埃森特科技(苏州)有限公司
Essent Technologies(Suzhou)Co.,Ltd.

您可信赖的储能热管理专家
Your Prefect Cooling



WARNING

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance. Only professionals can install, debug, operate and maintain the equipment. Improper installation, operation and maintenance of chiller equipment may cause dangers. Improper operation of equipment by unqualified personnel may cause serious equipment damage, personal injury or even death. When operating the equipment, pay attention to all warnings and cautions in the text, as well as warning signs posted on the unit.

If the SUPPLY CORD is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Installation Operation Maintenance Manual

EGCA028EADCACA

PN：70000003001.A Original instruction

Date：Sep 24, 2024

EC Declaration of Conformity

according to the Machinery Directive 2006/42/EC

For the following equipment: :

Product	:	Air-cooled chiller
Type Designation /Trademark	:	EGCA028EADCACA/ Essent
Technical Ratings	:	AC 400V, 50/60Hz, IPX5, R454B, 4.7kg, MCA25A, MOP32A, Max. 23A
Manufacturers Name	:	**Essent Technologies (Suzhou) Co., Ltd.**
Manufacturers Address	:	Unit 01, Building A, No. 28 Yongchang Road, Caohu Street, Suzhou City, Jiangsu P.R. China

Refer to in this declaration conforms with the following directive(s):

Machinery Directive 2006/42/EC

Standard:

EN ISO 12100
EN IEC 60335-2-40

EN 60335-1

The company named above will keep on file for review the following technical documentation :

- Operating and maintenance instructions
- Technical drawings
- Description of measures designed to ensure conformity
- Other technical documentation ,e.g. quality assurance measures for design and production

Statement:

- ***An undertaking to transmit, in response to a reasoned request by the national authorities, relevant information on the partly completed machinery. This shall include the method of transmission and shall be without prejudice to the intellectual property rights of the manufacturer of the partly completed machinery;***
- ***The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of this Directive, where appropriate;***

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1. Introduction

1.1 Preface

We hope that you can carefully read this manual before installation and use, understand all the functional features of the unit, and install, operate, and maintain the unit according to the manual to ensure that the chiller unit can operate normally and reliably, so as to avoid failure caused by improper operation.

This manual belongs to the customer's property and is used together with the unit. After installation, please put it back and keep it properly.If the manual is lost ,please contact the local sales office for help.

This manual may not fully cover all the situations encountered in the installation of the chiller. If you need more detailed information or encounter special problems raised by customers which is not describe in the manual, you can contact the local sales office of Essent. The contents of the manual may be changed at any time with the improvement of the machine and will not be notified at that time.

All installation processes of the chiller must comply with national and local regulations and be completed by professionals. In this manual, "⚠WARING" and "⚠CAUTION" prompts will be given in appropriate places. To ensure personal safety and normal operation of the unit, please carefully read these contents and strictly follow them, each of which is extremely important.

⚠Warning	If not strictly observed, there is a risk of serious damage to the chiller unit or casualties.
⚠Caution	If not strictly observed, there is a risk of slight or moderate damage to the chiller unit, property loss, personal injury or environmental pollution. It also provides useful help information, which may be beneficial to unit operation or prolonging the service life of the unit. However, it does not mean that the help information is the best or directly related to the improvement of unit operation.

⚠Warning

- All installation processes of chiller units must comply with national and local regulations.
- For the installation of the equipment, please consult with the local sales department. Professional technicians with chiller installation qualification certificates are required to install the chiller unit. Users without chiller installation qualification certificate shall not install, repair or move by themselves to avoid water leakage, electric shock or fire.
- Before installation or maintenance, lock the unit power supply and disconnect switch in the power off state to avoid personal injury or death caused by electric shock or contact with a running part.
- Please set a special circuit. The fluctuation of voltage supply shall not exceed ± 10% of the rated voltage. The power supply line must be separated from the welding transformer, which will cause large voltage fluctuation.
- Professional electricians with qualification certificates are required to strictly carry out the installation according to the national power standards and the regulations of the local power department, and check whether the line capacity meets the requirements and whether the power cord is loose or damaged.
- The cover plate of the electric control box must be firmly installed to prevent dust, water, etc. from entering. The electrical part must be moisture-proof and away from the water source, otherwise it will cause electric shock, fire and other accidents.
- Use a fuse with the correct amperage. Do not use temporary substitutes, such as a piece of wire. This may not only damage the unit itself, but also lead to fire.
- The unit power supply must be equipped with leakage protection device, and the ground wire must be connected, otherwise, without protection, accidents such as injury or even casualties may occur.
- The specification of the power cord should meet the requirements, otherwise there will be accidents in circuit safety.
- Electrical auxiliary devices are forbidden to be installed on the unit
- Please strictly follow the wiring diagram in this manual. Wrong wiring or artificial change of wiring will lead to unit failure, damage or personal safety hazards.
- When cleaning the machine, do not sprinkle water directly on the machine. This may lead to short circuit or even electric shock.
- Before touching the wiring device, all power must be cut off.
- Before maintenance, please confirm that the unit is powered off to prevent electric shock.
- The maintenance can only be carried out by professional maintenance personnel. Please contact Essent sales when maintenance and repair are required. Improper maintenance and repair may cause water leakage, electric shock or fire.
- Do not use flammable materials (such as hair styling agents or pesticides) near this product.

1.2 General Safety Instructions

- When installing the options, ask a professional to install them. Be sure to use the options specified by our company. Improper installation may cause coolant leakage, electric shock and fire.
- Please do not use unqualified refrigerants, refrigerant substitutes or refrigerant additives. Incorrect use or use of unqualified refrigerants, refrigerant substitutes or refrigerant additives may lead to unit damage and various potential safety hazards. Please select qualified refrigerants to purchase qualified refrigerants. All technicians operating refrigerants must have qualification certificates, be familiar with and strictly abide by relevant technical requirements, laws and regulations on the use, treatment, recovery, and recycling of refrigerants.
- When the refrigerant leaks, fires are strictly prohibited. If the chiller fails to cool or heat, there may be refrigerant leakage. At this time, contact Essent sales.
-  ：Symbol ISO 7000-1659(2004-01) service indicator: read technical manual
-  ：Symbol ISO 7000-1641(2004-01) operator’s manual: operating instructions
-   ： warning; flammable symbol ISO 7010-W021 plus the safety group and number of refrigerant
- : Hazardous Voltage
- : Moving parts can cause injury. Keep a proper distance and turn off the power before service.



Meaning of crossed –out wheeled dustbin:

- Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.
- Contact your local government for information regarding the collection systems available.
- If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.
- When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposals at least free of charge.

1.3 Flammable refrigerant safety instructions

⚠Warning
If not strictly observed, there is a risk of serious damage to the chiller unit or casualties.

- The chiller unit must be installed in an outdoor , well-ventilated area, and the vents must not be blocked.
- Attention is drawn to the fact that additional transportation regulations may exist with respect to equipment containing flammable gas. The maximum number of pieces of equipment or the configuration of the equipment permitted to be transported together will be determined by the applicable transport regulations
- All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs.
- Disposal of equipment using flammable refrigerants need follow the local law.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer .
- The appliance shall be stored in a room without continuously operating ignition sources (for example :open flames, an operating gas appliance or an operating electric heater. Do not pierce or burn.
- The chiller has been charged refrigerant in the factory. If the refrigerant need recharge for service, charge the refrigerant according to the nameplate by professionals.
- If need to welding for service, The refrigerant around the unit must be removed before.
- The installation space of the chiller and the energy storage cabinet should be isolated and sealed.
- All service staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided
- The area share be checked with an appropriate refrigerant detector prior to and during work ,to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe. And the leak detection equipment can detect R454B.
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area
- The product contains A2L refrigerant R454B and any ignition source may cause fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or

conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere .

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.

- Repair and maintenance to electrical components shall include initial safety checks

  If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with.

  Initial safety checks shall include:

  • that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;

  • that no live electrical components and wiring are exposed while charging, recovering or purging the system;

  • that there is continuity of earth bonding.

- PTC, fan motor, electric control box and other sealing parts are not allowed to repair, need to contact Essent for replacement. and the other electrical components need replacement instead of service also. Replacement parts shall be in accordance with the manufacturer's specifications.

  Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification,damage to seals, incorrect fitting of glands, etc.Ensure that the apparatus is mounted securely.

