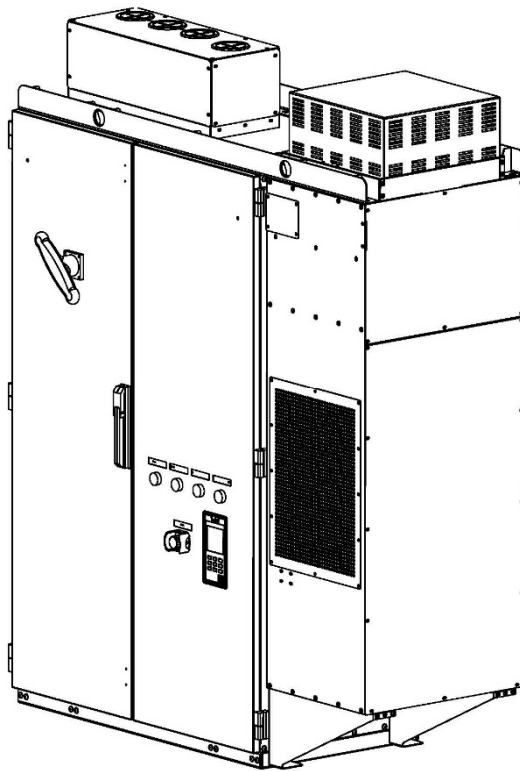




YD Series Non-AFE user manual

LG Electronics Air-Conditioning (Shandong) Co.,Ltd supervised



Contents

Chapter 0 Instruction	0
Chapter 1 Safety Precautions	
1.1 Before Power On	1-1
1.2 Wiring.....	1-2
1.3 Before Operation	1-2
1.4 Parameter Setting	1-3
1.5 Operation	1-3
1.6 Inspection, Maintenance and Replacement	1-4
Chapter 2 Model Instruction	2-1
2.1 Nameplate.....	2-1
Chapter 3 Electrical wiring	3-1
3.1 Terminal function description	3-1
Chapter 4 Surrounding Environment and Installation	
4.1 Environment	4-1
4.2 Dimension And Mounting Holes Position	4-2
4.3 Internal layout of the inverter cabinet	4-4
Chapter 5 Software Index	
5.1 LCD Panel Usage Instruction	5-1
5.1.1 Panel Function Instruction.....	5-2
5.1.2 Display instructions	5-2
5.1.3 Screen and parameter instruction	5-6
5.1.4 Parameter operation example	5-8
5.1.5 Password structure	5-9
5.2 Parameter Function Instruction	
5.2.1 U Group: Summary of User Monitoring Parameters	5-10
5.2.2 A Group: Programming environment parameter Settings.....	5-12
5.2.3 B Group: Programming program parameter Settings.....	5-12
5.2.4 C Group: Performance parameter adjustment	5-13
5.2.5 E Group: Motor data.....	5-15
5.2.6 L Group: Protection function parameter.....	5-15
5.2.7 O Group : Protective Functional Parameters	5-16
Chapter 6 Abnormal Diagnosis And Troubleshooting	
6.1 General Rules	6-1
6.2 Fault Alarm (Fault) Detection Function	6-3

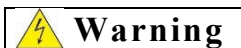
Chapter 0 Instruction

0.1 Instruction

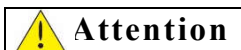
Thank you for purchasing the frequency converter designed and produced by **LG Electronics Air-Conditioning (Shandong) Co.,Ltd** and produced by Wuxi Youlikang Electrical Appliance Co., Ltd. In order to fully utilize the functions of this frequency conversion cabinet and ensure user safety, please read this operation manual carefully.

※ Notice for Use.

The inverter is a sophisticated electrical and electronic product. In order to ensure the safety of your life and property, this manual contains the words "Warning" "Attention", which is for reminding you the safety precautions when you are carrying, installing, using, and checking the inverter. Please cooperate and comply with.



Mishandling may cause serious personal injury.



Mishandling may cause the damage to the inverter or mechanical system.



Warning

- Avoid sensitive electricity! The DC capacitor in the cabinet cannot be discharged within 15 minutes after the power is removed. Please remove or check the power supply 15 minutes after the power is removed.
- Do not implement wiring during the power transmission process, and do not open the box to inspect the circuit when the is in operation;
- Please do not disassemble and assemble or change the internal connecting lines or wiring and parts of the inverter;
- The ground terminal should be sure grounding correctly.



Attention

- Please do not test the internal components of the inverter, these semiconductor parts are vulnerable to high pressure and damaged;
- Never connect the inverter output terminals U, V, W to the AC power supply;
- CMOS integrated circuit board of inverter is vulnerable to electrostatic influence and damage. Do not touch circuit boards.

Chapter 1 Safety Precautions

1.1 Before Power On



Warning

- The main circuit and terminal cable connection must be correct, three input terminals (R, S, T) are for power supply, absolutely, you can't mix with the motor output (U, V, W); if so, it will damage inverter panel.



Attention

- The selection of power supply voltage must be the same as the input voltage of the inverter panel specifications.
- Carrying inverter cabinet, please ensure that the fixing hole will buckle hook machine specified, and confirm tonnage forklift or lifting for handling, In order to prevent the inverter panel transportation process fall off, or causes the personal injury or inverter panel damage.
- Please install the inverter panel on noncombustible materials such as metal. Please do not install it on or near flammable materials to prevent fire.
- Please remove or install the operator after closing the power supply. Operating the keypad according to the diagram so as to avoid bad contact and cause malfunction or no display of the operator.



Warning

- This product had passed IEC 61800-3 Restricted Area Use level. In some circumstances, the use of this product may cause electromagnetic interference, so before use, please conduct proper testing, and be sure grounding properly.



Attention

- The installation and usage of the product must be carried out by qualified professionals.
- The installation must be installed with a fixed wiring.

1.2 Wiring



Warning

- Be sure to turn off the main power supply before any inverter or wiring, so as to avoid electric shock and fire.
- The wiring project personnel shall have the relevant professional knowledge, to avoid electric shock and fire.
- The distribution of cooling water required to have relevant professional knowledge and documents, to avoid the danger caused by improper placement.
- To confirm connection between the ground wire and earth. (class 400V: ground impedance needs less than 10 ohms)
- The wiring is completed, to confirm the emergency stop function effectively. (the liability of the wiring belongs to the user)
- Do not directly touch the input / output power line, and avoid all wiring and inverter shell contact with short circuit.
- Do not withstand voltage test of the inverter, easy to cause the semiconductor component damage.



Attention

- To confirm the main input power match up with inverter, avoid injury or fire.
- Please lock the terminal screws according to the specified torque in order to avoid the danger of fire.
- Please install the water and external cooling equipment according to the regulations to avoid the overflow of coolant or the burst of water pipe.
- Do not connect the input power to the output terminal of the inverter.
- Do not connect the electromagnetic contactor and the electromagnetic switch to the output terminal.
- Do not connect the incoming capacitor or the LC/RC filter to the output circuit.
- Ensure that interference from inverters and motors does not affect the peripheral sensors or equipment.

1.3 Before operation



Warning

- Before power transmission, please confirm that the capacity of the inverter is the same as the power capacity of the motor being dragged.
- The wire between the inverter and the motor is over 25 meters, and the carrier frequency or the output filter must be reduced to reduce the over voltage or oscillation of the load, so as to avoid the motor damage.
- Check the waterway equipment to ensure that the water pressure and flow of the outer loop meets the cooling requirements.

1.4 Parameter setting



Attention

- When you are debugging parameters, you need to read the instruction manual.
- When making parameter modifications, the professional or qualified technical certification personnel are required to avoid the damage to the machine or personnel in commissioning process.

1.5 Operation




Warning

- Please confirm the front door closed and turn the doorknob to the closed position, then turn on the power.
- In operation, the motor unit can not be put into or cut off, otherwise it will cause the inverter to jump over the current, which will cause the main loop of the inverter to be damaged seriously.
- Please do not close to the machine when resetting. The machine will start again after the fault has been cleared.
- Do not operate the machine in wet hands.
- Provide an emergency switch with independent external hardware, emergency shutdown of inverter output when danger occurs.
- Please confirm that the running command is closed before resetting the warning.
- If you choose to automatically restart after restoration, the inverter will start automatically in power recovery.
- During operation, please ensure the peripheral water system, avoid direct contact with electrical equipment, and ensure the safety of personnel.
- During operation, the water cooling equipment shall not be disassembled or repaired, so as to avoid internal hot circulating liquid overflow.
- Regardless of the inverter in operation or stopped state, avoid touching relevant terminals, in case of danger.
- After the power is cut off, the fan may continue to rotate for a period of time.
- After the machine has stopped running, the cabinet remains warm, and the maintenance personnel should be careful to prevent scalding.



Attention

- Please do not touch the heating components such as power line, motor cable and water cooling pipe. 
- The inverter can easily drive the motor from low speed to high speed. Please confirm the

allowable range of the motor and the load.

- When you use the circuit breaker or electromagnetic contactor to the front end, please pay attention to the specifications and related settings.
- Please do not check the signal on the circuit board when the inverter is in operation.



Warning

- Avoid sensitive electricity! The DC capacitor in the inverter can not be discharged within 15 minutes after the power is removed. Please remove or check the power supply 15 minutes after the power is removed.

1.6 Inspection, maintenance and replacement



Warning

- Before the maintenance check, make sure the power is off and the power indicator goes off (please confirm that the DC voltage is not more than 25 volts).
- There is a high voltage terminal in the inverter, please do not touch it at will.
- When the power is on, make sure to install the protective cap. After removing the protective cap, make sure to disconnect the power from the breaker.
- No maintenance, inspection, or replacement of parts, except for designated professionals.



Attention

- The temperature around the inverter should be used at 0, ~+40, 90%RH and no condensation. However, it is necessary to ensure that there is no dripping water and metal dust in the surrounding environment.

Attention when scrap the inverter



Attention

- When the inverter is to be scrapped, please treat it as industrial waste, and please pay attention to the following items:
- The electrolytic capacitor of the main circuit of the inverter and the electrolytic capacitor on the printed circuit board may explode when burned;
 - The internal wires, panels and other plastic parts of the inverter produce poisonous gas when burning.

