ISO Quality Management System Authentication

EDS820 series

0.2-2.2KW

Ver. 2.0

Users' Manual

SHENZHEN ENCOM ELECTRIC TECHNOLOGIES CO., LTD

Foreword

Thank you for purchasing the EDS820 series mini vector inverter produced by Shenzhen Encom Electric Technologies CO., LTD.

EDS820 series inverters adopt advanced control methods to achieve high torque, high precision, and wide speed regulation drive, which can meet various requirements of general inverters. EDS820 is a product that organically combines the general needs of customers with industry needs. It provides customers with a variety of powerful functions such as practical PID regulators, simple PLCs, programmable input and output terminals to control pulse frequency settings, etc.. We provide highly integrated integrated solutions to customers in the industry and automation engineering, which are of high value in reducing system costs and improving system reliability.

EDS820 uses space voltage vector PWM control and speed sensorless vector control technology and electromagnetic compatibility overall design to meet customers' environmental requirements for large torque, low noise, and low electromagnetic interference in applicable locations.

This manual provides users with precautions related to installation and wiring, parameter setting, fault diagnosis and countermeasures, and daily maintenance. In order to ensure that the EDS820 series inverter can be installed and operated correctly and that its superior performance can be exerted, please read this manual in detail before installing it, and please keep it properly and give it to the end user of this inverter.

If you have any questions or special requirements about the use of this inverter, please feel free to contact our company's local offices or dealers, or directly contact our headquarters after-sales service center. We will serve you wholeheartedly.

The contents of this manual are subject to change without prior notice.

Contents

1 Safety information and usage precautions

In order to ensure the safety of your personal life and equipment, please be sure to read this chapter carefully before using the inverter.

1.1 Safety precautions

There are three types of symbols used in this manual:

Symbol	Symbol Description
	Failure to operate as required may result in death, serious injury, or serious property damage.
	Things to note during operation and failure to operate as required may result in physical injury or equipment damage.
 **Note**	Tips on some matters that require special attention when using.

(1) It is strictly prohibited to connect terminals other than TA, TB and TC in the control terminals to AC 220V signals, otherwise risk of damage to property.

(2) If the inverter is damaged or parts are incomplete, please do not install and operate it, otherwise a fire may occur, or cause the risk of personal injury.

(3) When installing, it should be installed in a place that can bear the weight of the inverter, otherwise it may cause damage if it falls. Risk of injury or damage to property.

(1) It is strictly prohibited to connect the AC power supply to the U, V, W output terminals of the inverter, otherwise it will cause complete damage to the frequency inverter.
(2) Do not short-circuit N and P+, otherwise it will cause damage to the inverter and short circuit of the power supply.
(3) It is forbidden to install the inverter on flammable materials, otherwise there is a risk of fire.
(4) Do not install in an environment containing explosive gas, otherwise there is a risk of explosion.
(5) After wiring the main circuit, the exposed terminals should be insulated, otherwise there is a risk of electric shock.
(6) When the power is on, do not operate the inverter with wet hands, otherwise there is a risk of electric shock.
(7) The ground terminal of the frequency inverter must be well grounded.
(8) When the inverter is powered on, please do not open the cover or perform wiring work. Wiring or inspection can only be carried out after 10 minutes of power off.
(9) Only persons with professional qualifications can perform wiring work. It is strictly prohibited to leave any conductive objects inside the machine. Otherwise, there is a risk of electric shock or damage to the inverter.
(10) For inverters that have been stored for more than 6 months, the voltage should be gradually increased with a voltage regulator when powering on. Otherwise, there is a risk of electric shock and explosion.

1.2 Scope of use

(1) This inverter is only suitable for three-phase AC asynchronous motors used in general industry.
(2) If the inverter is used for equipment with very high reliability requirements related to life, major property, safety equipment, etc., it must be handled with caution, and please consult the manufacturer.
(3) This frequency inverter is a general industrial motor control device. If it is used in dangerous equipment, safety protection measures in case of failure of the inverter must be considered.

1.3 Precautions for use

(1) EDS820 series inverters are voltage-type inverters. The temperature rise, noise and vibration of the motor during use are slightly increased in comparison with mains frequency operation, which is normal.
(2) If long-term operation at low speed and constant torque is required, a variable frequency

motor must be selected. If a general asynchronous AC motor is used when running at low speed, the motor temperature should be monitored or forced heat dissipation measures should be taken to prevent the motor from burning out.

⑶ It is necessary to take measures in advance for the damage caused for the bad lubrication of the reduction box and wheel gear mechanical devices running at low speed for long time.

⑷ It is necessary to assure at first that the use speed range of motor bearings and mechanical devices, also the increasing of motor vibration and noise should be considered, when motor run over rated frequency.

⑸ It is necessary to select the suitable brake assembly for hoisting device and big inertia load to make sure the normal work when inverter stripping from power grid for the overcurrent or overvoltage failure.

⑹ Inverter start and stop control through terminal or other normal command channel, otherwise it may cause inverter damage via connecting inverter input terminal to big current switch just like contactor direct to start and stop inverter frequently.

⑺ It is necessary to make sure inverter cut off from operation without output, when inverter and motor connect through switch components just like contactor etc. Otherwise it will cause inverter damage.

⑻ When inverter output frequency within some range, it may meet mechanical resonance point of load device, through setting jump frequency to avoid it.

⑼ Checking power supply voltage within allowed working range before usage, otherwise, it need to change voltage or custom special voltage inverter.

⑽ When inverter usage site altitude over 1000 meters，inverter should decrease current to use, output current decrease about 10% of rated current per 1500 meters increase.

⑾ Motor should do insulation check before first usage or reusage after lay aside for long time. Checking method show as graph 1-1 below with 500V voltage type megohm meter , insulation resistance should not smaller than 5 MΩ，otherwise inverter maybe damaged.

⑿ Forbid inverter output side to assemble capacitor to improve power factor or anti-thunder dependent resistor etc, otherwise it may cause inverter fault trip or component damage show as graph 1-2.

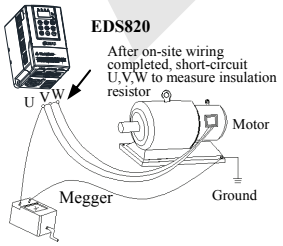


Fig.1-1 Motor insulation check

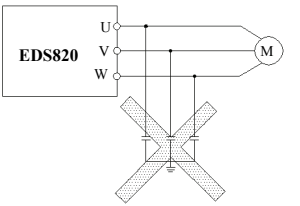


Fig.1-2 Capacitor at output side prohibited

1.4 Scrapping handling notice

Notices when handling with scrapped inverter and components:
(1) The unit: dispose the inverter as industrial waste.
(2) Electrolytic capacitor: It may cause explosion when electrolytic capacitor under burning.
(3) Plastic: it may result in harmful and poisonous gas when plastic and rubber of inverter burning, and safeguard preparations should be taken before burning.

2 Inverter Type and Specification

2.1 Incoming inverter inspect

(1) Check if there is damage during transportation and inverter itself has damage or fall-off parts.
(2) Check if parts presented in packing list are all ready.
(3) Please confirm nameplate data of the inverter is in line with your order requirement.

Our product is guaranteed by strict quality system during manufacturing, packing, transportation etc., please contact our company or local agent rapidly if some careless omission or mistake arise, we'll deal with it as soon as possible.

2.2 Inverter type description

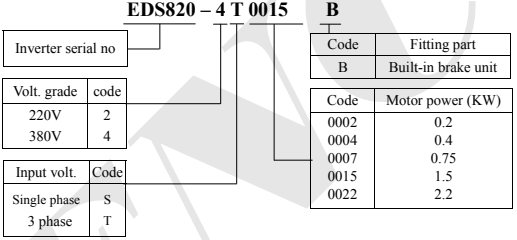


Fig. 2-1 Inverter type description

2.3 Nameplate description

Nameplate presented as Fig.2-2 with type and rating data at the bottom of inverter right side.

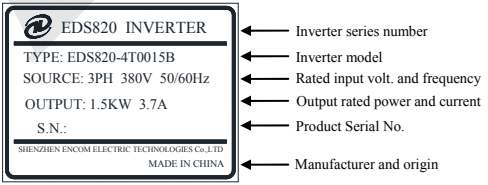


Fig. 2-2 Nameplate

2.4 Inverter type explanation

Table 2-1 Inverter type explanation

Inverter type	Rated capacity (KVA)	Rated output current (A)	Adaptable motor (KW)
EDS820-2S0002B	0.6	1.6	0.2
EDS820-2S0004B	1.1	3	0.4
EDS820-2S0007B	1.8	4.7	0.75
EDS820-2S0015B	2.8	7.5	1.5
EDS820-4T0007B	1.5	2.3	0.75
EDS820-4T0015B	2.4	3.7	1.5
EDS820-4T0022B	3.3	5	2.2

2.5 Inverter appearance and parts name description

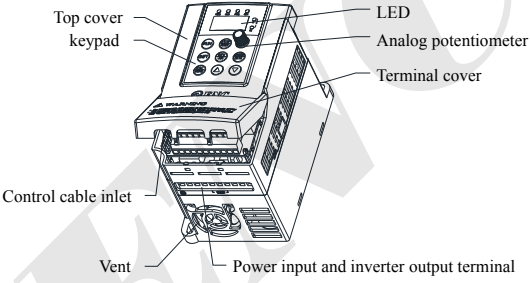


Fig.2-3 Parts name sketch

2.6 Overall dimensions

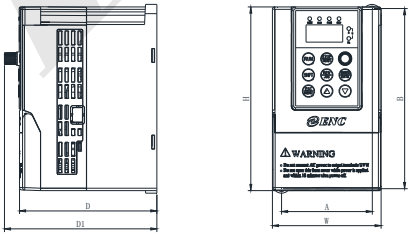


Fig.2-4 Outline drawing

Table 2-2 Installation dimensions

Inverter model	W (mm)	H (mm)	D (mm)	D1 (mm)	A (mm)	B (mm)	Installation hole diameter (mm)
EDS820-2S0002B	89	148.5	112.5	124.7	74	138	5
EDS820-2S0004B							
EDS820-2S0007B							
EDS820-2S0015B							
EDS820-4T0007B							
EDS820-4T0015B							
EDS820-4T0022B							

2.7 Dimensions of keypad (unit: mm)

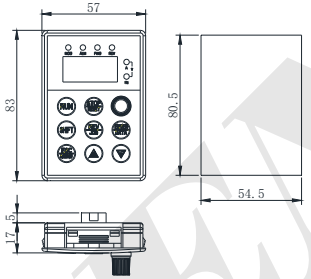


Fig.2-5 KB5 keypad and hole size

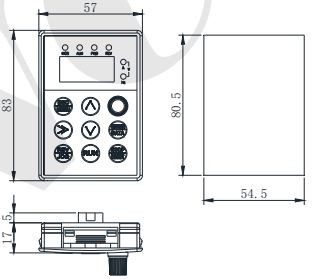


Fig.2-6 EN-LED5-D keypad and hole size

Note

(1) The KB5 keypad is standard, with an analog potentiometer, and does not support upload and download functions.

(2) EN-LED5-D keypad is optional, with a digital potentiometer and supports upload and download functions. If you need upload and download functions, please order this keypad separately.

2.8 Product technical index and Spec.

Item			Item description
Input	Rated voltage, frequency		Three phase 380V, 50Hz/60Hz Single phase 220V, 50Hz/60Hz
	Allowed volt. range		Three phase voltage: 320~460V Single phase voltage: 200~260V
Output	Voltage		380 volt. level: 0～380V 220 volt. level: 0～220V
	Frequency		0~ 500Hz
	Overload capacity		150% rated current for 1 minute, 200% rated current for 0.5 seconds
Control performance	Control mode		1. Optimal space voltage vector SVPWM constant voltage frequency ratio V/F control. 2. Open-loop magnetic flux vector control.
	Speed regulation range		1:100
	Starting torque		Up to 150% of rated torque at 0.5Hz.
	Running speed Steady state accuracy		≤±0.5% rated synchronous speed.
	Frequency accuracy		Digital setting: maximum frequency ×±0.01%; analog setting: maximum frequency ×±0.5%.
	frequency resolution	Analog setting	0.1% of the maximum frequency
		Digital setting	0.01Hz
		external pulse	0.5% of the maximum frequency
	Torque boost		Automatic torque boost, manual torque boost 0.1~30.0%
	V/F curve (voltage frequency characteristics)		The rated frequency can be set arbitrarily between 5 ~ 500Hz, and 4 types of curves can be selected: constant torque, degressive torque 1, degressive torque 2, and degressive torque 3.
	Acceleration and deceleration curve		Two modes: linear acceleration and deceleration and S-curve acceleration and deceleration; 7 acceleration and deceleration times, time unit (minutes/seconds) optional, up to 6000 minutes
	Brake	Energy consumption braking	External braking resistor
		DC braking	The start and stop actions are respectively selectable, the action frequency is 0~15Hz, the action voltage is 0~15%, and the action time is 0~20.0 seconds.
	Jog		Jog frequency range: 0.50Hz~200.00Hz; Jog acceleration and deceleration time 0.1~60.0 seconds can be set.
	Multi-speed operation		Multi-speed operation is realized through built-in PLC or control terminals.

	Built-in PID controller	A closed-loop control system can be easily constructed.
	Automatic voltage regulation (AVR)	When the grid voltage changes, it can automatically keep the output voltage constant.
	Automatic current limit	The current is automatically limited during operation to prevent frequent overcurrent fault tripping.
Run function	Run command given channel	Operation keyboard given, control terminal given, serial port given.
	Running frequency given channel	Digital given, analog given, pulse given, serial port given, combined given, can be switched at any time through a variety of methods.
	Pulse output channel	Pulse square wave signal output of 0~20KHz can realize the output of physical quantities such as set frequency and output frequency.
	Analog output channel	1 channel of analog signal output, AO channel can be selected 0~20mA or 0~10V, which can realize the output of physical quantities such as set frequency and output frequency.
Keypad	LED display	It can display 15 kinds of parameters such as set frequency, output frequency, output voltage, output current and etc..
	Key lock	Achieve partial or complete locking of buttons (analog potentiometer has no locking).
Protective function		Overcurrent protection, overvoltage protection, undervoltage protection, overheating protection, overload protection, phase loss protection, rapid current limiting, etc.
Optional accessories		Braking components, remote control keyboard, remote control keyboard connecting cable, etc.
Environment	Place of use	Indoors, away from direct sunlight, no dust, corrosive gases, flammable gases, oil mist, water vapor, dripping water or salt, etc.
	Altitude	Below 1000 meters
	Ambient temperature	-10℃～+40℃ (If the ambient temperature is between 40℃～50℃, please derate or enhance heat dissipation).
	Ambient humidity	Less than 95%RH, no water droplets will condense.
	Vibration	Less than 5.9 m/s² (0.6g)
	Storage temperature	-40℃～+70℃
Structure	Protection level	IP20
Installation method		Wall-mounted

Note

To get a perfect usage performance of the inverter, Please check and select right type according to this chapter before wiring.

The model must be selected correctly. Incorrect selection may cause abnormal operation of the motor or damage to the inverter.

3 Installation and wiring

3.1 Installation ambient

3.1.1 Installation environment requirements

(1) Installed in drafty indoor place，the ambient temperature should be within -10ºC~40ºC，it needs external compulsory heat sink or reduce the volume if temperature is over than 40ºC; when temperature under -10℃, please preheat inverter first.

(2) Avoid installing in places with direct sunlight, much dust, floating fiber and metal powder.

(3) Don't install in place with corrosive, explosive gas.

(4) The humidity should be smaller than 95%RH，without condensation water.

(5) Installed in place of plane fixing vibration smaller than 5.9m/s²(0.6g).

(6) Keep away from electromagnetic disturbance source and other electronic apparatus sensible to electromagnetic disturbance.

3.1.2 Installation direction and space

(1) Normally the inverter should be mounted vertically, horizontal mounting will seriously affect heat dissipation and the inverter must be used in lower volume.

(2) Demand for minimum mounting space and distance，please see Fig.3-1.

(3) When installing multiple inverters up and down, leading divider must be applied between them, see Fig. 3-2.

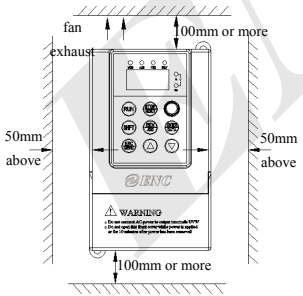


Fig.3-1 Installation distance

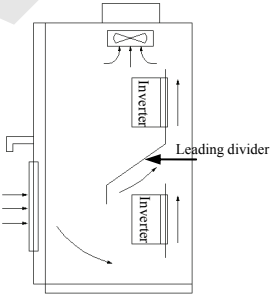


Fig.3-2 Installation of multiple inverters

3.2 Parts disassembly and installation

3.2.1 Keyboard disassembly and installation

(1) Disassembly

Let the forefinger press finger inlet on the keypad，depress fixing flexible plate on the top lightly, draw it outward, then you can disassemble the keypad.

(2) Assembly

First interface the fixed hook of on the bottom of keyboard with the keyboard installation claw of inverter, then press the fixed shrapnel on the top of keyboard to push it assembled well properly (keyboard assembled well when sounding of crisp).

3.2.2 Removal of plastic cover

(1) Disassembly

Put your fingers into the handle hole at the bottom of the cover and lift up to open the lower case.

3.3 Precautions for inverter wiring

⚠

⑴ Before wiring, make sure the power supply has been completely cut off for more than 10 minutes, otherwise there is a risk of electric shock.
⑵ It is strictly prohibited to connect the power cord to the output terminals U, V, and W of the inverter.
⑶ There is leakage current in the inverter itself. The leakage current of the medium and high power inverter is greater than 5mA. To ensure safety, the inverter and motor must be safely grounded. The general diameter of the grounding wire is 3.5mm². The ground resistance of the above copper wires is less than 10Ω.
⑷ The inverter has passed the withstand voltage test before leaving the factory. Users are not allowed to perform the withstand voltage test on the inverter.
⑸ Do not install an electromagnetic contactor, absorption capacitor or other resistance-capacitance absorption device between the inverter and the motor, as shown in Fig. 3-3.
⑹ In order to provide input side overcurrent protection and facilitate power outage maintenance, the inverter should be connected to the power supply through an intermediate relay.
⑺ For the wiring of the relay input and output circuits (X1～X5, OC, FWD, REV), stranded wires or shielded wires of above 0.75mm² should be used. One end of the shielding layer is suspended in the air and the other end is connected to the ground terminal PE of the frequency converter. The wiring length is less than 20m.

⑴ Make sure that the power supply of the inverter has been completely cut off, all LED indicators on the operation keyboard are off, and wait for more than 10 minutes before wiring operations can be performed.

⑵ Wiring operations can only be performed by trained and authorized qualified professionals.

⑶ Before powering on, please check whether the voltage level of the inverter is consistent with the power supply voltage, otherwise it may cause casualties and equipment damage.

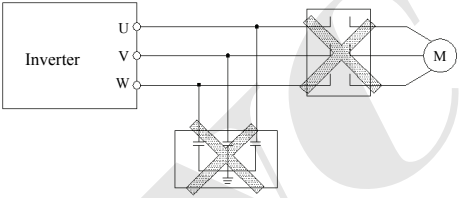


Fig. 3-3 Forbid to use contactor and absorbing capacitor

3.4 Main circuit terminal wiring

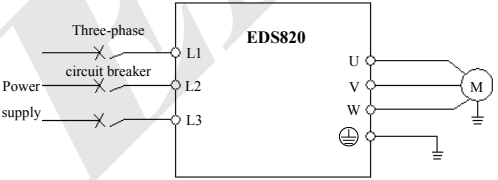


Fig. 3-4 Simple wiring of the main circuit

3.4.1 Connection of inverter and optional accessories

(1) Between the power grid and the inverter, disconnecting devices such as isolation switches must be installed to ensure personal safety during equipment maintenance and the need for forced power outages.

(2) The inverter power supply circuit must have over current protection circuit breaker or fuse to avoid subsequent equipment failure causing the scope of the fault to expand.

(3) AC input reactor

When high harmonics between inverter and power supply is strong which cannot meet system requirement or input side power factor need to improve, ac input reactor can be added.

(4) The contactor is only used for power supply control. Do not use the contactor for control the start and stop of the frequency converter.

(5) Input side EMI filter

Optional EMI filter to suppress the slave inverter power line high frequency conductive interference and radio frequency interference emitted.

(6) Output side EMI filter

Optional EMI filter to suppress the EMI generated on the output side of the inverter radio frequency interference noise and wire leakage current.

(7) AC output reactor

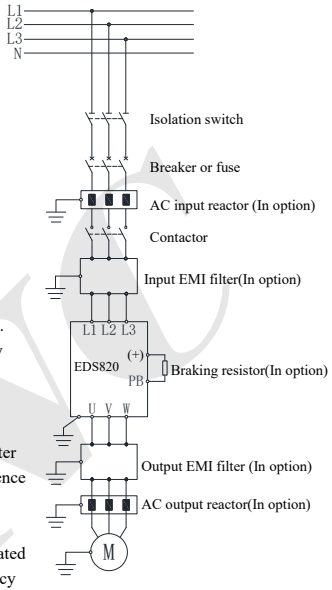


Fig. 3-5 Connection between inverter and optional accessories

Installing AC output reactor is suggested to avoid motor insulation damage, oversize current leakage and inverter frequent protection when connecting wire between inverter and motor exceeds 50m. But AC output reactor voltage drop problem must be considered . Or increase the inverter's input and output voltage, or derate the motor to avoid burning the motor.

(8) Safety ground wire

The inverter and motor must be grounded, and the grounding resistance is less than 10Ω. The grounding wire should be as short as possible, and the wire diameter should be no less than 3.5mm² copper wire.

3.4.2 Wiring of main circuit terminals

The main circuit input and output terminals are shown in Table 3-1

Table 3-1 Main circuit input and output terminal description

Applicable models	Main circuit terminal	Terminal name	Function Description
EDS820-2S0002B ~ EDS820-2S0015B		L1	Neutral line
		L3	Live line
		PE	Ground terminal
		PB, (+)	Brake terminal block
		(+), (−)	Common DC bus terminal block
		U, V, W	Three-phase AC output terminal
EDS820-4T0007B EDS820-4T0015B EDS820-4T0022B		L1, L2, L3	Three-phase AC input terminal
		PE	Ground terminal
		PB, (+)	Brake terminal block
		(+),(−)	Common DC bus terminal block
		U, V, W	Three-phase AC output terminal

3.5 Basic operation wiring diagram

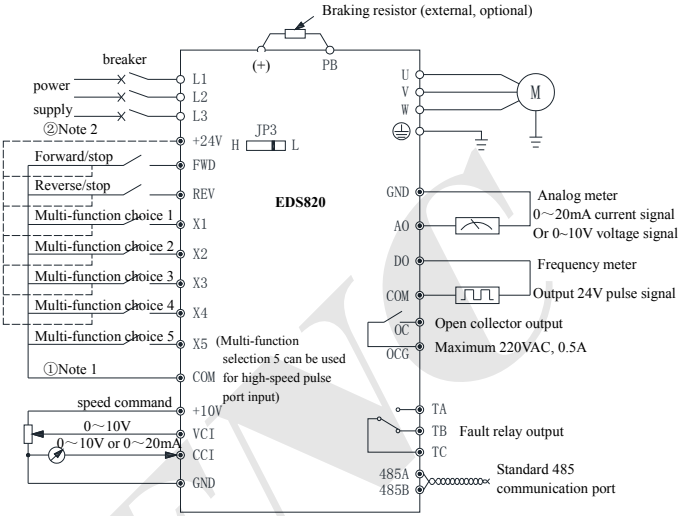


Fig. 3-6 Basic wiring diagram

Note 1: When the input signals of FWD, REV, X1~X5 terminals require low level (or short circuit with COM), please set JP3 to the "L" end.

Note 2: When the input signals of FWD, REV, and X1~X4 terminals require high level (or short circuit with +24V) to be valid, please set JP3 to the "H" end.

3.6 Control loop configuration and wiring

3.6.1 Relative position and function introduction of control board terminals and pull switch:

The positions of the terminals and pull switches on the inverter control board are shown in Fig. 3-7.

Please refer to Table 3-2 for terminal function descriptions provided to users. Please refer to Table 3-3 for the functions and setting instructions of the pull switch. Before putting the inverter into use, terminal wiring and switches on the control board should be correctly set. It is recommended to use wires of No. 24 or above as terminal connection wires.

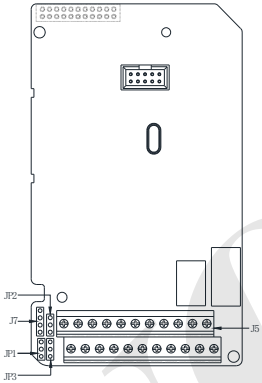


Fig. 3-7 Diagram of the position of the pull switch on the control panel

Table 3-2 Terminal function description provided to users

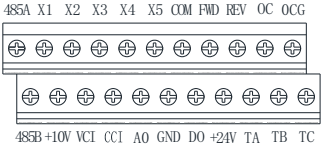
No.	Function	Description
J5	External terminal input and output control	When using external terminals to control the operation of the inverter, use this port

Table 3-3 Function description of the DIP switch provided to users

No.	Function	Factory default
JP1	Analog AO output, 0~10V and 0~20mA conversion. When placed at the "V" end, it is a 0~10V output; when placed at the "I" end, it is a 0~20mA output.	0～10V
JP2	Analog CCI input, 0~10V and 0~20mA conversion. When placed at the "V" end, it is a 0~10V input; when placed at the "I" end, it is a 0~20mA input.	0～10V
JP3	Xi terminal input effective level conversion: When it is placed at the "H" end, the Xi input is effective at high level (effective voltage range 15~28V); when placed at the "L" end, the Xi input is effective at low level (effective voltage range is 0~28V) 6V).	low level valid

3.6.2 Description of control board terminals

(1) The arrangement of control circuit terminal J5 is as follows:



(2) The function description of J5 terminal is shown in Table 3-4.

Table 3-4 Control board terminal function table

category	Terminal	Name	Terminal function description	Specification
run order	FWD	Forward run command	For forward and reverse switching commands, see the two-wire and three-wire control function description of group F5.08.	Input impedance: R=2KΩ Maximum input frequency: 200Hz
	REV	Reverse run command		
Multi-function input terminal	X1	Multi-function input terminal 1	It is programmable and defined as a switching input terminal with multiple functions. For details, please refer to Chapter 6, Section 6.6 Terminal Function Parameters (Group F5) for the introduction of input terminal functions.	X5 can be used as pulse input Maximum input frequency: 20KHz Maximum input voltage: 28V
	X2	Multi-function input terminal 2		
	X3	Multi-function input terminal 3		
	X4	Multi-function input terminal 4		
	X5	Multi-function input terminal 5		
	+10V	+10V power supply	Provide external +10V power supply (negative terminal: GND)	Maximum output current: 10mA
	+24V	+24V power supply	Provide +24V power supply to the outside world (negative terminal: COM)	Maximum output current: 100mA
	COM	Common terminal +24V power supply negative pole	24V ground	
	GND	+10V power supply negative pole	Reference ground for analog signals and +10V power supply	
Analog input	CCI	Analog input CCI	Accepts analog voltage/current input, voltage and current are selected by DIP switch JP2, factory default voltage. (Reference: GND)	Input voltage range: 0~10V (input impedance: 70KΩ) Input current range: 0～20mA (input impedance: 250Ω) Resolution: 1/4000
	VCI	Analog input VCI	Accept analog voltage input	Input voltage range: 0~10V (input impedance: 70KΩ) Resolution: 1/4000

Analog output	AO	Analog output	Provides analog voltage/current output, which can represent 11 quantities. Please refer to the parameter description of F5.17. The output voltage/current is selected by the DIP switch JP1. The factory default output voltage is used. (Reference: GND)	Current output range: 0~20mA Voltage output range: 0~10V
Multi-function output terminal	OC	Relay output terminal	Programmable switching output terminals defined as multiple functions. For details, see Chapter 6, Section 6.6 Terminal Function Parameters (Group F5) for the introduction of output terminal functions.	Working voltage range: 0~220VAC Maximum output current: 500mA For usage, see F5.10 parameter description.
	OCG			
	DO	High-speed pulse output terminal	Programmable pulse signal output terminals defined as multiple functions. For details, please refer to Chapter 6, Section 6.6 Terminal Function Parameters (Group F5) for the introduction of output terminal functions. (Reference: COM)	Output pulse voltage: 24V Output frequency range: determined by parameter F5.24, maximum 20KHz
relay output terminal	TA	Programmable fault output relay	The inverter is normal: TB-TC is closed, TA-TC disconnected. Inverter failure: TB-TC disconnected, TA-TC closed.	TB-TC: Normally closed, TA-TC: Normally open Contact capacity: AC250V/2A (COSΦ=1) AC250V/1A (COSΦ=0.4) DC30V/1A
	TB			
	TC			

⑶ 485 terminal function description is shown in Table 3-5

Table 3-5 Control board 485 terminal function table

category	Terminal	Name	Terminal function description	Specification
communication	485A	485 communication interface	485 differential signal positive terminal	Please use twisted pair or shielded wire for the standard 485 communication interface.
	485B		485 differential signal negative terminal	

3.6.3 Wiring of analog input and output terminals

(1) The VCI terminal accepts analog voltage signal input, and the wiring method is as follows:

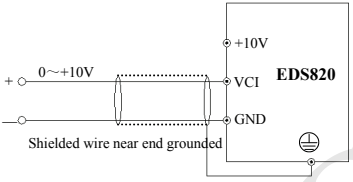


Fig.3-8 VCI terminal wiring diagram

(2) The CCI terminal accepts analog signal input, and the input voltage (0~10V) and input current (0~20mA) wiring methods are as follows:

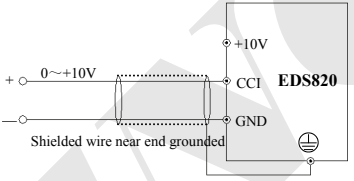


Fig.3-9 CCI terminal wiring diagram

(3) Wiring of analog output terminal AO

The analog output terminal AO is connected to an external analog meter to indicate a variety of physical quantities. The terminal wiring method is shown in Figure 3-10.

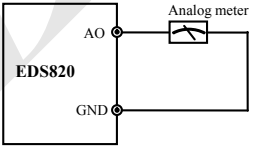


Fig.3-10 Analog output terminal wiring

Note

(1) Under analog input mode, filter capacitor or common mode inductor can be installed between VCI and GND or CCI and GND.

(2) Analog input and output signal can be interfered easily by ambient environment, it need use shield cable for connection and earth grounding well as short as possible.

3.6.4 Wiring of communication terminals

EDS820 inverter provides users with a 485 serial communication interface.

The following wiring methods can form a single master single slave or single master multiple slave control system. The upper computer (PC or PLC controller) software can be used to realize real-time monitoring and operation of the inverter, and to achieve complex operation control such as remote control and high automation; one inverter can also be used as the host and the remaining inverters as slaves. into a cascade or synchronous control inverter network.