1.4 Outline dimension

EGCA028EADCACA

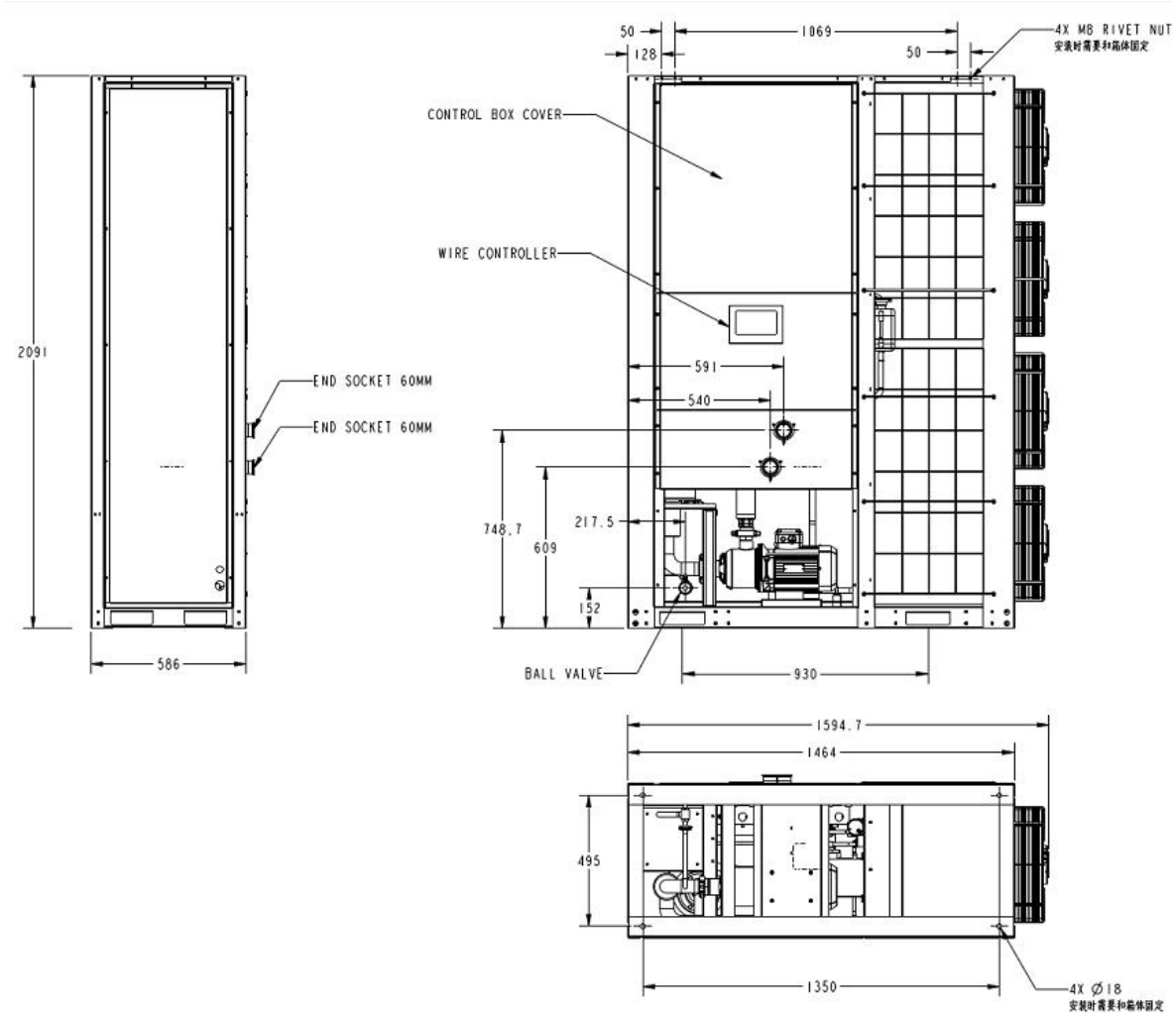


Figure 1.1 Outline dimension drawing

1.5 Specification

Table 1.1 Technical Parameters

Unit model	un	EGCA028EADCACA
Power supply for unit	V/	400/50/60/3N~PE
Nominal refrigerating capacity of chiller	k	28
Nominal cooling input power	k	10.5
Nominal cooling input current	A	15.9
Electric heating	k	5
Electric heating input power	k	5
Nominal heating input current	A	7.6
Maximum input power	k	15.9
Micro circuit breaker of unit	A	D32
Maximum input current	A	23.0

Nominal water flow	m	15.0
Rated power of water pump	k	2.5
External lift	m	17
Water side inlet and outlet size (bayonet	m	64
Make up water+Drainpipe (bayonet fitting)	m	50.5
Refrigerant		R454B
Charging quality	kg	4.7
Nominal refrigeration energy efficiency ratio	W	2.7
Waterproof grade of unit		IPX5
Anti electric shock protection category of		I
Unit weight	kg	380
Overall dimensions of the unit (L x W x H)	m	1594x586x2092
Maximum working pressure at suction and discharge side	M P	2.2/4.15
Maximum working pressure of heat	M	4.15
Maximum working pressure at coolant	M	0.3
Operation ambient temperature	℃	-30 ~ 50
Unit noise	d	74@1m
Filter		Y Type 20
Coolant		35% ethylene glycol aqueous

Remarks:

Test condition: nominal refrigeration: outdoor ambient wet and dry bulb temperature -/40℃; The outlet water temperature at the operating side is 15℃, and the water flow is 14.98m3/h.

Nominal cooling power and performance include pump power.

Electric heating power and current do not include water pump.

2. Preparation before installation

2.1 Installation precautions

1) Whether the nameplate of the unit is consistent with the order model.
2) Whether the accompanying documents of the unit are complete.
3) Whether the accompanying accessories of the unit are consistent with the items listed in the packing list.
4) Whether the unit is damaged in transportation. If the unit is obviously damaged, it shall be noted on the transportation bill of the transportation company, and the transportation agent shall be required to inspect and give treatment suggestions.

2.2 Storage

1) Storage ambient temperature range: - 40~70 ℃.
2) Humidity range of storage environment: at least 5~100% relative humidity.
3) The chiller must be kept upright during storage. It is strictly prohibited to place the chiller upside down or lying flat.
4) The appliance shall be stored in a room without continuously operating ignition sources (for example :open flames, an operating gas appliance or an operating electric heater.

2.3 Transportation and handling

⚠Caution
1. Easily damaged items, handle with care. **2.** The inclination during handling shall not exceed 15 ° (do not put the product on the side, and do not turn the unit upside down). **3.** Please protect the water inlet/outlet connector and drain/make-up connector during handling and installation. **4.** The plastic bags should be properly handled, and children should not be allowed to play. **5.** When handling with a forklift: Be careful when inserting the fork into the bottom forklift slot to prevent the fork from damaging the machine or chassis. **6.** When handling with a crane: tighten the lifting rope, and pay attention to maintaining the center of gravity of the machine when lifting the chiller. **7.** Two hoisting ropes with a length of more than 10m and a diameter of about 20mm must be used, which can bear the weight of the machine. Do not use product straps for handling. **8.** When the wooden frame has been removed: please use cardboard or cloth between the lifting rope and the unit for protection to prevent the body from being damaged.

1) Please use a forklift, crane, or crane of appropriate tonnage to transport the unit to its installation position.

2) During handling, the machine shall be kept level to avoid damaging the unit due to reckless operation. When carrying, move the unit slowly, and do not put your hand into the grid to avoid damage to the machine or personal injury. Before installing the unit, please select appropriate fixing bolts and handling tools according to the unit weight. See the parameter table for the unit weight.

3) Each chiller has been strictly inspected and tested before delivery, and great care must be taken during transportation and handling to avoid damage to the control system and pipeline components.

4) When handling the bare machine of the unit, it is forbidden to lift the power wire shield and the water inlet and outlet connectors, and they cannot be used as a force bearing support. See Figure 2.1 for the position of the wire shield and the water inlet and outlet connectors.

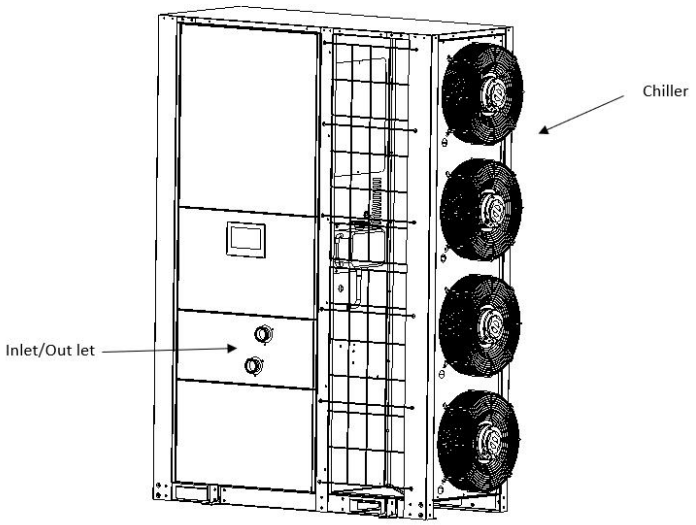


Fig. 2.1 Schematic diagram of water outlet connector of chiller

2.4 Requirements for installation materials

Tools required for installation (not supplied with the machine) Cross screwdriver, standard screwdriver, knife or peeling pliers, etc.

