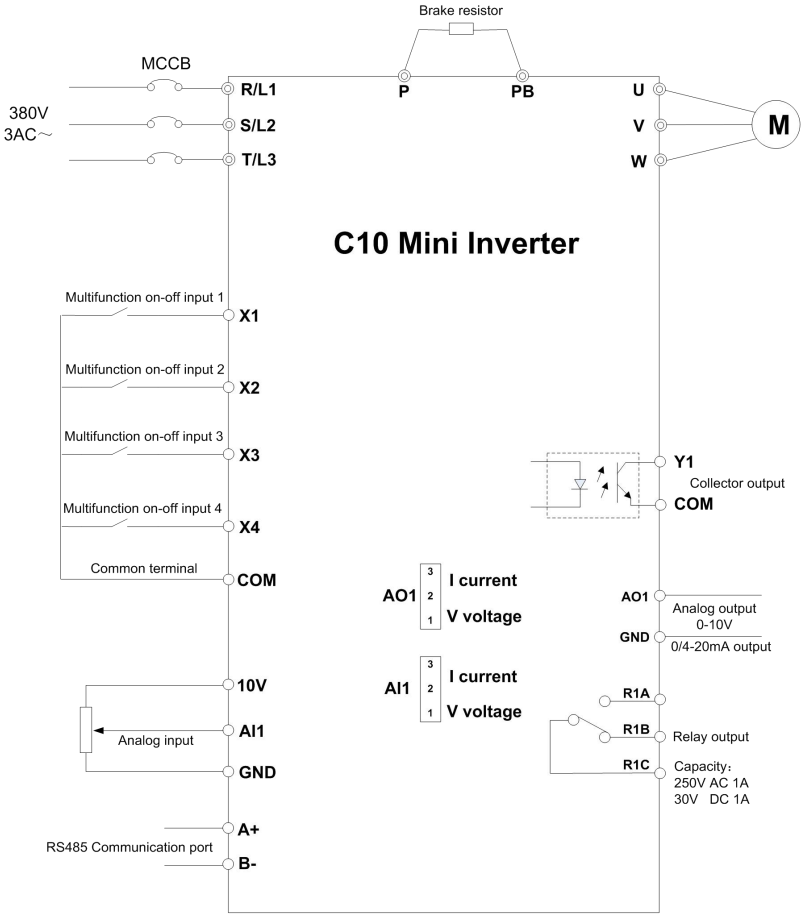


Fig.3-6 Standard wiring diagram

Note：

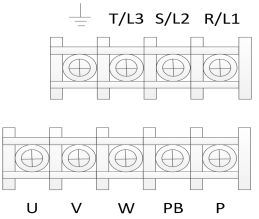
In the Figure, "◎" is Main circuit terminals,"○" is control terminals.

"AI1" is analog voltage and current input jumper selection.

"AO1" is analog voltage and current output jumper selection.

3.2.2 Terminal configuration

Before starting the wiring of the terminals, the user must first find the main circuit terminals located at the upper and lower ends of the inverter. Then uncover the terminal cover of the inverter and find the control terminal on the control board.



C10 series main circuit terminal diagram (0.75~4W main circuit terminal)

Main circuit function description:

Terminal	Name	Function description
R、S、T	Inverter input terminal	Used to cc Control terminals wer supply
P、PB	Braking resistance terminal	Used for external braking resistance to realize quick stop
U、V、W	Inverter output terminal	Used to connect the motor
⏚	Earth	Earth terminal, earth resistance<10 OHM

Control circuit terminals

1.Control circuit terminal diagram:

2.Control circuit terminals function description:

Type	Terminal	Name	Function description
Analog input	+10V	+10V power supply	Provide +10V power supply for external units, with maximum output current of 10mA. It is generally used as the operating power supply for the external potentiometer.
	AI1	Analog input 1 (reference ground:GND)	Analog input, 0~10V/ 0~20mA, switched by J4(AI1) .

Type	Terminal	Name	Function description
	GND	Common terminal of analog signal	Common terminal of analog input and output signal
Analog output	AO1	Analog output 1	Provide voltage or current output which can be switched by J1(AO1). Output range: 0~10V/ 0~20mA
	GND	Common terminal of analog signal	Common terminal of analog input and output signal
Digital input	X1	Multifunction input terminal	Digital signal input, The common terminal is COM. Customers could use parameter F5.01~F5.07 to set the function. While using these terminals, pls short ＋24V and PW. Terminal valid state Xn and COM are interlinked, Xn low level effectively. Input voltage range: 9~30V Input impedance: 3.3kΩ
	X2		
	X3		
	X4		
	COM	Common ground terminal for digital signal	
Digital output	Y1	Open collector output port	Open collector output terminal, common terminal For COM, the function can be set by function code F6.02.
	COM	Common ground terminal for digital signal	
Relay output	R1A	Relay	Get by the function code F6.04 and F6.05 ,defined as a variety of functions for Relay TxA－TxC:Normally-open contact; TxB－TxC:Normally-closed contact; Max contact capacity:AC250V/2A , DC30V/1A
	R1B		
	R1C		
Communication	A+	RS485 anode	Standard 485 interface
	B-	RS485 cathode	

3.3 C500 Series Wiring

3.3.1 Standard wiring diagram

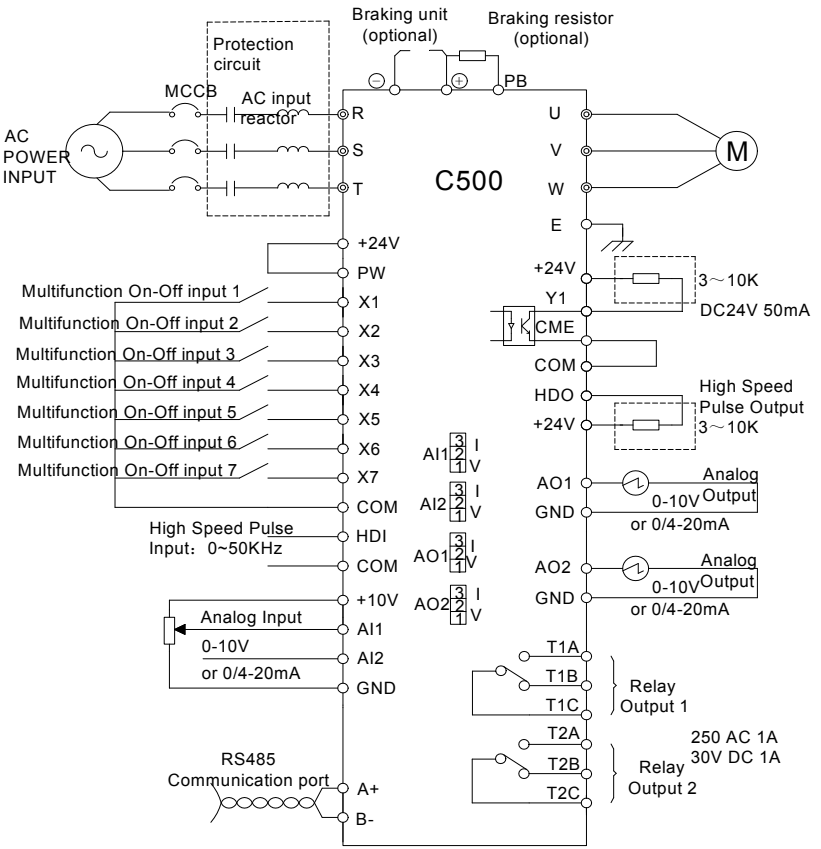


Fig.3-7 Standard wiring diagram

Note：

In the Figure, "◎" is Main circuit terminals,"○" is control terminals.

"AI1、AI2" is analog voltage and current input jumper selection.

"AO1、AO2" is analog voltage and current output jumper selection.

3.3.2 Terminal configuration

Before wiring terminals,users should remove cover plate of inverter（as show in chapter 3.1.4,Cover plate dismantlement and installation）, find the main circuit terminals and control terminals on the inverter,as shown in figure 4-7.

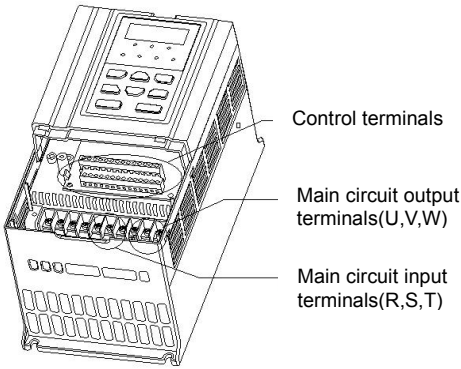
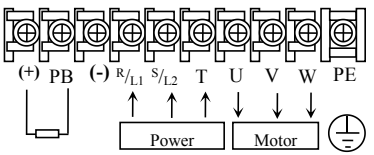
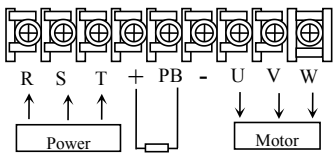


Fig.3-8 Schematic diagram for main circuit terminals

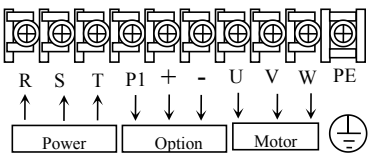
C500 series main circuit terminals



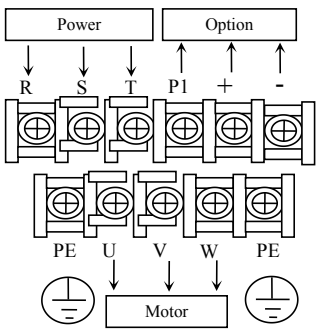
0.75-18.5kW main circuit terminals array



22~37KW main circuit terminals array



45~55KW main circuit terminals array



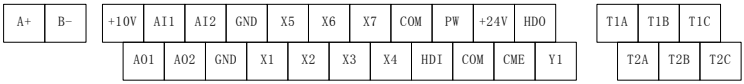
75~315KW main circuit terminals array

Main circuit function description:

Terminal	Name	Function description
R、S、T	Inverter input terminal	Used to connect 3-phase AC power supply
＋	DC power terminal	(-) means DC bus cathode, (+) means DC bus anode, used for external braking unit
－		
＋、PB	Braking resistance terminal	External braking resistance to quick stop
P1、＋	DC reactor terminal	Used to external DC reactor
U、V、W	Inverter output terminal	Used to connect the motor
⏚	Earth	Earth terminal, earth resistance<10 OHM

Control circuit terminals

1.Control circuit terminal diagram:



2.Control circuit terminals function description:

Type	Terminal	Name	Function description
Analog input	+10V	+10V power supply	10V power supply provided inside the inverter
	AI1	Analog input 1 (reference ground:GND)	Analog voltage/current input terminal (reference ground: GND), Input range: 0~10V/0~20 mA The user can select the analog voltage or current signal input via the AI1 jumper on the control board as needed. Factory default selection of analog voltage input
	AI2	Analog input 2 (reference ground:GND)	Analog voltage/current input terminal (reference ground: GND), Input range: 0~10V/0~20 mA The user can select the analog voltage or current signal input via the AI2 jumper on the control board as needed. Factory default selection of analog current input
	GND	Common terminal of analog signal	Common ground of analog input and analog output
Analog output	AO1	Analog output 1	Analog voltage and current output, can represent 11 kinds of quantities, can be set by function code F6.07 Output range: 0~10V/0~20mA The voltage/current output can be switched by jumper AO1

Type	Terminal	Name	Function description
	AO2	Analog output 2	The analog voltage and current output can represent 11 kinds of quantities, and its function can be set by function code F6.08. Output range: 0~10V/0~20mA The voltage/current output can be switched by jumper AO2
	GND	Common terminal of analog signal	Common ground for analog input and analog output
Digital input	X1	Multifunction input terminal	Program-defined multi-function digital input terminal, common terminal For COM, the function can be set by function code F5.01~F5.07. When using the multi-function input terminal, use the internal power supply to short the +24V and PW terminals, the terminal active state Xn is connected to COM, and Xn is active low. Input impedance: 3.3k Input voltage range: 9~30V
	X2		
	X3		
	X4		
	X5		
	X6		
	X7		
	COM	Common ground terminal for digital signal	
Pulse input	HDI	High speed pulse input	When using a high speed pulse input port，High-speed pulse input is optocoupler isolated input Input impedance: 1k Maximum input frequency: 50kHZ Input voltage range: 9V~30V
	COM	Common ground terminal for HDI	
Pulse output	HDO	High speed pulse output	When using the internal +24V power supply, you need to short the CME and COM terminals. Output high frequency pulse, can represent 11 kinds of quantity, frequency output range: 0~50kHz
	CME	Common terminal of open collector output	
	COM	Common ground terminal for HDO	
Relay output	TxA	Relay1 and Relay2	It can be programmed as a relay output terminal with multiple functions by function codes F6.04 and F6.05. TxA-TxC: normally open contact; TxB-TxC: normally closed contact AC250V/2A DC30V/1A
	TxB		
	TxC		
Communication	A+	RS485 anode	RS-485 serial communication for connection to other monitoring devices
	B-	RS485 cathode	

Chapter 4 Basic operation and run

4.1 Operation panel display

Operational control, parameters setting and display can be performed through the operation panel.Also the keyboard with potentiometer is optional,as show in Fig.4-1.

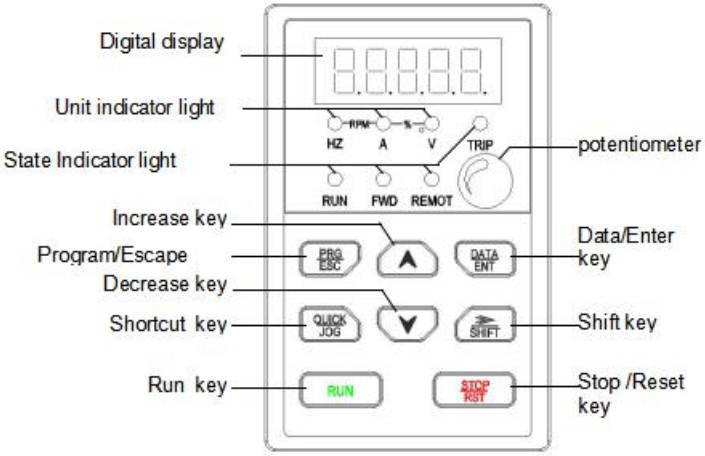


Fig.4-1 keyboard schematic diagram

4.2 Keyboard operation method

4.2.1 Keys function description

The keyboard has eight keys,Its function description as shown in table 4-1.

Table 4-1 Functions of keys

Keys	Name	Description
PRG ESC	Program Key	Entry or escape of first-level menu.
DATA ENT	Enter Key	Progressively enter menu and confirm parameters.
∧	Increase key	Progressively increase data or function codes.
∨	Decrease key	Progressively decrease data or function codes.
SHIFT	Shift Key	While modifying parameters, it is used to select the data bits. In stop and operate mode, it is used to cyclically display parameters

Keys	Name	Description	
RUN	Run Key	Start to run the inverter in keypad control mode.	Pressing the RUN and STOP/REST at the same time can achieve inverter free stop.
STOP RST	STOP / RESET Key	In running status,it can be used to stop the inverter. When fault alarm, it can be used to reset the inverter. This button is restricted by F7.04.	
QUICK JOG	Shortcut Key	Determined by Function Code F7.03: 0: Jog operation 1: Switch between forward and reverse 2: Clear the UP/DOWN settings.	

4.2.2 LED Indicator light description

Have 5 digit LED ,3 units indicator lights, and 4 status indicator lights ,which can display all kinds of monitoring data and alarm codes such as reference frequency, output frequency and so on,as show in Fig.4-1.The 3 units indicator lights combination can display 5 unit instructions,function and unit indicator light description as show in Table 4-2.

Table 4-1 indicator light description

Indicate		Indicator light	Description
Function indicator	RUN	Running indicator	Light on: running status Extinguished: stop status
	FWD	Forward/reverse indicator	Light on: reverse running Extinguished: forward running
	REMOT	Terminal control indicator	Light on:terminal control Extinguished: keypad control Flickering:communication control
	TRIP	Fault indicator	Light on:Inverter fault
Unit indicator	Hz	Frequency unit indicator	Light on:running frequency value Flickering:setting frequency value
	A	Current unit indicator	Current unit indicator light
	V	Voltage unit indicator	Voltage unit indicator light
	RPM	Rotating speed unit indicator	Light on:running rotate speed Flickering:setting rotate speed
	%	Percentage indicator	Light on:running parameter value Flickering:setting parameter value

4.2.3 Switching methods for status display

Inverter at stop or running state,can be used SHIFT key to circularly select the display parameters. When modifying the parameters, it can be used to select the bits of parameter for modification. For example, single-phase inverter without a motor running condition, introduce the parameter switch display method:

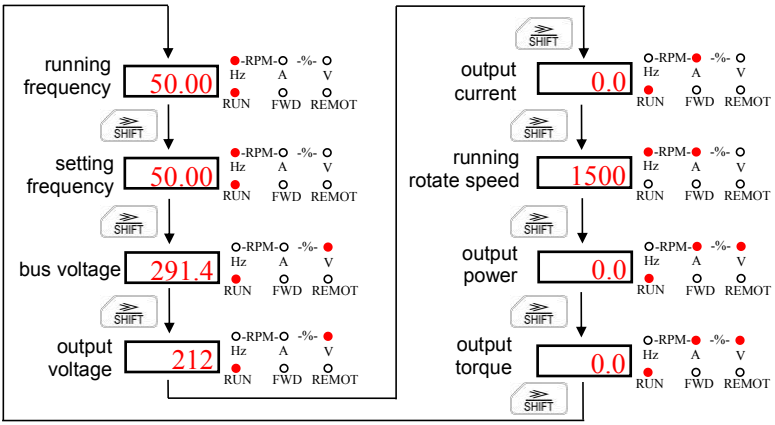


Fig.4-2 Under running condition, monitor parameters switching

4.2.4 Parameter setting method

Take changing the Relay 1, and set F6.04 = 6 as an example, describe how to modify inverter parameters:

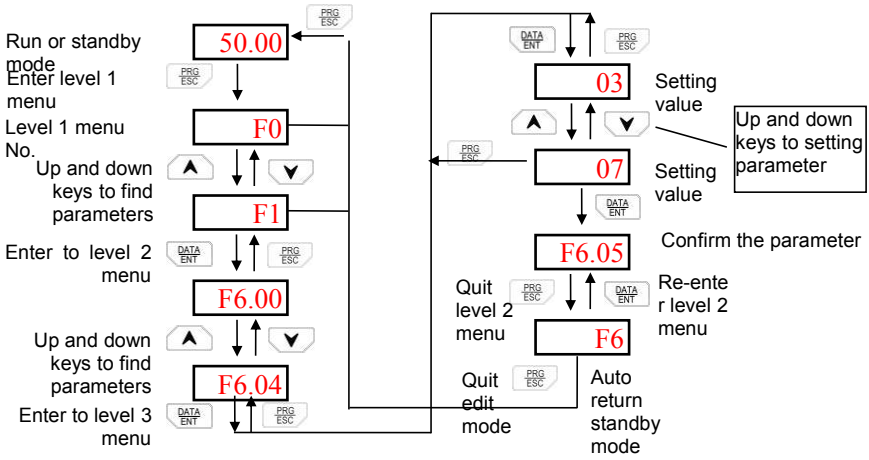


Fig.4-3 Function code parameter setting process

4.3 Motor parameters self-adjustment

If “Sensorless Vector Control”mode is chosen（F0.00=1）, motor nameplate parameters must be input correctly as the self-adjustment is based on it.The performance of vector control depends on the parameters of motor strongly, so in order to achieve excellent performance, firstly customers must obtain the motor parameter exactly.The procedure of motor parameter self-adjustment is as follows:

1）Firstly, choose keypad command as the run command source (F0.01).

2）Then input following parameters according to the actual motor parameters:F2.01: motor rated power;F2.02: motor rated frequency;F2.03: motor rated speed;F2.04: motor rated voltage; F2.05: motor rated current.

3）Then setting F0.16＝1 or 2, make the inverter for dynamic or static self learning.

4）Press the RUN keys，motor will be self learning.

5）At last motor parameter self learning finish.

For detailed description, please refer to function code F0.16.

When the inverter is self learning,it will automatically calculate following parameter of the motor: F2.06: motor stator resistance;F2.07: motor rotor resistance;F2.08: motor stator and rotor inductance;F2.09: motor stator and rotor mutual inductance;F2.10: motor current without load.

☞CAUTION:

The motor should be uncoupled with its load while self learning; otherwise, the motor parameters obtained by self learning may be incorrect.