Chapter 2 Model Instruction And Model Name Description

2.1 Nameplate

Model name description (机种命名说明):

YD 0909 YF T40-A M 1 W X S X X A A 00

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮

① YD series VFD (YD 系列变频器)

② Use Motor Rated Load Amps (NMRA) value (适用电机额定电流)

0236: 0~236A

0302: 237~302A

0472: 303~472A

0605: 473~605A

0708: 606~708A

0906: 709~906A

1100: 907~1100A

1236: 1101~1236A

1386: 1237~1386A

③ Type of cooling (冷却方式)

QS=Cooling water cooling system (冷却水冷却)

DS=Chilled water cooling system (冷冻水冷却)

LM= Refrigerant cooling system (冷媒冷却)

FL =Air cooling system (风冷)

YF = Liquid & Air cooling system (液态风冷)

④ Input voltage (输入电压)

T38= 380V-50/60Hz-3Ph

T40= 400V-50/60Hz-3Ph

T41= 415V-50/60Hz-3Ph

T44= 440V-50/60Hz-3Ph

T48= 480V-50/60Hz-3Ph

⑤ Customer Code (客户代码)

A=LG Qingdao (LG 青岛工厂)

C=LG South Korea (LG 韩国工厂)

⑥ The circuit breaker model (断路器形式)

A= ACB (框架断路器)

M=MCCB (塑壳断路器)

- ⑦ Terminal model (接线端子形式)
- 1= Each terminal one hole (单孔端子)
 - 2= Each terminal two holes (双孔端子)
 - 3= Aluminum Terminal (铝合金端子)
- ⑧ Power meter optional (功率表选配)
- X= None (无功率表)
 - W= Power meter optional (有功率表)
- ⑨ Current meter and Voltage meter optional (电压、电流表选配)
- X= None (无电压、电流表)
 - B= Current meter and Voltage meter optional (有电压、电流表)
- ⑩ Input reactor optional (输入电抗器选配)
- X= None (无输入电抗器)
 - R= Input reactor optional (有输入电抗器)
- ⑪ SPD optional (浪涌保护器选配)
- X= None (无浪涌保护器)
 - S= SPD optional (有浪涌保护器)
- ⑫ Low harmonic optional (低谐波选配)
- X= None (无谐波治理设备)
 - F=AFE optional (AFE 谐波治理设备)
 - P=APF optional (APF 谐波治理设备)
- ⑬ Chiller type (机组类型)
- A= H-model (常规离心机)
 - B=Magnetic Bearing (磁悬浮机组)
- ⑭ Version code (版本号)
- ⑮ Non-standard code (非标代号)

2.2 Specification table of inverter (变频柜选型规格表)

Specification table of inverter				
Rated Current	Applicable current	overload	Structure Frame	Cooling way
236A	0A-236A	110%	Frame1	Air-cooling
302A	237A-302A			
472A	303A-472A		Frame2	Liquid air cooling
605A	473A-605A			
708A	606A-708A			
906A	709A-906A		Frame3	water-cooling
1100A	907A-1100A			
1236A	1101A-1236A			
1386A	1237A-1386A			
Note : 1. The maglev inverter : the maximum current should correspond to applicable current. 2. The Non-maglev inverter: the rated current should correspond to the applicable current.				

Chapter 3 Electrical Wiring Instructions

3.1 Terminal function instructions

3.1.1 Main loop Terminal function instructions

Terminal symbol	Wiring object	Points for attention
R	Alternating current power supply	380-460 VAC +10%~-10%
S		
T		
U	Load motor	Motor interline impedance needs to be balanced, no short-circuit phenomenon; Motor wire and ground PE impedance need to be open.
V		
W		

3.1.2 Keyboard panel port communication instructions

Port model	Interface definition	Wiring instruction
RJ45	Communicating with PC / using for uploading and download parameters	slave station, RS485 Modbus protocol

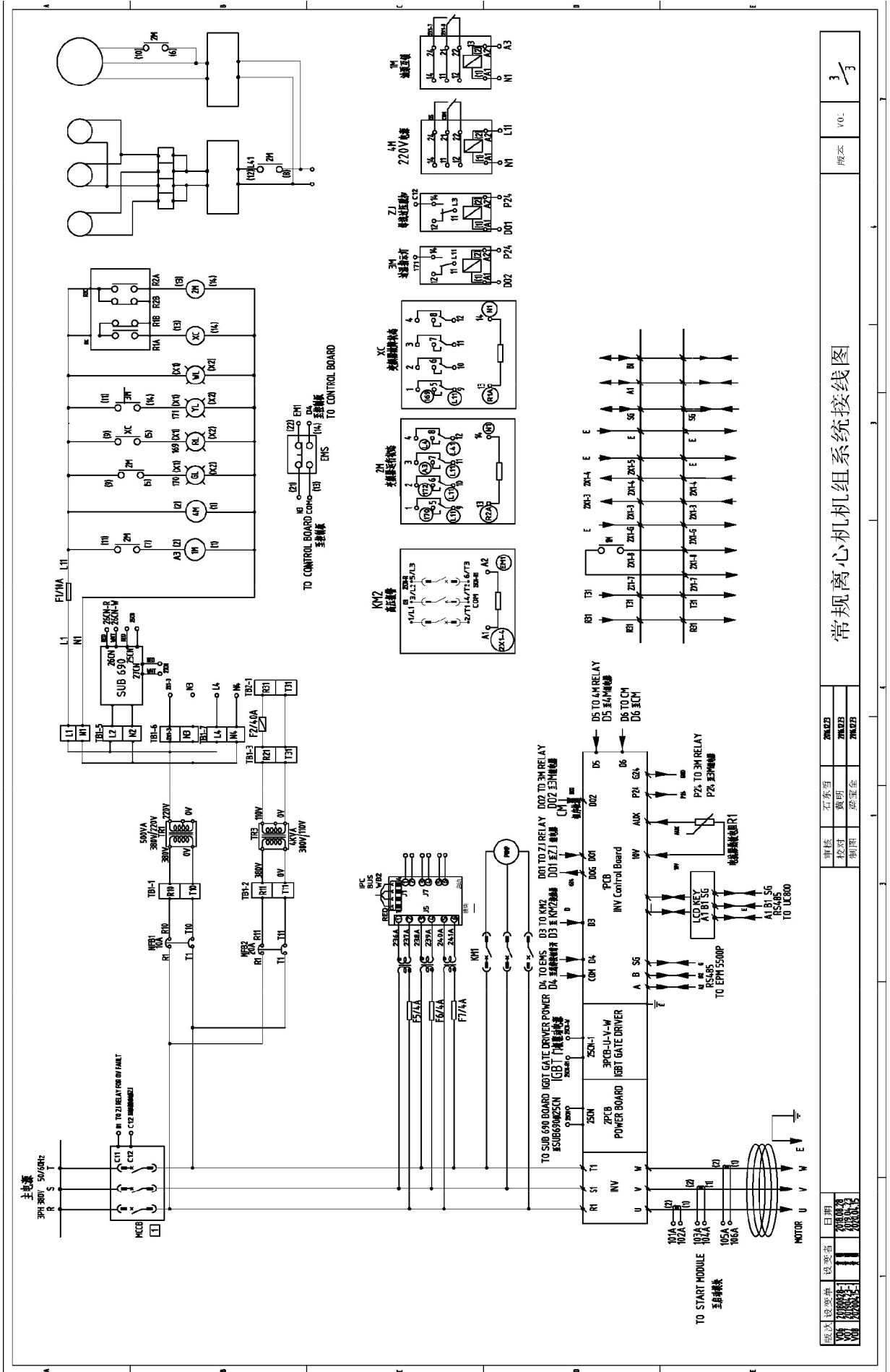


Attention

1. While wiring, Please refer to the error! Reference source not found., choose the appropriate wire diameter, when the main circuit wiring is very long, it needs to consider that the voltage drop must not be greater than 2% of the rated voltage.

Phase voltage drop $\Delta V = \sqrt{3} \times \text{Wire resistance } (\Omega/\text{km}) \times \text{wiring distance (m)} \times \text{electric current(A)} \times 10^{-3}$

2. When the wiring between the inverter and the motor is very long, appropriately turn down the carrier frequency please (parameter C6-01).



版本	3/3
图号	7M4ZB
日期	2008.05
设计	王东雪
校核	黄明
审核	王东雪
制图	戚宝全

常规离心机机组系统统接线图

版本

3/3

Chapter 4 Surrounding Environment and Installation

4.1 Environment

The installation environment of inverter panel cabinet can direct influence on the function and life span. Therefore, the installation environment around inverter must meet the following conditions:

Protection	
Protection Level	IP21/IP54
Applicable Environment	
External Circulating Coolant Temperature	15~40°C
Storage Temperature	-40~60°C
Humidity	5% to 90% relative humidity RH (follow IEC60068-2-78 standard)
Shake	Maximum acceleration : 1.2G (12m/s ²), from 49.84 to 150 Hz Displacement amplitude : 0.3mm (peak value), from 10 to 49.84 Hz (follow IEC60068-2-6 standard)
Altitude	Below 2000 meters above sea level, frequency converter does not drop capacity. Above 2000 meters above sea level, 100 meters per rise, inverter down 1%.