⚠Caution
1. Not accessible to general public , The cabinet must be locked and make sure the non-professionals can't touch any parts of the unit.
2. The product needs to be installed in a place where direct sunlight is not available
3. There must have enough space to install the unit. There should be no shelter within 500mm of the front of the unit and the air out surface.
4. The cabinet shouldn't have any flammable around the chiller unit.

2.5 Installation

1) The chiller unit adopts an integrated design, with compressor, condenser, plate heat exchanger, throttling device, control module, internal circulating water pump, fan and other components as a whole. Before leaving the factory, the pipeline has been assembled and the refrigerant has been charged. Refrigerant has been added according to the standard before leaving the factory and has been adjusted and measured. Refrigerant does not need to be filled on site during installation.
2) The chiller shall be installed on the ground. To ensure the normal operation of the chiller, no objects shall be placed at the external circulation air inlet of the chiller to block the airflow. The water inlet/outlet, make-up/drainage outlet and air duct flow path of the chiller are shown in Figure 2.2.
3) The unit can be fixed as shown in Figure 2.5.2 during installation. Namely, the unit bottom is fixed with 4X M12~M14 bolts, and the unit top can be fixed with 4XM8 bolts. Refer to the figure for other connecting pipes and important dimensions.
4) The relief valve port can't be blocked showing in the picture .(Coolant)

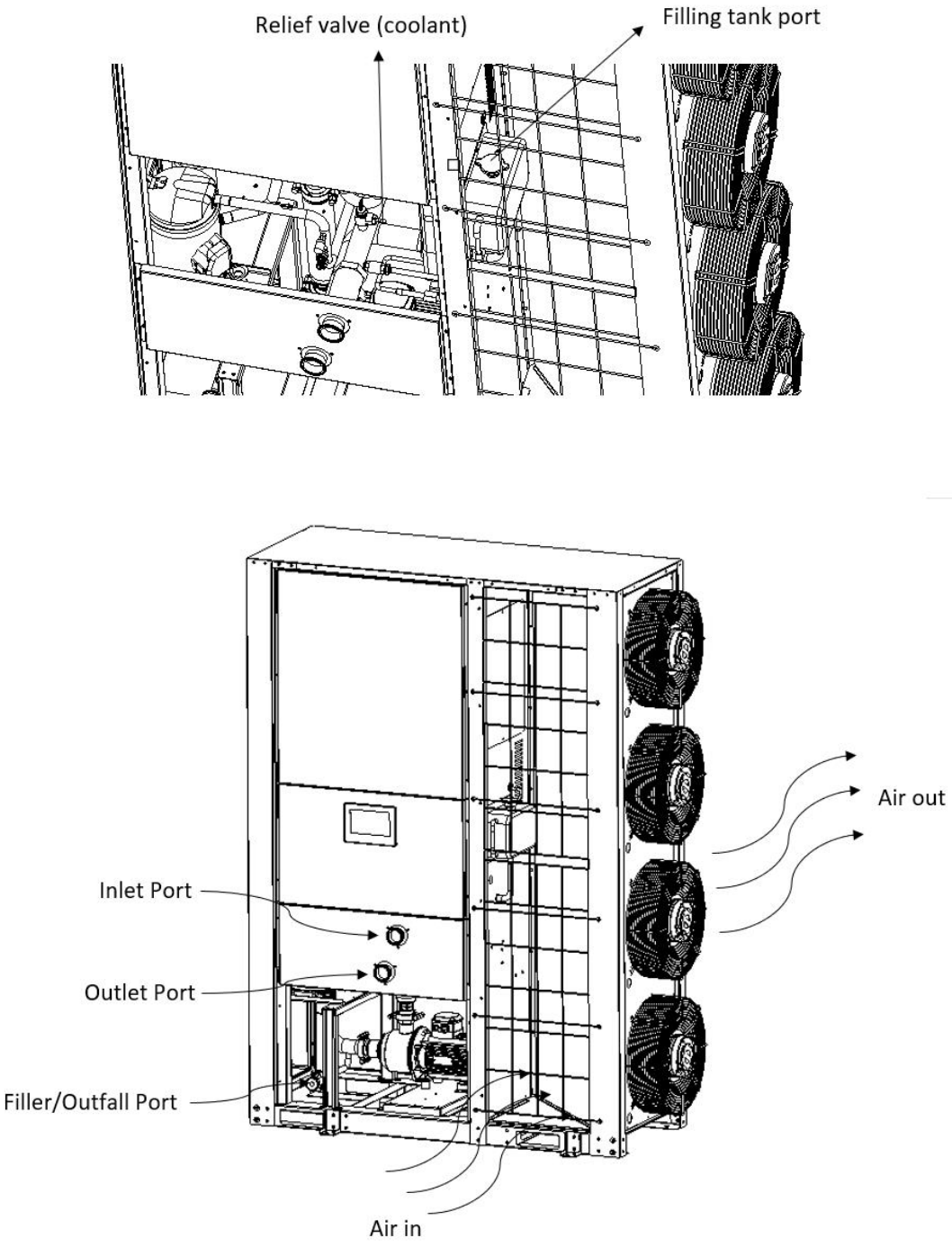


Figure 2.2 Schematic diagram of inlet Port/outlet Port, Filler/outfall Port and air duct flow path of chiller

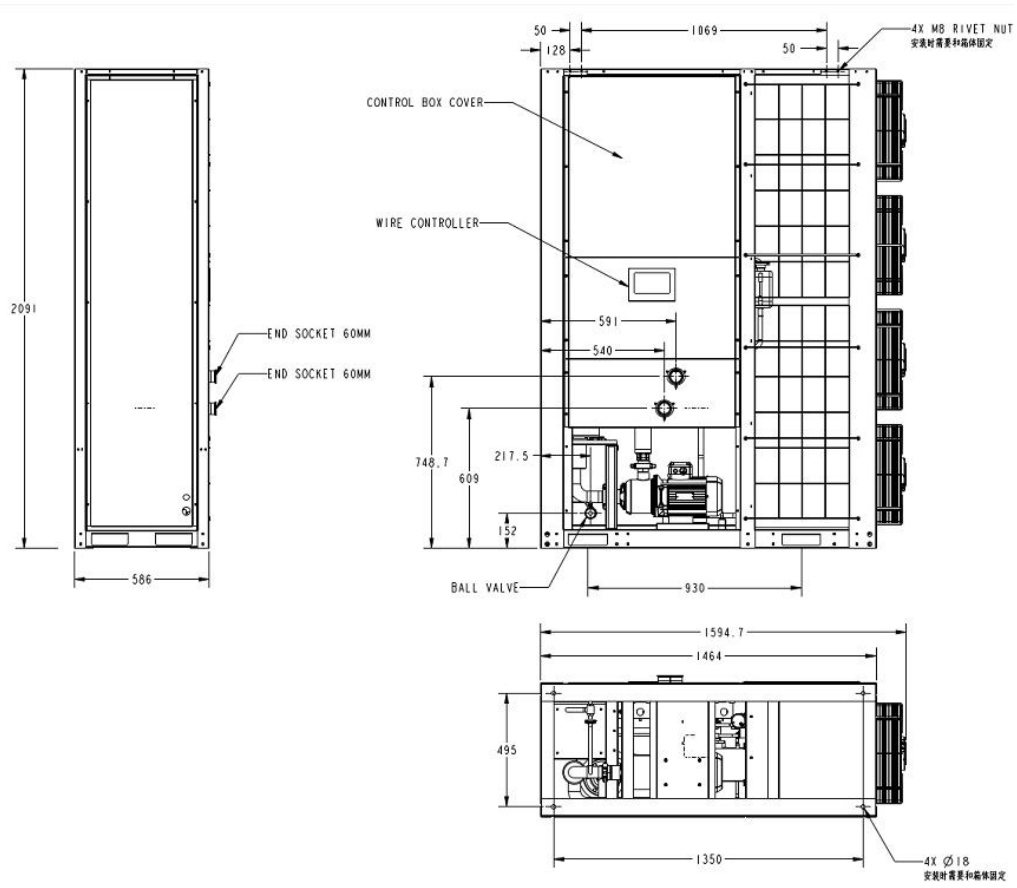


Fig. 2.3 Schematic Diagram of Fixing Mode of Chiller

3. Electrical connection

3.1 Power connection

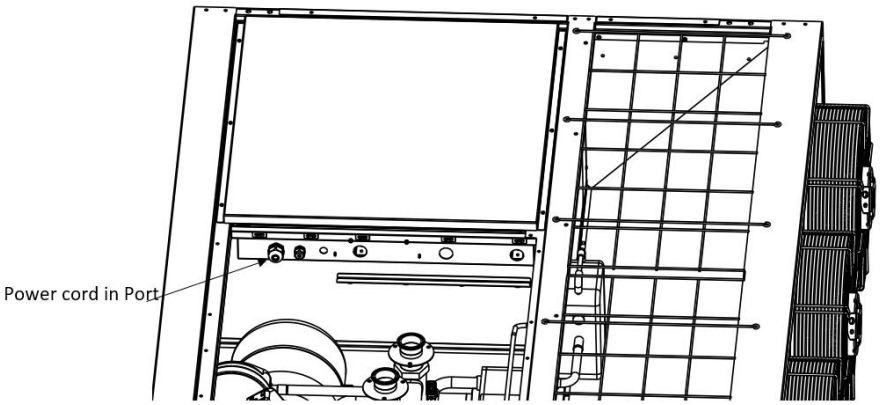
After the mechanical installation is completed, the power cord of the chiller shall be connected. See Table 2.1 for electrical specifications. Please read the precautions carefully before installation:

