EH600 S Series Inverter

User's manual

V1.3

● The content of the manual would be updated without prior notice.

SHENZHEN XILIN ELECTRIC TECHNOLOGIES CO., LTD.

Preface

EH600S series inverter, presented by ShenZhen xilin Electrical Technology Limited Corporation, is a new generation of high performance.It is a revolutionary product integrated with general ,personal and professional demands of customer. It has practical PI , simple PLC 、 flexible input and output terminals 、 paramter save selection when power-off , main/auxiliary reference control, frequency swing control , innovative exact stop mode (length/counter/time control) ,in-line modbus standard agreement , perfect protection for user password. So it can supply high-integration project for customer in equipment industry. It is valuable to reduce system costs and improve the reliability of the system.

EH600S meets customers' environmental needs , such as low noise, low electromagnetic interference by optimizing the PWM controlling technology and the unitary design of electromagnetic compatibility.

The manual provides the guidance for installation , wiring , parameter configuration ,fault diagnosis and debugging , relevant concerns for daily maintenance . In order to correctly install and operate EH600 series inverter thus to enable them to play their predominant capability , please read the manual thoroughly and keep it carefully and deliver it to the user of the equipment .

Upon unpacking , please confirm the followings :

1、Check whether there is any damage occurred during transportation ; whether there is any damage or falling in the components ; whether the main body is bumped .

2、Check whether the model and the rated values on the nameplate of the inverter are in accordance with your order . The box contains the product , and operation manual for the user .

Our corporation is strict in manufacturing , packing and quality assurance system , but if you find some missing inspections , please contact our corporation or the supplier as soon as possible .

Contents

Chapter 1 Safety and Cautions

Safety Definition:

To make sure your body 、 equipment and property are safe , please read this chapter thoroughly before using the inverter .

Safety cautions are divided into two types in this manual :

Danger : Danger arising due to improper operations may cause severe hurt or even death .

Caution : Danger arising due to improper operations may cause moderate hurt or light hurt or equipment damage .

1.1 Safety Cautions

1.1.1 Before Installation

Danger
● Do not use the damaged inverter or inverter with missing parts, or there may be risk of injury.

1.1.2 During Installation

Danger
● Mount the inverter on incombustible surface like metal, and keep away from flammable substances! Otherwise it may cause fire.

Caution
● When more than two inverters are to be installed in one cabinet, please pay attention to the installation locations (refer to Chapter 3 Mechanical and Electrical installation) to ensure the heat sinking effect. ● Do not drop the lead wire stub or screw in the inverter, or the inverter may be damaged!

1.1.3 During Wiring

⚠ Danger

- Operation shall be performed by the professional engineering technician, otherwise there will be danger of electric shock!
- A circuit breaker must be installed between power supply and the inverter, otherwise there will be danger of electric shock!
- Make sure the power is disconnected prior to the connection, otherwise there will be danger of electric shock!
- The earth terminal shall be earthen reliably, otherwise there will be danger of electric shock!

⚠ Caution

- Do not connect the input terminals with the output terminals (U, V, W), otherwise the inverter may be damaged!
- The wire size should be determined according to the manual, otherwise accident may occur!

1.1.4 Before Power-on

⚠ Danger

- Please confirm whether the power voltage class is consistent with the rated voltage of the inverter and whether the input/output cable connecting positions are correct, and check whether the external circuit is short circuited and whether the connecting line is firm, otherwise the inverter may be damaged!
- The cover must be well closed prior to the inverter power-on, otherwise there will be danger of electric shock!

⚠ Caution

- Dielectric strength test had been done at factory. Therefore, you needn't to test it again.
- Whether all the external fittings are correctly connected in accordance with the circuit provided in this manual.

1.1.5 Upon Power-on

⚠ Danger

- Do not open the cover of the inverter upon power-on, otherwise there will be danger of electric shock!
- Do not touch the inverter and its surrounding circuit with wet hand, otherwise there will be danger of electric shock!
- Do not touch the inverter terminals, otherwise there will be danger of electric shock!

⚠ Caution

- Do not change the factory settings at will, otherwise the equipment may be damaged!

1.1.6 During the operation

⚠ Danger

- Do not approach the equipment when choosing restart function, otherwise there will be danger of injury!
- Do not touch the fan and the discharging resistor, otherwise you may get burnt!
- Detection of signals during the operation shall be conducted by qualified technician, otherwise personal injury or equipment damage may be caused!

⚠ Caution

- Do not start and shut down the inverter by connecting and disconnecting the contactor, otherwise the equipment may be damaged!

1.1.7 During repair

⚠ Danger

- Do not repair and maintain the equipment with power connection, otherwise there will be danger of electric shock!

1.2 Cautions

1.2.1 Motor Insulation Inspection

When the motor is used for the first time or when it is reused after being kept, motor insulation inspection shall be conducted. It is recommended to use the 500V megameter, and the insulating resistance measured shall be at least 5MΩ!

1.2.2 Thermal Protection of Motor

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

1.2.3 Running with Frequency higher than Standard Frequency

If the user needs to run the inverter with the frequency higher than 50 Hz, please take the resistant pressure of the mechanical devices into consideration.

1.2.4 Vibration of Mechanical Device

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

1.2.5 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 lightening protection is installed at the output side of the inverter, it ’s easy to cause instantaneous over current in the inverter, which may damage the inverter. Don ’t use it.

1.2.6 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 start/stop of the inverter. If usage of this 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 terminal 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 easily damaged.

1.2.7 Change Three-phase Input into Two-phase Input

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

1.2.8 Altitude and Deration

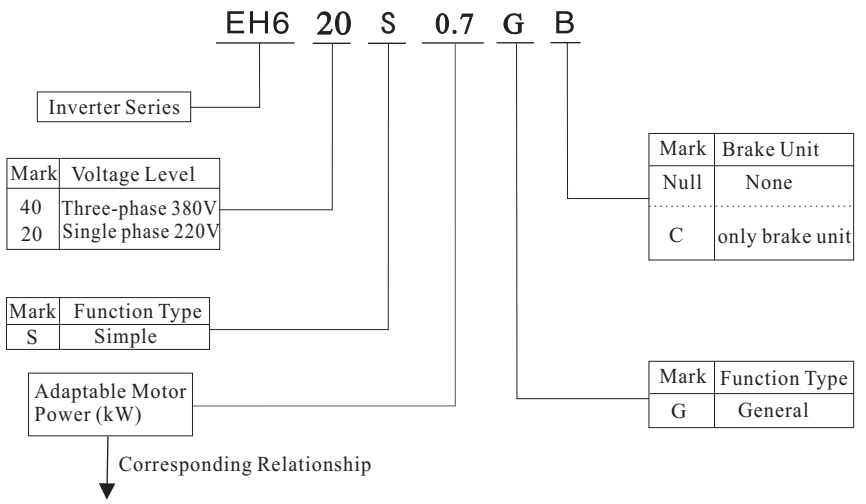
In areas with altitude of more than 1,000 meters, the heat sinking effect of the inverter may turn poorer due to rare air. Therefore, the derating using is necessary. Please contact our company for technical consulting in case of such condition.

1.2.9 Adaptable Motor

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

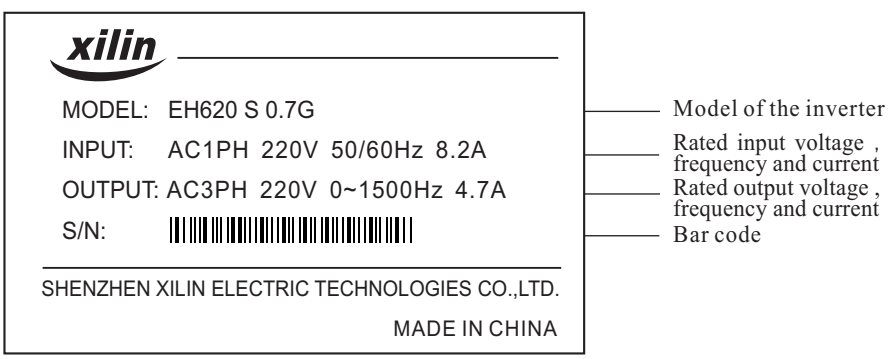
Chapter 2 Product Information

2.1 Designation Rules



Mark	0.2	0.4	0.7	1.5
Motor Power (kW)	0.2	0.4	0.7	1.5

2.2 Nameplate



2.3 EH600S Inverter Series

Inverter Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Adaptable Motor (kW)
EH620S 0.2	0.6	3.2	1.8	0.2
EH620S 0.2	1.0	5.4	3.0	0.4
EH620S 0.2	1.5	8.2	4.7	0.75
EH620S 0.2	1.0	2.9	1.5	0.4
EH620S 0.2	1.5	3.4	2.3	0.75
EH620S 0.2	3.0	5.0	3.7	1.5

2.4 Technical Specifications

Item		Specification
Basic Specification	Maximum frequency	1500Hz
	Input voltage range	There-phase:380V single phase:220V Range:-15%~20%
	Carrier frequency	1.0k~9.0kHz; The carrier frequency will be automatically adjusted according to the load characteristics.
	Input frequency resolution	Digital setting:0.1Hz Analog setting: maximum frequency x 0.1%
	Overload capacity	150% rated current 60s; 180% rated current 2s.
	Torque hoist	Automatic torque hoist; Manual torque hoist 0.1%~30.0%
	V/F curve	Three types: straight line; multiple point; square type.
	Accelerate and Decelerate curve	Straight line or S-curve Acc/Dec mode: four kind of Acc/Dec time; Range of Acc/Dec Time: 0.0 to 6553.5s.
	DC brake	DC brake frequency: 0.0Hz to Maximum frequency; brake time: 0.0to 36.0s; brake current value: 0.0 to 100%
	Jog control	Jog frequency range: 0.00Hz to Maximum frequency; Jog Acc/Dec time: 0.1 to 6553.5s.

Item		Specification
Basic specification	Simple PLC Multi-speed running	It can realize a maximum of 16 segment speed running via the built-in PLC or control terminal.
	Automatic voltage regulation(AVR)	It can keep constant output voltage automatically in case of change of mains voltage.
Individualized function	S key	Programmable key: meet the individual need. Realize the jog/reverse command and clear data at exact stop.
	Wobble frequency control	Multi-triangle wave frequency
	Exact stop control	There are three exact stop modes: counter, fix-length,fix-time.
Input/Output features	Running command channel	There are three channels: operation panel, control terminal, serial port.
	Frequency source	Nine frequency sources, auxiliary frequency sources. It can implement micro turning and synthesis of auxiliary frequency.
	Input terminal	Five digital input terminals(X1~X5). X5 can also be used as pulse input terminal; One analog input terminal: can be used as voltage or current input.
	Output terminal	One OC output terminal, one relay output terminal; One analog output terminal, AO output: 0/2~10V.
Display and operation	Operation panel display	It can display 26 kinds of parameters, such as preset frequency, output voltage, output current. etc. Two methods for reading the status parameters are provided.
	Double-rank LED operation panel (select component)	It can display the debugging result when you are setting parameter, and it is convenient to monitor two status parameters.
	Protection function	Output phase failure protection, over current protection, over voltage protection, under voltage protection, over heat protection, overload protection. etc.
Environment	Application environment	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapor, drip or salt.
	Altitude	Lower than 1,000m
	Ambient temperature	-10℃~+40℃ (derated when used in the ambient temperature of 40℃~50℃.

Item		Specification
Environment	Humidity	Less than 95%RH, without condensation.
	Vibration	Less than 5.9m/s (0.6g).
	Storage temperature	-20℃~+60℃

2.5 Physical appearance and installing dimensions of inverter and operation panel

1) Physical Appearance

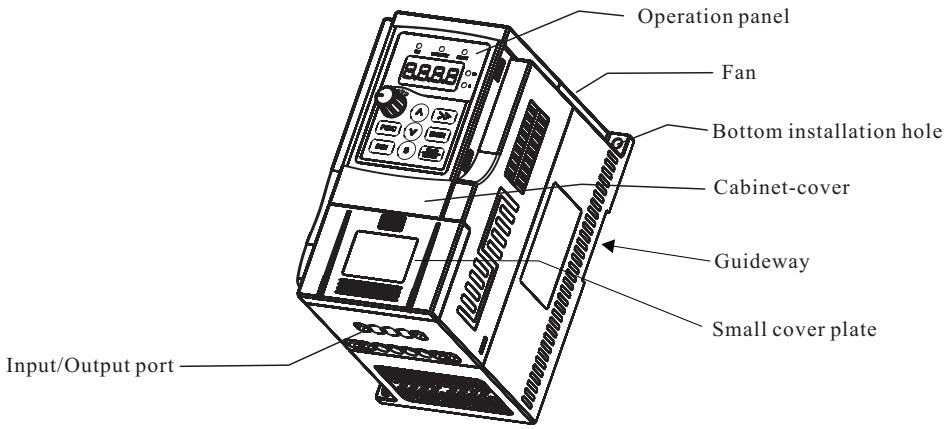


Fig.2-1 Physical Appearance of Inverter

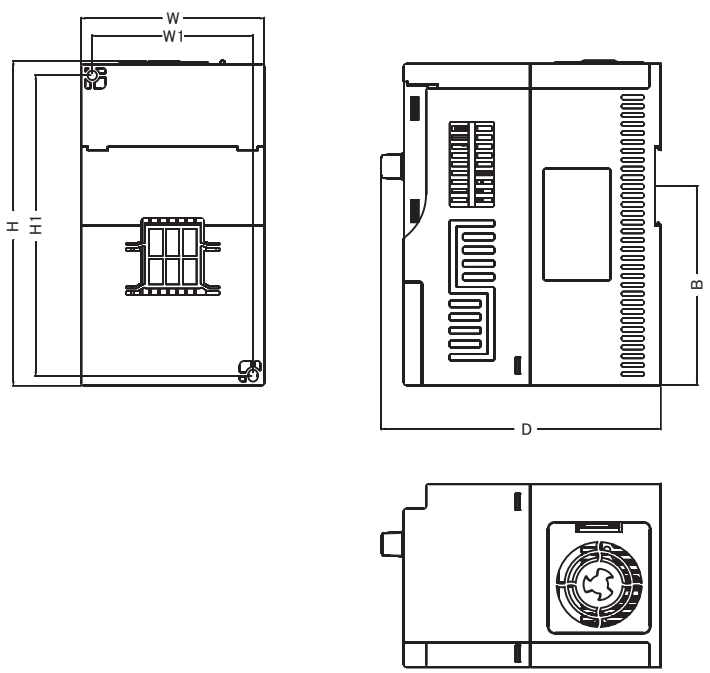
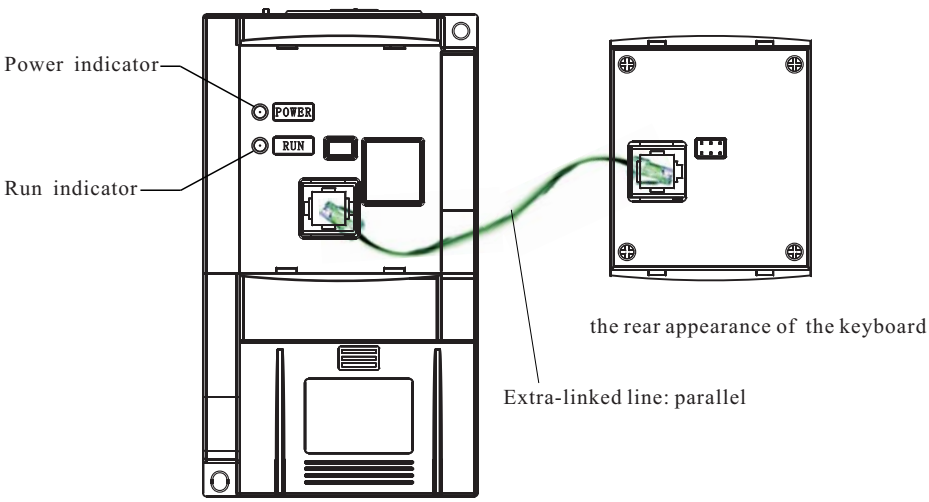


Fig.2-2 Physical dimensions and mounting dimensions of Inverter



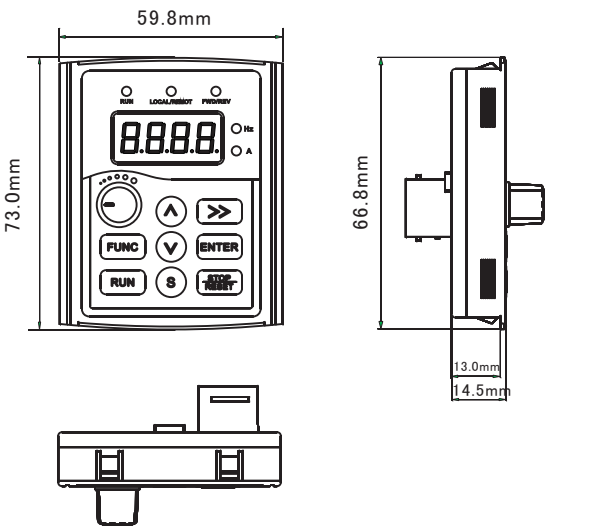
POWER	When switch on, it lights; when cut off the power, the lights out.
RUN	When it is ON, it indicates the inverter is in rotation status; when it is OFF, it indicates the inverter is in stop status.

2) Mounting Hole Dimensions

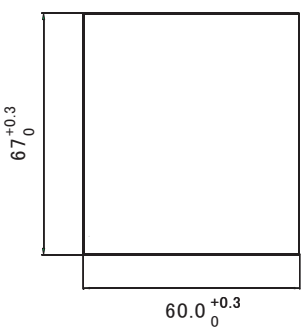
Model	H (mm)	W (mm)	D (mm)	H1 (mm)	W1 (mm)	B (mm)	Diameter of mounting hole(mm)	Weight (kg)
EH620S 0.2G	145	80	125	135	72	89	Φ4	0.74
EH620S 0.4G	145	80	125	135	72	89	Φ4	0.74
EH620S 0.7G	145	80	125	135	72	89	Φ4	0.74
EH640S 0.4G	145	80	125	135	72	89	Φ4	0.74
EH640S 0.7G	145	80	125	135	72	89	Φ4	0.74
EH640S 1.5G	145	80	125	135	72	89	Φ4	0.74

3) Physical dimentions of external keyboard

EH60S-KE:



Schematic diagram for physical dimensions of external keyboard



Schematic diagram for mounting hole dimensions of external keyboard

2.6 Optional Parts

Name	Model	Function
Built-in brake unit	The letter "C" attached behind the product model	Built-in brake unit
Modbus communication port	S series inverter achieve their communication function not by external communication card, but internal communication components. As general S series inverter have no communication card inside, M series inverter with communication card belong to nonstandard product. You must give clear indication while ordering.	
Copy keyboard	EH60S-CP	It can copy , compare parameters and display the modification of parameters after leaving factory.
Extended cable of the operation panel	EH60S-CAB	It can be connected to the external LED panel, 20m cable is provided.

2.7 Routine repair and maintenance of Inverter

1) Routine repair

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

⚠ Caution : There still has high voltage in the filter capacitor when cut off the power, you can't repair or maintain the inverter until the bus voltage is below 36V.

Routine inspection items include:

a、Whether there is any abnormal noise during the running of motor;

b、Whether there is any vibration of motor;

c、Whether there is any change to the installation environment of the inverter;

d、Whether the cooling fan of the inverter works normally.

Routine cleaning:

a、The inverter shall be kept clean all the time;

b、The dust on the surface of inverter shall be effectively removed, so as to prevent the dust

entering the inverter. Especially the metal dust is not allowed;

c、The oil stain in the cooling fan of the inverter shall be effectively removed.

2) Periodical inspection

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

Periodical inspection items include:

a、Check and clean the air duct periodically;

b、Check if the screws are loose;

c、Check if the inverter is rusted;

d、Check if the wire connector has arc signs;

e、The main circuit insulation test.

Note: When using the megameter (DC 500V megameter recommended) to measure the insulating resistance, the main circuit shall be disconnected with the inverter. Don't use the insulating resistance meter to control the insulation of the circuit. It isn't necessary to conduct the high voltage test (which has been completed upon delivery).

3) Replacement of vulnerable Parts

The vulnerable parts of inverter mainly include cooling fan and filtering electrolytic capacitor, whose service life depend on the operating environment and maintenance status. Generally, their service life is shown as following:

Part name	Service life
Fan	2 to 3 years
Electrolytic capacitor	4 to 5years

The user can determine the year of replacement according to the operating time.

a、Cooling fan

Possible reason for damage: bearing is worn and blade is aging.

Judging criteria: whether there is crack on the blade and whether there is abnormal vibration noise upon startup.

b、Filter electrolytic capacitor

Possible reason for damage: poor quality of input power supply, high ambient temperature, frequent load fluctuation and electrolyte aging.

Judging criteria : Whether there is liquid leakage and whether the safe valve has projected, measure the static capacitance and the insulation resistance.

4) Storage of Inverter

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

a、Pack the inverter with the original package and place back into the packing box of our company;

b、Long-term storage will degrade the electrolytic capacitor. Thus the product shall be powered up once half a year, each time lasts at least 5 hours. The input voltage shall be increased slowly to the rated value with the regulator.

2.8 Instructions on warranty of inverter

Free warranty only applies to the inverter itself.

1) Our company will provides 18-month warranty (starting from the delivery date as indicated on the bar code) for the failure or damage under normal use. If the equipment has been used for over18 months, reasonable repair expenses will be charged.

2) Reasonable repair expenses will be charged for the following situations within 18 months:

a、Damage resulting from operations not in compliance with the user manual;

b、Damage caused by fire, flood, abnormal voltage, and so on;

c、Damage caused when the inverter used for abnormal function.

The service expenses will be calculated according to the standard of the manufacturer. If there is any agreement, priority shall be given to the agreement.

2.9 Prototyping guide

The user must be familiar with the technical requirements of the system for variable frequency speed adjustment and specific details regarding the applications and load characteristics before selecting the inverter. It should take into overall consideration the adaptable motor, output voltage and rated output current to select the correct model and operation mode.

The basic principle is that the rated load current of the motor shall not exceed the rated current of the inverter. Generally, the overload capability of the adaptable motor capacity as specified in the instruction manual is very important for the start and brake process. In case short-time overload occurs during the running process, variation of load speed may arise. If the requirement for the speed precision is relatively high, please consider to increase the level.

2.10 Guide to prototyping of brake components

The table below provides data for reference, user can select different resistance value and power according to actual needs, (but the resistance shall not be lower than the recommended value, and the power can be higher than the recommended value). The selection of brake resistor shall be determined in accordance with the power generated by the motor in the actual application system and shall be associated with the system inertia, speed-down time and energy of potential load. Thus user has to select based on the actual needs. The higher the system inertia be, the shorter the speed-down time required and more frequent the brake is, and then it needs to select higher power and lower resistance value for the brake resistor.

Brake components prototyping table

Inverter model	Brake resistor	Brake unit	Remark
EH620S 0.2(Single phase220V)	50W, ⩾300Ω	Built-in optional	The letter“C”is attached behind the inverter model
EH620S 0.4	80W, ⩾200Ω		
EH620S 0.7	80W, ⩾150Ω		
EH640S 0.4(There-phase380V)	100W, ⩾500Ω		
EH640S 0.7	150W, ⩾300Ω		
EH640S 1.5	150W, ⩾220Ω		

Chapter 3 Mechanical and Electric Installation

3.1 Mechanical Installation

1、Insatallation Environment

1) Ambient temperature : the ambient temperature exerts great influences on the service life of the inverter and is not allowed to exceeds the allowable temperature range(-10℃ to 50℃).

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

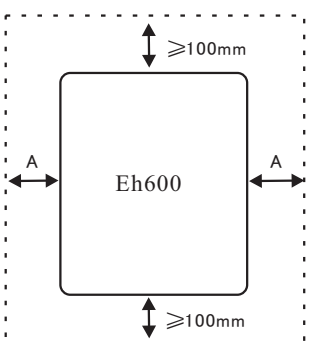
3) The inverter shall be mounted in the place without vibration or with vibration less than 0.6G. And also , it shall be kept away from such equipment as punching machine.

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

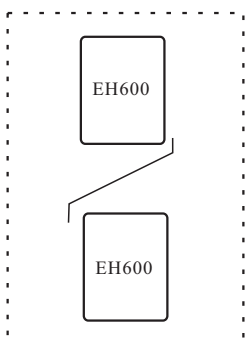
5) The inverter shall be mounted in locations free from corrosive gas, explosive gas and combustible gas.

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

2、Insatallation Location



Single unit installation diagram



Installation diagram of Upper and down parts

Note : When installing the up and down parts of the inverter, the insulating splitter is required.

Fig.3-1

When the inverter power is not higher than 22kw ,the “A”size can be omitted . When the inverter power is higher than 22kw, the “A”size shall be higher than 50mm .

Heat sinking shall be taken into account during the mechanical installation . Please pay attention to the following items :

1) Install the inverter vertically so that the heat may be expelled from the top. However the equipment cannot be installed upside down. If there are several inverters, parallel installation is a better choice. In applications where the upper and lower parts of the inverter needs to be installed, please refer to Fig.3-1 ans install an insulating splitter.

2) The mounting space shall be as indicated as the above figure so as to ensure the heat sinking space of the inverter. What's more, the heat sinking space of other devices in the cabinet shall also be taken into account.

3) The installation bracket must be flame retardant.