⑴ For wiring between the 485 interface of the frequency converter and other equipment with 485 interfaces, just follow the diagram below.

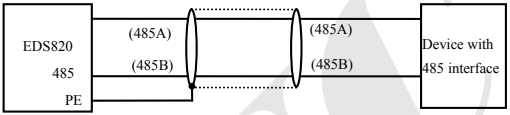


Fig.3-11 Communication terminal wiring

⑵ Connection between inverter 485 interface and the host computer (with RS232 interface):

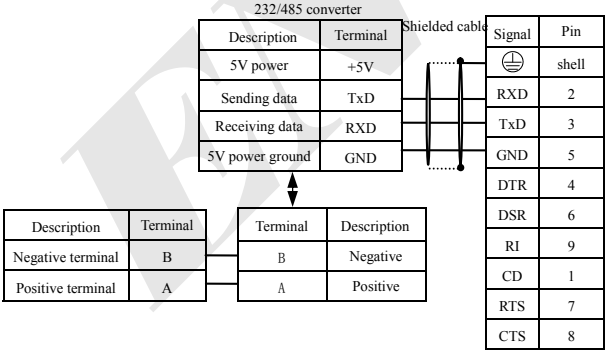


Fig. 3-12 485 communication wiring

⑶ Multiple inverters can be connected together through 485, and up to 20 inverters can be connected. As the number of connected units increases, the communication system is more susceptible to interference. It is recommended to wire as follows:

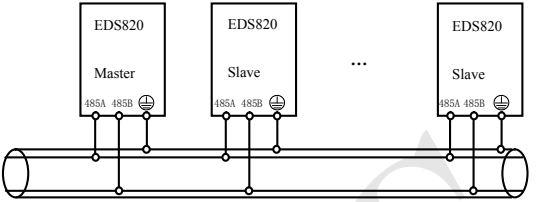


Fig. 3-13 Recommended wiring diagram for multiple inverters communication(Inverter and motor are all well grounded)

If you still cannot communicate normally with the above wiring, you can try the following measures:

1>Power the PLC (or host computer) separately or isolate its power supply.

2>Use magnetic rings on communication lines.

3>Appropriately reduce the carrier frequency of the inverter.

Note

⑴ When forming a network using only inverters, F2.15 (local address) of the master EDS820 inverter must be set to 0.

⑵ Please refer to Chapter 10 Modbus Communication Protocol for command programming of RS485 interface.

3.7 Anti-interference installation instructions

The main circuit of the frequency converter is composed of high-power semiconductor switching devices, which will produce a certain amount of electromagnetic noise during operation. In order to reduce or eliminate the interference of the frequency converter to the outside world, this section covers interference suppression, field wiring, system grounding, leakage current, The use of power filters and other aspects introduces the installation methods of frequency converters to suppress interference for on-site installation reference.

3.7.1 Suppression of noise interference

The interference generated by the operation of the inverter may have an impact on nearby electronic instruments and equipment. The degree of impact is related to the electromagnetic environment surrounding the installation of the inverter itself and the anti-interference ability of the equipment.

(1) Types of interference noise

According to the working principle of the frequency converter, there are three main sources of noise interference:

1> Circuit conductive interference;

2> Space radio frequency interference;

3> Electromagnetic induction interference;

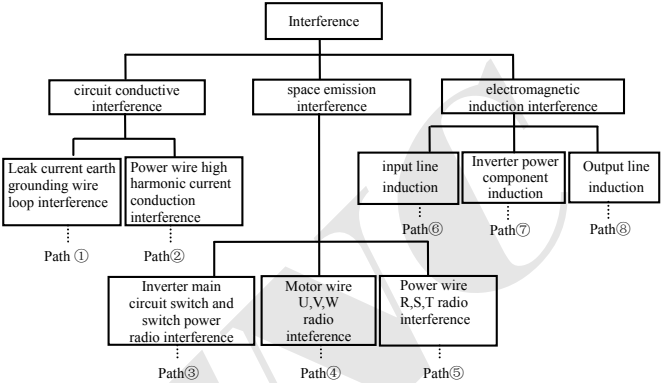


Fig. 3-14 Classification of noise interference

(2) Basic countermeasures to suppress interference

Table 3-7 Interference suppression countermeasures table

Noise propagation path	Countermeasures to reduce the impact
①	When the ground wire of peripheral equipment and the wiring of the inverter form a closed loop, the leakage current of the ground wire of the inverter will cause the equipment to malfunction. If the equipment is not grounded at this time, malfunctions will be reduced.
②	When the power supply of peripheral equipment and the power supply of the inverter are connected to the same power supply end, the high-order harmonics generated by the inverter will cause the voltage and current to spread through the power line, which will cause interference to other equipment in the same power supply system, which may cause Take the following suppression measures: install an electromagnetic noise filter at the input end of the frequency converter; use an isolation transformer to isolate other equipment. Connect the power supply end of the peripheral equipment to the remote power grid; add a power ferrite filter magnetic ring to the L1, L2, and L3 three-phase wires of the frequency converter to suppress the conduction of high-frequency harmonic currents.
③④⑤	● Equipment and signal lines that are susceptible to interference should be installed as far away from the inverter as possible. The signal wire should use a shielded wire, with the shielding layer grounded at one end, and should be as far away from the inverter and its input and output wires as possible. If signal wires must intersect with high-power cables, they should be kept orthogonal and avoid parallelism.

	● Installing high-frequency noise filters (ferrite common mode choke coils, commonly known as magnetic rings) at the roots of the input and output sides of the frequency converter can effectively suppress radio frequency interference from power lines. ● Motor cables should be placed in a thicker barrier, such as a thicker (above 2mm) pipe or buried in a cement tank. The power wire is put into a metal tube and grounded with a shielded wire (the motor cable uses a 4-core cable, one of which is grounded on the inverter side and the other side is connected to the motor shell).
⑥⑦⑧	Avoid wiring strong and weak current wires in parallel or bundling them together; install equipment as far away from the inverter as possible, and the wiring should be away from the L1, L2, L3, U, V, W and other power lines of the inverter. Equipment with strong electric fields or strong magnetic fields should pay attention to the relative installation position with the frequency converter, and should maintain a distance and vertical intersection.

⑶ Noise propagation path

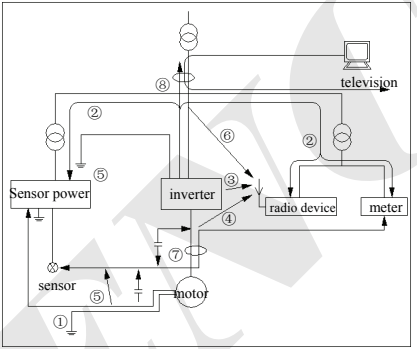


Fig. 3-15 Schematic diagram of the propagation path of noise interference

3.7.2 On-site wiring and grounding

⑴ The cables from the inverter to the motor (U, V, W terminal leads) should be kept away from the power lines (L1, L2, L3 terminal input line) . A distance of more than 30 cm should be maintained.

⑵ The three motor wires of U, V, and W terminals should be placed in metal tubes or metal wiring troughs.

⑶ Generally, shielded cables should be used for control signal lines. After the shielding layer is connected to the inverter end ⏚, it should be the single end earth grounding which closed to inverter side.

⑷ The grounding cable at the end ⏚ of the inverter must be directly connected to the grounding plate, and it cannot connect to earth grounding through other device.

⑸ High-current cables (L1, L2, L3, U, V, W) must not be routed parallel to control signal lines at close range, nor can they be bundled together. They must be kept at a distance of more than 20 to 60 cm (depending on the size of the high-current). If they want to

intersect, they should cross each other perpendicularly, as shown in Fig. 3-16.

(6) The strong current grounding wire must be grounded independently from the weak current grounding wires such as control signals and sensors.

(7) It is prohibited to connect other electrical equipment to the power input terminals (L1, L2, L3) of the inverter.

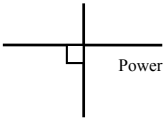


Fig. 3-16 System wiring requirements

3.7.3 Relationship between long-distance wiring and leakage current and countermeasures

When the inverter and the motor are wired over a long distance, high-order harmonics will form line-to-line leakage current and ground leakage current through distributed capacitance. The following methods can be used to suppress it:

(1) Install a ferrite magnetic ring or output reactor on the output side of the inverter.

When installing a reactor with a rated voltage drop of more than 5% and wiring U, V, and W over long distances, the voltage of the motor will be significantly reduced. When the motor is running at full load, there is a risk of burning the motor, so it should be derated or the input and output voltage should be increased.

(2) Reduce the carrier frequency, but the motor noise will increase accordingly.

3.7.4 Installation requirements for electromagnetic switching appliances

Relays, electromagnetic contactors, electromagnets and other electromagnetic switching appliances will produce a lot of noise when working. Full attention should be paid when installing them around the inverter or in the same control cabinet. Install the surge absorber, as shown in Fig. 3-17.

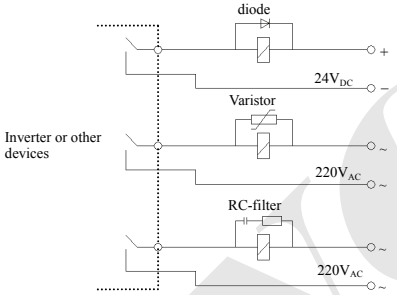


Fig. 3-17 Installation requirements for electromagnetic switching electrical appliances

4 Run and operation explanation for inverter

4.1 Operation of the frequency converter

4.1.1 Command channel for inverter operation

This machine has three command channels to control the start, stop, jog and other operating actions of the inverter:

0: Operation keyboard

Use the RUN , STOP/RESET , REV/JOG keys on the operation keyboard to control (factory setting).

1: Control terminal

Use the control terminals FWD, REV, and COM to form a two-wire control, or use one terminal from X1 to X5 and two terminals FWD and REV to form a three-wire control.

2: Serial port

Start and stop the inverter through the host computer or other devices that can communicate with this machine.

The selection of the command channel can be accomplished through the setting of function code F0.02; it can also be accomplished through the multi-function input terminal selection (F5.00~F5.04 selects functions No. 29, 30, and 31).

When switching command channels, please perform switching debugging in advance to confirm whether it can meet the needs of the system. Otherwise, there is a risk of damaging the equipment and injuring people!

4.1.2 Inverter frequency reference channel

There are 11 given channels in EDS820 normal operating mode:

0: Keyboard analog potentiometer setting

1: Operation keyboard number setting

2: Terminal UP/DOWN adjusts the set frequency (storage during power outage or shutdown)

3: Serial port given

4: VCI simulation setting (VCI-GND)

5: CCI simulation setting (CCI-GND)

6: Reserved

7: Terminal pulse (PULSE) setting frequency

8: Combination settings

9: Terminal UP/DOWN adjusts the set frequency (not stored in power outage or shutdown)

10: Serial port given (storage when power off)

11: Terminal PWM pulse setting frequency

4.1.3 Working status of the frequency converter

The working status of EDS820 is divided into standby status and running status:
Standby state: After the inverter is powered on and initialized, if there is no running command input, or after a stop command is executed during operation, the inverter will enter the standby state.
Running state: After receiving the running command, the frequency converter enters the running state.

4.1.4 Operation mode of frequency converter

There are six operating modes of EDS820 inverter. According to their priority, they are: jogging operation → closed-loop operation → PLC operation → multi-speed operation → swing frequency operation → normal operation. As shown in Figure 4-1.

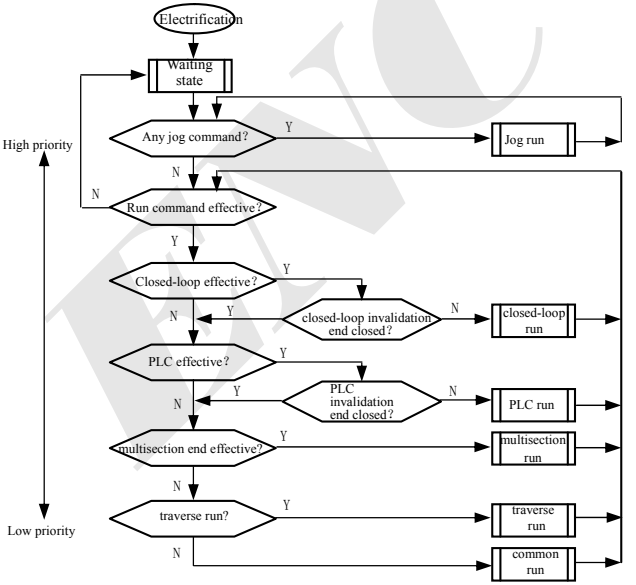


Fig.4-1 Logic program of EDS820 inverter operating status

0: Jog operation

In the standby state, after receiving the jog operation command (for example, pressing

the (REV JOG) operation keyboard key), the frequency converter will run at the jog frequency (see function code F2.06~F2.08).

1: Closed loop operation

Set the effective parameters of closed-loop operation control (F3.00=1), and the inverter will enter the closed-loop operation mode. That is, PID adjustment is performed on the given quantity and feedback quantity (proportional integral operation, see group F3 function code). The output of the PID regulator is the basic instruction of the frequency converter output frequency. Through the multi-function terminal (No. 20 function), the closed-loop operation mode can be invalidated and switched to a lower level operation mode.

2: PLC operation

Set the valid parameters of the PLC function (F4.00 ones digit ≠0), the frequency converter will enter the PLC operating mode, and the frequency converter will operate according to the preset operating mode (see the description of the function code of group F4). Through the multi-function terminal (No. 21 function), the PLC operating mode can be invalidated and switched to a lower level operating mode.

3: Multi-speed operation

Through the non-zero combination of multi-function terminals (functions 1, 2, 3, and 4), select multi-step frequencies 1 to 15 (F2.30~F2.44) for multi-step speed operation.

4: Swing frequency operation

Set the effective parameters of the swing frequency function (F6.00=1), the inverter will enter the swing frequency operation mode, and set the corresponding swing frequency operation special parameters according to the textile swing frequency process, thereby realizing the swing frequency operation.

5: Normal operation

General open-loop operation mode of general-purpose frequency converter.

Among the above six operating modes, except "jogging operation", all of them can be operated according to various frequency setting methods. "PID operation", "PLC operation", "multi-stage operation" and "normal operation" can also perform swing frequency adjustment processing.

4.2 Operation and use of keyboard

4.2.1 Keyboard layout

The operation keyboard is the main unit for the inverter to accept commands and display parameters. The overall dimensions of the operation keyboard are shown in Figure 4-2.

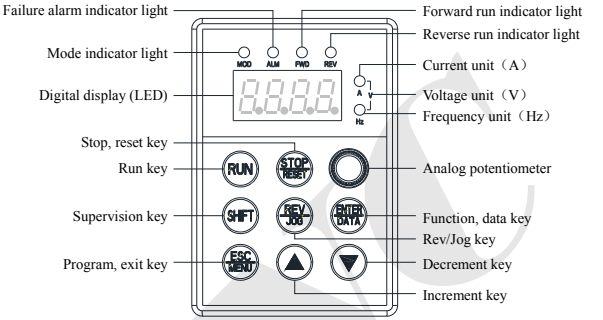


Fig.4-2 Operation keyboard layout (KB5)

4.2.2 Keyboard function description

There are 8 buttons and a keyboard potentiometer on the inverter operation keyboard. The function definition of each button is shown in Table 4-1.

Table 4-1 Operation keyboard function table

Key		Name	Function Description
KB5	EN-LED5-D		
ESC MENT		Program/ Exit key	Enter or exit programming state.
SHFT		Shift/ monitor key	In the editing state, you can choose to set the modification bit of the data; in other states, you can switch the display of status monitoring parameters.
ENTER DATA		Function/ data keys	Enter the lower-level menu or data confirmation.
REV JOG		Reverse/ jog key	In keyboard operation mode, press this key to perform reverse or jog operation according to the hundreds digit setting of parameter F0.03.
RUN		Forward run key	In keyboard operation mode, press this key and the inverter will run forward.

		Stop/reset button	When the frequency converter is in normal operation, if the running command channel of the frequency converter is set to the keyboard stop valid mode, pressing this key will cause the frequency converter to stop in the set method. When the inverter is in fault state, pressing this key will reset the inverter and return to the normal shutdown state.
	–	Analog potentiometer	Used for frequency given. When F0.00=0, the analog potentiometer is set to frequency given.
–		digital potentiometer	The functions of the increment and decrement keys on the keyboard are the same. Rotate left to decrease and right to increase.
		Increment key	Increment of data or function code (when pressed continuously, the increment speed can be increased).
		Decrement key	Decrement of data or function code (when pressed continuously, the decrement speed can be increased).

4.2.3 LED digital tube and indicator light description

Four running status indicators: The four running status indicators are all above the LED. The order from left to right is MOD (mode), ALM (warning indication), FWD (forward rotation), REV (reverse rotation), respectively. The meaning of the instructions is explained in Table 4-2.

Table 4-2 Description of status indicators

Project			Function Description	
Display function	digital display		Displays the current running status parameters and setting parameters of the inverter.	
	Status Indicator	A, Hz, V	The unit of the physical quantity corresponding to the current digital display parameter (current is Ampere A, voltage is Volts V, frequency is Hertz Hz).	
		MOD	In the non-monitoring state, the indicator light is on. If there is no key input for one minute, the indicator light goes off and returns to the monitoring state.	
		ALM	Warning indicator light indicates that the inverter is currently in overcurrent or overvoltage suppression state or fault alarm state.	
		FWD	Forward rotation indicator light indicates that the inverter outputs positive phase sequence. When the motor is connected, the motor will rotate forward.	If the FWD and REV indicators are on at the same time, it indicates that the inverter is working in DC braking state.
		REV	Reversal indicator light indicates that the inverter outputs reverse phase sequence. When the motor is connected, the motor will rotate in reverse direction.	

4.2.4 Keyboard display status

The display states of the EDS820 operation keyboard are divided into four states: standby state parameter display, function code parameter editing state display, fault alarm state display, and running state parameter display. After the unit is powered on, all LED

indicators will light up, and then the digital display (LED) will display"-EN-" characters, and thenenter the set frequency display. As shown in Figure 4-3 Figure a.

(1) Standby parameter display status

The inverter is in standby state, and the operation keyboard displays the standby state monitoring parameters. The normally displayed state monitoring parameters are determined by the F3.28 parameter. As shown in Figure 4-3 b, the unit indicator light on the right side displays the unit of the parameter.

Press the SHIFT button to cycle through different standby state monitoring parameters (the fifteen monitoring parameters of group C are displayed by default, and whether the subsequent seven monitoring parameters are displayed is defined by function codes F2.11 and F2.12. For details, see the list of functional parameters in Chapter 5. Group C status monitoring parameters).

(2) Operating parameter display status

After receiving a valid running command, the frequency converter enters the running state, and the operation keyboard displays the running status monitoring parameters. The displayed status monitoring parameters are determined by F3.28. As shown in Figure 4-3 (c), the unit indicator light on the right displays the unit of the parameter.

Press the SHIFT key to display the running status monitoring parameters cyclically (defined by function codes F2.11 and F2.12). During the display, you can press ENTER/DATA to switch to the initial monitoring parameters determined by the F3.28 parameter, otherwise the last displayed parameters will always be displayed.

Fig. a electrification, display-EN-

Fig. b waiting status, display waiting status parameter

Fig. c run status, display run status parameter

Fig.4-3 Inverter electrification, waiting, run status display

(3) Fault alarm display status

When the inverter detects a fault signal, it enters the fault alarm display state and flashes the fault code (as shown in Fig.4-4); press the SHIFT button You can check the relevant parameters after shutdown; if you want to check the fault information, you can press to ESC/MENU enter the programming state to query the Fd group parameters. After the fault is identified and eliminated, the fault can be reset by operating the keyboard (STOP/RESET keys, control terminals or communication commands. If the fault persists, the fault code remains displayed.

Overcurrent during acceleration

Fig.4-4 Fault alarm display

For some serious faults, such as inverter module protection, over-current, over-voltage, etc., you must not force the fault reset operation and run the inverter again without confirming that the fault has been eliminated. Otherwise, there is a risk of damaging the inverter!

(4) Function code editing display status

In standby, running or fault alarm state, press the ESC/MENU key to enter the editing state (if a user password is set, you need to enter the password Only then can you enter the editing state (see FF.00 description and Figure 4-10). The editing state is displayed in a three-level menu, as shown in Fig.4-5. Press the ENTER/DATA key to enter step by step. In the function parameter display state, press the ENTER/DATA key to perform parameter storage operation; the parameters modified by pressing the ESC/MENU key will not be stored, and you can only return to the upper menu.

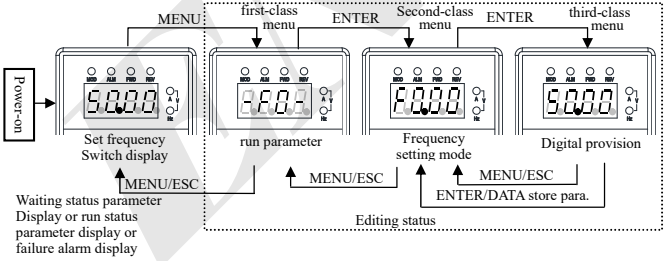


Fig.4-5 Keypad display status switching

(5) Special display function

When the keyboard potentiometer is selected to be valid (F0.00=0) or the keyboard digital setting is valid (F0.00=1), the set frequency can be changed directly in the monitoring state. At this time, if it is stopped, the set frequency will be displayed; if it is running, the output frequency will be displayed. After the set frequency stops changing for 1 second, it will return to the steady display state.

4.2.5 Keyboard operation method

Various operations can be performed on the inverter through the operation keyboard, examples are as follows:

(1) Display switching of status parameters:

After pressing the SHFT key, the status monitoring parameters of group C are displayed. When the code of a monitoring parameter is displayed, the parameter value will be automatically displayed for 1 second.

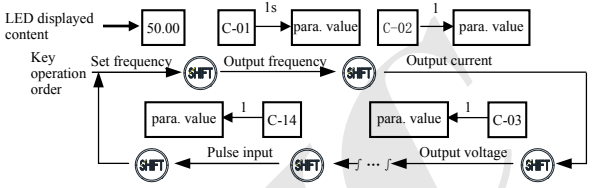


Fig.4-6 Waiting status parameter display operating example

Illustrate:

① When the inverter leaves the factory, the status parameters only display fifteen parameters from C-00 to C-14. If the user wants to change the menu for viewing status parameters, he can modify the function code F2.11 , F2.12 method to achieve, specific reference to the F2.11, F2.12 function code description.

② When the user is querying the status monitoring parameters, he can press the ENTER DATA key to directly switch back to the normal monitoring parameter display state.

(2) Setting of function code parameters

Take the function code F2.06 changing the setting from 5.00Hz to 6.00Hz as an example for explanation. The numbers in bold in Fig.4-7 indicate the flashing bits.

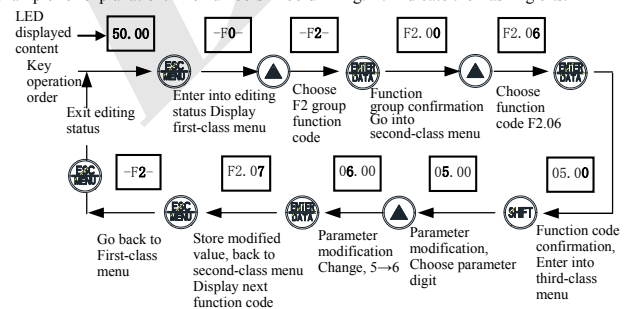


Figure 4-7 Example for parameter setting and modification

Note: In the third-level menu state, if the parameter does not flash, it means that the function code cannot be modified. The possible reasons are:

① This function code is an unmodifiable parameter, such as the actual detected status parameters, operation record parameters, etc.;

② This function code cannot be modified during operation and needs to be shut down before modification can be made;

③ Parameters are protected. When the ones digit of function code F2.13 = 1 or 2, the function code cannot be modified. This is parameter protection to avoid incorrect operations. If you want to edit function code parameters, you need to set function code F2.13 to 0 first.

⑶ Given frequency adjustment for normal operation

Take the example of changing the given frequency from 50.00Hz to 40.00Hz during operation when F0.00=1.

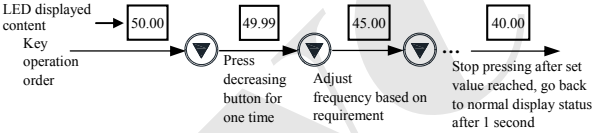


Fig.4-8 Set frequency adjustment operation example

⑷ Jog operation

Take the current running command channel as the operation keyboard and the jog running frequency 5Hz standby state as an example.

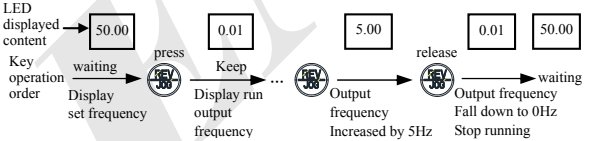


Fig. 4-9 Example of jogging operation

⑸ The operation of entering the function code editing state after setting the user password

"User password" FF.00 has been set to "6886". The bold numbers in Fig. 4-7 indicate flash positions.

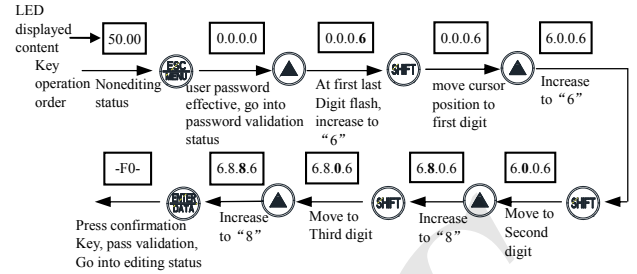


Fig.4-10 Inputting password to go into function code operation

⑹ Fault status query fault parameters:

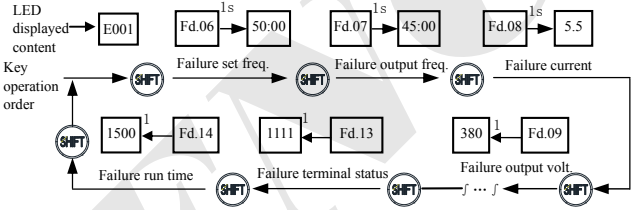


Fig.4-11 Example of fault status query operation

Description:

1> The user can query the Fd group function code parameters by pressing the SHIFT button in the fault state. The query range is from Fd.06 to Fd.14. When the user presses the SHIFT button, the LED first displays the function code number, the parameter value of the function code will be automatically displayed after 1 second.

2> When the user queries the fault parameters, he can press the ENTER DATA key to directly switch back to the fault alarm display state (E0XX)

⑺ Keyboard key lock operation

When the operation keyboard is not locked, press the ESC MENU key for five seconds to lock the keyboard. The specific keyboard is locked according to the hundred digit of the F2.13 function code.

⑻ Operation keyboard key unlock operation

When the operation keyboard is locked, press the ESC MENU key for five seconds to unlock the keyboard.

4.3 Powering on the inverter

4.3.1 Inspection before powering on

Please make wiring connections in accordance with the operating requirements provided in "Inverter Wiring" in this manual.