⚠Caution

1. Electrical connections must be made by trained professionals.
2. When connecting the power cord, it is forbidden to operate with power.
3. If the voltage is too high, the chiller may be damaged. Connect according to the voltage requirements marked on the nameplate.
4. In order to avoid any destructive impact, the chiller must be reliably grounded before the power is connected.
5. All electrical connections must meet the requirements of national and local electrical codes. Before installation, disconnect all coolant chillers.
6. Wires shall not contact copper tubes, compressors, motors or other moving parts.
7. The manufacturer will not be responsible for the problems caused by unauthorized changes to the internal wiring.
8. After the power cable is connected, do not loosen it.
9. The specification of unit power cord is UL2586 5C 8AWG,105 deg C, 600Vac, Cable flame.

Table 2.1 Electrical Specifications

1) The incoming power cord of three-phase unit is from the user side air switch lead to the XT1 terminal R, S, T, N, and PE of the unit. And ensure that after installing the incoming power cord in the electrical box , it can keep IP55 as before . External air switches that comply with local regulations must be installed separately. See the electrical wiring diagram and the picture for details.



See the electrical wiring diagram for the wiring method as follows:

Model	Power Supply (V/Hz/Ph)	Maximum line current of unit (A)	Recommended air switch specifications (A)	Recommended leakage current protector specification(mA)	Minimum size of copper core wire diameter of power line	Recommended communicate cable
EGCA-28EADCACA	400/60/3	23	32	30	5*UL2586 5C 8AWG	UL2464 20AWG 2C

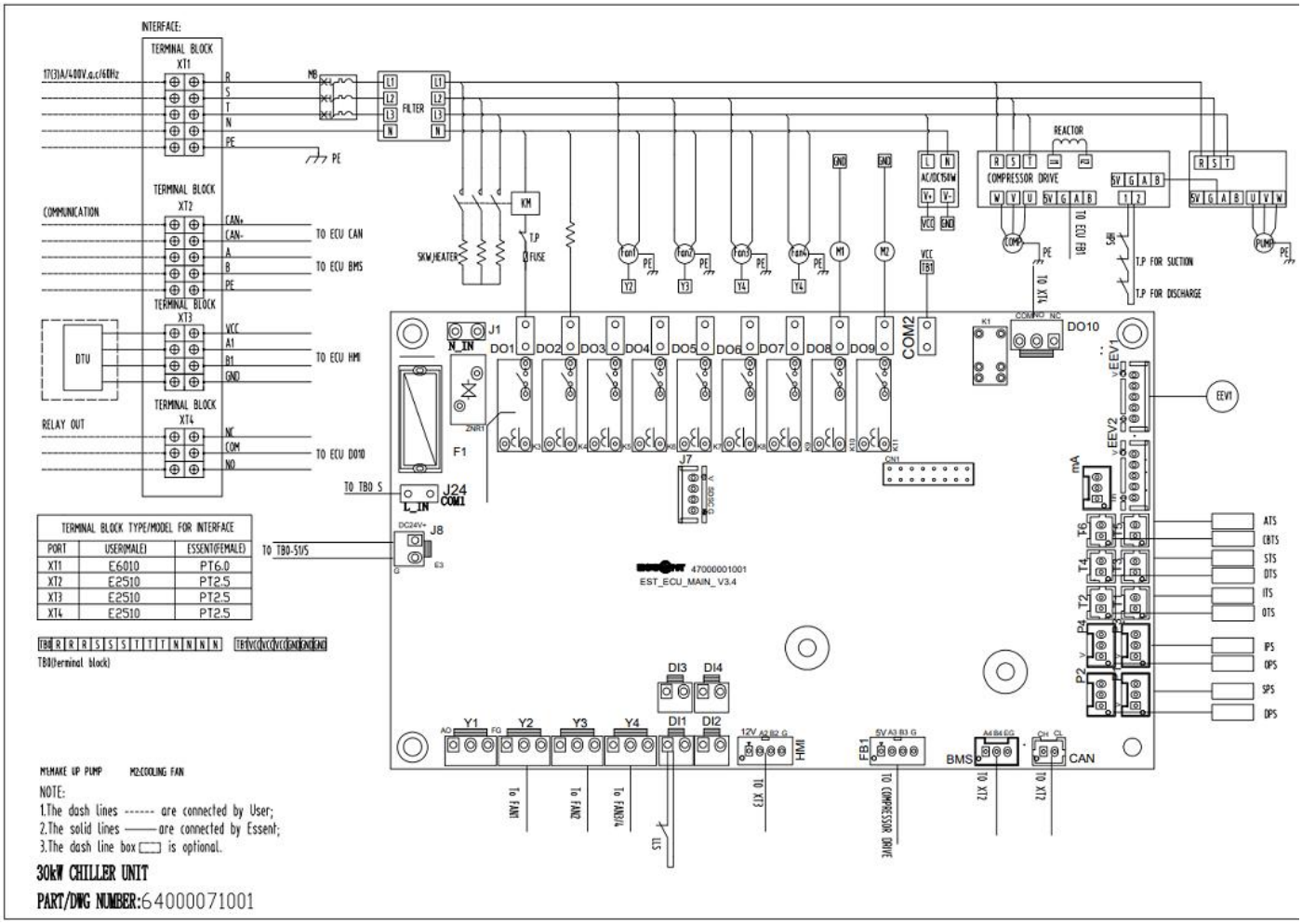


Fig. 2.4 Electrical Wiring Diagram

USER SIDE					
ITEMS	PORT NAME	TERMINAL BLOCK TYPE/MODEL	TERMINAL TYPE/MODEL	PIN	SIGNAL DESCRIPTION
1	XT1 POWER PORT	NOT APPLICATION	E16-12(TUBE MODEL TERMINAL)	R	L1
2				S	L2
3				T	L3

4				N	N
5				PE	PE
6	CONNCTION VIEW				
					

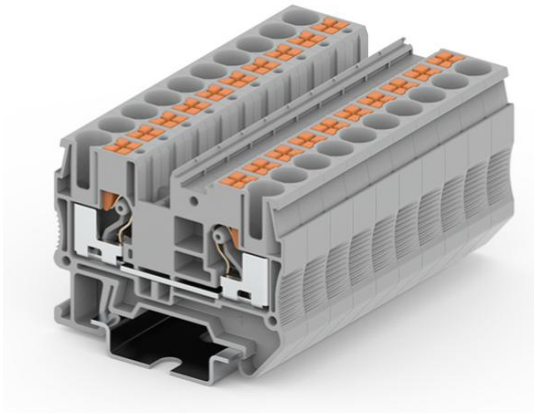
ESSENT SIDE					
ITEMS	PORT NAME	TERMINAL BLOCK TYPE/MODEL	TERMINAL TYPE/MODEL	PIN	SIGNAL DESCRIPTION
1	XT1 POWER PORT	TP6.0	NOT APPLICATION	R	L1
2				S	L2
3				T	L3
4				N	N
5				PE	PE
6	CONNCTION VIEW				
					

Fig. b. User power input connection point

ESSENT SIDE					
ITEMS	PORT NAME	TERMINAL BLOCK TYPE/MODEL	TERMINAL TYPE/MODEL	脚位 PIN	IGNAL DESCRIPTION
1	XT2 COM PORT	NOT APPLICATION	E0510 (TUBE MODEL TERMINAL)	CH	CAN H
2				CL	CAN L
3				A	RS485A
4				B	RS485B
5				PE	SHIELDING LAYER
6	CONNECTION VIEW				
					
USER SIDE					
ITEMS	PORT NAME	TERMINAL BLOCK TYPE/MODEL	TERMINAL TYPE/MODEL	脚位 PIN	IGNAL DESCRIPTION
1	XT2 COM PORT	TP2.5	NOT APPLICATION	CH	CAN H
2				CL	CAN L
3				A	RS485A
4				B	RS485B
5				PE	SHIELDING LAYER
6	CONNECTION VIEW				

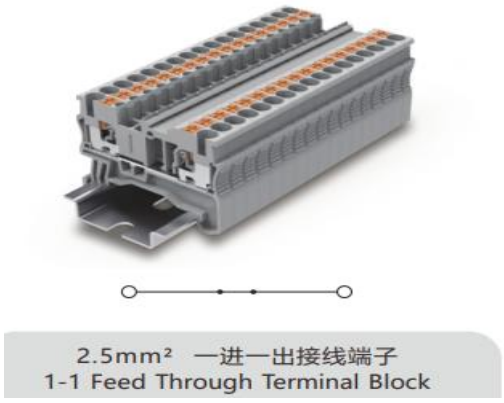


Fig. c. User RS485 connection point

⚠Warning

Please pay more attention to the follow items

Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

4. Wired Controller

The air-cooled chiller unit is equipped with a controller. The control panel is displayed by LCD screen, and parameters are set by the button on both side of screen. The LCD screen can display the inlet and outlet water temperature, inlet and outlet water pressure, system operation mode, set value and alarm. User can change the cooling or heating mode, set value to operate the system. This chapter introduces menu operations and control features.