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

3、Removing and installing the lower cover plate

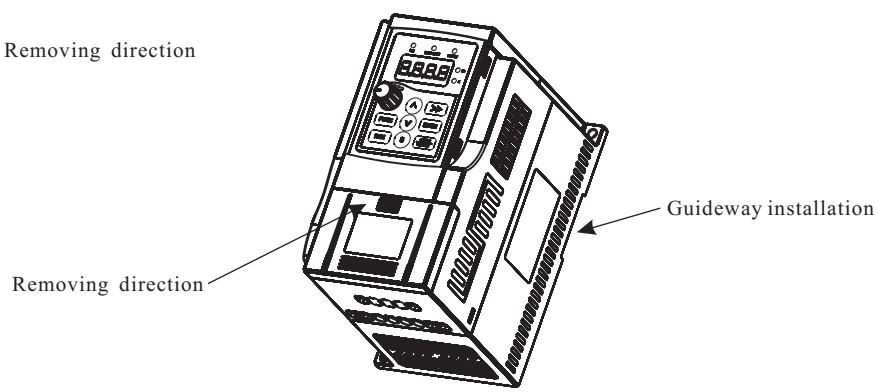


Fig.3-2 Removing the lower cover plate of plastic enclosure

3.2 Electrical Installation

1、Guide to the external electrical parts :

Inverter model	Circuit breaker (MCCA) (A)	Contactor (A)	Conducting wire of the main circuit at the input side(mm^2)	Conducting wire of the main circuit at the output side(mm^2)	Conducting wire of the control circuit (mm^2)	Grounding wire(mm^2)
Eh620 0.2G	10	10	2.5	2.5	0.75	2.5
Eh620 0.4G	16	10	2.5	2.5	0.75	2.5
Eh620 0.7G	16	10	2.5	2.5	0.75	2.5
Eh640 0.4G	10	10	2.5	2.5	0.75	2.5
Eh640 0.7G	10	10	2.5	2.5	0.75	2.5
Eh640 1.5G	16	10	2.5	2.5	0.75	2.5

2、Instruction for the use of external electrical parts :

Part name	Mounting location	Function description
Circuit breaker	The front part of input circuit	Disconnect the power supply when the equipment at the lower part is over current.
Contactor	Between the circuit breaker and the input side of the inverter	Connection and disconnection of inverter. Frequent power-on and power-off operation on the inverter (less than 2 times every minute) or direct startup operation by using the contactor shall be avoided.
AC input reactor	The input side of the inverter	1) Improve the power factor of the input side; 2) Eliminate the higher harmonics of the input side, effectively, and prevent other equipment from damaging due to distortion of voltage wave; 3) Eliminate the unbalanced input current caused by the unbalance between the power phase.
AC output reactor	Between the motor and the output side of the inverter, fixed close to the inverter	Generally, the output side of the inverter has higher harmonics. When the motor is far from the inverter, there are many distributed capacitors in the circuit, certain harmonics may cause resonance in the circuit and bring about the following two impacts: 1) Degrade the insulation performance of motor and damage the motor; 2) Generate large leakage current and arouse frequent protection of the inverter. In general, as long as the distance between the inverter and the motor exceeds 50m, it is recommended to install an AC output reactor.

3、There-phase connection

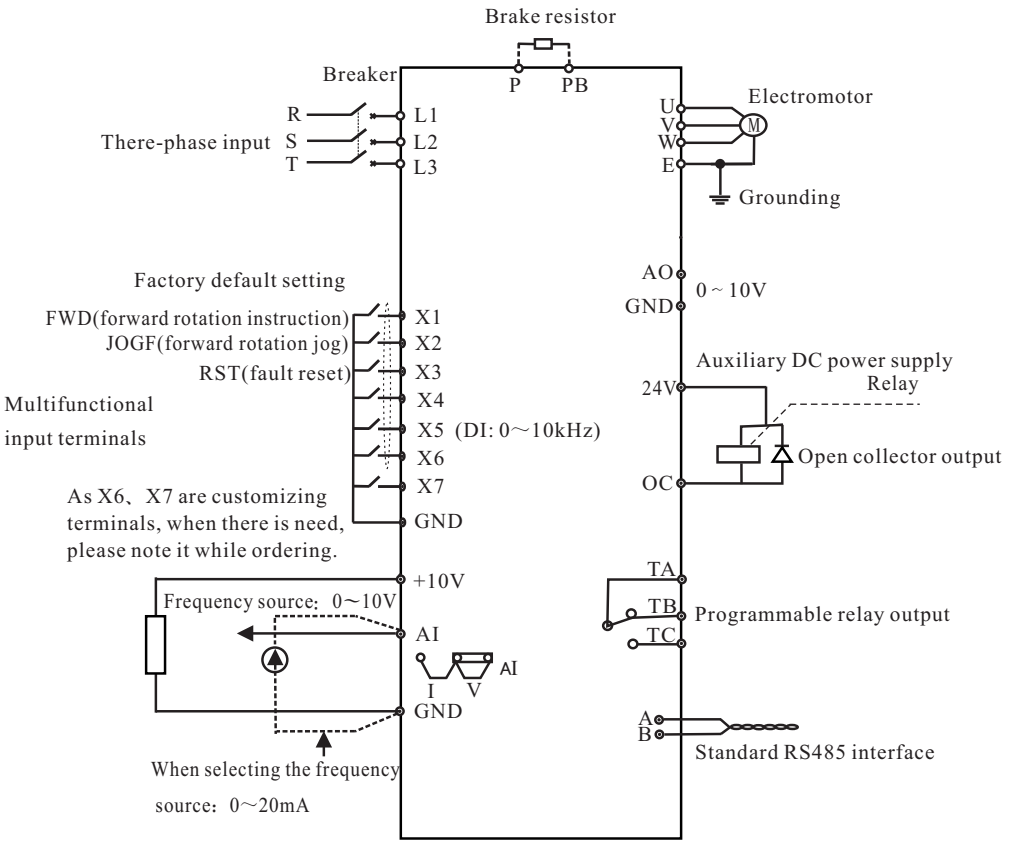


Fig.3-3 Schematic diagram for basic connection

4、Single phase connection

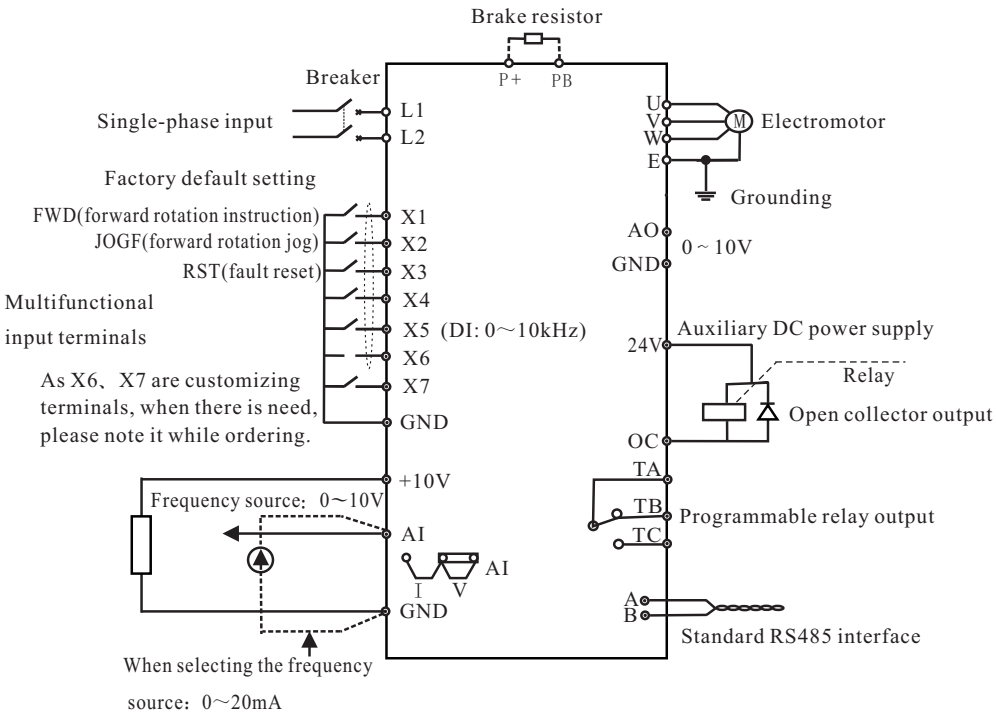


Fig.3-4 Schematic diagram for basic connection

⚠ Danger

- Make sure that the power switch is in OFF status before performing wiring connection, otherwise there may be danger of electric shock!
- Only the qualified and trained personnel can perform wiring connection, otherwise it may cause equipment and human injuries!
- It shall be earthed reliably, otherwise there may be danger of electric shock or fire!

⚠ Caution

- Make sure that the rated value of the input power supply is consistent with that of the inverter, otherwise it may damage the inverter!
- Make sure that the motor matches the inverter, otherwise it may damage the motor or generate inverter protection!
- Don't connect the power supply to the terminals of U、V、W, otherwise it may damage the inverter!

Precautions on wiring:

A、The DC bus has residual voltage after power-off, you cannot touch until make sure that the voltage is less than 36V, otherwise there may be danger of electric shock.

B、Connecting terminals of brake resistor: the connecting terminals of the brake resistor are effective only for the inverter with built-in brake unit. The prototype of brake resistor can refer to the recommended value and the wiring length shall be less than 5m, otherwise it may damage the inverter.

C、Terminals U、V、W at the output side of the inverter:

The output side of the inverter cannot connect to the capacitor or surge absorber, otherwise it may cause frequent inverter protection and even damage the inverter.

In case the motor cable is too long, it may damage the motor insulation or generate higher leakage current to invoke. When the length of the motor cable is longer than 30m, it needs to reduce carrier wave to decrease leakage current. When the length of the motor cable is longer than 50m, an AC output reactor shall be installed.

D、Earth terminal E: the terminal shall be earthed reliably, the diameter of the earth cable shall be more than $10mm^2$, with resistance less than 5Ω. Otherwise it may cause fault or damage the inverter. Don't share the earth terminal with the zero line of the power supply.

5、Control terminals and connection

1) The control circuit terminals are arranged as bellow :

TA	TC	X2	X4	24V	10V	GND	A/X6
TB	X1	X3	X5	OC	AI	AO	B/X7

2) Function description of control terminal :

Type	Terminal symbol	Terminal name	Function description
Power supply	10V-GND	External 10V power supply	Provide 10V power supply for external-unit, and the maximum output current is 10mA. It is generally used as the operating power supply for the external potentiometer. The potentiometer resistance range is 1~5kΩ.
	24V-GND	External 24V power supply	Provide 24V power supply for external-unit, It is generally used as the operating power supply for the open collector output terminal, and the maximum output current is 50mA.
Analog input	AI-GND	Analog input terminal	Input voltage range: DC 0~10V Input current range: DC 0~20mA It is determined by AI jumping wire. It is 500Ω at the time of current input.
Control terminal	X1-GND	Multifunctional input terminal 1	The specific function of the multifunctional input terminals is set by parameter F3.00~F3.04. The terminals work when close to GND terminal. X5 is also used as pulse input terminal(DI),the maximum input frequency is 10kHz.
	X2-GND	Multifunctional input terminal 2	
	X3-GND	Multifunctional input terminal 3	
	X4-GND	Multifunctional input terminal 4	
	X5(DI)-GND	Multifunctional input terminal 5	
Analog output terminal	AO-GND	Analog output	Output voltage range: 0~10V
OC output	OC	Open collector output	The output function is selected by parameter F4.01

Type	Terminal symbol	Terminal name	Function description
Relay output	TA-TB	Normally close terminal	The output function is selected by parameter F4.00 Contact driving capability: resistive load Contact rating: AC250V 1A
	TA-TC	Normally open terminal	
Standard 485 interface	A	Standard RS485 interface	S series inverter achieve their communication function not by external communication card, but internal communication components. As general S series inverter have no communication card inside, S series inverter with communication card belong to nonstandard product. You must give clear indication while ordering.
	B		

3) Description of connection of control terminals :

A、 Analog input terminal:

Since the weak analog voltage signal is easy to suffer from external interference, generally, it needs to adopt shielded cable and its length shall be no longer than 20m, as shown in Fig.3-5. In case the analog signal is severely interfered, an filter capacitor or ferrite magnetic core shall be installed at the side of analog signal source, as shown in Fig.3-6.

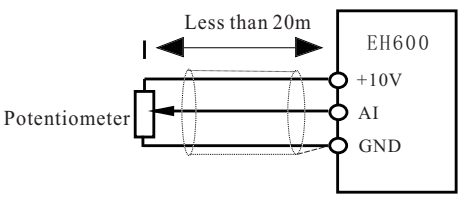


Fig.3-5

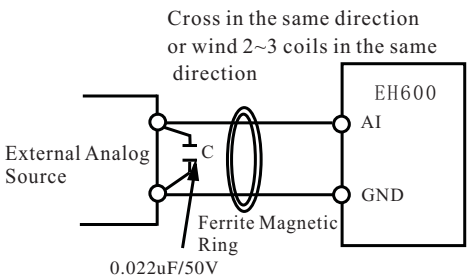


Fig.3-6

B、 Multifunctional input terminal:

Through short connecting input terminal with GND, it can enable corresponding function to become efficient, and the terminal can also be connected with the controller which is outputted by the common emitter of NPN. See the diagram below for the wiring mode. Here, the power is supplied by the 24V power in the inverter. Generally, it needs to employ shielded cable and the wiring shall be no longer than 20m.

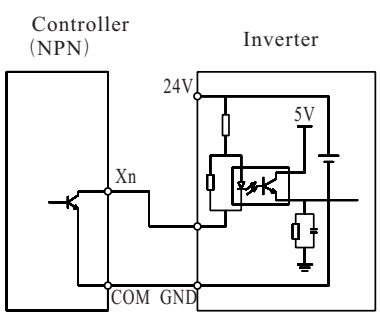


Fig.3-7

C、 OC output terminal

When the digital output terminal needs to drive the relay ,absorption diode should be installed at the two sides of the relay coil . otherwise it may damage the 24 power supply.

Caution : The absorption diode must be installed with correct polarity ,otherwise it may damage the DC 24 power supply.

6、Solution to the EMC Matter

1、Harmonic effect

1) The higher harmonics of power supply may damage the inverter . Thus, in some places where mains quality is rather poor , it is recommended to install an AC input reactor.

2) As there is higher harmonics at the output side of the inverter , the capacitors and surge suppressor which are used to improve the power may cause electrical oscillation to damage the equipment. Therefore , capacitor and surge suppressor can not be installed at the output side.

2、Electromagnetic interference and management

1) There are two kinds of electromagnetic interference, one is interference to the inverter caused by surrounding electromagnetic noise, this kind of interference may beget error action of the inverter itself. However, the impact is small, internal management to this interference has been done while designing the inverter, so the inverter has strong anti-interference capability. Another is impact on peripheral equipment caused by the inverter.

Common approach:

A、 The grounding wires of the inverter and other electric products should be well grounded, the resistance shall be less than 5Ω.

B、 The power cable and control line shall not be arranged in parallel, if it is allowable, vertical arrangement shall be adopted.

C、 For high-demanded anti-interference places, it is recommended that shield cable shall be employed to connect the inverter and the motor, moreover the shielding layer shall be grounded reliably.

D、 For the equipment which has been interfered, it is recommended to employ twisted-pair shielded control cables as the down-lead and the shielding layer shall be grounded reliably.

2) Handling method for the interference of the surrounding equipment on the inverter :

Generally, the reason why electromagnetic interference generated is that plenty of relays, contactors and electromagnetic brakes are installed near the inverter. When the inverter has error action due to the interferences, the following measures can be taken:

A、 Install an surge suppressor on the devices which generated interference.

B、 Install an filter at the input side of the inverter.

C、 Shield cable shall be employed as the down-lead of the control signal cable and the detection line. Moreover, the shielding layer shall be grounded reliably.

3) Handling method for the interference of inverter on the surrounding equipment :

There are two kinds of this interference: one is radiation interference of the inverter, and another is radiation conducted by the down-lead which connects the inverter and the motor. These two kinds of interference cause the surrounding electric equipment to suffer electromagnetic or electrostatic induction, hereby, the equipment produces error action. For different interference, different solutions are as follow:

A、 The signal of measuring meters, receivers and sensors are generally weak. If they are placed nearby the inverter or together with the inverter in the same control cabinet, they are easy to suffer interference and thus to generate error action. It is recommended to adopt the following methods: keep it far away from the interference source, don't arrange the signal cable with the power cable in parallel and never bind them together, both the signal cable and power cable shall employ shielded cable, install an linearity filter or wireless noise filter at the input/output side of the inverter.

B、 When the interfered equipment and the inverter share the same power supply, an linearity filter or wireless noise filter shall be installed between the inverter and the power supply in case that the above methods cannot remove the interference.

C、 When the surrounding equipment is separately grounded, it can avoid the interference caused by the leakage current of the grounding wire.

3、Leakage current and handling

There are two kinds of leakage current when using the inverter. One is leakage current to the earth, the other is leakage current between cables.

1) Factors influencing the leakage current to the earth and solutions:

There are distributed capacitance between lead cable and the earth, the larger the distributed capacitance is, the larger the leakage current will be. The distributed capacitance can be reduced by reducing the distance between the inverter and the motor, effectively. The higher the carrier frequency is, the larger the leakage current will be. The leakage current can be reduced by reducing the carrier frequency. However, reducing the carrier frequency may result in addition of motor noise. Please pay attention to it! Installation of an reactor is also an effective method to remove the leakage current.

The leakage current may increase along with the addition of circuit current. Therefore, if the motor power is high, accordingly, the leakage current will be high too.

2) Factors influencing the leakage current between cables and solutions:

There is distributed capacitance between the output cables of the inverter. If the current, which is passing through the circuitry, has high harmonic, it may cause resonance and thus to

cause leakage current. Here, if thermal relay is being used, it may generate error action.

The solution is to reduce the carrier frequency or to install an output reactor. It is recommended that while using the inverter, the electronic over current protection function can be employed instead of installing a thermal relay in front of the motor.

Chapter 4 Operation and Display

4.1 Introduction to operation and display interface

With the operation panel, it can perform such operations on the inverter as function parameter modification, inverter working status monitoring and inverter running control(startup and stop). Refer to Fig.4-1 for the physical appearance and function zone of the operation panel.

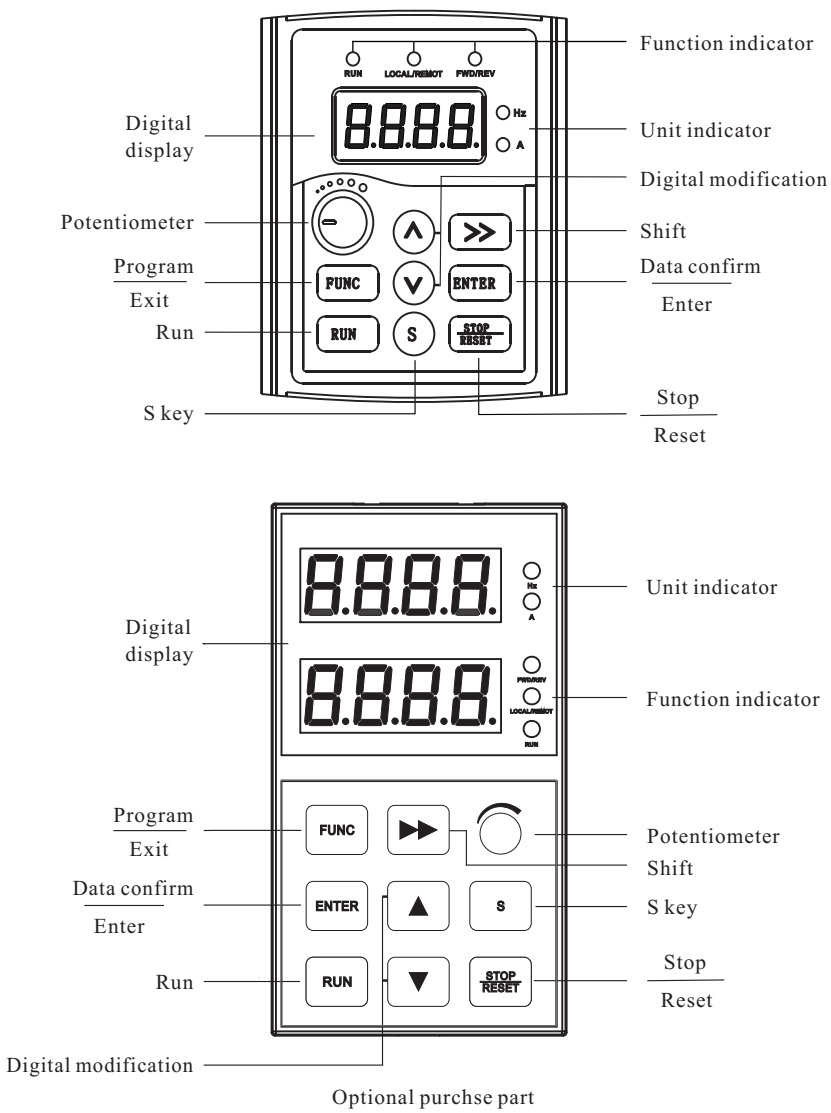


Fig.4-1 Operation panel diagram

1、Description of function LED indicator:

RUN When it is ON , it indicates the inverter is in rotation status;

When it is OFF , it indicates the inverter is in stop status.

LOCAL/REMOT When it is OFF , it indicates the keyboard operation control status;

When it is ON , it indicates the terminal operation control status;

When it flashes , it indicates the communication control status;

FWD/REV When it is OFF , it indicates the inverter is in forward rotation status;

When it is ON , it indicates the inverter is in reverse rotation status.

2、 Unit indicator description:

Hz refers to the unit of Frequency

A
Hz V refers to the unit of Voltage

A refers to the unit of Current

3、Digital display zone :

The digital LED of above displays function code , parameter numerical value , status parameter and so on.

The digital LED of underside displays FV parameter which is set by F6.05 .

4、 Keyboard button description

Button	Name	Function
FUNC	Program key	Entry and exit of primary menu
ENTER	Confirmation key	Enter the menu interfaces level by level, and confirm the set parameters
Λ	Increase key	Increase of the data or function code
V	Decrease key	Decrease of the data or function code
>>	Shift key	Select the displayed parameters in turn on the stop display interface and running display interface, select the modification digit of parameters when modifying parameters.
RUN	Running key	It is used to start the running of the inverter under keyboard control mode
STOP/ RESET	Stop/Reset	Press the button can stop the inverter from running while it is in running status and reset the operation when it is in fault alarm status

Button	Name	Function
S	S key	F6.00=0 S key disabled
		F6.00=1 Forward rotation jog operation (factory setting)
		F6.00=2 Reverse rotation operation
		F6.00=3 Clear the data of exact stop process

4.2 Description of function code viewing and modification methods

The operation panel of our inverter adopts three-level menu structure to carry out operations, such as parameter setup.

The three-level menu includes function parameter set (level 1 menu)→function code(level 2 menu)→function code setup value(level 3 menu). Refer to Fig.4-2 for the operation procedure.

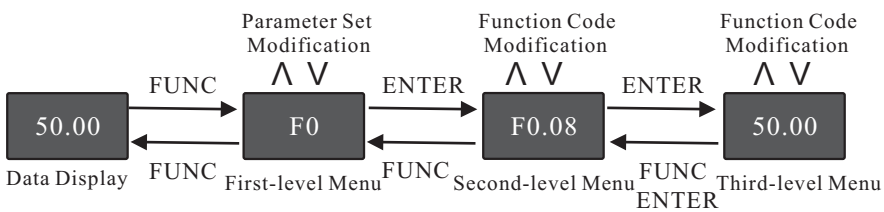


Fig.4-2 Operation procedure of three-level menu

Caution: When operating on level 3 menu, press FUNC key or ENTER key to return to level 2 menu. The difference between FUNC key and ENTER key is described as follows: by pressing ENTER key, it will save the setup parameter and return to the level 2 menu, then turn to the next function code, automatically. While pressing FUNC key, it will return to level 2 menu, directly, without saving the parameter, then return to the current function code.

Example: Modify the function code FB.02 from 10.00Hz to 15.00Hz. (The bold-faced word indicates the flashing bit)

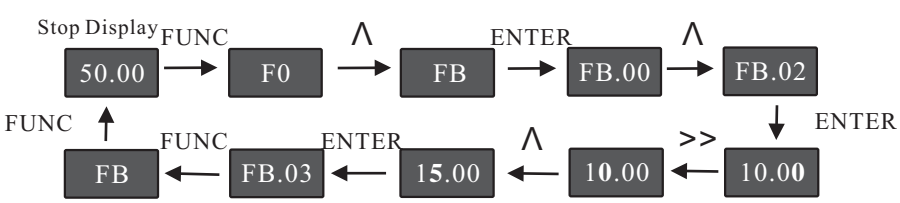


Fig.4-3 Example of parameter editing operation

In the third menu, if the parameter has no flashing bit, it indicates that the function code cannot be modified. The reasons could be:

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

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

3) The operation panel is in code protection status.

4.3 Method of viewing status parameter

The inverter provides 26 kinds of status parameter for user. There are two kinds of methods to refer to.

1) As the FV status parameter can only be read, you can enter the three-level menu to view it by using the same method to view others. Refer to 4.2 section for operation details. And it is convenient to view parameters which don't need to inquire again and again.