4.4 All kinds of status for inverter

4.4.1 Power-on initialization status

Firstly the system initializes during the inverter power-on, and LED displays “00000”. After the initialization is completed, the inverter is on stand-by status.

4.4.2 Motor parameter self-adjustment status

Please refer to the description of function code F0.16.

4.4.3 Stop status

In stop status,there are nine parameters which can be chosen to display or not.They are: setting frequency, DC bus voltage, input terminal status, PID setting value, PID feedback value, analog AI1, analog AI2, and current No. of multi-steps. Press SHIFT keys to switch display parameters.

4.4.4 Running status

In running status,there are fifteen parameters which can be chosen to display or not.They are:running frequency, setting frequency, DC bus voltage,output voltage,output current, rotate speed, output power, output torque,PID setting value, PID feedback value, HDI frequency,analog AI1, analog AI2, and current No. of multi-steps.Press SHIFT keys to switch display parameters.

4.4.5 Malfunction status

Inverter offers a variety of fault information,for details, please refer to Chapter 7 Fault Diagnosis and Countermeasures.

Chapter 5 Function parameter table

Symbol description:

"◇" indicates that this parameter can be modified all the time.

"◆" indicates that this parameter cannot be modified during the inverter is running.

"¤" indicates that this parameter is read only.

5.1 F0 Group: Basic function

Function Code	Name	Setting Range	Factory Setting	Modify
F0.00	Speed control mode	0: Sensorless vector control 1: Sensorless vector control 1 2: V/F control 3: Torque control 4: Sensor vector control	0	◆
F0.01	Run command	0: Keypad (LED extinguished) 1: Terminal (LED lights on) 2:Communication(LED flickering)	0	◇
F0.02	Frequency Source A selection	0: Keyboard 1: AI1 2. AI2 3: HDI 4: PLC 5: Multi-steps speed 6: PID 7: Communication setting 8: Keyboard potentiometer	8	◇
F0.03	Frequency Source B selection	0: Keyboard 1: AI1 2. AI2 3: HDI 4: PLC 5: Multi-steps speed 6: PID 7: Communication 8: Keyboard potentiometer	1	◇
F0.04	Frequency Source B reference	0: Relative to Maximum frequency 1: Relative to Frequency Source A	0	◇
F0.05	Frequency source combination mode	0: Frequency source A 1: Frequency source B 2. A+B 3: A<=>B 4: A<=>A+B,depend on Xn terminal 5: B<=>A+B,depend on Xn terminal	0	◇

Function Code	Name	Setting Range	Factory Setting	Modify
		6: Max(A,B) 7: MIN(A,B) 8: A valid.=A; A invalid,=B		
F0.06	Keypad reference frequency	0.00Hz~F0.07	50.00Hz	◇
F0.07	Maximum frequency	10.00~600.00Hz	50.00Hz	◆
F0.08	Frequency upper limit	0.00Hz~Maximum frequency	50.00Hz	◆
F0.09	Frequency lower limit	0.00Hz~F0.08	0.00Hz	◆
F0.10	Keypad and terminal UP/DOWN set	0: Valid，and off electricity storage 1: Valid，and off electricity does not storage 2: Invalid 3: Valid in running, clear zero at stop 4: Revise keypad reference frequency to clear zero	0	◇
F0.11	Acceleration time 1	0.1～3600.0S	Depend on model	◇
F0.12	Deceleration time 1	0.1～3600.0S	Depend on model	◇
F0.13	Running direction selection	0: Forward 1: Reverse 2: Forbid reverse	0	◆
F0.14	Carrier frequency	1.0~16.0kHz	Depend on model	◇
F0.15	AVR function selection	0: Invalid 1: All valid 2: Invalid in deceleration only	2	◆
F0.16	Motor parameters autotuning	0: No action 1: Rotation autotuning 2: Static autotuning	0	◆
F0.17	Restore parameters	0: No action 1: Restore factory setting(Except motor parameters) 2: Clear fault records 3: Restore factory setting(Including motor parameters)	0	◆
F0.18	Parameters copy	0: No action 1: Parameters upload 2: Parameters download（all） 3: Parameters download（Except the motor parameters）	0	◆

5.2 F1 Group: Start and stop control

Function Code	Name	Setting Range	Factory Setting	Modify
F1.00	Start-up mode	0: Start directly 1: Braking first then start by frequency 2: Speed tracking , judge direction then start	0	◇
F1.01	Start frequency	0.10～300.00Hz	0.50Hz	◇
F1.02	Start frequency hold time	0.0～50.0S	0.0S	◇
F1.03	Braking current before starting	G type: 0.0~100.0% P type: 0.0~80.0%	0.0%	◇
F1.04	Braking time before starting	0.0～50.0S	0.0S	◇
F1.05	Deceleration mode	0: Linear 1: S Curve	0	◇
F1.06	Stop mode	0: Decelerate to stop 1: Free stop	0	◆
F1.07	DC braking initial frequency	0.00～Maximum frequency	0.00Hz	◇
F1.08	DC braking waiting time	0.0～50.0S	0.0S	◇
F1.09	DC braking current	G type: 0.0~100.0% P type: 0.0~80.0%	0.0%	◇
F1.10	DC braking time	0.0～50.0S	0.0S	◇
F1.11	FWD&REV dead time	0.0～3600.0S	0.0S	◇
F1.12	Action when running frequency is less than lower frequency limit	0: Running at the lower frequency limit 1: Stop	0	◆
F1.13	Terminal protection selection when power is on	0: Terminal running command is invalid when power is on 1: Terminal running command is valid when power is on	0	◇
F1.14	Restart waiting time When power on	0.0~3600.00S	2.0S	◇

5.3 F2 Group: Motor parameters

Function Code	Name	Setting Range	Factory Setting	Modify
F2.00	Inverter type	0: G type 1: P type	Depend on model	◆
F2.01	Motor rated power	0.4～6553.5KW	Depend on model	◆
F2.02	Motor rated frequency	0.01Hz～Maximum frequency	50.00Hz	◆
F2.03	Motor rated speed	0～60000rpm	Depend on model	◆
F2.04	Motor rated voltage	50～460V	Depend on model	◆
F2.05	Motor rated current	0.1～6553.5A	Depend on model	◆
F2.06	Motor stator resistance	0～65.535Ω	Depend on model	◇
F2.07	Motor rotor resistance	0～65.535Ω	Depend on model	◇
F2.08	Motor stator & rotor inductance	0～6553.5mH	Depend on model	◇
F2.09	Motor stator & rotor mutual inductance	0～6553.5mH	Depend on model	◇
F2.10	Motor no-load current	0.1～655.35A	Depend on model	◇

5.4 F3 Group: Vector control parameters

Function Code	Name	Setting Range	Factory Setting	Modify
F3.00	Speed loop proportional gain 1	1～3000	1000	◇
F3.01	Speed loop integral time 1	1～8000	300	◇
F3.02	Speed loop switching frequency 1	0.00Hz～F3.05	5.00Hz	◇
F3.03	Speed loop proportional gain 2	0～3000	800	◇
F3.04	Speed loop integral time 2	0～3000	200	◇
F3.05	Speed loop switching frequency 2	F3.02～F0.07	10.00Hz	◇
F3.06	Slip compensation rate of VC	0～200.0%	100.0%	◇
F3.07	Speed loop filter time	0~10	3	◇

Function Code	Name	Setting Range	Factory Setting	Modify
F3.08	Current loop Kp	0~5000	3000	◇
F3.09	Current loop Ki	0~5000	1500	◇
F3.10	Torque upper limit	0.0～300.0%	160.0%	◇
F3.11	Torque setting mode	0: Invalid 1: Keypad 2: Potentiometer 3: AI1 4: AI2 5: HDI 6: Multi-steps speed 7:Communication	0	◇
F3.12	Keypad torque setting	0.0%～200.0%	50.0%	◇
F3.13	Low speed torque boost during torque control	0.0%~20.0%	5.0%	◇
F3.14	Overvoltage PID proportional gain (Kp)	0.01~10.00	0.20	◇
F3.15	Overvoltage PID integration time	0.00~100.00S	0.10S	◇
F3.16	VC controls the weak magnetic coefficient	20.0~300.0%	100.0%	◇
F3.17	VF control weak magnetic coefficient	20.0~300.0%	200.0%	◇
F3.18	Encoder pulse number	0~65535	1024	◆
F3.19	Encoder pulse direction	0: Forward 1: Reverse	0	◆

5.5 F4 Group: V/F control

Function Code	Name	Setting Range	Factory Setting	Modify
F4.00	V/F curve selection	0: Linear V/F curve 1: Square V/F curve 2: User-defined V/F curve	0	◆
F4.01	V/F frequency 1	0.00Hz～F4.03	10.00Hz	◆
F4.02	V/F voltage 1	0.0%～100.0%(Motor rated voltage)	20.0%	◆
F4.03	V/F frequency 2	V/F frequency 1～F4.05	25.00Hz	◆
F4.04	V/F voltage 2	0.0%～100.0%(Motor rated voltage)	50.0%	◆
F4.05	V/F frequency 3	V/F frequency 2～motor rated frequency	40.00Hz	◆
F4.06	V/F voltage 3	0.0%～100.0%(Motor rated voltage)	80.0%	◆

Function Code	Name	Setting Range	Factory Setting	Modify
F4.07	Slip compensation rate of V/F	0.0%～200.0%	0.0%	◇
F4.08	Slip compensation time of V/F	0.00~10.00S	0.20S	◇
F4.09	Torque boost	0.0: (Auto) , 0.1～30.0	Depend on model	◇
F4.10	Torque boost cut-off	0.0～100.0%(Motor rated frequency)	50.0%	◇
F4.11	Auto energy-saving selection	0: no auto energy-saving 1: auto energy-saving	0	◆
F4.12	Oscillation suppression gain Kp	0～100	5	◇
F4.13	Oscillation suppression gain Ki	0～100	10	◇
F4.14	Voltage separation control	0: Invalid 1: Keypad setting torque 2: AI1 setting torque 3: AI2 setting torque 4: HDI setting torque 5: Multi-steps setting torque 6: Communication setting torque	0	◆
F4.15	Setting torque by keypad voltage	0~440V	0V	◇
F4.16	Voltage rising time	0.1～3600.0S	1.0S	◇
F4.17	Voltage falling time	0.1～3600.0S	1.0S	◇

5.6 F5 Group: Input terminals

Function Code	Name	Setting Range	Factory Setting	Modify
F5.00	Terminal control mode	0: 2-line 1 1: 2-line 2 2: 3-line 1 3: 3-line 2	0	◆
F5.01	Multifunction input terminal 1(X1)	0: No function 1: FWD 2: REV 3: 3-line running control 4: FWD JOG 5: REV JOG 6: Free stop 7: Fault reset	1	◆
F5.02	Multifunction input terminal 2(X2)		2	◆
F5.03	Multifunction input terminal 3(X3)		7	◆
F5.04	Multifunction input terminal 4(X4)		0	◆

Function Code	Name	Setting Range	Factory Setting	Modify
F5.05	Multifunction input terminal 5(X5)	8: Running pause 9: Exterior fault input 10: Frequency UP 11: Frequency DW 12: UP/DW clear 13: Multi-steps terminal 1 14: Multi-steps terminal 2 15: Multi-steps terminal 3 16: Multi-steps terminal 4 17: ACC/DEC time choose 1 18: ACC/DEC time choose 2 19: PID control pause 20: Swing frequency pause 21: Swing frequency reset 22: ACC/DEC forbid 23: Torque control forbid 24: Counter trigger 25: Counter clear 26: Frequency source switch 27: HDI input 28: Motor switch 29: PLC status reset 30: Running command switch to the terminals 31: DC braking 32～40:Reserved	0	◆
F5.06	Multifunction input terminal 6(X6)		0	◆
F5.07	Multifunction input terminal 7(X7)		0	◆
F5.08	HDI terminal function		0	◆
F5.09	X terminal closed logic	0：On valid 1：Off valid X5，X4，X3，X2，X1 Bits:X1,Ten:X2,Hundreds:X3, One thousand:X4,Ten thousands:X5	00000	◆
F5.10	UP/DOWN changing rate	0.01～50.00Hz/S	0.50Hz/S	◇
F5.11	AI1 lower limit	0.00～10.00V	0.00V	◇
F5.12	AI1 lower limit corresponding setting	-100.0～100.0%	0.0%	◇
F5.13	AI1 upper limit	0.00～10.00V	10.00V	◇
F5.14	AI1 upper limit corresponding setting	-100.0～100.0%	100.0%	◇
F5.15	AI1 input filter time	0.00～10.00S	0.10S	◇
F5.16	AI2 lower limit	0.00～10.00V	0.00V	◇

Function Code	Name	Setting Range	Factory Setting	Modify
F5.17	AI2 lower limit corresponding setting	-100.0～100.0%	0.0%	◇
F5.18	AI2 upper limit	0.00～10.00V	10.00V	◇
F5.19	AI2 upper limit corresponding setting	-100.0～100.0%	100.0%	◇
F5.20	AI2 input filter time	0.01～10.00S	0.10S	◇
F5.21	HDI lower limit	0.00～50.00 KHz	0.00KHz	◇
F5.22	HDI lower limit corresponding setting	-100.0～100.0%	0.0%	◇
F5.23	HDI upper limit	0.00～50.00 KHz	50.00KHz	◇
F5.24	HDI upper limit corresponding setting	-100.0～100.0%	100.0%	◇
F5.25	HDI input filter time	0.00～10.00S	0.10S	◇
F5.26	Frequency Up/Down benchmark	0~1	0.10S	◇

5.7 F6 Group: Output terminals

Function Code	Name	Setting Range	Factory Setting	Modify
F6.00	HDO selection	0: High-speed pulse output 1: ON-OFF output	0	◇
F6.01	HDO ON-OFF output selection	0: No output 1: Running	1	◇
F6.02	Y1 output selection	2: Run forward	4	
F6.03	Reserved	3: Run reverse	0	◇
F6.04	Relay 1 output selection	4: Fault output	1	◇
F6.05	Relay 2 output selection	5: FDT1 output 6: Frequency reached 7: Zero speed running 8: Preset count value reached 9: Specified count value reached 10: Overload pre-alarm 11: Simple PLC step completed 12: PLC cycle completed 13: Running time reached 14: Upper frequency limit reached	4	◇

Function Code	Name	Setting Range	Factory Setting	Modify
		15: Lower frequency limit reached 16: Ready 17: FDT2 reached 18: AI1＞AI2 19: AI1＜F8.29 20: AI1＞F8.30 21: AI1 between F8.29~F8.30 22: PID disconnection 23: Overcurrent output(Running current＞F8.33)		
F6.06	HDO output selection	0: Running frequency	0	◇
F6.07	AO1 function selection	1: Setting frequency	1	◇
F6.08	AO2 function selection	2: Running RPM 3: Output current 4: Output voltage 5: Output power 6: Setting torque 7: Output torque 8: AI1 9: AI2 10: HDI	0	◇
F6.09	AO1 lower limit	0.0～100.0%	0.0%	◇
F6.10	AO1 lower limit corresponding output	0.00～10.00V	0.00V	◇
F6.11	AO1 upper limit	0.0～100.0%	100.0%	◇
F6.12	AO1 upper limit corresponding output	0.00～10.00V	10.00V	◇
F6.13	AO2 lower limit	0.0～100.0%	0.0%	◇
F6.14	AO2 lower limit corresponding output	0.00～10.00V	0.00V	◇
F6.15	AO2 upper limit	0.0～100.0%	100.0%	◇
F6.16	AO2 upper limit corresponding output	0.00～10.00V	10.00V	◇
F6.17	HDO lower limit	0.0～100.0%	0.0%	◇
F6.18	HDO lower limit corresponding output	0.00～50.00KHz	0.00KHz	◇
F6.19	HDO upper limit	0.0～100.0%	100.0%	◇
F6.20	HDO upper limit corresponding output	0.00～50.00KHz	50.00KHz	◇

5.8 F7 Group: Keypad and display parameters

Function Code	Name	Setting Range	Factory Setting	Modify
F7.00	User password	0～65535	0	◇
F7.01	Reserved			
F7.02	Change Parameter display	0: Display all parameter 1: Display amended parameter only	0	◇
F7.03	QUICK/JOG function selection	0: Jog 1: FWD/REV switching 2: Clean UP/DOWN setting 3: Running command source switching	0	◇
F7.04	STOP/RST function selection	0: Valid when keypad control 1: Valid when keypad and terminal control 2: Valid when keypad and communication control 3: Always valid	2	◇
F7.05	Running status display selection	0～0x7FFF BIT0:Running frequency BIT1: Given frequency BIT2:Bus voltage BIT3:Output voltage BIT4:Output current BIT5:Running speed BIT6:Output power BIT7:Output torque BIT8:PID given value BIT9:PID feedback value BIT10:Setting RPM BIT11:HDI frequency BIT12:AI1 value BIT13:AI2 value BIT14:Multi-speed number of current segment BIT15:Reserved	0x303F	◇
F7.06	Stop status display selection	0～0x7FFF BIT0:Running frequency BIT1: Given frequency BIT2:Bus voltage BIT3:Output voltage BIT4:Output current BIT5:Running RPM	0x3006	◇

Function Code	Name	Setting Range	Factory Setting	Modify
		BIT6:Output power BIT7:Output torque BIT8:PID given value BIT9:PID feedback value BIT10:Setting RPM BIT11:HDI frequency BIT12:AI1 value BIT13:AI2 value BIT14:Multi-speed number of current segment BIT15:Reserved		
F7.07	RPM display coefficient	0.1～999.9% mechanical rotational speed =120*running frequency*F7.05/Number of poles motor	100.0%	◇
F7.08	Rectifier module temperature	0～100.0℃	——	¤
F7.09	IGBT module temperature	0～100.0℃	——	¤
F7.10	Software version 1	1.00～10.00	——	¤
F7.11	Software version 2	0.00~99.99		
F7.12	Inverter rated power	0.4~900KW	——	¤
F7.13	Total running time	0～65535h	——	¤
F7.14	Running frequency display	0: Before the compensation 1: After the compensation	0	◇

5.9 F8 Group: Auxiliary function

Function Code	Name	Setting Range	Factory Setting	Modify
F8.00	Acceleration time 2	0.1～3600.0S	20.00S	◇
F8.01	Deceleration time 2	0.1～3600.0S	20.00S	◇
F8.02	Acceleration time 3	0.1～3600.0S	20.00S	◇
F8.03	Deceleration time 3	0.1～3600.0S	20.00S	◇
F8.04	Acceleration time 4	0.1～3600.0S	20.00S	◇
F8.05	Deceleration time 4	0.1～3600.0S	20.00S	◇
F8.06	JOG operate frequency	0.00～50.00Hz	5.00Hz	◇
F8.07	JOG acceleration time	0.1～3600.0S	Depend on model	◇
F8.08	JOG deceleration	0.1～3600.0S	Depend	◇

Function Code	Name	Setting Range	Factory Setting	Modify
	time		on model	
F8.09	Skip frequency 1	0.00～300.00Hz	0.00Hz	◆
F8.10	Skip frequency 2	0.00～300.00Hz	0.00Hz	◆
F8.11	Skip frequency amplitude	0.00～10.00Hz	0.00Hz	◆
F8.12	Swing frequency amplitude	0.0～100.0%(Setting frequency)	0.0%	◇
F8.13	Jitter frequency amplitude	0.0～50.0%(Swing frequency amplitude)	0.0%	◇
F8.14	Rise time of Swing frequency	0.1～3600.0S	5.0S	◇
F8.15	Fall time of swing frequency	0.1～3600.0S	5.0S	◇
F8.16	FDT1 level	0.00～300.00Hz	50.00Hz	◇
F8.17	FDT1 lag	0.00~10.00Hz	1.00Hz	◇
F8.18	FDT2 level	0.00～300.00Hz	50.00Hz	◇
F8.19	FDT2 lag	0.00~10.00Hz	1.00Hz	◇
F8.20	Frequency arrive detecting amplitude	0.00~10.00Hz	2.00Hz	◇
F8.21	Specify the counter value	0～65530	0	◇
F8.22	Setting counter value	0~65530	0	◇
F8.23	Overmodulation	0:Invalid 1:valid	1	◆
F8.24	Droop control	0.00～10.00Hz	0	◇
F8.25	Brake threshold voltage	380V:650～750V 220V:360～390V	380V:700V 220V:390V	◇
F8.26	ACC/DEC time unit	0:0.1S 1:0.01S	0	◇
F8.27	Fan control	0:Inverter control 1:Fan runs after power on	0	◇
F8.28	Over voltage rise frequency	0.00～10.00Hz	0	◆
F8.29	AI1 Comparison threshold 1	0.00～10.00V	0	◇
F8.30	AI1 Comparison threshold 2	0.00～10.00V	0	◇
F8.31	AI1 Comparative residual	0.00～1.00V	0.20	◇