4.3.2 Initial power-on operation

After the wiring and power supply are checked and confirmed to be correct, turn on the AC power switch on the input side of the inverter and power on the inverter. The LED on the inverter operation keyboard displays "-EN-" and the contactor is closed normally. , when the characters displayed on the digital tube change to the set frequency, it indicates that the inverter has been initialized. The initial power-on operation process is as follows:

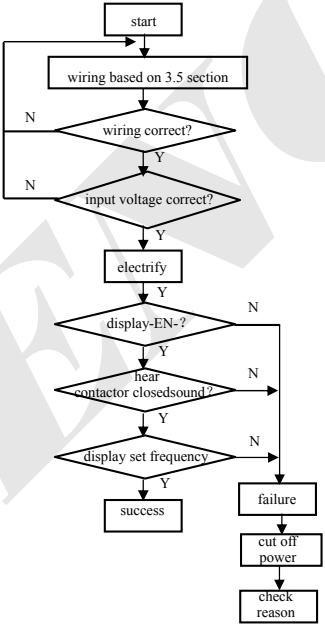


Fig. 4-12 First electrification operation flow

5 Function parameter schedule graph

5.1 Symbol description

× ---- Parameter can't be changed in process of running
○ ---- Parameter can be changed in process of running
* ---- Read-only parameter, unmodifiable

5.2 Function parameter schedule graph

F0—Basic operating function parameter group					
Function code	Name	Set range	Unit	Factory default	Modification
F0.00	Frequency input channel selection	0: Keyboard analog potentiometer setting 1: Operation keyboard number setting 2: Terminal UP/DOWN adjusts the set frequency (storage during power outage or shutdown) 3: Serial port given 4: VCI simulation setting (VCI-GND) 5: CCI simulation setting (CCI-GND) 6: Reserved 7: Terminal pulse (PULSE) setting frequency 8: Combination settings 9: Terminal UP/DOWN adjusts the set frequency (not stored in power outage or shutdown) 10: Serial port given (storage when power off) 11: Terminal PWM pulse setting frequency	1	1	○
F0.01	Frequency digital setting	Lower limit frequency ~ upper limit frequency	0.01Hz	50.00Hz	○
F0.02	Run command channel selection	0: Operation keyboard operation control 1: Terminal operation command control (operation keyboard STOP command is invalid) 2: Terminal operation command control (STOP command on the operation keyboard is valid) 3: Serial port operation command control (operation keyboard STOP command is invalid) 4: Serial port running command control (STOP command on the keyboard is valid)	1	0	○
F0.03	Running direction setting	Units place: 0: Forward rotation 1: Reverse rotation Tenth place: 0: Reverse operation allowed 1: Reverse operation prohibited Hundreds digit: panel REV/JOG key selection 0: Use the reverse command key 1: Use the jog button	1	100	○
F0.04	Acceleration and deceleration mode selection	0: Linear acceleration and deceleration mode 1: S-curve acceleration and deceleration mode	1	0	×

F0.05	S-curve starting time	10.0～50.0% (acceleration and deceleration time) F0.05+F0.06≤90%	0.1%	20.0%	○
F0.06	S-curve rising time	10.0～70.0% (acceleration and deceleration time) F0.05+F0.06≤90%	0.1%	60.0%	○
F0.07	Acceleration and deceleration time unit	0: Second 1: Minute	1	0	×
F0.08	Acceleration time 1	0.0～6000.0	0.1	20.0	○
F0.09	Deceleration time 1	0.0～6000.0	0.1	20.0	○
F0.10	upper limit frequency	Lower limit frequency～500.00Hz	0.01Hz	50.00Hz	×
F0.11	lower limit frequency	0.00～upper limit frequency	0.01Hz	0.40Hz	×
F0.12	Lower limit frequency operation mode	0: Run at the upper limit frequency 1:shutdown (PWM blocked)	1	1	×
F0.13	Torque boost cutoff frequency	0.0～100.0% (motor rated frequency)	0.1%	100.0%	○
F0.14	Torque boost	0.0～30.0%	0.1%	Determine according to model	○
F0.15	V/F curve setting	0: Constant torque curve 1: Decreasing torque curve 1 (2.0 power) 2: Decreasing torque curve 2 (1.7 power) 3: Decreasing torque curve 3 (1.2 power) 4: User-set VF curve (determined by F2.37~F2.44 function code) F2.37 VF frequency value 0 F2.38 VF voltage value 0 F2.39 VF frequency value 1 F2.40 VF voltage value 1 F2.41 VF frequency value 2 F2.42 VF voltage value 2 F2.43 VF frequency value 3 F2.44 VF voltage value 3 Note: VF frequency and voltage cannot be 0 or the maximum value	1 0.01Hz 0.01% 0.01Hz 0.01% 0.01Hz 0.01% 0.01Hz 0.01%	0 0.50Hz 2.00% 20.00Hz 38.00% 25.00Hz 48.00% 40.00Hz 80.00%	×
F0.16	Parameter upload and download (Only valid for communication keyboard)	0: No action 1: Parameter upload 2: Parameter download (without motor parameters) 3: Parameter download (with motor parameters)	1	0	×
F0.17 ~ F0.45	Reserved				

F1—Start, stop and brake function parameter group					
Function code	Name	Set range	Unit	Factory default	Modification
F1.00	Start operation mode	0: Start from starting frequency 1: Brake first and then start from the starting frequency 2:Speed tracking start	1	0	×
F1.01	Starting frequency	0.0～10.00Hz	0.01Hz	0.00Hz	○
F1.02	Starting frequency duration	0.0～20.0s	0.1s	0.0s	○
F1.03	Zero frequency DC braking voltage	0～15%	1	0	○
F1.04	Zero frequency DC braking time	0.0～20.0s	0.1s	0.0s	○
F1.05	shutdown mode	0: Deceleration to stop 1: Free stop 2: Deceleration + DC braking to stop	1	0	×
F1.06	DC braking starting frequency at shutdown	0.0～15.00Hz	0.01Hz	0.00Hz	○
F1.07	DC braking time during shutdown	0.0～20.0s	0.1s	0.0s	○
F1.08	DC braking voltage at shutdown	0～15%	1	0	○

F2—Auxiliary operation function parameter group					
Function code	Name	Set range	Unit	Factory default	Modification
F2.00	Analog filter time constant	0.000～30.000s	0.001s	0.200s	○
F2.01	Forward and reverse dead time	0.0～3600.0s	0.1s	0.1s	○
F2.02	Special function selection	Units digit: Jog priority selection 0: Highest priority 1: Lowest priority Tens digit: Keyboard adjustment display content setting 0: Display the set frequency 1: Display the set speed	1	00	○
F2.05	carrier frequency	2.0～15.0K	0.1K	Depend on device type	○
F2.06	Jogging operating frequency	0.10～200.00Hz	0.01Hz	5.00Hz	○
F2.07	Jog acceleration time	0.1～60.0s	0.1s	20.0s	○
F2.08	Jog deceleration time	0.1～60.0s	0.1s	20.0s	○

F2.09	Frequency input channel combination	0:VCI+CCI 1:VCI-CCI 2~ 5: reserved 6: External pulse reference +CCI 7: External pulse reference-CCI 8~ 12: reserved 13: Any non-zero value of VCI and CCI is valid, VCI takes precedence 14: Reserved 15:485+CCI 16:485-CCI 17:485+VCI 18:485-VCI 19: 485+ keyboard analog potentiometer 20:485-KeyboardAnalog potentiometer 21: VCI+ keyboard analog potentiometer 22: VCI-keyboard analog potentiometer 23: CCI+ keyboard analog potentiometer 24: CCI-keyboard analog potentiometer 25: VCI*QWG (keyboard analog potentiometer) 26: CCI*QWG (keyboard analog potentiometer) 27, 28: Reserved	1	0	×
F2.10	Master-slave communication frequency given ratio	0～500%	1%	100%	○
F2.11	LED display control 1	0000～1111 Units digit: running time 0: Not displayed 1: Displayed Tens digit: cumulative running time 0: Not displayed 1: Displayed Hundreds digit: input terminal status 0: Not displayed 1: Displayed Thousands digit: output terminal status 0: Not displayed 1: Displayed	1	1111	○
F2.12	LED display control 2	0000～1111 Units digit: Analog input VCI 0: Not displayed 1: Displayed Tens digit: Analog input CCI 0: Not displayed 1: Displayed Hundreds place: reserved Thousands digit: external pulse input 0: Not displayed 1: Displayed	1	1111	○
F2.13	Parameter operation control	Units place: 0: All parameters are allowed to be modified 1: Except for this parameter, all other parameters are not allowed to be modified. 2: Except for F0.01 and this parameter, all other parameters are not allowed to be modified. Tenth place: 0: No action 1: Restore factory values 2: Clear historical fault records	1	000	×

		Hundreds digit (after setting, you need to press and hold the MENU button for 5 seconds to enter the LOCC state to take effect): 0: Fully locked 1: All locked except STOP key 2: All locked except ▲ ▼ , STOP keys 3: All locked except RUN and STOP keys 4: All locked except SHIFT and STOP keys			
F2.14	Communication configuration	Units digit: baud rate selection 0:1200BPS 1:2400BPS 2: 4800BPS 3:9600BPS 4: 19200BPS 5: 38400BPS Tens digit: data format 0: 1-8-1 format, no check 1:1-8-1 format, even parity 2: 1-8-1 format, odd parity 3: 1-8-2 format, no check 4: 1-8-2 format, even parity 5: 1-8-2 format, odd parity Hundreds digit: response selection 0: Respond to host commands and reply to data packets 1: Respond to host commands, do not respond Thousands: protocol selection 0: Modbus protocol 1: Free Agreement	1	0003	×
F2.15	Local address	0~127, 0 is the broadcast address	1	1	×
F2.16	Communication timeout detection time	0.0~1000.0s, 0 communication timeout detection is invalid	0.1s	0.0s	×
F2.17	Local response delay	0～200ms	1ms	5ms	×
F2.18	Acceleration time 2	0.1～6000.0	0.1	20.0	○
F2.19	Deceleration time 2	0.1～6000.0	0.1	20.0	○
F2.20	Acceleration time 3	0.1～6000.0	0.1	20.0	○
F2.21	Deceleration time 3	0.1～6000.0	0.1	20.0	○
F2.22	Acceleration time 4	0.1～6000.0	0.1	20.0	○
F2.23	Deceleration time 4	0.1～6000.0	0.1	20.0	○
F2.24	Acceleration time 5	0.1～6000.0	0.1	20.0	○
F2.25	Deceleration time 5	0.1～6000.0	0.1	20.0	○
F2.26	Acceleration time 6	0.1～6000.0	0.1	20.0	○
F2.27	Deceleration time 6	0.1～6000.0	0.1	20.0	○
F2.28	Acceleration time 7	0.1～6000.0	0.1	20.0	○
F2.29	Deceleration time 7	0.1～6000.0	0.1	20.0	○
F2.30	Multi-band frequency 1	Lower limit frequency ~ upper limit frequency	0.01Hz	5.00Hz	○
F2.31	Multi-band frequency 2	Lower limit frequency ~ upper limit frequency	0.01Hz	10.00Hz	○
F2.32	Multi-band frequency 3	Lower limit frequency ~ upper limit frequency	0.01Hz	20.00Hz	○

F2.33	Multi-band frequency 4	Lower limit frequency ~ upper limit frequency	0.01Hz	30.00Hz	○
F2.34	Multi-band frequency 5	Lower limit frequency ~ upper limit frequency	0.01Hz	40.00Hz	○
F2.35	Multi-band frequency 6	Lower limit frequency ~ upper limit frequency	0.01Hz	45.00Hz	○
F2.36	Multi-band frequency 7	Lower limit frequency ~ upper limit frequency	0.01Hz	50.00Hz	○
F2.37	Multi-band frequency 8	Lower limit frequency ~ upper limit frequency	0.01Hz	0.50Hz	○
	VF frequency value 0	0.00～F2.39	0.01Hz	0.50Hz	○
F2.38	Multi-band frequency 9	Lower limit frequency ~ upper limit frequency	0.01Hz	2.00Hz	○
	VF voltage value 0	0.00～F2.40	0.01%	2.00%	○
F2.39	Multi-band frequency 10	Lower limit frequency ~ upper limit frequency	0.01Hz	20.00Hz	○
	VF frequency value 1	F2.37～F2.41	0.01Hz	20.00Hz	○
F2.40	Multi-band frequency 11	Lower limit frequency ~ upper limit frequency	0.01Hz	38.00Hz	○
	VF voltage value 1	F2.38～F2.42	0.01%	38.00%	○
F2.41	Multi-band frequency 12	Lower limit frequency ~ upper limit frequency	0.01Hz	25.00Hz	○
	VF frequency value 2	F2.39～F2.43	0.01Hz	25.00Hz	○
F2.42	Multi-band frequency 13	Lower limit frequency ~ upper limit frequency	0.01Hz	48.00Hz	○
	VF voltage value 2	F2.40～F2.44	0.01%	48.00%	○
F2.43	Multi-band frequency 14	Lower limit frequency ~ upper limit frequency	0.01Hz	40.00Hz	○
	VF frequency value 3	F2.41～upper limit frequency	0.01Hz	40.00Hz	○
F2.44	Multi-band frequency 15	Lower limit frequency ~ upper limit frequency	0.01Hz	80.00Hz	○
	VF voltage value 3	F2.42～100.0% (rated voltage)	0.01%	80.00%	○
F2.45	Jump frequency 1	0.00～400.00Hz	0.01Hz	0.00Hz	×
F2.46	Jump frequency 1 range	0.00～30.00Hz	0.01Hz	0.00Hz	×
F2.47	Jump frequency 2	0.00～400.00Hz	0.01Hz	0.00Hz	×
F2.48	Jump frequency 2 range	0.00～30.00Hz	0.01Hz	0.00Hz	×
F2.49	Jump frequency 3	0.00～400.00Hz	0.01Hz	0.00Hz	×
F2.50	Jump frequency 3 range	0.00～30.00Hz	0.01Hz	0.00Hz	×
F2.51	Set running time	0～65535 hours	1	0	○
F2.52	Running time accumulation	0～65535 hours	1	0	*
F2.53	Encryption time	0～65535 hours	1	0	○

F3－Closed-loop operation function parameter group					
Function code	Name	Set range	Unit	Factory default	Modification
F3.00	Closed loop operation control selection	0: Closed-loop operation control is invalid 1: PID closed-loop operation control is valid 2: Special for PID control of constant pressure water supply (one to one)	1	0	×
F3.01	Given channel selection	0: Digital given 1: VCI analog 0~10V voltage given 2: CCI simulation given 3: Keyboard analog potentiometer given	1	0	○

F3.02	Feedback channel selection	0: VCI analog input voltage 0~10V 1: CCI analog input 2:VCI+CCI 3:VCI-CCI 4: Min{VCI, CCI} 5: Max{VCI,CCI} 6: Pulse feedback	1	0	○
F3.03	Given quantity digital setting	0.000~9.999V (set F3.00=1, F3.21=9.999)	0.001V	0.200V	○
	Target pressure value setting	0.000～F3.21Mpa (set F3.00=2)	0.001 Mpa	0.200 Mpa	○
F3.04	Minimum given amount	0.0~maximum given amount; percentage relative to 10.00V	0.1%	0.0%	○
F3.05	The minimum given amount corresponds to the feedback amount	0.0～100.0%	0.1%	0.0%	○
F3.06	Maximum given amount	Minimum given amount～100.0%	0.1%	100.0%	○
F3.07	The maximum given amount corresponds to the feedback amount	0.0～100.0%	0.1%	100.0%	○
F3.08	Proportional gain Kp	0.000～9.999	0.001	0.150	○
F3.09	Integral gain Ki	0.000～9.999	0.001	0.150	○
F3.10	Differential gain Kd	0.000～9.999	0.001	0.000	○
F3.11	Sampling period T	0.01～1.00s	0.01s	0.10s	○
F3.12	Deviation limit	0.0~20.0%, relative to the percentage of the given value	0.1%	2.0%	○
F3.13	Integral separation PID threshold	0.0～100.0%	0.1%	100.0%	○
F3.14	Closed loop preset frequency	0～upper limit frequency	0.01Hz	0.00Hz	○
F3.15	Closed-loop preset frequency holding time	0.0～6000.0s	0.1s	0.0s	○
F3.16	sleep frequency threshold	0.00～400.00Hz	0.01Hz	30.00Hz	○
F3.17	Awakening pressure threshold	0.000～F3.21Mpa	0.001	0.150	○
F3.18	Sleep delay time	0.0～6000.0s	0.1s	0.0s	○
F3.19	Wake-up delay time	0.0～6000.0s	0.1s	0.0s	○
F3.20	Reserved				
F3.21	Remote pressure gauge range	0.000～9.999Mpa	0.001	1.000	○
F3.22 ~ F3.25	Reserved				
F3.26	Water supply monitoring parameter display	0: C-11 and C-12 display the voltage values of VCI and CCI. 1: C-11, C-12 display PID given pressure and feedback pressure.	1	0	○
F3.27	Closed loop regulation	0: Positive effect 1: Reverse effect	1	0	○

	characteristics				
F3.28	LED initial monitoring parameter selection	0: Set frequency 1: Output frequency 2: Output current 3: Output voltage 4: DC bus voltage 5: Motor speed 6: Radiator temperature 7: Running time 8: Accumulated running time 9: Input terminal status 10: Output terminal status 11: Analog input VCI/PID given 12: Analog input CCI/PID feedback 13: Reserved 14: External pulse input 15: PID given 16: Set speed	1	1	○
F3.39	PID feedback signal loss detection	0.0～999.9s	0.1s	0.0s	○
F3.30	Fault relay TA, TB, TC function selection	0: The inverter is running (RUN) 1: Frequency arrival signal (FAR) 2: Frequency level detection signal (FDT1) 3: Reserved 4: Overload pre-alarm signal (OL) 5: The output frequency reaches the upper limit (FHL) 6: The output frequency reaches the lower limit (FLL) 7: The inverter is shutting down due to undervoltage (LU) 8: External fault shutdown (EXT) 9: The frequency converter is running at zero speed. 10: During PLC operation 11: Simple PLC stage operation completed 12: The PLC operation cycle ends 13: Reserved 14: The inverter is ready for operation (RDY) 15: Frequency converter failure 16: Swing frequency upper and lower limits 17: Internal counter final value reached 18: The specified value of the internal counter reaches 19: Arrival of set running time 20: Internal timer arrives at scheduled time 21: Reserved 22: Forward running 23: Reverse operation in progress 24: X1 terminal closed is valid 25: X2 terminal closed is valid 26: X1 trigger output is maintained.	1	15	○

F4－Simple PLC function parameter group					
Function code	Name	Set range	Unit	Factory default	Modification
F4.00	Simple PLC operation settings	Units place: 0: No action 1: Stop after single cycle 2: Keep the final value after a single cycle 3: Continuous loop Tenth place: 0: Restart from the first paragraph 1: Continue running at the stage frequency at the time of interruption 2: Continue running at the operating frequency at the time of interruption Hundreds digit: PLC running time unit 0: seconds 1 point Thousands digit: PLC running status power-off processing method 0: No memory when power off 1: When power is off, the running status is memorized and needs to be re-run after power on (except for terminal control) 2: When power is turned off, the running status is memorized and will run automatically after power is turned on again.	1	0000	×
F4.01	Stage 1 setup	000～621 Units digit: frequency setting 0: Multi-segment frequency i (i=1～7) 1: The frequency is determined by the F0.00 function code Tens digit: running direction selection 0: Forward rotation 1: Reverse 2: Determined by the operation command Hundreds digit: acceleration and deceleration time selection 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4 4: Acceleration and deceleration time 5 5: Acceleration and deceleration time 6 6: Acceleration and deceleration time 7	1	000	○
F4.02	Phase 1 run time	0.0～6000.0	0.1	10.0	○
F4.03	Stage 2 Setup	000～621	1	000	○
F4.04	Phase 2 run time	0.0～6000.0	0.1	10.0	○
F4.05	Stage 3 setup	000～621	1	000	○
F4.06	Phase 3 run time	0.0～6000.0	0.1	10.0	○
F4.07	Stage 4 Setup	000～621	1	000	○

F4.08	Phase 4 run time	0.0～6000.0	0.1	10.0	○
F4.09	Stage 5 Setup	000～621	1	000	○
F4.10	Phase 5 run time	0.0～6000.0	0.1	10.0	○
F4.11	Stage 6 Setup	000～621	1	000	○
F4.12	Phase 6 run time	0.0～6000.0	0.1	10.0	○
F4.13	Stage 7 Setup	000～621	1	000	○
F4.14	Phase 7 run time	0.0～6000.0	0.1	10.0	○

F5－Terminal related function parameter group

Function code	Name	Set range	Unit	Factory default	Modifi-cation
F5.00	Input terminal X1 function selection	0: The control terminal is idle 1: Multi-speed control terminal 1 2: Multi-speed control terminal 2 3: Multi-speed control terminal 3 4: Multi-speed control terminal 4 5: External forward jog control 6: External reverse jog control 7: Acceleration and deceleration time selection terminal 1 8: Acceleration and deceleration time selection terminal 2 9: Acceleration and deceleration time selection terminal 3 10: External device fault input 11: External reset input 12: Free parking input 13: External shutdown command 14: Stop DC braking input command DB 15: Inverter operation prohibited 16: Frequency incremental control (UP) 17: Frequency Decrease Control (DOWN) 18: Acceleration and deceleration prohibition command 19: Three-wire operation control 20: Closed loop failure 21: PLC failure 22: Simple PLC pause operation control 23: PLC shutdown status reset 24: Frequency given channel selection 1 25: Frequency given channel selection 2 26: Frequency given channel selection 3 27: Frequency switching to CCI 28: Command switch to terminal 29: Run command channel selection 1 30: Run command channel selection 2 31: Run command channel selection 3 32: Swing frequency input 33: External interrupt input 34: Internal counter clearing end	1	0	×

		35: Internal counter trigger end 36: Internal timer clear end 37: Internal timer trigger end 38: Pulse frequency input (only valid for X5) 39: Pulse width frequency input (only valid for X5) 40: Forward running FWD terminal 41: Reverse running REV terminal 42: Externally triggered shutdown command.			
F5.01	Input terminal X2 function selection	Same as above	1	0	×
F5.02	Input terminal X3 function selection	Same as above	1	0	×
F5.03	Input terminal X4 function selection	Same as above	1	0	×
F5.04	Input terminal X5 function selection	Same as above	1	0	×
F5.05	Reserved				
F5.06	Input terminal FWD function	Same as F5.00	1	40	×
F5.07	Input terminal REV function	Same as F5.00	1	41	×
F5.08	FWD/REV operation mode selection	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Three-wire control mode 1 3: Three-wire control mode 2	1	0	×
F5.09	UP/DOWN rate	0.01～99.99Hz/s	0.01 Hz/s	1.00 Hz/s	○
F5.10	Open collector output terminal OC output setting	0: Inverter running signal (RUN) 1: Frequency arrival signal (FAR) 2: Frequency level detection signal (FDT1) 3: Reserved 4: Overload pre-alarm signal (OL) 5: The output frequency reaches the upper limit (FHL) 6: The output frequency reaches the lower limit (FLL) 7: The inverter is shutting down due to undervoltage (LU) 8: External fault shutdown (EXT) 9: The frequency converter is running at zero speed. 10: During PLC operation 11: Simple PLC stage operation completed 12: The PLC operation cycle ends 13: Reserved 14: The inverter is ready for operation (RDY) 15: Frequency converter failure 16: Swing frequency upper and lower limits 17: Internal counter final value reached 18: The specified value of the internal counter	1	0	×

		reaches 19: Arrival of set running time 20: Internal timer arrives 22: Forward running 23: Reverse operation in progress 24: X1 terminal closed is valid 25: X2 terminal closed is valid 26: X1 trigger output is maintained.			
F5.11	Function selection when DO is an ordinary multi-function output terminal	Same as F5.10	1	0	×
F5.12	Input terminal filter time	0.000～1.000s	1	0.010s	○
F5.13	Simulate the input steady state threshold	0.0～20.0%	0.1%	0.0%	○
F5.14	Frequency arrival (FAR) detection amplitude	0.00～50.00Hz	0.01Hz	5.00Hz	○
F5.15	FDT1 (frequency level) level	0.00～upper limit frequency	0.01Hz	10.00Hz	○
F5.16	FDT1 hysteresis	0.00～50.00Hz	0.01Hz	1.00Hz	○
F5.17	Analog output (AO) selection	0: Output frequency (0 ~ upper limit frequency) 1: Set frequency (0~upper limit frequency) 2: Output current (0~2×rated current) 3: Output voltage (0~1.2×load motor rated voltage) 4: Bus voltage (0~800V) 5: PID given (0.00~10.00V) 6: PID feedback (0.00~10.00V) 7～9: Reserved	1	0	○
F5.18	Analog output (AO) gain	0.00～2.00	0.01	1.00	○
F5.19	Analog Output (AO) Bias	0.00～10.00V	0.01V	0.00V	○
F5.20	Reserved				
F5.21	Reserved				
F5.22	DO terminal configuration	0: High-speed pulse output terminal 1: Ordinary multi-function output terminal	1	0	○
F5.23	Function selection when DO is a high-speed pulse output terminal	Same as F5.17	1	0	○
F5.24	DO is the maximum pulse output frequency when the high-speed pulse output terminal	0.1~20.0KHz (maximum 20KHz) DO port maximum output pulse frequency corresponds to the maximum value selected by F5.23	0.1KHz	10.0KHz	○
F5.25	Set the internal count value to reach the given	0～9999	1	0	○
F5.26	Specifies that the internal count value reaches the given	0～9999	1	0	○
F5.27	Internal timer timing settings	0.1～6000.0s	0.1	60.0s	○

F6—Swing frequency special function parameter group					
Function code	Name	Set range	Unit	Factory default	Modification
F6.00	Swing frequency function selection	0: Do not use the swing frequency function 1: Use the wobble function	1	0	×
F6.01	Swing frequency operation mode	Units digit: input method 0: Automatic investment method 1: Terminal manual input method Tenth place: 0: variable amplitude 1: Fixed swing Hundreds digit: Swing frequency stop and start mode selection 0: Restart 1: Start according to the status memorized before shutdown Thousands digit: swing frequency state storage 0: Do not store 1: Storage Note: The swing frequency center frequency input channel is set by the F0.00 function parameter.	1	0000	×
F6.02	Swing frequency amplitude	0.0～50.0%	0.1%	0.0%	○
F6.03	Kick frequency	0.0～50.0%	0.1%	0.0%	○
F6.04	Swing frequency period	0.1～999.9s	0.1s	10.0s	○
F6.05	Triangular wave rise time	0.0～98.0% (swing frequency cycle)	0.1%	50.0%	○
F6.06	Swing frequency preset frequency	0.00～400.00Hz	0.01Hz	0.00Hz	○
F6.07	Swing frequency preset frequency waiting time	0.0～6000.0s	0.1s	0.0s	○

F7—Frequency given function parameter group					
Function code	Name	Set range	Unit	Factory default	Modification
F7.00	VCI minimum given	0.00～F7.02	0.01V	0.00V	○
F7.01	VCI minimum given corresponding frequency	0.00～upper limit frequency	0.01Hz	0.00Hz	○
F7.02	VCI maximum given	0.00～10.00V	0.01V	9.9V	○
F7.03	VCI maximum given corresponding frequency	0.00～upper limit frequency	0.01Hz	50.00Hz	○
F7.04	CCI minimum given	0.00～F7.06	0.01V	0.00V	○
F7.05	CCI minimum given corresponding frequency	0.00～upper limit frequency	0.01Hz	0.00Hz	○
F7.06	CCI maximum given	0.00～10.00V	0.01V	9.9V	○
F7.07	CCI maximum given corresponding frequency	0.00～upper limit frequency	0.01Hz	50.00Hz	○
F7.08	Maximum input pulse	0.1～999.9ms (F0.00=11)	0.1ms	100.0ms	○

	width				
F7.09	Minimum given pulse width	0.0~F7.11 (maximum given pulse) (F0.00=11)	0.1ms	0.0ms	○
F7.10	Minimum given corresponding frequency	0.00～upper limit frequency	0.01Hz	0.00Hz	○
F7.11	Maximum given pulse width	F7.09 (minimum given pulse) ~ F7.08 (maximum input pulse)	0.1ms	100.0ms	○
F7.12	Maximum given corresponding frequency	0.00～upper limit frequency	0.01Hz	50.00Hz	○
F7.13	PULSE maximum input pulse	0.1～20.0K	0.1K	10.0K	○
F7.14	PULSE minimum given	0.0～F7.16 (PULSE maximum setting)	0.1K	0.0K	○
F7.15	PULSE minimum given corresponding frequency	0.00～upper limit frequency	0.01Hz	0.00Hz	○
F7.16	PULSE maximum given	F7.14 (PULSE minimum reference) ~ F7.13 (maximum input pulse)	0.1K	10.0K	○
F7.17	PULSE maximum given corresponding frequency	0.00～upper limit frequency	0.01Hz	50.00Hz	○

F8－Motor and vector control parameter group					
Function code	Name	Set range	Unit	Factory default	Modifi-cation
F8.00	control mode	0: VF control 1: Speed sensorless vector control (SVC)	1	0	×
F8.01	Motor rated voltage	1～999V	1V	Determine according to model	×
F8.02	Motor rated current	0.01~99.99A	0.01A	Determine according to model	×
F8.03	Motor rated frequency	1.00~500.0Hz	0.01Hz	Determine according to model	×
F8.04	Motor rated speed	1~9999r/min	1r/min	Determine according to model	×
F8.05	Number of motor poles	2~90	2	Determine according to model	×
F8.06	Motor rated power	0.1~5.5KW	0.1	Determine according to model	×
F8.07	Reserved				
F8.08	Motor parameter auto-tuning selection	0: No action 1: Static self-tuning of asynchronous motor 2: Asynchronous motor rotation no-load self-tuning 3: Static full tuning of asynchronous motor Note: ① Before tuning, the motor nameplate data needs to be set correctly	1	0	×

		② The motor parameter group can automatically set the default value according to the machine model settings, or it can be manually modified and self-tuning corrected. ③ After modifying the F8.06 parameter, other parameters of the motor will also be automatically set to the default values.			
F8.09	Asynchronous motor stator resistance	0.001～65.535Ω	0.001Ω	Determine according to model	×
F8.10	Asynchronous motor rotor resistance	0.001～65.535Ω	0.001Ω	Determine according to model	×
F8.11	Asynchronous motor leakage inductance	0.01～655.35mH	0.01mH	Determine according to model	×
F8.12	Asynchronous motor mutual inductance	0.1～6553.5mH	0.1mH	Determine according to model	×
F8.13	Asynchronous motor no-load current	0.01～655.35A	0.01A	Determine according to model	×
F8.14 ~ F8.18	Reserved				
F8.19	Speed loop high speed proportional gain	1～100	1	20	○
F8.20	Speed loop high speed integration time	0.01～10.00s	0.01s	1.00s	○
F8.21	Speed loop low speed proportional gain	1～100	1	30	○
F8.22	Speed loop low speed integral time	0.01～10.00s	0.01s	0.50s	○
F8.23	Speed loop parameter switching frequency 1	0.00Hz～F8.24	0.01Hz	5.00Hz	○
F8.24	Speed loop parameter switching frequency 2	F8.23 ~ upper limit frequency	0.01Hz	10.00Hz	○
F8.25	Maximum output voltage coefficient	100～120%	1%	105%	○
F8.26	Asynchronous machine excitation adjustment proportional gain	0～60000	1	2000	○
F8.27	Asynchronous machine excitation adjustment integral gain	0～60000	1	1300	○
F8.28	Asynchronous machine torque adjustment proportional gain	0～60000	1	2000	○
F8.29	Asynchronous machine torque adjustment integral gain	0～60000	1	1300	○
F8.30	Asynchronous machine	50～200%	1%	100%	○

	without speed vector slip gain				
F8.31	Reserved				
F8.32	Asynchronous machine speed feedback filter time (valid under SVC)	0.001～0.100s	0.001s	0.015s	○
F8.33	Asynchronous machine flux braking coefficient	0～300%	1%	0%	○
F8.34	Vector control stop frequency	0.00～5.00Hz	0.01Hz	0.50Hz	○
F8.35	Electric torque current limit value	0.0～250.0%	0.1%	150.0%	○
F8.36	Braking torque current limit value	0.0～250.0%	0.1%	150.0%	○
F8.37	reserve				
F8.38	V/F oscillation suppression gain	0～100	1	40	○
F8.39	V/F overexcitation gain	0～300	1	150	○
F8.40	V/F slip frequency gain	0.0～200.0%	0.1%	50.0%	×
F8.41	V/F overcurrent stall enable	0: invalid 1: valid	1	1	×
F8.42	V/F overcurrent stall action current	50～200%	1%	150%	×
F8.43	V/F overpass stall suppression gain	0～100	1	20	○
F8.44	V/F double speed over-speed stall action current compensation coefficient	50～200%	1%	50%	×
F8.45	V/F overvoltage stall enable	0: invalid 1: valid	1	1	×
F8.46	V/F overvoltage stall action voltage	100～150% (rated bus voltage)	1%	Determine according to model	×
F8.47	V/F overvoltage stall suppression frequency gain	0～100	1	30	○
F8.48	V/F overvoltage stall suppression voltage gain	0～100	1	30	○
F8.49	V/F overvoltage stall maximum rising limit frequency	0.00～50.00Hz	0.01Hz	5.00Hz	×
F8.50	Speed tracking starting frequency selection	0: Start from the stop frequency 1: Start from the power frequency 2: Start from the upper limit frequency Note: Valid in VF control mode	1	0	×
F8.51	Speed tracking speed	1～100 (Note: valid in VF control mode)	1	20	○
F8.52	Speed tracking current size	30～150% Note: Valid in VF control mode	1%	Determine according to model	×
F8.53	Demagnetization time	0.00～20.00s Note: Asynchronous machine VF and SVC	0.01s	Determine according	○

		speed tracking is valid		to model	
F8.54	Speed tracking closed-loop current KP (VF)	0～1000	1	Determine according to model	○
F8.55	Speed tracking closed-loop current KI (VF)	0～1000	1	Determine according to model	○
F8.56 ~ F8.99	Reserved				