2) In stop or running status, the status parameter which needs requiring again and again is setting by running parameter(F6.01~F6.02) and stop parameter(F6.03~F6.04) . The common status parameter can be reached by controlling shift key(>>)to display in turns. Refer to parameter group F6 for the setting methods.

Our company provide double-range LED operation panel which is optional. The content of the under-range LED can be displayed by setting F6.05 to corresponding number of FV parameter. It is convenient for client to debug. In respect that the interfaces of keyboard are unitive, users can select the operation panel of double-range LED as the external keyboard of small power inverter.

4.4 Digital setting modify on-line

Set F6.01to F6.04 properly, press shift key(>>)to display those FV parameters that need to be modified online. Refer to group F6 for the explanation.

1: Timely modification to the speed reference in open-loop running status

When one of parameter(F0.03、F0.04)is selected by frequency source to set as digital setting UP、DOWN, Then when it is switched to display status parameter FV.00、FV.01, FV.03、FV.04, FV.05、FV.06, you can modify the set frequency, the set rotate speed and the set line speed on-line by pressing increase key and decrease key(∧∨).

2: Timely modification to the PID digital reference in close-loop control status

When PID reference source selects PID digital reference, after switching to display status parameter FV.13、FV.14, you can press increase key and decrease key(∧∨)to modify F9.02 on-line without entering the three-level menu.

3:Timely modification to correlative parameter of exact stop

When it is shifted to display status parameter FV.16~FV.21, you can press increase key and decrease key(∧∨)to modify correlative parameter on-line without entering three-level menu. Refer to the explanation of FA.11for the operation details about exact stop.

4.5 Password setting

The inverter provides user password protection function. When F6.08 is set to non-zero value, it indicates the user password, and the password protection turns valid after exiting the function code editing status. When pressing FUNC key again, “0000”will be displayed to indicate user to input password, the parameter cannot be modified until user password is input correctly. Otherwise, all function codes cannot be modified, even if you entered the function code program status.

To cancel the password protection function, enter with password and set F6.08 to “0”.

4.6 Suggestive information

While operating the inverter, the operation panel provides full suggestive information.

P.LU: Suggest the insufficiency of voltage during the process of power-on and power-down.

CE: Owing to vibration or other casual factor, the keyboard communication may become abnormal. You can retry the operation after raveling out those factors.

As for parameter that cannot be modified, there are suggestive information as follows:

RESE: parameter reserve, good for user’s expansion

HIDE: parameter hidden

E-CH: parameter cannot be modified(function parameter that cannot be modified when status parameter or function parameter in running status).

Chapter 5 Function Parameter Table

According to different function, the function parameter of our inverter can be divided into 15 groups, there are F0~FD、FV. Every function group contains some function codes, which adopt the mark way that function code group number add function code number. The typeface like FX.YZ means that the YZ function code in X group. For example, F6.08 means that the eighth function code in the sixth group.

To convenient for the setting of function code, the function group corresponds to the level 1 menu, the function code number corresponds to the level 2 menu, the function code parameter corresponds to the level 3 menu while you are using the operation panel.

The description about the row content in the function table:

The first row " function code ": It refers to function parameter group and parameter number.

The second row " name ": It refers to the whole name of function parameter.

The third row " setup range ": It refers to valid setting value of function parameter.

The forth row " minimum unit ": It refers to the minimum unit of function parameter setup value.

The fifth row " factory default value ": It refers to original setting value of function parameter in factory.

The sixth row " modification ": It refers to the modifiable property(means whether it is allowed to modify and the modifiable condition), the description is as follows:

"○": It indicates that the setup value of the parameter can be modified whether the inverter is in stop status or running status.

"X": It indicates that the setup value of the parameter cannot be modified when the inverter is in running status.

" * ": It indicates that the numerical value of the parameter is the actually measured value or reserves parameter, which cannot be modified.

In order to protect parameter more effectively, the inverter provides password protection for function code. After setting user password(it means F6.08 parameter is set to non-zero), the system will enter the status to confirm user password firstly when you press FUNC key to enter the function code edit status, and then "0000"will be displayed to suggest you input password. The parameter cannot be modified until user password is input correctly. Otherwise, all function codes cannot be modified, even if you entered the function code program status.

In the unlock password protection status, you can change the user password at any moment, the inverter takes the last input numerical value as the correct one.

If F6.08 is set to zero, you can cancel user password. If F6.08 is set to non-zero, then the parameter is protected by password when upon power.

Function Parameter Table

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
Group F0 Basic function group					
F0.00	Software version number	0~9999	1	Model dependent	*
F0.01	Control mode	0: V/F 1: Reserved	1	0	X
F0.02	Command source selection	0: Operation panel running command channel(LED ON) 1: Terminal command channel/ keyboard STOP disabled (LED OFF) 2: Terminal command channel/ keyboard STOP enabled (LED OFF) 3: Serial port command channel /keyboard STOP disabled (LED flashes) 4: Serial port command channel /keyboard STOP enabled (LED flashes)	1	0	○
F0.03	Main frequency source X selection	0: Panel potentiometer 1: Digital setup by UP and DW adjustment(panel or external terminal) 2: AI 3: Reserved 4: PULSE setup(DI) 5: MS speed 6: PLC 7: PID 8: Communication setup	1	0	○
F0.04	Auxiliary frequency source Y selection	0: Panel potentiometer 1: Digital setup by UP ans DW adjustment(panel or external terminal) 2: AI1 3: AI2 4: PULSE setup(DI) 5: MS speed 6: PLC 7: PID 8: Communication setup	1	2	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F0.05	Auxiliary frequency source Y range selection	0: Relative to frequency upper limit F0.11 1: Relative to frequency source X	1	0	○
F0.06	Auxiliary frequency source Y range	0~100%	1%	100%	○
F0.07	Frequency source selection	0: Main frequency source X 1: Auxiliary frequency source Y 2: Main frequency source X plus auxiliary frequency source Y 3: Switching between main frequency source X and auxiliary frequency source Y 4: Switching between main frequency source X and(main frequency source X plus auxiliary frequency source Y 5: Switching between auxiliary frequency source Y and(main frequency source X plus auxiliary frequency source Y	1	0	X
F0.08	Digital setup UP and DW adjustment preset frequency	0.0Hz~frequency upper limit F0.11(operation panel and terminal UP and DW is enabled	0.1Hz	50.0Hz	○
F0.09	Preset frequency control	0: Setup frequency saving when power failure 1: Setup frequency without saving when power failure	1	0	○
F0.10	Running direction	0: Direction is consistent 1: Direction is reverse	1	0	○
F0.11	Frequency upper limit	Lower limit F0.12~1500Hz	0.1Hz	50.0Hz	○
F0.12	Frequency lower limit	0.0Hz~upper limit F0.11	0.1Hz	0.5Hz	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F0.13	Speed-up time 1	0.1~6553.5s	0.1s	Model dependent	○
F0.14	Speed-down time 1	0.1~6553.5s	0.1s	Model dependent	○
Group F1 Motor parameters					
F1.00	Function reserved	—	—	—	*
F1.01	Rated power	0.2~1000.0kW(just for the user to view)	0.1kW	Model dependent	*
F1.02	Rated current	0.1~1000.0A(just for the user to view)	0.1A	Model dependent	*
F1.03	Rated voltage	1~250V 1~460V	1V	220V 380V	X
F1.04	Rated frequency	1.0Hz~frequency upper limit	0.1Hz	50.0Hz	X
F1.05	Rated rotation speed	0~9999rpm	1rpm	1460rpm	○
F1.06	Motor type selection	0: common asynchronous motor 1: reserved 2: reserved	1	0	X
F1.07	Motor no-load current coefficient	10%~90%	1.0%	40.0%	X
Group F2 V/F control parameters					
F2.00	V/F curve setup	0: straight V/F curve 1: multiple-point V/F curve 2: square V/F curve 1(1.5 time power 3: square V/F curve 2(2.0 time power	1	0	X
F2.01	V/F frequency point F1	0.00Hz~F2	0.1Hz	0.0Hz	X
F2.02	V/F voltage point V1	0.0%~V2	0.1%	0.0%	X

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F2.03	V/F frequency point F2	F1~F3	0.1Hz	25.0Hz	X
F2.04	V/F voltage point V2	V1~V3	0.1%	50.0%	X
F2.05	V/F frequency point F3	F2~rated motor frequency	0.1Hz	50.0Hz	X
F2.06	V/F voltage point V3	V2~100.0%	0.1%	100.0%	X
F2.07	Torque boost	0.0%: automatic torque boost 0.1~20.0%: manul torque boost	0.1%	Model dependent	○
F2.08	Cutoff frequency of torque boost	0~maximun frequency F0.11	0.1Hz	50.0Hz	X
F2.09	Slip compensation coefficient	0~200%	1%	0%	○
F2.10	Automatic voltage regulation (AVR) selection	0: disabled 1: active 2: disabled only at the time of deceleration	1	2	○
F2.11	Oscillation suppression gain	0~100	1	15	○
F2.12	Carrier frequency	1.0~9.0kHz	0.1kHz	Model dependent	○
F2.13	Carrier frequency adjustment selection	0: fixed PWM, carrier frequency temperature adjustment disabled 1: random PWM, carrier frequency temperature adjustment disabled 2: fixed PWM, carrier frequency temperature adjustment active 3: random PWM, carrier frequency temperature adjustment active	1	2	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
Group F3 Input terminal					
F3.00	X1 terminal function selection (0~30)	0: No function 1: MS speed terminal 1 2: MS speed terminal 2 3: MS speed terminal 3 4: MS speed terminal 4 5: Three-line mode running control 6: Forward rotation jog(JOGF) 7: Reserve rotation jog(JOGR) 8: Terminal UP 9: Terminal DOWN 10: Coast to stop 11:Pause 12:External fault normally open input 13: Acceleration/deceleration selection terminal 1 14: Acceleration/deceleration selection terminal 2 15: Frequency source switching 16: UP and DOWN setup clear (terminal and operation panel) 17: DC brake input command DB of stop 18: Acceleration/deceleration disabled 19: PID pause 20: PLC status reset 21: Swing frequency pause 22: Counter reset 23: Length reset 24: Time reset 25: PID second reference value enable switching terminal 26: Forward rotation(FWD) 27: Reserve rotation(REV) 28: Fault reset(RST) 29: Broken wire reset terminal 30: Broken wire proximity switch input 31: Counter input 32: Length count input	1	26	X
F3.01	X2 terminal function selection (0~30)		1	6	X
F3.02	X3 terminal function selection (0~30)		1	28	X
F3.03	X4 terminal function selection (0~30)		1	0	X
F3.04	X5 terminal function selection (0~32)		1	0	X
F3.05	Function reserved		1	0	*
F3.06	Terminal command mode	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	1	0	X

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F3.07	Change rate of terminals UP/DW	0.01~100.0Hz/s	0.01Hz	1.00Hz/s	○
F3.08	AI minimum input	0.00V~10.00V when current inputs: 1V corresponds to 2mA	0.01V	0.00V	○
F3.09	AI minimum input corresponding setup	-100.0~100.0%	0.1%	0.0%	○
F3.10	AI maximum input	0.00V~10.00V when current inputs: 1V corresponds to 2mA	0.01V	10.00V	○
F3.11	AI maximum input corresponding setup	-100.0~100.0%	0.1%	100.0%	○
F3.12	Function reserved		—	—	*
F3.13	Function reserved		—	—	*
F3.14	Function reserved		—	—	*
F3.15	Function reserved		—	—	*
F3.16	Pulse input (DI)lower limit frequency	0.000kHz~F3.18	0.001kHz	0.0kHz	○
F3.17	Pulse input (DI) lower limit frequency corresponding setup	-100.0~100.0%	0.1%	0.0%	○
F3.18	Pulse input (DI)upper limit frequency	F3.16~10.00kHz	0.001kHz	10.00kHz	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F3.19	Pulse input (DI) upper limit frequency corresponding setup	-100.0~100.0%	0.1%	100.0%	○
F3.20	Analog input filter time	0.01~10.00s	0.01s	0.25s	○
Group F4 Output terminal					
F4.00	Relay output selection	0: No output 1: Inverter is running 2: Fault output 3: Frequency level detection FDT1 output 4: Frequency level detection FDT2 output 5: Frequency arrival 6: In the zero speed operation 7: Inverter overload pre-warning 8: Setup counting value arrival 9: Designated counting value arrival 10: Setup length arrival 11: PLC circulation completion 12: PLC phase completion 13: Setup running time arrival 14: Output frequency arrive at upper limit 15: Output frequency arrive at lower limit 16: Output X1 17: Output X2 18: Running command indication 19: Reserved 20: Dormant 21: Ready to running 22: Three-line running mode 1 start to trigger information output by itself	1	2	○
F4.01	OC output selection		1	1	○
F4.02	Function reserved		1	0	*
F4.03	Function reserved		1	0	*

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
		23: Band-type brake information output 24: Broken wire detection output 25: Reference length arrival			
F4.04	OC close protract	0~1000.0s	0.1s	0.0s	○
F4.05	OC brake protract	0~1000.0s	0.1s	0.0s	○
F4.06	Function reserved		—	—	*
F4.07	Function reserved		—	—	*
F4.08	AO output channel selection	0: 0~10V 1: 2~10V	1	0	○
F4.09	AO output gain	1.0~500.0%	0.1%	100%	○
F4.10	Function reserved	—	—	—	*
F4.11	AO output selection	0: Running frequency 1: Setup frequency 2: Output current 3: Output voltage 4: Pulse reference(DI) 5: AI 6: Reserved 7: Length 8: Counting value 9: Running time 10: Output torque 11: Output power 12: Keyboard potentiometer reference	0	0	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
Group F5 Start/stop control					
F5.00	Start mode	0: Start from start frequency 1: Perform braking prior to start 2: Velocity tracking restart	0	0	○
F5.01	Start frequency	0.0Hz~10.0Hz	0.1Hz	0.5Hz	○
F5.02	Start frequency holding time	0.0~36.0s	0.1s	0.0s	X
F5.03	DC brake current at start	0~100%	1%	0%	X
F5.04	DC brake time at start	0.0~36.0s	0.1s	0.0s	X
F5.05	Stop mode	0: Decelerate to stop 1: Coast to stop	1	0	○
F5.06	DC brake beginning frequency at stop	0.0Hz~frequency upper limit F0.11	0.1Hz	0.0Hz	○
F5.07	DC brake waiting time at stop	0.0~36.0s	0.1s	0.0s	X
F5.08	DC brake current at stop	0~100%	1%	0%	X
F5.09	DC brake time at stop	0.0~36.0s	0.1s	0.0s	X
F5.10	Beginning voltage of dynamic braking	115~140%	1V	130%	○
F5.11	Use ratio of dynamic braking	0~100%	1%	30%	○
F5.12	Acceleration/ deceleration mode	0: Straight acceleration/ deceleration 1: S-curve acceleration/ deceleration	1	0	X

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F5.13	Start segment proportion of S-curve	0.0~40.0%	0.1%	30.0%	X
F0.14	End segment proportion of S-curve	0.0~40.0%	0.1%	30.0%	X
Group F6 Keyboard and display					
F6.00	S key function selection	0: S key function disabled 1: Forward rotation jog command 2: Reverse rotation run command 3: Clear the data of exact stop process	1	1	○
F6.01	LED operation display parameter 1	0~8191	1	5	○
F6.02	LED operation display parameter 2	0~8191	1	0	○
F6.03	LED stop display parameter 1	0~8191	1	1	○
F6.04	LED stop display parameter 12	0~8191	1	0	○
F6.05	Auxiliary supervise item selection	0~25	1	1	○
F6.06	Load speed display coefficient	0.01~100.0	0.01	1.00	○
F6.07	Function reserved	—	—	—	*

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F6.08	User password	0~9999	1	0	○
F6.09	Copy keyboard function selection	Please refer to the copy keyboard description of our company	1	0	○
Group F7 Auxiliary function					
F7.00	Jog running frequency	0.0Hz~frequency upper limit F0.11	0.1Hz	5.0Hz	○
F7.01	Jog acceleration time	0.0~6553.5s	0.1s	20.0s	○
F7.02	Jog deceleration time	0.0~6553.5s	0.1s	20.0s	○
F7.03	Jog action selection on running status	0: Active 1: Disabled It can avoid the inverter accepting error operation to cause jog command by setting 1	1	0	○
F7.04	Acceleration time 2	0.1~6553.5s	0.1s	20.0s	○
F7.05	Deceleration time 2	0.1~6553.5s	0.1s	20.0s	○
F7.06	Acceleration time 3	0.1~6553.5s	0.1s	20.0s	○
F7.07	Deceleration time 3	0.1~6553.5s	0.1s	20.0s	○
F7.08	Acceleration time 4	0.1~6553.5s	0.1s	20.0s	○
F7.09	Deceleration time 4	0.1~6553.5s	0.1s	20.0s	○
F7.10	Skip frequency	0.0Hz~frequency upper limit F0.11	0.1Hz	0.0Hz	○
F7.11	Skip frequency amplitude	0.0Hz~frequency upper limit F0.11	0.1Hz	0.0Hz	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F7.12	Forward/ reverse rotation dead-zone time	0.0~3000.0s	0.1s	0.0s	X
F7.13	Reverse control	0: Active 1: Disabled	1	0	X
F7.14	Setup frequency lower than frequency lower limit action	0: Run with frequency lower limit 1: Stop 2: Zero speed operation	1	1	X
F7.15	Frequency detection value (FDT 1level)	0.0Hz~frequency upper limit F0.11	0.1Hz	50.0Hz	○
F7.16	Frequency detection hysteresis (FDT1 hysteresis)	0.0Hz~frequency upper limit F0.11	0.1Hz	2.0Hz	○
F7.17	Frequency detection value (FDT 2 level)	0.0Hz~frequency upper limit F0.11	0.1Hz	50.0Hz	○
F7.18	Frequency detection hysteresis (FDT1 hysteresis)	0.0Hz~frequency upper limit F0.11	0.1Hz	2.0Hz	○
F7.19	Frequency arrival detection amplitude	0.0Hz~frequency upper limit F0.11	0.1Hz	2.0Hz	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
Group F8 Fault and protection					
F8.00	Inverter overload pre-warning	50~200%	1%	110%	○
F8.01	Inverter overload pre-warning delayed time	0.0~20.0s	0.1s	2.0s	○
F8.02	Overload、overheat protective action mode	0: Inverter locks output 1: Limitative current running (alarm)	1	0	○
F8.03	Motor overload protection coefficient	30~100%	1%	100%	○
F8.04	Stall protection current over current	110~200%	1%	150%	○
F8.05	Stall protection voltage over voltage	120~150%	1%	130%	○
F8.06	Restart setup after power-off	0: No action 1: Action	1	0	X
F8.07	Restart waiting time after power-off	0.0~10.0s	0.1s	1.0s	X
F8.08	Fault auto reset times	0~3	1	0	X
F8.09	Fault auto reset interval	0.1~100.0s	0.1s	1.0s	X

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F8.10	The first fault type	0: No fault(--) 1: Inverter unit protection(E.1) 2: Acceleration over current (E.OC1) 3: Deceleration over current (E.OC2) 4: Constant speed over current (E.OC3) 5: Acceleration over voltage (E.OU1) 6: Deceleration over voltage (E.OU2) 7: Constant speed over voltage (E.OU3) 8: Stop over voltage(E.OU4) 9: Running under voltage (E.LU) 10: Inverter overload(E.OL1) 11: Motor overload(E.OL2) 12: Output phase failure(E.LF) 13: Inverter overheat(E.OH) 14: External equipment fault (E.EF) 15: Communication fault (E.CE) 16: Output grounding(E.GF) 17: CPU interference(E.2) 18: Current detection fault (E.3) 19: EEPROM read-write fault (E.4) 20: Input phase failure(E.5) 21: PID feedback disconnection (E.6) 22: Reserved	—	—	*
F8.11	The second fault type		—	—	*
F8.12	The third fault type		—	—	*
F8.13	Output frequency upon fault	—	0.1Hz	—	*
F8.14	Output current upon fault	—	0.1A	—	*

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F8.15	Bus voltage upon fault	—	1V	—	*
F8.16	Module temperature upon fault	—	0.1℃	—	*
F8.17	Terminal state upon fault	—	1	—	*
Group F9 PID function					
F9.00	PID control mode setup	The third part of LED: PID action direction 0: positive action 1: reverse action The second part of LED: PID feedback source 0: AI 1~5: reserved 6: pulse setup(DI) 7:communication setup The first part of LED: PID reference source 0: panel potentiometer 1: PID digital reference (F9.02) 2: AI 3: reserved 4: pulse setup(DI) 5:communication setup	1	001	X
F9.01	PID reference feedback range	0~9999	1	1000	○
F9.02	PID digital reference	0~F9.01	1	500	○
F9.03	PID second digital reference	0~F9.01 note: It can switch with other PID reference source by setting the external terminal to 25.	1	500	○
F9.04	Deviation limit	0.0~50.0%	0.1%	0.0%	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
F9.05	Function reserved	—	—	—	*
F9.06	Proportional gain P	0.0~100.0% 0.0%: close P	1	20.0%	○
F9.07	Integration time I	0.1~100.0s 100.0s: close I	0.1s	2.0s	○
F9.08	Differential time D	0.0~10.00s 0.0s: close D	0.01s	0.0s	○
F9.09	Differential amplitude	0.0~100.0%	0.1%	5.0%	○
F9.10	PID preset frequency	0.0Hz~frequency upper limit	0.1Hz	0.0Hz	○
F9.11	PID preset frequency holding time	0.0~3600.0s	0.1s	0.0s	X
F9.12	Dormant frequency	0.0Hz~frequency upper limit	0.1Hz	0.0Hz	○
F9.13	Dormant protract	0.0~3600s	0.1s	60.0s	○
F9.14	Awakening threshold	0.0~100.0%	0.1%	0.0%	○
F9.15	Awakening protract	0.0~60.0s	0.1s	0.5s	○
F9.16	PID feedback disconnection detection	The second part of LED: action mode 0: enter the PID feedback disconnection fault state (display E.6) 1: stop in terms of the stop mode of F5.05 2: keep current running frequency	1	00	X

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
		The first part of LED: detection mode 0: no detection 1: detection in terms of PID feedback signal 2: detection in terms of disconnection proximity switch signal			
F9.17	PID feedback disconnection result	0.0~50.0%	0.1%	0.0%	○
F9.18	PID feedback disconnection and judgement protract	0~20.0s	0.1s	2.0s	○
F9.19	Function reserved	—	—	—	*
F9.20	Function reserved	—	—	—	*
F9.21	Function reserved	—	—	—	*
F9.22	The precision after PID range radix point	0~3	1	0	○
Group FA Swing frequency, fixed length, count and timing					
FA.00	Swing setup mode	The second part of LED: swing frequency function enable 0: disable 1: enabled The first part of LED: swing amplitude benchmark 0: no detection 1: relative to the central frequency 2: relative to frequency upper limit	1	00	X

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FA.01	Swing frequency amplitude	0.0~100.0%	0.1%	0.0%	○
FA.02	Kick frequency amplitude	0.0~50.0%	0.1%	0.0%	○
FA.03	Swing frequency cycle	0.1~3000.0s	0.1s	10.0s	○
FA.04	Time constant of triangular wave boost	0.1~100.0%	0.1%	50.0%	○
FA.05	Setup length	0.0~65.535(km)	0.001km	1.000km	○
FA.06	Designed length	0.0~65.535(km)	0.001km	1.000km	○
FA.07	Number of pulses each meter	0.1~6553.5	0.1	100.0	○
FA.08	Setup counting value	1~9999	1	1000	○
FA.09	Designed counting value	1~9999	1	1000	○
FA.10	Internal timing setup running time	0.0~65.535h	0.001h	24.000h	○
FA.11	Exact stop mode setup	0: disabled 1: setup counting value arrival 2: setup length arrival 3: setup running time arrival	1	0	X

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
Group FB MS speed and PLC					
FB.00	MS speed 0	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.01	MS speed 1	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.02	MS speed 2	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.03	MS speed 3	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.04	MS speed 4	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.05	MS speed 5	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.06	MS speed 6	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.07	MS speed 7	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.08	MS speed 8	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.09	MS speed 9	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.10	MS speed 10	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.11	MS speed 11	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.12	MS speed 12	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.13	MS speed 13	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.14	MS speed 14	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.15	MS speed 15	0.0Hz~frequency upper limit	0.01Hz	0.0Hz	○
FB.16	PLC running mode	The second part of LED: PLC running time unit selection 0: second 1: hour The first part of LED: PLC action mode 0: stop upon completion of one-time running 1: keep final value upon completion of one-time running 2: constant circulation	1	00	X