Function Code	Name	Setting Range	Factory Setting	Modify
F8.32	Frequency resolution	0: Two decimals, maximum frequency 300.00Hz 1: One decimal, the maximum frequency is 3000.0Hz	0	◆
F8.33	Overcurrent judgment threshold	0~200.0%(Percentage of rated current of the inverter)	105%	◇

5.10 F9 Group: PID control

Function Code	Name	Setting Range	Factory Setting	Modify
F9.00	PID given source selection	0: Keypad 1: AI1 2: AI2 3: HDI 4: Multi-steps 5: Remote communication 6: Keypad potentiometer setup	0	◇
F9.01	Keypad PID preset	0.0%～100.0%	0.0%	◇
F9.02	PID feedback source selection	0: AI1 1: AI2 2: AI1+ AI2 3: HDI 4: Communication	0	◇
F9.03	PID output characteristic	0: Positive 1: Negative	0	◇
F9.04	Proportional gain（Kp）	0.01～10.00	0.10	◇
F9.05	Integral time（Ti）	0.00～100.00S	1.00S	◇
F9.06	Differential time（Td）	0.00～10.00S	0.00S	◇
F9.07	PID output delay time	0.00~10.00S	0.00S	◇
F9.08	PID control deviation limitation	0.0～100.0%	0.0%	◇
F9.09	PID output upper limit	0.0~100.0%	100.0%	◇
F9.10	PID output lower limit	-100.0~100.0%	0.0%	◇
F9.11	Feedback lost detecting value	0.0～100.0%	0.0%	◇
F9.12	Feedback lost detecting time	0.0～200.0S	2.0S	◇

Function Code	Name	Setting Range	Factory Setting	Modify
F9.13	Action selections while feedback wire break	0: No action 1: Go on PID operation and output alarm signal 2: Stop and alarm malfunction	1	◇
F9.14	PID initial frequency	0.0~100.0%	0.0%	◇
F9.15	PID initial frequency keep time	0.0~3600S	0.0S	◇
F9.16	Dormancy frequency	0～300.00Hz	0.00Hz	◇
F9.17	Dormancy detection time	0~2000S	10S	◇
F9.18	Start-up threshold	0.0%～100.0%	80.0%	◇
F9.19	Sensor range	0.1~6553.5	100.0	◇
F9.20	PID keyboard setpoint value	0~F9.19	0	◇

5.11 FA Group: Multi-steps speed

Function Code	Name	Setting Range	Factory Setting	Modify
FA.00	Multi-steps speed 0	-100.0～100.0%	0.0%	◇
FA.01	Multi-steps speed 1	-100.0～100.0%	0.0%	◇
FA.02	Multi-steps speed 2	-100.0～100.0%	0.0%	◇
FA.03	Multi-steps speed 3	-100.0～100.0%	0.0%	◇
FA.04	Multi-steps speed 4	-100.0～100.0%	0.0%	◇
FA.05	Multi-steps speed 5	-100.0～100.0%	0.0%	◇
FA.06	Multi-steps speed 6	-100.0～100.0%	0.0%	◇
FA.07	Multi-steps speed 7	-100.0～100.0%	0.0%	◇
FA.08	Multi-steps speed 8	-100.0～100.0%	0.0%	◇
FA.09	Multi-steps speed 9	-100.0～100.0%	0.0%	◇
FA.10	Multi-steps speed 10	-100.0～100.0%	0.0%	◇
FA.11	Multi-steps speed 11	-100.0～100.0%	0.0%	◇
FA.12	Multi-steps speed 12	-100.0～100.0%	0.0%	◇
FA.13	Multi-steps speed 13	-100.0～100.0%	0.0%	◇
FA.14	Multi-steps speed 14	-100.0～100.0%	0.0%	◇
FA.15	Multi-steps speed 15	-100.0～100.0%	0.0%	◇
FA.16	0^{th} step running time	0~65536	0	◇
FA.17	1^{st} step running time	0~65536	0	◇
FA.18	2^{nd} step running time	0~65536	0	◇
FA.19	3^{rd} step running time	0~65536	0	◇

Function Code	Name	Setting Range	Factory Setting	Modify
FA.20	4th step running time	0~65536	0	◇
FA.21	5th step running time	0~65536	0	◇
FA.22	6th step running time	0~65536	0	◇
FA.23	7th step running time	0~65536	0	◇
FA.24	8th step running time	0~65536	0	◇
FA.25	9th step running time	0~65536	0	◇
FA.26	10th step running time	0~65536	0	◇
FA.27	11th step running time	0~65536	0	◇
FA.28	12th step running time	0~65536	0	◇
FA.29	13th step running time	0~65536	0	◇
FA.30	14th step running time	0~65536	0	◇
FA.31	15th step running time	0~65536	0	◇
FA.32	ACC/DEC time selection for step 0~7	0~0xFFFF	0	◇
FA.33	ACC/DEC time selection for step 8~15	0~0xFFFF	0	◇
FA.34	Simple PLC mode	0: Stop after single cycle 1: Keep final value after single cycle 2: Continuous cycles	2	◆
FA.35	Simple PLC status saving after power off	0: No saved 1: Saved	0	◆
FA.36	Simple PLC restart selection	0: Restart from step 0 1: Continue from paused step	0	◆
FA.37	Time unit	0: S 1: M	0	◆
FA.38	Current program running segments	0～15		¤
FA.39	The block runtime	0.0～3600.0		¤

5.12 Fb Group: Protection and malfunction

Function Code	Name	Setting Range	Factory Setting	Modify
Fb.00	Motor overload protection	0: Disabled 1: Normal motor(with low speed compensation)	1	◆
Fb.01	Motor overload protection coefficient	20.0%～120.0%（rated current of the motor）	100.0%	◇
Fb.02	Non-stop instantaneous power	0: Disabled 1: Enabled	0	◇

Function Code	Name	Setting Range	Factory Setting	Modify
	failure			
Fb.03	Instantaneous frequency reduction point when power supply drop	220V: 210~260V 380V: 410~600V	220V:230 380V:420	◇
Fb.04	Instantaneous power off frequency dropping rate	0.00Hz～Maximum frequency	10.00Hz	◇
Fb.05	Input phase-failure protection	0: Disabled 1: Enabled	1	◆
Fb.06	Output phase-failure protection	0: Disabled 1: Enabled	1	◆
Fb.07	Over-voltage stall protection	0: Disabled 1: Enabled	1	◇
Fb.08	Over-voltage stall protection point	110～150%	220V:120% 380V:140%	◇
Fb.09	Auto current limiting selection	0: Disabled 1: Enabled	1	◇
Fb.10	Auto current limiting threshold	80～200%	G：160% P：120%	◇
Fb.11	Inverter overload pre-alarm	20.0～200.0%	150.0%	◆
Fb.12	Inverter overload pre-alarm time	0.0~100.0S	20.0S	◆
Fb.13	Fault recovery time	0～10	0	◆
Fb.14	Fault auto-reset interval	0.1～20.0S	5.0S	◆
Fb.15	The first two fault type	0: No fault 1: IGBT U phase fault（Out1） 2: IGBT V phase fault（Out2） 3: IGBT W phase fault（Out3）		¤
Fb.16	The last fault type		——	¤

Function Code	Name	Setting Range	Factory Setting	Modify
Fb.17	Current fault type	4: Over-current while ADD(OC1) 5: Over-current while DEC(OC2) 6: Over-current at constant speed (OC3) 7: Over-voltage while ADD（OU1） 8: Over-voltage while DEC（OU2） 9: Over-voltage at constant speed（OU3） 10: Bus under-voltage （UU） 11: Motor overload（OL1） 12: Frequency inverter overload（OL2） 13: Input side phase lack（SPI） 14: Output side phase lack（SPO） 15: Rectifier bridge overheat（OH1） 16: Inverter overheat（OH2） 17: Exterior fault（EF） 18: Rs485 communication fault（CE） 19: Current detection fault（ItE） 20: Motor detect malfunction circularly（tE） 21: Store malfunction（EEP） 22: PID feedback wire connection fault（PIDE） 23: Brake unit fault（bCE） 24: Operate time arrive fault（END） 25: Electronic overload（OL3） 26: Keyboard connection fault（PCE） 27: Parameter upload fault（UPE） 28: Parameter download fault（DNE） 29: Short circuitl（SC） 30: Current-limiting fault（LCE） 31: Phase short circuit(GF) 31: Encoder failure(ECE)	——	¤
Fb.18	Current fault running frequency	0.00~300.00Hz	——	¤
Fb.19	Current fault output current	0.0~6553.5A	——	¤

Function Code	Name	Setting Range	Factory Setting	Modify
Fb.20	Current fault bus voltage	——	——	¤
Fb.21	Reserved	——	——	¤
Fb.22	Reserved	——	——	¤
Fb.23	Previous fault output frequency	0.00~300.00Hz	——	¤
Fb.24	Previous fault output current	0.00~6553.5A	——	¤
Fb.25	Previous fault bus voltage	0~1000V	——	¤
Fb.26	The first two fault output frequency	0.00~300.00Hz	——	¤
Fb.27	The first two fault output current	0.00~6553.5A	——	¤
Fb.28	The first two fault bus voltage	0~1000V	——	¤
Fb.29	GF Protection	0: Enabled 1: Disabled	0	◇

5.13 FC Group: Communication parameters

Function Code	Name	Setting Range	Factory Setting	Modify
FC.00	Local address	1～247， 0: broadcast address	1	◇
FC.01	Baud rate selection	0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS 6: 57600BPS 7: 115200BPS	3	◇
FC.02	Date bits checking set	0:No parity check（N，8，1）for RTU 1:Even parity check（E，8，1）for RTU 2:Odd parity check（O，8，1）for RTU 3:No parity check（N，8，2）for RTU 4:Even parity check（E，8，2）for RTU 5:Odd parity check（O，8，2）for RTU	0	◇
FC.03	Communication on delay time	0～200mS	5mS	◇
FC.04	Communication on timeout delay	0.0（Disable），0.1～100.0S	0.0S	◇
FC.05	Communication	0: Alarm and coast to stop	1	◇

Function Code	Name	Setting Range	Factory Setting	Modify
	error action	1: No alarm and continue to run 2: No alarm and stop according to F1.06(only Communication setup) 3: No alarm and stop according to F1.06		
FC.06	Communication setting factor	10.0~500.0%	100.0	◇
FC.07	Communication address mark	0: Default address 1: Compatible with other manufacturers' addresses	0	◇

5.14 FU Group:Monitor code

Function Code	Name	Setting Range	Factory Setting
FU.00	Setting frequency	——	——
FU.01	Operate frequency	——	——
FU.02	Bus voltage	——	——
FU.03	Output voltage	——	——
FU.04	Output current	——	——
FU.05	Output power	——	——
FU.06	Output torque	——	——
FU.07	Setting RPM	——	——
FU.08	Operate RPM	——	——
FU.09	PID given	——	——
FU.10	PID feedback	——	——
FU.11	AI1	——	——
FU.12	AI2	——	——
FU.13	HDI	——	——
FU.14	Multi-steps speed	——	——
FU.15	Multi-steps speed run time at present	——	——
FU.16	Digital input terminal status 1	——	——
FU.17	Digital input terminal status 2	——	——
FU.18	Counting value of counter	——	——
FU.19	G/P display	0~1, 0:G type; 1: P type	——
FU.20	Inverter rated power	——	——
FU.21	Inverter rated current	——	——
FU.22	Inverter rated voltage	——	——
FU.23	Terminal status	Hexadecimal	——

Chapter 6 Function Parameter Specification

6.1 F0 Group: Basic function

Function Code	Name	Setting Range
F0.00	Speed control mode	0～4【0】

0:Sensorless vector control

Being both the excellent property of the vector sensor and not sensitive to the motor par ameters,suitable for most occasions.

1:Sensorless vector control 1

The precision of speed sensorless vector control technology really realize decoupling of a c motor,make operation control dc motor,suitable high-performance occasions,has advantages o f high accuracy rotating speed, torque of high accuracy,without installing encoder.

2:V/F control

Suitable for the occasion of control accuracy is not high,such as fan and pump load.Can be used in the occasion of one inverter drives multiple motor.

3:Torque control

Suitable for the occasion of counter rotating torque control accuracy is not high,such as wire wound,wire drawing, etc.In torque control mode,the speed of the motor is determined by the motor load,the acceleration/deceleration speed no longer decided by the acceleration/decel eration time of the frequency inverter.

Note：Choosing a vector control method,must have motor parameter self learning.On ly get the exact motor parameters can give a full play to the superiority of the vector c ontrol mode.

4:Sensor vector control

Refers to the closed-loop vector, must be equipped with encoder and PG card, suitable f or high-precision speed control or torque control.

Function Code	Name	Setting Range
F0.01	Run command source	0～2【0】

Choosing the inverter control instruction.Inverter control command include:Start,stop,forward, inversion and point movement,fault restoration,etc.

0:Keypad（“LOCAL/REMOT” LED extinguished）;

Both RUN and STOP/RST key are used for running command control.If multifunction key QUICK/JOG is set as FWD/REV switching function（F7.03=1）, it will be used to change the rot ating orientation.In running status,pressing RUN and STOP/RST at the same time will cause the i nverter coast to stop.

1:Terminal（“LOCAL/REMOT” LED lights on）;

The operation,including forward run,reverse run,forward jog,reverse jog etc.can be controlled by multifunctional input terminals.

2:Communication（“LOCAL/REMOT” LED flickering）;

The operation of inverter can be controlled by host through communication.

Function Code	Name	Setting Range
F0.02	Frequency Source A selection	0～8【8】

Select frequency A command input channel and there are 8 main given frequency channels.

0：Keypad

Set the frequency by the keypad through modifying F0.06.To achieve the purpose of the keypad set frequency

1：AI1

2：AI2

Set the frequency through analog input terminals.Inverter provide 2 ways analog input terminal in its standard configuration,both AI1，AI2 are 0～10V/0（4）～20mA input，the current/voltage can be shifted by wire jumper AI1,AI2.Note：when AIx selects 0～20mA input,20mA corresponds to 10V.

100.0% of analog input corresponds to the max.Frequency（function code F0.07），-100.0% corresponds to the Max.Frequency in reverse（function code F0.07）。

3：HDI

The reference frequency is set by high speed pulse input.inverter provide 1 way HDI input in its standard configuration.

Pulse voltage range：15～30V

Pulse frequency range：0.0～50.0kHz。

100.0% of the setting impulse corresponds to maximal frequency,while -100.0% corresponds with minus maximal frequency.

Note：pulse can only be input through mutli-function terminal HDI.And set F5.08=27 to select the function of HDI as “setting input”.

4：Simple PLC

The inverter will run at simple PLC when selecting this frequency setting method.It is necessary to set the parameter of FA group to determine the given frequency,running direction and each ACC/DEC time.Please refer to the instruction of FA group carefully.

5：Multi-stage speed

The inverter will run at multi-stage speed when selecting this frequency setting method.The reference frequency is determined by F5 and FA group.If F0.02 is not multi-stage speed setting,then the multi-stage setting has the priority which is lower than the priority of jogging.Olny

stage 1～15 can be set when multi-stage setting has the priority.So stage 0～15 can be set when F0.02 is multi-stage speed setting.

6：PID control

The running mode is procedure PID control when selecting this parameter.It is a necessary to set F9 group.The reference frequency is the result of PID adjustment.For details,please refer to description of F9 group.

7：Remote communication

The frequency command is given by the upper monitor through communication given.Please refer to MODBUS communication protocol.

8：Keyboard potentiometer

The frequency is given by the keyboard potentiometer.

Function Code	Name	Setting Range
F0.03	Frequency Source B selection	0～8【1】
F0.04	Frequency Source B reference	0～1【0】

F0.03:

Frequency Source B selection is same as F0.02,Please refer to the instruction of F0.02 carefully.

F0.04：

0:Maximum output frequency

100% of B frequency setting corresponds to the maximum output frequency.

1:A frequency command

100% of B frequency setting corresponds to the maximum output frequency.Select this setting if it needs to adjust on the base of a frequency command.

Function Code	Name	Setting Range
F0.05	Frequency command selection	0～8【0】

0:A

1:B

2:A+B

3:A<=>B

4:A<=>A+B,depend on Xn terminal

5:B<=>A+B,depend on Xn terminal

6:MAX(A,B), taking the maximum values of A and B

7:MIN(A,B), taking the minimum of A and B

8:A is valid for A, and A is invalid for B.

Function Code	Name	Setting Range

F0.06	Keypad reference frequency	0.00 Hz～F0.07【50.00 Hz】

When Frequency instruction selection is set to be keypad,this parameter is the initial valu e of inverter reference frequency.

Function Code	Name	Setting Range
F0.07	Maximum frequency	50.00～300.00 Hz【50.00 Hz】
F0.08	Frequency upper limit setup	F0.09～F0.07【50.00 Hz】
F0.09	Frequency lower limit setup	0.00Hz～F0.08【0.00 Hz】

F0.07:

This parameter is used to set the Max Output frequency of the inverter. It is the basic of frequency setting and ACC/DEC speed. Please pay attention to it.

F0.08:

This is the upper limit of the output frequency and it will be less than or equal to the Ma x Output frequency.

F0.09:

This is the lower limit of the output frequency of the inverter.

This parameter can be selected by function code F1.12. If the setting frequency is lower than the upper limit, the inverter will run, stop or hibernate at the lower limit frequency.

The Max. Output frequency＞ Upper limit of the frequency＞Lower limit of the frequency.

Function Code	Name	Setting Range
F0.10	Keypad and terminal UP/DOWN set	0～4【0】

The frequency can be set by "∧" , "∨" and terminal UP/DOWN. This setting method h ave the highest and it can be combined with setting channel. It is used to adjust the output f requency during the commissioning of controlling system.

0:Valid,and the value can be saved when the inverter is powered off. The frequency com mand can be set and the value can be saved after the inverter is powered off and it will co mbination with the current frequency when it is repower on.

1:Valid,and the value can not be saved when the inverter is powered off. The frequency command can be set but the value can not be saved after the inverter is powered off.

2:Invalid,the function of "∧" , "∨" and terminal UP/DOWN is invalid, and the setting wil l be cleared automatically.

3:Valid during running. The function of "∧" , "∨" and terminal UP/DOWN is valid during running and the setting will be cleared automatically when the inverter stops.

4:When the keyboard setting frequency is modified, the "△", "▽" of the keyboard and the terminal UP/DOWN setting are automatically cleared.

Note:When the factory setting is restored, the value of keypad and UP/DOWN will be cleared.

Function Code	Name	Setting Range
F0.11	Acceleration time 1	0.1～3600.0S【Depend on model】
F0.12	Deceleration time 1	0.1～3600.0S【Depend on model】

Acceleration time is the time of accelerating from 0Hz to maximum frequency (F0.07) Deceleration time is the time of decelerating from maximum frequency (F0.07) to 0Hz Please refer to following figure.

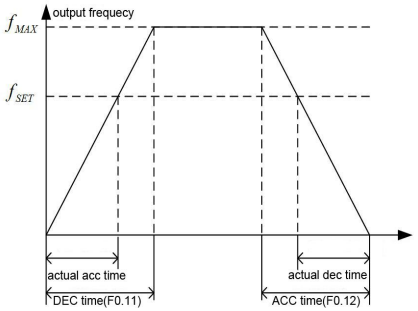


Fig.6-1 ACC and DEC time

When the reference frequency is equal to the maximum frequency,The actual acceleration and deceleration time will be equal to actual setting.

When the reference frequency is less than the maximum frequency,the actual acceleration and deceleration time will be less than actual setting.

The actual acceleration (deceleration) time=setting ACC/DEC time* reference frequency/ maximum frequency.

Inverter have 4 groups of ACC/DEC time

1st group:F0.11、F0.12；

2nd group:F8.00、F8.01；

3rd group:F8.02、F8.03；

4th group:F8.04、F8.05。

By multifunction digital input terminal of the ACC/DEC time choose terminal combination to choose ACC/DEC time.

Function Code	Name	Setting Range
F0.13	Running direction selection	0～2【0】

0:Runs at the default direction. the inverter runs in the forward direction.

1:Runs at the opposite direction, the inverter runs in the reverse direction. This effect equals to the shifting the rotation direction by adjusting either two of the motor wires.

Note: If the parameters are restored,the running direction will be back to its original status.It is careful to use to system debugging after is forbidden to change the motor to occasion.

2: Forbid to run in reverse direction. It can be used in some special cases if the reverse running is disabled.