F9—Protection related function parameter group					
Function code	Name	Set range	Unit	Factory default	Modification
F9.00	Reserved				
F9.01	Fault self-recovery times	0～10 (0 means no automatic reset function) Note: There is no automatic reset function for overload and overheating	1	0	×
F9.02	Failure self-recovery interval	0.5～20.0s	0.1s	5.0s	×
F9.03	Motor overload protection method selection	0: No action 1: Inverter blocks output	1	1	×
F9.04	Motor overload protection coefficient	20.0～300.0%	0.1%	100.0%	×
F9.05	Overload pre-alarm detection level	20～200%	1%	130%	○
F9.06	Overload warning delay time	0.0～20.0s	0.1s	5.0s	○
F9.07	Overvoltage stall gain	0～100 Note: Valid under vector	1	30	○
F9.08	Stall overvoltage point	100～150% (rated bus voltage) Note: Valid under vector	1%	Determine according to model	○
F9.09	Reserved				
F9.10	Reserved				
F9.11	Protection action selection	Units place: reserved Tens digit: Input phase loss enable 0: invalid 1: valid Hundreds digit: Output phase loss enable 0: No detection 1: Fault, free stop Thousands: reserved	1	0000	×
F9.12	Protection action selection 2	Units digit: Inverter overload selection 0: Fault, free stop 1: Use with derating Tens place: reserved	1	00	×
F9.13	Reserved				
F9.14	Non-stop function selection during	0: Prohibited 1: Bus voltage constant control	1	0	×

	momentary power outage	2: Deceleration and stop			
F9.15	Instantaneous power outage voltage recovery voltage	80～100% (rated bus voltage)	1%	85%	×
F9.16	Instantaneous power outage voltage recovery judgment time	0.0～100.0s	0.1s	0.5s	×
F9.17	Instantaneous power outage action judgment voltage	60～100% (rated bus voltage)	1%	80%	×
F9.18	Instant stop and non-stop gain Kp	0～100	1	40	○
F9.19	Instantaneous stop integral coefficient Ki	0～100	1	30	○
F9.20	Instant stop and non-stop action deceleration time	0～300.0s	0.1s	20.0s	○
F9.21 ～ F9.29	Reserved				
F9.30	Check mode	0: off 1: open	1	0	○

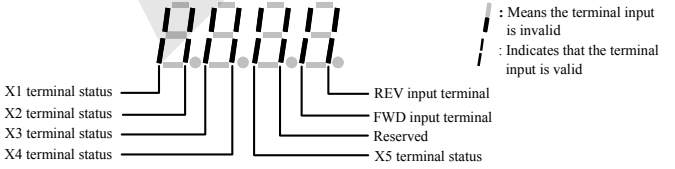
Fd—fault recording function parameter group					
Function code	Name	Set range	Unit	Factory default	Modifi-cation
Fd.00	Previous fault record	Previous fault record	1	0	*
Fd.01	Previous two fault records	Previous two fault records	1	0	*
Fd.02	Records of the first three failures	Records of the first three failures	1	0	*
Fd.03	The first four fault records	The first four fault records	1	0	*
Fd.04	Previous five fault records	Previous five fault records	1	0	*
Fd.05	Records of the first six failures	Records of the first six failures	1	0	*
Fd.06	The set frequency at the time of the previous fault	The set frequency at the time of the previous fault	0.01Hz	0	*
Fd.07	Output frequency at the time of previous fault	Output frequency at the time of previous fault	0.01Hz	0	*
Fd.08	Output current at the previous fault	Output current at the previous fault	0.1A	0	*
Fd.09	Output voltage at the time of previous fault	Output voltage at the time of previous fault	1V	0	*
Fd.10	DC bus voltage at the time of the previous fault	DC bus voltage at the time of the previous fault	1V	0	*
Fd.11	Load motor speed at the time of previous fault	Motor speed at previous fault	1(r/m)	0	*
Fd.12	Module temperature at the time of previous failure	Module temperature at the time of previous failure	1℃	0	*
Fd.13	Input terminal status at the time of previous fault	Input terminal status at the time of previous fault		0	*

Fd.14	Cumulative running time from the previous fault	Cumulative running time from the previous fault		0	*

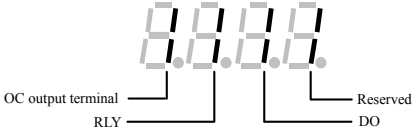
FF—Password and manufacturer function parameter group					
Function code	Name	Set range	Unit	Factory default	Modification
FF.00	user password	0000～9999	1	0000	×
FF.01	Manufacturer password	0000～9999	1	0000	×
FF.02 FF.0X	Manufacturer specific parameters				

C—Monitoring function parameter group					
Function code	Name	Set range	Unit	Factory default	Modification
C-00	Set frequency	Current set frequency	0.01Hz		
C-01	Output frequency	Current operating frequency	0.01Hz		*
C-02	Output current	Current effective value of output current	0.1A		*
C-03	The output voltage	The effective value of the current output voltage	1V		*
C-04	DC bus voltage	Current DC link voltage	1V		*
C-05	Load motor speed	Product of output frequency and load motor speed correction factor	1r/m		*
C-06	Module temperature	IGBT heat sink temperature	1℃		*
C-07	operation hours	Inverter power-on running time	1h		*
C-08	Cumulative running time	Accumulated running time of the inverter	1h		*
C-09	Input terminal status	Switch input terminal status	———		*
C-10	Output terminal status	Switch output terminal status	———		*
C-11	Analog input VCI	Analog input VCI value	V		*
C-12	Analog inputCCI	Analog input CCI value	V		*
C-13	Reserved				
C-14	External pulse input	External pulse input	0.1KHz		*

(1) The corresponding relationship between input terminal status is as follows:



(2) The corresponding relationship between output terminal status is as follows:



: Means the terminal has no output
: Indicates that the terminal has output

6 Detailed function description

List column content for parameter function code description in this chapter is as follows:

code	name	Set range or description	Factory default

6.1 Basic run function parameter group: F0

F0.00	Frequency input channel selection	Range: 0~11	1

0: Keyboard analog potentiometer setting. Set running frequency by keypad analog potentiometer.

1: Operate keypad frequency number settings. Initial value of frequency setting is F0.01. can change the set frequency by change F0.01 parameter though keypad, and you can also modify F0.01 by ▲ , ▼ .

2: Terminal UP/DOWN adjusts the set frequency (storage after power off and stop). Initial set frequency value is the value stored during the last power off time. You can adjust set running frequency by terminal UP/Down.

3: Serial port provision. : serial port frequency setting Initial value is F0.01, and the set frequency can be changed by setting F0.01 through the serial port.

4: VCI simulation setting (VCI-GND). The frequency setting is determined by VCI terminal analog voltage of the , and the input voltage range is: DC 0~10V.

5: CCI simulation setting (CCI-GND). The frequency setting is determined by the CCI terminal analog voltage/current, input range: DC 0~10V (CCI switch choose V side), DC: 0~20mA (CCI dip switch selects A side).

6: Reserved.

7: Terminal pulse (PULSE) setting frequency. Frequency set by terminal pulse (only input though X5, see the definition of F5.03 and F5.04). The input pulse signal spec: voltage range 15~28V; frequency range 0~20.0KHz.

8: Combination settings. See function parameter F2.09, set the frequency through combination settings of each channel.

9: Terminal UP/DOWN adjusts the set frequency (not stored after power off or stop). The initial value of frequency setting is F0.01. Use terminal UP/DOWN to adjust and set the operating frequency.

10: Serial port reference (storage after power off. The inverter will save the current operating frequency after power off, and will run at the saved frequency after the next power supply.

11: Terminal PWM pulse set frequency.

Note When the frequency input channel is selected as 4, 5, 6, or 7, the corresponding relation between frequency and input information is determined by function codes F7.00~F7.17, please refer to Section 6.8.

F0.01	Freq. digital setting	Range: lower limit frequency ~ high limit frequency	50.00Hz

F0.01 parameter is the original setting frequency of the inverter. When the frequency setting channel is defined as digital setting (F0.00=1, 3).

F0.02	Run command channel selection	Range: 0~4	0

0: run keypad run control. Start and stop the inverter by RUN , STOP/RESET , REV/JOG key on the keypad.

1: Terminal run command control (Keypad STOP command ineffective). Start and stop the inverter by external control terminals FWD, REV, X1~X5, etc.

2: Terminal run command control (Keypad STOP command effective). Start and stop the inverter by external control terminals FWD, REV, X1~X5, etc.

3: Serial port run command control (Keypad STOP command ineffective). Start and stop the inverter by 485 interface.

4: Serial port run command control (Keypad STOP command effective). Start and stop the inverter by 485 interface.

The inverter can change the run commend channel by modified the F0.02 during waiting and running, pls confirmed that modification is allowed during running on the sport.

F0.03	Running direction setting	Range: Unit digit: 0, 1 Tens digit: 0, 1 Hundreds digit: 0, 1	100

The Unit digit:

0: Forward run.

1: Reverse run.

The tens digit:

0: Reverse run allowed

1: Reverse run banned. The inverter will stop output when there is reverse run commend.

Hundreds digit: REV/JOG key selection

0: As REV command key.

1: As JOG key.

Note

When the tens digit of F0.03 is set to "1", it is valid for the keypad run command channel, terminal run command channel and serial port run command channel.

F0.04	Acceleration and deceleration mode selection	Range: 0, 1	0

0: Linear Acce/Dece mode. Output frequency increases or decreases according to a constant slope, Just as shown in Fig.6-1.

1: S-curve Acce/Dece mode. Output frequency increases or decreases according to an S-shaped curve, Just as shown in Fig.6-2.

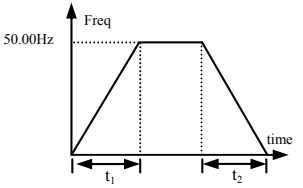


Fig.6-1 Linear Acce/Dece

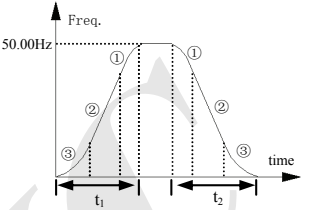


Fig.6-2 S curve Acce/Dece

F0.05	S-curve starting time	Range: 10.0～50.0%(Acce/Dece time) F0.05+F0.06≤90%	20.0%
F0.06	S-curve rising time	Range: 10.0～70.0%(Acce/Dece time) F0.05+F0.06≤90%	60.0%

F0.05 and F0.06 are only effective when S curve Acce/Dece mode(F0.04＝1) selected during Acce/Dece selection , and F0.05, F0.06≤90%.

S Curve starting time is shown as Fig.6-2③,slop of output frequency variation increases by degrees from 0.

S Curve rising time is shown as 6-2②,the slop of output frequency variation constant.

S curve ending time is shown as 6-2①, the slope of the output frequency variation step down to 0.

Note: The S-curve Acce/Dece mode is suitable for starting and stopping elevators, deferent belts, carrier transporter load etc.

F0.07	Acce/dece time unit	Range: 0,1	0

This function determines the time unit of Acce/Dece.

0: seconds.

1：Minute

Note

(1) This function is effective for all Acce/Dece processes except jog run.

(2) It is recommended to use seconds as the time unit whenever possible.

F0.08	Acce time 1	Range: 0.0～6000.0	20.0
F0.09	Dece time 1	Range: 0.0～6000.0	20.0

Acceleration time is defined as time for inverter accelerating from 0Hz to high limit frequency, see t_1 in Fig.6-3. Deceleration time is defined as time for inverter decelerating from high limit frequency to 0Hz, see t_2 in Fig.6-3.

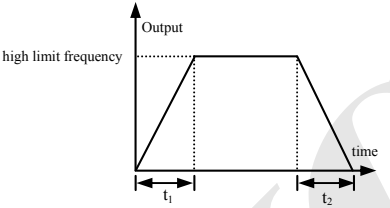


Fig.6-3 Definition of Acce/Dece time

Note

(1) EDS820 series inverter defines a total of seven kind of Acce/Dece time. Here we Only defines Acce/Dece time 1. Acce/Dece time 2~7 are defined in F2.18~F2.29. Please refer to Section 6.3.

(2) Can choose time unit minute or second for Acce/Dece times 1-7, factory defailure unit is second.

F0.10	High limit frequency	Range: low limit freq.～500.00Hz	50.00Hz
F0.11	low limit frequency	Range: 0.00～High limit frequency	0.40Hz
F0.12	Low limit freq. run mode	Range: 0, 1	1

0: Run at the High limit frequency.

1: stop running (PWM blocked).

The inverter will decrease output frequency gradually in set decelerating time When actual set frequency is lower than the low limit frequency, After reaching low limit frequency, the inverter will run at the low limit frequency if F0.12 is set to 0;the inverter will reduce the output frequency to zero frequency run if F0.12 is set to 1. At this time, the PWM is blocked and the motor is in a free running state.

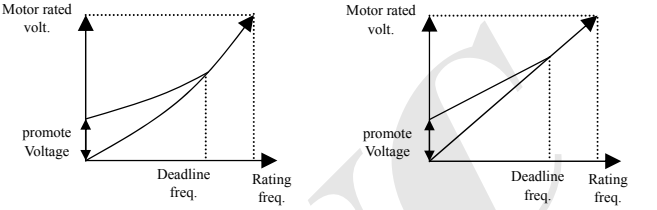
F0.13	Torque boost cutoff frequency	Range: 0.0～100.0% (motor rated frequency)	100.0%

The compensation torque decreases linearly with the output frequency from 0Hz to F0.13. When the output frequency is greater than the F0.13 frequency, the compensation torque is 0.

F0.14	Torque boost	Range: 0.0～30.0%	Depend on device type

To improve the inverter's low-frequency torque characteristics, can carry on boost compensation for output voltage. Degressive torque curve and constant torque curve torque boost are separately shown as Fig. 6-4a、b.

This parameter can be used to improve the low-frequency torque characteristics of the inverter and to increase the output voltage for compensation.



a: Degressive torque curve torque boost graph **b: Constant torque curve torque boost graph**

Fig. 6-4 torque boost graph

Note

(1) Improper setting of F0.14 torque boost can cause motor heating or over-current protection or the inability of the motor to accelerate start normally.

(2) F0.13 and F0.14 are only valid for VF control mode.

(3) When F0.14 is 0, the compensation adopts the self-adaptive mode. At this time, it is necessary to accurately obtain the F8.09 stator resistance parameter.

F0.15	V/F curve setting	Range: 0～4	0

This function codes defines EDS820 flexible V/F setting mode to satisfy different load characteristic . Can choose Four kind of fixed curves according definition of F0.15.

When F0.15=0, the V/F curve bears constant torque curve characteristic; curve 0 in Fig. 6-5.

When F0.15=1, the V/F curve bears 2.0 order power degressive torque characteristic; curve 3 in Fig.6-5.

When F0.15=2, the V/F curve bears 1.7th order power degressive torque characteristic; curve 2 in Fig.6-5.

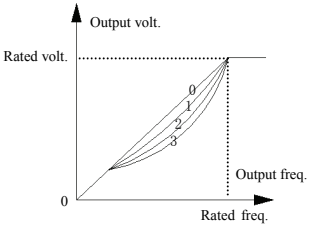
When F0.15=3, the V/F curve bears 1.2 order power degressive torque characteristic; curve 1 in Fig.6-5.

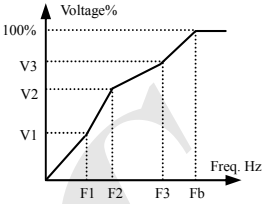
The user can choose 1、2、3 V/F curve run modes according to load characteristics to reach energy save result while the inverter is driving degressive torque load such as blower

and water pump etc.

When F0.15=4, the user can set the V/F curve by setting the parameters F2.37~F2.44.

Generally, as shown in Fig.6-5b, by setting three inflection points (V1, F1), (V2, F2), and (V3, F3), the V/F curve can be defined arbitrarily to apply to special load.





V1～V3: The 1st-3rd Voltage percentage of vf multi section

F1～F3: The 1st-3rd of multi-section VF freq. points

Fb: rated frequency

Fig.6-5 a V/F curve **b user-set the General form of V/F curve**

The bus voltage can be adjusted through this parameter to make the bus voltage detection of the frequency converter consistent with the actual situation.

F0.16	**Parameter upload and download**	**Range:0～3** (only valid for communication keypad)	**0**

0: No action.

1: Parameter upload.

2: Parameter download(without motor parameters).

3: Parameter download(with motor parameters).

F0.17 ~ F0.45	**Reserved**		

6.2 Start-up, stop and braking function parameter group: F1

F1.00	Start-up run mode	Range: 0～2	0

0: Start from the starting frequency. The inverter starts according to F1.01 stating frequency and F1.02 starting frequency holding time(F1.02).

1: First braking then starting from the starting frequency. First brake with DC braking voltage and time (F1.03, F1.04),then start at starting frequency.

2: Speed tracking start.

Note

(1) Starting mode 0: Advise the users to adopt startup mode 0 in common application.

(2) Starting mode 1: Be applicable to small inertia loads with forward run phenomena when the motor doesn't drive any device. For big inertia loads, advise not to adopt start-up mode 1.

(3) Starting method 2: Be applicable to large inertia loads starting before they come to a complete stop. It is generally used with functions such as electric off and restart, failure self-recovery and other functions. When using this starting method, please note: after the inverter coasts to a stop, you need to wait a few seconds before starting the inverter again. If an overcurrent failure occurs during the starting process, please extend the F8.53 time appropriately.

F1.01	Starting frequency	Range: 0.0～10.00Hz	0.00Hz
F1.02	Starting freq. Holding time	Range: 0.0～20.0s	0.0s

Starting frequency means the initial frequency when the inverter starts, as shown in $f_s$in Fig.6-6;starting frequency holding time means consecutive run time during which the inverter run at the starting frequency, as shown in t_1 in Fig.6-6.

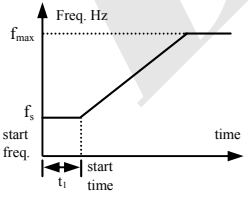


Fig.6-6 starting freq. and starting time

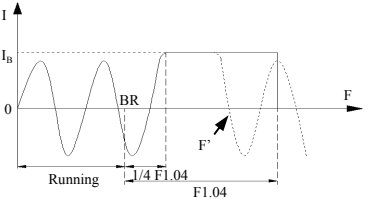


Fig.6-7 0Hz DC braking volt. and time

Note

The starting freq. is not limited by low limit frequency.

F1.03	Zero freq. DC braking volt.	Range: 0～15%	0
F1.04	Zero freq. DC braking time	Range: 0.0～20.0s	0.0s

Zero-freq. DC braking is special function for FKM(Flat knitting machine. Specific function is the inverter enters into braking states Automatically during running When the frequency is lower than F3.29 (zero freq. braking freq.), And realized continuance of current phase intelligently ,fast and smooth orientation Running if specified frequency increased Or reverse running instruction provided in the braking, The curve is shown in Fig.6-7.

(1) I_B is zero-freq. braking current. To set According to actual braking torque by Setting F1.03.

(2) BR is specified zero-freq. braking signal point, inverter enters into zero-freq. braking state automatically after 1/4 F1.04.

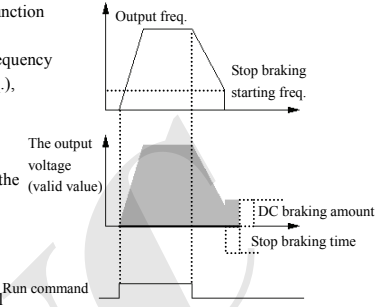


Fig. 6-8 Schematic diagram of deceleration to stop + DC braking

(3) F' is any time in braking, when specified frequency increased or reverse running instruction provided, the inverter will end zero Freq. Breaking and enter into running status. But the inverter is still running states and waiting for frequency raising instruction.

(4) After the F1.04 time, the inverter stops output and the motor is in zero-frequency runs states if there is no frequency rasing instruction nor reverse instruction.

F1.05	Stop mode	Range: 0～2	0

0: Dece. stop. Inverter reduces the output frequency gradually according to set dece. Time upon received of stop command and stops running after the frequency is reduced to 0.

1: Free stop. The inverter stop output at once when received stop command and the load stop according to mechanical inertia.

2: Dece. + DC braking to stop. The inverter reduced the output frequency according to set Dec time upon receival of stop command and start DC braking when F1.06 stop braking initiative frequency is reached .

F1.06	Stop DC braking starting freq.	Range: 0.0～15.00Hz	0.00Hz
F1.07	Stop DC braking time	Range: 0.0～20.0s	0.0s
F1.08	Stop DC braking volt.	Range: 0～15%	0

F1.08 is the percentage relative to inverter rated input volt.Have no DC braking process if stop braking time is 0.0s,As shown in Fig.6-8.

6.3 Auxiliary run function parameter group: F2

F2.00	Analog filter time constant	Range: 0.000～30.000s	0.200s

The time constant used When the inverter filter sampled value when frequency is set by exterior analog channel, can improve the situation by increasing this filtering time constant if connecting wire is long or disturbance is serious which cause unstable set frequency.

Analog filtering time constant must be larger than F3.11 (sampling cycle), otherwise the system will run unsteadily.

F2.01	FWD and REV run dead-section time	Range:0.0～3600.0s	0.1s

During process of transitions from forward run to reverse run or from reverse run to forward run, the transition time during which the inverter waits at zero output frequency , as t_1 shown in Fig.6.9.

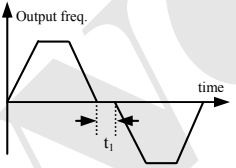


Fig.6-9 FWD and REV run dead-section time

F2.02	Special function selection	Range: units digit: 0, 1 Tens digit: 0, 1	00

Units digit: Click to select priority.

0: Highest priority

1: Lowest priority

Tens digit: keyboard to adjust display content settings.

0: Display the set frequency

1: Display the set speed

F2.05	carrier freq.	Range:2.0～15.0K	Depend on device type

Carrier frequency mainly affects the motor noise and heat consumption during running. The relation between carrier frequency and motor noise, leakage current, and disturbance is as follows:

The carrier frequency increases (↑), the motor noise decreases (↓), the motor leakage current increases (↑), and the disturbance to environment increases (↑);

The carrier frequency decreases (↓), the motor noise increases (↑), the motor leakage current decreases (↓), and the disturbance to environment decreases (↓).

Should decrease the carrier frequency properly to reduce heat consumption of the

inverter When the ambient temperature is high and the motor load is heavy, Relation of EDS820 each type and carrier frequency is as shown in Table 6-1.

Table 6-1 Relation table of device type and carrier frequency

Carrier Freq. / Device Type	Max. carrier freq. (KHz)	Min. carrier frequency (KHz)	Factory defailure (KHz)
0.2KW	15	1.0	2.0
0.4KW	15	1.0	2.0
0.75KW	14	1.0	2.0
1.5KW	13	1.0	2.0
2.2KW	13	1.0	2.0

Note

(1) To get better control characteristics, suggest that the ratio of carrier frequency to the max. run frequency of the inverter should not be lower than 36.

(2) When the carrier frequency is low, there is an error in the current display value.

F2.06	**Jog run frequency**	**Range:0.10～200.00Hz**	**5.00Hz**
F2.07	**Jog ACC time**	**Range:0.1～60.0s**	**20.0s**
F2.08	**Jog Dec time**	**Range:0.1～60.0s**	**20.0s**

Jog frequency has the been the highest priority. Under any states, The inverter would transit to run at jog frequency at once according to set jog accelerating, decelerating time as long as jog command is inputted, As shown in Fig.6-10.

Jog accelerating time means time during which the inverter accelerating from 0Hz to high limit frequency, jog deceleration time means time which the inverter deceleration from the High limit frequency to zero frequency.

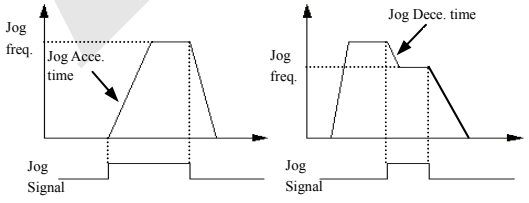


Fig. 6-10 Jog run

Note

(1) keypad, control terminals and serial port can do jog control all
(2) After the jog run command is withdrawn, the inverter will stop according to the Dece. stop mode.

F2.09	Frequency input channel combination	Range:0～28	0

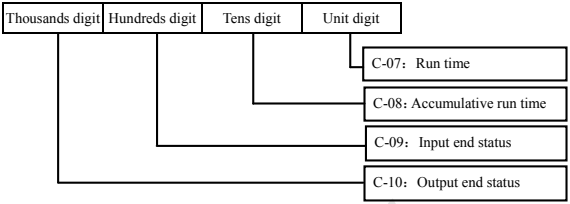
0: VCI+CCI.
1:VCI-CCI.
2～5: Reserved.
6: External pulse provision +CCI.
7: External pulse provision-CCI.
8～12: Reserved.
13: Any non-zero value of VCI and CCI is valid, VCI preferred.
14: Reserved.
15:485+CCI.
16:485-CCI.
17:485+VCI.
18:485-VCI.
19: 485+ keypad analog potentiometer.
20:485-keypad analog potentiometer.
21: VCI+ keypad analog potentiometer.
22: VCI-keypad analog potentiometer.
23: CCI+ keypad analog potentiometer.
24: CCI-keypad analog potentiometer.
25:VCI*QWG. (keypad analog potentiometer)
26:CCI*QWG. (keypad analog potentiometer)
27, 28: Reserved.

F2.10	Host & sub communication freq. Provision proportion	Range:0～500%	100%

Host & sub inverter communication freq.provision proportion,The parameter need to be set in sub inverter , the host inverter does not need to be set.

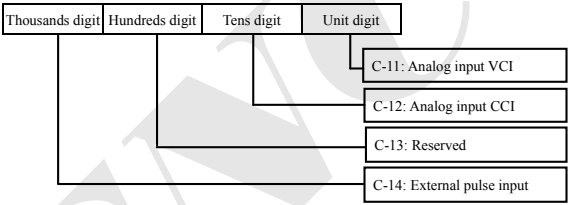
F2.11	LED display control 1	Range:0000～1111	1111

F2.11 make use of four bits of the parameter to set if C-07～C-10 is displayed in parameter group, thereinto 0 indicated not display and 1 indicates display. Set parameters of four bit is as following fig.:



F2.12	LED display control 2	Range:0000～1111	1111

F2.12 make use of 4 bit of the parameter to set if C-11~C-14 is displayed in parameter, thereinto 0 means not to display, 1 means display. The parameters set by four digits correspond to the following Fig.:



F2.13	Parameter run control	Range: units digit: 0～2 Tens digit: 0～2 Hundreds digit: 0～4	000

Units digit:

0: All parameters are allowed to be modified.

1: Except this parameter, all other parameters are not allowed to be modified.

2: Except F0.01 and this parameter, all other parameters not allowed to be modified.

Tenth digit:

0: No action.

1: Renew factory defailure.

2: Clear history failure records.

Hundreds digit(After setting , it will be valid after pressing MENU key for 5 seconds and entering into LOCC states)**:**

0: lock all buttons.

1: All the buttons locked except STOP key.

2: All the buttons locked except ▲ , ▼ key.

3: All the buttons locked except RUN and STOP keys.

4: All the buttons locked except SHIFT and STOP keys.

Note

(1) Factory defailure of this function parameter is 0. all the function parameters can bu modified. Pls first set this function code to 0 if you want to modified the function code settings, After modifying the parameters you can change this function code setting to expected protection grade if parameters protection is needed.

(2) After clearing memory information or restoring the factory parameters, the 1st bit of this function code will resume to 0.

(3) After setting the hundred digit of F2.13, press ESC for five seconds to lock the keyboard, and then the corresponding keyboard keys will be locked. If you want to unlock the keyboard, press ESC for five seconds to unlock the keyboard.

F2.14	**Communication deployment**	**Range: units digit:0～5 Tens digit:0～5 Hundreds digit:0, 1 Thousands digit: 0, 1**	**0003**

F2.14 uses the ones, tens and hundreds digits to set the baud rate and data format of serial communication. The Unit digit of the LED represents the communication baud rate. The setting values are as follows:

0:1200BPS
1:2400BPS
2: 4800BPS
3:9600BPS
4: 19200BPS
5: 38400BPS

Tens digit: data format.

0: 1-8-1 format, no checkout. Namely: 1 bit for starting, 8 bits for date, 1 bit for stop, no checkout.

1: 1-8-1 format, even checkout. Namely: 1 bit for starting, 8 bits for date, 1 bit for stop, even checkout.

2: 1-8-1 format, odd checkout. Namely: 1 bit for starting, 8 bits for date, 1 bit for stop, odd checkout.

3: 1-8-2 format, no checkout. Namely: 1 bit for starting, 8 bits for date, 1 bit for stop, no checkout.

4: 1-8-2 format, even checkout. Namely: 1 bit for starting, 8 bits for date, 1 bit for stop, even checkout.

5: 1-8-2 format, odd checkout. Namely: 1 bit for starting, 8 bits for date, 1 bit for stop, odd checkout.

Hundreds digit: response selection:

0: Respond to host commands and reply to data packets.

1: Respond to host commands, but not reply.

Thousands digit: protocol selection

0: Modbus protocol.

1: Free protocol.

F2.15	Local address	Range:0～127, 0 is the broadcast address	1

In serial port communication, this function code is used to identify the address of this inverter. When set to 0, the inverter only receives not send.

0 is the broadcast address. Are only received and execute broadcast commands from high machine, but not respond to the high machine.

F2.16	Communication overtime checkout time	Range:0.0～1000.0s,0 means Communication timeout detection invalid	0.0s

When serial port communication fails and its continue time exceeds the setting value of this function code, the inverter judge it as communication failure.

When the setting value is 0, the inverter does not detect the serial port communication signal, that is, this function is invalid.

F2.17	Local response delay time	Range:0～200ms	5ms

Local response delay time represents the time within which the inverter serial port receive and execute command from high device and then respond to high device,this function is just used for setting this delay time.

F2.18	Acceleration time 2	Range:0.1～6000.0	20.0
F2.19	Deceleration time 2	Range:0.1～6000.0	20.0
F2.20	Acceleration time 3	Range:0.1～6000.0	20.0
F2.21	Deceleration time 3	Range:0.1～6000.0	20.0
F2.22	Acceleration time 4	Range:0.1～6000.0	20.0
F2.23	Deceleration time 4	Range:0.1～6000.0	20.0
F2.24	Acceleration time 5	Range:0.1～6000.0	20.0
F2.25	Deceleration time 5	Range:0.1～6000.0	20.0
F2.26	Acceleration time 6	Range:0.1～6000.0	20.0
F2.27	Deceleration time 6	Range:0.1～6000.0	20.0
F2.28	Acceleration time 7	Range:0.1～6000.0	20.0
F2.29	Deceleration time 7	Range:0.1～6000.0	20.0

Three acceleration and deceleration times can be defined, and the acceleration and deceleration time 1～7 during the run of the inverter can be selected through different combinations of control terminals, please refer to F5.00～F5.04 Definition of acceleration and deceleration time terminal function.

Note

Acce. and Dece.time 1 is defined in F0.08 and F0.09.