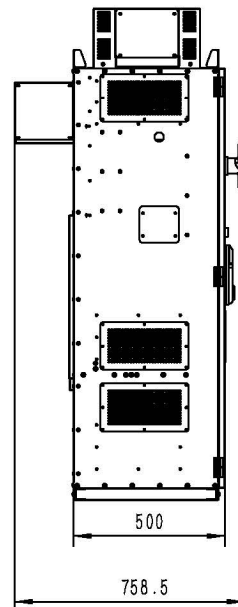
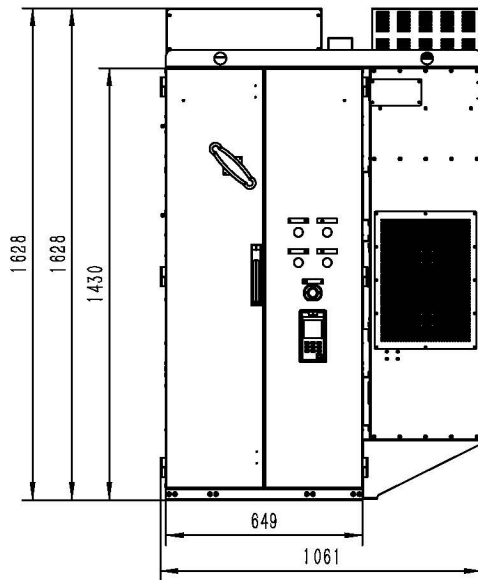
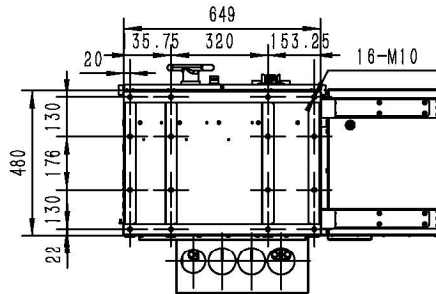
Installation Location

Products should be installed in an easy to operate environment and avoid exposure to the following circumstances:

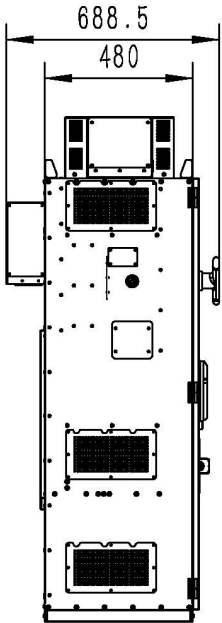
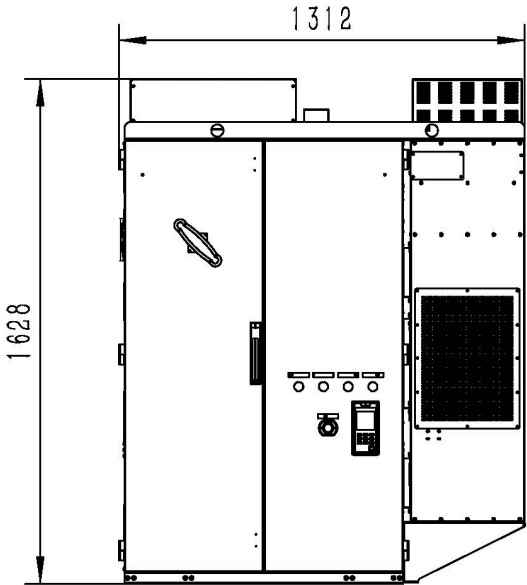
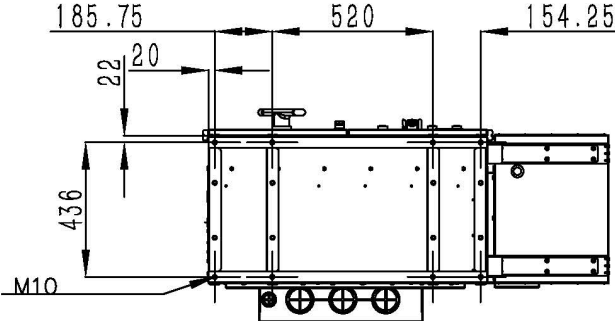
- To avoid direct sunlight.
- To prevent the rain dripping.
- To prevent the erosion of salt, oil mist.
- To prevent the corrosive liquid and gas.
- To prevent dust, cotton and Metal filings invasion.
- To prevent electromagnetic interference (welding machine, power machine).
- Keep away from radioactive materials and combustibles.
- To prevent vibration, if not avoid, please install shock proof gasket to reduce vibration.

4.2 Dimension And Mounting Holes Position

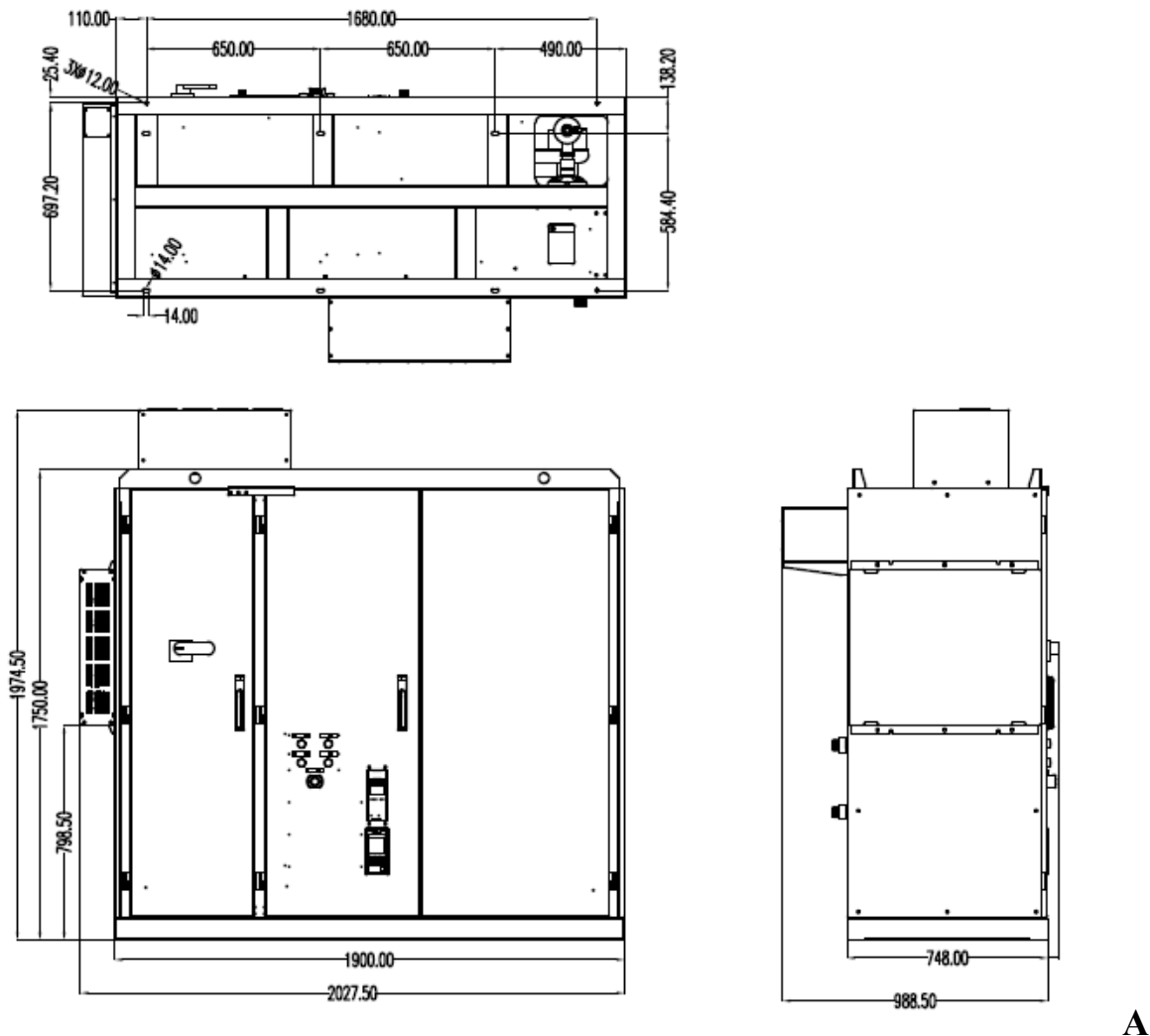
Frame2 303A-605A



Frame3 606A-906A



Frame4 907A-1386



4.3 Inverter Panel Peripheral Equipment Wiring And Attentions



Attentions

1. Within **15** minutes after the input power is cut off, the main circuit may still have high voltage. The operation can be carried out only after confirming that the DC bus voltage is lower than 36V;
2. Wiring or disassembly of internal connector of inverter cabinet shall not be carried out in power transmission;

3. Never connect the inverter output terminals U, V, W to the AC power supply;
4. The grounding terminal E of the inverter cabinet must be grounded;
5. Please do not test the internal components of the inverter, these semiconductor parts are vulnerable to high pressure and damaged;
6. CMOS integrated circuit board of inverter is vulnerable to electrostatic influence and damage.
Do not touch circuit boards.

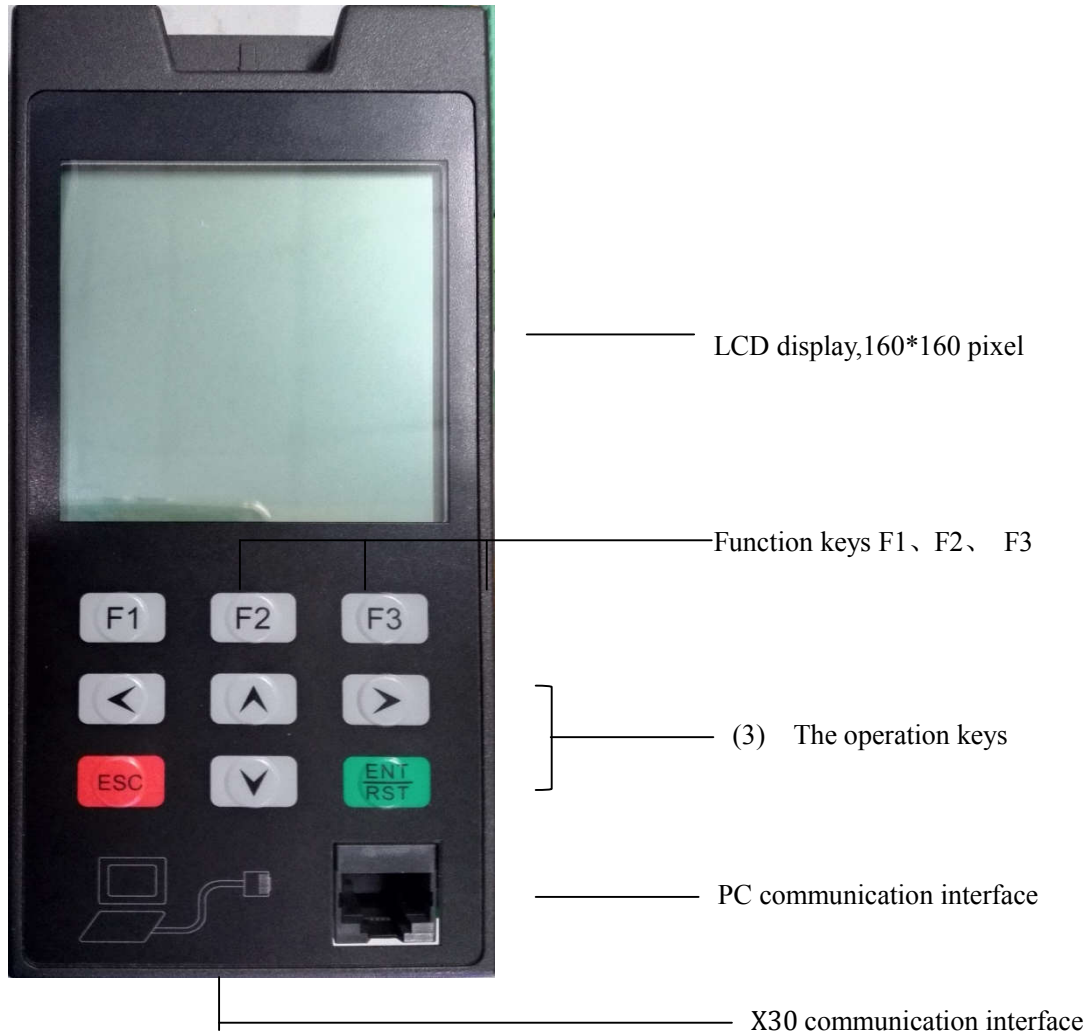
*Note: The main power switch points to the "OFF" position when the inverter is out of the factory. Do not switch the main power switch to the "ON" position **until the connection is completed and check is confirmed.***

Chapter 5.1 Software Index

5.1 LCD panel usage instructions

5.1.1 Panel function instructions

The following is the appearance of the LCD panel:



The panel supports three function keys (F1, F2, F3) and six operation keys (up, down, left, right, ESC, ENT/RST).