Function Code	Name	Setting Range
F0.14	Carrier frequency	1.0～16.0KHz【Depend on model】

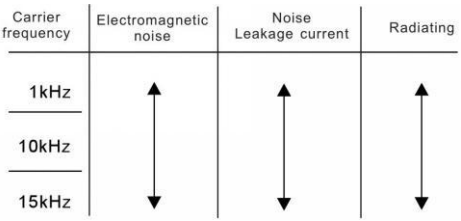


Fig.6-2 Effect of carrier frequency

The advantage of high carrier frequency:ideal current waveform,little current harmonic wav e and motor noise.

The disadvantage of high carrier frequency:increasing the switch loss,increasing inverter te mperature and the impact to the output capacity. The inverter needs to derate

on high carrier frequency. At the same time, the leakage and electrical magnetic interfere nce will increase.

Applying low carrier frequency is contrary to the above,too low carrier frequency will caus e unstable running,torque decreasing and surge.

The manufacturer has set a reasonable carrier frequency when the inverter is in factory. I n general, users do not need to change the parameter.

When the frequency used exceeds the default carrier frequency,the inverter needs to derate 20% for each additional 1k carrier frequency.

Function Code	Name	Setting Range
F0.15	AVR function selection	0～2【2】

0:Invalid

1:All valid

2:Valid in deceleration only

When AVR is invalid,the output voltage will change with the input voltage (or DC bus voltage);when AVR is valid,the output voltage won't change with the input voltage (or DC bus voltage).The range of output voltage will keep constant.

Function Code	Name	Setting Range
F0.16	Motor parameters autotuning	0～2【0】

0:No action

1:Rotation autotuning

Input right parameters of the motor nameplate (F2.01-F2.05) and do not connect any load to the motor before performing autotuning and ensure the motor is in static and empty status.Otherwise the parameters detected by autotuning will be incorrect.

Set the proper acceleration and deceleration time (F0.11 and F0.12) according to the motor inertia before performing autotuning.Otherwise it may cause over-current and over-voltage fault during autotuning.

Set F0.16 to be then press the DATA/ENT, LED will display "TURN" and flicker.Press RUN to start the autotuning,and the LED will display "TURN" , "RUN" light will flicker,motor begin to run.When "RUN" lights off,that means the autotuning is finished and return to the stop status.

When flickers "TURN" flickers,pressing PRG/ESC can escape from the parameter autotune.

During the autotuning, press the STOP/RST will stop the autotune.

Note: Only keypad can control the autotuning. F0.16 will restore to 0 automatically when the autotuning is finished.

2: Static autotuning

When motor static parameter autotune, will not interrupt motor and load.Before the motor parameter self learning, it is necessary to correct the input parameters of motor nameplates. Since autotuning will detect the motor stator resistance and rotor resistance and leakage indu ctance of the motor.But the mutual inductance and the non-load current can not be measured. if needed user should input suitable value according to experience.

Function Code	Name	Setting Range
F0.17	Restore parameters	0～3【0】

0:No action

1:Restore factory parameters (without motor parameters)

2:Clear fault records

3:Restore all factory parameters (including motor parameters)

This function code will restore to 0 automatically when complete the function operation.

Function Code	Name	Setting Range

F0.18	Parameters copy	0～3【0】

0:No action

1:Parameters upload

According to save the parameters of the type on the operation panel (with or without the motor parameters etc),automatically uploaded to the control panel.

2:Parameters download（all）

In addition to the historical record run (FU) parameters,other parameters downloaded to EEPROM on the operation panel.

3:Parameters download（Except the motor parameters）

In addition to the running record (FU) and motor parameters group (F2),other parameters downloaded to EEPROM on the operation panel.

6.2 F1 Group: Start and stop Control

Function Code	Name	Setting Range
F1.00	Start mode	0～2【0】

0:Start directly: Start the motor at the starting frequency directly.

1:DC braking and start: Inverter will output DC current firstly and then start the motor at the starting frequency(Pay attention to set the parameters of F1.03 and F1.04).It is suitable for the motor which have small inertia load and may reverse rotation when start.

2: Speed tracking and start:Inverter detects the rotation speed and direction of motor,then start running to its reference frequency based on current speed.This can realize smooth start of rotating motor,suitable for large inertia load to start again when the instantaneous power failure.

It only applies on the inverter of 7.5kW and above.

Function Code	Name	Setting Range
F1.01	Start frequency	0.10～300.00Hz【0.50Hz】
F1.02	Start frequency hold time	0.0～50.0S【0.0S】

Set proper starting frequency can increase the starting torque.The inverter runs from the starting frequency and after the keeping time of the starting frequency,the inverter will accelerate to the aimed frequency during the ACC time.If the reference frequency is less than starting frequency,the inverter will be at stand-by status.The starting frequency could be less than the lower frequency limits.The starting frequency takes no effect during FWD/REV switching.

Function Code	Name	Setting Range

F1.03	Braking current before starting	G:0.0～100.0% P:0.0~80.0% 【0.0%】
F1.04	Braking time before starting	0.0～50.0S【0.0S】

During the DC braking before F1.03,the increased current is the percentage to the rated current of the inverter.

DC braking is invalid when F1.04 is set to be 0.

The bigger the DC braking current,the greater the braking torques.

Function Code	Name	Setting Range
F1.05	Acceleration/Deceleration mode	0～1【0】

The frequency changing method during the running and starting of the inverter.

0:Linear

Output frequency according to the linear increasing or decreasing

1:S Curve

Output frequency according to the S Curve increasing or decreasing.S curve commonly u sed in the up,stop process requires quite gentle,such as The elevator,conveyor belt.

Function Code	Name	Setting Range
F1.06	Stop mode	0～1【0】

0:Deceleration to stop

When the stop command takes effect,frequency converter according to the definition of de celeration mode and the deceleration time to reduce the output frequency,frequency drop to 0 after downtime

1:Coast to stop

When the stop command takes effect, the inverter blocks the output immediately.The moto r coasts to stop by its mechanical inertia.

Function Code	Name	Setting Range
F1.07	DC braking initial frequency	0.00～F0.07【0.00Hz】
F1.08	DC braking waiting time	0.0～50.0S【0.0S】
F1.09	DC braking current	G:0.0～100.0% P:0.0~80.0% 【0.0%】
F1.10	DC braking duration	0.0～50.0S【0.0S】

DC braking initial frequency:Start the DC braking when running frequency reaches starting frequency determined.Starting frequency of DC braking is 0 and the DC braking is invalid.The

inverter will stop in the defined DEC time.

DC braking waiting time:Before the start of the outage dc braking,inverter blockade output, after the delay a restart dc braking.Used to prevent the high speed start over current fault c aused by dc braking.

DC braking current:Refers to add the amount of dc braking. The bigger braking current is, the greater the braking torque is.

DC braking duration:Refers to the amount of dc braking sustain time.

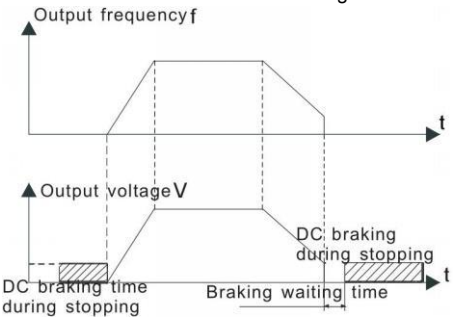


Fig.6-3 DC braking diagram

Function Code	Name	Setting Range
F1.11	FWD&REV dead time	0.0～3600.0S【0.0S】

Set the hold time at zero frequency in the transition between forward and reverse running.It is shown as following figure：

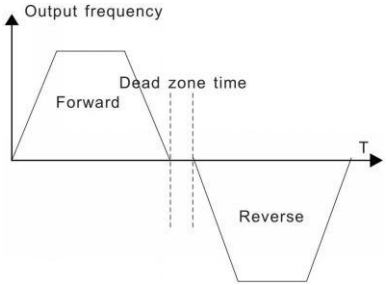


Fig.6-4 FWD/REV dead time diagram

Function Code	Name	Setting Range
F1.12	Action when running frequency is less than lo wer frequency limit	0～1【0】

This function code is used to determine the running state when the setting frequency is lower than the lower frequency limit.

0:Running at the lower frequency limit

1:Running at zero frequency.Inverter will Running at zero frequency when the running frequency is less than the lower frequency limit.When the reference frequency is higher than or equal to the lower frequency limit again,the Inverter will automatic increase frequency to run.

Function Code	Name	Setting Range
F1.13	Terminal detection selection when power is on	0～1【0】

This function only takes effect if run command source is terminal control.

0:Terminal running command is invalid,when power is on,inverter will not start even if FWD/REV terminal is active,until FWD/REV terminal disabled and enabled again.

1:Terminal running command is valid,when power on and FWD/REV terminal is active,inverter will start automatically.

Note:This function may cause the inverter restart automatically,please use it with cautious.

Function Code	Name	Setting Range
F1.14	Restart waiting time when power on	0～1【0】

The waiting time of restart when power is on.

6.3 F2 Group: Motor parameters

Function Code	Name	Setting Range
F2.00	Inverter mode	0～1【Depend on model】

0:G model:Applicable to constant torque load.

1:P model:Applicable to constant power load.

Inverters apply the manner of G/P unification,which means the power of the motor used in G type is lower than the power of the motor used in P type for one gear.

The factory setting of the inverter is G model.If P model is selected,it is necessary to set the function code to 1 and reset the motor parameters of F2.

Function Code	Name	Setting Range
F2.01	Motor rated power	0.4～6553.5KW【Depend on model】
F2.02	Motor rated frequency	0.01Hz～F0.07【50.00Hz】
F2.03	Motor rated speed	0～60000rpm【Depend on model】
F2.04	Motor rated voltage	50～460V【Depend on model】
F2.05	Motor rated current	0.1A~6553.5A【Depend on model】

Note: In order to achieve superior performance, please set these parameters according to motor nameplate, and then perform autotuning.

The inverter provides parameters autotune.Correct parameters autotune is from the right s etting of parameter of motor.

The power rating of inverter should match the motor.If the bias is too big,the control perf ormances of inverter will be deteriorated distinctly.

Note:Reset F2.01 can initialize F2.06-F2.10 automatically.

Function Code	Name	Setting Range
F2.06	Motor stator resistance	0～65.535Ω【Depend on model】
F2.07	Motor rotor resistance	0～65.535Ω【Depend on model】
F2.08	Motor stator & rotor inductance	0～655.35mH【Depend on model】
F2.09	Motor stator & rotor mutual inductance	0～6553.5mH【Depend on model】
F2.10	Motor no-load current	0.1～6553.5A【Depend on model】

After autotuning,the value of F2.06－F2.10 will be automatically updated.These parameter s are the basic parameters for high performance V/F control which have direct impact to the control performance.

Note:Do not change these parameters.

6.4 F3 Group: Vector control

Function Code	Name	Setting Range
F3.00	ASR proportional gain 1	1～3000【1000】
F3.01	ASR integral time 1	1～8000【300】
F3.02	ASR switching point 1	0.00Hz～F3.05【5.00Hz】
F3.03	ASR proportional gain 2	1～3000【800】
F3.04	ASR integral time 2	1～3000【200】
F3.05	ASR switching point 2	F3.02～F0.07【10.00Hz】

The above parameters are only valid for vector control.ASR PI parameters is decided by F3.00 and F3.01 when output frequency is less than F3.02.ASR PI parameters is decided by F3.03 and F3.04 when output frequency is greater than F3.05.When output frequency is betw een F3.02 and F3.05,ASR PI parameters obtained by two groups of parameters of the linear change,please refer to following figure.

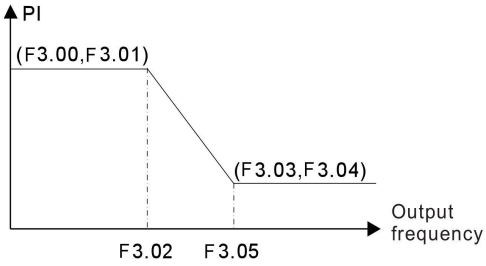


Fig.6-5 PI parameter diagram

By setting the speed regulator's the proportion gain and the integral time Can adjust the ASR of the vector control dynamic response.if the proportion gain is increased or the integral time is decreased,The system dynamic response will be faster.However,if the proportion gain is too large,the system tends to oscillate.If the integral time is too small,the system tends to oscillate And there may be speed difference.Please adjust these parameter according to actual situation.

ASR PI parameters is close to the system of inertia,according to different load characteristics need to be in default on the basis of PI parameters to adjust to meet the needs of various occasions.

Function Code	Name	Setting Range
F3.06	Slip compensation rate of VC	0～200%【100%】

The parameter is used to adjust the slip frequency of vector control and improve the precision of speed control. Properly adjust this parameter can effectively restrain the static speed bias.

Function Code	Name	Setting Range
F3.07	ASR filter time	0-10【3】

Velocity loop filter:ASR output after a first order filter go into current controller.Filter time constant is determined by F03.07.Increase the filter can reduce the output current ripple,but will also slow dynamic response.

Function Code	Name	Setting Range
F3.08	Current loop Kp	0～5000【3000】
F3.09	Current loop Ki	0～5000【1500】

These two parameters adjust the PI regulation parameters of the current loop, which directly affect the dynamic response speed and control accuracy of the system. Under normal circumstances, the user does not need to change the default value.

Function Code	Name	Setting Range
F3.10	Torque upper limit setting	0.0～300.0%【160%】

The above parameters set the maximum torque limit for vector speed control. The upper torque limit can be set by the function code (F3.10), or it can be set by analog quantity, pulse frequency, or communication mode. The upper torque limit is given as a percentage and 100.0% corresponds to the torque at the rated current of the drive.

Note: The upper torque limit does not include the direction. The absolute value of the output torque does not exceed the upper limit of the torque, whether it is positive or negative, electric or power generation.

Function Code	Name	Setting Range
F3.11	Torque setting method	0～7【0】

0: invalid

1: keyboard set torque

Use the keyboard to set the torque, which is set by parameter F3.12.

2: Keyboard potentiometer set torque

Use the keyboard potentiometer to set the torque.

3: Analog AI1 set torque

Set the torque using analog AI1. 0 to 10V or 0 to 20mA corresponds to 0 to F3.10.

4: Analog AI2 set torque

Set the torque using analog AI2. 0 to 10V or 0 to 20mA corresponds to 0 to F3.10.

5: High speed pulse HDI set torque

The torque is set using the high speed pulse HDI. 0 to F5.23 correspond to 0 to F3.10.

6: Multi-speed setting torque

Set the torque using multi-speed. 100% corresponds to 0 to F3.10.

7: Communication set torque

Use communication to set the torque. Via MODBUS.

Function Code	Name	Setting Range
F3.12	Keyboard setting torque	0.0%～200.0%【50.0%】

When F3.11 is set to 0, the torque is set by this parameter.

Function Code	Name	Setting Range
F3.13	Low speed torque boost during torque control	0.0%～20.0%【5.0%】

This parameter is the low speed torque boost value for torque control.

Function Code	Name	Setting Range
F3.14	Overvoltage PID proportional gain (Kp)	0.01～10.00【0.20】
F3.15	Overvoltage PID integration time	0.00～100.00S【0.10S】

The above two parameters are used for occasions where the bus voltage fluctuates greatly, suppressing the rapid rise of the bus voltage and reducing the overvoltage alarm.

Function Code	Name	Setting Range
F3.16	VC controls the weak magnetic coefficient	20.0～300.0%【100.0%】

F3.17	VF control weak magnetic coefficient	20.0～300.0%【200.0%】

F3.16 is effective at constant power. When the motor speed is running above the rated speed, the motor enters the field weakening operation. The curvature of the weak magnetic curve can be changed by modifying the weak magnetic control coefficient. The larger the value is, the steeper the weak magnetic curve is. The smaller the value is, the smoother the weak magnetic curve is.

F3.17 is used for torque upper limit and current limit control.

Function Code	Name	Setting Range
F3.18	Encoder pulse number	0～65535【1024】
F3.19	Encoder pulse direction	0～1【0】

F3.18 Encoder pulse number, using incremental encoder, the number of pulses output by the encoder corresponding to one rotation of the axis.

F3.19 encoder pulse direction value 0: forward; 1: reverse.

6.5 F4 Group: V/F control

Function Code	Name	Setting Range
F4.00	V/F curve selection	0～2【0】

0:Linear V/F curve.It is applicable for normal constant torque load.

1:Square V/F curve.It is suitable for centrifugal load，Such as fans and pumps.

2:User-defined V/F curve.It can be defined through setting (F4.03-F4.08).

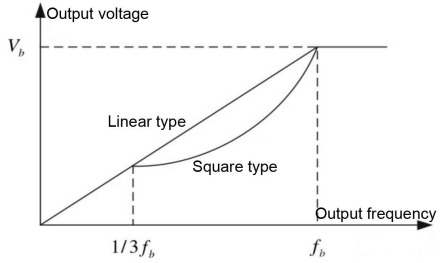


Fig.6-6 V/F curve

Function Code	Name	Setting Range
F4.01	V/F frequency 1	0.00Hz～F4.03【10.00】
F4.02	V/F voltage 1	0.0%～100.0%【20.0】
F4.03	V/F frequency 2	F4.01～F4.05【25.00】
F4.04	V/F voltage 2	0.0%～100.0%【50.0】
F4.05	V/F frequency 3	F4.03～F2.02【40.00】
F4.06	V/F voltage 3	0.0%～100.0%【80.0】

F4.01-F4.06 are used to set the user-defined V/F curve.The value of V/F curve should be set according to the load characteristic of motor.

Note：V1＜V2＜V3,f1＜f2＜f3. The voltage corresponding to low frequency should not be set too high otherwise it may cause motor overheat or inverter fault.

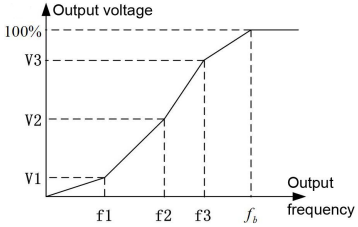


Fig.6-7 V/F curve setting diagram

Function Code	Name	Setting Range
F4.07	Slip compensation rate of V/F	0.0%～200.0%【0】
F4.08	Slip compensation time of V/F	0.00~10.00S【0】

This parameter can be compensated for on load application of V/F control motor speed change,In order to improve the hardness of motor mechanical properties,100.0% is corresponding to slip frequency rating of the motor.

Function Code	Name	Setting Range
F4.09	Torque boost	0.0:（auto）0.1～30.0【Depend on model】
F4.10	Torque boost cut-off	0.0～100.0%【50.0%】

Torque boost will take effect when output frequency is less than cut-off frequency of torque boost (F4.10).Torque boost can improve the torque performance of V/F control at low speed.

The value of torque boost should be determined by the load.The heavier the load,the larger the value is.If the boost is too large,the motor will run in exciting.The efficiency of the motor decreases as the current of the inverter increases and the motor increase the heat-releasing.

When the torque boost is set to 0.0%,the inverter is in the automatic torque boost state.

Cut-off point of torque boost:The torque boost is valid under this point,and the torque boost is invalid when exceeding this set frequency.

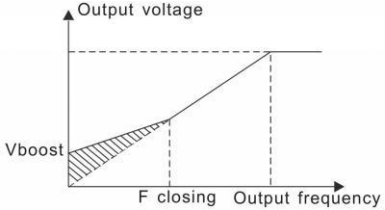


Fig.6-8 Torque boost by hand diagram

Function Code	Name	Setting Range
F4.11	Auto energy-saving selection	0～1【0】

0: no auto energy-saving

1: auto energy-saving

When motor In no load or light load run at constant speed,it will adjust the inverter outpu t voltage and save energy through detecting the load current.

Note:This function is especially effective for fan and pump load

Function Code	Name	Setting Range
F4.12	Oscillation suppression gain Kp	0～100【5】
F4.13	Oscillation suppression gain Ki	0～100【10】

When V/F is running and the motor light load and low frequency (average 5.00 Hz ~ 20. 00 Hz),it may appear Mechanical and electrical parameters of resonance.At the moment,Motor speed fluctuate, the inverter output current, bus voltage fluctuate.Serious when may damage the load equipment downtime or frequency inverter.At the moment,it can improve the system d amping and eliminate oscillations through adjusting F4.12 F4.13.Generally do not need to adju st.

Function Code	Name	Setting Range
F4.14	Voltage separation control	0～6【0】
F4.15	Keypad setting voltage	0~440V【0V】

When separating V/F operates，the output voltage will set by the user.If F4.14 set to 1(ke yboard set),setting the size of the output voltage instruction by F4.15,no more than motor rate d voltage and output voltage of bus bar can provide|(The maximum output voltage of the bus can provide is $V_{bus}/\sqrt{2}$).Voltage command also set by the way,such as Analog value, input pulse, communication.100% is Corresponding to the motor rated voltage value.