F2.30	**Multi-step freq.1**	**Range: Low limit freq.～high limit freq.**	**5.00Hz**
F2.31	**Multi-step freq.2**	**Range: Low limit freq.～high limit freq.**	**10.00Hz**
F2.32	**Multi-step freq.3**	**Range: Low limit freq.～high limit freq.**	**20.00Hz**
F2.33	**Multi-step freq.4**	**Range: Low limit freq.～high limit freq.**	**30.00Hz**
F2.34	**Multi-step freq. 5**	**Range: Low limit freq.～high limit freq.**	**40.00Hz**
F2.35	**Multi-step freq. 6**	**Range: Low limit freq.～high limit freq.**	**45.00Hz**
F2.36	**Multi-step freq. 7**	**Range: Low limit freq.～high limit freq.**	**50.00Hz**
F2.37	**Multi-step freq. 8**	**Range: Low limit freq.～high limit freq.**	**0.50Hz**
	VF freq. value 0	**Range: 0.00～F2.39**	**0.50Hz**
F2.38	**Multi-step freq. 9**	**Range: Low limit freq.～high limit freq.**	**2.00Hz**
	VF voltage value 0	**Range:0.00～F2.40**	**2.00%**
F2.39	**Multi-step freq.10**	**Range: Low limit freq.～high limit freq.**	**20.00Hz**
	VF freq. value 1	**Range: F2.37～F2.41**	**20.00Hz**
F2.40	**Multi-step freq.11**	**Range: Low limit freq.～high limit freq.**	**38.00Hz**
	VF freq. value 1	**Range: F2.38～F2.42**	**38.00%**
F2.41	**Multi-step freq.12**	**Range: Low limit freq.～high limit freq.**	**25.00Hz**
	VF freq. value 2	**Range: F2.39～F2.43**	**25.00Hz**
F2.42	**Multi-step freq.13**	**Range: Low limit freq.～high limit freq.**	**48.00Hz**
	VF freq. value 2	**Range: F2.40～F2.44**	**48.00%**
F2.43	**Multi-step freq.14**	**Range: Low limit freq.～high limit freq.**	**40.00Hz**
	VF freq. value 3	**Range:F2.41～high limit freq.**	**40.00Hz**
F2.44	**Multi-step freq.15**	**Range: Low limit freq.～high limit freq.**	**80.00Hz**
	VF voltage value 3	**Range: F2.42～100.0%**(rated voltage)	**80.00%**

This function parameter table is a composite parameter definition. Two function definitions cannot be used at the same time. The details are as follows:

When F0.15=4, F2.37～F2.44 are the V/F curve setting. For detailed function

description, please refer to F0.15.

When F0.15≠4, F2.37～F2.44 can be used in multi-speed frequency and simple PLC run mode, please refer to F5.00~Multi-speed run in F5.04 Terminal function and F4 group simple PLC function.

F2.45	**Jump freq. 1**	**Range:0.00～400.00Hz**	**0.00Hz**
F2.46	**Jump freq.1 range**	**Range:0.00～30.00Hz**	**0.00Hz**
F2.47	**Jump freq. 2**	**Range:0.00～400.00Hz**	**0.00Hz**
F2.48	**Jump freq. 2 range**	**Range:0.00～30.00Hz**	**0.00Hz**
F2.49	**Jump freq. 3**	**Range:0.00～400.00Hz**	**0.00Hz**
F2.50	**Jump freq. 3 range**	**Range:0.00～30.00Hz**	**0.00Hz**

F2.45～F2.50 function is set to make the output frequency of the inverter avoid the resonance frequency of mechanical load.

Inverter set frequency can jump around certain frequency points as shown in Fig.6-11, at most 3 jump ranges can be defined.

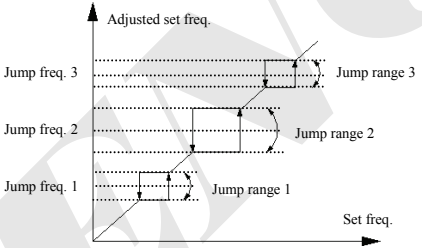


Fig.6-11 Jumping frequency and range graph

F2.51	**Set run time**	**Range:0～65535 hours**	**0**
F2.52	**Run time accumulation**	**Range:0～65535 hours**	**0**

After the accumulated running time reaches the set running time (F2.51), the inverter can output an indication signal. Please refer to the function introduction of F5.10.

F2.52 denotes accumulative running time of the inverter from leaving factory to now.

F2.53	**encryption time**	**Range:0～65535 hours**	**0**

When F02.53 is larger than 1, encryption time valid. When the accumulated running time (F2.52) exceeds time defined by F02.53, the inverter will stop in the shutdown mode, and the keyboard will display A-53, which must be decrypted before the inverter can be started again.

6.4 Closed-loop run function parameter: F3

Analog feedback control system:

Input pressure specified value through VCI port ,send 0~20mA feedback value of pressure sensor to inverter CCI input port . An analog closed-loop control system is formed through the built-in PID adjustor, as shown in Fig.6-12.

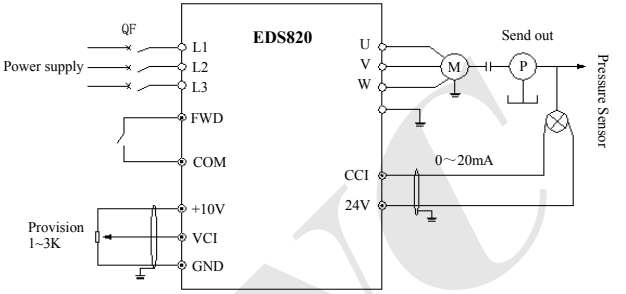


Fig.6-12 Schematic diagram of built-in PID analog feedback control system

Note Special value can also be provided with option by F0.00 function code.

EDS820 built-in PID regulator make up of control system and its work principle chart is as follows:

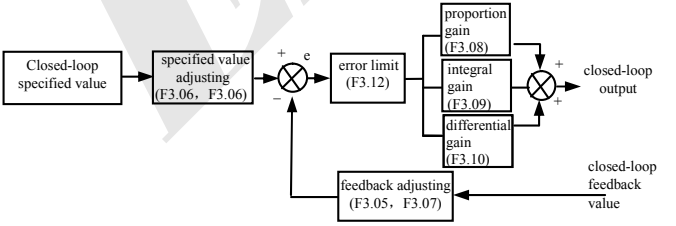


Fig. 6-13 PID control principle diagram

In the above fig., Kp: proportional gain; Ki: integral gain; differential gain. The definitions of the closed-loop provision amount, feedback amount, deviation limit and proportional integral parameters in Fig. 6-13 have the same meaning as ordinary PID

adjustment. See (F3.01~ F3.12) Definition, the relation between the provision quantity and the expected feedback quantity is shown in Fig. 6-14. The provision value is based on 10V, and the feedback value is based on 20mA.

The purpose of the provision quantity adjustment and feedback quantity adjustment in Fig. 6-13 is to determine the corresponding relation between the provision and feedback quantities and their mutually unified dimensions.

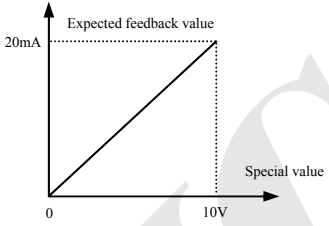


Fig. 6-14 specified value and expected feedback value

When the system is determined, basic steps for setting closed-loop parameters are as follows:

⑴ Determine the closed-loop provision and feedback channels (F3.01, F3.02).

⑵ Need to set the relation between closed loop provision and feedback for analog closed loop(F3.04～F3.07).

⑶ Set the closed-loop preset frequency function (F3.14, F3.15).

⑷ Set proportional gain, integral gain, differential gain, sampling period, and error limit (F3.08～F3.12).

F3.00	Closed loop run control selection	Range:0～2	0

0: Closed-loop run control is invalid.

1: PID closed-loop run control is valid.

2: Constant pressure water supply PID control Specialized(one to one).

F3.00=1, when ordinary PID regulation, the deviation is within the deviation limit, No PID calculation ,keep stable output .

F3.00=2, constant pressure water supply regulation, when the deviation is within the deviation limit and the operating frequency is above the sleep frequency, it is energy-saving run, and the output frequency is reduced to 3Hz/Min. If the deviation is within the deviation limit and the operating frequency is lower than or equal to the sleep frequency, it will drop to 0Hz after the sleep delay time and run in the sleep state. When feedback pressure is less than revive pressure, After the time of revive delay, the inverter will run according to PID regulation.

F3.01	Provision channel selection	Range:0～3	0

0: digital provision.

1: VCI simulates 0~10V voltage provision.

2: CCI analog provision. Can choose 0~10V voltage or 0~20mA current **provision**.

3: Keyboard analog potentiometer provision.

F3.02	Feedback channel selection	Range:0～6	0

0: VCI analog input voltage 0~10V.

1: CCI analog input.

2:VCI+CCI.

3: VCI-CCI.

4: Min{VCI,CCI}.

5: Max{VCI,CCI}.

When the CCI analog input is selected to be current input, it will be voltage value in the inverter.

6: Pulse feedback.

F3.03	Specified value digital setting	Range: 0.000～9.999V	0.200V
	Target pressure value setting	Range: 0.000～F3.21Mpa	0.200Mpa

When F3.00=1, Fig. provision value F3.03 will be as specified value of the closed-loop control system directly. At this time, please set F3.21 to 9.999V;

When F3.00=2, Start PID control constant pressure water supply. At this point, the water supply system F3.03 will becomes the target pressure value , High limit is F3.21Mpa.

F3.04	Min specified value	Range:0.0~Max specified value	0.0%
F3.05	Corresponding feedback value of min. Specified value	Range: 0.0~100.0%	0.0%
F3.06	Maximum provision amount	Range: minimum provision amount～100.0%	100.0%
F3.07	The maximum provision amount corresponds to the feedback amount	Range: 0.0~100.0%	100.0%

F3.04～F3.07 define relation curve of analog closed-loop provision and expected feedback. The set value is the percentage of the actual value of the provision and feedback physical quantity relative to the reference value (10V or 20mA).

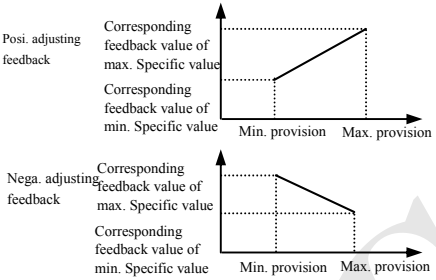


Fig. 6-15 Provision and feedback curves

F3.08	**Proportional gain Kp**	**Range:0.000～9.999**	**0.150**
F3.09	**Integral gain Ki**	**Range: 0.000～9.999**	**0.150**
F3.10	**Differential gain Kd**	**Range: 0.000～9.999**	**0.000**
F3.11	**Sampling cycle T**	**Range: 0.01～1.00s**	**0.10s**

The more big Kp proportional gain is, the more quick the response is. But overing is prone to bringing surge.

Only adjusting the proportional gain Kp cannot completely eliminate the deviation. In order to eliminate the residual deviation, the integral gain Ki can be used to form a PID control. The larger Ki is, the faster it will respond to changing deviations, but if it is too large, it will easily produce oscillations.

sampling cycle T is the sampling cycle for feedback value. During each sampling cycle PID adjuster calculate for one time. The larger the sampling cycle is, the slower the response.

F3.12	**offset limit**	**Range:0.0～20.0%**	**2.0%**

For max. Offset of closed-loop special value, as shown in Fig. 6-16, when the feedback amount is within this range, the PID regulator stops adjusting. To utilize this function reasonably redound to harmonizing the conflict between system output the accuracy and stability .

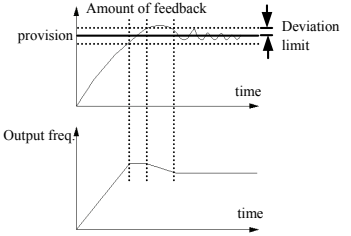


Fig.6-16 Offset limit

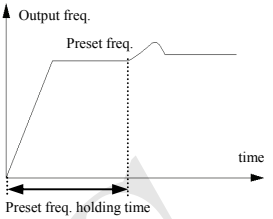


Fig.6-17 Closed-loop preset freq. run

F3.13	Integral separation PID threshold	Range:0.0～100.0%	100.0%

Integral separation PID. Integral don't react When specified value and feedback value are bigger than this limit, only when specified value and feedback value are smaller than or equal to this limit , the integral react. Can Adjust system's response speed By adjusting this parameter.

F3.14	Closed loop preset frequency	Range:0～high limit freq.	0.00Hz
F3.15	Closed-loop preset frequency holding time	Range: 0.0～6000.0s	0.0s

This function can make the closed-loop adjustment enter into stable phase quickly.

After closed-loop run started, the inverter first accelerates to the closed-loop preset frequency F3.14 according to the acceleration time, and continues to run at this frequency point for a period of time F3.15 before running according to the closed-loop characteristics. As shown in Fig.6-17.

Note

Set preset freq.and holding time to 0 if closed loop present freq. Function is not needed.

F3.16	sleep frequency threshold	Range:0.00～400.00Hz	30.00Hz
F3.17	Revival frequency threshold	Range: 0.000～F3.21Mpa	0.150

Revival frequency defines the frequency limit from sleep states to work state . When the set frequency is greater than this limit and the wake-up delay time is delayed, the set frequency is greater than this limit and the inverter enters the work from the sleep state. state.

The sleep frequency defines the frequency limit for the system to enter the sleep state from the working state. When the set frequency is less than this limit and the sleep delay time is delayed, the set frequency is less than this limit and the inverter enters the sleep state

from the working state.

This function can realize sleep function and make energy-saving run possible, and avoid inverter starting of the inverter at the threshold frequency.

F3.18	Sleep delay time	Range:0.0～6000.0s	0.0s

This parameter is to sets delay time when entering into sleep function. EDS820 will stop running if the output frequency is lower than the sleep frequency and holding time longer than this sleep delay time.

F3.19	Revival delay time	Range:0.0～6000.0s	0.0s

This parameter is sets delay time for entering into revival function.

F3.20	Reserved		

F3.21	Long distance manometer range	Range: 0.000～9.999Mpa	1.000

Set this parameter to correspond to 10V or 20mA.

F3.22 ～ F3.25	Reserved		

F3.26	Water supply supervision para. display	Range: 0, 1	0

0: C-11 and C-12 display the voltage values of VCI and CCI.

1: C-11, C-12 display PID specified pressure and feedback pressure.

F3.27	Closed loop adjusting characteristics	Range: 0, 1	0

0: Forward effect. motor speed increase as specified value increase.

1: Reverse function. motor speed decrease as specified value decrease.

F3.28	LED initial supervision para. selection	Range: 0～16	1

This parameter defines initial supervision parameter selection during running or stop. For example, if F3.28=3,LED initially displays the value of the output voltage. If you want to see other monitoring parameters, press the SHIFT key.

0: Set frequency. In standby mode, the frequency is set, and after run, the output frequency is displayed.

1: Output frequency. The output frequency is displayed in both standby and running states.

2: Output current.

3: Output voltage.

4: DC bus voltage.

5: Motor speed.

6: Radiator temperature.
7: Running time.
8: Accumulated running time.
9: Input terminal status.
10: Output terminal status.
11: Analog input VCI/PID provision.
12: Analog input CCI/PID feedback.
13: Reserved.
14: External pulse input.
15: PID given.
16: Set speed

F3.29	PID feedback signal loss detection	Range: 0.0～999.9s	0.0s

PID feedback signal loss detection: When F3.29=0.0, the PID feedback signal loss detection and protection function is invalid; when F3.29 is not zero, the feedback signal is ＜12.5% provision value and the duration is >F3.29, that is, the feedback is judged The signal is lost to prevent damage to the equipment. The failure code is displayed as E017.

F3.30	failure relay TA, TB, TC function selection	Range: 0～26	15

Table 6-2 Function selection of failure relays TA, TB and TC

Item	Corresponding function	Item	Corresponding function
0	The inverter is running (RUN)	13	Reserved
1	Frequency Arrival Signal (FAR)	14	The inverter is ready for run (RDY)
2	Frequency level detection signal (FDT1)	15	Inverter failure
3	Reserved	16	Traverse frequency High and lower limits
4	Overload warning signal (OL)	17	Internal counter final value arrive
5	Output freq. reach High limit (FHL)	18	Interior counter final value reached
6	Output freq.y reaches low limit (FLL)	19	set running time Arrival
7	Inverter stops for under voltage (LU)	20	Internal timer arrives regularly
8	Stop for External failure (EXT)	21	Reserved
9	The inverter zero speed running	22	Forward running
10	During PLC process	23	REV running
11	Simple PLC segment run finished	24	X1 terminal closed is valid
12	PLC finish one cycle run	25	X2 terminal closed is valid
-	-	26	X1 trigger output is maintained.

The functions listed in Table 6-2 are introduced as follows:

0: The inverter during running (RUN). The inverter is in running state and outputs indication signals.

1: Frequency arrival signal (FAR). Refer to the function description of F5.14.

2: Frequency level detection signal (FDT1). Refer to the function description of F5.15 and F5.16.

3: Reserved.

4: Overload warning signal (OL). When the output current of the frequency converter exceeds the F9.05 overload detection level and the time is greater than the F9.06 overload detection time, an indication signal is output.

5: Output frequency reaches the high limit (FHL). When the set frequency ≥ high limit frequency and the operating frequency reaches the high limit frequency, an indication signal is output.

6: Output frequency reaches the lower limit (FLL). When the set frequency ≤ lower limit frequency and the operating frequency reaches the lower limit frequency, an indication signal is output.

7: Inverter stop for under voltage blockage(LU). When the inverter is running, LED displays "P.O FF" and an output indicator signal if DC bus-bar voltage lower than limitative level.

8: External failure shutdown (EXT). When an external failure trip alarm (E014) occurs in the frequency converter, an indication signal is output.

9: Inverter is running at zero speed. The output frequency of the inverter is 0, but it outputs an indication signal when it is running.

10: PLC run process

11: Simple PLC segment run finished. After simple PLC current segment run is finished, output indicator signal (single pulse signal, width 500ms)

12: The PLC finished one cycle run.

13: Reserved.

14: The inverter is ready for run (RDY). If the signal output is valid, it means that the bus voltage of the inverter is normal, the run prohibition terminal of the inverter is invalid, and the starting command can be accepted.

15: Inverter failure. If a failure occurs during the run of the frequency converter, an indication signal will be output.

16: high and lower limits of Traverse frequency. After selecting the Traverse frequency function, if the frequency fluctuation range of the Traverse frequency calculated based on the center frequency exceeds the high limit frequency F0.10 or is lower than the lower limit frequency F0.11, an indication signal will be output, as shown in Fig. 6-18.

17: The final value of the internal counter is reached. Refer to F5.25 function description.

18: The specified value of the internal counter is reached. Refer to F5.26 function description.

19: The set running time is reached. When the cumulative running time of the frequency converter (F2.52) reaches the set running time (F2.51), an indication signal is output.

20: Internal timer arrives at scheduled time. Refer to F5.27 function description.
21: Reserved.
22: In forward rotation.
23: Reverse run in progress.
24: X1 terminal closed is valid.
25: X2 terminal closed is valid.
26: X1 trigger output is maintained.

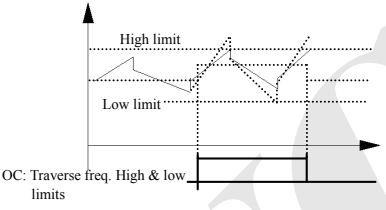


Fig. 6-18 Traverse range restriction

6.5 Simple PLC run function parameter group: F4

The user can set by himself the output frequency direction and running time of the inverter within an run cycle by simple PLC function according to spot craft demand, as shown in Fig. 6-19.

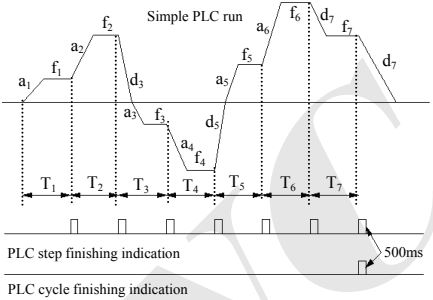


Fig. 6-19 Simple PLC run diagram

The simple PLC run function of EDS820 series inverter provides 7 multi-speed run modes. The following takes 7-speed as an example. In Fig. 6-20, a_1～a_5, d_1～$d_5$are the acceleration and deceleration times of the current stage. , set by a total of 7 parameters including acceleration and deceleration time parameters F0.08, F0.09 and F2.18～F2.29, f_1～f_7, T_1～T_7The operating frequency and operating time referred to are set by function codes F4.01～F4.14.

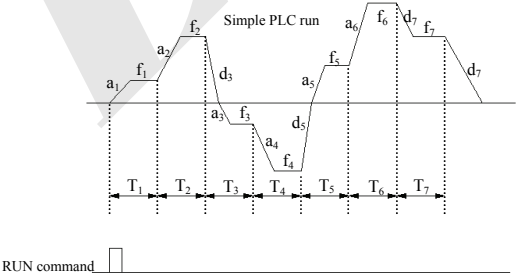


Fig. 6-20 Stop after PLC single cycle

PLC Step finishing and cycle finishing indication can be realized by outputing 500mS pulse indication signal through the open circuit collector terminal OC. Detailed function defined by F5.10.

F4.00	**Simple PLC run settings**	**Range: units: 0～3** **Tens digit: 0～2** **Hundreds digit: 0, 1** **Thousands digit: 0～2**	**0000**

The function code make uses of its 1st bit ,2nd bit, 3rd bit to set the PLC run mode, the PLC re-run mode after interruption, set run time unit, detail as follows:

Units digit:

0: No action. The PLC run mode is ineffective.

1: Stop after single cycle. As shown in Fig.6-20, the inverter stop automatically after finishing a cycle can only start when another run command is available.

2: Keep final value after single cycle. As shown in Fig.6-21, after completing a cycle, the frequency converter automatically maintains the operating frequency and direction of the last segment until a stop command is input, and the frequency converter stops with the set deceleration time.

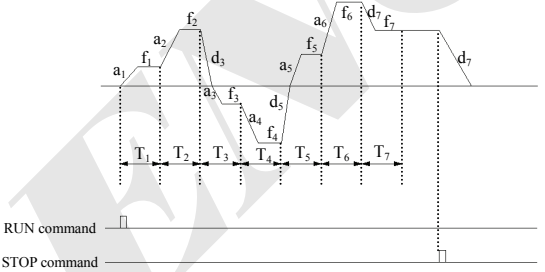


Fig. 6-21 PLC holding mode after single cycle

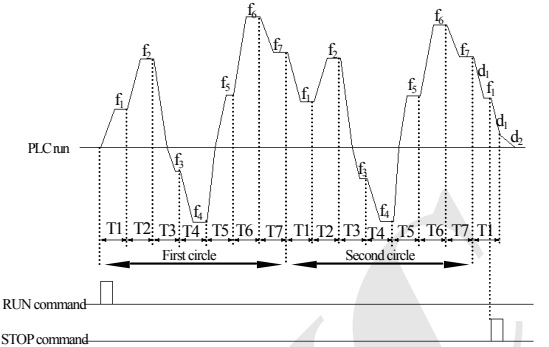


Fig.6-22 PLC consecutive cycle mode

3: Consecutive circle. As shown in Fig.6-22, the inverter starts next cycle automatically after finishing a circle,until there is a stop command.

Tenth digit:

0: start from the first step. stopped during running caused by a stop command, failure or power off,after restarting the inverter will run from first step.

1: Continue to run from step frequency of interruption moment. When stopped during running caused by a stop command or failure, the inverter automatically records the running time of the current stage, automatically enters this stage after restarting, and continues to run for the remaining time at the frequency defined in this stage, as shown in Fig. 6-23. In case of power failure, the inverter will restart from the first stage when restarted.

2: Continue running from the run frequency of interruption moment. When stopped during run caused by a shutdown command or failure, the inverter not only automatically records the running time of the current stage but also records the operating frequency at the time of shutdown. After restarting, it first returns to the operating frequency at the time of shutdown and continues the run in the remaining stages, such as As shown in Fig. 6-24.

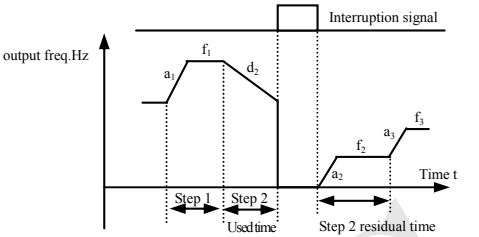


Fig. 6-23 PLC starting mode 1

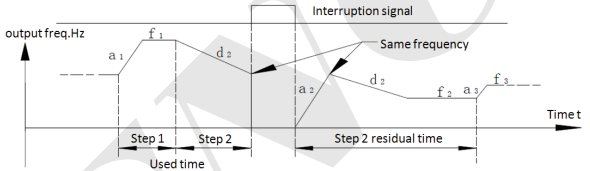


Fig. 6-24 PLC starting mode 2

Hundreds digit: PLC running time unit.

0: Seconds.

1: Minute.

This unit is only effective to PLC run step time. The acceleration and deceleration time of PLC run period, their unit selection is determined by F0.07.

Thousands digit: PLC running status power-off processing method.

0: power off no memory .

1: When power is off, the run status is memorized. It needs to be run again after power on (except for terminal control). It will not start automatically after power on. It memorizes the number of segments, speed and running time that the simple PLC was running before the power was turned off. After the power is turned on again, the status at the time of the power off is automatically read, but it does not run directly (except for the control command in terminal mode), and the running command needs to be provision again.

2: When power is turned off, the operating status is memorized, and it will run automatically after power is turned on again. Memorize the number of segments, speed and

running time that the simple PLC was running before the power was cut off. After the power is turned on again and it is normal, it will start running directly from the state at the time of the power off, without giving running instructions again.

Note

(1) When the running time of a certain section of the PLC is set to zero, the section is invalid.
(2) The PLC process can be paused, disabled, run, etc. controlled through the terminals. Please refer to Group F5 for details.

F4.01	**Stage 1 setting**	**Range: 000～621**	**000**
F4.02	**Phase 1 run time**	**Range: 0.0～6000.0**	**10.0**
F4.03	**Stage 2 setting**	**Range: 000～621**	**000**
F4.04	**Phase 2 run time**	**Range: 0.0～6000.0**	**10.0**
F4.05	**Stage 3 setting**	**Range: 000～621**	**000**
F4.06	**Phase 3 run time**	**Range: 0.0～6000.0**	**10.0**
F4.07	**Stage 4 setting**	**Range: 000～621**	**000**
F4.08	**Phase 4 run time**	**Range: 0.0～6000.0**	**10.0**
F4.09	**Stage 5 setting**	**Range: 000～621**	**000**
F4.10	**Phase 5 run time**	**Range: 0.0～6000.0**	**10.0**
F4.11	**Stage 6 setting**	**Range: 000～621**	**000**
F4.12	**Phase 6 run time**	**Range: 0.0～6000.0**	**10.0**
F4.13	**Stage 7 setting**	**Range: 000～621**	**000**
F4.14	**Phase 7 run time**	**Range: 0.0～6000.0**	**10.0**

F4.01～F4.14 utilize LED 1ST bit ,2nd bit , 3rd bit to separately define frequency setting, direction and accelerating decelerating time of PLC run,see following for detail:

Units digit: frequency setting.

0: Multi-segment frequency i=1～7 is defined by F2.30～F2.44.

1: The frequency is determined by the F0.00 function code.

Tens digit: running direction selection.

0: forward run

1: Reverse run

2: Determined by the run command.

Hundreds digit: acceleration and deceleration time selection.

0: Acceleration and deceleration time 1.

1: Acceleration and deceleration time 2.

2: Acceleration and deceleration time 3.
3: Acceleration and deceleration time 4.
4: Acceleration and deceleration time 5.
5: Acceleration and deceleration time 6.
6: Acceleration and deceleration time 7.

6.6 Terminal correlative function parameter group: F5

F5.00	**Input terminal X1 function selection**	**Range: 0～42**	**0**
F5.01	**Input terminal X2 function selection**	**Range: 0～42**	**0**
F5.02	**Input terminal X3 function selection**	**Range: 0～42**	**0**
F5.03	**Input terminal X4 function selection**	**Range: 0～42**	**0**
F5.04	**Input terminal X5 function selection**	**Range: 0～42**	**0**
F5.05	**Reserved**		
F5.06	**Input terminal FWD function**	**Range: 0～42**	**40**
F5.07	**Input terminal REV function**	**Range: 0～42**	**41**

Multi-function input terminals X1~X5 provide 43 kinds of selection methods for the user, can choose based on spot requirement. See 6-3 for parameter function list.

Table 6-3 Multi-function input selection table

Item	Corresponding function	Item	Corresponding function
0	Leave control terminal unused	22	Simple PLC pause run control
1	Multi-speed control terminal 1	23	PLC stop state restoration(reset the variables of PLC interruption moment make it can restart from first segment)
2	Multi-speed control terminal 2	24	Frequency provision channel selection 1
3	Multi-speed control terminal 3	25	Frequency provision channel selection 2
4	Multi-speed control terminal 4	26	Frequency provision channel selection 3
5	External forward jog control	27	Frequency switch to CCI
6	External reverse jog control	28	Command switch to terminal
7	Acce. & Dece. time selection terminal 1	29	Run command channel select 1
8	Acce. & Dece. time selection terminal 2	30	Run command channel select 2
9	Acce. & Dece. time selection terminal 3	31	Run command channel select 3
10	External device failure input	32	Traverse frequency input
11	External reset input	33	External interrupt input
12	free stop input	34	Internal counter clear end
13	External shutdown command	35	Internal counter trigger end
14	Stop DC braking input command DB	36	Internal timer clear terminal
15	Inverter run prohibited	37	Internal timer trigger end
16	Frequency incremental control (UP)	38	Pulse frequency input (valid for X5 only)
17	Frequency Decrease Control (DOWN)	39	Pulse width frequency input(only for X5)
18	Acce. & Dece. prohibition command	40	Forward running FWD terminal
19	Three-wire run control	41	Reverse run REV terminal
20	Closed loop failure	42	Externally triggered shutdown command.
21	PLC failure	-	-

Explain listed function in table 6-3 as follows:

1～4: Multi-speed running terminal. Can set 15 step speed fun frequency by choosing ON/OFF (on/off) combination of these functions

Table 6-4 Multi-step run selection table

K_4	K_3	K_2	K_1	Frequency setting
OFF	OFF	OFF	OFF	Common run frequency
OFF	OFF	OFF	ON	Multi-step frequency 1
OFF	OFF	ON	OFF	Multi-step frequency 2
OFF	OFF	ON	ON	Multi-step frequency 3
OFF	ON	OFF	OFF	Multi-step frequency 4
OFF	ON	OFF	ON	Multi-step frequency 5
OFF	ON	ON	OFF	Multi-step frequency 6
OFF	ON	ON	ON	Multi-step frequency 7
ON	OFF	OFF	OFF	Multi-step frequency 8
ON	OFF	OFF	ON	Multi-step frequency 9
ON	OFF	ON	OFF	Multi-step frequency 10
ON	OFF	ON	ON	Multi-step frequency 11
ON	ON	OFF	OFF	Multi-step frequency 12
ON	ON	OFF	ON	Multi-step frequency 13
ON	ON	ON	OFF	Multi-step frequency 14
ON	ON	ON	ON	Multi-step frequency 15

The above multi-step frequency can be used when using multi-step run and simple PLC run. Pls see below an example of multi-step run:

The control terminals X1, X2, X3, and X4 are defined as follows:

After set F5.00=1, F5.01=2, F5.02=3, F5.03=4, X1, X2, X3 and X4 are used to realized multi-step run, as shown in Fig.6-25.