The function of the operation keys as follows:

1>. The function of the operation keys

Key	Name	Function
【↑】	Up key	Please click this button when you select the method, group, function, parameter name, setting value (increase), etc.
【↓】	Down key	Please click this button when you select the method, group, function, parameter name, setting value (decrease), etc.
【←】	Left key	Numeric selection key for numeric settings of the parameter
【→】	Right key	Numeric selection key for numeric settings of the parameter
【ESC】	Escape key	Skip to parent menu
【ENT/RST】	Enter key	Press the key when determining the mode, function, parameter, setting value
	Reset key	【F1】When you monitor the alarm at the interface, press this button to reset the fault

In addition, the panel also supports RS485 communication port of slave station, as follows:

2>. The definition of upper computer communication interface

NO.	Name	Fuction
1	A	(+)RS485
2	B	(-)RS485
3	SG	Ground shield wire (for RS485 communication only)

5.1.2 Display instructions

1> Power on the initial interface, or press [F1] key to enter the monitoring interface

↳ Inverter status -> normal:



Display line 1, display content from left to right in turn:
Bus Voltage, Output Current, Frequency
Instruction

Display line 2:
output frequency

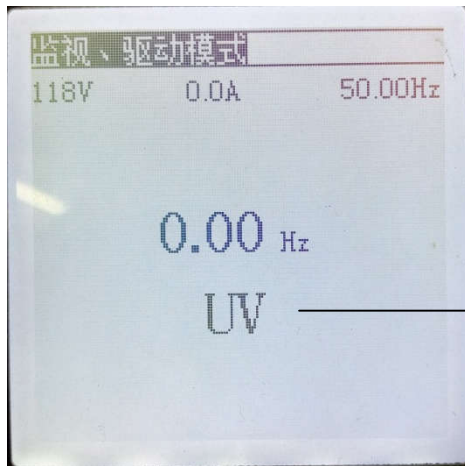
Display line 3, bit7 to bit0 from left to right:
Inverter status (see table below)

Inverter status:

Bit	State
0	1: running
1	Unused
2	1: inversion state
3	Unused
4	Unused
5	1: inverter ready
6	Unused
7	Unused

2 Inverter status: report an error:

The monitor is in the lower center of the screen. For example, when the inverter reports low-voltage alarm, the panel screen is shown as follows:



The inverter is in low-voltage state, and "UV" flashes.

2>. Press the key **【F2】** to enter user mode

Set the LCD parameters and X30 parameters in this mode.

The parameter attributes of inverter can only be read that can not be modified . Detailed description of parameters can be seen in Section 4.3.



— Status monitoring
 — Mode display
 — Parameter group

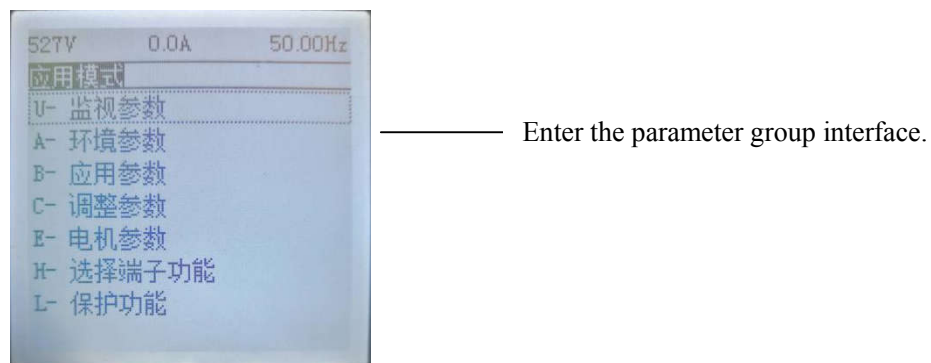
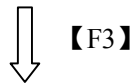
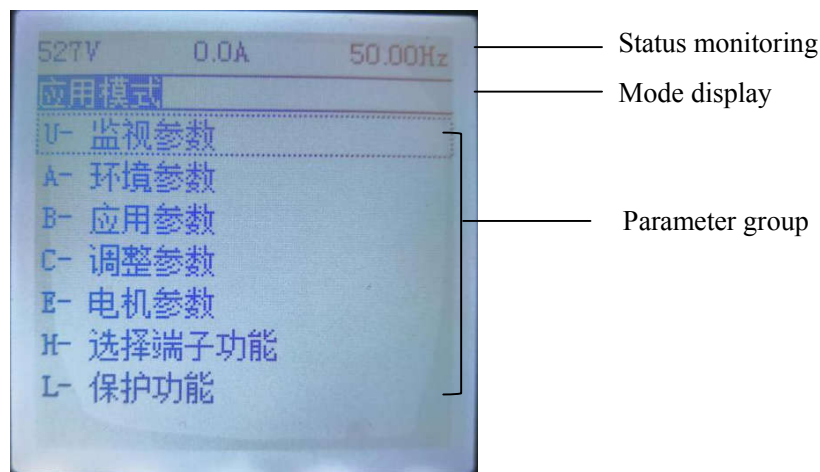
3>. Press the key **【F3】** to enter programming mode

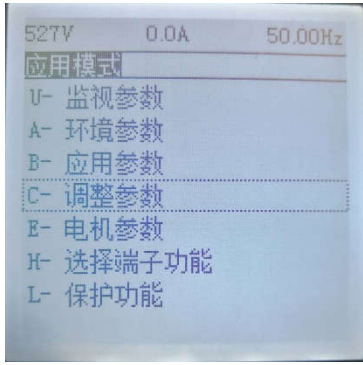
In this mode, the internal parameters of the inverter can be set.

★ When entering the programming mode, you need to set the permission of use parameters.
See the content of the programming mode for details.

In addition, the person who uses the programming mode should has considerable professional ability and know how to use the inverter.

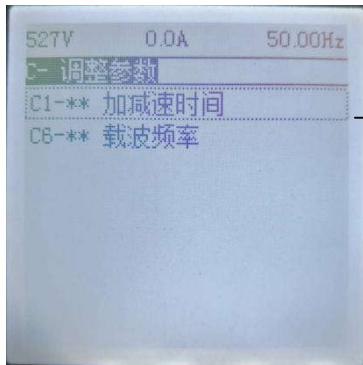
The interfaces of keypad as below:





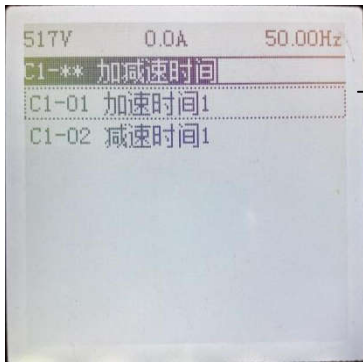
Select the parameter group through **【↑】 / 【↓】**.

【ESC】 ↑ ↓ **【ENT/RST】**



Enter the parameter group interface.

【ESC】 ↑ ↓ **【ENT/RST】**



Enter the parameter group interface.