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FB.17	PLC power failure recorded selection	0: power failure non-recorded 1: power failure recorded	0	0	○
FB.18	Running time of zero-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.19	Running time of first-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.20	Running mode of zero and first-segment	The forth part of LED: acceleration/deceleration time selection of 1 segment:0~3 The third part of LED: direction selection of 1segment: 0: forward 1: reverse The second part of LED: acceleration/deceleration time selection of 0 segment:0~3 The first part of LED: direction selection of 0 segment: 0: forward 1: reverse	1	0000	○
FB.21	Running time of second-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.22	Running time of third-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FB.23	Running mode of second and third-segment	The forth part of LED: acceleration/deceleration time selection of 3 segment:0~3 The third part of LED: direction selection of 3segment: 0: forward 1: reverse The second part of LED: acceleration/deceleration time selection of 2 segment:0~3 The first part of LED: direction selection of 2 segment: 0: forward 1: reverse	1	0000	○
FB.24	Running time of forth-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.25	Running time of fifth-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.26	Running mode of forth and fifth-segment	The forth part of LED: acceleration/deceleration time selection of 5 segment:0~3 The third part of LED: direction selection of 5segment: 0: forward 1: reverse The second part of LED: acceleration/deceleration time selection of 4 segment:0~3 The first part of LED: direction selection of 4 segment: 0: forward 1: reverse	1	0000	○
FB.27	Running time of sixth-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.28	Running time of seventh-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FB.29	Running mode of sixth and seventh-segment	The forth part of LED: acceleration/deceleration time selection of 7 segment:0~3 The third part of LED: direction selection of 7segment: 0: forward 1: reverse The second part of LED: acceleration/deceleration time selection of 6 segment:0~3 The first part of LED: direction selection of 6 segment: 0: forward 1: reverse	1	0000	○
FB.30	Running time of eighth-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.31	Running time of ninth-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.32	Running mode of eighth and ninth-segment	The forth part of LED: acceleration/deceleration time selection of 9 segment:0~3 The third part of LED: direction selection of 9segment: 0: forward 1: reverse The second part of LED: acceleration/deceleration time selection of 8 segment:0~3 The first part of LED: direction selection of 8 segment: 0: forward 1: reverse	1	0000	○
FB.33	Running time of tenth-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.34	Running time of eleventh-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FB.35	Running mode of tenth and eleventh-segment	The forth part of LED: acceleration/deceleration time selection of 11 segment:0~3 The third part of LED: direction selection of 11segment: 0: forward 1: reverse The second part of LED: acceleration/deceleration time selection of 10 segment:0~3 The first part of LED: direction selection of 10 segment: 0: forward 1: reverse	1	0000	○
FB.36	Running time of twelfth-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.37	Running time of thirteenth-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.38	Running mode of twelfth and thirteenth-segment	The forth part of LED: acceleration/deceleration time selection of 13 segment:0~3 The third part of LED: direction selection of 13segment: 0: forward 1: reverse The second part of LED: acceleration/deceleration time selection of 12 segment:0~3 The first part of LED: direction selection of 12 segment: 0: forward 1: reverse	1	0000	○
FB.39	Running time of fourteenth-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FB.40	Running time of fifteenth-segment	0.0~6553.5s(h)	0.1s(h)	0.0s	○
FB.41	Running mode of fourteenth and fifteenth-segment	The forth part of LED: acceleration/deceleration time selection of 15 segment:0~3 The third part of LED: direction selection of 15segment: 0: forward 1: reverse The second part of LED: acceleration/deceleration time selection of 14 segment:0~3 The first part of LED: direction selection of 14 segment: 0: forward 1: reverse	1	0000	○
Group FC Communication parameters					
FC.00	Baud rate	0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS	1	3	○
FC.01	Data format	The second part of LED: data frames check mode selection 0: CRC16 1: accumulate sum(16 bit) The first part of LED: byte check mode selection 0: no parity check(8,N,2) note: two stop bit 1: even parity check(8,E,1) note: one stop bit 2: odd parity check(8,0,1) note: one stop bit	1	00	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FC.02	Local address	0~247 0: broadcast address When local address is zero, it indicates that the local computer as host sends synchronous command and frequency signal to all guests with broadcast address. The guests accept the command and execute it in terms of correspondence of the baud rate and data format. 1~247: slave address	1	1	○
FC.03	Response delay	0~20ms	1ms	2ms	○
FC.04	Communication overtime time	0.0(inactive), 0.1~60.0s	0.1s	0.0s	○
FC.05	Communication overtime action selection	0: Stop 1: Keep current setup frequency 2: Stop and notify communication fault(E.CE)	1	0	○
Group FD Particular function					
FD.00	Droop control	0.0Hz~10.0Hz	0.1Hz	0.0Hz	○
FD.01	Function reserved	—	—	—	*
FD.02	Function reserved	—	—	—	*
FD.03	Relay break protract	0~1000.0s	0.1s	0.0s	○
FD.04	Pulse input (DI) filter	0~10	1	4	○
FD.05	Function reserved	—	—	—	*

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FD.06	Output phase failure protection selection	0: disabled 1: active	1	1	○
FD.07	Response delay	—	—	—	*
FD.08	Inner fan control	0: automatic 1: constant open	1	0	○
FD.09	User password	0~9999	1	0	X
FD.10	Parameter initialization	0: no operation 1: restore factory default setup value 2: clear the fault record	1	0	X
Group FV Status parameters					
FV.00	Output frequency	0.0Hz~frequency upper limit	0.1Hz	—	*
FV.01	Setup frequency (flashes)	0.0Hz~frequency upper limit	0.1Hz	—	*
FV.02	Output current	0.1~1000.0A	0.01A	—	*
FV.03	Running rotation speed	0~9999rpm	1r/min	—	*
FV.04	Setup rotation speed (flashes)	0~9999rpm	1r/min	—	*
FV.05	Running load speed	0.001~9999	0.01m/s	—	*
FV.06	Setup load speed (flashes)	0.001~9999	0.01m/s	—	*

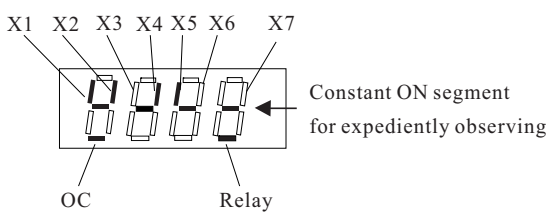
Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FV.07	Output voltage	0~rated voltage	1V	—	*
FV.08	Bus voltage	—	1V	—	*
FV.09	Input AC voltage	—	1V	—	*
FV.10	AI	0~10.00V Note: when current inputs: 1V corresponds to 2mA	0.01V	—	*
FV.11	Function reserved			—	*
FV.12	Pulse reference (DI)	0~10.00kHz	0.001kHz	—	*
FV.13	PID setup (flashes)	—	0.1%	—	*
FV.14	PID feedback	—	0.1%	—	*
FV.15	Terminal status	Refer to the following detailed explanation	—	—	*
FV.16	Actual counting value	0~setup counting value	1	0	○
FV.17	Setup counting value (flashes)	1~9999	1	1000	○
FV.18	Actual length	0.0~65.535km	0.001km	0.0km	○
FV.19	Setup length (flashes)	0.0~65.535km	0.001km	1.000km	○
FV.20	Actual running time	0.0~65.535h	0.001h	—	○
FV.21	Setup running time (flashes)	0.0~65.535h	0.001h	24.00h	○

Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FV.22	AO output			—	*
FV.23	Function reserved			—	*
FV.24	Radiator temperature	—	0.1℃	—	*
FV.25	Total running time	Total running time after leave factory	1h	—	*

Display mode of terminal status parameter (FV.15/F8.16)

The displayed terminal information contains multi-functional terminal X1 to X7, double direction open collector output terminal OC and relay output terminal state. The state of each function terminal was indicated by ON or OFF of LED digital certain segment, the terminal state is enabled when it is ON, contrarily, the terminal is in disabled state.

As shown in following figure: The input of multi-functional terminal X1、X2、X4、X5 and the output of OC、 relay is enabled, others are disabled. There are four constant ON segment for observe expediently.



Terminal status indication

Chapter 6 Parameter Description

Group F0 Basic Function

F0.00	Software version number		Factory default value	Model dependent
	Setup range	Display the software version of the machine		

F0.01	Control mode		Factory default value	0
	Setup range	0	V/F control	
		1	Reserved	

F0.02	Command source selection		Factory default value	0
	Setup range	0	Operation panel running command channel (LED ON)	
		1	Terminal command channel/keyboard STOP disabled (LED OFF)	
		2	Terminal command channel/keyboard STOP enabled (LED OFF)	
		3	Serial port command channel/keyboard STOP disabled (LED flashes)	
		4	Serial port command channel/keyboard STOP enabled (LED flashes)	

Select the channel for inverter control command:

The inverter control command includes start, stop, forward rotation, reverse rotation and jog.

0: Operation panel command channel

Perform running command control with keys on the operation panel, such as RUN、 STOP、S key.

1(2): Terminal command channel

Perform running command controlled by the multifunctional input terminals, such as FWD、REV、 JOGF、 JOGR, etc.

3(4): Serial port command channel

The running command is sent by the host computer via the communication mode. When selecting this item, it must be used together with Modbus of Shenzhen XILIN ELECTRIC TECHNOLOGIES CO., LTD.

When the parameter is set to 2/4(STOP enabled), you can stop the inverter by pressing STOP key on the operation panel. To restart it, firstly, you must use the multifunctional input terminal/ Modbus interface to input stop command, and then input running command.

As for the detailed setup method of terminal command and the explanation about Modbus communication command, please refer to the parameter explanation in F3.06 and <<EH600 serial communication protocol>>, respectively.

F0.03	Main frequency source X selection		Factory default value	0
	Setup range	0	Panel potentiometer	
		1	Digital setup by UP and DW adjustment (panel or external terminal)	
		2	AI	
		3	Reserved	
		4	Pulse setup(DI)	
		5	MS speed	
		6	PLC	
		7	PID	
		8	Communication setup	

Select the input channel for the main reference frequency of the inverter. There are nine types of main reference frequency channels:

0: Running frequency is set by the potentiometer on the operation panel.

1: The initial value is the value of F0.08, it can change the setup frequency value of the inverter by the data modification key of the operation panel(when the LED keyboard displays output frequency or setup frequency)or UP and DW of the multifunctional input terminals. It can make a selection whether the current frequency setup value is saved to F0.08 while power off through setting F0.09.

2: The frequency setup is determined by analog input terminal AI, the input voltage range is DC: 0~10V.

3: Reserved

4: Pulse setup(DI)

Input through X5 terminal.

5: To select MS speed running mode, you need to set the parameters of Group F3 “Input terminal” and Group FB “MS Speed and PLC” to determine the relative relationship between the reference signal and the reference frequency.

6: When the frequency source is simple PLC, you need to set the parameters of Group FB “MS Speed and PLC” to determine the reference frequency, veer and running time.

7: Select process PID control. In this case, you need to set the parameters of Group F9"PID Function”. The running frequency of the inverter is based on the value after PID function. For the meaning of PID reference source, reference quantity and feedback source, please refer to Group F9"PID Function”.

8: Communication reference

It means that the main frequency source is given by the host computer via the communication mode.

F0.04	Auxiliary frequency source Y selection		Factory default value	2
	Setup range	0	Panel potentiometer	
		1	Digital setup by UP and DW adjustment (panel or external terminal)	
		2	AI	
		3	Reserved	
		4	Pulse setup(DI)	
		5	MS speed	
		6	PLC	
		7	PID	
		8	Communication setup	

When the auxiliary frequency source is used as independent frequency reference channel, it is used in the same way as the main frequency source.

When the auxiliary frequency source is used as overlap reference, it has special points as follows:

1: When the auxiliary frequency source is digital reference, the preset frequency(F0.08) has no action, and it needs to adjust the main reference frequency through the keys “Λ”and“V” of the keyboard.(or UP and DW of multifunctional input terminals).

2:When the auxiliary frequency source is analog input reference(AI)or pulse input reference, 100% of input setup is relative to the auxiliary frequency source range (refer to F0.05 and F0.06). To adjust the main reference frequency, it needs to set the corresponding setup range of analog input into -n% to +n%(refer to F3.08 to F3.11).

3: When the frequency source is pulse input reference, it is similar to the analog value.

F0.05	Auxiliary frequency source Y range selection			Factory default value	0
	Setup range	0	Relative to frequency upper limit F0.11		
		1	Relative to frequency source X		
F0.06	Auxiliary frequency source Y range			Factory default value	100%
	Setup range	0~100%			

When the frequency source selection is frequency overlap reference(F0.07 is set to 2), it is used to determine the adjustment range of auxiliary frequency source. F0.05 is used to determine the relative object of that range. If it is relative to frequency upper limit F0.11, this range is a fixed value; if it is relative to main frequency source X, then this range will vary along with the main frequency X.

When the frequency source selection is auxiliary frequency source Y(F0.07 is set to 1) and F0.05 is set to 1,simple and convenient synchronous control can be realized through setting the main frequency source X as the main standard and the auxiliary frequency source as the synchronous coefficient to make corresponding setup.

F0.07	Frequency source selection			Factory default value	0
	Setup range	0	Main frequency source X		
		1	Auxiliary frequency source Y		
		2	Main frequency source X plus auxiliary frequency source Y		
		3	Switching between main frequency source X and auxiliary frequency source Y		
		4	Switching between main frequency source X and(main frequency source X and auxiliary frequency source Y)		
		5	Switching between auxiliary frequency source Y and(main frequency source X and auxiliary frequency source Y)		

This parameter is used to select the frequency reference channel. Frequency reference is realized by the combination of the main frequency source X and the auxiliary frequency source Y.

When 2 is selected, it can realize frequency overlapping function.

When 3 or 4 or 5 is selected, the frequency source switching is realized by the X input terminal“frequency source switching”function.

In this way, mutually switching between the frequency reference modes can be realized. For example, switching between PID running and common running, switching between simple PLC and common running, switching between pulse setup and analog setup, and switching between analog setup and common running.

F0.08	Preset frequency		Factory default value	50.0Hz
	Setup range	0.0Hz~frequency upper limit F0.11 (enables when the frequency source selection mode is digital setup)		
F0.09	Preset frequency control		Factory default value	0
	Setup range	0	Setup frequency saving when power failure	
		1	Setup frequency without saving when power failure	

When the main frequency source is selected as “digital setup” or “terminals UP/DW”, this function code is the initial value of frequency digital setup of the inverter.

When F0.09 is selected as“without saving when power failure”, it means that the setup frequency value is recovered to the value of F0.08 in case of inverter power failure.

When F0.09 is selected as “saving when power failure”, it means that when the inverter restarts, the setup frequency remains the same as before.

F0.10	Running direction		Factory default value	0
	Setup range	0	Direction is consistent	
		1	Direction is reverse	

By using this function code, the rotary direction of the motor can be changed without changing any other parameters. The role of this function code is to adjust any two lines of the motor(U、V and W) so as to further change the rotary direction of the motor.

Prompt: After parameter initialization, the motor running direction will restore to the original status. This action shall be carefully performed in the applications where the rotary direction of the motor is not allowed to change upon system debugging.

F0.11	Frequency upper limit		Factory default value	50.0Hz
	Setup range	Frequency lower limit F0.12~1500Hz		
F0.12	Frequency lower limit		Factory default value	0.5Hz
	Setup range	0.0Hz~Frequency upper limit F0.11		

The inverter starts from the start frequency. If the reference frequency is lower than frequency lower limit during the running process, the inverter will determine the relation between actual output frequency and lower limit frequency in terms of F7.14.

F0.13	Acceleration time 1		Factory default value	Model dependent
	Setup range	0.0~6553.5s		
F0.14	Deceleration time 2		Factory default value	Model dependent
	Setup range	0.0~6553.5s		

Acceleration time refers to the time required for the inverter to accelerate from 0 Hz to the maximum output frequency. Deceleration time refers to the time required for the inverter to decelerate from the maximum output frequency to 0 Hz.

There are still three groups of acceleration/deceleration time for user selection. Refer to parameter description from F7.04 to F7.09.

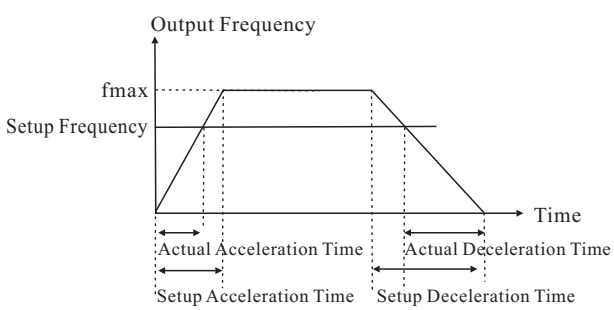


Fig.6-1 Schematic diagram for acceleration/deceleration time

Group F1 Motor Parameters

F1.00	Function reserved		Factory default value	—
	Setup range	—		
F1.01	Rated power		Factory default value	Model dependent
	Setup range	0.4~1000kW(just for the user to view)		
F1.02	Rated current		Factory default value	Model dependent
	Setup range	0.1~999.9A(just for the user to view)		
F1.03	Rated voltage		Factory default value	220V/380V
	Setup range	1~250V/1~460V		
F1.04	Rated frequency		Factory default value	50.0Hz
	Setup range	1.0Hz~frequency upper limit F0.11		
F1.05	Rated rotation velocity		Factory default value	1460rpm
	Setup range	0~9999rpm		
F1.06	Motor type selection		Factory default value	0
	Setup range	0	Common asynchronous motor	

To ensure the control performance, please carry out motor configurations in accordance with the standard adaptable motor of the inverter. If there is hug difference between the motor power and the power of standard adaptable motor, the control performance of the inverter will decrease obviously.

F1.07	Motor no-load current coefficient	Factory default value	40%
	Setup range	0~100	

In the automatic control mode(when F2.07=0.0%), the parameter is enabled.

F1.07=motor no-load current/rated output current of the inverter. When the motor is not match with the inverter, please setup the parameter correctly.

Group F2 V/F Control Parameters

F2.00	V/F curse setup			Factory default value	0
	Setup range	0	Straight V/F curve		
		1	Multiple-point V/F curve		
		2	Square V/F curve1(1.5 time power)		
		3	Square V/F curve 2(2.0 time power)		

0: Straight V/F curve. It is suitable for common constant torque load.

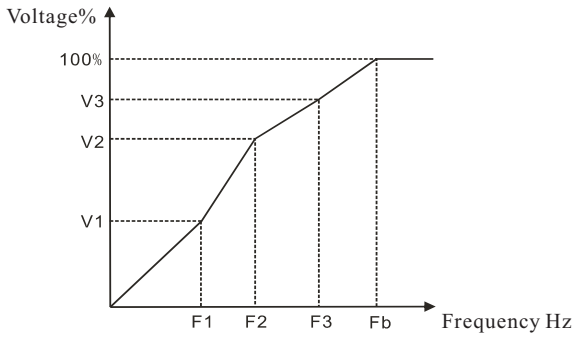
1: Multiple-point V/F curve. It is suitable for the special loads, such as dehydrator and centrifugal machine.

2 or 3: Square V/F curve 1 or 2. It is suitable for the centrifugal loads, such as fan and pump.

F2.01	V/F frequency point F1		Factory default value	0.0Hz
	Setup range	0.0Hz~F2		
F2.02	V/F voltage point V1		Factory default value	0.0%
	Setup range	0.0%~V2		
F2.03	V/F frequency point F2		Factory default value	25.0Hz
	Setup range	F1~F3		
F2.04	V/F voltage point V2		Factory default value	50.0%
	Setup range	V1~V3		
F2.05	V/F frequency point F3		Factory default value	50.0Hz
	Setup range	F2~motor rated frequency		
F2.06	V/F voltage point V3		Factory default value	100.0%
	Setup range	V2~100.0%		

There are six parameters F2.01 to F2.06 to define MS V/F curve. The setup value of V/F curve is generally set in accordance with the load characteristics of the motor.

Note: In case of low frequency, higher setup voltage may cause overheat and even burning of the motor, the inverter is likely to encounter stall over current or current protection.



V1-V3: Segments 1 to 3 Voltage Proportion MS V/F

F1-F3: Segments 1 to 3 Frequency Point of MS V/F

Fb: Rated Motor Frequency F1.04

Fig.6-2 Schematic diagram for V/F curve setup

F2.07	Torque boost		Factory default value	Model dependent
	Setup range	0.0~20.0%		
F2.08	Cutoff frequency of torque boost		Factory default value	50.00Hz
	Setup range	0.0Hz~rated frequency		

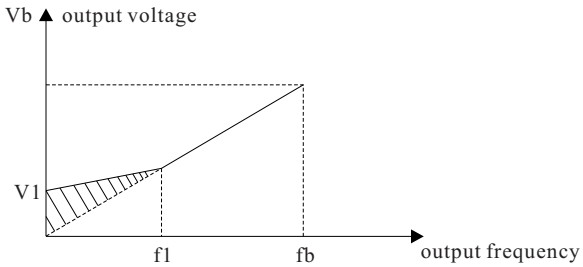
To compensate the low frequency torque characteristics of V/F control, it can boost the output voltage of the inverter at the time of low frequency.

If the torque boost is set too large, the motor may be overheat and the inverter may be over current.

Adjust this parameter effectively can avoid over current upon startup. For the relatively large loads, it is recommended to increase this parameter. For the small loads, this parameter value could be reduced.

When the torque boost is set to 0%, the inverter will adopt automatic torque boost.

Cutoff frequency of torque boost. Under this frequency, the torque boost is enabled. If it exceeds this setup frequency, the torque boost is disabled. Refer to figure for details.



V1: manual torque boost voltage Vb: rated output voltage
f1: cutoff frequency of torque boost fb: rated frequency

Fig. 6-3 Schematic diagram for manual torque boost

It is active only for V/F control. By setting this parameter, it can compensate the slip in the V/F control mode due to load and reduce the variation of the motor rotation velocity which is change with the variety of the load. In general, 100% corresponds to the rated slip of the motor with rated load. Slip coefficient adjustment can refer to the following principles: When the load is rated load and the slip compensation coefficient is set to 100%, the rotation velocity of the motor in the inverter is close to the reference velocity. If the actual rotation velocity is lower than the reference velocity, the coefficient should be increased accordingly and vice versa.

F2.10	Automatic voltage regulation (AVR) selection		Factory default value	2
	Setup range	0	Disabled	
		1	Enabled	
		2	Disabled only at time of deceleration	

AVR is output voltage regulate automatically, which means when input voltage fluctuates, the inverter adjusts automatically and keep the output voltage stable so as to overcome motor radiation for higher output voltage and power shortage for lower output voltage. The parameter can choose the effective session of AVR. When deceleration stopped, AVR selection disabled, deceleration time will shorten but running current will become large, when AVR selection enabled, deceleration time will lengthen but running current will decrease.

F2.11	Oscillation suppression gain		Factory default value	15
	Setup range	0~100		

The function is used to suppress the fixed oscillation while inverter is matching up motor. If the output current varied again and again while the constant load running, you can adjust the function code based on the factory default value to eliminate oscillation and make the motor running on an even keel.

F2.12	Carrier frequency		Factory default value	Model dependent
	Setup range	1.0~9.0kHz		

This function is used to adjust the carrier frequency of the inverter. By adjusting the carrier frequency, the motor noise can be reduced, and the resonance of the mechanical system can be avoided, so that the leakage current to the earth and the interference of the inverter can be reduced.

When the carrier frequency is low, the output current higher harmonic component will increase, the loss of motor will increase, and the motor temperature rise will also increase.

When the carrier frequency is high, the loss of motor is reduced, and the motor temperature is decreased, but the loss of the inverter and its temperature rise will increase and so will the interference.

The adjustment of carrier frequency will have influences on the following performances:

Carrier frequency	low to high
Motor noise	high to low
Output current wave form	poor to good
Motor temperature rise	high to low
Inverter temperature rise	low to high
Leakage current	low to high
External radiation interference	low to high

F2.13	Carrier frequency adjustment selection		Factory default value	2
	Setup range	0	Fixed PWM, and carrier frequency temperature adjustment disabled.	
		1	Random PWM, and carrier frequency temperature adjustment disabled.	
		2	Fixed PWM, and carrier frequency temperature adjustment actived.	
		3	Random PWM, and carrier frequency temperature adjustment actived.	

Two kinds of PWM carrier frequency adjustment modes are provided: fixed and random. The random PWM motor noise has wide frequency range, while the fixed PWM motor noise has fixed frequency.

When the carrier wave temperature adjustment is enabled, the inverter can automatically adjust the carrier frequency in term with its temperature. This function can reduce the possibility of over heat alarm of the inverter.

Group F3 Input Terminal

F3.00	X1 terminal function selection	Factory default value	26(FWD)
F3.01	X2 terminal function selection	Factory default value	6(JOGF)
F3.02	X3 terminal function selection	Factory default value	28(RST)
F3.03	X4 terminal function selection	Factory default value	0
F3.04	X5 terminal function selection	Factory default value	0

This parameter is used to set the function of the multifunctional digital input terminals.

Setup value	Function	Description
0	No function	Even if there is signal input, the inverter has no action. The unused terminals can be set as non-function to prevent error action.
1	MS speed terminal 1	It can realize 16S speed through the combination of digital status of these four terminals. Details about the combination refers to attached drawing 1.
2	MS speed terminal 2	
3	MS speed terminal 3	
4	MS speed terminal 4	

Setup value	Function	Description
5	Three-line mode running control	This terminal is used to realize three-line control mode of terminal command. As for detailed description, please refer to F3.06 function code.
6	Forward rotation jog(JOGF)	For details about frequency and jog acceleration/ deceleration time during the jog running, refer to function codes F7.00 to F7.02.
7	Reverse rotation jog(JOGR)	
8	Terminal UP	When the frequency is provided by the external terminals, then modify the frequency UP/DOWN command. When the frequency source is set as the digital setup, it can regulate the setup frequency up and down.
9	Terminal DOWN	
10	Coast to stop	The inverter locks the output and loses control of the process of motor stop. It is the method that is often adopted when there are large amount of loads and no requirements for the stop time. This mode has the same meaning as that of F5.05.
11	Running pause	The inverter decelerates to stop, but the running parameters are all in memory status, such as PLC parameter, swing frequency parameter and PID parameter. When this signal disappeared, the inverter restores to the status before stopping.
12	External fault input	When the external fault signal was sent to the inverter. the inverter reports fault(E.EF)and stops.
13	Acceleration/ deceleration selection terminal 1	It can select four kinds of acceleration/deceleration time through the combination of digital status of these two terminals. Refer to the attached drawing 2.
14	Acceleration/ deceleration selection terminal 2	
15	Frequency source switching	When the frequency source selection(F0.07)is set as 3, it performs switching between the main frequency source X and the auxiliary frequency source Y via this terminal. When the frequency source selection(F0.07)is set as 4 or 5, it performs switching between the frequency source X or Y and (X plus Y)via this terminal.