4.1 LCD Panel

Unit parameter settings, alarm records, alarm history, system operation status, etc. can be displayed through the text screen.

4.2 System interface

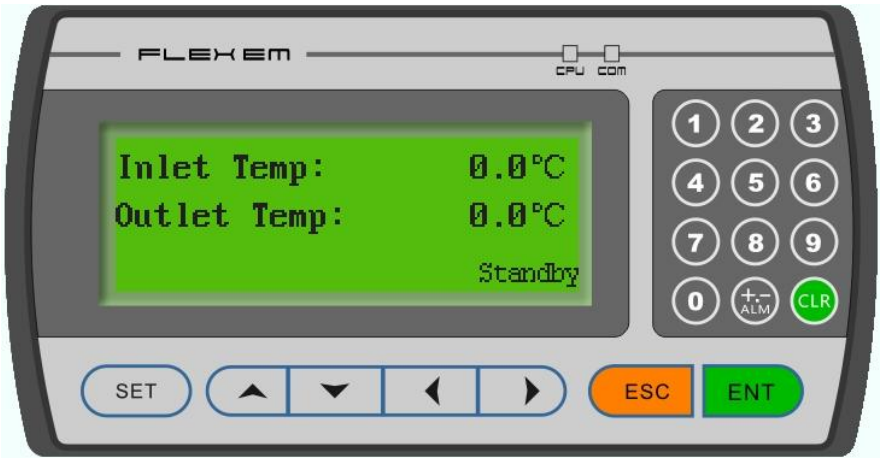
4.2.1 Main interface

System initial interface



Once powered on, display will automatically show the initial mask with only the logo of the manufacture. Press key “ENT” to home mask.

Home interface



Line 1, Inlet Temp, is the temperature of inlet liquid.
Line 2, Outlet Temp, is the temperature of outlet liquid.
Line 3, alarm status (when at least one alarm is active) is at the left, and running mode is at the right. There are four states as below table.

- Cooling
- Heating
- Cycle
- Stand By

Description of buttons：

1.Alarm key 

。

No matter what page the display currently on, when a certain alarm is active，Display is going to the alarm mask automatically with all active alarms.

2. Number keyboard 

Number keyboard can be used to change parameter values. Every number button including decimal point can be entered to group an integer or a decimal.

3. Esc 

return button。

Press Esc to return to the previous mask or upper level. If it is already on the home screen, keep it on the home screen. If you do not perform any operation in the menu for a long time, the system automatically returns to the main page.

4.Arrow button 

To change the parameter value or scroll the mask up and down.
In the Settings submenu, press the up and Down buttons when the cursor is in the upper left corner to turn the page. If the submenu has only one page, it stays on the current page.
When the cursor is in another position, press the Up and Down buttons to change the set value, press the Confirm button to take effect, and move the cursor to the next digit. To turn the page, press the Confirm button repeatedly to move the cursor until the cursor moves to the upper left corner. Then press the up and Down buttons to turn the page.

5.Enter button 

①. Press button “ENT” to enter the main menu on home mask.
②. Used in the menu to select the option to enter the submenu.
③. To confirm the operation when finishing changing the parameter value.

6.Set button 

To move curser to the parameter location when a parameter is required to be modified, and escape from modification that means the new value will not be accepeted.

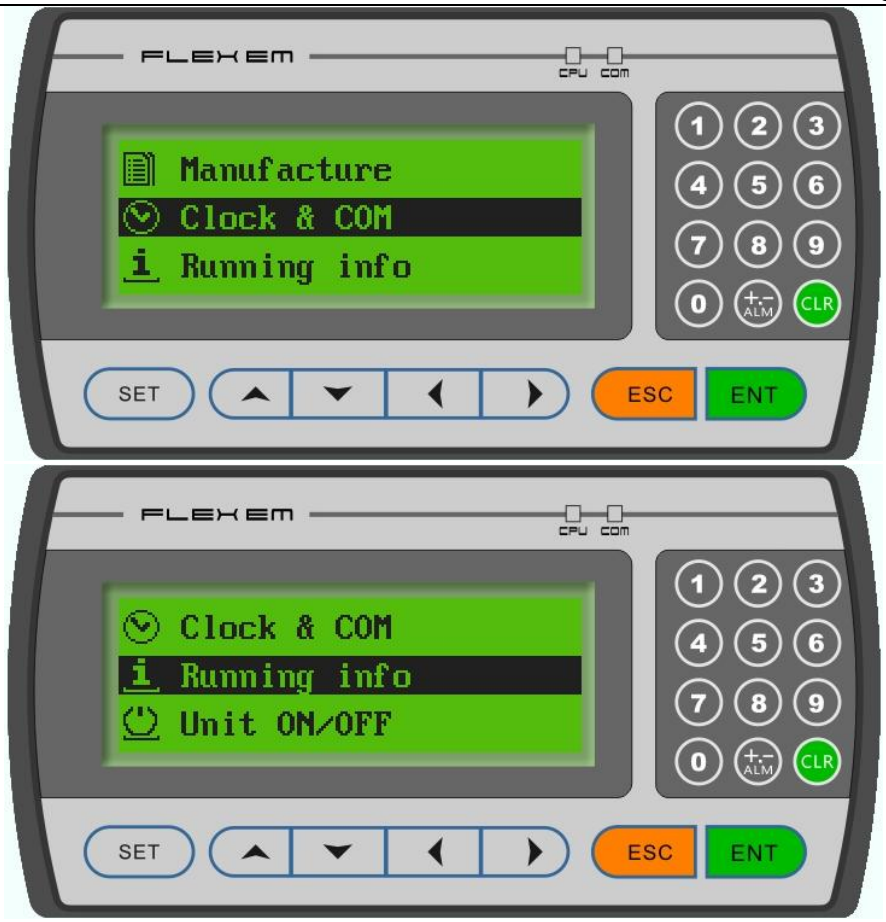
4.2.2 More interface at main interface

Main menu

Press button 

to enter the main menu while on home mask. Totally six options are listed, they are unit ON/OFF, user setting, maintenance, manufacture, clock & COM, and running info.


FLEXEM
CPU COM
Running info
Unit ON/OFF
User Setting
1 2 3
4 5 6
7 8 9
0 +.- CLR
ALM
SET
ESC
ENT
FLEXEM
CPU COM
Unit ON/OFF
User setting
Maintenance
1 2 3
4 5 6
7 8 9
0 +.- CLR
ALM
SET
ESC
ENT
FLEXEM
CPU COM
User setting
Maintenance
Manufacture
1 2 3
4 5 6
7 8 9
0 +.- CLR
ALM
SET
ESC
ENT
FLEXEM
CPU COM
Maintenance
Manufacture
Clock & COM
1 2 3
4 5 6
7 8 9
0 +.- CLR
ALM
SET
ESC
ENT



4.2.3 Submenus

1. **Unit ON/OFF**

Press the button “ENT” on the home screen, go to unit ON/OFF setting.