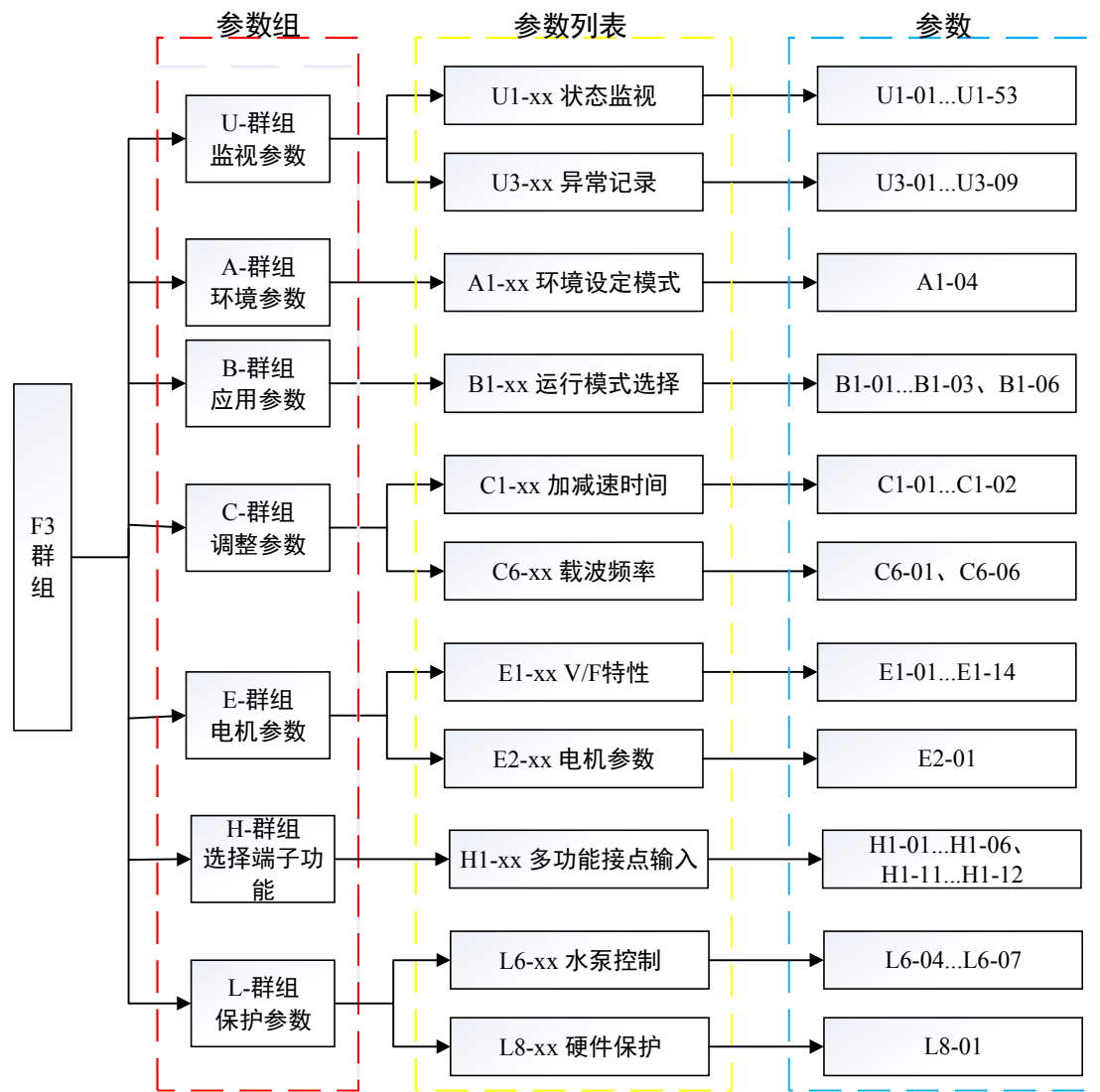
【ESC】 ↑ ↓ **【ENT/RST】**



Enter the parameter group interface.

5.1.3 Screen and parameter instruction

The parameter tree is as follows:



The picture tree is as follows:



Enter the parameter group interface





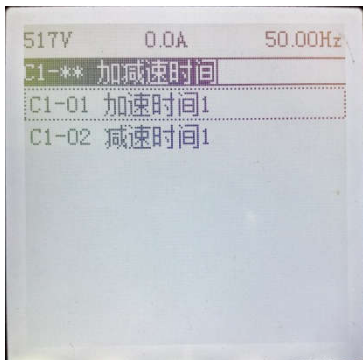
Select the parameter groups through 【↑】 / 【↓】

【ESC】 ↑ ↓ 【ENT/RST】



Enter the parameter list interface

【ESC】 ↑ ↓ 【ENT/RST】



Enter the parameter display interface

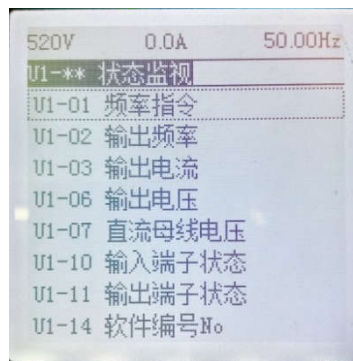
【ESC】 ↑ ↓ 【ENT/RST】



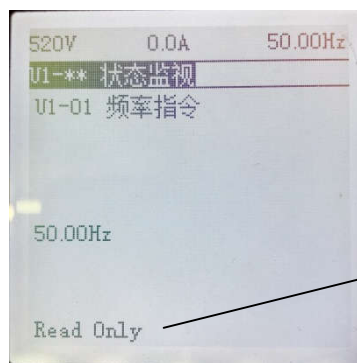
Enter the parameter display interface

5.1.4 Parameter operation example

1>. Unchangeable parameters: (Read Only):

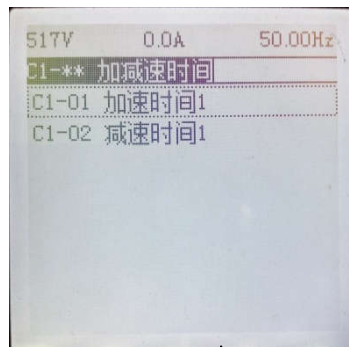


【ESC】 ↑ ↓ 【ENT/RST】

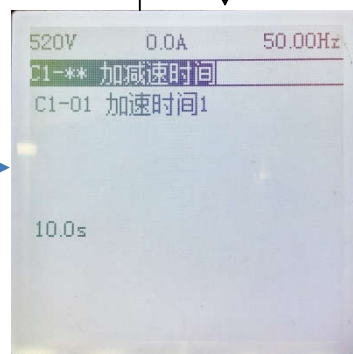


! For unchangeable parameters:
* Only the [ESC] key is available!
→ No change in parameters

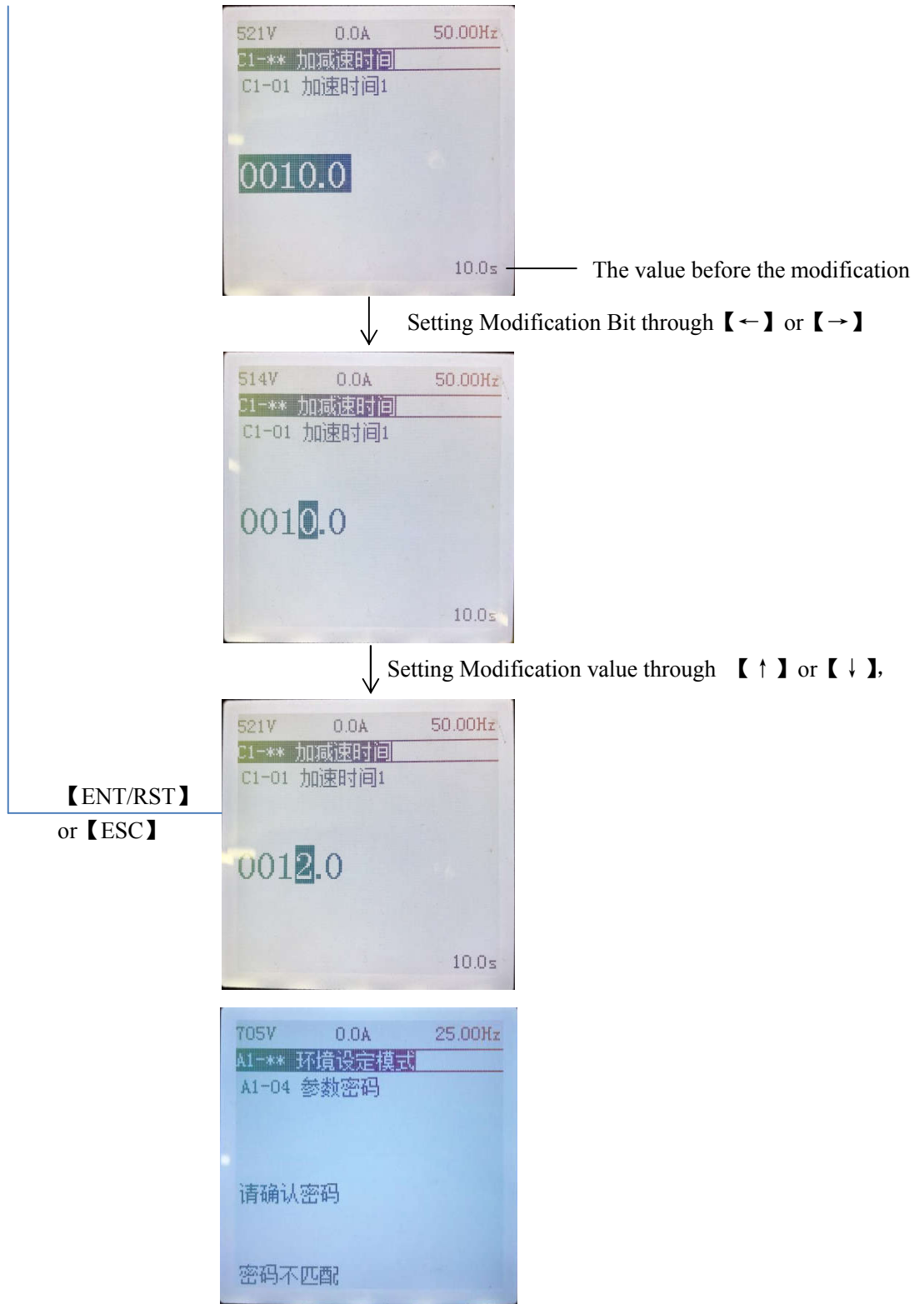
2>. Variable parameter:



【ESC】 ↑ ↓ 【ENT/RST】



【ENT/RST】



5.1.5 Password structure

5.1.5.1 Password level

- LG customer parameters:

LG customer parameters can display the contents (current state of frequency converter, bus voltage, current, frequency instruction, current fault code) (F1 monitoring and running interface)

You can check the history of the fault code and all the monitoring parameters (F3 interface)

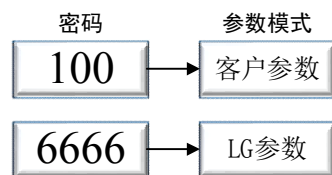
- LG parameters:

1) The parameters can be set by LG ;