Setup value	Function	Description
16	UP/DOWN setup clear (terminal and keyboard)	When the frequency reference is digital frequency reference, this terminal can be used to clear the frequency value modified by UP/DOWN and thus restore the reference frequency to the setup value of F0.08.
17	DC brake input command DB of stop	It can realize exigency stop of motor and exact orientation. Brake start frequency, brake waiting time and brake current are defined in F5.06 to F5.09.
18	Acceleration/ deceleration disabled	Protect the inverter from affecting by the external signals (except stop command), and maintain the current frequency.
19	PID pause	PID is disabled temporarily, and the inverter maintains the current frequency to output.
20	PLC status reset	PLC pauses during the execution process. When it resumes running, it can effectively restore to the initial status of simple PLC via this terminal.
21	Swing frequency pause	The inverter outputs with central frequency. Swing frequency pause.
22	Counter reset	Clear the counter status.
23	Length reset	Length clear.
24	Timing reset	Actual running time clear
25	PID second reference value enable switching terminal	The PID setup value can be switched from the setup value selected by F9.00 to the value selected by F9.03 via this terminal.
26	Forward rotation(FWD)	The forward/reserve rotation of the inverter were controlled by the external terminal.
27	Reserve rotation(REV)	
28	Fault reset(RST)	Its function is as the same as that of keyboard.
29	Disconnection reset terminal	Exit disconnection status.
30	Disconnection proximity switch	Input terminal of disconnection proximity switch.
31	Counter	Input terminal of counting pulse.

Setup value	Function	Description
32	Length count	Input terminal of length counting pulse.
33	Disconnection detective disabled enabled terminal	When the terminal is enabled, disconnection detective is disabled.

K1	K2	K3	K4	Frequency setup	Corresponding parameter
OFF	OFF	OFF	OFF	MS speed 0	FB.00
OFF	OFF	OFF	ON	MS speed 1	FB.01
OFF	OFF	ON	OFF	MS speed 2	FB.02
OFF	OFF	ON	ON	MS speed 3	FB.03
OFF	ON	OFF	OFF	MS speed 4	FB.04
OFF	ON	OFF	ON	MS speed 5	FB.05
OFF	ON	ON	OFF	MS speed 6	FB.06
OFF	ON	ON	ON	MS speed 7	FB.07
ON	OFF	OFF	OFF	MS speed 8	FB.08
ON	OFF	OFF	ON	MS speed 9	FB.09
ON	OFF	ON	OFF	MS speed 10	FB.10
ON	OFF	ON	ON	MS speed 11	FB.11
ON	ON	OFF	OFF	MS speed 12	FB.12
ON	ON	OFF	ON	MS speed 13	FB.13
ON	ON	ON	OFF	MS speed 14	FB.14
ON	ON	ON	ON	MS speed 15	FB.15

Attached drawing 1

Terminal 2	Terminal1	Acc/Dec time selection	Corresponding parameter
OFF	OFF	Acc/Dec time 1	F0.13、F0.14
OFF	ON	Acc/Dec time 2	F7.04、F7.05
ON	OFF	Acc/Dec time 3	F7.06、F7.07
ON	ON	Acc/Dec time 4	F7.08、F7.09

Attached drawing 2

F3.06	Terminal command mode		Factory default value	0
	Setup range	0	Two-line mode 1	
		1	Two-line mode 2	
		2	Three-line mode 1	
		3	Three-line mode 2	

This parameter defines four different modes to control the operation of the inverter via the external terminal.

0: Two-line running mode1: this mode is the most commonly used one. The forward/reverse rotation of the motor is decided by the commands of FWD and REV terminals.

K1	K2	Running Command
0	0	Stop
1	0	Forward Rotation
0	1	Reverse Rotation
1	1	Stop

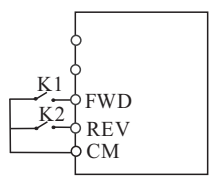


Fig. 6-4 Two-line running mode 1

1: Two-line running mode 2: when this mode is adopted, REV is enabled terminal. The direction is determined by the status of FWD.

K1	K2	Running Command
0	0	Stop
1	0	Forward Rotation
1	1	Reverse Rotation
0	1	Stop

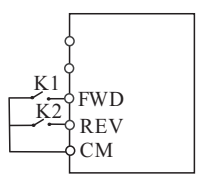


Fig. 6-5 Two-line running mode 2

2: Three-line running mode 1: In this mode, Xn is enabled terminal, and the direction is controlled by FWD and REV, respectively. However, the pulse is enabled by disconnecting the signal of Xn terminal when the inverter stops.

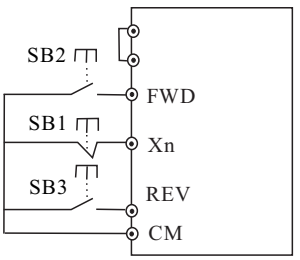


Fig. 6-6 Three-line running mode 1

Where:

SB1: Stop button

SB2: Forward rotation button

SB3: Reverse rotation button

3: Three-line running mode 2: In this mode, Xn is enabled terminal, and the running command is given by FWD(pulse enabled), while the direction is determined by the status of REV. Stop command is performed by disconnecting the Xn signal.

K	Running Direction Selection
0	Forward Rotation
1	Reverse Rotation

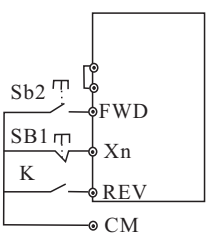


Fig. 6-7 Three-line running mode 2

Where:

SB1: Stop button

SB2: Running button

Prompt:

Xn is a kind of multifunctional input terminal. In this way, its corresponding terminal function shall be defined as NO.5 function“Three-line mode running control”.

Under the control of terminal, as for two-line running mode 1 or 2, though it is terminal level enabled, when stop command given by other source that makes the inverter stop, it can’t give running command in spit of the still enabled control terminals FWD/REV. To make the inverter

running again, there is necessity to trigger the enabled status of FWD/REV again, such as terminal function PLC single cycle stop, exact stop, and effective stop of the STOP key under the command of terminal running channel. (Refer to the description of function code in F0.02.)

F3.07	Terminal UP/DOWN velocity		Factory default value	1.00Hz/s
	Setup range	0.01~100.0Hz/s		

Terminal UP/DOWN is used to adjust the change rate when setting the frequency.

F3.08	AI minimum input		Factory default value	0.00V
	Setup range	0.0V~10.00V when current inputs: 1V corresponds to 2mA		
F3.09	AI minimum input corresponding setup		Factory default value	0.0%
	Setup range	-100.0~100.0%		
F3.10	AI maximum input		Factory default value	10.00V
	Setup range	0.0V~10.00V		
F3.11	AI maximum input corresponding setup		Factory default value	100.0%
	Setup range	-100.0~100.0%		
F3.12	Function reserved		Factory default value	
F3.13	Function reserved		Factory default value	
F3.14	Function reserved		Factory default value	
F3.15	Function reserved		Factory default value	

The above function codes define the relations between the analog input voltage setup value and the analog input representative setup value. When the analog input voltage exceeds the setup maximum input, it will be calculated according to the maximum input. When the analog input voltage is lower than the minimum input, the setup is 0. The nominal value of the analog setup 100% varies with the application situation. For details, please refer to the description of each application part.

Steer stick mode: the above parameters are set in reason, it can realize the forward/reverse rotation of the motor through changing the analog input, this mode usually called JOYST mode, details about the setup is as follow:

The minimum value of signal corresponding to the maximum reference of reverse, the maximum value of signal corresponding to the maximum reference of forward, and the minimum input shall be 0.3V(0.6mA) or a little bigger. Because by using the 0 to 10V signal as reference, once the reference signal lost, the inverter might run toward the reverse at the highest speed by mistake. To avoid the mistake, the minimum input can't be too low so that when the reference signal lost, the inverter will stop automatically.

Several setting examples are shown in the following figures:

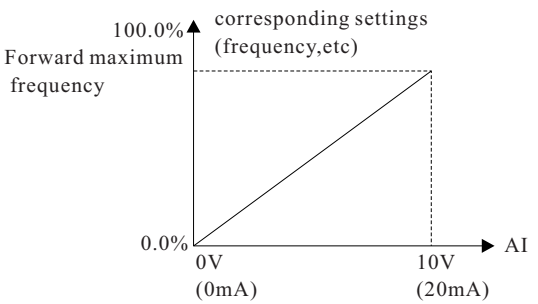


Fig.6-8

Corresponding relationship between analog reference as main frequency source reference and output frequency

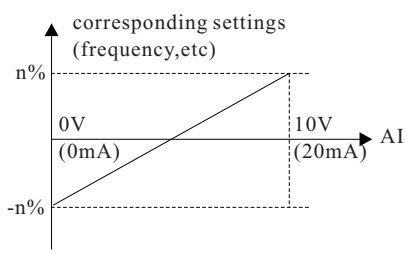


Fig.6-9

Analog reference as auxiliary frequency source for main frequency source micro tuning

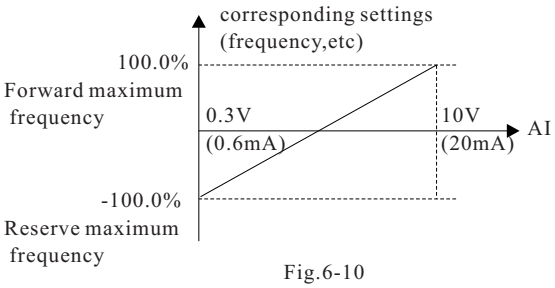


Fig.6-10

JOYST mode: corresponding relationship between analog reference and setup value

Prompt: The above cutlines are typical application settings. As for the setting details, the adjustment shall be made to meet the demand of customers.

F3.16	Pulse input(DI)lower limit frequency		Factory default value	0.00kHz
	Setup range	0.00kHz~(F3.18)		
F3.17	Pulse input(DI)lower limit frequency corresponding setup		Factory default value	0.0%
	Setup range	-100.0~100.0%		
F3.18	Pulse input(DI)upper limit frequency		Factory default value	10.00kHz
	Setup range	(F3.16)~10.00kHz		
F3.19	Pulse input(DI)upper limit frequency corresponding setup		Factory default value	100.0%
	Setup range	-100.0~100.0%		

This group of function code defines the corresponding relationship between the input pulse signal frequency and the setup value when the select pulse reference enabled.

F3.20	Analog input filter time		Factory default value	0.25s
	Setup range	0.01s~10.00s		

The function code determines the sensitivity of analog input AI. If error action is made due to prevent the analog input from interferences, this parameter can be increased to enhance the anti-interference capability. But the sensitivity of the analog input will be lowered.

Group F4 Output Terminal

Inverter has following output terminals:

1: One multifunctional digital output terminal;

2: One multifunctional relay output terminal;

3: AO: Output voltage signal.

F4.00	Relay output selection	Factory default value	2
F4.01	OC output selection	Factory default value	1
F4.02	Function reserved	Factory default value	

The function selection of multifunctional output terminal is as follows:

Setup value	Function	Description
0	No output	The output terminals don't have any function.
1	Inverter is running	Inverter is running, and there is output frequency(can be zero), ON signal will be output at this time.
2	Fault output	When the inverter is faulty, it outputs ON signal.
3	FDT1 output	Please refer to function code F7.15 and F7.16 for details.
4	FDT2 output	Please refer to function code F7.17 and F7.18 for details.
5	Frequency arrival	Please refer to function code F7.19 for details.
6	At the zero speed running	When the inverter output frequency is less than the start frequency, it outputs ON signal.
7	Inverter overload pre-warning	According to the warning system setting of F8.00, once the output current exceeds the pre-warning value, it outputs ON signal after the setup time of F8.01.
8	Setup counting value arrival	As for the action mode of output terminal, please refer to function code FA.08 and FA.09 for details.
9	Designated counting value arrival	
10	Setup length arrival	When the measured actual length exceeds the setup value of FA.06, it outputs ON signal.

Setup value	Function	Description
11	PLC circulation completion	When the simple PLC has been running for one cycle, it outputs a pulse signal with width of 500ms.
12	PLC phase completion	When the simple PLC has been running for one phase, it outputs a pulse signal with width of 500ms.
13	Setup running time arrival	When the actual running time of the inverter exceeds the setup time FA.10 , it outputs ON signal.
14	Output frequency arrive at upper limit	When the running frequency reaches the frequency upper limit F0.11, it outputs ON signal.
15	Output frequency arrive at lower limit	When the running frequency is less than the frequency lower limit F0.12, it outputs ON signal.
16	Output X1	The status of input terminal X1 outputs through output terminal.
17	Output X2	The status of input terminal X2 outputs through output terminal.
18	Running command	When inverter received the running command, the output enabled.
19	Reserved	
20	Dormant	When PID running is in dormant status.
21	Ready for running	When the inverter is in running status, it outputs ON signal.
22	There-line running mode 1 start to trigger information output by itself	The inverter allows to run and output the trigger signal when it is not at running status.
23	Band-type brake information output	It starts output when output frequency lower than FDT2 at the first time, the time length is setting by OC break protract.
24	Disconnection detection output	It outputs when accords with the disconnection judgement terms.
25	Reference length arrival	When the measured actual length exceeds the setup value of FA.06, it outputs ON signal.

F4.03	Function reserved	Factory default value	—

F4.04	OC close protract		Factory default value	0.0s
	Setup range	0~1000.0s		
F4.05	OC break protract		Factory default value	0.0s
	Setup range	0~1000.0s		
F4.06	Function reserved		Factory default value	
F4.07	Function reserved		Factory default value	

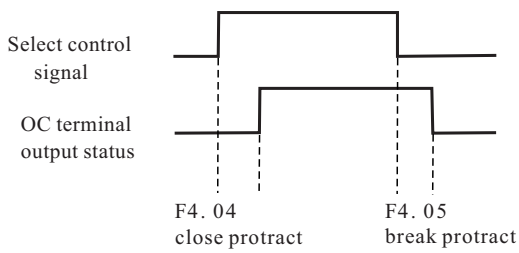


Fig.6-11

Schematic diagram for

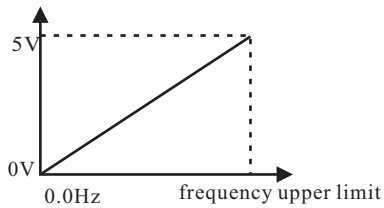
OC output closed/ Break protract

F4.08	AO output channel selection		Factory default value	0
	Setup range	0: 0~10V 1: 2~10V		
F4.09	AO output gain		Factory default value	100.0%
	Setup range	1.0%~500.0%		

1: The output gain coefficient is generally used to correct the analog output deviation.

Application examples of AO output analog signal are shown as followings:

Client hoped that AO outputs content selection: running frequency (0.0Hz to the frequency upper limit); corresponding AO output: 0 to 5V voltage signal. These are shown as the following figure.



Setup : the first part of F4.08 is 0 、F4.09=50.0%、F4.11=0

F4.10	Function reserved	Factory default value	
F4.11	AO output selection	Factory default value	0
F4.12	Function reserved	Factory default value	

The corresponding value range that it indicates is shown in the table below:

Setup value	Function	Description
0	Running frequency	0~maximum frequency F0.11
1	Setup frequency	0~maximum frequency F0.11
2	Output current	0~200% of the rated current of the inverter
3	Output voltage	0~rated voltage of the inverter
4	Pulse reference(DI)	0.0~DI maximum pulse input frequency F3.18
5	AI	0~10V
6	Reserved	
7	Length	0~setup length
8	Counting value	0~setup counting value
9	Running time	0~FA.10
10	Output torque	0~200% of the rated torque of the motor
11	Output power	0~twice rated power
12	Keyboard potentiometer	0~maximum value

Group F5 Start/Stop Control

F5.00	Start mode			Factory default value	0
	Setup range	0	Start from start frequency		
		1	Perform braking prior to start		
		2	Velocity tracking restart		

0: Start from start frequency

To start according to setup start frequency(F5.01) and setup start frequency retention time (F5.02).

1: Perform braking prior to start

Perform DC braking prior to start(refer to F5.04、F5.05).

It is applicable to the applications where reverse rotation is likely to occur when small loads are started.

2: Velocity tracking restart

Track the rotation velocity and direction of the motor automatically, and make the rotating motor working smoothly without surge.

It is applicable to the restart upon transient power failure due to large loads.

F5.01	Start frequency		Factory default value	0.5Hz
	Setup range	0.0Hz~10.0Hz		
F5.02	Start frequency retention time		Factory default value	0.0s
	Setup range	0.0~36.0s		

To ensure the torque at the start of inverter, it needs to set a proper start frequency. In addition, to set up flux at the time of starting motor, accelerate the start frequency after a certain period of time. The start frequency value F5.01 is not confined by the frequency lower limit.

When the frequency reference value (frequency source) is lower than the start frequency, the inverter cannot start and is in standby status.

When the forward rotation and reverse rotation switches to each other, the start frequency retention time is disabled. The retention time is not included in the acceleration time but in the running time of simple PLC.

F5.03	DC brake current at start		Factory default value	0%
	Setup range	0~100%		
F5.04	DC brake time at start		Factory default value	0.0s
	Setup range	0.0~36.0s		

DC brake is generally used when the motor is restarted after it stops completely.

F5.03 and F5.04 only enabled when the start running mode selects the braking prior to start mode(F5.00=1), and when F5.04 is 0.0s, it has no start DC braking process.

The setup DC brake current at start is relative to the percentage of the rated current of the inverter.

The higher the DC brake current is, the higher the brake force is.

When DC brake at start enabled, the inverter firstly performs DC brake in accordance with the DC brake current at start, and then start running after the setup time of DC brake at start.

The process of DC brake is shown as the following figure:

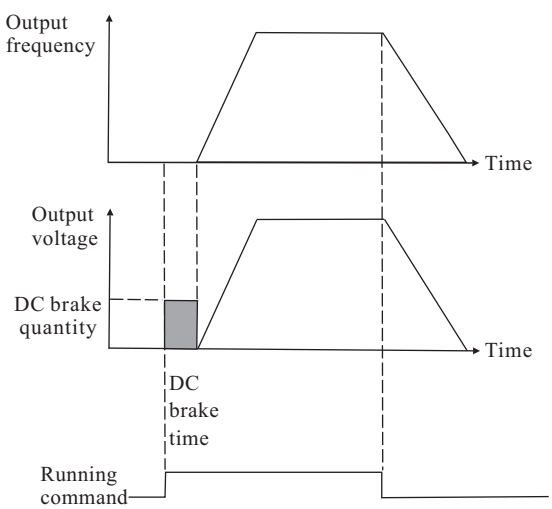


Fig.6-12 Schematic diagram for DC automatic start mode

F5.00	Stop mode			Factory default value	0
	Setup range	0	Decelerate to stop		
		1	Coast to stop		

0: Decelerate to stop

After receiving the stop command, the inverter will reduce the output frequency in accordance with the deceleration mode and stops when the frequency reduced to zero.

1: Coast to stop

After receiving the stop command, the inverter will terminate the output immediately. The load will coast to stop according to the mechanical inertia.

F5.06	DC brake beginning frequency at stop		Factory default value	0.0Hz
	Setup range	0.0Hz~maximun frequency		
F5.07	DC brake waiting time at stop		Factory default value	0.0s
	Setup range	0.0~36.0s		
F5.08	DC brake current at stop		Factory default value	0%
	Setup range	0~100%		
F5.09	DC brake time at stop		Factory default value	0.0s
	Setup range	0.0~36.0s		

During the process of deceleration to stop, when the running frequency reaches DC brake beginning frequency and in course of the DC brake waiting time at stop (F5.07), the DC brake quantity will be inflicted until it reached the DC brake time at stop (F5.09).

Inverter has no output during the DC brake waiting time at stop. As for high-power motor, the setup time can prevent the over-high current at the brake beginning moment.

The setup of DC brake current at stop is relative to the percentage of rated current of inverter. The higher the value is, the better the DC brake effect is.

When the DC brake time at stop is 0.0s, there is no DC brake process.

F5.10	Beginning voltage of dynamic braking		Factory default value	130%
	Setup range	115~140%		
F5.11	Use ratio of dynamic braking		Factory default value	30.0%
	Setup range	0~100%		

It is enabled for the inverter with built-in brake unit. It can be used to adjust the brake effect of the brake unit.

F5.12	Acceleration/deceleration mode		Factory default value	0
	Setup range	0	Straight acceleration/deceleration	
		1	S-curve acceleration/deceleration	

It is used to select the frequency change mode during the inverter start and stop process.

0: straight acceleration/deceleration

The output frequency increases or decreases along with the straight line. The acceleration/deceleration time varies with the setup acceleration/deceleration time. EH600S series inverter provides four types of acceleration/deceleration time. It can select acceleration/deceleration time via the multifunctional digital input terminals(F3.00 to F3.04).

1: S-curve acceleration/deceleration

The output frequency increases or decreases along with the S curve. S curve is generally used in the applications where start and stop process are relatively flat, such as elevator and conveyor belt. Refer to F5.13 and F5.14 for the meanings of the parameters.

F5.13	Start segment proportion of S curve		Factory default value	30.0%
	Setup range	0.0~40.0%		
F5.14	End segment proportion of S curve		Factory default value	30.0%
	Setup range	0.0~40.0%		

t1 in the following figure is the parameter defined in F5.13, within which the output frequency change slop increases gradually. t2 is the time defined in F5.14, within which the slop of the output frequency change gradually decreases to zero. Within the time between t1 and t2, the slop of the output frequency change remains fixed.

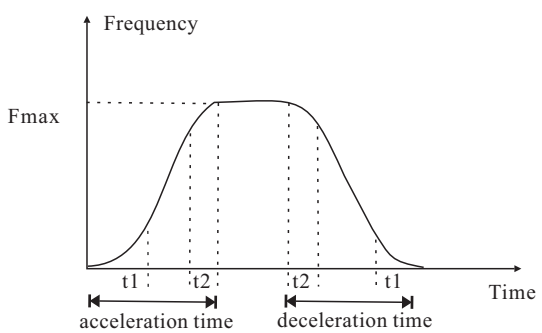


Fig.6-13 Schematic diagram for S curve acceleration/deceleration

Group F6 Keyboard and Display

F6.00	S key function selection			Factory default value	1
	Setup range	0	S key function inactive		
		1	Forward rotation jog command		
		2	Reserve rotation run command		
		3	Clear the data of exact stop process		

S key refers to multifunctional key. It can set and define the function of S key on the keyboard via this parameter.

0: This key has no function

1: Forward rotation jog command

It can realize forward rotation jog(FJOG) through the S key on the keyboard.

2: Reserve rotation run command

The S key of operation panel used as the input of the reverse rotation run command, when the keyboard control mode (F0.02) is 0, press the key, then the inverter will output frequency from the reverse phase order.

3: When the exact stop mode is enabled (FA.11≠0), press S key, then the data of the exact stop process will be clean out.

Please refer to FA.11for the detailed description of exact stop mode.

F6.01	LED running display parameter 1		Factory default value	5
	Setup range	0~8191		
F6.02	LED running display parameter 2		Factory default value	0
	Setup range	1~8191		
F6.03	LED stop display parameter 1		Factory default value	1
	Setup range	0~8191		
F6.04	LED stop display parameter 2		Factory default value	0
	Setup range	1~8191		

In stop or running status, when the status parameter (FV)needs to be inquired again and again, by setting running parameter (F6.01 to F6.02)and stop parameter(F6.03 to F6.04), and realizing the common-using status parameter by controlling the shift key (>>) to display in turns. The parameter value of F6.01 to F6.04 is set according to binary system, input by transforming it into decimal system.

When there needs to display one parameter of FV, you only need to set the corresponding binary bite of F6.01 to F6.04 as 1.

The corresponding relationship between the binary bite of F6.01、F6.02 running display parameter and FV parameter number is shown as attached fig.3.

There are two examples about the setup way of F6.01 to F6.04 in the following.

1: Client wants to display FV.00, FV.02 and FV.18 circularly in the running state.

Setting as following: F6.01=1+4=5 F6.02=32

2: Client wants to display the setup frequency (FV.01) in the stop state.

Setting as following: F6.03=2

F6.01	LED running display parameter 1			corresponding relationship between binary and decimal
	Setup range	0~8191	FV.00: Output frequency	2^0=1
			FV.01: Setup frequency(flashes)	2^1=2
			FV.02: Output current	2^2=4
			FV.03: Running rev	2^3=8
			FV.04: Setup rev(flashes)	2^4=16
			FV.05: Running load speed	2^5=32
			FV.06: Setup load speed(flashes)	2^6=64
			FV.07: Output voltage	2^7=128
			FV.08: Bus voltage	2^8=256
			FV.09: Input AC voltage	2^9=512
			FV.10: AI	2^{10}=1024
			FV.11: Reserved	2^{11}=2048
			FV.12: Pulse reference (DI)	2^{12}=4096
			If the above parameters need to be displayed during the operation, set the corresponding bit to 1, and set them into F6.01 after changing the binary numbers into decimal numbers.	