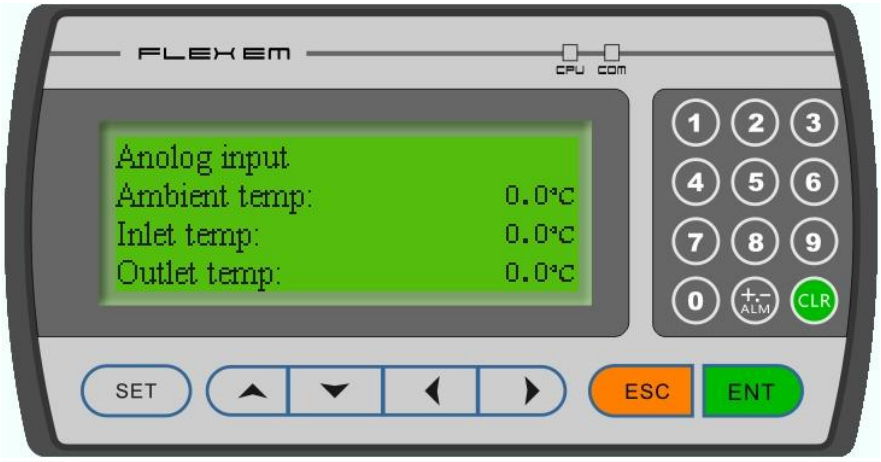


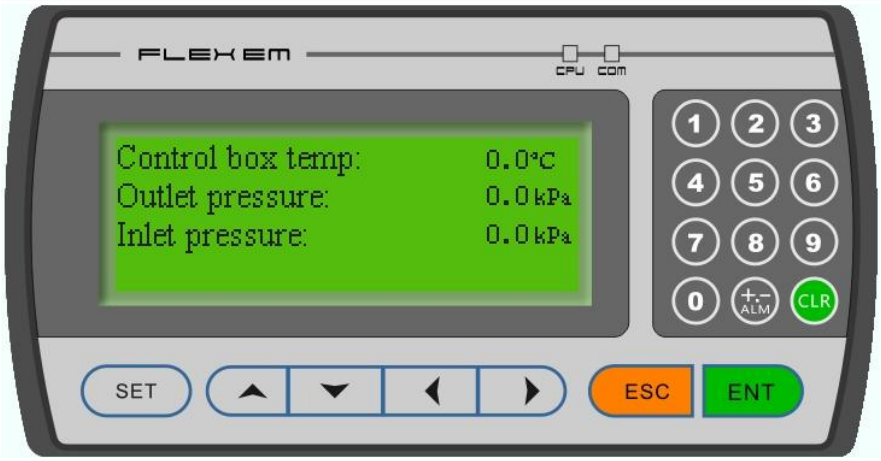
Press the up and down arrow buttons  to change On/Off status.

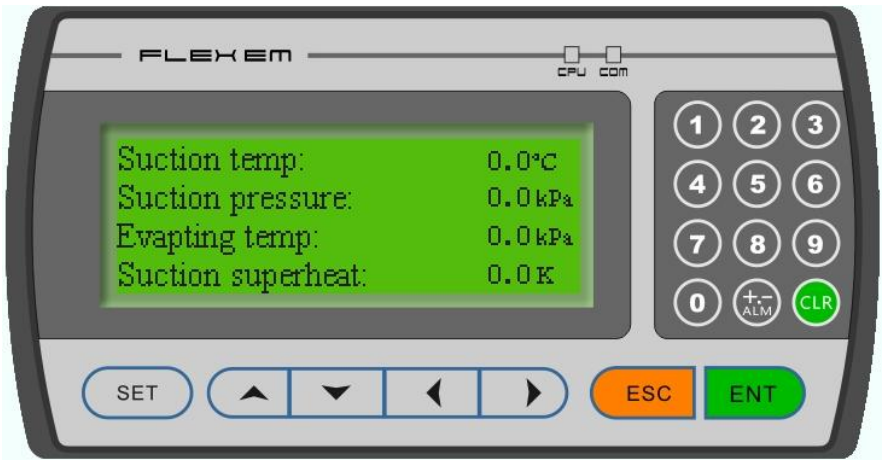


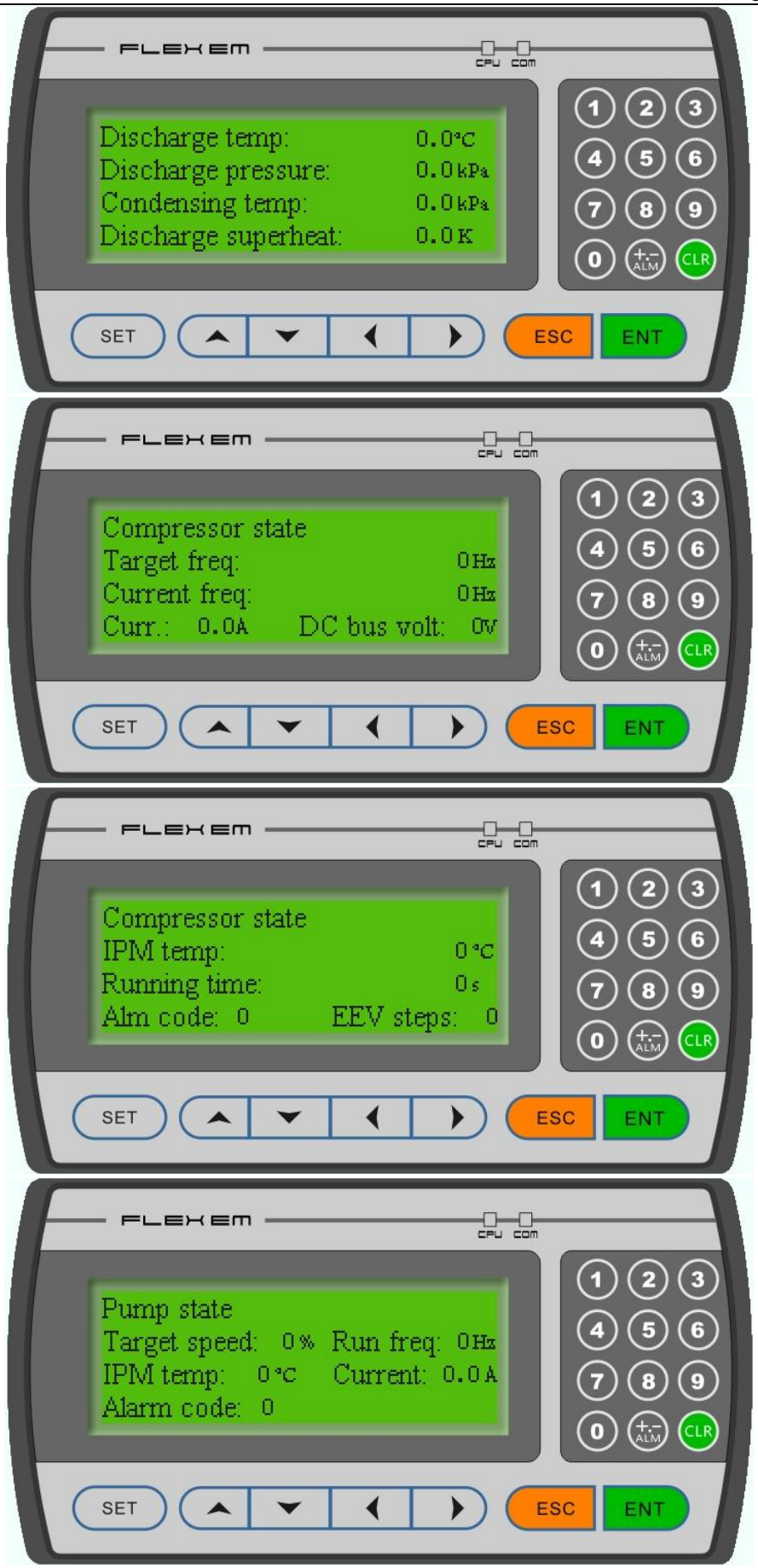
2. Information

To view the operating parameters of main units, press the Up and down buttons to turn page. Parameters includes： Environment Temperature, inlet water temperature, outlet water temperature and device running status.



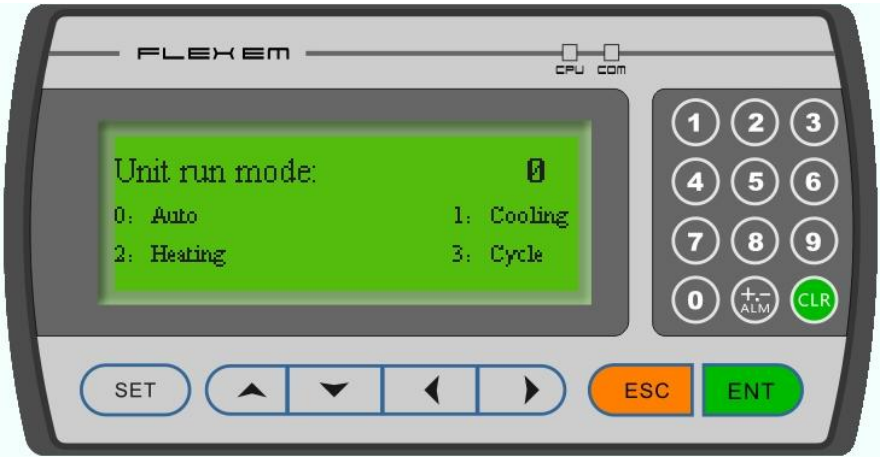





FLEXEM
CPU COM
Discharge temp: 0.0°C
Discharge pressure: 0.0kPa
Condensing temp: 0.0kPa
Discharge superheat: 0.0K
1 2 3
4 5 6
7 8 9
0 +.- ALM CLR
SET
ESC
ENT
FLEXEM
CPU COM
Compressor state
Target freq: 0Hz
Current freq: 0Hz
Curr.: 0.0A DC bus volt: 0V
1 2 3
4 5 6
7 8 9
0 +.- ALM CLR
SET
ESC
ENT
FLEXEM
CPU COM
Compressor state
IPM temp: 0°C
Running time: 0s
Alm code: 0 EEV steps: 0
1 2 3
4 5 6
7 8 9
0 +.- ALM CLR
SET
ESC
ENT
FLEXEM
CPU COM
Pump state
Target speed: 0% Run freq: 0Hz
IPM temp: 0°C Current: 0.0A
Alarm code: 0
1 2 3
4 5 6
7 8 9
0 +.- ALM CLR
SET
ESC
ENT