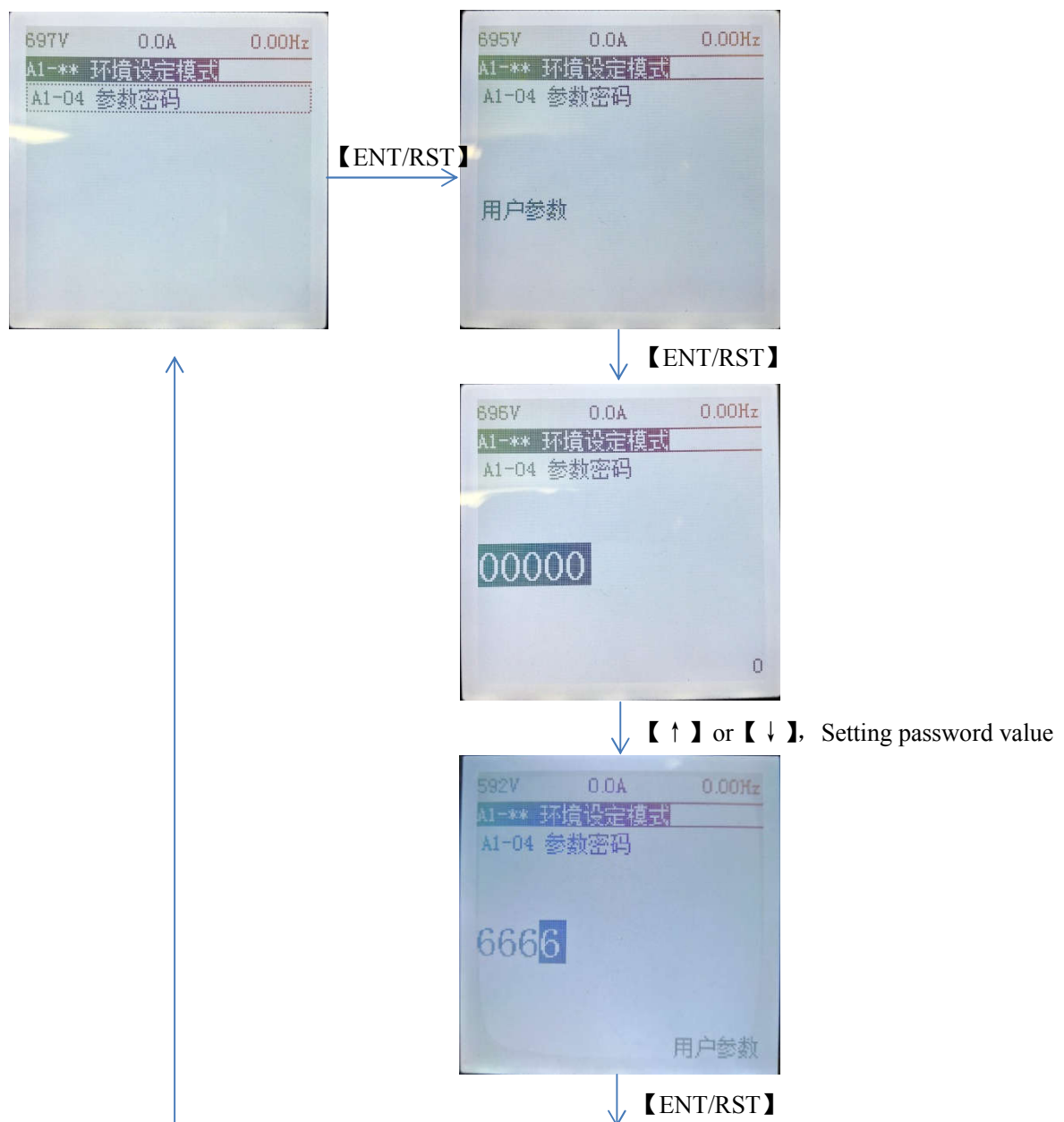
You can check the history code of the fault and all the monitoring parameters.

5.1.5.2 Parameter setting

By selecting one of the following passwords, you can switch to the corresponding parameter mode.



5.1.5.3 Password level change



【ESC】



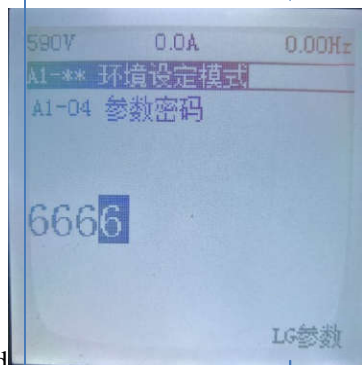
5.1.5.4 LG password reset



【ENT/RST】 + 【↑】， Setting password value

Correct password

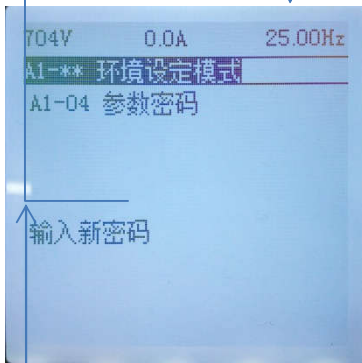
Wrong password



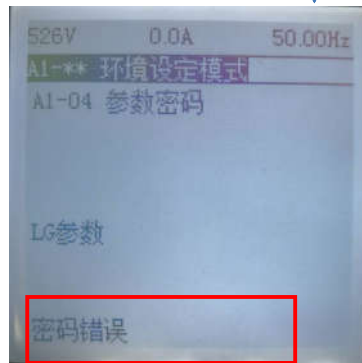
【ESC】
Exit password
modification
interface



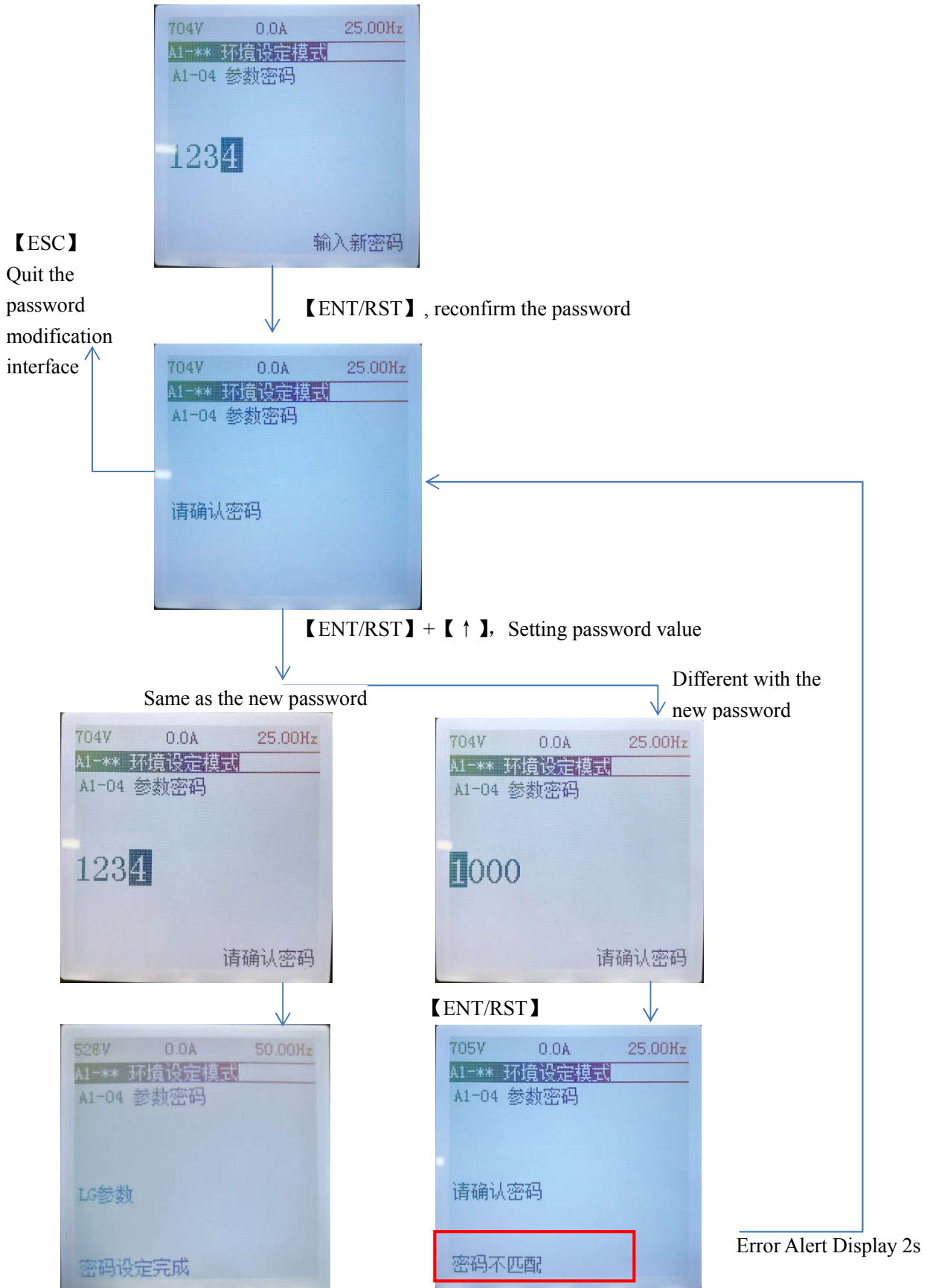
【ENT/RST】



【ENT/RST】， password reset



False alarm Display 2s



Chapter 5.2 Software Index (Parameters instructions)

5.2 Parameter function instruction

User parameter group

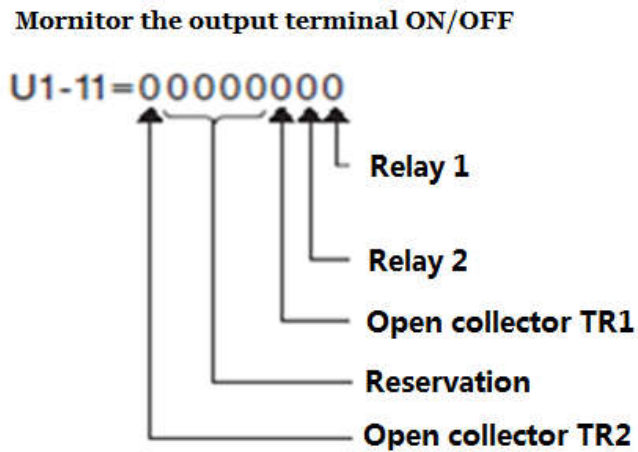
5.2.1 U Group: Summary of User Monitoring Parameters

Function	Parameter	Name	Contents	Simulation monitoring output	Minimum unit
Status monitoring	U1-01	Frequency instruction	Monitoring and Setting of frequency instruction value	10V/maximum frequency	0.01Hz
	U1-02	Output frequency	Monitor the output frequency	10V/maximum frequency	0.01Hz
	U1-03	Output current	Monitor the output current of inverter	10V/ rated current of inverter	0.1A
	U1-06	Output voltage	Monitor the output voltage instruction value of inverter	10V/E1-13 input value	0.1V
	U1-07	DC voltage	Monitor DC Bus Voltage Value of Main Circuit of inverter	10V/ (E1-13 input value $\times\sqrt{2}$)	--
	U1-10	Input terminal status	Monitor the status of input terminals*1	No outputing	--
	U1-11	Output terminal status	Monitor the status of input terminals*2	No outputing	--
	U1-14	Software No.	Check the software version No.	No outputing	--
	U1-15	Terminal AVI input	Monitor the input of AVI.	When inputting 10v , it corresponds to 100%.	0.1%
	U1-16	Terminal ACI input	Monitor the input of ACI.	When inputting 20ma , it corresponds to 100%.	0.1%
	U1-45	Reactor temperature	Monitor the internal temperature of reactor	No output	--
	U1-46	IGBT temperature	Monitor the internal temperature of IGBT	No output	--
	U1-48	Working time (hours)	Monitor working time 1 (hours)	No output	--
U1-49	Working time (days)	Monitor working time 2 (days)	No output	--	