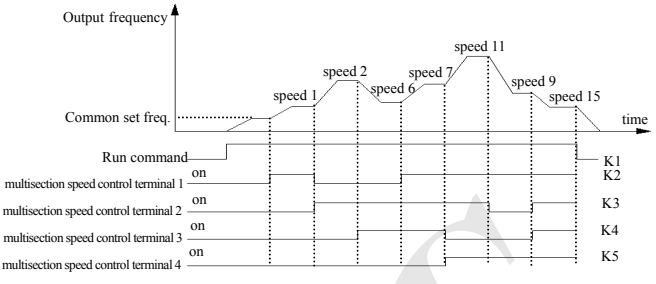


Fig.6-25 Multi-step speed run

In Fig.6-26, see an example of terminal run command channel. Can made forward, revere run control by K_5,K_6 In Fig.6-25, by different logical combinations of K_1, K_2, K_3, K_4, the inverter can run according to common set frequency or multi-step frequencies based on above table.

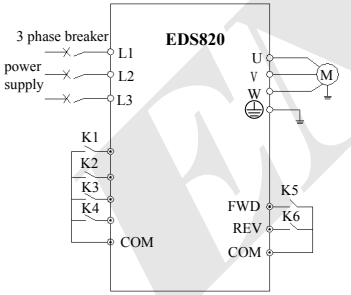


Fig.6-26Multi-step speed run

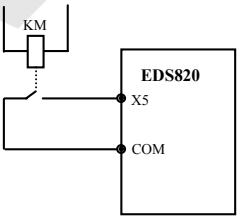


Fig.6-27 External device failure always open input

5～6: External jog run control input JOGF/JOGR. When run command channel is set to terminal run command channel F0.02=1, JOGF is jogging forward run, JOGR is jogging reverse running, and the jogging running frequency and jogging Acce. and Dece. time are between F2.06 and F2. defined in 08. (Note: Jog run command channel is determined by F0.02).

7～9: Acce. and Dece. time terminal selection

Table 6-5 Accel. and Dece. time terminal selection logic mode

Terminal 3	Terminal 2	Terminal 1	Dece.and Acce. time selection
OFF	OFF	OFF	Acce. time 1/Dece. time 1
OFF	OFF	ON	Acce. time 2/Dece. time 2
OFF	ON	OFF	Acce. time 3/Dece. time 3
OFF	ON	ON	Acce. time 4/Dece. time 4
ON	OFF	OFF	Acce. time 5/Dece. time 5
ON	OFF	ON	Acce. time 6/Dece. time 6
ON	ON	OFF	Acce. time 7/Dece. time 7

Can realized selection for Acce. and Dece. time 1-7 by ON/OFF combination of Acce. and Dece. time terminal

10: External equipment failure input. Can input failure signal of the external equipment by this terminal to be convenience for the inverter to monitor failure of the external equipment. the inverter displays "E0.14",namely external equipment failure alarm receiving the external equipment failure signal.

11: External restoration input. After the failure alarm take digit in the inverter, can be restore the inverter through this terminal. Its function is same as function of STOP RESET key on the run panel.

12: Free stop input. This function has is same as the free running stop defined in F1.05, but it is realized by control terminal to be convenience for long distance control.

13: External stop command. This command is effective for all running command channels. when this function terminal is effective, the inverter will stop running in mode set by F1.05.

14: DC injection braking input command DB during stop. Implement DC braking injection braking to the motor during the stop by control terminal. The braking starting frequency and braking time are defined in F1.06 and F1.07.

15: Inverter run prohibited. When this terminal is effective to all running inverter will coast to stop, and starting is prohibited in the standby state. Mainly used in situations where safety linkage is required.

16, 17: Frequency increase control UP/decrease control DOWN. The frequency can be increased or decreased through the control terminal, instead of operating the keyboard for remote control. Valid when F0.00=2 in normal run. The acceleration and deceleration rate is set by F5.09.

18: Acce. and Dece. Speed forbidden command. let the motor not effected by any foreign signals (except stop commands) and keep running at current frequency.

Note

Ineffective during normal deceleration and stop.

19: Three-wire run control. Refer to the function description of F5.08 run mode (three-wire run mode).

20: Closed loop ineffective. Realize flexible switch to lower level run mode under closed-loop run states.

Note

(1) Can switch between closed-loop and low-level RUN modes only during closed-loop run (F3.00=1).
(2) Start-stop control direction and acceleration and deceleration time are subject to settings of the corresponding run mode. When it's switching to low-level run mode.

21: PLC fineffective. Realize flexible switching between PLC running state and low-level run mode.

Note

(1) Can switch between PLC and low-level run mode Only during PLC run (F4.00≠0) .
(2) Start-stop control, direction and Acce. and Dece. time are subject to settings of the corresponding run mode when it's switched to low-level run mode.

22: Simple PLC pause run control. Implement pause control to PLC process during the running. Run at zero frequency when this terminal is effective, not time for PLC run; after ineffective implement automatic speed track start and continue PLC running. For application, please see F4.00~F4.14 function description

23: PLC stop status restoration. Using stop state of PLC run mode, will clearly PLC running step, running time, frequency etc. Recorded when PLC run stops if this terminal is effective . Please see Group F4 function description.

24～26: Terminal frequency provision channel selection. Through ON/OFF combination of frequency provision channel switch shown in Table 6-6.For relation of terminal switching and function code F0.00 setting, that is, latter effective.

Table 6-6 Terminal frequency provision channel selection logic mode

Frequency provision channel selection end 3	Frequency provision channel selection end 2	Frequency provision channel selection end 1	Frequency provision channel selection
OFF	OFF	OFF	Hold Freq. setting maintained
OFF	OFF	ON	Potentiometer provision
OFF	ON	OFF	Keyboard number provision
OFF	ON	ON	Terminal UP/DOWN adjustment provision
ON	OFF	OFF	Serial port provision

ON	OFF	ON	VCI
ON	ON	OFF	CCI
ON	ON	ON	Terminal PULSE provision

27: Switches Frequency to CCI. When this function terminal is valid, the frequency provision channel is forced to switch to CCI provision. After this function terminal is invalid, the frequency provision channel returns to its original state.

28: Command switches to terminal. When this function terminal is valid, the running command channel is forced to switch to the terminal running command channel.

29～31: Terminal select running command channel

Table 6-7 Run command channel Logical mode

Run command channel Select terminal 3	Run command channel Select terminal 2	Run command channel Select terminal 1	Run command channel
OFF	OFF	OFF	Hold Run command channel
OFF	OFF	ON	Keypad run command channel
OFF	ON	OFF	End run command channel (The keypad STOP command ineffective)
OFF	ON	ON	End run command channel (keypad STOP command effective)
ON	OFF	OFF	Serial port run command channel (Keypad STOP command is ineffective)
ON	OFF	ON	Serial port run command channel (keypad STOP command effective)

Can realized control command selection shown in Table 6-7 by ON/OFF combination of run command channel selection terminal. For relation of terminal switching and function code F0.02 setting is effective later.

32: Traverse jump-in. When the Traverse frequency starting mode is manual input, the Traverse frequency function is valid when this terminal is valid. See the function parameter description of Group F6.

33: Exterior interrupt input. During the run of the frequency converter, after receiving an external interrupt signal, the output is blocked and runs at zero frequency. Once the external interrupt signal is released, the inverter automatically starts speed tracking and resumes run.

34: Internal counter clearing end. Clear the built-in counter of the frequency converter and use it with the counter trigger signal input.

35: Internal counter trigger end. The counting pulse input port of the built-in counter, the maximum pulse frequency: 200Hz, see function codes F5.24 and F5.25.

36: Internal timer clear end. Clear the timer built into the frequency converter and use it with the timer trigger signal input.

37: Internal timer trigger end. See parameter F5.27 function description.

38: Pulse frequency input (only valid for X5). Only effective for multi-function input terminal X5. This function terminal accepts pulse signal as frequency reference. For the relation between the input signal pulse frequency and the set frequency, please refer to the parameters of group F7 for details.

39: Pulse width frequency input (only effective for X5).

40: FWD terminal for forward run.

41: REV terminal for reverse run

42: Externally triggered shutdown command.

F5.08	FWD/REV run mode selection	Range: 0～3	0

This parameter defines four kinds of external terminals control mode for inverter running .

0: Two-wire control mode 1.

K2	K1	run command
0	0	stop
1	0	reverse run
0	1	forward run
1	1	stop

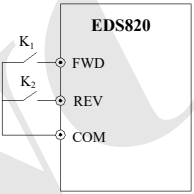


Fig. 6-28 Two-wire run mode 1

1: Two-wire control mode 2.

K2	K1	run command
0	0	stop
1	0	stop
0	1	forward run
1	1	reverse run

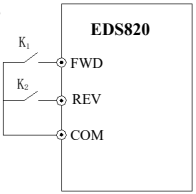


Fig. 6-29 Two-line run mode 2

2: Three-wire control mode 1.

There in:
SB1: Stop button
SB2: forward run button
SB3: reverse run button

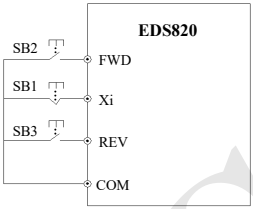
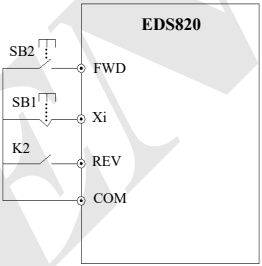


Fig.6-30 Three-wire run mode 1

Xi is the multi-function input terminal of X1～X5,here should define its corresponding terminal function as No.19 “3 wire run control” function.

3: Three-wire control mode 2

SB1: Stop button
SB2: Run button



K2	Running direction selection
0	Forward run
1	Reverse run

Fig.6-31 Three-wire run mode 2

Xi is the multi-function input terminal of X1～X5,here should define its corresponding terminal function as No.19 “3 wire run control” function

The inverter restores after failure and start at once if run command channel selection terminal and the terminal FWD/REV is effective during warning alarm stop.

F5.09	UP/DOWN speed	Range: 0.01～99.99Hz/s	1.00Hz/s

This function code defines the change rate of the set frequency modified by the UP/DOWN terminal.

F5.10	**Open collector output terminal OC output setting**	**Range: 0~26**	**0**
F5.11	**Function selection when DO is an ordinary multi-function output terminal**	**Range: 0~26**	**0**
F5.12	**Input terminal filter time**	**Range: 0.000～1.000s**	**0.010s**

OC and DO (when F5.22=1) are open collector output terminals. Table 6-8 shows the options for the above four function parameters, allowing the same output terminal function to be selected repeatedly.

Table 6-8 Output terminal function selection table

Item	Corresponding function	Item	Corresponding function
0	inverter running signal (RUN)	13	Reserved
1	Frequency Arrival Signal (FAR)	14	Inverter is ready for run (RDY)
2	Freq. level detecting signal(FDT1)	15	Inverter failure
3	Reserved	16	Traverse high & low limit restriction
4	Overload warning signal (OL)	17	Interior counter final value arrive
5	Output freq. reaches the high limit (FHL)	18	The internal counter specified value is reached
6	Output freq. reaches the lower limit (FLL)	19	set running time arrive
7	Inverter is stops for under voltage blockage(LU)	20	Internal timer arrives regularly
8	Stop for External failure (EXT)	21	Reserved
9	The inverter is running at zero speed	22	Forward running
10	During PLC run	23	Reverse run in progress
11	Simple PLC stage run finished	24	X1 terminal is valid when closed
12	PLC finish one cycle run	25	X2 terminal is valid when closed
-	-	26	X1 trigger output is maintained.

The functions listed in Table 6-8 are introduced as follows:

0: Inverter during running (RUN). The inverter is in running state and outputs indication signals.

1: Frequency arrival signal (FAR). Refer to the function description of F5.14.

2: Frequency level detecting signal (FDT1). Refer to function description of F5.15 and F5.16.

3: Reserved

4: Overload warning signal (OL). When the output current of the frequency converter exceeds the F9.05 overload detection level and the time is greater than the F9.06 overload detection time, an indication signal is output.

5: The output frequency reaches high limit (FHL). When the set frequency ≥ high limit frequency and the operating frequency reaches the high limit frequency, an indication signal is output.

6: The output frequency reaches low limit (FLL). When the set frequency ≤ lower limit frequency and the operating frequency reaches the lower limit frequency, an indication

signal is output.

7: The frequency converter is shutting down due to under voltage (LU). During the run of the inverter, when the DC bus voltage is lower than the limit level,, the LED displays "P.O FF" and an indication signal is output.

8: Stop for External failure (EXT). When the inverter give the alarm (E014) and stops for exterior failure, output indicator signal.

9: inverter zero speed running when the inverter output is 0, but in run states,output indicator signal.

10: PLC is run process

11: simple PLC segment run finished. After simple PLC current segment run is finished ,output indicator signal (single pulse signal, width 500ms)

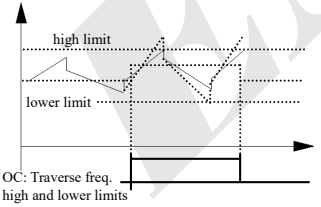
12: The PLC finished one cycle run

13: Reserved.

14: The inverter is ready for run (RDY). If the signal output is effective, it means that the bus voltage of the frequency converter is normal and run prohibition terminal is ineffective, and the inverter can receive start-up command .

15: inverter failure. If a failure occurs during the run of the frequency converter, an indication signal will be output.

16: Traverse High and low limits restriction. After choosing Traverse function, if the frequency fluctuation range based on the center frequency of traverse is above high limit frequency F0.10 or under low limit frequency F0.11, the inverter will be output indicator signal, as shown in Fig.6-32.



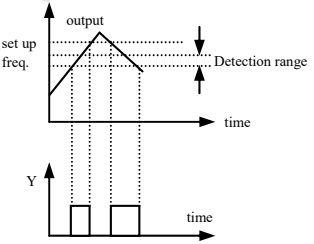


Fig.6-32 Traverse range restriction **Fig.6-33 Freq. Arriving signal output**

17: Internal counter final value arrive. Refer to F5.25 function description.

18: Internal counter specified value arrive. Refer to F5.26 function description.

19: Set run time arrive. When accumulative runtime of the inverter (F2.52) reaches set runtime (F2.51), output indication signal.

20: Interior timer timing arrive. Refer to function description for F5.27 .

22: In forward rotation.

23: Reverse run in progress.
24: X1 terminal is closed and effective.
25: X2 terminal is closed and effective.
26: X1 trigger output is maintained.

F5.13	Simulate the input steady state threshold	Range: 0.0～20.0%	0.0%

The larger the parameter setting, the larger the change of CCI and VCI input is required before the response can be performed.

F5.14	Freq. arrival (FAR) detect range	Range: 0.00～50.00Hz	5.00Hz

This parameter is a supplementary definition of function No. 1 in Table 6-8. As shown in Fig. 6-33, when the output frequency of the frequency converter is within the positive and negative detection width of the set frequency, output pulse signal.

F5.15	FDT1 (freq. level) electric level	Range: 0.00～high limit frequency	10.00Hz
F5.16	FDT1 hysteresis	Range: 0.00～50.00Hz	1.00Hz

F5.15 and F5.16 are functions No. 2 in Table 6-8 the supplementary definition is introduced as follows: When the output freq. exceeds at a certain set frequency (FDT1 level), the indication signal is output signal until the output frequency drops below the FDT1 level a certain frequency (FDT1 level-FDT1 lag), As shown in Fig. 6-34.

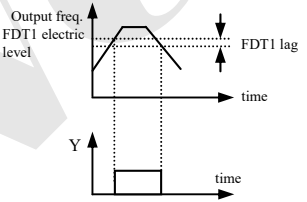


Fig.6-34 Freq. level detecting

F5.17	Analog output (AO) selection	Range: 0～9	0

0: Output frequency (0～high limit frequency).
1: Set frequency (0～high limit frequency).
2: Output current (0～2×rated current).
3: Output voltage (0～1.2×rated voltage of load motor).
4: Bus-bar voltage (0～800V).
5: PID provision (0.00～10.00V).
6: PID feedback (0.00～10.00V).
7～9: Reserved.

F5.18	Analog output (AO) gain	Range: 0.00～2.00	1.00
F5.19	Analog Output (AO) Bias	Range: 0.00～10.00V	0.00V

For AO analog output, if the user needs to change the display range or correct the meter error, it can be achieved by adjusting the output gain .

F5.20	Reserved		
F5.21	Reserved		

F5.22	DO terminal configuration	Range: 0, 1	0

0: High-speed pulse output terminal.

1: Ordinary multi-function output terminal.

F5.23	Function selection when DO is a high-speed pulse output terminal	Range: 0～9	0

Same as F5.17 function parameter description.

F5.24	DO max. pulse output freq. when the high-speed pulse output terminal	Range: 0.1～20.0KHz (maximum 20KHz)	10.0KHz

The DO port max. output pulse frequency corresponds to max. value optioned by F5.23, such as 0:output frequency, then maximum output pulse frequency corresponds to high limit frequency.

F5.25	Set internal count value to reach the provision	Range: 0～9999	0
F5.26	Specifies internal count number arriving provision	Range: 0～9999	0

F5.25 and F5.26 are supplementary definitions to No. 17 and 18 functions in Table 6-8.

Set count number provision, show that when some number of pulse are inputted to Xi (counting trigger signal input function terminal), and OC (open collector output terminal) outputs an indication signal.

As shown in Fig.6-35, when Xi inputs the 8th pulse, OC outputs an indication signal. At this time F5.25=8.

The specified count value refers to how many pulses are input from Xi, and Yi outputs an indication signal until the set count value is reached.

As shown in Fig. 6-35, when Xi inputs the fifth pulse, TA, TB, and TC start to output an indication signal. Until the set count value 8 is reached. At this time, F5.26=5. When the specified count value is greater than the set count value, the specified count value is invalid.

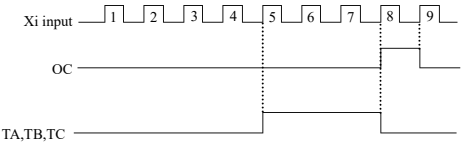


Fig. 6-35 Sett count number and specified count value provision

F5.27	Internal timer timing settings	Range: 0.1～6000.0s	60.0s

This parameter is used to set the timing time of the internal timer of the frequency converter. The starting of the timer is completed by the external trigger terminal of the timer (the trigger terminal is selected by parameters F5.00~F5.04). It starts from the reception of the external trigger signal. Timing, after the timing time is up, a valid pulse signal with a width of 0.5 seconds is output at the corresponding OC terminal.

6.7 Traverse special function parameter group: F6

F6.00	Traverse function selection	Range:0, 1	0

0: Do not use the Traverse frequency function.

1: Use the wobble function.

F6.01	Traverse run mode	Range: units digit:0, 1 Tens digit: 0, 1 Hundreds digit: 0, 1 Thousands digit: 0, 1	0000

Units digit: input method.

0: Automatic jump-in mode. After starting, it first runs at the Traverse frequency preset frequency for a period of time, and then automatically enters Traverse frequency run.

1: Terminal manual run mode. When the multi-function terminal Xi (Xi=X1~X5, FWD, REV) is defined as function 32 is valid, it enters the Traverse frequency state; when it is invalid, it exits the Traverse frequency state and the operating frequency remains at the Traverse frequency preset frequency.

Tenth digit:

0: variable amplitude. The Traverse amplitude AW changes with the center frequency, and its change rate is defined in F6.02.

1: Fixed Traverse. The Traverse AW is determined by the high limit frequency and F6.02.

Hundreds digit: Traverse stop and start mode selection.

0: Restart.

1: Start according to the status memorized before shutdown.

Thousands digit: Traverse state storage.

0: Do save.

1: Save.

F6.02	Traverse amplitude	Range: 0.0～50.0%	0.0%

Changing amplitude: AW=center frequency×F6.02

Fixed amplitude: AW = high limit frequency × F6.02

Note

The Traverse run frequency is restricted by the high and low limits; if set improperly, the Traverse frequency will not work properly.

F6.03	Sudden jumping freq.	Range: 0.0～50.0%	0.0%

As shown in Fig. 6-36, if this parameter is set it to 0 ,no jump frequency

F6.04	Traverse cycle	Range: 0.1～999.9s	10.0s

Whole time for cycle Define the time of a complete cycle of the Traverse frequency rising and falling process.

F6.05	Triangular wave rise time	Range: 0.0~98.0%(referring to the Traverse frequency period)	50.0%

Define the running time of the rising stage of the Traverse frequency = F6.04×F6.05 (s), and the running time of the falling stage = F6.04×(1-F6.05) (s). Please see the description in Fig. 6-38.

F6.06	Traverse frequency preset frequency	Range: 0.00～400.00Hz	0.00Hz
F6.07	Traverse frequency preset frequency waiting time	Range: 0.0～6000.0s	0.0s

F6.06 is used to define the operating frequency of the inverter before entering the Traverse frequency run state.

When the automatic start mode is selected, F6.07 is used to set the duration of run at the Traverse frequency preset frequency before entering the Traverse frequency state; when the manual start mode is selected, the F6.07 setting is invalid. See description in Fig. 6-36.

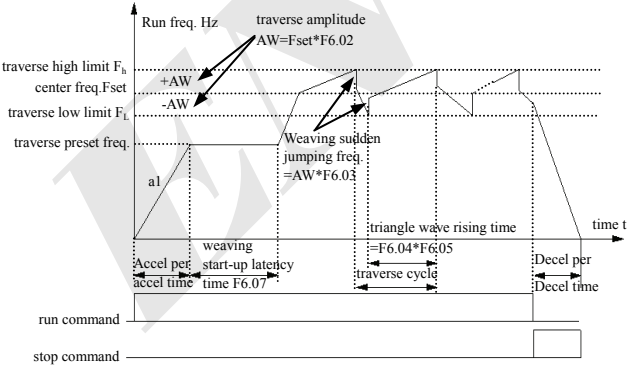


Fig. 6-36 Traverse frequency diagram

6.8 Frequency provision function parameter group: F7

F7.00	**VCI minimum provision**	**Range: 0.00～F7.02**	**0.00V**
F7.01	**corresponding freq.VCI minimum provision**	**Range: 0.00～high limit freq.**	**0.00Hz**
F7.02	**VCI maximum provision**	**Range: 0.00～10.00V**	**9.9V**
F7.03	**VCI maximum provision corresponding frequency**	**Range: 0.00～high limit freq.**	**50.00Hz**
F7.04	**CCI minimum provision**	**Range: 0.00～F7.06**	**0.00V**
F7.05	**CCI minimum provision corresponding frequency**	**Range: 0.00～high limit freq.**	**0.00Hz**
F7.06	**CCI maximum provision**	**Range: 0.00～10.00V**	**9.9V**
F7.07	**CCI maximum provision corresponding freq.**	**Range: 0.00 ~ high limit freq.**	**50.00Hz**
F7.08	**Maximum input pulse width**	**Range: 0.1～999.9ms**(F0.00=11)	**100.0ms**
F7.09	**Minimum provision pulse width**	**Range: 0.0～F7.11**(Maximum provision pulse) (F0.00=11)	**0.0ms**
F7.10	**Minimum provision corresponding freq.**	**Range: 0.00～high limit freq.**	**0.00Hz**
F7.11	**Maximum provision pulse width**	**Range: F7.09 (minimum provision pulse)～F7.08 (maximum input pulse)**	**100.0ms**
F7.12	**Maximum provision corresponding freq.**	**Range: 0.00～high limit freq.**	**50.00Hz**

When choose F0.00=11(terminal pulse setting frequency).the function of above parameter effective.

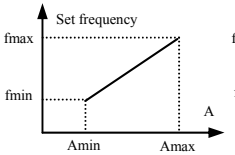
Pulse width is measured milliseconds. The freq. of input pulse width will affect the accuracy of the output frequency. to ensure the accuracy of the output frequency, it is recommended that customers use a pulse width frequency between 1Hz and 100Hz.

Please don't use this function for strict frequency control purposes.

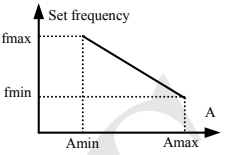
F7.13	**PULSE max. input pulse**	**Range: 0.1～20.0K**	**10.0K**
F7.14	**PULSE minimum provision**	**Range: 0.0～F7.16 (FULSE maximum setting)**	**0.0K**
F7.15	**PULSE minimum provision corresponding frequency**	**Range: 0.00～high limit freq.**	**0.00Hz**
F7.16	**PULSE maximum provision**	**Range: F7.14 (PULSE min. reference)～F7.13 (max. input pulse)**	**10.0K**
F7.17	**PULSE maximum provision corresponding freq.**	**Range: 0.00～high limit freq.**	**50.00Hz**

F2.00 sets the analog channel filter time constant to filter the input signal. The longer the filter time, the stronger the anti-interference ability, but the response speed becomes slower. The more short the filter time is, the more fast the response speed, but anti-jamming ability is weak.

The relation curve of VCI and set frequency is below:



(1)Plus characteristics

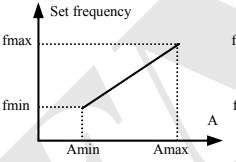


(2)Minus characteristics

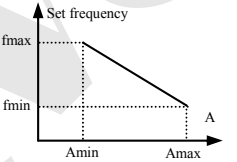
A: VCI provision
Amin: Min.provision
Amax: Max.provision

fmin: corresponding Min.provision freq.
fmax: corresponding Max.provision freq.

The relation curve of CCI and set frequency is below:



(1)Plus characteristics

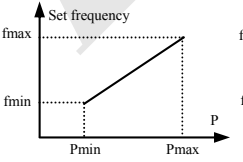


(2) Minus characteristics

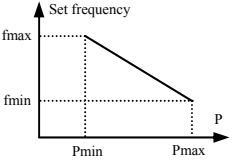
A: CCI provision
Amin: Min. provision
Amax:Max. provision

fmin:corresponding Min.provision freq.
fmax:corresponding Max.provision freq.

The relation curve of PULSE and set frequency is below:



(1)Plus characteristic



(2) Minus characteristic

A: End PULSE provision
Pmin:Min. provision
Pmax:Max. provision

fmin:corresponding Min.provision freq.
fmax:corresponding Max.provision freq.

6.9 Motor and vector control function parameter group: F8

F8.00	**control mode**	**Range: 0, 1**	**0**
F8.01	**Motor rated voltage**	**Range: 1～999V**	**Depend on device type**
F8.02	**Motor rated current**	**Range: 0.01～99.99A**	**Depend on device type**
F8.03	**Motor rated frequency**	**Range: 1.00～500.0Hz**	**Depend on device type**
F8.04	**Motor rated speed**	**Range: 1～9999r/min**	**Depend on device type**
F8.05	**Number of motor poles**	**Range: 2～90**	**Depend on device type**
F8.06	**Motor rated power**	**Range: 0.1～5.5KW**	**Depend on device type**

In order to ensure safe run of the frequency converter, please set the above parameter function codes according to the nameplate data of the motor actually driven by the frequency converter.

F8.08	**Motor parameter auto-tuning selection**	**Range: 0～3**	**0**

0: No action.

1: Static self-tuning of asynchronous motor.

When the motor cannot be disconnected from the load or the process of disconnecting from the load is cumbersome, static auto-tuning can be selected. Before self-tuning, correctly enter the motor nameplate parameters (F8.01～F8.06), set F8.08 to 1, press the key (ENTER DATA), and then return to the monitoring window and press the key (RUN) to start self-tuning. At this time, the keyboard displays "tune".

After the self-tuning is completed, the inverter automatically exits and stores the adjusted stator resistance, rotor resistance, motor leakage inductance (F809~F8.11), and current loop gain parameters (F8.26～F8.29).

The no-load current and mutual inductance of the motor cannot be set. The user can input the corresponding values based on the data provided by the motor manufacturer or the data in the motor test report; if there is no corresponding The data does not need to be entered, just use the factory values. However, it may affect the control performance of the motor.

During the tuning process, if an abnormality occurs, the user can press the key (STOP RESET) to end parameter auto-tuning.

2: No-load self-tuning of asynchronous motor rotation.

If the load of the motor is less than 30% of the rated load or the load it carries is not a large inertia load, you can choose to perform rotational auto-tuning. However, please try to disconnect the load and keep the motor in a static and no-load state, otherwise the set parameters may be incorrect.

Before auto-tuning, correctly enter the motor nameplate parameters (F8.01～F8.06, set F8.08 to 2, press the button (ENTER DATA), and then return to the monitoring window and press the button (RUN) to start auto-tuning. At this time, the keyboard displays "tune". After

self-tuning is completed, the inverter automatically exits and stores the set stator resistance, rotor resistance, motor leakage inductance, motor mutual inductance, no-load current, and current loop gain parameters (F8.26～F8.29).

During the tuning process, if an abnormality occurs, the user can press the key '**STOP**' to end parameter auto-tuning.

3: The asynchronous machine is fully tuned at rest.

If the motor cannot come off the axis and the control performance cannot meet the requirements after static tuning, the static full tuning method can be used. After correctly inputting F8.01～F8.06, set F8.8=3 and press the run key to enter full tuning. Static tuning.

F8.09	**Asynchronous motor stator resistance**	**Range: 0.001～65.535Ω**	**Depend on device type**
F8.10	**Asynchronous motor rotor resistance**	**Range: 0.001～65.535Ω**	**Depend on device type**
F8.11	**Asynchronous motor leakage inductance**	**Range: 0.01～655.35mH**	**Depend on device type**
F8.12	**Asynchronous motor mutual inductance**	**Range: 0.1～6553.5mH**	**Depend on device type**
F8.13	**Asynchronous motor no-load current**	**Range: 0.01～655.35A**	**Depend on device type**

F8.09～F8.13 are the parameters of the asynchronous motor. These parameters are generally not found on the motor nameplate and need to be obtained through automatic tuning of the inverter. In order to obtain better control performance, it is necessary to perform rotation tuning after the motor is off-axis. In situations where the axis cannot be detached, you can choose static tuning or static full tuning; or modify the F8.06 motor power parameter, and the inverter will set the F8.01～F8.05, F8.09～F8.13 parameters as the defailure standard motor Parameters; or manually input motor parameters.

F8.19	**Speed loop high speed proportional gain**	**Range: 1～100**	**20**
F8.20	**Speed loop high speed integration time**	**Range: 0.01～10.00s**	**1.00s**
F8.21	**Speed loop low speed proportional gain**	**Range: 1～100**	**30**
F8.22	**Speed loop low speed integral time**	**Range: 0.01～10.00s**	**0.50s**
F8.23	**Speed loop parameter switching freq. 1**	**Range: 0.00Hz～F8.24**	**5.00Hz**
F8.24	**Speed loop parameter switching freq. 2**	**Range: F8.23～high limit freq.**	**10.00Hz**

The speed response characteristics under vector control can be improved by adjusting the gain and integral time of the speed loop at high speed and low speed. Increasing the proportional gain and reducing the integration time can speed up the dynamic response of the speed loop. However, if the proportional gain is too large or the integration time is too small, the system may oscillate. The recommended adjustment method is: If the factory

parameters cannot meet the requirements, fine-tune them based on the factory value parameters. First increase the proportional gain to ensure that the system does not oscillate; then reduce the integration time so that the system has faster response characteristics and exceeds The tone is smaller.