Function Code	Name	Setting Range
F4.16	Voltage rising time	0.1～3600.0S【1.0S】
F4.17	Voltage falling time	0.1～3600.0S【1.0S】

Separating V/F output voltage generated by the voltage instruction through the up (down) slope.F4.16 set the up and speed of the slope,F4.17 set the down and speed of the slope.V oltage rising (falling) time is equal to the output voltage from 0 up (down) to the time require d to 100.0%.

6.6 F5 Group: Input terminals

Function Code	Name	Setting Range
F5.00	Terminal control mode	0～3【0】

This parameter defines four different control modes that control the inverter operation thro ugh external terminals.

0: 2-wire control mode 1,The defined FWD and REV terminal (X1~X7) command determin es the direction

When (X1~X7) terminal of the definition of "FWD" is ON and (X1~X7) terminal of the defi nition of "FWD" is OFF,motor will forwardly run.

When (X1~X7) terminal of the definition of "FWD" is OFF and (X1~X7) terminal of the de finition of "FWD" is ON,motor will reversely run.

When (X1~X7) terminal of the definition of "FWD" And (X1~X7) terminal of the definition of "FWD" State is consistent,motor stop running.

K1	K2	Run command
OFF	OFF	Stop
ON	OFF	FWD
OFF	ON	REV
ON	ON	Stop

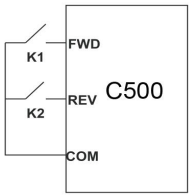


Fig.6-9 2-wire control mode1

1:2-wire control mode 2: START command is determined by FWD terminal.Run direction i s determined by REV terminal.

When (X1~X7) terminal of the definition of "FWD" is ON and (X1~X7) terminal of the defi nition of "FWD" is OFF,motor will forwardly run.

When (X1~X7) terminal of the definition of "FWD" is OFF and (X1~X7) terminal of the de finition of "FWD" is ON,motor will reversely run.

When (X1~X7) terminal of the definition of "FWD" And (X1~X7) terminal of the definition of "FWD" State is consistent,motor stop running.

K1	K2	Run command
OFF	OFF	Stop
ON	OFF	FWD
OFF	ON	Stop
ON	ON	REV

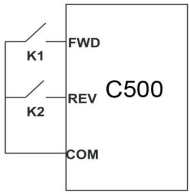


Fig.6-10 2-wire control mode2

2:3-wire control mode 1: START command is determined by FWD terminal.Run direction i s determined by REV terminal.STOP command is determined by 3-wire control.

When (X1~X7) terminal of the definition of "FWD" trigger once,If (X1~X7) terminal of the definition of "REV" is OFF,motor will forwardly run;If (X1~X7) terminal of the definition of "REV " is ON,motor will reversely run.

Xi is Terminal control functions of (X1~X7) terminal of the definition of 3-wire control,if sta te is OFF,inverter stop running.

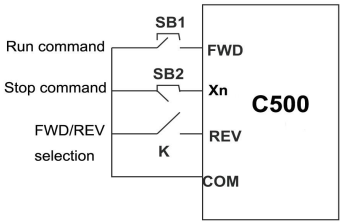


Fig.6-11 3-wire control mode1

3:3-wire control mode 2: START command is determined by FWD terminal.Run direction i s determined by REV terminal.STOP command is determined by 3-wire control.

When (X1~X7) terminal of the definition of "FWD" trigger once,motor will forwardly run. W hen (X1~X7) terminal of the definition of "REV" trigger once,motor will reversely run.

Xi is Terminal control functions of (X1~X7) terminal of the definition of 3-wire control,if sta te is OFF,inverter stop running.

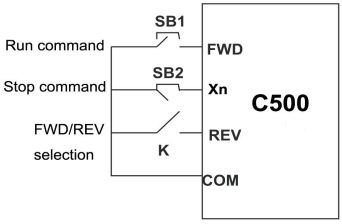


Fig.6-12 3-wire control mode2

Note: In 2-wire control mode,When produced by other sources halt instruction and make t he inverter stopping,the inverter will not run in following situation even if FWD/REV terminal is enabled.Inverter will not run after the stop order to disappear.If you want to make the inverte r running, terminal of the definition of "FWD" or "REV" need trigger again.

Function Code	Name	Setting Range
F5.01	Multifunction input terminal 1(X1)	0～40【1】
F5.02	Multifunction input terminal 2(X2)	0～40【2】
F5.03	Multifunction input terminal 3(X3)	0～40【7】
F5.04	Multifunction input terminal 4(X4)	0～40【0】
F5.05	Multifunction input terminal 5(X5)	0～40【0】
F5.06	Multifunction input terminal 6(X6)	0～40【0】
F5.07	Multifunction input terminal 7(X7)	0～40【0】
F5.08	HDI terminal function	0～40【0】

This group parameters are used to set digital multifunction input terminals corresponding f unction

0:No function

1:FWD

2:REV

When operation instruction channels is the terminal control, frequency converter running c ommands given by the terminal function.

3:3-line running control

Please refer to description of F5.00.

4:FWD JOG

5:REV JOG

Please refer to description of F8.06-F8.08.

6:Free stop

When the Command is effective,motor will immediately blockade output and coasts to sto p by its mechanical inertia.It should use this way when large inertia load and no demands to stop time.This way has the same meaning as free stop which F1.08 mention.

7:Malfunction reset

Resets faults that have occurred.It has the same function as STOP/RST .

8:running pause

When this terminal takes effect,inverter decelerates to stop and save current status, such as PLC,traverse frequency and PID.When this terminal takes no effect,inverter restores the sta tus.

9:Exterior fault input

Stop the inverter and output an alarm when a fault occurs in a peripheral device.

10:Frequency UP

11:Frequency DW

12:UP/DW clear

The reference frequency of inverter can be adjusted by UP command and DOWN comma nd.These three functions are used to modify the reference frequency through external terminal s. UP is the increasing command, DOWN is the decreasing command, and the Clear UP/DO WN is used to restore to the reference frequency given by the frequency command chann el.

13,14,15,16:Multi-steps terminal 1～4

16 steps speed control can be realized by the combination of these four terminals.

Note:Multi-steps terminal 1 is the low,Multi-steps terminal 4 is the high.

Multi-steps terminal 4	Multi-steps terminal 3	Multi-steps terminal 2	Multi-steps terminal 1
BIT3	BIT2	BIT1	BIT0

17,18:ACC/DEC time choose terminal 1,2

4 groups of ACC/DEC time can be selected by the combination of these two terminals.

Terminal 2	Terminal 1	ACC/DEC time choose	Corresponding parameters
OFF	OFF	ACC/DEC time 0	F0.11 F0.12
OFF	ON	ACC/DEC time 1	F8.00 F8.01
ON	OFF	ACC/DEC time 2	F8.02 F8.03
ON	ON	ACC/DEC time 3	F8.04 F8.05

19:PID control pause

PID adjustment will be paused and inverter keeps output frequency unchanged.

20:Swing frequency pause

Inverter keeps output frequency unchanged.If this terminal is disabled, inverter will continue traverse operation with current frequency.

21:Swing frequency reset

Reference frequency of inverter will be forced as center frequency of traverse operation.

22:ACC/DEC forbid

ACC/DEC is invalid and maintains output frequency if it is enabled.

23:torque control forbid

Torque control is forbidden and switch inverter to run in speed control mode.

24:Counter trigger

The pulse input terminal of internal counter.Maximum pulse frequency:200Hz.

25:Counter clear zero

Clear the value of counter.

26:Frequency source switch

The power terminal is valid,frequency source combinations are forced to switch,frequency source refer to function code F0.05.

27:HDI input

The terminal will be set to high speed pulse input(Only the HDI port effectively).

28:Motor switch

Using to switch the first motor and the second motor.

29:PLC status reset

Restart the process of simple PLC,removing previous state of PLC memory information.

30:Running command switch to the terminals

This terminal is valid,running command is controlled by the terminal.

31:DC braking

This terminal is valid,inverter switch to Dc braking state,braking current is determined by F1.09.

32～40:Reserved

Function Code	Name	Setting Range

F5.09	X terminal trait selection	0～1【0】

Setting the working logic of X terminal.
0: On valid
1: Off valid

Function Code	Name	Setting Range
F5.10	UP/DOWN setting change rate	0.01～50.00Hz/S【0.50】

This parameter is used to determine how fast UP/DOWN setting changes.

Function Code	Name	Setting Range
F5.11	AI1 lower limit	0.00～10.00V【0.00V】
F5.12	AI1 lower limit corresponding setting	-100.0～100.0%【0.0%】
F5.13	AI1 upper limit	0.00～10.00V【10.00V】
F5.14	AI1 upper limit corresponding setting	-100.0～100.0%【100.0%】
F5.15	AI1 filter time constant	0.01～10.00S【0.10S】

These parameters determine the relationship between analog input voltage and the corresponding setting value.When the analog input voltage exceeds the range between lower limit and upper limit,it will be regarded as the upper limit or lower limit.

The analog input AII can only provide voltage input,and the range is 0V～10V.

For different applications,the corresponding value of 100.0% analog setting is different.For details,please refer to description of each application.

The following illustration shows several set of conditions.

Note: AI1 lower limit must be less or equal to AI1 upper limit.

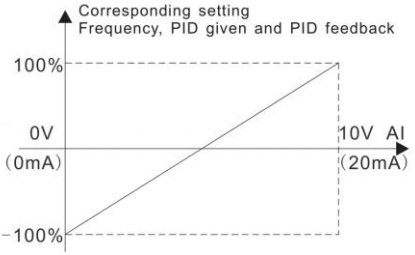


Fig.6-13 Relationship between AI and corresponding setting

AI1 filter time constant is effective when there are sudden changes or noise in the analog input signal.Responsiveness decreases as the setting increases.

Function Code	Name	Setting Range
F5.16	AI2 lower limit	0.00～10.00V【0.00V】
F5.17	AI2 lower limit corresponding setting	-100.0～100.0%【0.0%】

F5.18	AI2 upper limit	0.00～10.00V【10.00V】
F5.19	AI2 upper limit corresponding setting	-100.0～100.0%【100.0%】
F5.20	AI2 filter time constant	0.00～10.00S【0.10S】

Please refer to description of AI1.When AI2 is set as 0-20mA input,the corresponding voltage range is 0-10V.

Function Code	Name	Setting Range
F5.21	HDI lower limit	0.00～50.00 KHz【0.00KHz】
F5.22	HDI lower limit corresponding setting	-100.0～100.0%【0.0%】
F5.23	HDI upper limit	0.00～50.00 KHz【50.00KHz】
F5.24	HDI upper limit corresponding setting	-100.0～100.0%【100.0%】
F5.25	HDI filter time constant	0.00～10.00S【0.10S】

This group function code define corresponding relationship when using HDI pulse to set the input mode.

Function Code	Name	Setting Range
F5.26	The frequency UP/DOWN benchmark	0～1【0】

Use the UP/DOWN function to adjust frequency benchmark

0：0.01Hz

1：0.1Hz

6.7 F6 Group: Output terminals

Function Code	Name	Setting Range
F6.00	HDO selection	0～1【0】

HDO terminal is the reuse of programmable terminal.

0:High-speed pulse output:The maximum pulse frequency is 50.0 kHz.Please refer to description of F6.06.

1:ON-OFF output:Please refer to description of F6.01.

Function Code	Name	Setting Range
F6.01	HDO ON-OFF output selection	0～22【1】
F6.02	Open collector output Y1	0～22【4】
F6.03	Reserved	0～22【0】
F6.04	Relay 1output selection	0～22【1】
F6.05	Relay 1output selection	0～22【4】

ON-OFF output functions are indicated in the following table:

0:No output

1:Running.ON:Run command is ON or voltage is being output.

2:Run forward.ON: During forward run.

3:Run reverse.ON: During reverse run.

4:Fault output.ON: Inverter is in fault status.

5:FDT1 reached.Please refer to description of F8.16,F8.17.

6:Frequency reached.Please refer to description of F8.20.

7:Zero speed running.ON: The running frequency of inverter and setting frequency are zero.

8:Preset count value reached.Please refer to description of F8.22.

9:Specified count value reached.Please refer to description of F8.21.

10:overload pre-alarm.When the output current value detection reaches the setting of Fb.11 and the running time is more than the setting of Fb.12,inverter will output ON signal.

11:Simple PLC step completed.After simple PLC completes one step,inverter will output ON signal for 500ms.

12:PLC cycle completed.After simple PLC completes one cycle,inverter will output ON signal for 500ms.

13:Running time reached.ON:The accumulated running time of inverter is more than the setting time.

14:Upper frequency limit reached.ON:Running frequency reaches the upper limiting frequency.

15:Lower frequency limit reached.ON:Running frequency reaches the lower limiting frequency.

16:Ready.ON:Inverter is ready (no fault, power is ON).

17:FDT2 reached.Please refer to description of F8.18,F8.19.

18:AI1＞AI2

19:AI1＞F8.29

20:AI1＞F8.30

21:AI1 is between F8.29 and F8.30

22:PID discconection

23:Overcurrent output(Running current＞F8.33)

Function Code	Name	Setting Range
F6.06	HDO function selection	0～10【0】
F6.07	AO1 function selection	0～10【1】
F6.08	AO2 function selection	0～10【0】

Standard of Analog output is either 0～20mA or 0～10V.It is able to select the voltage output or current output through jumper AO1,AO2.The range of HDO ON-OFF output is 0khz～50.0khz.

AO/HDO output functions are indicated in the following table:

Setting value	Function	Range
0	Running frequency	0～Maximum frequency
1	Reference frequency	0～Maximum frequency
2	Running speed	0～2*rated synchronous speed of motor
3	Output current	0～2*inverter rated current
4	Output voltage	0～1.5*inverter rated voltage
5	Output power	0～2*rated power
6	Setting torque	0～2*rated current of motor
7	Output torque	0～2*rated current of motor
8	AI1 input	0～10V/0～20mA
9	AI2 input	0～10V/0～20mA
10	HDI input	0.1Hz～50.000kHz

Function Code	Name	Setting Range
F6.09	AO1 lower limit	0.0～100.0%【0.0%】
F6.10	AO1 lower limit corresponding output	0.00～10.00V【0.00V】
F6.11	AO1 upper limit	0.0～100.0%【100.0%】
F6.12	AO1 upper limit corresponding output	0.00～10.00V【10.00V】

These parameters determine the relationship between analog output voltage/current and the corresponding output value. When the analog output value exceeds the range between lower limit and upper limit, it will output the upper limit or lower limit.

When A01 is current output, 1 mA is corresponding to 0.5V.

For different applications, the corresponding value of 100.0% analog output is different.For details, please refer to description of each application.

The following illustration shows several set of conditions:

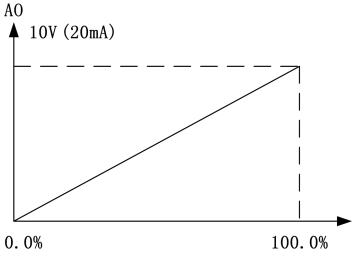


Fig.6-14 Relationship between AO and corresponding setting

Function Code	Name	Setting Range
F6.13	AO2 lower limit	0.0～100.0%【0.0%】
F6.14	AO2 lower limit corresponding output	0.00～10.00V【0.00V】
F6.15	AO2 upper limit	0.0～100.0%【100.0%】
F6.16	AO2 upper limit corresponding output	0.00～10.00V【10.00V】

Please refer to description of A01.Please refer to F6.09～F6.12.

Function Code	Name	Setting Range
F6.17	HDO lower limit	0.0～100.0%【0.0%】
F6.18	HDO lower limit corresponding output	0.00～50.00KHz【0.00KHz】
F6.19	HDO upper limit	0.0～100.0%【100.0%】
F6.20	HDO upper limit corresponding output	0.00～50.00KHz【50.00KHz】

The corresponding relationship of the output is similar to AO1.

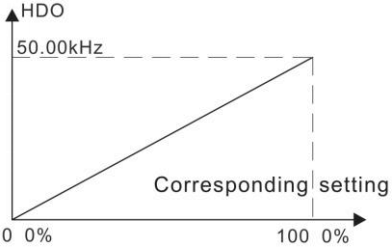


Fig.6-15 Relationship between HDO and corresponding setting

6.8 F7 Group: Keypad and display parameters

Function Code	Name	Setting Range
F7.00	User password	0～65535【0】

The password protection function will be valid when P7.00 is set to be any nonzero data.

When P7.00 is set to be 00000,user's password set before will be cleared and the password protection function will be disabled.

After the password has been set and becomes valid,the user can not access menu if the user's password is not correct.Only when a correct user's password is input,the user can see and modify the parameters.Please keep user's password in mind.The password protection becomes valid in 1 minute after quitting from the function code editing state.Press PRG/ESC again to the function code editing state, "0.0.0.0.0." will be displayed.Unless using the correct password,the operators cannot enter it.

Function Code	Name	Setting Range
F7.02	Change Parameter display	0～1【0】

0:Display all parameter

1:Display amended parameter only

Unmodified Parameters will be hidden.

Function Code	Name	Setting Range
F7.03	QUICK/JOG function selection	0～3【0】

QUICK/JOG is a multifunctional key, whose function can be defined by the value.

0:Jog.Press QUICK/JOG ,the inverter will jog.

1: FWD/REV switching.Press QUICK/JOG , the running direction of inverter will reverse.It is only valid When the keyboard control.

2:Clear UP/DOWN setting.Press QUICK/JOG , the UP/DOWN setting will be cleared.

3:Run command channel switching (switch between terminal and keyboard).

Function Code	Name	Setting Range
F7.04	STOP/RST function selection	0～3【2】

This function code defines the STOP/RST STOP function effective choice.

0:Valid when keypad control

1:Valid when keypad or terminal control

2:Valid when keypad or communication control

3:Always valid

The reset function of STOP/RST is always valid.

Function Code	Name	Setting Range
F7.05	Running status display selection	0~0x7FFF【0x303F】
F7.06	Stop status display selection	0~0x7FFF【0x3006】

F7.05 and F7.06 define the parameters that can be displayed by LED in running status. Using a 16 bit binary number,if Bit is 0,the parameter will not be displayed;If Bit is 1,the para meter will be displayed.Press 》/SHIFT to look the corresponding parameters in right order.sett ing the function code should To convert binary into hexadecimal,than Enter the function code.

The display content corresponding to each bit of F7.05 is described in the following table:

BIT15	BIT14	BIT13	BIT12	BIT11	BIT10	BIT9	BIT8	BIT7	BIT6	BIT5	BIT4
Reserved	Step NO. Of Multi-steps speed	AI2 value	AI1 value	HDI frequency	Setting speed	PID feedback value	PID given value	Output torque	Output power	Running speed	Output current
								BIT3	BIT2	BIT1	BIT0
								Output voltage	Bus voltage	Given frequency	Running frequency

The display content corresponding to each bit of F7.06 is described in the following table:

BIT15	BIT14	BIT13	BIT12	BIT11	BIT10	BIT9	BIT8	BIT7	BIT6	BIT5	BIT4
Reserved	Step NO. Of Multi-steps speed	AI2 value	AI1 value	HDI frequency	Setting speed	PID feedback value	PID given value	Output torque	Output power	Running speed	Output current
								BIT3	BIT2	BIT1	BIT0
								Output voltage	Bus voltage	Given frequency	Running frequency

setting the function code F7.05 and F7.06 should To convert binary into hexadecimal,than enter the function code.

Function Code	Name	Setting Range
F7.07	Coefficient rotation speed	0.1～999.9%【100.0%】

Actual mechanical speed=120*output frequency*P7.09/Number of poles of motor.This parameter is used to calibrate the bias between actual mechanical speed and rotation speed,Has no effect on the actual speed.

Function Code	Name	Setting Range
F7.08	Rectifier module temperature	0～200.0℃【--】
F7.09	IGBT module temperature	0～200.0℃【--】
F7.10	MCU software version 1	1.00～10.00【--】
F7.11	MCU software version 2	0.00～99.99【--】

Note: Above parameters are read only.

Rectify module temperature:Indicates the temperature of rectify module Overheat protection point of different model may be different.

IGBT module temperature:Indicates the temperature of IGBT module Overheat protection point of different model may be different.

Software version:Indicates current software version of DSP.

Function Code	Name	Setting Range
F7.12	Inverter rated power	0.4～900.0KW【Depend on model】

Above Inverter rated power are read only.

Function Code	Name	Setting Range
F7.13	Accumulated running time	0～65535h【--】

Accumulated running time:Displays accumulated running time of inverter.