F6.02	LED running display parameter 2			corresponding relationship between binary and decimal
	Setup range	1~8191	FV.13: PID setup(flashes)	2^0=1
			FV.14: PID feedback	2^1=2
			FV.15: Terminal status	2^2=4
			FV.16: Actual counting value	2^3=8
			FV.17: Setup counting value(flashes)	2^4=16
			FV.18: Actual length	2^5=32
			FV.19: Setup length(flashes)	2^6=64
			FV.20: Actual running time	2^7=128
			FV.21: Setup running time(flashes)	2^8=256
			FV.22: AO output	2^9=512
			FV.23: Reserved	2^{10}=1024
			FV.24: Radiator temperature	2^{11}=2048
			FV.25: Total running time	2^{12}=4096
			If the above parameters need to be displayed during the operation, set the corresponding bit to 1, and set them into F6.02 after changing the binary numbers into decimal numbers.	
F6.03	LED stop display parameter 1		The corresponding relationship between binary in F6.03 and FV parameter number is as the same as that of F6.01	
	Setup range	0~8191		
F6.04	LED stop display parameter 2		The corresponding relationship between binary in F6.04 and FV parameter number is as the same as that of F6.02	
	Setup range	1~8191		

Attached fig.3

F6.05	Auxiliary supervise		Factory default value	1
	Setup range	0~25		

The parameter is used to set FV parameter number of underside range LED display of the double range LED operation panel, please refer to FV parameter of page 35 for the details.

It is the content of underside range LED display that make it convenient for the client to debug and monitor inverter running. As for users who use exact stop function can realize setup value displaying and actual value displaying at the same time through the double range LED.

F6.06	Load speed display coefficient		Factory default value	1
	Setup range	0.0~100.0		

The output frequency of the inverter and the load speed are corresponding together through this parameter. It is set when the load speed needs to be displayed.

F6.07	Function reserved		Factory default value	—
F6.08	User password	0~9999	Factory default value	0

Once any non-zero number be set, the password protection function will be enabled.

0: Clear the previous user password setup and make the password protection function invalid.

To view F6.08 under the status of password protection, the LED will prompt user that the parameter is hidden, you can only view and modify this parameter when the password input correctly. Please remember the user password correctly. If the password is set wrongly or forgotten, please contact the manufacturer. Refer to the description of password setting in 4.5 section.

F6.09	Copy keyboard function selection	Factory default value	0

Please refer to the copy keyboard description of our company.

Group F7 Auxiliary Function

F7.00	Jog running frequency		Factory default value	5.0Hz
	Setup range	0.0~frequency upper limit F0.11		
F7.01	Jog acceleration time		Factory default value	20.0s
	Setup range	0.0~6553.5s		
F7.02	Jog deceleration time		Factory default value	20.0s
	Setup range	0.0~6553.5s		

It is used to define the reference frequency and acceleration/deceleration time of the inverter during jog.

The jog process starts and stops according to the start mode 0(F5.00=0, start from start frequency) and the stop mode 0(deceleration time to stop).

The jog acceleration time means the time required for the inverter to accelerate from 0Hz to the maximum output frequency(F0.11).

The jog deceleration time means the time required for the inverter to decelerate from the maximum output frequency(F0.11) to 0Hz.

F7.03	Jog action selection on running status			Factory default value	0
	Setup range	0	actived		
		1	disabled		

It can avoid jog command for error operation by setting it to 1 during the running process of inverter.

F7.04	Acceleration time 2		Factory default value	20.0s
	Setup range	0.0~6553.5s		
F7.05	Deceleration time 2		Factory default value	20.0s
	Setup range	0.0~6553.5s		
F7.06	Acceleration time 3		Factory default value	20.0s
	Setup range	0.0~6553.5s		

F7.07	Deceleration time 3		Factory default value	20.0s
	Setup range	0.0~6553.5s		
F7.08	Acceleration time 4		Factory default value	20.0s
	Setup range	0.0~6553.5s		
F7.09	Deceleration time 4		Factory default value	20.0s
	Setup range	0.0~6553.5s		

Acceleration/deceleration time can select F0.13 and F0.14 and the above three types of acceleration/deceleration time. Their meanings are the same.

It can select acceleration/deceleration time 1 to 4 during the inverter running precess through the different combination of multifunctional digital input terminal X. Please refer to the description of Group F3(Input terminal).

The above acceleration/deceleration time can also be used to satisfy the local need under the mode of PLC running.

F7.10	Skip frequency		Factory default value	0.0Hz
	Setup range	0.0Hz~frequency upper limit F0.11		
F7.11	Skip frequency amplitude		Factory default value	0.0Hz
	Setup range	0.0Hz~frequency upper limit F0.11		

When the setup frequency is within the range of skip frequency, the actual running frequency will be in the skip frequency boundary close to the setup frequency.

It can make the inverter run away from the mechanical resonance point of the load through setting the skip frequency.

If the two skip frequency are set to zero, this function will be disabled.

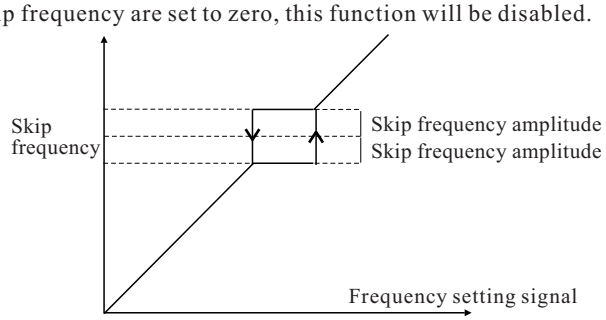


Fig.6-14 Schematic diagram for Skip frequency

F7.12	Forward/reverse rotation dead-zone time		Factory default value	0.0s
	Setup range	0.0~3000.0s		

During the setting of forward/reverse rotation of the inverter, the transition time at the output zero frequency position. It is shown as the following figure:

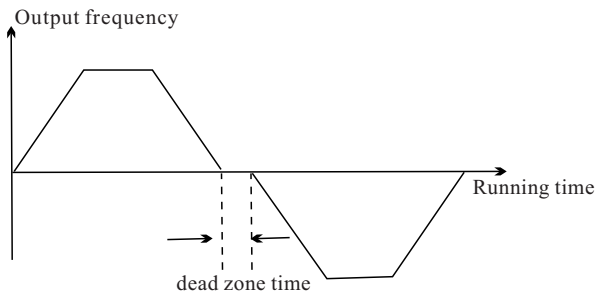


Fig.6-15 Schematic diagram for forward/reverse rotation dead-zone time

F7.13	Reverse control		Factory default value	0
	Setup range	0	actived	
		1	disabled	

When the parameter is set as 0: Reverse rotation control is active;

When the parameter is set as 1: Reverse rotation control is inactive.

The parameter is enabled for all command sources.

F7.14	Reverse control		Factory default value	0
	Setup range	0	Run with frequency lower limit	
		1	Stop	
		2	Running with zero velocity	

It is used to select the running status of the inverter when the setup frequency is lower than the frequency lower limit.

In order to avoid the motor always running with low velocity, this function can be used to stop.

F7.15	Frequency detection value(FDT1 level)		Factory default value	50.0Hz
	Setup range	0.0Hz~frequency upper limit F0.11		
F7.16	Frequency detection hysteresis (FDT1 hysteresis)		Factory default value	2.0Hz
	Setup range	0.0Hz~frequency upper limit F0.11		
F7.17	Frequency detection value(FDT2 level)		Factory default value	50.0Hz
	Setup range	0.0Hz~frequency upper limit F0.11		
F7.18	Frequency detection hysteresis (FDT2 hysteresis)		Factory default value	2.0Hz
	Setup range	0.0Hz~frequency upper limit F0.11		

It is used to set the detection value of output frequency and hysteresis value upon removing of the output action.

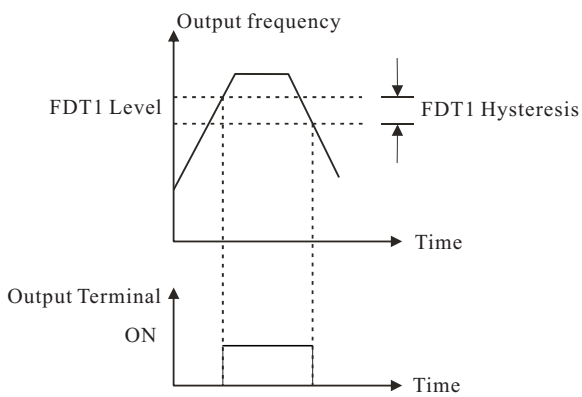


Fig.6-16 Schematic diagram for FDT level

F7.19	Frequency arrival detection amplitude		Factory default value	2.0Hz
	Setup range	0.0Hz~frequency upper limit F0.11		

When the output frequency of the inverter reached the setup frequency value, this function can be used to adjust the detection amplitude, it is shown as the following figure.

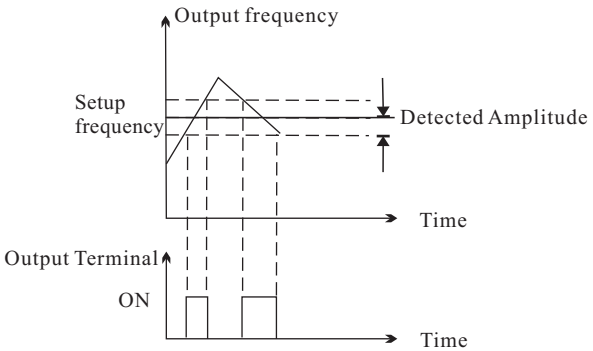


Fig.6-17 Schematic diagram for Detection amplitude

Group F8 Fault and Protection

F8.00	Inverter overload pre-warning		Factory default value	110%
	Setup range	50~200%		
F8.01	Inverter overload pre-warning delayed time		Factory default value	2.0s
	Setup range	0.0~20.0s		

The reference for this value is the inverter rated current. When the inverter detects that the output current exceeds the corresponding current of parameter F8.00 continuously, it outputs pre-warning signal from OC or relay, after the delayed time of F8.01.

F8.02	Overload、 overheat protective action mode		Factory default value	0
	Setup range	0	Inverter locks output	
		1	Limitative current running(alarm)	

The parameter set the inverter protective action mode when it is overload or overheat.

0: The inverter locks output immediately. When it is overload or overheat, the inverter locks output and the motor coasts to stop.

1: Limitative current running(alarm). When it is overload or overheat, the inverter might reduce the output frequency to decrease the load current at this time.

F8.03	Motor overload protection coefficient		Factory default value	100%
	Setup range	30.0~100.0%		

The reference for this value is the motor rated current/inverter rated current. When the inverter output current exceeds F8.03xthe inverter rated output current for a certain time, the inverter reports motor overload fault.

F8.04	Stall protection current over current		Factory default value	150%
	Setup range	110~200%		

Select the protection point for function of stall over current. When the value is exceeded, the inverter starts executing the protection function for stall over current.

F8.05	Stall protection voltage over voltage		Factory default value	130%
	Setup range	120~150%		

Select the protection point for function of stall over voltage. When the value is exceeded, the inverter starts executing the protection function for stall over voltage.

F8.06	Restart setup after power-off			Factory default value	0
	Setup range	0	No action		
		1	Action		
F8.07	Restart waiting time after power-off			Factory default value	1.0s
	Setup range	0.1~10.0s			

When restart after power-off is enabled, inverter is on the running state before power cut. Then the inverter will start automatically after the setup waiting time (it is set by F8.07) when power-on. During the restart waiting time, the inverter won't start, even though there inputs run command, if there inputs stop command, it will finish the restart waiting state.

F8.08	Fault automatic reset time		Factory default value	0
	Setup range	0~3		

When the inverter selects fault automatic reset, it is used to set the times of automatic reset. If the value is exceeded, the inverter will stop because of failure and wait for maintenance.

F8.09	Fault automatic reset interval time		Factory default value	1.0s
	Setup range	0.1~100.0s		

The waiting time of the inverter from the fault alarm to automatic reset.

F8.10	First time fault type	Factory default value	—
F8.11	Second time fault type	Factory default value	—
F8.12	Third time fault type	Factory default value	—
	Fault meaning	Fault code	
	0: No fault	--	
	1: Inverter unit protection	E.1	
	2: Acceleration over current	E.OC1	
	3: Deceleration over current	E.OC2	
	4: Constant speed over current	E.OC3	
	5: Acceleration over voltage	E.OU1	
	6: Deceleration over voltage	E.OU2	
	7: Constant speed over voltage	E.OU3	
	8: Stop over voltage	E.OU4	
	9: Running under voltage	E.LU	
	10: Inverter overload	E.OL1	
	11: Motor overload	E.OL2	
	12: Phase loss output	E.LF	
	13:Inverter overheat	E.OH	
	14: External equipment fault	E.EF	
	15: Communication fault	E.CE	
	16: Output grounding	E.GF	
	17: CPU interference	E.2	
	18: Current detect fault	E.3	
	19: EEPROM read-write fault	E.4	
	20: Phase loss input	E.5	
	21: PID feedback disconnection	E.6	
	22: Reserved	E.7	
	23: Reserved	E.8	

F8.13	Output frequency upon fault	Display the status of parameter upon fault for the most recent one time. As for terminal status expression upon fault, please refer to the details in FV.15.
F8.14	Output current upon fault	
F8.15	Bus voltage upon fault	
F8.16	Module temperature upon fault	
F8.17	Terminal state upon fault	

Group F9 PID Function

PID function summarize:

PID control is a common method of process control. It adjusts the output frequency through proportional, integral and differential calculations of the difference between the reference signal of the controlled quantity and the feedback signal, and thus to stabilize the controlled quantity at the target quality.

PID reference signal: It is the signal that corresponding to control target of the controlled quantity.

PID feedback signal: It is the signal that measured by sensor and corresponding to the actual value of the controlled quantity, it varied with process load and indicated the actual state during the control process.

The differences between the actual status of the controlled quantity and the control target will be reflected by the differences between PID feedback and the reference signal.

According to different symbols, PID controller rises or reduces output frequency accordingly so as to achieve the autocontrol propose.

The built-in PID controller inverter is applicable to process control such as fluid control, press control, temperature control and so on.

Prompt: When client needs to use the PID controller function, he should set the frequency source selection parameter as PID enabled at first, which means F0.03(F0.04)=7.

F9.00	PID control mode setup		Factory default value	001
	Setup range	The third part of LED: PID action direction 0: positive action 1: reverse action The second part of LED: PID feedback source 0: AI 1~5: reserved 6: pulse setup(DI) 7:communication setup The first part of LED: PID reference source 0: panel potentiometer 1: PID digital reference (F9.02) 2: AI 3: reserved 4: pulse setup(DI) 5:communication setup		

The third part of LED: PID action direction

Positive action: When the feedback signal is higher than the PID reference, the output frequency of the inverter should be reduced to balance the PID. Such as the tension PID control of winding.

The second part of LED: PID feedback source

This parameter is used to select the PID feedback channel.

When using the sensor with voltage output, you need to modify the voltage loss of the longer signal cable. It can be realized through setting the minimum/maximum input of AI in Group F3.

The first part of LED: PID reference source

This parameter decides the target quantity reference channel of the process PID.

PID reference has two expression modes:

1: PID reference source selection: When the value is 0 or 2 or 4, PID setup value adopts percentage expression that control target is relative to PID range, 100% PID setup corresponding to 100% feedback signal of controlled system, PID is not necessary at that moment. No matter how much the range is, the system operates according to the relative value(0 to 100%). Once setting the PID range, you can directly observed PID setup and the feedback corresponding signal actual value through the operation panel display parameter.

2: When PID reference source selects 1 or 5, or PID second digital reference enabled, PID setup value adopts absolute value expression that control target is relative to PID range, the control target value of controlled quantity is directly endued with parameter F9.02 and F9.03 at this moment.

When PID setup value is equal to the range, it is corresponding to 100% feedback signal of controlled system, here PID range is necessary, for it is the value which is the percentage relationship of both setup value and range that takes part in PID calculation. It means: PID setup= PID digital setup value/range *100%. The value corresponding to PID feedback percentage.

3: The above explanation is applicable to PID feedback of communication setup.

F9.01	Fault automatic reset time		Factory default value	1000
	Setup range	0~9999		

PID reference feedback range is a non-dimensional unit, it is used to display the PID reference and feedback.

F9.02	PID digital reference		Factory default value	500
	Setup range	0~F9.01		

PID digital reference is one of the PID reference channel. Refer to explanation about the second expression mode of PID reference for its meaning.

F9.03	PID second digital reference		Factory default value	500
	Setup range	0~F9.01		

PID second digital reference is one of the PID reference channel. Refer to explanation about the second expression mode of PID reference for its meaning.

PID second digital reference is a supplement of the default PID reference source.

The external terminal is set as 25 by Group F3 parameter, when the terminal enabled, PID setup value will be switched from the PID reference channel value selected in the first part of F9.00 into the value of F9.03.

F9.04	Deviation limit		Factory default value	0.0%
	Setup range	0.0~50.0%		
F9.05	Function reserved		Factory default value	0

Deviation limit: It means that PID system output value corresponding to the biggest deviation allowed by close loop reference. When the PID feedback deviation is within this range, the PID stops adjustment. It is shown as the following. Setting the function code in reason can improve the precision and stability of PID system.

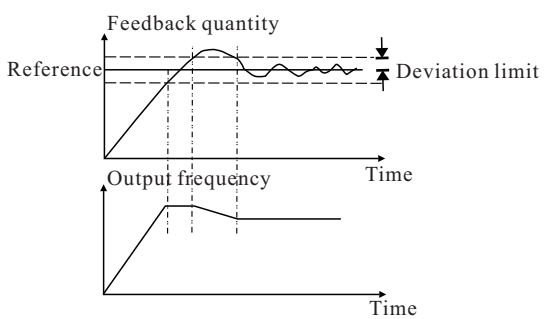


Fig.6-18 Corresponding relationship between deviation limit and output frequency

F9.06	Proportional gain P		Factory default value	20.0%
	Setup range	0~100.0% 0.0%: close P		

F9.07	Integration time I		Factory default value	2.0s
	Setup range	0.1~100.0s 100.0s: close I		

Proportional gain P:

It decides the adjustment intensity of the whole PID regulator. The higher the P is, the more powerful the adjustment intensity is. When this parameter is 100, it indicates the deviation between PID feedback quantity and the reference quantity is 100%, the adjustment amplitude of the PID regulator on the output frequency command is maximum frequency(the integral and differential functions are neglected).

Integration time I:

It decides the speed of PID regulator adjusting the deviation between the PID feedback quantity and the reference quantity. Integration time is the time within which the integration regulator(the proportional and differential functions are neglected)performs continuous adjustment and the adjustment quantity reaches the maximum frequency when the deviation between the PID feedback quantity and reference quantity is 100%. The shorter the integration time is, the more powerful the adjustment intensity is.

F9.08	Differential time D		Factory default value	0.0s
	Setup range	0.0~10.00s 0.0s: close D		
F9.09	Differential amplitude		Factory default value	5.0%
	Setup range	0.0~100.0%		

Differential time D:

It decides the intensity of PID regulator adjusting the change rate if deviation between the PID feedback quantity and the reference quantity. Differential time is the time within which if the feedback quantity changes 100%, the adjustment quantity reaches the maximum frequency(proportional and integral functions are neglected). The longer the differential time is, the more powerful the adjustment intensity is.

F9.10	PID preset frequency		Factory default value	0.0Hz
	Setup range	0.0Hz~frequency upper limit		
F9.11	PID preset frequency keep time		Factory default value	0.0s
	Setup range	0.0~3600.0s		

In some applications, if process adjustment is set by optimum, it will delay the time to reach the required process state. In this kind of application, you'd better make sure the output frequency that the inverter inquired the motor to reach before start the process adjustment. It can be realized by setting parameter F9.10. In this operational mode, if running command is input, the inverter will make response according to the acceleration/deceleration time at the open loop. Only when the output frequency reached the setup PID preset frequency and kept running at the frequency point for a period time, will it run in term of the characteristics of close loop.(The PID preset frequency could set by corresponding frequency of normally run of speed. This could be more easy to meet the process condition).

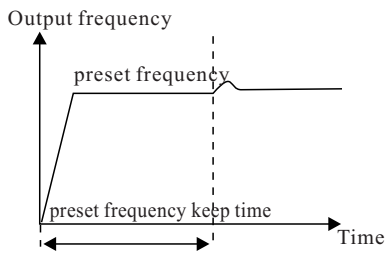


Fig.6-19 Schematic diagram for PID preset frequency

Prompt: If close loop preset frequency function is not inquired, you can set the preset frequency and its holding time to zero.

F9.12	Sleeping frequency		Factory default value	0.0Hz
	Setup range	0.0Hz~frequency upper limit		
F9.13	Sleeping protract		Factory default value	60.0s
	Setup range	0.0~3600s		

When output frequency is lower than F9.12, it will enter the status of sleeping and coast to stop after F9.13 setup time. By selecting the output terminal function as 20, the output terminal enabled at sleeping status. In this condition, the output terminal can drive small sleeping pump. For details, please refer to parameters from F4.00 to F4.02.

F9.14	Awakening threshold		Factory default value	0.0%
	Setup range	0.0~100.0%		
F9.15	Sleeping protract		Factory default value	0.5s
	Setup range	0.0~60.0s		

Awakening threshold is the corresponding percentage of PID setup. In sleeping state, when PID feedback lower than PID setup value *F9.14, the inverter restarts after the time of F9.15.

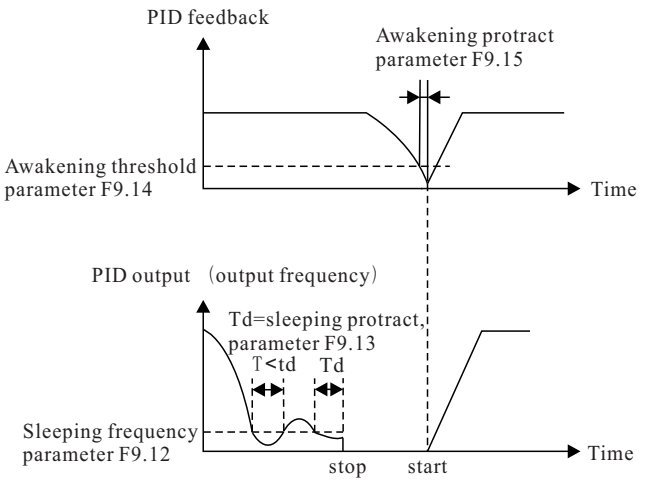


Fig.6-20 Schematic diagram for PID sleeping/awakening

F9.16	PID feedback disconnection detection		Factory default value	00
	Setup range	The second part of LED: action mode 0: enter the PID feedback disconnection fault state (display E.6) 1: stop in terms of the stop mode of F5.05 2: keep current running frequency The first part of LED: detection mode 0: no detection 1: detection in terms of PID feedback signal 2: detection in terms of disconnection proximity switch signal		

F9.17	PID feedback disconnection result		Factory default value	0.0%
	Setup range	0.0~50.0%		
F9.18	PID feedback disconnection and judgement		Factory default value	2.0s
	Setup range	0~20.0s		

There are two disconnection detection modes for selection: When the first part of F9.16 is set as 1, PID feedback detects disconnection, F9.17 is the threshold. When the feedback is lower than the threshold, it may be in disconnection state.

When the first part of F9.16 is set as 2, the disconnection detection proximity switch signal detects disconnection, there needs to set the corresponding parameter of input terminal as 30 before use.

Procedure deals with disconnection adjustment:

After the inverter starts, it starts to detect disconnection, when disconnection signal(terminal/ PID feedback) enabled and the duration reached F9.18(disconnection adjustment protract), the inverter is in the status of disconnection and it deals with this in term of F9.16 setup action mode.

F9.19	Function reserved	Factory default value	—
F9.20	Function reserved	Factory default value	—
F9.21	Function reserved	Factory default value	—

F9.22	The precision after PID range radix point	Factory default value	0
	Setup range	0~3	

Group FA Swing Frequency, Fixed Length and Count

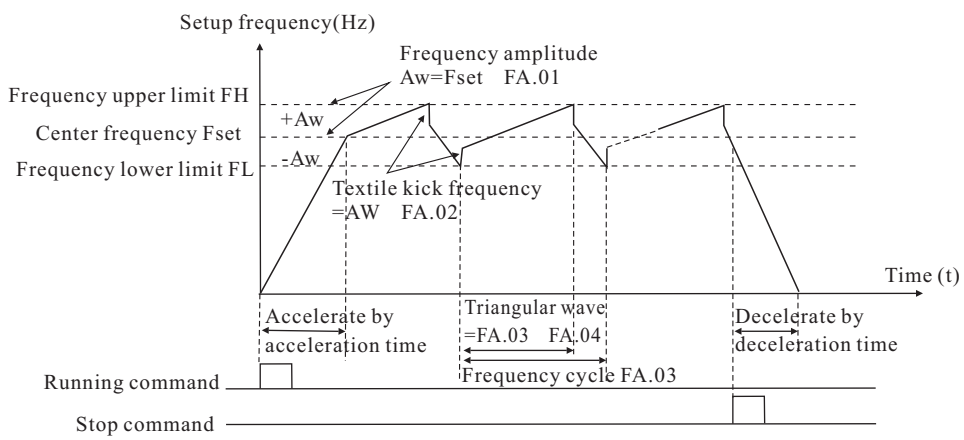


Fig.6-21 Schematic diagram for Swing frequency

The swing frequency function is applicable to the textile and chemical fiber fields and the applications where traversing and winding functions are required.