F8.25	**Max. output voltage coefficient**	**Range: 100～120%**	**105%**

Appropriately increasing this parameter can improve the ability to output motor torque under field weakening, but the larger this value is, the harmonics of the output current will increase.

F8.26	**Asynchronous motor excitation adjustment proportional gain**	**Range: 0～60000**	**2000**
F8.27	**Asynchronous motor excitation adjustment integral gain**	**Range: 0～60000**	**1300**
F8.28	**Asynchronous motor torque adjustment proportional gain**	**Range: 0～60000**	**2000**
F8.29	**Asynchronous motor torque adjustment integral gain**	**Range: 0～60000**	**1300**

The above are the PI regulator parameters of the current loop under the SVC vector of the asynchronous motor. Increasing the current loop gain can speed up the dynamic response of the system torque; reducing the gain can enhance the stability of the system. Generally this parameter does not need to be changed. After the motor performs self-learning, this current loop gain parameter will automatically be optimized and updated.

F8.30	**Asynchronous motor without speed vector slip gain**	**Range: 50～200%**	**100%**

For asynchronous motor speed sensorless vector control (F8.00=1), this parameter is used to adjust the speed stability accuracy of the asynchronous motor: When the motor is loaded and the speed is low, increase this parameter, otherwise decrease it.

F8.31	**Reserved**		

F8.32	**Asynchronous motor speed feedback filter time**	**Range: 0.001～0.100s**	**0.015s**

Under the open-loop vector of an asynchronous motor, if the speed fluctuates greatly, this parameter can be increased appropriately to reduce the speed fluctuation, but adjusting the size may cause the system to become unstable. Generally this parameter does not need to be adjusted.

F8.33	**Asynchronous motor flux braking coefficient**	**Range: 0～300%**	**0%**

This function is effective under the open-loop vector of asynchronous motor. The

inverter can quickly decelerate the motor by increasing the magnetic flux when the motor decelerates and stops. The electric energy generated during the braking process is mainly consumed in the form of heat energy inside the motor. Therefore, frequent use of magnetic flux braking will cause the temperature inside the motor to rise. Please be careful not to allow the motor temperature to exceed the maximum allowable value. If a run command is input during flux braking, the flux braking will be canceled and the inverter will accelerate to the set frequency again. When using a braking resistor, disable flux braking. When this parameter is 0%, magnetic flux braking is invalid.

F8.34	**Vector control stop frequency**	**Range: 0.00～5.00Hz**(only valid when F8.00=1)	**0.50Hz**

In the vector control deceleration stop mode, especially in the case of quick stop, appropriately adjusting this parameter can improve the smoothness of the deceleration stop.

F8.35	**Electric torque current limit value**	**Range: 0.0～250.0%**	**150.0%**
F8.36	**Braking torque current limit value**	**Range: 0.0～250.0%**	**150.0%**

The range of the speed loop output torque is determined by the electric and braking torque limit values. When rapid acceleration and deceleration are required, this parameter can be appropriately increased to meet specific needs. However, setting it too high can easily cause over current and other phenomena. In addition, the torque limit of the speed loop is also affected by factors such as the excitation current, field weakening state, overload state of the frequency converter, and the maximum current output capability of the frequency converter.

F8.37	**Reserved**		

F8.38	**V/F oscillation suppression gain**	**Range: 0～100**	**40**

Under V/F control, this parameter can be set appropriately to prevent the motor from shaking and make the motor run stably. When running at no-load and low frequency, the greater the motor power, the more serious the motor oscillation. This parameter can be increased to suppress motor jitter. When the carrier frequency becomes smaller, this parameter can be adjusted smaller to reduce oscillation.

F8.39	**V/F over excitation gain**	**Range: 0～300**	**150**

Under V/F control, if overvoltage occurs during deceleration, this parameter can be appropriately increased to improve the deceleration effect.

F8.40	V/F slip frequency gain	Range: 0.0～200.0%	50.0%

Under V/F control, the speed accuracy and low-speed torque characteristics at low speed can be improved by appropriately increasing this parameter.

F8.41	V/F over current stall enable	Range: 0: invalid 1: valid	1
F8.42	V/F over current stall action current	Range: 50～200%	150%
F8.43	V/F overpass stall suppression gain	Range: 0～100	20
F8.44	V/F double speed over-speed stall action current compensation coefficient	Range: 50～200%	50%
F8.45	V/F overvoltage stall enable	Range: 0: invalid 1: valid	1
F8.46	V/F overvoltage stall action voltage	Range: 100～150% (rated bus voltage)	Depend on device type
F8.47	V/F overvoltage stall suppression frequency gain	Range: 0～100	30
F8.48	V/F overvoltage stall suppression voltage gain	Range: 0～100	30
F8.49	V/F overvoltage stall max. rising limit freq.	Range: 0.00～50.00Hz	5.00Hz

In V/F control mode, the over current and overvoltage suppression capabilities can be improved by appropriately setting the above parameters.

F8.50	Speed tracking starting freq. selection	Range: 0～2	0

0: Start from the stop frequency.

1: Start from the power frequency.

2: Start from the high limit frequency.

Select a frequency closer to the current running speed of the motor to quickly track the current running speed of the motor. This parameter is valid in VF control mode.

F8.51	Speed tracking speed	Range: 1～100	20

You can use this parameter to appropriately improve the tracking speed. This parameter is valid in VF control mode.

F8.52	Speed tracking current size	Range: 30～150%	Depend on device type

This parameter is the current size during tracking and generally does not need to be changed. This parameter is valid in V/F control mode.

F8.53	**Demagnetization time**	**Range: 0.00～20.00s**	**Depend on device type**

This parameter defines the delay time before starting. The greater the power, the longer the setting time is. If over current occurs during speed tracking, this parameter can be increased appropriately. This parameter is valid under VF and asynchronous machine SVC control.

F8.54	**Speed tracking closed-loop current KP (VF)**	**Range:0～1000**	**Depend on device type**
F8.55	**Speed tracking closed-loop current KI (VF)**	**Range:0～1000**	**Depend on device type**

By adjusting F8.54 and F8.55, the stability of the current control during the speed tracking process can be adjusted to prevent over current conditions during the tracking process.

F8.56 ～ F8.99	**Reserved**		

6.10 Protection related function parameter group: F9

F9.00	Reserved		

F9.01	Failure self-restoration times	Range: 0～10	0
F9.02	Failure self-recovery interval	Range: 0.5～20.0s	5.0s

During the run process, failure will take place accidently due to load fluctuation and the inverter will be cutoff output . At this time, in order not to interrupt the run of the equipment, the failure self-recovery function of the inverter can be used. During self-recovery , the inverter will to resume running in speed checking restart mode but stop outputting and failure protected if the inverter can't resume running successfully within set times, self-recovery function will be shutdown if failure self recovery time is set to 0.

(1) When using the failure self-recovery function, it must be premised that the equipment is allowed and the inverter has no substantial failure.
(2) The self-recovery function is invalid for failure protection caused by overload and overheating.

F9.03	Motor overload protection mode selection	Range: 0, 1	1

This parameter defines protective action mode when overload or overheating occurs in the inverter.

0: No action. No motor overload protection feature (apply with caution). Here the inverter has no overload protection for the load motor;

1: The inverter cut off output at once. The inverter cut off output and motor stop freely when overload , overheat take place.

F9.04	Motor overload protection coefficient	Range: 20.0～300.0%	100.0%

In order to implement effective overload protection for motors with different types of loads, ensure that the F8.02 (motor rated current) parameter is set according to the motor nameplate.

You can adjust F9.04 to adjust the motor overload time, as shown in Fig. 6-37. When the motor output current is equal to 150% of the motor's rated current, the motor overload protection will be triggered after the time determined by 4min*F9.04. If F9.04=120.0%, the overload time is 4min*120.0%=4.8min. The minimum time for motor overload is 5 seconds.

This adjustment value can be set according to the user's needs. Under the same conditions, if quick protection is required when the motor is overloaded, set the F9.04 value to a small value, otherwise set it to a large value.

Note

When one frequency converter operates with multiple motors in parallel, the thermal relay protection function of the frequency converter will lose its function. In order to effectively protect the motor, please install a thermal protection relay at the incoming line end of each motor.

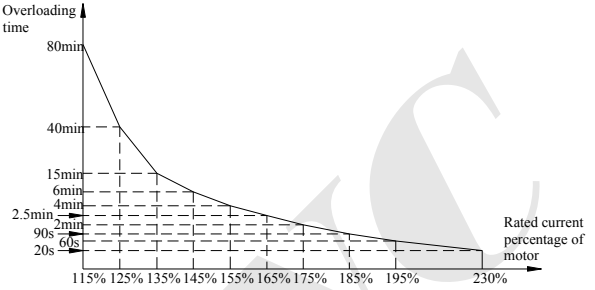


Fig. 6-37 Electronic thermal relay protection

F9.05	**Overload alarm checkout level**	**Range: 20～200%**	**130%**
F9.06	**Overload alarm delay time**	**Range: 0.0～20.0s**	**5.0s**

If output current exceeds electric lever set by parameter F9.05 continuously, open collector outputs a valid signal (refer to Fig. 6-38 and the relevant description of parameter F5.10) after delay time set by F9.06 passed.

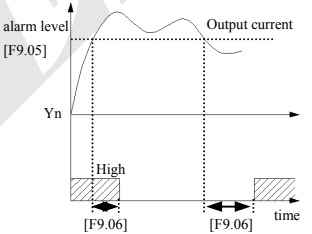


Fig. 6-38 Overload alarm

F9.07	**Overvoltage stall gain**	**Range: 0～100**	**30**

Under vector control, if an overvoltage failure occurs during rapid deceleration or severe load fluctuations, the overvoltage speed gain can be appropriately increased. The

larger the gain, the stronger the overvoltage suppression capability. In the absence of overvoltage, the smaller the gain, the better. . If the braking unit is turned on, this parameter can be appropriately reduced.

F9.08	Stall overvoltage point	Range: 100～150%	Depend on device type

During the decel. run of the inverter, due to the influence of load inertia, the actual decrease rate of the motor speed may be lower than the decrease rate of the output frequency. At this time, the motor will return to normal. Feed energy to the inverter, causing DC bus voltage of the inverter Pressure rises, and if no measures are taken, overpressure will occur Protect. Overvoltage stall protection function during deceleration run of the inverter During the process, the bus voltage is detected and compared with F9.08 (phase Overvoltage stall protection defined for standard bus voltage) point comparison, if the overvoltage stall protection voltage is exceeded, The output frequency of the frequency converter stops falling. When the bus is detected again . After the voltage is lower than the overvoltage stall protection voltage, reduce the Run at high speed, as shown in Fig. 6-39.

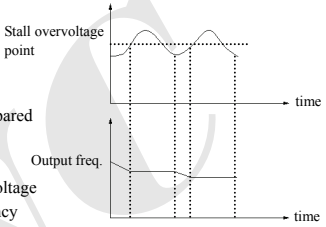


Fig. 6-39 Overvoltage stall function

F9.11	Protection action selection	Range: units: Reserved Tens digit: 0, 1 Hundreds digit: 0, 1 Thousands: reserved	0000

Units digit: Reserved.

Tens digit: Input phase loss enable.

0: Ineffective.

1: effective.

Hundreds digit: Output phase loss enable.

0: No detection.

1: failure, free stop.

Thousands: reserved.

F9.12	Protection action selection 2	Range: units: 0, 1 Tens digit: Reserved	00

Units digit: Inverter overload selection.

0: failure, free stop.

1: Use with derating. When the frequency converter detects an imminent overload, the frequency converter actively reduces the output torque to prevent the frequency converter from reporting an overload failure. At this time, the output speed of the frequency converter may decrease. After the overload condition is eliminated, the output torque of the frequency converter will automatically recover to ensure that the output speed returns to normal.

Tens: Reserved.

F9.13	**Reserved**		

F9.14	**Non-stop function selection during momentary power outage**	**Range: 0～2**	**0**

0: Forbidden.

1: Bus voltage constant control. If the input voltage fluctuates during run, the inverter maintains a constant bus voltage by controlling the output frequency, and returns to normal run after the power supply is normal.

2: Deceleration and stop. After input voltage fluctuation occurs during run, the inverter performs deceleration and stop run.

F9.15	**Instantaneous power outage voltage recovery voltage**	**Range: 80～100% (rated bus voltage)**	**85%**
F9.16	**Instantaneous power outage voltage recovery judgment time**	**Range: 0.0～100.0s**	**0.5s**
F9.17	**Instantaneous power outage action judgment voltage**	**Range: 60～100% (rated bus voltage)**	**80%**
F9.18	**Instant stop and non-stop gain Kp**	**Range: 0～100**	**40**
F9.19	**Instantaneous stop integral coefficient Ki**	**Range: 0～100**	**30**
F9.20	**Instant stop and non-stop action deceleration time**	**Range: 0～300.0s**	**20.0s**

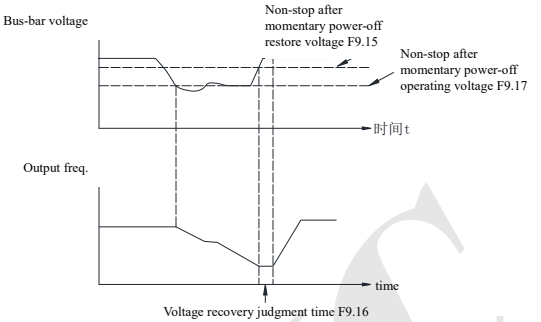


Fig.6-40 instantaneous power outage

This function means that when there is a momentary power outage or a sudden voltage drop, the inverter reduces the output speed and uses the load feedback energy to compensate for the drop in the DC bus voltage of the inverter to maintain the continued run of the inverter. See Fig. 6-40 for a schematic diagram of instantaneous power outage action.

If F9.14=1, when there is a momentary power outage or the voltage is suddenly lower than the value defined by F9.17 (based on the rated bus voltage), the inverter will automatically reduce the output speed. When the bus voltage returns to normal, the inverter will Accelerate normally to run at the set frequency. It is judged that the bus voltage returns to the bus voltage defined by F9.15, and after the duration exceeds the time set by F9.16, the speed returns to normal. By adjusting the F9.18 and F9.19 gain parameters, the responsiveness to bus voltage control can be improved.

If F9.14=2, when a power supply abnormality is detected, the inverter will continue to decelerate to 0 according to the deceleration time defined by F9.20 and then stop. An appropriate deceleration time needs to be set to prevent an under voltage failure from reporting during the deceleration process, resulting in The motor coasts to a stop.

F9.30	Check mode	Range: 0, 1	0

0: Off.

1: On.

6.11 failure record function parameter: Fd

Fd.00	**Previous one failure record**	**Range: 0~23**	**0**
Fd.01	**Previous two failure record**	**Range: 0~23**	**0**
Fd.02	**Records three failure record**	**Range: 0~23**	**0**
Fd.03	**Records four failure record**	**Range: 0~23**	**0**
Fd.04	**Records five failure record**	**Range: 0~23**	**0**
Fd.05	**Records six failure record**	**Range: 0~23**	**0**

0: No failure.

1～23: E0.01～E0.23 failures, see Chapter 7 for specific failure types.

Fd.06	**The set freq. at previous failure**	**Range: 0 ~ high limit freq.**	**0**
Fd.07	**Output freq. at previous failure**	**Range: 0 ~ high limit freq.**	**0**
Fd.08	**Output current at the previous failure**	**Range: 0～999.9A**	**0**
Fd.09	**Output voltage at previous failure**	**Range: 0~999V**	**0**
Fd.10	**DC bus voltage at previous failure**	**Range: 0～800V**	**0**
Fd.11	**Load motor speed at previous failure**	**Range: 0~9999**	**0**
Fd.12	**Module temperature at previous failure**	**Range: 0~100**	**0**
Fd.13	**Input terminal status at previous failure**		**0**
Fd.14	**Cumulative running time from the previous failure**	**Range: 0~65535 hours**	**0**

6.12 Code and manufacturer function parameter: FF

FF.00	User password	Range:0000～9999	0000

The user password setting function is used for prohibit unauthorized personnel from consulting and modifying function parameters.

set this function code to 0000 When user password function is not required,

First input 4 digit as user password and press ENTER DATA key to confirm,then the password will come into effect at once.

Password modification:

Press ESC MENT key to enter the password verification state. After inputting primary 4 digit password parameter editing state is available .choose FF.00 (FF.00=0000 here),input the new password, and press ENTER DATA the key to confirm. The password come into effect at once.

Note

please keep the password they set without fail.in case the password is missing please consult the manufacture.

FF.01	Manufacturer password	Range: 0000～9999	0000

Setting function for the manufacturer ,user need not modify it.

7 Troubleshooting

7.1 Failure and countermeasure

Possible failure types in EDS820 are shown in Table 7-1 and failure code is from E001 to E023. Some failure code is reserved for intelligent automatic diagnosis function which will be executed continuously in future. When failure takes place in the inverter, the user should check according to note of this table first and record failure phenomena detailedly. Please contact our after-sale service and technical support Department or agent in your local place when technical service is needed.

Table 7-1 Failure type and the countermeasure

Fault code	Fault type	Possible reason	Countermeasure
E001	Over current during acceleration process	Acceleration time is too short	Prolong acceleration time
		Improper V/F curve	Adjust V/F curve setting, adjust manual torque boost amount or change to automatic torque boost
		Restart rotating motor	Set speed checking and restart function
		Low voltage source voltage	Check input power supply
		Inverter power is too small	Choose an inverter with a bigger power
E002	Over current during deceleration process	Deceleration time too short	Prolong decelerating time
		Have potential energy load or big inertia load	Increase braking power of external energy-consuming braking subassembly
		Power of inverter is a bit small	Choose an inverter with a higher power
E003	Over current during constant speed process	Load change suddenly or have unwonted phenomena	Check or reduce break of the load
		Acceleration and deceleration time is set too short	Prolong accelerating &decelerating time properly
		Low power source voltage	Check input power supply
		Inverter power is a bit small	Choose an inverter with higher power
E004	Over voltage during accelerating process	Unwonted input voltage	Check input power supply
		Acceleration time is set too short	Prolong the acceleration time
		Restart the rotating motor	Set speed checking restart function
E005	Over voltage Frequency during decelerating process	Deceleration time is too short	Prolong the deceleration time
		Have potential energy load or big inertia load	Increase the braking power of external energy-consuming braking subassembly
E006	Over voltage during constant speed process	Unwonted input voltage	Check input power
		Acceleration and deceleration time setting is too short	Properly extend the acceleration and deceleration time
		Abnormal changes in input voltage	Assemble reactor
		Load inertia is a bit big	Use energy-consuming braking subassembly

E007	Control power supply over voltage	Unwonted input voltage	Check input power or look for service
E008	Inverter overload	Acceleration time is too short	Prolong accelerating time
		DC injection braking is too big	Reduce DC braking current and prolong braking time
		Improper V/F curve	Adjust V/F curve and torque boost
		Restart a rotating motor	Set to speed checking restart function
		Power source voltage is too low	Check power source voltage
		Load is too big	Choose inverter with high power
E009	Motor overload	Improper V/F curve	Adjust V/F curve and torque boost
		Power source voltage is too low	Check power source voltage
		General motor run at low| speed with big load	Can choose frequency conversion motor for long time low speed run
		Motor overload protection factor set incorrectly	To set motor overload protection factor correctly
		Motor blocked up or load change too suddenly and quickly	Check the load
E010	Inverter overheating	Air-path blocked	Clean air-path or improve ventilation conditions
		Ambient temperature is too high	Improve ventilation condition, low carrier frequency
		Fan damaged	Replace the fan
E011	Output phase loss	Unwonted phenomena of the lead wire from the inverter to the motor	Check motor leading wire
		The three-phase output of the inverter is unbalanced when the motor is running.	Check whether the three-phase windings of the motor are balanced
		Abnormal condition for power board	Seeking services from manufacturers or agents
		Abnormal condition for Main control board	Seeking services from manufacturers or agents
E012	Input phase loss	Three-phase input power is abnormal	Check whether the three-phase input power cord is disconnected or has poor contact.
		The power board is abnormal	Seeking services from manufacturers or agents
		The main control board abnormal	Seeking services from manufacturers or agents
E013	Inverter module protection	Transient over current	Refer to countermeasures for over-current
		Phase to phase short circuit or earthing short circuit of output 3 phase	Rewiring
		Air-path blocked or fan damaged	Clean the air path or replace the fan
		Ambient temperature is too high	Lower ambient temperature

		Connecting wire or insert on control board loose	Check and reconnect
		Nwonted current wave caused by missing output phase etc.	Check wiring
		Assistant power supply damaged and drive voltage lacking	Seeking services from manufacturers or agents
		Unwonted control board	Seeking services from manufacturers or agents
		When F0.45=4, the signal is valid when a continuous short circuit is detected.	
E014	External device failure	Use sudden stop key in non-keypad run key	Check the operation method
		Use sudden stop Key under condition of stall	Correctly set operating parameters
		Sudden stop terminal for external failure closed stop terminal is closed	Open external failure terminal after external failure is settled
E015	Current detection circuit Failure	Connecting wire or insert on control board loose	Check and reconnect
		Auxiliary power supply damaged	Seeking services from manufacturers or agents
		Hall component damaged	Seeking services from manufacturers or agents
		Unwonted amplifying circuit	Seeking services from manufacturers or agents
		F0.45=0: V-phase current detection is abnormal, F0.45=1: W-phase current detection is abnormal F0.45=2: Both V and W phase current detection are abnormal.	
E016	485 communication failure	Improper baud rate setting	Set the baud rate appropriately
		Serial port communication error	Press STOP/RESET key to reset and seek service
		Improper setting of fault alarm parameters	Modify F2.16 and F2.17
		Upper device doesn't work	Check whether the upper device is working and whether the wiring is correct
E017	PID disconnection fault	PID feedback is lost	Check whether the PID feedback loop wiring is good
		The PID value becomes very small instantly	Check whether there is any abnormality in the device
E019	Under voltage fault	Under voltage	Check spot input voltage
E020	System interference	Serious interference	Press the key STOP/RESET to reset or add a power filter to the power input side.

		Main control board DSP read and write error	Press the reset button and seek service
		When F0.45=0, it is a fault caused by the watchdog. When F0.45=1, it is a fault caused by other interference.	
E021	Parameter identification failure	Motor parameters are not set according to the nameplate	Correctly set relevant parameters according to the motor nameplate
		Abnormal current during tuning process	Choose an inverter that matches the motor
		Motor wiring is wrong	Check the three-phase wiring of the motor
E023	E^2PROM read and write error	An error occurred while reading and writing control parameters.	Reset the key (STOP/RST) and seek service from the manufacturer or agent.
A-53	Operation limit warning	The time limit for running is up	Please contact the upper level supplier
P.OFF	Under voltage fault	Under voltage	Check spot input voltage

7.2 Fault record search

This series of inverters records the most recent 6 fault codes and the operating parameters of the inverter at the time of the last fault. Searching this information can help find the cause of the fault.

All fault information is saved in the Fd group parameters. Please refer to the keyboard operation method to enter the Fd group parameters to search for information.

Code name	Content	Code name	Content
Fd.00	Previous fault record	Fd.08	Output current at the previous fault
Fd.01	Previous two fault records	Fd.09	Output voltage at the time of previous fault
Fd.02	Records of the first three failures	Fd.10	DC bus voltage at the time of the previous fault
Fd.03	The first four fault records	Fd.11	Load motor speed at the time of previous fault
Fd.04	Previous five fault records	Fd.12	Module temperature at the time of previous failure
Fd.05	Records of the first six failures	Fd.13	Input terminal status at the time of previous fault
Fd.06	The set frequency at the time of the previous fault	Fd.14	Cumulative running time from the previous fault
Fd.07	Output frequency at the time of previous fault	-	-

7.3 Fault reset

(1) Before reset you must find out reason of failure downright and eliminate it, otherwise may cause permanent damage to the inverter.
(2) If can't reset or failure takes place again after resetting, should look for reason and continuous resetting will damage the inverter.
(3) Reset should take place 5 minutes after overload, overheat protection action.

When the inverter fails, to restore normal operation, you can choose any of the following operations:

⑴ Set any terminal among X1～X5 to external RESET input (F5.00 F5.04=10), close and then disconnect with COM terminal.
⑵ When the fault code is displayed, press the key STOP/RESET after restoration confirmed.
⑶ Cut off the power supply.

8 Maintenance

8.1 Routine maintenance

When you use EDS820 series you must assemble and operate it according to demand listed in this 《Service manual》strictly. During run state, temperature,humidity, vibration and aging parts may affect it. To avoid this, it is recommended to perform routine inspections.

Table 8-1 Daily inspection items

Period		Inspection item	Inspection content	Criteria
daily	Periodic			
√		Running status parameters	(1)Output current	(1) Within range of rated
			(2) Output voltage	(2) Within range of rated
			(3) Internal temperature	(3) Temperature rise less than 35℃
√		Cooling system	(1) Installing ambivalent	(1)Good ventilation, unblocked air-path
			(2) Local fan	(2) Rotate normally without abnormal noise
√		Motor	(1) Heating	(1) No abnormality
			(2) Noise	(2) Even
	√	Inverter	(1) Vibration and heating	(1) Vibration balanced, proper wind temp.
			(2) Noise	(2)Without abnormal sound
			(3) Fixing of lead and terminals	(3) The fixing screws are not loose.
√		Operating ambience	(1) Temperature, humidity	(1) -10℃~ +40℃; 40℃~50℃ derating or forced heat dissipation
			(2) Dust, water and leakage	(2) No water leakage imprint or dust
			(3) Gas	(3) No peculiar smell

Recommend to inspect with following instrument:

Input voltage: electric voltmeter; output voltage: rectifying voltmeter; input output current: pincers ammeter.

8.2 Inspection and replacement of damageable parts

Some component parts in the inverter will be abraded or bear descending performance for long-term usage，to assure that the inverter can run stably and reliably, it is recommended to perform defending maintenance and replace corresponding parts if necessary.

(1) Cooling fan

Abnormal noise, even oscillation may take place if the fan have wearing bearing, aging

blade, here replacement of the fan should be considered.

⑵ Filter electrolytic capacitance

When frequent-changing load causes increasing pulsant current and aging electrolyte under high ambient temperature, the electrolyte capacitance may be damaged and here should replace it.

8.3 Repair guarantee

⑴ We provide the free maintenance within warranty time if any failure or damage under normal usage, the warranty time can be seen in the warranty card, we will charge some when exceed warranty time.

⑵ We will take some upkeep if one of following situations takes place within period of repair guarantee.

① If did not use the inverter according to《service manual》strictly or did not use it under ambient demanded in《service manual》, which cause failure.

② Failure caused by applying the inverter to non-normal function;

③ Failure caused by self-repair, refit which is not already allowed;

④ Damage caused by bad keeping, falling down from high place or other extrinsic factor after purchasing the inverter;

⑤ Failure caused by 1 natural disaster or its reason such as unwonted voltage, thunderbolt, water fog, fire, salt corroding, gas corroding, earthquake and storm etc.;

⑥ Make bold to tear up product logo (such as: nameplate etc.); Body serial number don't accord with that in repair guarantee card.

⑶ We calculate service fee based on actual cost, which is subject to contract if any.

⑷ You can contact the agent and also our company directly if you have questions. After repair guarantee period, we shall also provide lifetime charge repair service for our products.

Note Our company will also provide lifetime repair service with fee for inverter which is not within period of repair guarantee.

8.4 Storage

The user must pay attention to following points for temporary storage and long-term storage after purchasing the inverter:

⑴ Avoid storing the inverter in high temperature, moist place and place of dust, metal powder and assure good ventilation.

⑵ Longtime storage will cause electrolyte capacitance of low quality, so must assure that it's electrified for one time within 2 years and electrification time is not shorter than 5 hours and input voltage must be increased to rated value gradually by voltage adjustor.

9 Example

9.1 General speed regulation running

9.1.1 Basic wiring diagram

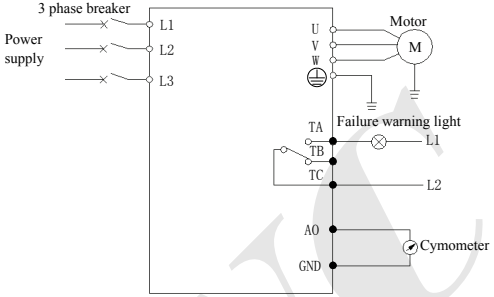


Fig. 9-1

9.1.2 The basic parameters for setting are as follows:

(1) Set parameter F8.01~F8.06 according to rated value of the inverter.
(2) Set F0.00 parameter to 0, choose keypad analog potentiometer to set frequency.
(3) Set F0.02 parameter to 0, choose keypad to control start-up, stop.
(4) Use F0.03 parameter to set run direction.

Note

(1) Press key to set frequency.
(2) To press STOP/RESET key, the inverter will stop.
(3) To press ENTER/DATA key, inverter enter into next menu or confirm data.
(4) Press ▲ ▼ key to increase or decrease the data.

9.1.3 Realized functions

(1) Realize stepless speed regulation to the motor, use keypad to control start/stop and keypad analog potentiometer to adjust frequency.
(2) Bear failure warning function.
(3) Connect with cymometer, which indicates output frequency of the inverter.

9.1.4 Application field

Used for common speed regulation field, such as: transportation machine, china machine, baccy machine, metallurgy machine etc.

9.2 Terminal control running

9.2.1 Basic wiring diagram

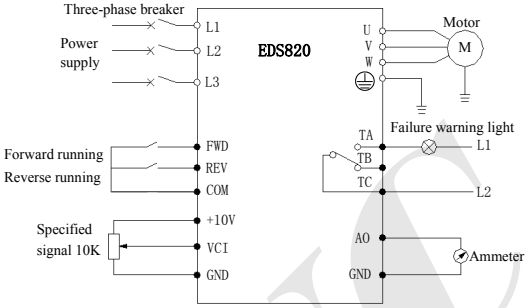


Fig. 9-2

9.2.2 Parameter setting

(1) Set parameter F8.01~F8.06 according to rated value of the inverter.

(2) Set F0.00 parameter to 4, 5 to choose VCI, CCI accordingly, can accept frequency set signal within 0~ 10V.

(3) Set F0.02 parameter to 1, to choose terminal run command channel.

Note

(1) If F5.08=0,namely 2 wire control mode 1, FWD and COM are closed, motor is in forward run; REV and COM are closed, motor is in reverse run FWD, R EV and COM are closed or opened together, the inverter stop.

(2) Set frequency is specified through VCI analog channel.

9.2.3 Realized function

(1) Control forward run/reverse run of the motor by external on-off quantum.

(2) Control speed of the motor by 0~ 10V signal.

(3) Bear failure warning and output current indication function.

9.2.4 Application field

Used in field where need long-distance control to start/stop of the motor such as blower, food, chemical machine, packing machine, transportation machine etc.

9.3 Application of multi-speed control running

9.3.1 Parameter settings

(1) Set parameter F8.01-F8.06 according to rated value of the inverter. Set F0.02 parameter to 1, to choose terminal run command channel .

(2) F2.30-F2 .44: multi-step speed frequency setting.