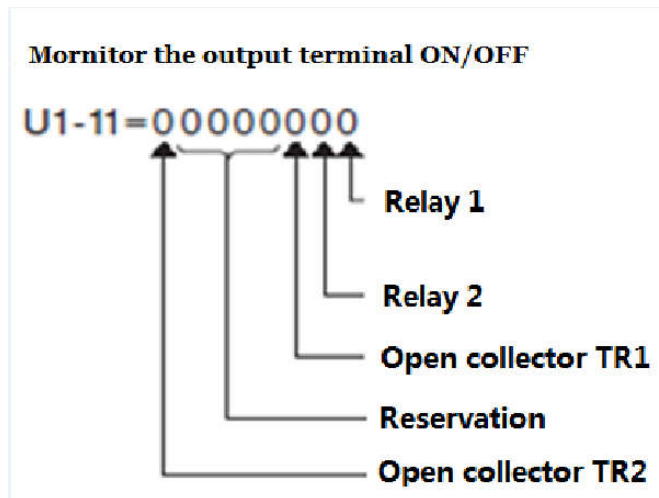
U1-50	IGBT overtemperature protection point	IGBT overtemperature protection set point	No output	--
U1-51	Reactor overtemperature protection point	Reactor overtemperature protection set value	No output	--
U1-52	Inverter type code	Display the type code of inverter	No output	--
U1-53	Rated Current of inverter	Display rated current value of inverter	No output	--
U3-01	Last fault	One time abnormal content	No output	--
U3-02	Previous second fault	Two times abnormal content	No output	--
U3-09	Previous Ninth fault	Nine times abnormal contents	No output	--

Remark

*1 LCD Keypad display:



*2 LCD Keypad display:



Programming parameter group

5.2.2 A Group : Programming environment parameter setting

A1- 03	Restore factory Values
Range	<p>【0】</p> <p>【01150】 : Restore 50Hz system factory values</p> <p>【01160】 : Restore 60Hz system factory values</p> <p>【0】</p>

0 No initialization

01150 The parameter values restore to 50Hz system

01160 The parameter values restore to 60Hz system

Note:

Restore the parameter values to EX-factory state and initialize it in a specialized way.

5.2.3 B Group : Programming parameter settings

B1- 03	Stop mode selection
Range	<p>【0】 : Slow to stop</p> <p>【1】 : Freedom to stop 【1】</p>

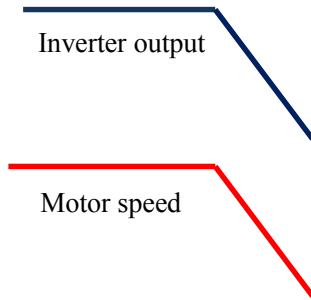
After the stop command issued, the inverter stop the motor.

B1-03 = 0, after issuing the shutdown command, the output of the inverter will slow down to zero from the current frequency according to the deceleration time C1-02.

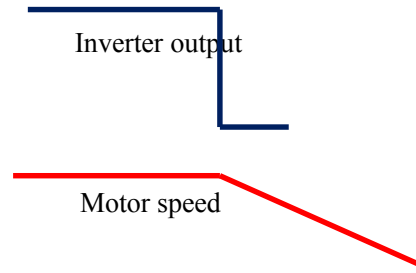
Picture B1-03-01

B1-03 = 1, after issuing the shutdown command, the output of the inverter will immediately stop, and the motor will run freely from the current frequency and decelerate to zero.

Picture B1-03-02



【Picture B1-03-01】



【Picture B1-03-02】

Note: When the motor stop mode is set as deceleration stop, if the deceleration time c1-02 is too short, it is easy to cause overvoltage (OV) alarm during the inverter shutdown.

It is generally recommended to set the free stop mode during shutdown. The time from running to free stop of the motor is related to the inertia of the motor and the load being dragged at that time. When the motor has not completely stopped, it is not recommended to put in the operation command again.

5.2.4 C Group : Performance parameter adjustment

C1-01	Acceleration time	
Range	【0.1~6000.0】 Sec	【20.0】 Sec
C1-02	Deceleration time	
Range	【0.1~6000.0】 Sec	【20.0】 Sec

The time required to set the output of the inverter to accelerate from 0 Hz to the rated frequency of the motor E1-06 is in seconds.

The time required to set the output frequency of the inverter to decelerate from motor rated frequency E1-06 to 0 Hz in seconds

$$T_a = \frac{\text{Theoretical acceleration time of the target frequency}}{\text{UC800 setting frequency}} * \text{C1 - 01(acceleration time)}$$

Theoretical deceleration time of target frequency

$$Td = \frac{\text{UC800 setting frequency}}{\text{E1} - 06 \text{ rated motor frequency}} * \text{C1} - 02(\text{deceleration time})$$

Attention:

The actual acceleration time also need to add the delayed time ‘Tid’ limited by CPU algorithm and a large current during the process.

The actual deceleration time also need to add the delayed time limited by CPU algorithm and rebound voltage during the process.

C6-01	Carrier frequency	
Range	【1~10】 KHz	According to customer’s order

Select the output Pulse-Width Modulation (PWM) carrier wave value of the inverter in KHz.

The change of the carrier wave setting will mainly affect the operation of the inverter and motor. In general, it’s not recommended that customers change the carrier wave frequency value, as the EX-factory default is ok.

Assuming that the carrier wave is raised from 2KHz to 5Hz, it will mainly affect the following parameters of the inverter and motor.

Parameter	Noise	Temperature Rise	Interference	Power Consumption
Inverter	Nothing	Higher	Higner	Higner
Motor	Lower	Lower	Nothing	Lower

Generally, as the output line of the motor increases, the leakage current of the frequency converter will increase. If the output line is long, the carrier needs to be appropriately reduced.

5.2.5 E Group E: Motor parameters

E1- 06	motor rated frequency	unit Hz
Range	【0.00~650.00】 Hz	According to customer's order
E1- 13	motor rated voltage	unit V
Range	【0.0~510.0】 V	According to customer's order
E2- 01	Motor rated current	unit A
Range		Table A

Before setting the rated frequency and voltage of the motor, please refer to the motor nameplate that you want to drag.

The factory default values of each model are shown in the following table:
table A:

Power	Rated current (factory default)
450kW	927A
630kW	1235A
710kW	1385A

If the rated frequency parameter E1-06 and rated voltage E1-13 are not consistent with the actual driving motor, the motor cannot output the correct rated power, which will also affect the motor output current.

If the motor rated current E2-01 is not set correctly, it will affect the accuracy of the inverter's electronic overload protection for the motor. For example the motor current is 650A. If it is set too low, the inverter is prone to overload protection (OL1). If the setting is too high, the inverter will burn the motor without protection when the motor is overloaded.

5.2.6 L Group L: Protective Functional Parameters

L6- 04	Ethylene glycol pump operating temperature	unit ℃
Range	【20~90】 ℃	【60】 ℃

When the IGBT temperature is higher than the setting value, the ethylene glycol pump will act.

L6- 05	Closing Temperature of Ethylene Glycol Pump	unit ℃
Range	【10~80】 ℃	【50】 ℃

When the IGBT temperature is lower than the setting value, the ethylene glycol pump stops.

L6- 06	Operation temperature of cold water pump	unit ℃
Range	【20~90】 ℃	【60】 ℃

When the IGBT temperature is higher than the setting value, the cold water pump moves.

L6- 07	Closing temperature of cold water pump	unit ℃
Range	【10~80】 ℃	【50】 ℃

When IGBT temperature lower than the setting value, the cold water pump stops.

L8- 01	IGBT Overtemperature Protection Settings	unit ℃
Range	【80~100】 ℃	【95】 ℃

When the IGBT temperature is higher than the setting value, the inverter will alarm OH.

5.2.7 O Group : Protective Functional Parameters

O2- 02	Stop button
Range	【0】 : Stop button is valid 【1】 : Stop button is invalid 【1】

The stop button is set in the factory.

Chapter 6 Abnormal diagnosis and trouble shooting

6.1 General rules

Inverter cabinet fault detection and early warning / self diagnosis function. When the inverter detects a fault, the code is displayed on the LCD operator, The output of the fail contact is acting, the inverter output is cut off, and the motor is free to stop (in some areas of failure, the method of shutdown is optional.).

The following faults may occur during the use of the inverter. Please refer to the following methods for simple fault analysis :

No.	Fault phenomenons	Possible reasons	Solutions
1	No display when powered on	<ol style="list-style-type: none"> 1. No network voltage or it's too low 2. Switch power occurs fault on the drive board of inverter 3. The rectifier bridge is damaged 4. Buffer resistance of inverter is damaged 5. Failure of control board and keyboard 6. The connection line between the control board, drive board and keyboard is broken 	<ol style="list-style-type: none"> 1. Check the input power 2. Check busbar voltage 3. Reset the hand controller 4~6. Seek Manufacturer's Service
2	The motor does not rotate after inverter runs	<ol style="list-style-type: none"> 1. Motor and motor wire 2. Inverter parameter setting error (motor parameter) 3. Poor contact between drive board and control board 4. Drive Board Fault 	<ol style="list-style-type: none"> 1. Reconfirm the connection between the inverter and the motor 2. Replace or remove the mechanical faults 3. Check and reset motor parameters 4. Seek Manufacturer's Service
3	Input terminal failure	<ol style="list-style-type: none"> 1. Parameter setting error 2. External signal error 3. Control panel fault 	<ol style="list-style-type: none"> 1. Check and reset H1 group parameters 2. Re-connect the external signal line 3. Seek Manufacturer's Service
4	Inverters frequently report overcurrent and overvoltage faults	<ol style="list-style-type: none"> 1. The motor parameters are set incorrectly 2. Improper acceleration and deceleration time 3. Load fluctuation 	<ol style="list-style-type: none"> 1. Reset motor parameters or adapt motor 2. Set the appropriate acceleration and deceleration time 3. Seek Manufacturer's Service

No.	Fault phenomenons	Possible reasons	Solutions
5	Power on (or operation) report UV3	1. Soft start contactor does not engage	1. Check whether the contactor cable is loose 2. Check whether the contactor has faults 3. Check whether the 24V power supply of contactor has faults 4. Seek Manufacturer's Service
6	Compressor doesn't rotate	1. Starting signal or frequency failure 2. Low frequency torque boost is too small	1. Check signal given 2. Increase low frequency torque
7	Compressor reversal	The motor phase sequence is inconsistent with the inverter phase sequence	1. Change wiring between motor and inverter
8	Compressor speed is slow	1 X30 Frequency Communication Command Given is too Low	1. Check the given frequency of X30
9	The compressor can not reach the maximum speed	1 X30 maximum frequency and upper limit frequency are set too low	1 X30 increases the maximum frequency
10	The compressor speed is not stable	1. Motor parameters set wrong	1. Set parameters according to motor nameplate
11	The unbalanced three-phase input current of the main power supply exceeds 3%	1. The power supply of the power grid is provided by transformer, and the voltage is unbalanced 2. Abnormal reactor	1. Check whether the power grid is balanced; 2. Check whether the reactor is damaged

When the inverter detects a warning or autodiagnosis, the LCD will display the warning code or self-diagnostic codes, the fault output contact does not act, once this warning is eliminated, the system will automatically restore the original state.