Function Code	Name	Setting Range
F7.14	Running frequency display	0～1【0】

0:Before the compensation

1:After the compensation

6.9 F8 Group: Auxiliary function

Function Code	Name	Setting Range
F8.00	Acceleration time 2	0.1～3600.0S【20.0S】
F8.01	Deceleration time 2	0.1～3600.0S【20.0S】
F8.02	Acceleration time 3	0.1～3600.0S【20.0S】
F8.03	Deceleration time 3	0.1～3600.0S【20.0S】
F8.04	Acceleration time 4	0.1～3600.0S【20.0S】
F8.05	Deceleration time 4	0.1～3600.0S【20.0S】

ACC/DEC time can be selected among F0.11，F0.12 and the above three groups.Their me anings are the same. Please refer to the relative instructions of F0.11 and F0.12.

Select the ACC/DEC time 0～3 through the different combination of the multifunction digit al terminals when the inverter runs.

Function Code	Name	Setting Range
F8.06	JOG reference	0.00～50.00【5.00Hz】
F8.07	JOG acceleration time	0.1～3600.0S【Depend on model】
F8.08	JOG deceleration time	0.1～3600.0S【Depend on model】

Defining JOG reference frequency,JOG acceleration time and JOG deceleration time.JOG running process operate according to the direct starting for start-stop operation way and slow down.

JOG acceleration time is the required time of inverter from 0Hz Accelerating to Maximum output frequency(F0.07).

JOG deceleration time is the required time of inverter from Maximum output frequency(F0. 07) decelerating to 0Hz.

Function Code	Name	Setting Range
F8.09	Skip frequency 1	0.00～F0.07【0.00Hz】
F8.10	Skip frequency 2	0.00～F0.07【0.00Hz】
F8.11	Skip frequency amplitude	0.00～F0.07【0.00Hz】

By means of setting skip frequency, the inverter can keep away from the mechanical reso nance with the load. F8.09 and F8.10 are center value of frequency to be skipped.

Note:

- If F8.11 is 0, the skip function is invalid.
- If both F8.09 and F8.10 are 0, the skip function is invalid no matter what F8.11 is.
- Operation is prohibited within the skip frequency bandwidth, but changes during accele ration and deceleration are smooth without skip.

The relation between output frequency and reference frequency is shown in following figur e.

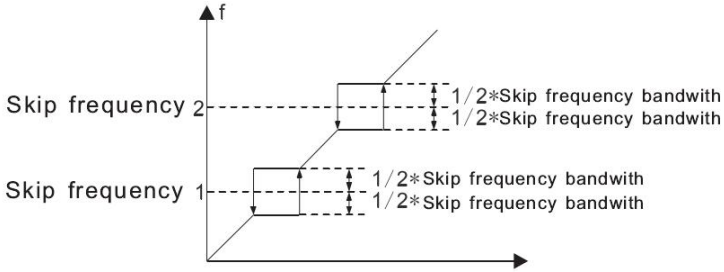


Fig.6-16 skip frequency diagram

Function Code	Name	Setting Range
F8.12	Traverse amplitude	0.0～100.0%【0.0%】
F8.13	Jitter frequency amplitude	0.0～50.0%【0.0%】
F8.14	Rise time of traverse	0.1～3600.0S【5.0S】
F8.15	Fall time of traverse	0.1～3600.0S【5.0S】

Traverse function applies to the industries where need the traverse and convolution functi on such as textile and chemical fiber industries.

The traverse function means that the output frequency of the inverter is fluctuated with th e set frequency as its center.The route of the running frequency is illustrated as below,of whic h the traverse is set by F08.12 and when F08.12 is set as 0,the traverse is 0 with no functio n.

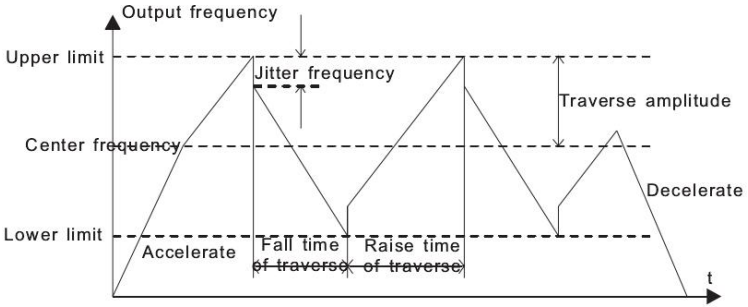


Fig.6-17 Traverse operation diagram

Traverse range:The traverse running is limited by upper and low frequency.

The traverse range relative to the center frequency: traverse range AW=center frequency*t raverse range F08.12.

Sudden jumping frequency=traverse range AW *sudden jumping frequency range F08.13.When run at the traverse frequency, the value which is relative to the sudden jumping frequency.

The raising time of the traverse frequency:The time from the lowest point to the highest one.

The declining time of the traverse frequency:The time from the highest point to the lowest one.

Function Code	Name	Setting Range
F8.16	FDT1 level	0.00 Hz～F0.07【50.00Hz】
F8.17	FDT1 lag	0.00~10.00Hz【1.00Hz】
F8.18	FDT2 level	0.00 Hz～F0.07【50.00Hz】
F8.19	FDT2 lag	0.00~10.00Hz【1.00Hz】

Setting the testing-value of the output frequency and the lag value of The output action removing.as shown in following figure:

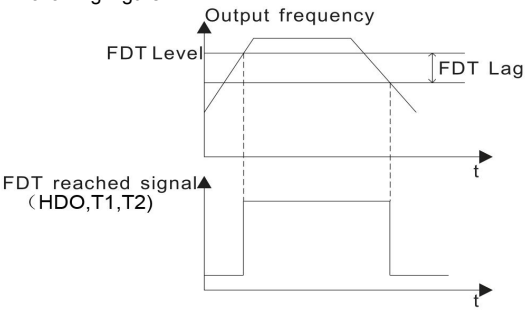


Fig.6-18 FDT level and lag diagram

Function Code	Name	Setting Range
F8.20	Frequency arrive detecting amplitude	0.00~10.00Hz【2.00Hz】

When output frequency is within the detecting range of reference frequency, an ON-OFF signal will be output.The function can adjust the detecting range.as shown in following figure:

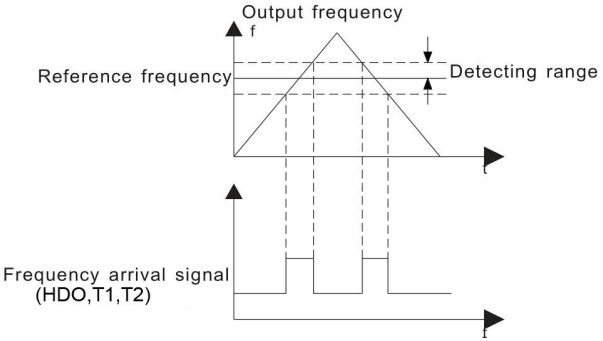


Fig.6-19 Frequency arriving detection diagram

Function Code	Name	Setting Range
F8.21	Specify the counter value	0~65530【0】
F8.22	Setting counter value	0~65530【0】

If function of output terminal is set as preset count reached, when the count value reaches preset count value (F8.22), it will output an ON-OFF signal. Inverter will clear the counter and restart counting.

If function of output terminal is set as specified count reached,when the count value reaches specified count value (F8.21), it will output an ON-OFF signal until the count value reaches preset count value (F8.22). Inverter will clear the counter and restart counting.

Note:

- Specified count value (F8.21) should not be greater than preset count value (F8.22).
- Output terminal can be R01, R02 or HDO.

This function is shown as following figure:

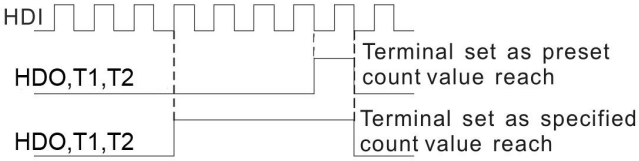


Fig.6-20 Preset and specified count value reached diagram

Function Code	Name	Setting Range
F8.23	Overmodulation	0～1【1】

0:the function is invalid

1:the function is valid

The function is applicable in the instance of low network voltage or heavy load for a long time,inverter raises the output voltage with rising utilization rate of bus voltage.

Function Code	Name	Setting Range
F8.24	Droop control	0.00～10.00Hz【0.00Hz】

When several motors drive the same load, each motor's load is different because of the difference of motor's rated speed. The load of different motors can be balanced through droop control function which makes the speed droop along with load increase.When the motor outputs rated torque, actual frequency drop is equal to F8.24. User can adjust this parameter from small to big gradually during commissioning. The relation between load and output frequency is in the following figure:

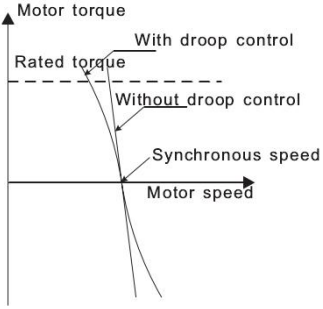


Fig.6-21 Droop control diagram

This parameter adjustment speed droop of the frequency change-value of the frequency inverter.

Function Code	Name	Setting Range
F8.25	Brake threshold voltage	380V：650～750V【700V】 220V：360～390V【380V】

380V model factory value: 700V

220V model factory value: 380V

The function code is to set the starting bus voltage of the energy consumption brake. Ap propriate adjustment of this value can effectively brake the load.

Function Code	Name	Setting Range
F8.26	ACC/DEC time unit	0～1【0】

This parameter is used to set ACC/DEC time units.

0:0.1s

1:0.01s

Function Code	Name	Setting Range
F8.27	Fan control	0～1【0】

0:Auto stop mode:The fan keeps working when the inverter is running.When the inverter s tops,whether the fan works or not depends on the module temperature of inverter.

1:The fan keeps working when powering on.

Function Code	Name	Setting Range
F8.28	Over voltage rise frequency	0.00～10.00Hz【0】

When the bus voltage is too high, on the basis of the current frequency automatic rise F 8.28 Settings, to stabilize the busbar voltage, reduce overvoltage faults occur.

Function Code	Name	Setting Range
F8.29	AI1 Comparison threshold 1	0.00～10.00V【0】
F8.30	AI1 Comparison threshold 2	0.00～10.00V【0】
F8.31	AI1 Comparative residual	0.00～1.00V【0.20】

These parameters and the choice of open collector output function is 18, 19, 20, 21.

Function Code	Name	Setting Range
F8.32	Frequency resolution	0～1【0】

0: Display two decimal points, the maximum frequency can be adjusted to 300.00Hz.

1: Display one decimal point, the maximum frequency can be adjusted to 3000.0Hz.

Function Code	Name	Setting Range
F8.33	Overcurrent judgment threshold	0.0～200.0%【105%】

When the bus voltage is too high, on the basis of the current frequency automatic rise F 8.28 Settings, to stabilize the busbar voltage, reduce overvoltage faults occur.

6.10 F9 Group: PID control

PID control is a common used method in process control,such as flow, pressure and temperature control.The principle is firstly to detect the bias between preset value and feedback value,then calculate output frequency of inverter according to proportional gain,integral and differential time. Please refer to following figure:

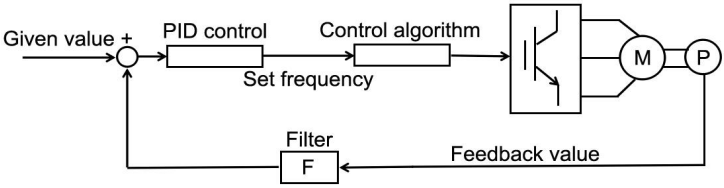


Fig.6-22 PID control diagram

Function Code	Name	Setting Range
F9.00	PID preset Source selection	0～6【0】

0:Keypad number setup

1:AI1

2:AI2

3:HDI

4:Multi-steps

5:Remote communication

6:Keypad potentiometer setup

When F0.02=6,this function is valid.The parameter determines the target given channel during the PID procures..

Goal-setting value of Process of PID is relative value,100% of preset value is corresponding to 100% of controlled system's feedback value.

System is always processing for operation according to the relative value (0 ~ 100%).Each given and feedback are 100.0% relative to 10.0 V

Function Code	Name	Setting Range

F9.01	Keypad PID preset	0.0%～100.0%【0.0%】

Set the parameter when P9.00=0.

The basic value of this parameter is the feedback value.

Function Code	Name	Setting Range
F9.02	PID feedback source selection	0～4【0】

0:AI1

1:AI2

2:AI1+ AI2

3:HDI

4:Communication

This parameter is used to select PID feedback source.

The given channel and the feedback channel can not coincide,otherwise,PID can not control effectively.

Function Code	Name	Setting Range
F9.03	PID output characteristic	0～1【0】

0:Positive.When the feedback value is greater than the preset value,output frequency will be decreased, such as tension control in winding application.

1:Negative.When the feedback value is greater than the preset value,output frequency will be increased,such as tension control in unwinding application.

Function Code	Name	Setting Range
F9.04	Proportional gain（Kp）	0.01～10.00【0.10】
F9.05	Integral time（Ti）	0.00～100.00S【1.00S】
F9.06	Differential time（Td）	0.00～10.00S【0.00S】

Optimize the responsiveness by adjusting these parameters while driving an actual load.

Adjusting PID control:

Use the following procedure to activate PID control and then adjust it while monitoring the response.

1.Enabled PID control (F0.02=6).

2.Increase the proportional gain (Kp) as far as possible without creating oscillation.

3.Reduce the integral time (Ti) as far as possible without creating oscillation.

4.Increase the differential time (Td) as far as possible without creating oscillation.

Making fine adjustments:

First set the individual PID control constants, and then make fine adjustments.

● Reducing overshooting

If overshooting occurs, shorten the differential time and lengthen the integral time.

● Rapidly stabilizing control status

To rapidly stabilize the control conditions even when overshooting occurs, shorten the integral time and lengthen the differential time.

● Reducing long-cycle oscillation

If oscillation occurs with a longer cycle than the integral time setting, it means that integral operation is strong.The oscillation will be reduced as the integral time is lengthened.

● Reducing short-cycle oscillation

If the oscillation cycle is short and oscillation occurs with a cycle approximately the same as the differential time setting, it means that the differential operation is strong. The oscillation will be reduced as the differential time is shortened.

If oscillation cannot be reduced even by setting the differential time to 0, then either lower the proportional gain or raise the PID primary delay time constant.

Function Code	Name	Setting Range
F9.07	PID output delay time	0.00~10.00S【0.00S】

Frequency instruction output delay time setting of PID control.

Function Code	Name	Setting Range
F9.08	PID control deviation limitation	0.0～100.0%【0.0%】

Bias limit defines the maximum bias between the feedback and the preset.PID stops operation when the bias is within this range.Setting this parameter correctly is helpful to improve the system output accuracy and stability.

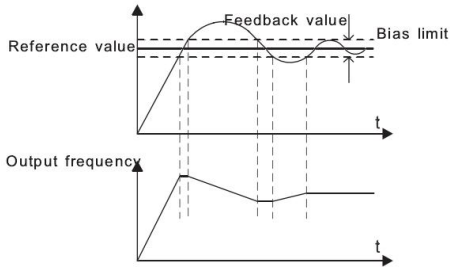


Fig.6-23 Relationship between bias limit and output frequency

Function Code	Name	Setting Range
F9.09	PID output upper limit	0.0~100.0%【100.0%】
F9.10	PID output lower limit	-100.0~100.0%【0.0%】

These two parameters are used to restrict the output range of the PID regulator.

Function Code	Name	Setting Range
F9.11	Feedback lost detecting value	0.0～100.0%【0.0%】
F9.12	Feedback lost detecting time	0.0～3600.0S【2.0S】
F9.13	Action selections while feedback wire break	0～2【1】

Feedback lost detecting value:the values of relative is full scale(100%),The system has be en testing the PID feedback quantity.When the feedback value is less than the feedback brea

k line readings,the system will start recording time.When the test time is beyond feedback bolt testing time,the system will alarm feedback lost failure (PIDE).

Function Code	Name	Setting Range
F9.14	PID initial frequency	0.0~100.0%【0.0%】
F9.15	PID initial frequency keep time	0.0~3600S【0S】

Appropriate Settings PID,Preset frequency holding time or Preset output switching thresholds Can avoid the inverter start initial feedback and instruction deviation limits and make the PID regulator saturation,Can make the closed-loop regulating quickly into a stable stage and no obvious overshoot or oscillation.

After the PID operation,Frequency accelerates to PID preset frequency according to ACC/DEC time,and run continuously at the frequency point until the output can not meet the needs of F9.14 setting PID preset keep conditions, according to the PID output operation.As shown in the figure below:

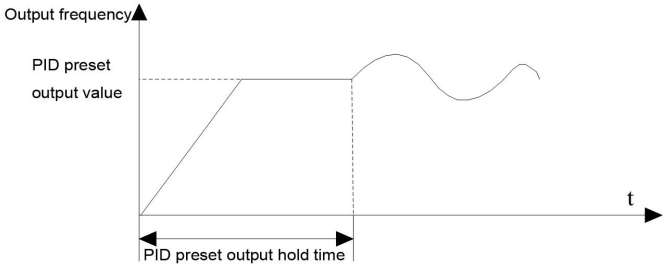


Fig.6-24 PID preset output diagram

Function Code	Name	Setting Range
F9.16	Dormancy frequency	0.00～300.00【0.00Hz】
F9.17	Dormancy detection time	0~2000S【10S】
F9.18	Start-up threshold	0.0%～100.0%【80.0%】

PID dormancy:When the system detects the PID feedback value higher than that of PID frequency thresholds and maintain longer than PID after dormancy detection time,inverter will start deceleration according to the current set of deceleration time.Entering a dormant state after frequency reduced to 0.If PID feedback is less than PID frequency of dormancy,PID will be back to adjust status and Dormancy detection time will be Reseted.When this parameter is set to 100%,PID dormancy function will be invalid.

PID revival:When frequency converter in PID dormant state, PID feedback below the PID awaken and more than PID dormant waiting time after time, and frequency converter out of hibernation back to PID control mode.

This function is particularly used for the application such as constant pressure water supply.

Function Code	Name	Setting Range

F9.19	Sensor range	0.1～6553.5【100.0】
F9.20	PID keyboard set value (numerical value)	0~ F9.19【0】

F9.19 Sensor Range Parameter range: 0.1-6553.5, default 100.0, unit 0.1kg/cm2.

F9.20 PID keyboard set value (numerical value), parameter range: 0.0~F9.19, default is 0, the unit is 0.1kg/cm2.

Note: When F9.20 is not 0, the PID keyboard is given = F9.20/F9.19; when F9.20 is 0, the PID keyboard is given as: F9.01 (percentage value).

6.11 FA Group: Multi-steps speed

Simple function of PLC is an inverter built-in programmable controller (PLC) to complete the logic of multistage frequency automatic control.Can set up running time, direction and operation frequency, in order to meet the process requirements.

This series of frequency inverter can achieve 16 segment speed change control, there are four kinds of ACC/DEC time for choice

When set by PLC after completion of a cycle can be made of multifunction digital output terminals or multifunction relay output ON a signal.

Function Code	Name	Setting Range
FA.00	Multi-steps speed 0	-100.0～100.0%【0.0%】
FA.01	Multi-steps speed 1	-100.0～100.0%【0.0%】
FA.02	Multi-steps speed 2	-100.0～100.0%【0.0%】
FA.03	Multi-steps speed 3	-100.0～100.0%【0.0%】
FA.04	Multi-steps speed 4	-100.0～100.0%【0.0%】
FA.05	Multi-steps speed 5	-100.0～100.0%【0.0%】
FA.06	Multi-steps speed 6	-100.0～100.0%【0.0%】
FA.07	Multi-steps speed 7	-100.0～100.0%【0.0%】
FA.08	Multi-steps speed 8	-100.0～100.0%【0.0%】
FA.09	Multi-steps speed 9	-100.0～100.0%【0.0%】
FA.10	Multi-steps speed 10	-100.0～100.0%【0.0%】
FA.11	Multi-steps speed 11	-100.0～100.0%【0.0%】
FA.12	Multi-steps speed 12	-100.0～100.0%【0.0%】
FA.13	Multi-steps speed 13	-100.0～100.0%【0.0%】
FA.14	Multi-steps speed 14	-100.0～100.0%【0.0%】
FA.15	Multi-steps speed 15	-100.0～100.0%【0.0%】
FA.16	0th step running time	0~3600.0【0】
FA.17	1st step running time	0~3600.0【0】
FA.18	2nd step running time	0~3600.0【0】
FA.19	3rd step running time	0~3600.0【0】
FA.20	4th step running time	0~3600.0【0】
FA.21	5th step running time	0~3600.0【0】
FA.22	6th step running time	0~3600.0【0】
FA.23	7th step running time	0~3600.0【0】
FA.24	8th step running time	0~3600.0【0】

FA.25	9th step running time	0~3600.0【0】
FA.26	10th step running time	0~3600.0【0】
FA.27	11th step running time	0~3600.0【0】
FA.28	12th step running time	0~3600.0【0】
FA.29	13th step running time	0~3600.0【0】
FA.30	14th step running time	0~3600.0【0】
FA.31	15th step running time	0~3600.0【0】

100.0% of the frequency setting corresponds to the Maximum Frequency(F0.07).