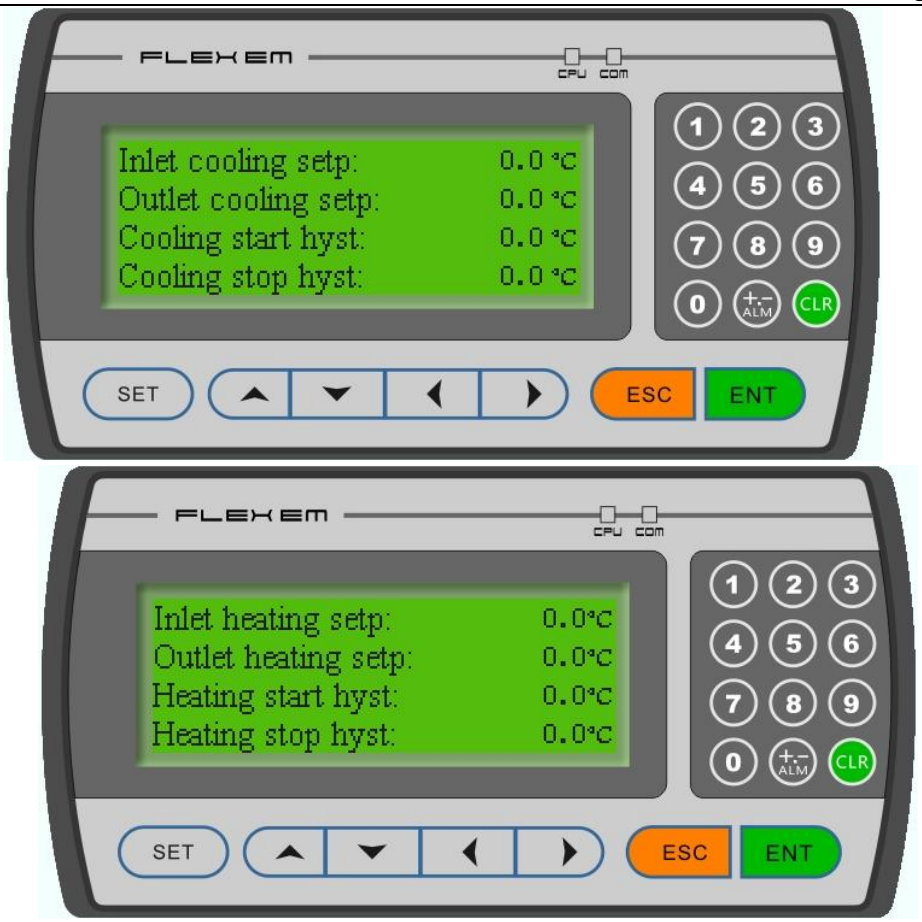
3. User setting



Unit function setting includes 4 function modes, press the up or down key to change the set value, or directly enter the value through keyboard.

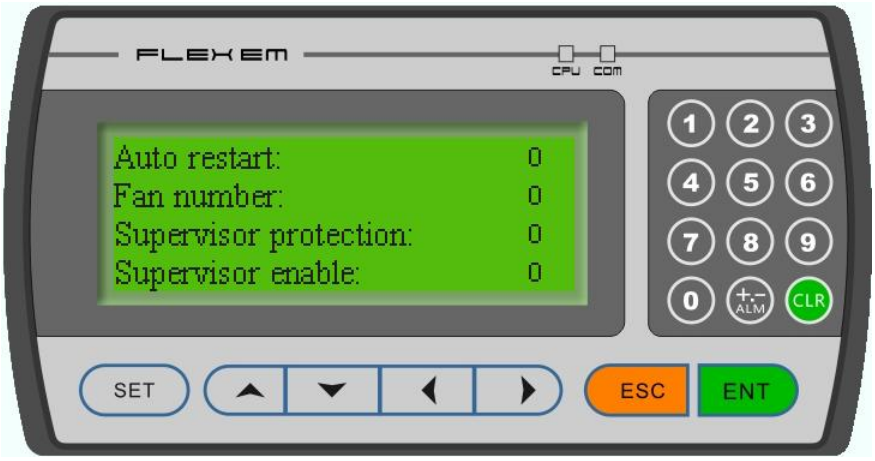
- Auto mode
- Cooling mode
- Heating mode
- Pump Only mode

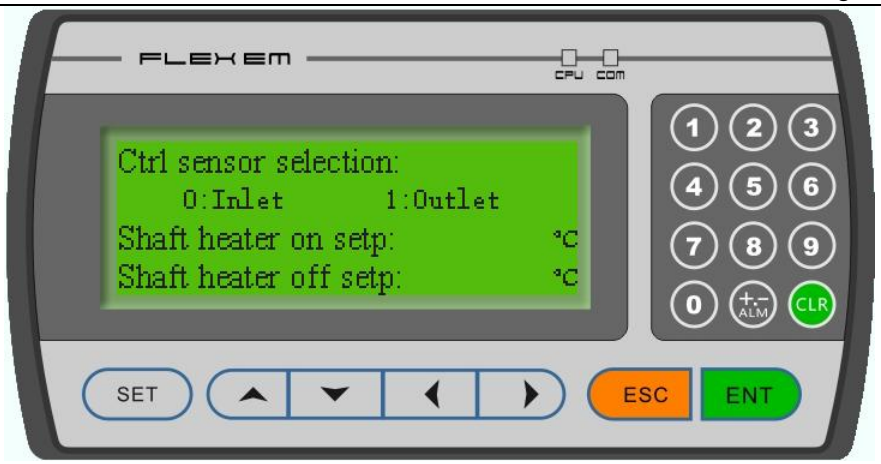
Press the up and down keys to set new target values, cooling setpoint and heating setpoint is effective in relative working mode.



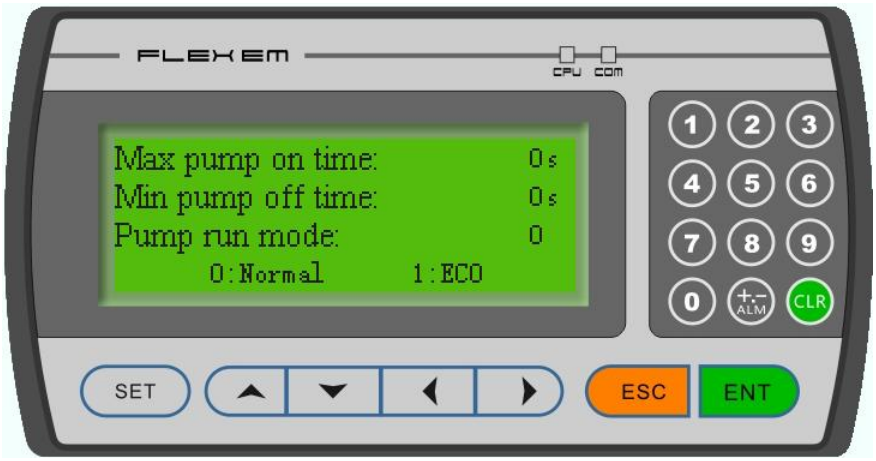
4. Maintenance

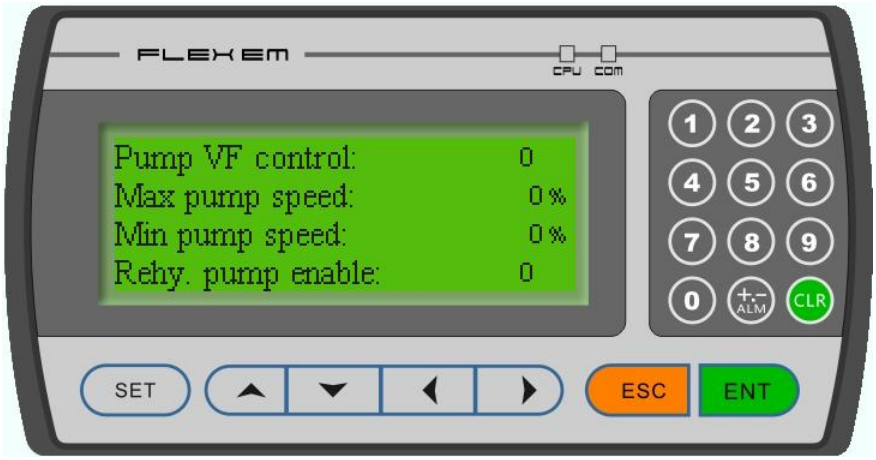
Some parameters for maintenance use are open to customer, but only for authorized person.