The inverter has three levels of error message display, as follows:

Item	Level	Inverter Reaction	Supplement
1	Inverter Fault Alarm (Fault)	The inverter stops and displays the fault code	Red level
2	Inverter Warning Alarm (Warning)	Inverter No Stop and Display Warning Code	Yellow level

6.2 Fault detection function- [Inverter stop]

When failure occurs, refer to the table 6.1 for possible reasons and take appropriate measures.

When restarting, use either of the following methods:

1. Press the Reset button on the LCD operator.

When a fault occurs, the fault message is stored in the fault information (group U3 parameter).

Table 6.1 Breakdown stop error messages and corrective action

LCD display	Illustration	Possible reasons	Corrective action
Over current	Over current: The inverter output current exceeds the over current detection value (about 200% of the rated current). The output or load of the inverter is short circuited	1.The acceleration / deceleration time is too short. 2. Start the rotating motor 3. Short circuit or ground fault occurs 4. Contact and grounding short circuit caused by motor damage, insulation deterioration and cable damage 5. Low voltage 6. Choose a small-sized inverter	1. Extend the acceleration/deceleration time c1-01/02 2. Select speed tracking start or start after the motor stops 3. Confirm whether the load wiring is short circuit 4. Remove the motor and try to run the inverter 5. Adjust the voltage to the normal range 6. Choose an inverter with higher power level
OC			
GF			
Busbar over-voltage	The main circuit voltage is too high: DC voltage has exceeded the overvoltage detection value About 820V DC	1. Too short deceleration time leads to too high recovery energy. 2. Overvoltage of power supply 3. Existing external force to drive motor operation 4. No brake unit and brake resistance	1. Extend deceleration time c1-02 2. Check the input circuit and reduce the input voltage Comply with the requirements of the specification. 3. Cancel additional power or
OV			

			add braking resistance 4. Add braking unit and resistance
Emergency stop ES	The emergency stop button is pressed	The inverter emergency stop button is pressed	Check the emergency stop button of inverter
Missteering of pump FAN.E	Control failure of water valve in inverter	Check water valve controller alarm failure	Contact after-sales service
Inverter output fault OE	Inverter output fault	1. The inverter is not connected to the motor for operation 2. The inverter is damaged	1. Operate after connecting the motor 2. Contact after-sales service

LCD display	Illustration	Possible reasons	Corrective action
Input owe phase	Input owe phase The inverter input side owe phase or there is a large unbalanced voltage.	1. The three-phase input power supply is abnormal 2. Lightning protection board is abnormal 3. The main control board is abnormal	1. Check and eliminate problems in peripheral lines 2. Seek Technical Support 3. Seek Technical Support
PF	When I8-05=1, start this fault detection.		
Output owe phase	Output owe phase The inverter output owe phase.	1. The lead from the inverter to the motor is abnormal. 2. Three-phase output unbalance of inverter during motor operation 3. Abnormal drive board 4. Abnormal module	1. Troubleshoot peripheral faults 2. Check whether the three-phase winding of the motor is normal and troubleshoot 3. Seek technical support 4. Seek technical support
LF	When L8-07=1, start this fault detection.		
IGBT overheat		1. The ambient temperature is too high 2. The cooling fan has stopped 3, water cooling problems 4. The carrier frequency is set too high 5. IGBT alarm temperature parameters are set too low	1. Check the temperature around the inverter cabinet 2. Check the fan or heat sink dust and dirt 3. Check whether the waterway flow is low or blocked 4. Check the carrier frequency setting (c6-01) 5. Check the setting of IGBT alarm temperature (I8-01)
OH	IGBT overheat		
reactor overheats		1. The ambient temperature is too high. 2. The cooling fan has stopped. 3, water cooling problems. 4. The alarm temperature parameters of the reactor are set too low.	1. Check the temperature around the environment of the converter. 2. Check the dust of fan or radiator. 3. Check whether the water flow/temperature is normal. 4. Check the setting of reactor alarm temperature (L8-02).
OH1	The reactor temperature is too high.		
Motor overload	Motor overload:	1. Voltage setting in V/F mode is too high, which leads to motor overexcitation. 2. The motor rated current setting (E2-01) is incorrect. 3. Motor load is too large.	1. Check V/F mode. 2. Check motor rated current. 3. Check load size and running cycle time.
OL1			
Inverter overload	Inverter overload:	1. The voltage setting of V/F mode is too high. 2. The capacity of inverter is too small. 3. Motor load is too large. 4. The acceleration time is too short.	1. Check V/F mode. 2. Replace to a higher capacity inverter . 3. Check load size and running cycle time. 4. Extend the acceleration time C1-01.
OL2			
Communication error 1	1. The communication between the panel (handwritten device)	1. Loose connection between D and SUB. 2, D-sub cable fault.	1. Check the D-sub cable and replug it (power off is needed).

CE1	and inverter has been abnormal for 5 times continuously 2. Communications reset automatically after re-establishment.	3, Panel (hand) or inverter motherboard fault.	2. Replace the D-sub cable. 3. Replace the panel (handwriting device) or inverter motherboard.
Low voltage			
UV1	The main circuit voltage is too low: The DC bus voltage is lower than the low voltage detection value or the DC bus electromagnetic contactor is not put into operation. At the same time, the inverter is in operation. About 380VDC The detection value can be adjusted by L5-09.	1. The input voltage is too low. 2. Input power supply owe phase. 3. The acceleration time is too short. 4. Voltage fluctuation of input power supply is too large. 5. DC bus electromagnetic contactor is not put into operation.	1. Check the power supply system. 2. Check whether the terminal is loose or the power system. 3. Extend the acceleration time. 4. Check the power system capacity. 5. Check the electromagnetic contactor.
The surge prevention circuit is abnormal	The main contactor is abnormal: Detection of circuit or line faults. CPU motherboard failure	1. Check whether the contactor auxiliary contacts is loose. 2. Check whether the connecting line of main board terminal is loose 3. Control Board Fault 4. Contactor failure	1. Re-lock the contact 2. Re-lock the terminal 3. Replace the control board. 4. Replace the contactor.
UV3			
Storage abnormal	CPU motherboard	1. CPU motherboard	.1. Replace the control board
CPF03	EEPROM action abnormality	EEPROM fault	
Anomalous Hall effect	Anomaly Detection in Current Loop	1.Current sensor failure.	1. Replace the sensor.
CTER			
Low Voltage During Shutdown	Main circuit voltage: The dc bus voltage is below the low voltage detection level, while the inverter has stopped.	1. The power supply voltage is too low. 2. Instantaneous power loss occurs.	1. Check the input power supply voltage. 2. Check the main circuit MC.
UV	380 VDC: (15-09 can set the detection level)		
X30 disconnection		1.Connection broken or communication with X30 has stopped.	1.Check all connections

	Error in communication between handwriting device and X30: Exceeded cm-06 (communication abnormal detection time), no communication was received. After the communication is disconnected, stop the machine. if you need to reset, please press the reset button		
COT			

Note: Currently CE1 and UV are not stored in U3 group.

6.3 Warning alarm/self-diagnostic detection function – [The inverter is not stopped]

When a warning is detected in the inverter, the LCD LCD screen operator will display the warning code, and the failure output contacts will not act. Once the warning is lifted, the system will automatically restore its original state.

When the inverter detects a self-diagnostic function (for example, an invalid setting or two contradictory parameter settings), the LCD operator will display the self-diagnostic code and the fault output contacts will not act.

When a warning or self-diagnostic error occurs, please refer to Table 6.2 to identify and correct the resulting error.

Press the RESET key at this point, and the warning message will not disappear unless the warning or self-diagnostic error still exists.

Table 6.2 Warnings/Self-diagnosis and Corrective Measures

LCD display	Illustration	Possible reasons	Corrective action
The parameter value is too large/too small	The parameter values to be set exceed the upper and lower limits	1. When controlling data or parameters are entered , the upper and lower limits are exceeded.	Reconfirm the input parameter values
"Data setting error"			
	.	1. The upper computer tries to	1. Confirm the working state

LCD display	Illustration	Possible reasons	Corrective action
"Input mode error	(illegal input)- attempted to modify the parameter "property is unmodifiable during operation"	input parameters during operation 2. Attempt to input and read dedicated data	and parameter properties of the inverter 2. Reconfirm parameter properties
Communication error 2	1.The communication between the panel (handwritten device) and power meter has been abnormal for 5 times continuously 2.Communications reset automatically after re-establishment.	1. Loose communication cable. 2. Communication cable fault. 3, panel (hand) or power meter fault.	1. Check the communication connection and re-plug it (power off is needed). 2. Replace the communication connection. 3. Replace the panel (handwritten device) or power meter.
X30 anomaly	Error in communication between handwritten device and X30: The continuous frequency of communication abnormal exceeds cm-11 (the frequency of communication abnormal detection). Communications reset automatically after re-establishment.	1. Connection broken or communication with X30 has stopped.	1.Check all connections
CO_NG			