When selecting simple PLC running,set FA.00~FA.33 to define the running and direction of all stages.

Note:The symbol of Multi-steps determines the running direction of simple PLC.The negative value means reverse rotation.

Multi-steps speeds are in the range of -Fmax~Fmax and it can be set continuously.Inverters can set 16 stages speed, selected by the combination of Multi-steps terminals X1,X2,,X3,,X4,corresponding to the speed 0 to speed 15.

When X1=X2=X3=X4=OFF,the frequency input manner is selected via code F0.02.When all S1=S2=S3=S4 terminals aren't off,it runs at Multi-steps which takes precedence of keypad, analog value, high-speed pulse,PLC,communication frequency input.Select at most 16 stages speed via the combination code of X1,X2,X3,X4.

The start-up and stopping of Multi-steps running is determined by function code F0.01,the relationship between X1,X2,X3,X4 terminals and Multi-steps speed is as following:

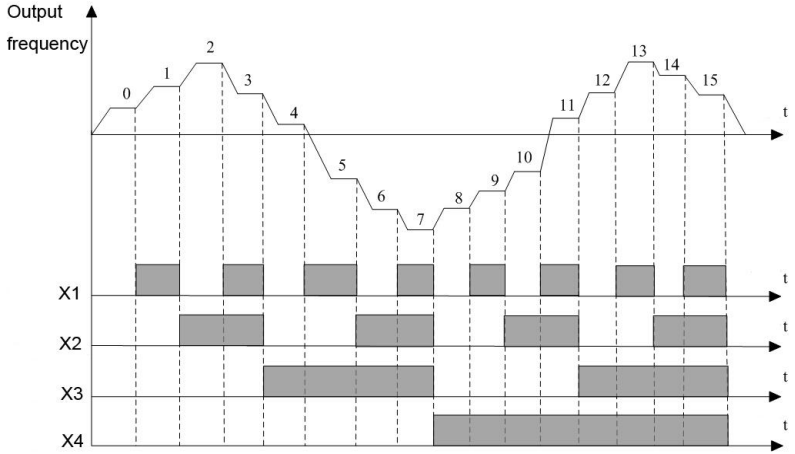


Fig.6-25 Multi-steps speed operation diagram

Function Code	Name	Setting Range
FA.32	ACC/DEC time selection for step 0~7	0~0xFFFF【0】

FA.33	ACC/DEC time selection for step 8~15	0~0xFFFF【0】

When F0.02 set to 4,FA.32 will be used to set ACC/DEC time selection for step 0~7 and FA.32 will be used to set ACC/DEC time selection for step 8~15.

Function Code	Name	Setting Range
FA.34	Simple PLC mode	0～2【2】

0: Stop after one cycle:Inverter stops automatically as soon as it completes one cycle,and it needs run command to start again.

1:Hold last frequency after one cycle:Inverter holds frequency and direction of last step after one cycle.

2: Circular run: Inverter continues to run cycle by cycle until receive a stop command.

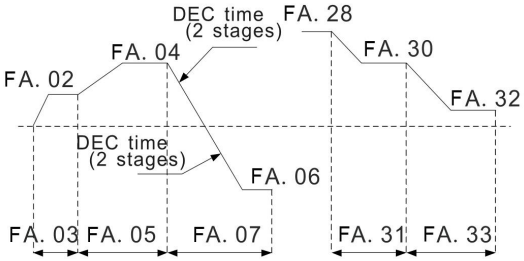


Fig.6-26 Simple PLC operation diagram

Function Code	Name	Setting Range
FA.35	Simple PLC status saving after power off	0～1【0】

0:Power loss without memory

1:Power loss memory

PLC record the running stage and frequency when power loss.

Function Code	Name	Setting Range
FA.36	Simple PLC restart selection	0～1【0】

0: Restart from step 0

If the inverter stops during running (due to stop command or fault),it will run from step 0 when it restarts.

1:Continue from interrupted step

If the inverter stops during running (due to stop command or fault), it will record the running time of current step. When inverter restarts,it will resume from interrupted time automatically.

Function Code	Name	Setting Range
FA.37	Time unit	0～1【0】

0:Seconds

1:Minutes

This parameter determines the unit of x step running time.

Function Code	Name	Setting Range
FA.38	Current program running segments	0～15【--】

FA.39	The block runtime	0.0～3600.0【--】

6.12 Fb Group: Protection and malfunction

Function Code	Name	Setting Range
Fb.00	Motor overload protection	0～1【1】

0:Disabled.No motor overload protection characteristics(care of applications),at the moment, inverter is no overload protection to load motor.

1:Common motor (with low speed compensation).As the cooling effect of the common mot or is weakened at low speed,the corresponding electronic heating protection is adjusted.The lo w speed compensation means decrease the motor overload protection threshold whose freque ncy is below 30Hz.

Function Code	Name	Setting Range
Fb.01	Motor overload protection current	20.0%～120.0%【100.0%】

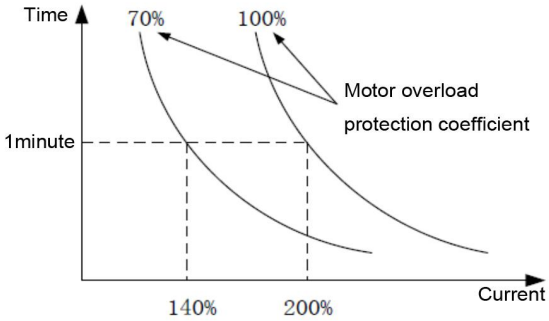


Fig.6-27 Motor overload protection coefficient

This value can be determined by the following formula:

Motor overload protection current=(allow the maximum load current/the rated current of the motor)*100%。

Mainly used in place of large frequency inverter drive small motor,it is necessary to Set th e function to protect motor.

Function Code	Name	Setting Range
Fb.02	Non-stop instantaneous power failure	0～1【0】
Fb.03	Threshold of trip-free	220V:210~260V【230V】 380V:410~600V【420V】
Fb.04	Decrease rate of trip-free	0.00Hz～F0.07【10.00Hz】

If Fb.02 is set to be 0,the trip-free function is invalid.If Fb.05 is set to be 1, the trip-free function is valid.

Fb.03 is the bus voltage of Threshold of trip-free.

Threshold of trip-free:Trip-free function enables the inverter to perform low-voltage compensation when DC bus voltage drops below Pb.04. The inverter can continue to run without tripping by

reducing its output frequency and feedback energy via motor.When the grid power is down and bus voltage equal to the value of threshold of trip-free,the inverter will Reduce the operating frequency according to Fb.05,The motor will be in a mode of power generator,Feedback of electricity will be used to maintain the bus voltage and the inverter will run under the normal state until The inverter is on electricity again.

Note:properly adjusting the two parameters is a good way to realize the power switch,and not causing the inverter protection causing production stagnation.

Function Code	Name	Setting Range
Fb.05	Input phase-failure protection	0～1【1】
Fb.06	Output phase-failure protection	0～1【1】

0:Disable

1:Enable

Input phase loss protection: select whether to protect the input phase loss.

Output phase loss protection: select whether to protect the output phase loss.

Function Code	Name	Setting Range
Fb.07	Over-voltage stall protection	0～1【1】
Fb.08	Over-voltage stall protection point	110～150%【220V:120%】 【380V:140%】

Fb.07:

0:Disabled

1:Enabled

Fb.08:

220V model factory value: 120%

380V model factory value: 140%

During deceleration,the motor's decelerating rate may be lower than that of inverter's output frequency due to the load inertia.At this time,the motor will feed the energy back to the inverter, resulting in rise of DC bus voltage rise.If no measures taken,the inverter will trip due to over voltage.

During deceleration,the inverter detects DC bus voltage and compares it with over-voltage stall protection point.If DC bus voltage exceeds Fb.07,the inverter will stop reducing its output frequency.When DC bus voltage become lower than Fb.07,the deceleration continues.as shown in following figure:

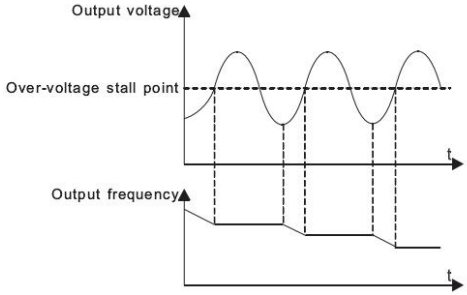


Fig.6-28 Over-voltage stall function

Function Code	Name	Setting Range
Fb.09	Auto current limiting selection	0～1【1】
Fb.10	Auto current limiting threshold	80～200%【G:160%】【P:120%】

Fb.09:

0:Disabled

1:Enabled

Fb.10:The automatic level of current limiting the factory values related to the model,among: G-type:160%;P-type:120%

When inverter is running in large load,the actual rate of climb motor speed will less than output frequency rate of climb.If measures are not taken,it will lead to accelerated flow of fail ure and cause the inverter tripping.

Automatic current limiting protection function in the process of inverter operation is com paring with the current limit levels is determined by Fb.10 through detecting the output current. When more than current limit levels,the inverter output frequency will be carried out in accord ance with the flow frequency decrease rate of decline;When the level of output current is low er than the current limit point again,the inverter will recover to the normal operation.As shown in figure:

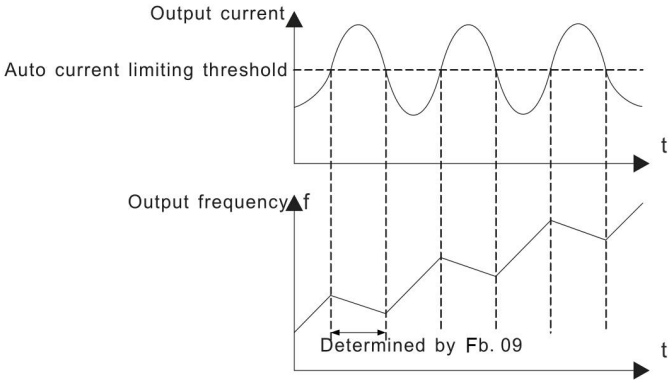


Fig.6-29 Current limiting protection function

During auto current limiting process, the inverter's output frequency may change; therefore, it is recommended not to enable the function when inverter needs to output stable frequency.

During auto current limiting process, if Fb.10 is too low, the overload capacity will be impacted.

Function Code	Name	Setting Range
Fb.11	Inverter overload pre-alarm	20.0～200.0%【150.0%】
Fb.12	Inverter overload pre-alarm time	0.0~100.0S【20.0S】
Fb.13	Malfunction recovery times	0～10【0】
Fb.14	Malfunction auto-reset interval	0.1～20.0S【5.0S】

Malfunction recovery times:When inverter selects malfunction recovery,this parameter will c an be used to set malfunction recovery times.If more than the value of frequency converter fa ult standby,it will wait for restore.

Malfunction auto-reset interval:Choosing the time interval between failure occurrence and a utomatic reset action.

Function Code	Name	Setting Range
Fb.15	The first two malfunction types	0～30【--】
Fb.16	The last malfunction types	0～30【--】
Fb.17	Malfunction types	0～30【--】

Recording the inverter recently three failure types:

0:No fault

1～30:30 different kinds of faults,please refer to Chapter 7.

Function Code	Name	Setting Range
Fb.18	Malfunction running frequency	--【--】
Fb.19	Malfunction output current	--【--】
Fb.20	Malfunction bus voltage	--【--】
Fb.21	Reserved	--【--】
Fb.22	Reserved	--【--】
Fb.23	Previous fault output frequency	--【--】
Fb.24	Previous fault output current	--【--】
Fb.25	Previous fault bus voltage	--【--】
Fb.26	First two fault output frequency	--【--】
Fb.27	First two fault output currents	--【--】
Fb.28	First two fault bus voltages	--【--】
Fb.29	GF Protection： 0:Enabled；1:Disabled	0～1【0】

Recording The current fault state of the inverter.

6.13 FC Group: Communication parameter

Function Code	Name	Setting Range
FC.00	Local address	0～247【1】

When the master is writing the frame,the communication address of the slave is set to 0,the address is the communication address.All slaves on the MODBUS fieldbus can receive the frame.but the salve doesn't answer.Note:The address of the slave cannot set to 0.

The communication of the drive is unique in the communication net.This is the fundamental for the point to point communication between the upper monitor and the drive.

Function Code	Name	Setting Range
FC.01	Baud rate selection	0～7【3】

0：1200bps

1：2400bps

2：4800bps

3：9600bps

4：19200bps

5：38400bps

6：57600bps

7：115200bps

This parameter can set the data transmission rate during serial communication.Note,The baud rate between the upper monitor and the inverter must be the same.Otherwise,the communication is not applied.The bigger the baud rate,the quicker the communication speed.

Function Code	Name	Setting Range
FC.02	Date format	0～5【0】

0:RTU,1 start bit,8 data bits,no parity check,1 stop bit.

1:RTU,1 start bit,8 data bits,even parity check,1 stop bit

2:RTU,1 start bit,8 data bits,odd parity check,1 stop bit

3:RTU,1 start bit,8 data bits,no parity check,2 stop bit.

4:RTU,1 start bit,8 data bits,even parity check,2 stop bit

5:RTU,1 start bit,8 data bits,odd parity check,2 stop bit

6:ASCII,1 start bit,7 data bits,no parity check,1 stop bit.

7:ASCII,1 start bit,7 data bits,even parity check,1 stop bit

8:ASCII,1 start bit,7 data bits,odd parity check,1 stop bit

9:ASCII,1 start bit,7 data bits,no parity check,2 stop bit.

10:ASCII,1 start bit,7 data bits,even parity check,2 stop bit

11:ASCII,1 start bit,7 data bits,odd parity check,2 stop bit

12:ASCII,1 start bit,8 data bits,no parity check,1 stop bit.

13:ASCII,1 start bit,8 data bits,even parity check,1 stop bit

14:ASCII,1 start bit,8 data bits,odd parity check,1 stop bit

15:ASCII,1 start bit,8 data bits,no parity check,2 stop bit.

16:ASCII,1 start bit,8 data bits,even parity check,2 stop bit

17:ASCII,1 start bit,8 data bits,odd parity check,2 stop bit

This parameter defines the data format used in serial communication protocol.

Function Code	Name	Setting Range
FC.03	Communication on delay time	0～200mS【5mS】

This parameter means the interval time when the drive receive the data and sent it to the upper monitor.If the answer delay is shorter than the system processing time,then the answer delay time is the system processing time,if the answer delay is longer than the system processing time,then after the system deal with the data,waits until achieving the answer delay time to send the data to the upper monitor.

Function Code	Name	Setting Range
FC.04	Communication on timeout delay	0.0(invalid)，0.1～100.0S【0.0S】

When the function code is set as 0.0, the communication overtime parameter is invalid.

When the function code is set to a valid value. if the interval time between two communications exceeds the communication overtime,the system will report“communication faults”(CE).

Generally, set it as invalid; set the parameter in the continuous communication to monitor the communication state.

Function Code	Name	Setting Range
FC.05	Communication on error action	0～3【1】

0:Alarm and coast to stop

1:No alarm and continue to run

2:No alarm and stop according to F1.06(only Communication setup)

3:No alarm and stop according to F1.06

Inverter in communication exception cases can be set by communication error handling ac tion selection is shielding CE fault, stop or continue to run.

Function Code	Name	Setting Range
FC.06	Communication setting factor	10.0～500.0%【100.0】

When the communication frequency is set, the actual set frequency is equal to the frequency set by the communication multiplied by this coefficient.

Function Code	Name	Setting Range
FC.07	Communication address mark	0～1【0】

This function code can modify the communication command address of the inverter.

0: Default communication address. For details of the relevant communication control address, see Chapter 8.6.

1: Compatible with other manufacturers' communication control addresses. The control command address is 0x2000, the status address is 0x2100, the communication set value address is 0x2001, the PID reference value address is 0x2002, the PID feedback value address is 0x2003, and the torque set value address is 0x2004.

Chapter 7 Fault checking and solution

7.1 Fault alarm and countermeasures

There are 35 warning messages and protection functions. Once the fault occurs, the inverter fault relay contacts action. Before seeking service, the user can perform self-check according to the tips in this section to analyze the cause of the fault and find a solution. If you can't solve it yourself, please seek service, contact the dealer of your purchased inverter or contact us directly.

If the inverter is powered up and running, if an abnormality occurs, the fault code will be displayed on the inverter display panel. At this time, the inverter has effectively protected this fault, and the output stops outputting. The current fault information indicated by the display panel is represented by a display code consisting of 2~5 letters and numbers.

In the event of a fault, the keypad of the inverter displays the fault function code, the fault code and its representative contents and corrective actions are as follows:

Fault code	Fault type	Possible Cause	Solution
0	No fault		
Out1	IGBT Phase-U fault	1. Acc/Dec time is too short. 2. IGBT module fault. 3. Fault caused by interference. 4. Grounding is not properly.	1. Increase Acc/Dec time. 2. Ask for support. 3. Inspect external equipment and eliminate interference.
Out 2	IGBT Phase-V fault		
Out 3	IGBT Phase-W fault		
OC1	Over-current when acceleration	1.Acc time is too Short. 2.Motor parameters are not accurate. 3.The voltage of the grid is too low. 4.The power of the inverter is too low. 5. V/F curve is not suitable.	1.Prolong Acc time. 2.The motor parameters self-adjusting 3.Check input power. 4.Select inverter with right capacity. 5.Reset V/F curve or torque boost value.
OC2	Over-current when deceleration	1.Dec time is too Short. 2.Load potential energy or inertia is too large. 3.The power of the inverter is too low.	1.Prolong Dec time. 2.Connect external braking resistance or braking unit. 3.Select inverter with right capacity.
OC3	Over-current when constant speed running	1.The load transients or is abnormal. 2.The voltage of the grid is too low. 3.The power of the inverter is too low.	1. Check load's changing and eliminate it. 2.Check input power. 3.Select inverter with right capacity
OU1	Over-voltage	1. Input voltage is too high.	1.Check input power.

Fault code	Fault type	Possible Cause	Solution
	when acceleration	2. While power is off, restart motor which is running .	2.Avoid restart-up after stopping.
OU2	Over-voltage when deceleration	1 .Dec time is too short. 2.The inertia of the load is big. 3.The input voltage is abnormal.	1.Increase the Dec time. 2.Increase the energy-consuming components. 3. Check the input power.
OU3	Over-voltage when speed constant running	1 .The input voltage changes abnormally. 2. The inertia of the load is big.	1 .Install the input reactor. 2.Add proper energy-consuming components.
UU	DC bus Under-voltage	1.The voltage of the grid is low. 2.Momentary interruption.	1.Check input power. 2.RESET operation.
OL1	Motor overload	1 .The voltage of the power supply is too low. 2. The motor setting rated current is incorrect. 3. The motor stall or load transients is too strong. 4.The power of the motor is too big.	1 .Check the power grid voltage. 2. Reset the rated current of the motor. 3. Check the load and adjust the torque lift. 4. Select a proper motor.
OL2	Inverter overload	1 .The acceleration is too fast. 2. Restart the rotating motor. 3. The voltage of the power supply is too low. 4. The load is too heavy.	1.Increase the ACC time 2. Avoid restarting after stopping. 3. Check the power of the supply line. 4. Select an inverter with bigger power.
SPI	Input phase loss	Phase loss or fluctuation of input R, S and T	1.Check input power 2.Check input wiring.
SPO	Output phase loss	1.U, V and W phase loss output. 2. Three phase of the load are serious asymmetrical.	1 .Check output distribution. 2. Check the motor and cable.
OH1	Rectify overheat	1.Sudden over current of the inverter. 2.There is direct or indirect short circuit between output 3 phase. 3.Air duct jam or fan damage. 4.Ambient temperature is too high. 5.The wiring of the control panel or plug-ins are loose. 6.The auxiliary power supply is damage and the drive voltage is undervoltage. 7.The rectifier module is	1 .Refer to the over current solution. 2. Rewiring. 3. Dredge the wind channel or change the fan. 4. Reduce the ambient temperature. 5. Check and reconnect. 6. Ask for service.
OH2	IGBT overheat		

Fault code	Fault type	Possible Cause	Solution
		broken. 8.The control panel is abnormal.	
EF	External fault	Xn External fault input terminal take action.	Inspect external equipment.
CE	Communication fault	1.Improper baud rate setting. 2.Communication fault. 3.Communication is interrupted for Long time.	1. Set proper baud rate. 2. Ask for service. 3.Check the communication connection distribution.
ItE	Current detection fault	1. Wires or connectors of control board are loose. 2. Auxiliary power is damaged. 3.Hall sensor is damaged. 3. Amplifying circuit is abnormal.	1.Check the wiring.
tE	Motor autotuning fault	1 .The motor capacity does not comply with the inverter capacity. 2.The rated parameter of the motor does not be set correctly. 3. There is a big difference between autotune.parameter and the standard parameter 4. Autotune overtime.	1.Change the inverter model. 2.Set the rating parameters according to the name plate of the motor. 3.Do not connect motor to the load and identify again. 4.Check the motor wiring and set the parameters.
EEP	EEPROM fault	1 .Error of controlling the write and read of the parameters 2. Damage to EEPROM.	1.Press STOP/RESET to reset. 2.Ask for service.
PIDE	PID feedback fault	1.PID feedback offline. 2. PID feedback source disappear disappear.	1.Check the PID feedback signal wires. 2.Check PID feedback source.
bCE	Braking unit fault	1.Braking circuit fault or damage to the braking pipes. 2.The external braking resistor is a little low.	1.Check the braking unit and change new braking pipes. 2.Increase braking resistence.
END	Time reach of factory setting	Trial time arrival	Using parameter initialization functio n to remove record information.
OL3	Electronic thermal overload	1.The temperature sensor wiring is loose	1.Check the temperature sensor wiring and troubleshooting.