The swing frequency function means that the output frequency of the inverter swings up and down with the setup frequency(frequency command is selected by F0.07)as the center. The trace of

running frequency at the time axis is shown as the figure above, in which the swing amplitude is set by FA.01 and FA.02.

FA.00	Swing amplitude setup mode		Factory default value	00
	Setup range	The second part of LED: swing frequency function enable 0: disable 1: enabled The first part of LED: swing amplitude benchmark 0: no detection 1: relative to the central frequency 2: relative to frequency upper limit F0.11		

The second part of LED: whether the selection of swing frequency function enabled.

The first part of LED: it is used to determine the swing amplitude benchmark.

0: Relative to the central frequency, and it is a variable swing amplitude system. The swing amplitude varies with the central frequency(setup frequency).

1: Relative to frequency upper limit (F0.11), and it is fixed swing amplitude system. The swing amplitude is fixed.

FA.01	Swing frequency amplitude		Factory default value	0.0%
	Setup range	0.0~100.0%		
FA.02	Kick frequency amplitude		Factory default value	0.0%
	Setup range	0.0~50.0%		

The parameter is used to determine the value of swing amplitude and kick frequency.

Swing amplitude AW(variable swing amplitude)=frequency source F0.07xswing amplitude FA.01

Swing amplitude AW(fixed swing amplitude)=frequency upper limit F0.11xswing amplitude FA.01

Prompt: the swing frequency is limited by the frequency upper limit and frequency lower limit. If the setting is inappropriate, it works abnormally.

Kick frequency=swing amplitude AW x kick frequency amplitude FA.02

If the swing amplitude relative to the central frequency is selected, the kick frequency is a variable value.

If the swing amplitude relative to the upper limit frequency is selected, the kick frequency is a fixed value.

FA.03	Swing frequency cycle		Factory default value	10.0s
	Setup range	0.1~3000.0s		
FA.04	Time constant of triangular wave boost		Factory default value	50.0%
	Setup range	0.1~100.0%		

Swing frequency cycle: It refers to the time of a complete cycle of swing frequency.

FA.04 Time constant of triangular wave boost is relative to FA.03 swing frequency cycle.

Triangular wave boost time= FA.03x FA.04(unit: s)

Triangular wave falling time= FA.03x (1-FA.04) (unit: s)

FA.05	Setup length		Factory default value	1.000km
	Setup range	0~65.535km		
FA.06	Designed length		Factory default value	1.000km
	Setup range	0~65.535km		
FA.07	Number of pulses each meter		Factory default value	100.0
	Setup range	0.1~6553.5		

The setup(designed)length, actual length and number of pulses each meter are mainly used for fixed length control. For the image parameter FV.19 of FA.05 and FA.06, their meanings are the same, just one method added to easy parameter modification and viewing.(Please refer to the description of FA.11 exact stop mode).

The length is calculated via the pulse signal input by the X5 input terminal, and it needs to set the corresponding input terminal to length count input terminal.

Actual length=length count input number of pulsed/number of pulses each meter

When the actual length FV.18 exceeds the setup length FA.05, the output terminal“length arrival terminal” will output ON signal(refer to Group F4 function code).

Fixed length control as one of the exact stop modes, when it arrivals the setup length, the inverter stops automatically. For details, refer to the parameter description of FA.11.

FA.08	Setup counting value		Factory default value	1000
	Setup range	1~9999		
FA.09	Designated counting value		Factory default value	1000
	Setup range	1~9999		

Actual counting value FV.16 is calculated via the pulse signal input by the X6 input terminal, and it needs to set the X6 terminal as count input terminal.

For image parameter FV.17 of FA.08, its meaning is the same, just one method added to easy parameter modification and viewing.(Please refer to the description of FA.11 exact stop mode).

When the actual counting value reaches the setup counting value, the output terminal will output signal of setup counting value arrival. The counter will stop counting.

When the actual counting value reaches the designated counting value, the output terminal will output signal of designated counting value. The counter will continue counting till the “setup counting value” is reached.

The designated counting value FA.09 shall not exceed the setup counting value FA.08.

The function is shown as the following figure:

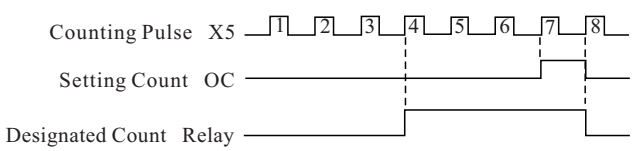


Fig.6-22 Schematic diagram for Setup counting value reference and designated counting value reference

Counter control as one of the exact stop modes, when it arrivals the setup length, the inverter stops automatically.

For details, refer to the parameter description of FA.11.

FA.10	Internal timing setup running time		Factory default value	24.000h
	Setup range	0.0~65.535h		

For image parameter FV.21 of FA.10, its meaning is the same, just one method added to easy parameter modification and viewing.(Please refer to the description of FA.11 exact stop mode).

When actual running time FV.20 exceeds the setup running time FA.10, the output terminal“Setup running time arrival terminal” will output ON signal(refer to Group F4 function code).

Timing stop control as one of the exact stop modes, when it arrivals the setup length, the inverter stops automatically. For details, refer to the parameter description of FA.11.

FA.11	Exact stop mode setup			Factory default value	0
	Setup range	0	disabled		
		1	Setup counting value arrival		
		2	Setup length arrival		
		3	Setup running time arrival		

Exact stop mode: In term of several control produce quantity which is in common use to realize inverter automatic stopping, and you can use operation panel to replace counter, length controller, timing which are widely used in machine facilities.

The operation methods of exact stop:

1: Data display and modification

If the parameter is set in reason, the inverter can display and modify the data just like operating the counter, the length controller and the timing.

Firstly, set the corresponding parameter of exact stop as enabled by setting parameter F6.01 to F6.04.

e.g. Set F6.02=96 to make the setup length and the actual length enabled.

In the monitor mode of the state parameter, you can switch display content via shift key. When it switches into display actual length, you can modify it via Increase key/Decrease key of the operation panel, exit it by pressing FUNC key or ENTER key. The actual length value will increase unceasingly, on base of modified value, along with the signal input.

When it switches into display setup length, you can modify the setup length via Increase key/ Decrease key of operation panel, exit it by pressing FUNC key or ENTER key. The difference between FUNC key and ENTER key is described as follows: By pressing ENTER key, the modified content will be saved to EEPROM so that it is still active when power-on at the next time, while by pressing FUNC key, the modification of setup length only enabled at this time.

The above examples are also applicable to the modification of counter and timing data.

2: Process data reset

The process data contains actual counting value, actual length and actual running time. Through setting corresponding parameters, the reset of them can be realized by external terminals(setting Group F3 parameter) or S key(setting F6.00).

3: Process data memory when power-off

When power-off, the inverter will save the process data, which contains actual counting value, actual length and actual running time, to EEPROM, and the data will recover to the value as before when power-on again so that it can produce continuously.

An example for exact stop action mode(set the counting value as N).

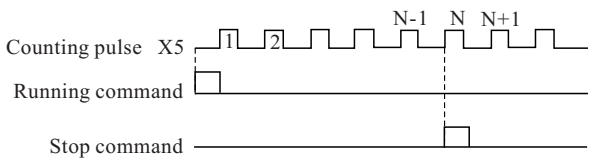


Fig.6-22 Schematic diagram for Exact stop control mode

Group FB MS Speed Function and Simple PLC Function

Simple PLC function is to perform automatic control on the MS frequency logic through a built-in programmable controller(PLC)of the inverter. It can set running time, running direction and running frequency so as to meet the process requirements.

The series of inverter can implement 16-segment variable control and has four types of acceleration/deceleration time for selection.

When the setup PLC completes one cycle, the multifunctional output terminal can output an ON signal. Refer to F4.00 to F4.01 for details.

When the frequency source selections F0.07, F0.03 and F0.04 are determined as MS speed running mode, FB.00 to FB.15 shall be set to determine its characteristics.

FB.00	MS speed 0		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.01	MS speed 1		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.02	MS speed 2		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.03	MS speed 3		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.04	MS speed 4		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		

FB.05	MS speed 5		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.06	MS speed 6		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.07	MS speed 7		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.08	MS speed 8		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.09	MS speed 9		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.10	MS speed 10		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.11	MS speed 11		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.12	MS speed 12		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.13	MS speed 13		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.14	MS speed 14		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		
FB.15	MS speed 15		Factory default value	0.0Hz
	Setup range	0.0~frequency upper limit F0.11		

When the frequency source F0.07, F0.03 and F0.04 are determined as PLC running mode, FB.00 to FB.15, FB.16, FB.17 and FB.18 to FB.41 should be set to determine its characteristics.

FB.16	PLC running mode		Factory default value	00
	Setup range	The second part of LED: PLC running time unit selection 0: second 1: hour The first part of LED: PLC action mode 0: stop upon completion of one-time running 1: keep final value upon completion of one-time running 2: constant circulation		

The second part of LED: PLC running time unit selection.

It is used to define every segment running time unit of the sixteen segments program.

The first part of LED: PLC action mode

0: Stop upon completion of one-time running

The inverter will automatically stop upon completion of one single cycle, and will not restart until another running command is given.

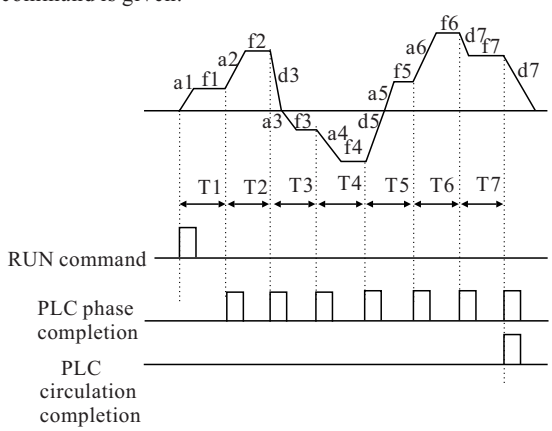


Fig.6-24 Stop upon the Completion of one-time running

1: Keep final value upon the completion of one-time running

The inverter will automatically keep the running frequency and direction of last one segment upon completing one single cycle.

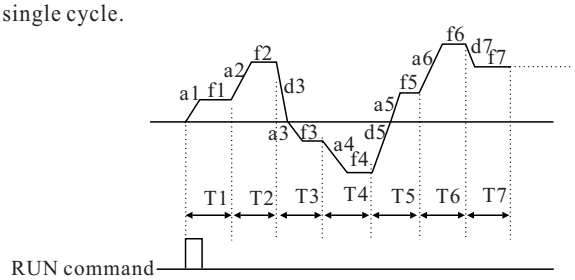


Fig.6-25 Keep final value upon the completion of one-time running

2: Constant circulation

The inverter will automatically start next one cycle upon the completion of one cycle, and will not stop until stop command is given.

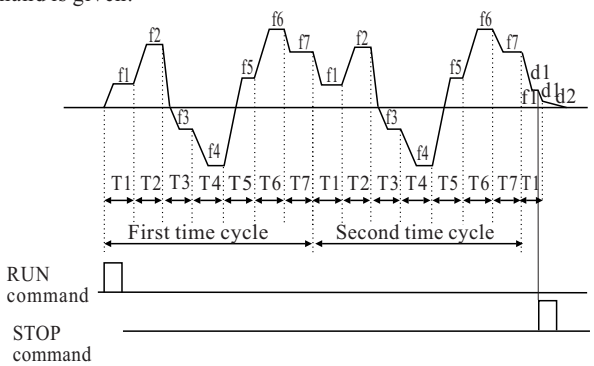


Fig.6-26 Constant circulation

FB.17	PLC power-failure memory selection		Factory default value	0
	Setup range	0	power failure without memory	
		1	power failure with memory	

PLC power failure with memory means the memory of running phase and frequency of PLC before power failure.

FB.18	Phase 0 running time	Factory default value	0.0s

As for the above parameters, refer to the description of parameter table.

FB.41	Phase 14/15 running mode	Factory default value	0000

Group FC Communication Parameter

The communication protocol of Eh600 accords with the protocol criterion of Modbus. To meet the application requirements of clients, the protocol added accumulation, check mode and complex command mode to enrich the programme choice of client. For details, please refer to<<EH600 communication protocol and description of communication>>.

Group FD Particular Function

FD.00	Droop control		Factory default value	0.0Hz
	Setup range	0.0Hz~10.0Hz		

When several inverters drive the same load, different velocity leads to the unbalanced load distribution, thereby, inverter with higher speed has to carry heavier load. The droop control characteristics can change the speed droop with the addition of load to balance the load distribution. The parameter is used to adjust the frequency change value of the inverter with droop velocity.

FD.01~FD.02	Function reserved		Factory default value	—
FD.03	Relay break protract		Factory default value	0.0s
	Setup range	0~1000.0s		
FD.04	Pulse input filter times		Factory default value	4
	Setup range	1~10		
FD.05	Function reserved		Factory default value	—
FD.06	Output phase loss protection selection		Factory default value	1
	Setup range	0: disabled 1: enabled		
FD.07	Function reserved		Factory default value	—

FD.08	Inner fan control			Factory default value	0
	Setup range	0	Automatic		
		1	Constant open		

0: Automatic

Inner fan switch on-off depends on the environmental temperature and inverter's working state.

1: Constant open

Inner fan opens all the time when power-on.

FD.09	User password		Factory default value	0
	Setup range	0~9999		

FA.11	Exact stop mode setup		Factory default value	0
	Setup range	0	No operation	
		1	Restore factory default setup value	
		2	Clear the fault record	

1: The inverter restores all the parameters except the parameters in Group F1 to the factory default ones.

2: The inverter clears the recent fault records.

Group FV Status Parameter					
Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FV.00	Output frequency	0~frequency upper limit F0.11	0.1Hz	—	*
FV.01	Setup frequency (flashes)	0~frequency upper limit F0.11	0.1Hz	—	*
FV.02	Output current	0.1~1000.0A	0.01A	—	*
FV.03	Running rev	0~9999rpm	1r/min	—	*
FV.04	Setup rev (flashes)	0~9999rpm	1r/min	—	*
FV.05	Running load speed	0.001~9999	0.001m/S	—	*
FV.06	Setup load speed (flashes)	0.001~9999	0.001m/S	—	*
FV.07	Output voltage	0~rated voltage	1V	—	*
FV.08	Bus voltage	—	1V	—	*
FV.09	Input AC voltage	—	1V	—	*

Group FV Status Parameter					
Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FV.10	AI	0~10.00V Note: when current inputs: 1V corresponds to 2mA	0.01V	—	*
FV.11	Function reserved			—	*
FV.12	Pulse reference (DI)	0~50.00kHz	0.001kHz	—	*
FV.13	PID setup (flashes)		0.1%	—	*
FV.14	PID feedback	—	0.1%	—	*
FV.15	Terminal status	Refer to the following detailed explanation	—	—	*
FV.16	Actual counting value	0~setup counting value	1	0	○
FV.17	Setup counting value (flashes)	1~9999	1	1000	○
FV.18	Actual length	0~65.535km	0.001km	0.0km	○
FV.19	Setup length (flashes)	0~65.535km	0.001km	1.000km	○
FV.20	Actual running time	0~65.535h	0.001h	0.0h	○
FV.21	Setup running time (flashes)	0~65.535h	0.001h	24.00h	○

Group FV Status Parameter					
Function code	Name	Setup range	Minimum unit	Factory default value	Modification
FV.22	AO output	0~10.00V	0.01V	—	*
FV.23	Function reserved			—	*
FV.24	Radiator temperature	—	0.1℃	—	*
FV.25	Total running time	Total running time after leave factory	1h	—	*

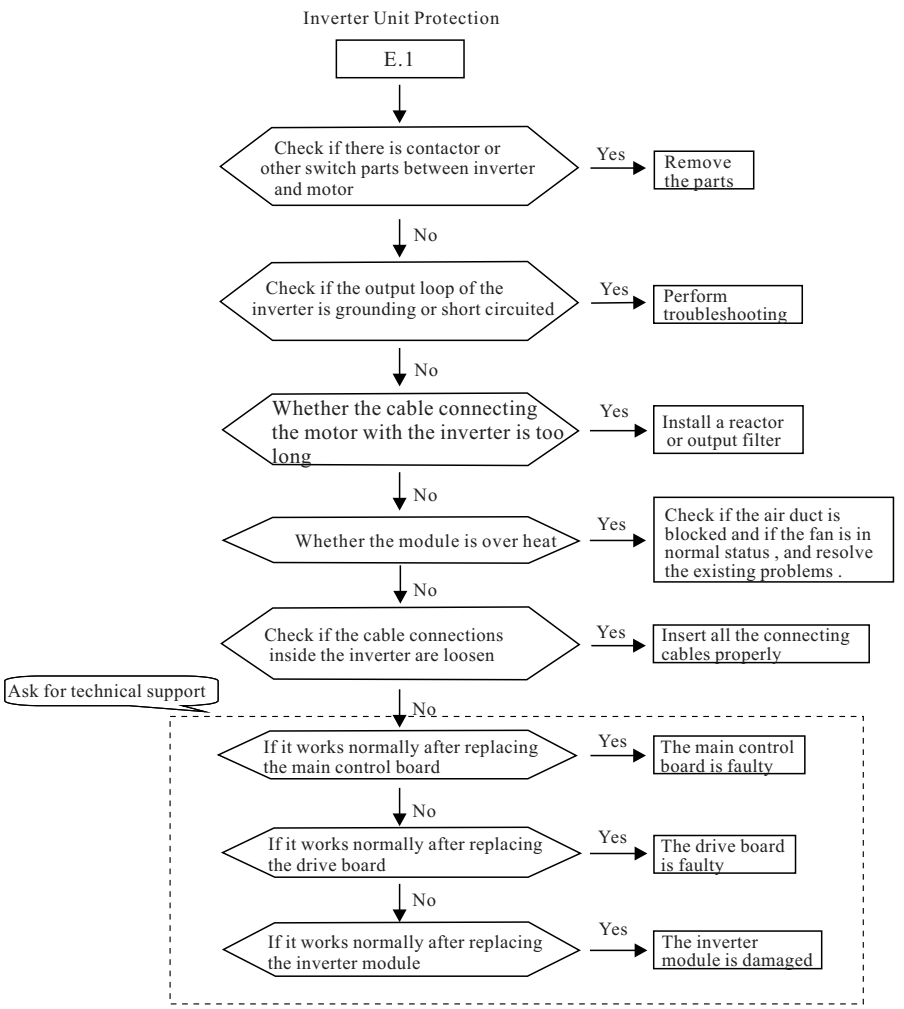
FV status parameter is used to display the current state of inverter, there are two methods to view it. As for details, please refer to the method of viewing status parameter in 4.3 section.

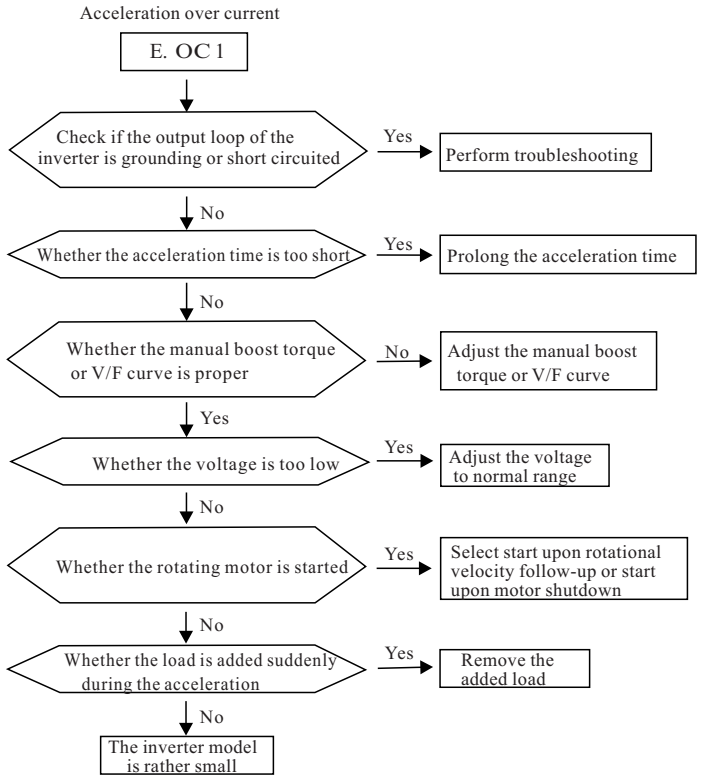
FV.16 to FV.21, the control parameter of exact stop, can be modified on-line. As for the modification and setting, refer to parameter description of FA.11.