(3) F5.00-F5.04 set multi-step speed terminal control function.

(1) If F5.08=0,namely 2 wire control mode 1: FWD and COM are closed, motor is in forward run; REV and COM are closed, motor is in reverse run; FWD, REV and COM are closed or opened together, the inverter stop.

(2) If any one or more terminal ofX1, X2, X3 and COM are closed together, the inverter will run according to multi-step speed frequency determined by X1, X2, X3 (Multi-step speed frequency set value are determined by F2.30-F2 .44).Can realize manual control and automatic control for multiple frequency, and also control for forward run, reverse run, free stop, reset, warning protection.

9.3.2 Basic wiring diagram

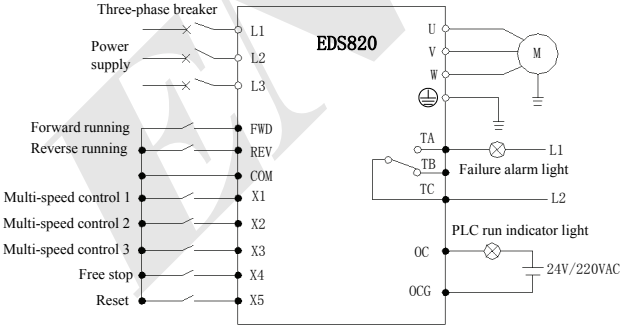


Fig. 9-3

9.3.3 Realized function

(1) Make use of external on-off quantum signal to control start/stop of the motor.

(2) Make use of external on-off quantum signal to make the motor run at set frequency.

(3) Bear free stop and reset function by utilizing external on-off quantum signal.

(4) Bear warning alarm and PLC run indication function.

9.3.4 Application areas:

It is used in fields such as tempered glass, textile, paper making, chemical industry, etc. that require frequent and multi-speed adjustment of motor speed according to settings.

9.4 Closed-loop control system

9.4.1 Parameter setting

(1) Set parameter F8.01~F8.06 according to rated value of the inverter.

(2) F3.00=1: setting channel selection,here PID closed loop run control is effective.

(3) F3.01=1: setting channel selection, here choose VCI as provision channel of PID adjuster.

(4) F3.02=1: feedback channel selection, here choose CCI as feedback channel, 0-20mA/0-10V feedback signal.

(5) F3.08~F3.11, set according to spot requirement.

9.4.2 Basic wiring diagram

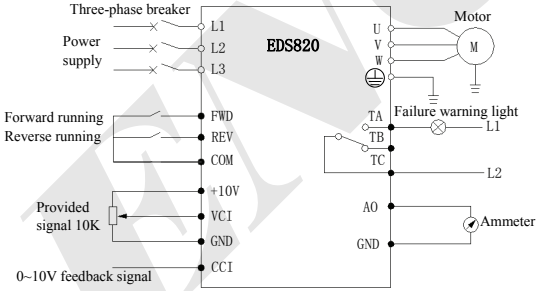


Fig. 9-4

9.4.3 Realized function

(1) The inverter can adjust output automatically according to feedback signal to make constant voltage, constant temperature, constant current etc. available.

(2) Can control Start/Stop of the motor from long distance.

(3) Bear failure alarm and current indicator function.

9.4.4 Application fields

Applied in field where need stable system, pressure, flux such as blower pump, constant pressure water supply, air compressor, air conditioner, freezer cooling tower, music fountain, heat supply etc..

9.5 Consecutive action running

9.5.1 Basic wiring diagram

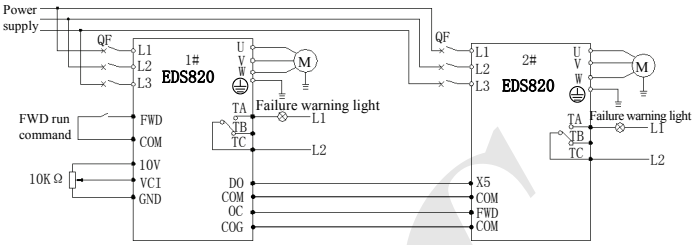


Fig. 9-5

9.5.2 Parameter setting

Set 1# inverter as follows:

(1) F0.02=1: terminal run command control.

(2)F5.23=0: DO terminal output pulse signal for 1# inverter output frequency.

(3) F5.10=0: 1# inverter running signal is outputted by digital output terminal OC. set 2# inverter as follows:

(5) F0.00=7: terminal pulse setting is frequency provision for 2# inverter.

(6) F0.02=1: terminal run command control.

(7) F5.04=38: X5 is for pulse frequency input.

After above setting, can use digital/pulse output quantum of 1# inverter to realize consecutive action of 2# inverter.

9.5.3 Operation description

After receive forward run command from external switch (closed) and frequency specified value (0~10V) from analog input terminal VCI, 1# inverter run at this frequency value. At the same time, already running state of 1# inverter, make 2# inverter get forward run command through open circuit collector output end OC, here, run frequency value from high-speed pulse output terminal of 1# inverter is passed to 2# inverter through X5 terminal.

9.5.4 Application field

Applied in field such as conveyor belt, coiler, factory production line, food chemistry, piece drawer etc.

10 Modbus communication protocol

10.1 Summarization

We provide general RS485 communication interface in our inverters for the user. Through this communication interface upper device (such as HMI, PC, PLC controller and etc.)can perform centralized monitor to the inverter (such as to set inverter parameter, control run of inverter, read work state of the inverter).

This communication protocol is interface criterion file designed for realizing above-mentioned function, please read it earnestly and program according to it so that realize long-distance and network control to the inverter.

10.2 Communication net buildup mode

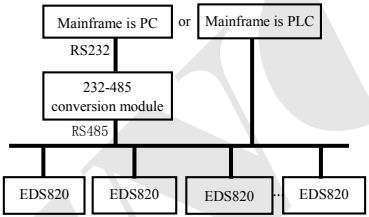


Fig. 10-1 Net buildup graph

10.3 Communication mode

At present, EDS820 inverter can be used only as auxiliary device in RS485 net. Can realize communication between inverters through PC, PLC or HMI if it's needed. Specific communication mode is as mentioned below:

(1) PC or PLC as mainframe, inverter as auxiliary device, point-to-point communication between mainframe and auxiliary device.

(2) Auxiliary device don't response when mainframe send out command by broadcast address.

(3) User can set local address, baud rate and data format of the inverter through auxiliary device keypad or serial communication mode.

(4) EDS820 provides optional RS485 interface.

(5) Default mode Asynchronous serial, semi-duplex transport mode. RTU mode.

Default format and transport rate: 8-N-1, 9600bps.

10.4 RTU Communication mode

10.4.1 Data frame format

Using RTU mode, messages are sent at least 3. 5 character time interval pause. The first transmitted field is device address, the character you can transfer is hexadecimal 0x00 ~ 0xFF. Network equipment continuously monitor the bus, including pauses. When the address field is received, all equipment determine whether it is sent to their own. when the last character of the packet transfer is complete, at least a 3.5 character times pause mean the end of the message. A new message can begin after this pause.

The entire message frame must be transmitted as a continuous flow. If a new message start transmitting in less than 3.5 character times after a message and then receiving device will consider it a continuation of the previous message. This will cause an error, because in the final CRC field value can not be right.

The RTU frame format is as follows:

Frame Header	3.5 characters time pause
Slave address	Slave value：1~127
Communication command code	03H：read slave parameter 06H：write slave parameter
Data content DATA	The contents of packet: Parameter address（16bit）; Number of parameter or bytes of parameter value; Parameter value（16bit）
Data content DATA	
……	
……	
CRC check value low byte	16bit Unsigned check value
CRC check value high byte	
Closing Flag	3.5 characters time pause

Regarding generation method of CRC check value, please refer to part 10.8 for check method.

10.4.2 Host read slave parameter

Command code 03H. Host can read or one or more parameter(up to ten) by initiating a communication transaction .E.g, read 2 contiguous inverter parameter values from the address 0000H of inverter whose address is 01, the contents of host command:

ADR	01H
CMD	03H
Parameter initial high byte	00H
Parameter initial low byte	00H
Number of parameter High byte	00H
Number of parameters low byte	02H
CRC check value low byte	Be calculated
CRC check value high byte	Be calculated

The contents of slave reply:

ADR	01H
CMD	03H
Parameter value bytes	04H
Address 0000H content high byte	00H
address 0000H content low byte	01H
Address 0001H content high byte	13H
Address 0001H content low byte	88H
CRC check value low byte	Be calculated
CRC check value high byte	Be calculated

10.4.3 Host write slave parameter

Command code 06H. The host can write 1 parameter when initiating a communication transaction. For example, write decimal 5000 (1388H) to the address 0001H of the inverter with slave address 02. The content of the host command including:

ADR	02H
CMD	06H
Parameter address high byte	00H
Parameter address low byte	01H
Parameter value high byte	13H
Parameter value Low byte	88H
CRC check value low byte	Be calculated
CRC check value high byte	Be calculated

The contents of slave reply：

ADR	02H
CMD	06H
Parameter address high byte	00H
Parameter address low byte	01H
Address 0903H content high byte	13H
Address 0903H content low byte	88H
CRC check value low byte	Be calculated
CRC check value high byte	Be calculated

10.4.4 The host writes multiple slave parameters（Only supports RTU format）

Command code 10H. The host can write up to 10 consecutive parameters when initiating a communication transaction.

For example, write the five decimal values 1, 4500, 3, 1, 1 into the F0.00~F0.04 parameters of the inverter with the slave address 02, and the parameter address of F0.00~F0.04 is 0000H ~0004H, host command package content:

ADR	02H
CMD	10H
Parameter address high byte	00H
Parameter address low byte	00H
High byte of parameter numbe	00H
Number of parameters low byte	05H
Number of parameter bytes	0AH
Parameter value 1 high byte	00H
Parameter value 1 low byte	01H
Parameter value 2 high byte	11H
Parameter value 2 low byte	94H
Parameter value 3 high byte	00H
Parameter value 3 low byte	03H
Parameter value 4 high byte	00H
Parameter value 4 low byte	01H
Parameter value 5 high byte	00H
Parameter value 5 low byte	01H
CRC check value low byte	Need to calculate
CRC check value high byte	Need to calculate

Slave machine response packet content:

ADR	02H
CMD	10H
Parameter address high byte	00H
Parameter address low byte	00H
High byte of parameter number	00H
Number of parameters low byte	05H
CRC check value low byte	Need to calculate
CRC check value high byte	Need to calculate

10.5 Data communication address allocation

10.5.1 Function code F0-Fd group communication address

Inverter function parameter's MODBUS communication address addressing process follows PPnn way: PP means high byte of the address, corresponding to function parameter's group number; “nn” means low byte of the address,corresponding to function code parameter 's group internal code. For example: F3.21 function code 's communication address is 0315H, 03H is the hex form of group number 3, 15H is the hex form of group internal code 21.F0.00~F9.11 communication address is 0000H~090BH, Fd group fault record parameter start address is 0D00H.

10.5.2 Control command and status word communication address

Variable Name	Communication address	Read-write attribute	Command data or response value meaning
Run command	2000H	Write only	1:Inching run

character			2: Inching stop
			3: Forward inching run
			4: Reverse inching run
			5: Run
			6: Stop
			7: Forward run
			8: Reverse run
			9: Fault reset
			10: Emergency stop
Serial port frequency provision	2001H	Read and write	Lower limit frequency ~ upper limit frequency
Inverter status	2100H	Read only	1: Forward running 2: Reverse running 3: Stop 4: Alarm status
Alarm code	2180H	Read only	0: No alarm 1~23: Indicates E001~E023 alarm

10.5.3 Monitoring parameter communication address

Monitor arameters	Name	Correspondence address (Read only)
C-00	Set frequency	1000H
C-01	Output frequency	1001H
C-02	Output current	1002H
C-03	Output voltage	1003H
C-04	DC bus-bar voltage	1004H
C-05	Load motor speed	1005H
C-06	Module temperature	1006H
C-07	Electrification running time	1007H
C-08	Cumulative running time	1008H
C-09	Input terminal status	1009H
C-10	Output terminal status	100AH
C-11	Analog input VCI value	100BH
C-12	Analog input CCI value	100CH
C-13	Reserved	
C-14	External pulse frequency	100EH

10.6 Communication errors

Inverter receiving data packet detection error, it finds reading & writing parameter address or parameter value invalid, so reply to the host with communication error response packet. Communication error response packet (host command code +80H) as command code, with 1 byte error code.

Format for communication error response packet as follows:

ADR	01H
CMD	83H/86H/90H
Communication error code	01H~06H (Refer to the table below)
CRC check value low byte	Obtain by calculating
CRC check value high byte	Obtain by calculating

The meaning of the response error code value is as follows:

Communication error code value	Communication error type
0x01	CRC check error
0x02	Command code illegal
0x03	The accessed register visited illegal
0x04	The value to register illegal
0x05	Not allowed to modify parameters
0x06	Registers number read illegal
0x07	The number of write registers is illegal
0x08	Data frame format is incorrect

10.7 Data Frame Example

10.7.1 Start #1 inverter running

Data field	Auxiliary address	Command code	Register address high byte	Register address low byte	Data high byte	Data low byte	CRC low bit	CRC high bit
Host command frame	01	06	20	00	00	05	42	09
Auxiliary response frame	01	06	20	00	00	05	42	09

10.7.2 Stop #1 inverter from running

Data field	Auxiliary address	Command code	Register address high byte	Register address low byte	Data high byte	Data low byte	CRC low bit	CRC high bit
Host command frame	01	06	20	00	00	06	02	08
Auxiliary response frame	01	06	20	00	00	06	02	08

10.7.3 Set the frequency reference value of #1 inverter to 50.00Hz

Data field	Auxiliary address	Command code	Register address high byte	Register address low byte	Data high byte	Data low byte	CRC low bit	CRC high bit
Host command frame	01	06	20	01	13	88	DE	9C
Auxiliary response frame	01	06	20	01	13	88	DE	9C

10.7.4 Read #1 inverter status

Data field	Auxiliary address	Command code	Register address high byte	Register address low byte	Data high byte	Data low byte	CRC low bit	CRC high bit
Host command frame	01	03	twenty one	00	00	01	8E	36
Auxiliary response frame	01	03	(Number of response value bytes) 02		00	00	B8	44

10.8 CRC check method

The CRC check value calculation function written in C language is as follows:

```
unsigned int cal_crc_value (unsigned char *pval, unsigned char len)
{
    unsigned int crc_value=0xFFFF;
    unsigned int i;

    while(len--)
    {
        crc_value ^= *pval++;
        for(i=0; i<8; i++)
        {
            if(crc_value & 0x0001)
            {
                crc_value >>= 1;
                crc_value ^= 0xA001;
            }
            else
            {
                crc_value >>= 1;
            }
        }
    }
    return(crc_value);
}
```

Appendix 1 Serial port 485 Communication protocol

1.1 Summarization

We provide general RS485/RS232 communication interface in our inverters for the user. Through this communication interface upper device (such as PC, PLC controller etc.)can perform centralized monitor to the inverter (such as to set inverter parameter, control run of inverter, read work state of the inverter) and also long-distance control keypad can be connected to realize various usage requirement of the user.

This communication protocol is interface criterion file designed for realizing above-mentioned function, please read it earnestly and program according to it so that realize long-distance and network control to the inverter.

1.2 Protocol content and description

1.2.1 Protocol content and description

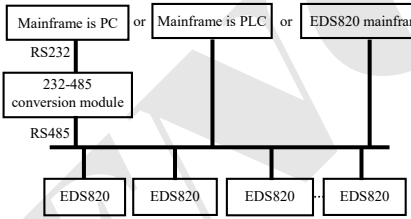


Fig.1 Net buildup graph

1.2.2 Communication mode

At present, EDS820 inverter can be used only as auxiliary device in 485 net. Can realize communication between inverters through PC or PLC if it's needed. Specific communication mode is as mentioned below.

(1) PC or PLC as mainframe, inverter as auxiliary device, point-to-point communication between mainframe and auxiliary device.

(2) Auxiliary device don't response when mainframe send out command by broadcast address.

(3) User can set local address, baud rate and data format of the inverter through auxiliary device keypad or serial communication mode.

(4) Auxiliary device report current failure information to mainframe in the last response frame.

(5) EDS820 provides 485 interface.

1.2.3 Transport mode

Asynchronous serial, semi-duplex transport mode. Default format and transport rate: 8-N-1, 9600bps. For specific parameter setting please see description for F2.14~F2.17 group function code.(Remark: Below definition is only effective under series port RS485 communication mode, and definition for other parameters are the same as original)

F2.14	Communication configuration	LED first bit: baud rate selection 0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS LED second bit: data format 0: 1-8-1 format, no checkout 1: 1-8-1 format, even checkout 2: 1-8-1 format, odd checkout 3: 1-8-2 format, no checkout 4: 1-8-2 format, even checkout 5: 1-8-2 format, odd checkout	1	03	×
F2.15	Local address	0~127, 127 is the broadcast address	1	1	×
F2.16	Communication timeout detection time	0.0～1000.0s	0.1s	0.0s	×
F2.17	Local response delay	0～200ms	1ms	5ms	×

1.2.4 Data command frame format

Main device command frame format																		
Sending order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Frame header	Auxiliary address	Auxiliary address	Main device command	Main device command	Auxiliary index	Auxiliary index	Command index	Command index	Setting data	Setting data	Setting data	Setting data	Checkout sum	Checkout sum	Checkout sum	Checkout sum	Frame end
Definition	head	Address		Command area		Index area				Set data area				Check area				End
Sending byte	1	2		2		4				4				4				1

Auxiliary device response frame format																		
Send order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Frame header	Auxiliary address	slave address	Auxiliary response	Auxiliary response	Failure index	Failure index	Command index	Command index	Checkout sum	Checkout sum	Checkout sum	Rin data	Checkout sum	Checkout sum	Checkout sum	Checkout sum	Frame end
Definition	Head	Address		Response area		Index area					Run data area			Check area				End
Sending byte	1	2		2		4					4			4				1

Fig.2 Command/response frame format

Remark:

(1) “Setting data area” and “run data area” may not be existent in some command/data frame format， so in protocol command list it's marked with “nothing”.

(2) In protocol effective character set is:~, 1,2,3,4,5, 6, 7,8, 9,A, B, C, D,E, F and hex data 0DH，ASCII lower case a,b, c, d, e, f are invalid.

(3) Effective command frame length is 14or 18 byte.

1.2.5 Explanation and explanation of format

(1) Frame head It's character“~”(namely hex 7E), single byte.

(2) Auxiliary device address

Data meanings: local address of auxiliary device, double byte. ASCI format.Inverter factory default is 01.

(3) Mainframe command/auxiliary device respond Data meanings: mainframe send out command and auxiliary device respond to the command. Double byte,

ASCII format. Response code function classification:

Species 1>: Command code=“10”，mainframe ask auxiliary device to report current preparation state and control situation.

Table 1 Response code meaning of command code “10”

Response code ASCII	Meaning		
	Preparation state of auxiliary device	Control from mainframe is allowed	Allow to set frequency
10	Don’t get ready	No meaning	
11	Get ready	Allowed	Allowed
12	Get ready	Allowed	Allowed
13	Get ready	Not allowed	Not allowed
14	Get ready	Not allowed	Not allowed
20	Frame error		

Species 2>:command code=“11”~“15” ,5 kinds of function command which mainframe send to auxiliary device, for detail please see protocol command list.

Table 2 Response code meanings of command codes “11~15”

Response code ASCII	The meaning of response code	Illustrate
00	Auxiliary device communication and control is normal; function code modification is effective; password is correct.	
20	(1) Frame checkout error; (2)“Command area" data overrun; (3)“Index area" data over run; (4) Frame length error/non ASCII byte exist in area except frame head, frame end.	When this response code is reported, data of “command area” “index area” and “running data Area are not reported
30	(1) Control to auxiliary device is ineffective; (2)Ineffective function code parameter modification; (3)“Setting/running data” area data overrun. (4) Password error.	Whether report this response code relate to current set state of auxiliary device. When report data of area, “Index area” and “Run data area” are reported according to protocol requirement.

(4) Auxiliary index/command index/failure index Data meanings: include auxiliary index byte and command index byte.

For mainframe, auxiliary index, command index are used for cooperating mainframe command in realizing specific function.

For auxiliary device, auxiliary index, command index are used for reporting failure state code, command index are reported without modification.

Data type: hex，4 byte, ASCII format.

Command index occupy 2 low byte, data range:“00” ~“FF ”Auxiliary index occupy 2 high byte, data range:“00”~“FF” Auxiliary device failure state occupy “auxiliary index” byte, see Appendix table 3.

Table 3 Failure type description

Failure code	Description	Failure code	Description
1	Acceleration operation over current	13	converting module protection
2	Deceleration operation over current	14	External device failure
3	Constant speed running over current	15	Current detection circuit failure
4	Acceleration operation over voltage	16	485 communication failure
5	Deceleration operation over voltage	17	Reserved
6	Constant speed operation over voltage	18	Reserved
7	Control power supply over voltage	19	Under voltage
8	Inverter overload	20	system disturbance
9	Motor overload	21	Reserved
10	Inverter over heating	22	Reserved
11	Reserved	23	E^2PROM read and write error
12	Reserved		

(5) Checkout sum

Data meaning: frame check, four bytes, ASCII.

Calculation method: The cumulative sum of the ASCII code values of all bytes from "slave address" to "running data".

(6) End of frame

Hexadecimal 0D, single byte.

1.2.6 Protocol command list

Frame 7E and frame end 0D, address, checkout sum，ASCII character format are omitted in following description.

Table 4 Protocol command table

Name		Main-frame Order	Auxiliary index	Order index	Run data setting range	Mainframe sending Example such as PC control operation of inverter(Language Cluster format auxiliary device address is set to 01)	Run data precision	Description
Query auxiliary status		10	00	00	No	~010A00000192\r	1	
Read parameters of auxiliary motor	Current set freq.	11	00	00	No	~010B00000193\r	0.01Hz	
	Current run freq.	11	00	01	No	~010B00010194\r	0.01Hz	
	Output current	11	00	02	No	~010B00020195\r	1V	
	Output voltage	11	00	03	No	~010B00030196\r	0.1A	
	Bus-bar voltage	11	00	04	No	~010B00040197\r	1V	
	Load motor speed	11	00	05	No	~010B00050198\r	1rpm	
	Module temp.	11	00	06	No	~010B00060199\r	1℃	
	Runtime	11	00	07	No	~010B0007019A\r	1 hour	
	Accumulative time	11	00	08	No	~010B0008019B\r	1 hour	
	Input terminal	11	00	09	No	~010B0009019C\r	None	
	Output terminal	11	00	0A	No	~010B000A01A4\r	None	
	Analog input VCI	11	00	0B	No	~010B000B01A5\r	0.01V	
	Analog input CCI	11	00	0C	No	~010B000C01A6\r	0.01V	
	Reserved	11	00	0D	No	~010B000D01A7\r	0.01V	
	Exterior pulse input	11	00	0E	No	~010B000E01A8\r	0.01Hz	

	Read inverter status	11	00	0F	No	~010B000F01A9\r	None	
Run control and adjusting function	Auxiliary device run command	12	00	00	No	~010C00000194\r	None	
	Set current run frequency provision of auxiliary device	12	00	01	0Hz~ upper limit freq.	~010C00010FA0027C\r	0.01Hz	Set frequency =40.00Hz
	Auxiliary device run with run freq. provision	12	00	02	0Hz~ upper limit freq.	~010C00020FA0027D\r	0.01Hz	Run from machine Set frequency =40.00Hz
	Auxiliary device forward run	12	00	03	No	~010C00030197\r	None	
	Auxiliary device reverse run reverse operation	12	00	04	No	~010C00040198\r	None	
	Auxiliary device forward run with run freq. provision	12	00	05	0Hz~ upper limit freq.	~010C00050FA00280\r	0.01Hz	Forward turn on Set frequency =40.00Hz
	Auxiliary device reverse run with run freq. provision	12	00	06	0Hz~ upper limit freq.	~010C00060FA00281\r	0.01Hz	Reverse boot Set frequency =40.00Hz
	Auxiliary device stop	12	00	07	No	~010C0007019B\r	None	
	Auxiliary device jog run	12	00	08	No	~010C0008019C\r	None	
	Auxiliary device forward jog run rotation jogging peration	12	00	09	No	~010C0009019D\r	None	
	Auxiliary device reverse jog run operation	12		0A	No	~010C000A01A5\r	None	
	Auxiliary device stop jog run operation	12	00	0B	No	~010C000B01A6\r	None	
	Auxiliary device failure restoration reset	12	00	0C	No	~010C000C01A7\r	None	

	Auxiliary device urgent stop	12	00	0D	No	~010C000E01A8\r	None	
Read function code parameters	Run freq. digital setting F0.01	13	00	01	No	~010D00010196\r	0.01Hz	
	Run direction setting F0.03	13	00	03	No	~010D00030198\r	1	
	Acceleration time 1 F0.08	13	00	0A	No	~010D000E01AA\r	0.1S	
	Deceleration time 1 F0.09	13	00	0B	No	~010D000F01AB\r	0.1S	
Set function code parameters	Run freq. digital setting F0.01	14	00	01	0Hz~upper limit freq.	~010E00011388026B\r	0.01Hz	Set function code F0.01=50.00Hz
	Running direction setting F0.03	14	00	03	0, 1	~010E00030001025A\r	1	Set function code F0.03 is reverse
	Acceleration time 1 F0.08	14	00	09	0~8CA0	~010E000E03E8028B\r	0.1S	Set function code F0.08 is 10.0 seconds
	Deceleration time 1 F0.09	14	00	0A	0~8CA0	~010E000F03E8028C\r	0.1S	Set function code F0.09 is 10.0 seconds
Query order Software version	Query auxiliary device software version	15	00	00	No	~010F00000197\r	1	

Table 5 Response status word meaning of read inverter status command

Bit	Meaning		
	Description	0	1
Bit0	Stop/Run state	Stop	Run
Bit1	Logo for under voltage	Normal	Under voltage
Bit2	Forward/reverse run logo	Forward run	Reverse run
Bit3	Traverse run mode logo	Ineffective	Ineffective
Bit4	Common run mode flag	Ineffective	Ineffective
Bit5	Jog run mode flag	No	Jog
Bit6	PLC run mode flag	No	Yes
Bit7	Multi-freq. run mode flag	No	Yes
Bit8	PID closed loop run mode logo	No	Yes

Bit9	Set counting value arrival logo	No	Yes
Bit10	Specified counting value arrival logo	No	Yes
Bit11~15	Reserved		

Table 6 Read auxiliary device function code parameters

Function definition	Read auxiliary function device code parameters: all function code parameters except user password and manufacturer password						
Meaning	Frame head	Address	Order	Order index	Run data	Checkout	Frame end
Mainframe order	7EH	ADDR	13	See remarks	None	BCC	0DH
Bytes	1	2	2	4	0	4	1
Auxiliary device response	7EH	ADDR	06	See remark	Function code para.	BCC	0DH
Bytes	1	2	2	4	4	4	1

Remark

Command index = composed of the function code group number and the hex code of the function code number. For example:
To read the parameters of the F0.05 function code, order index = 0005;
To read the parameters of the F2.11 function code, order index= 020B;
To read the parameters of the F2.15 function code, order index = 020F;
To read the parameters of the F2.13 function code, order index= 020D;

Correspondence between decimal and hexadecimal values of function code group No.

Function group	Decimal	Hex	Function group	Decimal	Hex
F0	0	00H	F6	6	06H
F1	1	01H	F7	7	07H
F2	2	02H	F8	8	08H
F3	3	03H	F9	9	09H
F4	4	04H	FD	13	0DH
F5	5	05H	FF	15	0FH

Virtual data	0～FFFF (i.e. 0～65535)

Please input correct user password before you set user function code parameter.

Table 7 Set auxiliary device function code parameters

Function definition	Read auxiliary function device code parameters: all function code parameters except user password and manufacturer password						
meaning	Frame head	Address	Order	Order index	Run data	Checkout sum	Frame end
Mainframe order	7EH	ADDR	14	See remarks	None	BCC	0DH
Bytes	1	2	2	4	0	4	1
Auxiliary device response	7EH	ADDR	06	See remark	Function code para.	BCC	0DH

<table>
<tr><td>Bytes quantity</td><td>1</td><td>2</td><td>2</td><td>4</td><td>4</td><td>4</td><td>1</td></tr>
<tr><td rowspan="9">Remark</td><td colspan="7">Command index = composed of the function code group number and the hexadecimal code of the function code number. For example:
To read the parameters of the F0.05 function code, order index = 0005;
To read the parameters of the F2.11 function code, order index = 020B;
To read the parameters of the F2.15 function code, order index = 020F;
To read the parameters of the F2.13 function code,order index = 020D;</td></tr>
<tr><td colspan="7">Correspondence between decimal and hex values of function code group number names</td></tr>
<tr><td>Function code group</td><td>Decimal</td><td>Hex</td><td>Function group</td><td>Decimal</td><td>Hex</td></tr>
<tr><td>F0</td><td>0</td><td>00H</td><td>F6</td><td>6</td><td>06H</td></tr>
<tr><td>F1</td><td>1</td><td>01H</td><td>F7</td><td>7</td><td>07H</td></tr>
<tr><td>F2</td><td>2</td><td>02H</td><td>F8</td><td>8</td><td>08H</td></tr>
<tr><td>F3</td><td>3</td><td>03H</td><td>F9</td><td>9</td><td>09H</td></tr>
<tr><td>F4</td><td>4</td><td>04H</td><td>FD</td><td>13</td><td>0DH</td></tr>
<tr><td>F5</td><td>5</td><td>05H</td><td>FF</td><td>15</td><td>0FH</td></tr>
<tr><td>Virtual data</td><td colspan="7">0～FFFF (i.e. 0～65535)</td></tr>
</table>

Appendix 2 Braking resistance

1.1 Braking resistance

The motor's electric potential energy will charge inverter's capacitance up reversely if speed of the motor descends too quickly or load of the motor wobbles too quickly while the inverter is running, which will increase the voltage upon power modules suddenly and is easy to make the inverter damaged. The inverter will control it according to load size and performance. You have to connect external resistance to realize timely energy discharge when the braking is not enough. To connect external resistance is a kind of energy consumption braking mode, as all the energy is consumed by the braking resistance.

EDS820 series have built-in braking unit and you can add external braking resistance ,but the external resistance need booking.

External braking resistance configuration table

Type	Built-in brake unit	Braking resistance	Qty	Power of Braking resistance	Remark
EDS820-2S0002B	Built-in	500Ω	1PCS	60W	External braking resistance
EDS820-2S0004B	Built-in	500Ω	1PCS	60W	External braking resistance
EDS820-2S0007B	Built-in	500Ω	1PCS	60W	External braking resistance
EDS820-2S0015B	Built-in	500Ω	1PCS	60W	External braking resistance
EDS820-4T0007B	Built-in	800Ω	1PCS	60W	External braking resistance
EDS820-4T0015B	Built-in	800Ω	1PCS	60W	External braking resistance
EDS820-4T0022B	Built-in	300Ω	1PCS	1KW	External braking resistance

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