Fault code	Fault type	Possible Cause	Solution
		2.The motor temperature is too high.	2.Reduce carrier frequency or other cooling measures to cooling the motor.
PCE	Keyboard connect fault	Keyboard wire fault.	Replace keyboard wire.
UPE	Parameters upload error	1.The keyboard and control panel cable is too long，the parameter is disturbed while transmission 2.In the download process , keyboard save data does not match the data with inverter.	1.Shorten the keyboard and control panel wire to reduce EMI. 2. Before the download process , make sure whether the keyboard saved data are matching with inverter.
DNE	Parameters download error		
SC	Short circuit	1. Acc time is too short. 2.IGBT module is damaged. 3.Electromagnetic disturb. 4.Output line is short circuit to the earth. 5.Short circuit between inverter and output side.	1.Prolong Acc time properly. 2.Check periphery equipment and restart after fault eliminating. 3.Ask for service.
LCE	Current limiting fault	1.The motor stall or load transients is too strong. 2.The power of the inverter is too low.	1.Reduce the load,Check the motor and mechanical conditions. 2.Select an inverter with bigger power.
GF	Phase short circuit	Short circuit between motor lines	Check motor line insulation
ECE	Encoder failure	1. Unconnected encoder 2. Encoder failure	1. Check the encoder wiring 2. Seek technical support from manufacturers

7.2 Common faults and solutions

7.2.1 No display after power on

Inspect whether the power supply voltage is the same as the inverter rated voltage. If the power supply has problem, inspect and solve it. Check whether the three-phase rectifier bridge is in good condition. If the rectifier bridge is broken, please, ask for service.

Check whether the “CHARGE” lamp is lighten,if not,the rectifier bridge or buffer resistance may be with fault;

If the lamp is lighten,maybe the switching power supply is fault, please ask for service.

7.2.2 Power supply air switch trips off when power on

Inspect whether the input power supply is grounded or short circuit. Please solve the problem.

Inspect whether the rectify bridge has been burnt or not. If it is damaged, ask for service.

7.2.3 Motor doesn’t move after inverter running

Inspect if there is balanced three-phase output among U, V, W. If yes, then motor could be damaged, or mechanically locked. Please solve it.If the output is unbalanced or lost, the inverter drive board or the output module may be damaged, ask for service.

7.2.4 Inverter displays normally when power on, but power supply air swith at the input side trips when running

①Inspect whether the output side of inverter is short circuit. If yes, ask for service.

②Inspect whether between the motor wires is short circuit or the motor wires is grounded. If yes,please solve the problem.

③If trip happens occasionally and the distance between motor and inverter is too far, it is recommended to install output AC reactor.

④After fault protection, remove faults, and press the STOP/RESET key to reset the fault , and then restart inverter.

⑤After removing fault,cut off the inverter power source,after all the LED lights on the inverter extinguish,turn on the inverter power source,then start inverter.

⑥When the above methods cannot make the inverter be used normally, please record the failure code on the keyboard, inverter model and series number,then contact our company technical engineer to solve

Chapter 8 Communication protocol

Inverters provide RS-485 communication interface and adopt the international standard Modbus-RTU format communication protocol for master-slave communication. The user can realize centralized control (set the inverter control command, operating frequency, modification of relevant function code parameters, inverter working status and fault information monitoring) through PC/PLC, control host computer, etc., to adapt to specific application requirements. .

8.1 Protocol content

The Modbus serial communication protocol defines the frame content and usage format for asynchronous transmission in serial communication. These include: host polling and broadcast frame, slave response frame format; host organization frame content includes: slave address (or broadcast address), execution commands, data and error check. The response of the slave also adopts the same structure, including: action confirmation, return data and error check. If the slave encounters an error while receiving a frame, or fails to complete the action requested by the host, it will organize a fault frame as a response to the host.

8.2 Application method

The inverters can be connected to a “single-master multi-slave” control network with RS-485 bus.

8.3 Frame

(1) Interface mode

RS-485 hardware interface

(2) Transmission method

Asynchronous serial, half-duplex transmission. At the same time, only one of the master and slave can send data and the other receive data. In the process of serial asynchronous communication, data is transmitted in frames and frames.

(3) Topology

Single-master multi-slave system. The slave address is set from 1 to 247, and 0 is the broadcast communication address. The address of each slave in the network is unique. This is the basis for ensuring Modbus serial communication.

8.4 Protocol description

The series inverter communication protocol is an asynchronous serial master-slave Modbus communication protocol. Only one device (host) in the network can establish a protocol (called "query/command"). Other devices (slave) can only respond to the host's "query/command" by providing data, or according to the host's "query/command". The host refers here to a personal computer (PC), an industrial control device, or a programmable logic controller (PLC). The slave refers to inverter or other control device having the same communication protocol. The host can

communicate with a slave separately and broadcast information to all slaves. For a host "query/command" that is accessed separately, the slave must return a message (called a response). For the broadcast message sent by the host, the slave does not need to feed back the response message to the host.

8.5 Communication frame

The Modbus protocol communication data format of the inverter is divided into RTU (Remote Terminal Unit) mode.

In RTU mode, the format of each byte is as follows:

Encoding system: 8-bit binary, each 8-bit frame field contains two hexadecimal characters, hexadecimal 0~9, A~F.

Data format: start bit, 8 data bits, parity bit and stop bit. The data format is described in the following table: In RTU mode, the new frame always starts with a silence of at least 3.5 bytes of transmission time. On a network that calculates the transmission rate at baud rate, 3.5 bytes of transmission time can be easily grasped. The data fields that are transmitted next are: slave address, operation command code, data, and CRC check word. Each domain transmission byte is hexadecimal 0...9, A...F. Network devices always monitor the activity of the communication bus. When the first domain (address information) is received, each network device acknowledges the byte. As the transmission of the last byte is completed, there is a similar 3.5-byte transmission time interval for identifying the end of the frame, after which a new frame transmission will begin.

The information of a frame must be transmitted in a continuous stream. If there is more than 3.5 bytes before the end of the entire frame transmission, the receiving device will clear the incomplete information and mistakenly believe that the next byte is new. The address field part of a frame. Similarly, if the interval between the start of a new frame and the previous frame is less than 3.5 bytes, the receiving device will consider it to be the continuation of the previous frame. Due to the disorder of the frame, the final CRC is corrected. The verification value is incorrect, resulting in communication failure. Standard structure of RTU frames：

Frame header START	T1-T2-T3-T4（3.5 bytes of transmission time）
Slave address field ADDR	Communication address：0~247（Decimal）（0:broadcast address）
Functional domain CMD	03H：Read slave parameters； 06H：Write slave parameters
Data field DATA（N-1）…DATA（0）	2*N bytes of data, this part is the main content of communication, and also the core of data exchange in communication.
CRC CHK Low number	Detected value：CRCCheck value（16BIT）
CRC CHK High number	
End of frame END	T1-T2-T3-T4（3.5 bytes of transmission time）
END Lo	

8.6 Command code and communication data description

8.6.1 Command code: 03H (0000 0011), read N words (Word) (up to 16 words can be read continuously)

For example, if the slave address is 01H, the memory start address is 0007 (the maximum output frequency address). If one consecutive word is read, the structure of the frame is described as follows：

RTU host command information

START	T1-T2-T3-T4
ADDR	01H
CMD	03H
Start address high (parameter group number)	00H（F0 Group）
Start address low (parameter number)	07H（F0.07）
High number of data	00H
Low number of data	01H
CRC CHK High number	35H
CRC CHK Low number	CBH
END	T1-T2-T3-T4

RTU Slave response message

START	T1-T2-T3-T4
ADDR	01H
CMD	03H
Number of bytes	02H
Data address 0007H high	13H
Data address 0007H low	88H
CRC CHK Low number	B5H
CRC CHK High number	12H
END	T1-T2-T3-T4

8.6.2 Command code: 06H (0000 0110), write a word (Word)

For example: Write 5000 (1388H) to the 0006H (keyboard setting frequency address) of the slave address 01H inverter. Then the structure of the frame is described as follows：

TRTU host command information

START	T1-T2-T3-T4
ADDR	01H
CMD	06H
Write data address high	00H
Write data address low	06H
High data content	13H
Low data content	88H
CRC CHK Low number	6CH
CRC CHK High number	43H
END	T1-T2-T3-T4

RTUSlave response message

START	T1-T2-T3-T4
ADDR	01H
CMD	06H
Write data address high	00H
Write data address low	06H
High data content	13H
Low data content	88H
CRC CHK Low number	6CH
CRC CHK High number	43H
END	T1-T2-T3-T4

8.6.3 Communication frame error check mode

The error check mode of the frame mainly includes two parts of the check, that is, the bit check of the byte (odd/even check) and the entire data CRC check of the frame.

8.6.3.1 Byte bit check

Users can choose different bit verification methods as needed, or they can choose no parity, which will affect the parity bit setting of each byte.

The meaning of even parity: an even parity bit is added before data transmission to indicate whether the number of "1" in the transmitted data is odd or even. When it is even, the check position is "0", otherwise it is set. It is "1" to keep the parity of the data unchanged.

The meaning of odd parity: an odd parity bit is added before data transmission to indicate whether the number of "1" in the transmitted data is odd or even. When it is odd, the check position is "0", otherwise it is set. It is "1" to keep the parity of the data unchanged.

For example, you need to transfer "11001110", the data contains 5 "1", if you use even parity, its even parity bit is "1", if you use odd parity, its odd parity bit is "0", transmission In the case of data, the parity bit is calculated at the position of the check bit of the frame, and the receiving device also

performs parity check. If the parity of the accepted data is found to be inconsistent with the preset, it is considered that the communication has an error.

8.6.3.2 CRC check method:

Using the RTU frame format, the frame includes a frame error detection field calculated based on the CRC method. The CRC field detects the contents of the entire frame. The CRC field is two bytes and contains a 16-bit binary value. It is calculated by the transmission device and added to the frame. The receiving device recalculates the CRC of the received frame and compares it with the value in the received CRC field. If the two CRC values are not equal, the transmission has an error.

The CRC is first stored in 0xFFFF, and then a procedure is called to process the consecutive six or more bytes in the frame with the values in the current register. Only the 8Bit data in each character is valid for the CRC, and the start and stop bits as well as the parity bit are invalid.

During the CRC generation process, each 8-bit character is individually or XORed with the contents of the register, and the result moves to the least significant bit direction, and the most significant bit is padded with 0s. The LSB is extracted and detected. If the LSB is 1, the register is individually or different from the preset value. If the LSB is 0, it is not performed. The entire process is repeated 8 times. After the last bit (bit 8) is completed, the next octet is individually different from the current value of the register. The value in the final register is the CRC value after all the bytes in the frame have been executed.

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

A simple function for CRC calculation is now provided for user reference (programming in C)：

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

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

8.6.4 Definition of communication data address

This part is the address definition of the communication data, which is used to control the operation of the inverter, obtain the status information of the inverter and set the relevant function parameters of the inverter.

(1) Function code parameter address representation rule

The function code serial number is used as the parameter corresponding to the register address, but to be converted into hexadecimal, such as the hexadecimal communication address of parameter F5.11 is 050BH, and the hexadecimal communication address of parameter F8.22 is 0816H.

Note: Some parameters cannot be changed while the inverter is running; some parameters cannot be changed regardless of the state of the inverter; change the function code parameters, and also pay attention to the parameter setting range, unit, and related instructions.

In addition, since the EEPROM is frequently stored, the service life of the EEPROM is reduced. For the user, some function codes do not need to be stored in the communication mode, and only need to change the value in the on-chip RAM to meet the usage requirements. If you need to modify the data in the EEPROM, you can add 80H (128 in hexadecimal notation) to the corresponding function code high address. For example, if the write function code F12.02 needs to be stored in the EEPROM, the address is set to 8C02H. If you only need to modify the value in the RAM and do not store it in the EEPROM, you can set the address to 0C02H, which can only be used to write the on-chip RAM. When used, it cannot be used as a read function. Reading this address is invalid.

(2) Address description of other functions：

Function	address definition	Data meaning description	R/W Features
Communication control command	1000H	0001H：Forward	W
		0002H：Reverse	
		0003H：Reserved	
		0004H：Reserved	
		0005H：Coast to stop	
		0006H：Slow down to stop	
		0007H：Fault reset	
Inverter status	1001H	0001H：Forward running	R
		0002H：Reverse running	

Function	address definition	Data meaning description	R/W Features
		0003H：Inverter standby	
		0004H：In failure	
Communication setting address	2000H	Communication setting range (-10000~10000) Note: The communication setting value is the percentage of relative value (-100.00%~100.00%), which can be used for communication writing. When set as a frequency source, the relative percentage of the maximum frequency (F0.07); when used as the torque timing, is the percentage of the rated motor torque. When given as a PID or feedback, the corresponding percentage of the PID.	W
Run/stop parameter address description	3000H	Operating frequency	R
	3001H	Setting frequency	R
	3002H	Bus voltage	R
	3003H	Output voltage	R
	3004H	Output current	R
	3005H	Speed	R
	3006H	Output power	R
	3007H	Output torque	R
	3008H	PID setting value	R
	3009H	PID feeback value	R
	300AH	Terminal input flag status	R
	300BH	Terminal output flag status	R
	300CH	Analog AI1 value	R
	300DH	Analog AI2 value	R
	300EH	Reserved	R
	300FH	Reserved	R
	3010H	Reserved	R
	3011H	Reserved	R
	3012H	Multi-speed current segment number	R
Inverter fault information address	5000H	The fault information code is consistent with the serial number of the fault type in the function code menu, except that the hexadecimal data is returned to the host computer instead of the fault character.	R

Function	address definition	Data meaning description	R/W Features
Communication failure address	5001H	0000H：No fault 0001H：Password error 0002H：Command code error 0003H：CRC Parity error 0004H：Illegal address 0005H：Illegal data 0006H：Invalid parameter change 0007H：The system is locked (requires unlocking by writing the correct user password) 0008H：The drive is busy (EEPROM is being stored)	R

Chapter 9 Peripheral equipment and options

9.1 AC reactor

AC reactor can improve power factor and suppress high-order harmonic from the power side. In the following cases, AC input reactor must be used:

The power supply capacity to the Inverter capacity is more than 10:1. Then tsilicon load is connected to the same power or power factor compensation device with switching control.

Three-phase power supply voltage unbalance degree is big（≥3%）。

Table 9-1 Specifications of the commonly used AC reactor

Voltage(V)	Power(kW)	Current(A)	Inductance (mH)	Voltage(V)	Power(kW)	Current(A)	Inductance (mH)
220	0.4	2.4	4.6	380	0.75	2.5	7.6
	0.75	4.5	2.4		1.5	4	4.8
	1.5	7	1.6		2.2	6	3.2
	2.2	11	1.0		4	9	2.0
	4	18	0.6		5.5	13	1.5
	5.5	22	0.5		7.5	17	1.2
	7.5	30	0.4		11	25	0.8
	11	42	0.27		15	32	0.6
	15	55	0.2		18.5	38	0.5
	18.5	70	0.16		22	45	0.42
	22	80	0.14		30	60	0.32
	30	110	0.1		37	75	0.26
	37	145	0.08		45	90	0.21
					55	110	0.18
					75	150	0.13
					93	170	0.11
					110	210	0.09
					132	250	0.08
					200	380	0.05
					250	480	0.04

9.2 DC reactor

While the power grid capacity is much bigger than the inverter, or the power supply capacity is more than 1000KVA, or the demand for mproving the power supply power factor is very high,DC reactor must be used.DC reactor can be used in conjunction with AC reactor, it is helpful to reduce input high-order harmonic.

Table 9-2 Specifications of the commonly used DC reactor

Voltage(V)	Power(kW)	Current(A)	Inductance (μH)	Voltage(V)	Power(kW)	Current(A)	Inductance (μH)
220	11~15	75	450	380	11~15	40	1500
	18.5~30	150	200		18.5~30	75	600
	37~55	300	100		37~55	150	300
					75~90	220	200
					110~132	280	140
					160~200	370	110
					220	560	70
					250~280	740	55

9.3 Remote operation keyboard

This series of inverter is with exquisite design and easy to use keyboard. User wants to keyboard panel to extend to other place, you can buy extension line, simply put forward with orders. The user can remove the panel to place within 10 m away from the host.

9.4 Braking unit and braking resistance

Braking resistance value and power in the chart are decided according to common inertia load and intermittent braking mode. While used in large inertia occasion or long time frequent brake occasion, please adjust resistance value and power according to the inverter specification and the rated parameter of braking unit.

Under the situation of braking torque is 100% and the brake unit utilization rate is 10%, r ecommend brake resistance as following table.

Table 9-3 Suggested braking resistance specification parameters

Voltage (V)	Motor power(KW)	Resistance value(Ω)	Resistance power(KW)	Voltage (V)	Motor power(KW)	Resistance value(Ω)	Resistance power(KW)
220	0.75	200	0.1	380			
	1.5	100	0.25		1.5	400	0.25
	2.2	75	0.25		2.2	250	0.25
	4	40	0.4		4	150	0.4
	5.5	30	0.5		5.5	100	0.5
	7.5	20	0.8		7.5	75	0.8
	11	13.6	2.25		11	50	1
	15	10	3		15	40	1.5
	18.5	8	4		18.5	30	4
	22	6.8	4.5		22	30	4
	30	5	6		30	20	6
	37	5	6		37	16	9

Shenzhen SINCREA Electrical Technology Co.,Ltd

Warranty Card

User	Name：	
	Address：	
	Post Code：	
	Contact：	Tel：
Product	Model：	
	Date of phurchase：	S/N No.：
	Use for machine：	Motor power：
	Distributor agent name：	
Fault	（Repair time and content）：	
Comment	Thank you for your evaluation of the quality of our services： □ Very good □ Good □ Normally □ Bad User signature date： Y M D	
Repair person/Tel：		Repair date：

Shenzhen SINCREA Electrical Technology Co.,Ltd

Certificate of Quality

Inspector：_____

TThis product has been inspected by our quality control and quality assurance department. Its performance parameters are in compliance with the standard “Product Manual” and are allowed to leave the factory.

Warranty Agreement

1.The warranty period of the product is 24 months （refer to the barcode on the equipment body）.During the warranty period, if the product fails or is damaged under the condition of normal use by following the instruction.Our company will be responsible for free maintenance.
2.Within the warranty period, maintenance will be charged for the following reasons:
A.The damage caused by improper use or repair/modification without prior permission.
B.The damage caused by fire, flood, abnormal voltage, other disasters and second disaster;
C.The hardware damage caused by dropping or transportation upon the procurement.
D.The damage caused by the improper operation;
E.The damage or fault caused by the trouble our of the equipment (e.g.external device).
3.If there is any fault or damage to the product, please correctly fill out the Product Warranty Card in detail.
4.The maintenance fee is charged according to the newly adjusted Maintenance Price List by 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.This agreement shall be interpreted by Shenzhen Sincrea Electrical Technology Co., Ltd.

Shenzhen Sincrea Electrical Technology Co., Ltd.
Service Center
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Tel:+86 755 29420485　P.C.: 518107
Website: http: //www.sincrea.com

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