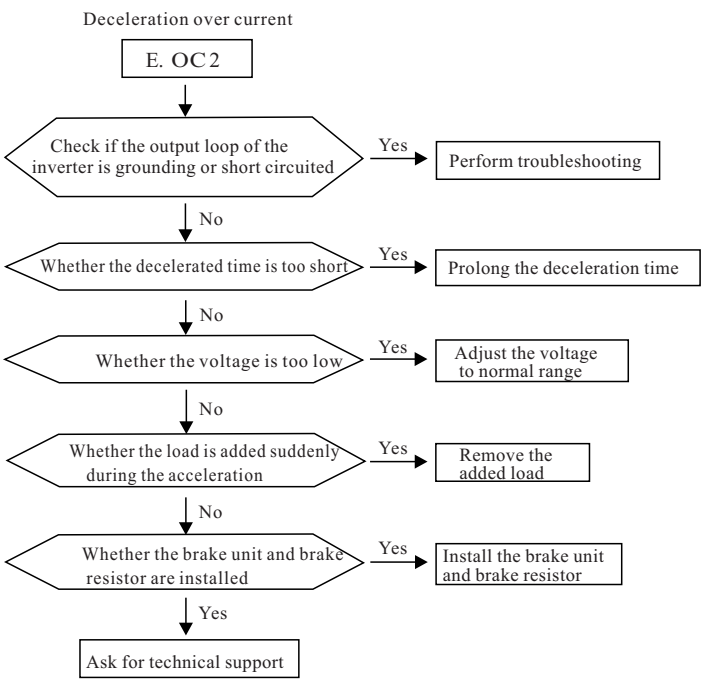
Chapter 7 Fault Diagnosis and Solution

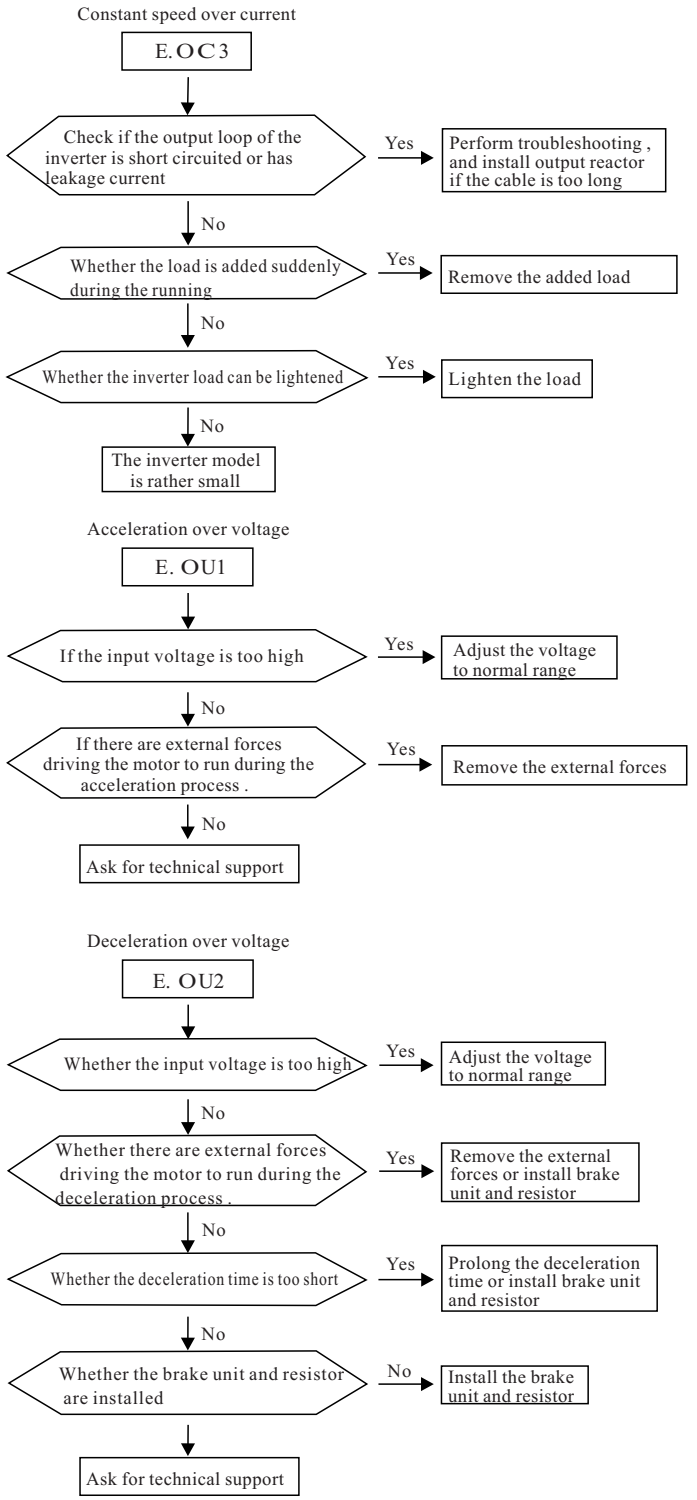
7.1 Fault Alarm and Countermeasures

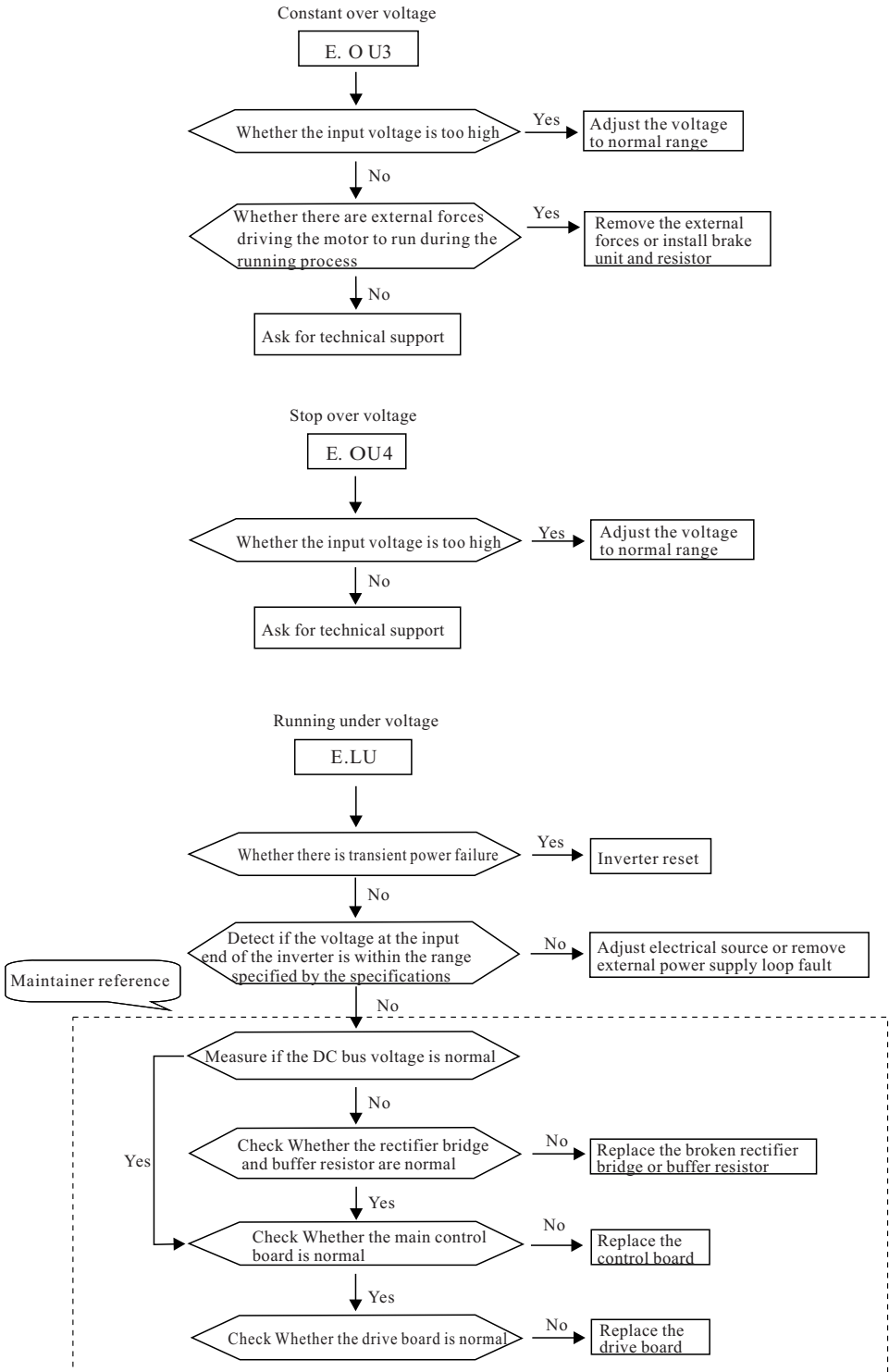
EH600S inverter has 22 pieces of warning information and protection function. in case of abnormal fault, the protection function will be invoked, the inverter will stop output, and the faulty relay contact of the inverter will start, the fault code will be displayed on the display panel of the inverter. Before consulting the service department, the user can perform self-check according to the prompts of the chapter, analyze the reason and find out the solution. If the fault is caused by the reasons described in the dotted frame, please consult the agent or our company directly.

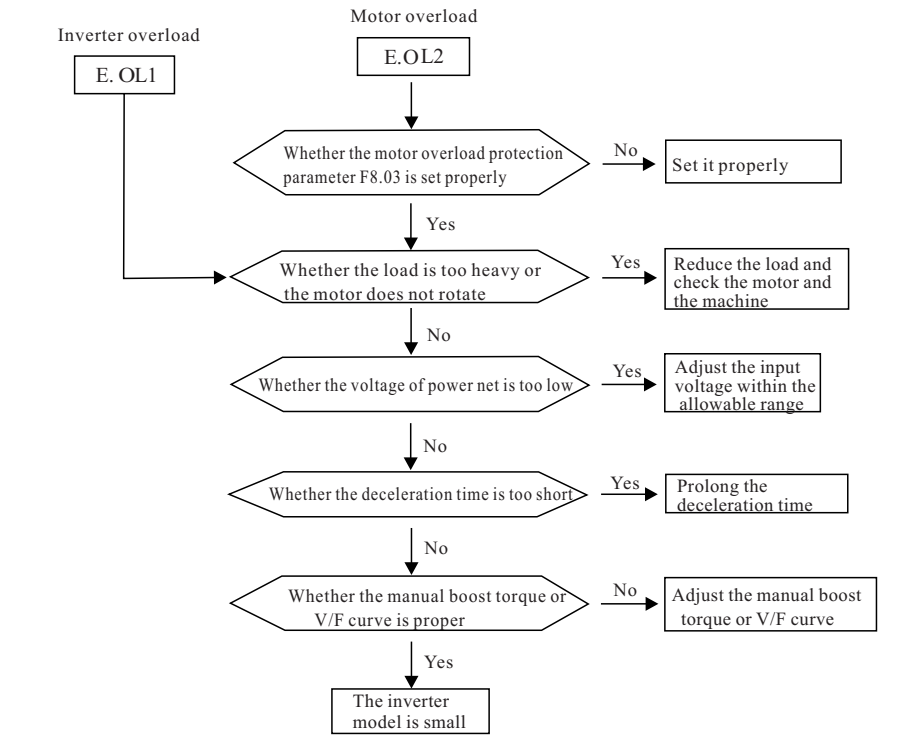


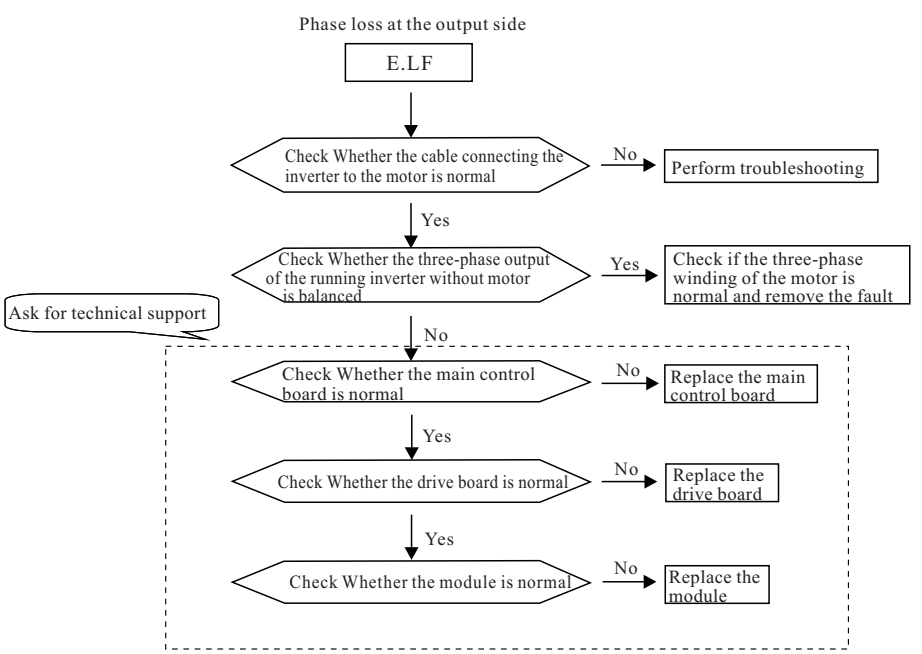

Acceleration over current
E. OC 1
Check if the output loop of the inverter is grounding or short circuited
Yes
Perform troubleshooting
No
Whether the acceleration time is too short
Yes
Prolong the acceleration time
No
Whether the manual boost torque or V/F curve is proper
No
Adjust the manual boost torque or V/F curve
Yes
Whether the voltage is too low
Yes
Adjust the voltage to normal range
No
Whether the rotating motor is started
Yes
Select start upon rotational velocity follow-up or start upon motor shutdown
No
Whether the load is added suddenly during the acceleration
Yes
Remove the added load
No
The inverter model is rather small

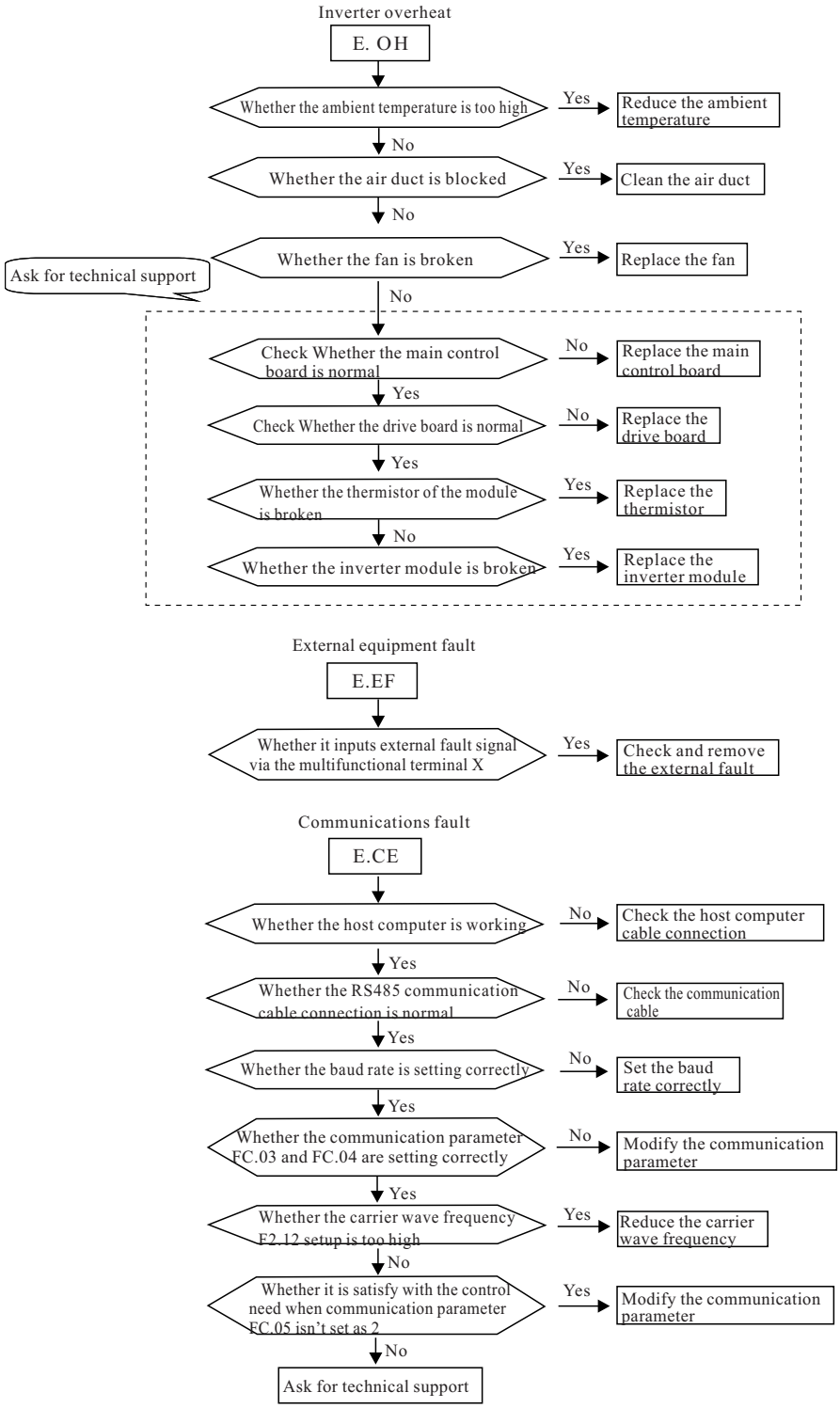

Deceleration over current
E. OC 2
Check if the output loop of the inverter is grounding or short circuited
Yes
Perform troubleshooting
No
Whether the decelerated time is too short
Yes
Prolong the deceleration time
No
Whether the voltage is too low
Yes
Adjust the voltage to normal range
No
Whether the load is added suddenly during the acceleration
Yes
Remove the added load
No
Whether the brake unit and brake resistor are installed
Yes
Install the brake unit and brake resistor
Yes
Ask for technical support

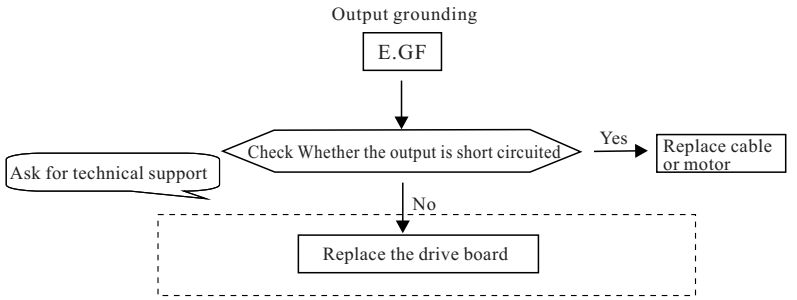

Constant speed over current
E.OC3
Check if the output loop of the inverter is short circuited or has leakage current
Yes
Perform troubleshooting , and install output reactor if the cable is too long
No
Whether the load is added suddenly during the running
Yes
Remove the added load
No
Whether the inverter load can be lightened
Yes
Lighten the load
No
The inverter model is rather small
Acceleration over voltage
E. OU1
If the input voltage is too high
Yes
Adjust the voltage to normal range
No
If there are external forces driving the motor to run during the acceleration process .
Yes
Remove the external forces
No
Ask for technical support
Deceleration over voltage
E. OU2
Whether the input voltage is too high
Yes
Adjust the voltage to normal range
No
Whether there are external forces driving the motor to run during the deceleration process .
Yes
Remove the external forces or install brake unit and resistor
No
Whether the deceleration time is too short
Yes
Prolong the deceleration time or install brake unit and resistor
No
Whether the brake unit and resistor are installed
No
Install the brake unit and resistor
Ask for technical support

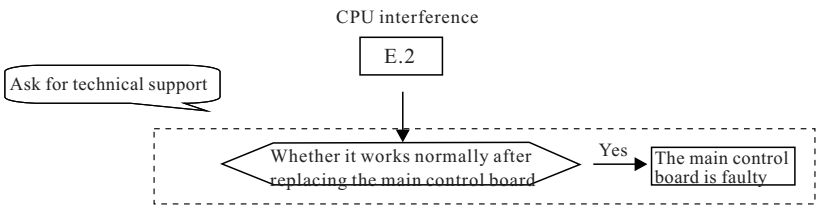

Constant over voltage
E. O U3
Whether the input voltage is too high
Yes
Adjust the voltage to normal range
No
Whether there are external forces driving the motor to run during the running process
Yes
Remove the external forces or install brake unit and resistor
No
Ask for technical support
Stop over voltage
E. OU4
Whether the input voltage is too high
Yes
Adjust the voltage to normal range
No
Ask for technical support
Running under voltage
E.LU
Whether there is transient power failure
Yes
Inverter reset
No
Detect if the voltage at the input end of the inverter is within the range specified by the specifications
No
Adjust electrical source or remove external power supply loop fault
Maintainer reference
No
Measure if the DC bus voltage is normal
No
Check Whether the rectifier bridge and buffer resistor are normal
No
Replace the broken rectifier bridge or buffer resistor
Yes
Yes
Check Whether the main control board is normal
No
Replace the control board
Yes
Check Whether the drive board is normal
No
Replace the drive board
Yes

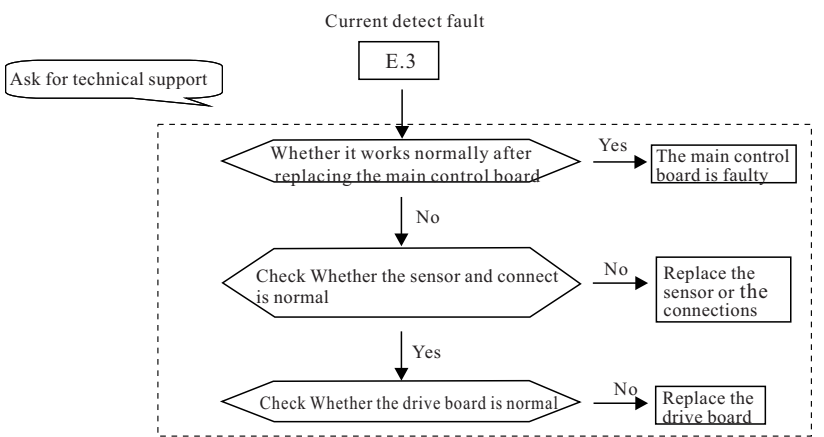

Inverter overload
E. OL1
Motor overload
E.OL2
Whether the motor overload protection parameter F8.03 is set properly
No
Set it properly
Yes
Whether the load is too heavy or the motor does not rotate
Yes
Reduce the load and check the motor and the machine
No
Whether the voltage of power net is too low
Yes
Adjust the input voltage within the allowable range
No
Whether the deceleration time is too short
Yes
Prolong the deceleration time
No
Whether the manual boost torque or V/F curve is proper
No
Adjust the manual boost torque or V/F curve
Yes
The inverter model is small

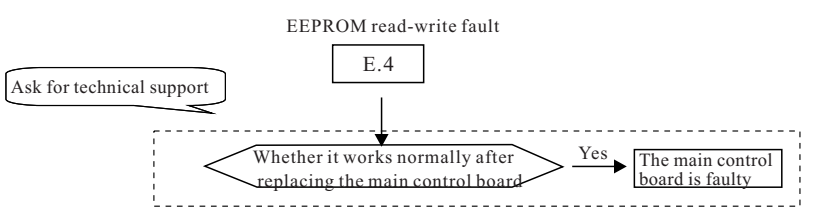

Phase loss at the output side
E.LF
Check Whether the cable connecting the inverter to the motor is normal
No
Perform troubleshooting
Yes
Check Whether the three-phase output of the running inverter without motor is balanced
Yes
Check if the three-phase winding of the motor is normal and remove the fault
Ask for technical support
No
Check Whether the main control board is normal
No
Replace the main control board
Yes
Check Whether the drive board is normal
No
Replace the drive board
Yes
Check Whether the module is normal
No
Replace the module

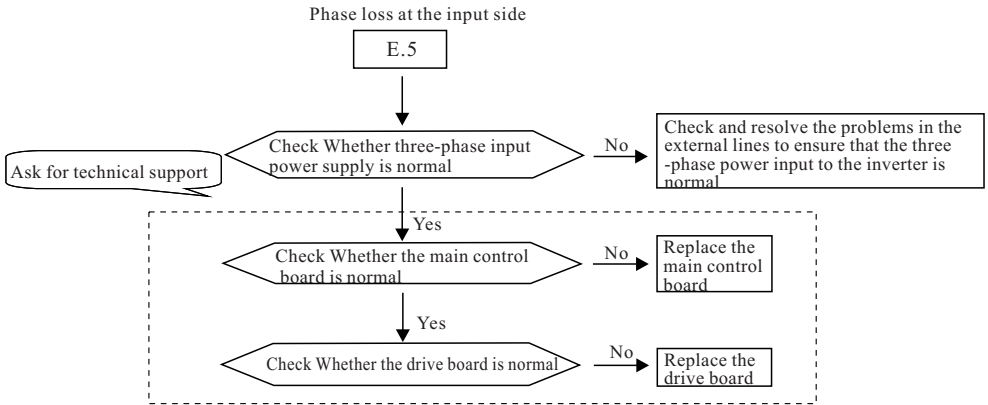

Inverter overheat
E. OH
Whether the ambient temperature is too high
Yes
Reduce the ambient temperature
No
Whether the air duct is blocked
Yes
Clean the air duct
No
Whether the fan is broken
Yes
Replace the fan
Ask for technical support
No
Check Whether the main control board is normal
No
Replace the main control board
Yes
Check Whether the drive board is normal
No
Replace the drive board
Yes
Whether the thermistor of the module is broken
Yes
Replace the thermistor
No
Whether the inverter module is broken
Yes
Replace the inverter module
External equipment fault
E.EF
Whether it inputs external fault signal via the multifunctional terminal X
Yes
Check and remove the external fault
Communications fault
E.CE
Whether the host computer is working
No
Check the host computer cable connection
Yes
Whether the RS485 communication cable connection is normal
No
Check the communication cable
Yes
Whether the baud rate is setting correctly
No
Set the baud rate correctly
Yes
Whether the communication parameter FC.03 and FC.04 are setting correctly
No
Modify the communication parameter
Yes
Whether the carrier wave frequency F2.12 setup is too high
Yes
Reduce the carrier wave frequency
No
Whether it is satisfy with the control need when communication parameter FC.05 isn't set as 2
Yes
Modify the communication parameter
No
Ask for technical support


Output grounding
E.GF
Check Whether the output is short circuited
Yes
Replace cable or motor
Ask for technical support
No
Replace the drive board


CPU interference
E.2
Ask for technical support
Whether it works normally after replacing the main control board
Yes
The main control board is faulty


Current detect fault
E.3
Ask for technical support
Whether it works normally after replacing the main control board
Yes
The main control board is faulty
No
Check Whether the sensor and connect is normal
No
Replace the sensor or the connections
Yes
Check Whether the drive board is normal
No
Replace the drive board


EEPROM read-write fault
E.4
Ask for technical support
Whether it works normally after replacing the main control board
Yes
The main control board is faulty



7.2 Common fault and resolution

During the using process of inverter, you may encounter the following faults. Please conduct simple fault analysis by referring to the methods below:

1: No display upon power-on:

1) Use multimeter to measure whether the input power is consistent with the rate voltage of inverter. If the power is faulty, please perform it.

2) Check whether the rectifier is good, if it is damaged, please ask for technical support.

3) Check whether the start resister is good, if it is good, the fault might be in switching power supply, please ask for technical support.

2: The operation panel displays the words“CE”upon power-on:

If the communication between keyboard and main control board has something wrong, you need to check whether the keyboard or main control board or it’s connection is normal.

3: The circuit breaker starts aside after power-on:

1) Check whether the earth terminal E of inverter is grounding reliably and perform the problem.

2) Check whether there is grounding or short circuited things between the input power, please remove it if there is.

3) Check whether the rectifier is punctured, if it is, please ask for technical support.

4: The motor does not rotate upon inverter running:

1) Whether it has balanceable three-phase output among U and V and W, if it has, there is something wrong with the motor circuit or it is damaged or the motor blocked for mechanical reasons, please remove it.

2) There is output but it is not balanceable, the reason might be the drive or module of inverter is damaged. Please ask for technical supply.

3) If there is no output voltage, the reason might be the drive board or output module is damaged. Please ask for technical supply.

5: The inverter displays normally upon power-on, but the circuit breaker starts aside upon running:

1) Check whether there is double phase short circuit or grounding between the output modules. If there is, please ask for technical supply.

2) Check whether there is grounding or short circuit things between the motor cables, remove it if there is.

3) If the trip happens every once in a while and the distance between motor and inverter is too long, then you may consider to install an AC output reactor.

Warranty Agreement

1. The warranty period of the product is 18 months(refer to the bar code on the equipment body). During the warranty period, if the product fails or it 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 damages caused by 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 natural disasters and second disaster;

c: The hardware damage caused be artificial falling or transportation after purchase.

d: The damage caused by the improper operation;

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

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

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

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

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

7. The interpretation of this agreement shall reside with SHENZHEN XILIN ELECTRIC TECHNOLOGIES CO., LTD.

SHENZHEN XILIN ELECTRIC TECHNOLOGIES CO.,LTD.

Service Department

Add.：3rd Floor,No.B Building ,Huafeng Industrial Zone , Gushu Hangcheng Street , Xixiang Town, Bao'an District, Shenzhen City,China

Tel：0755-29784876　　Sell Service Certer：0755-29784875

Fax：0755-29784873　　P.C.：518000

SHENZHEN XILIN ELECTRIC TECHNOLOGIES CO.,LTD.

Product Warranty Card

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