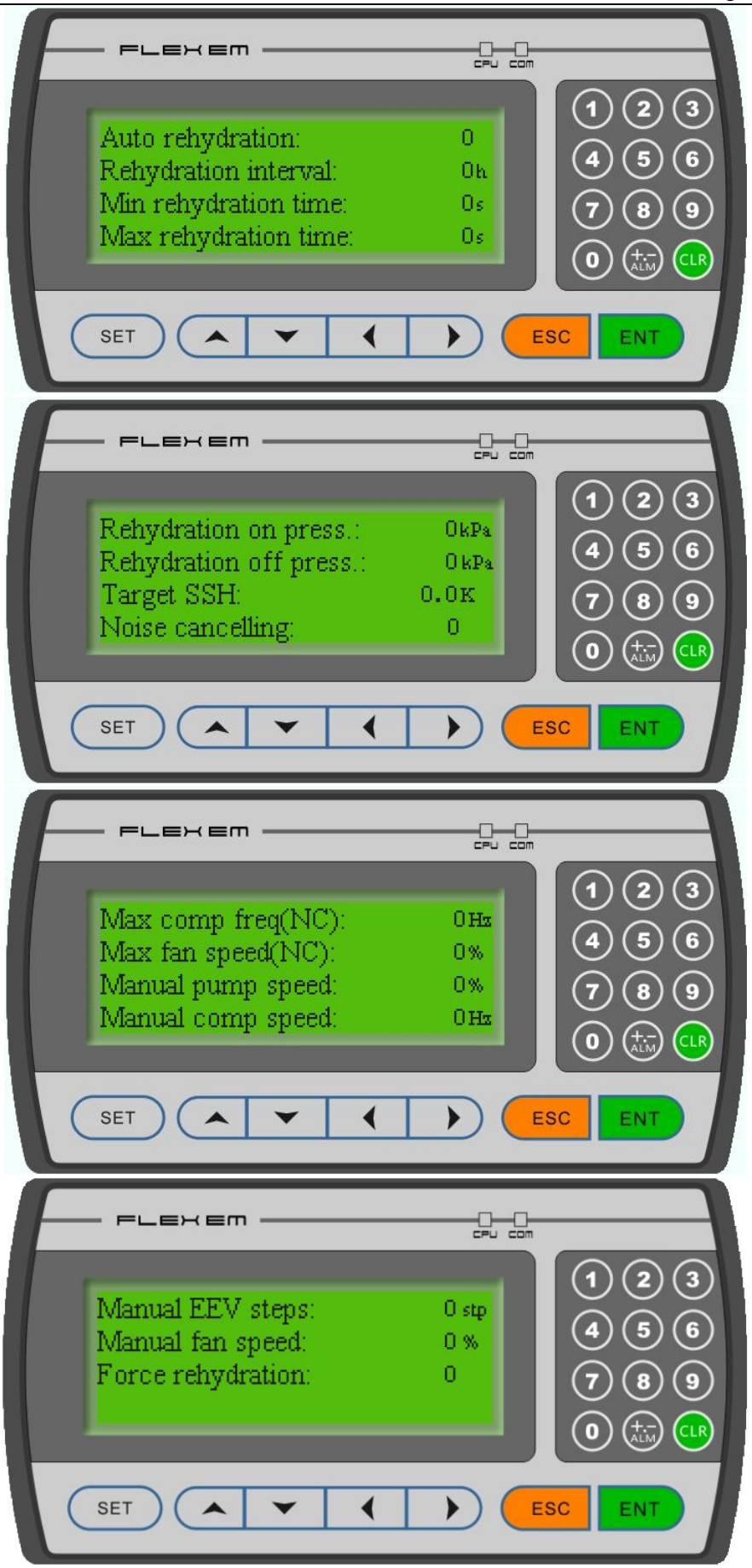



FLEXEM
CPU COM
Ctrl sensor selection:
0:Inlet 1:Outlet
Shaft heater on setp: °C
Shaft heater off setp: °C
1 2 3
4 5 6
7 8 9
0 +,- ALM CLR
SET
ESC
ENT


FLEXEM
CPU COM
Max fan speed: 0 %
Min fan speed: 0 %
Pump startup time: 0 s
Pump delay off time: 0 s
1 2 3
4 5 6
7 8 9
0 +,- ALM CLR
SET
ESC
ENT


FLEXEM
CPU COM
Max pump on time: 0 s
Min pump off time: 0 s
Pump run mode: 0
0:Normal 1:ECO
1 2 3
4 5 6
7 8 9
0 +,- ALM CLR
SET
ESC
ENT


FLEXEM
CPU COM
Pump VF control: 0
Max pump speed: 0 %
Min pump speed: 0 %
Rehy. pump enable: 0
1 2 3
4 5 6
7 8 9
0 +,- ALM CLR
SET
ESC
ENT

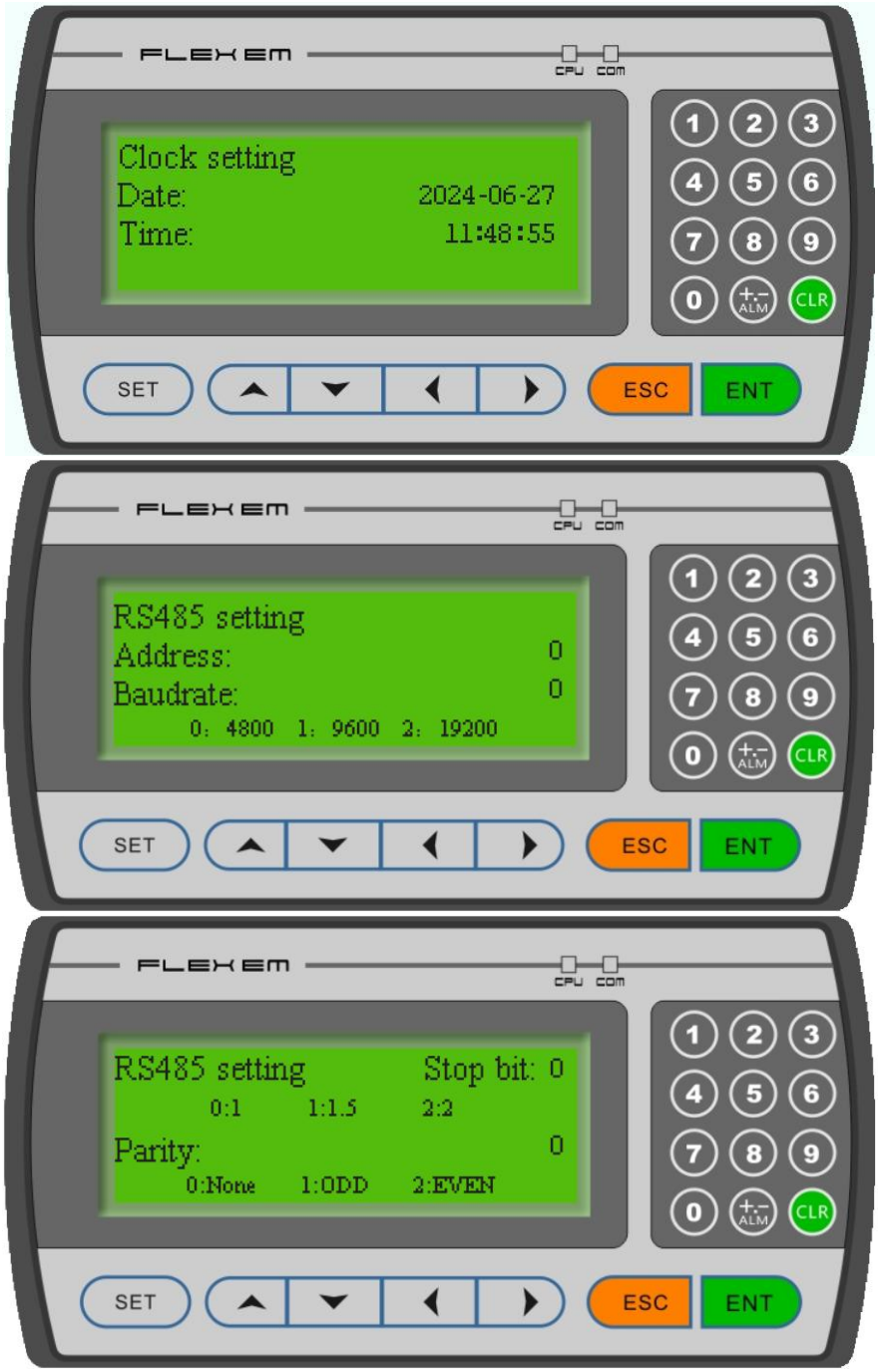


5. Manufacture

Manufacture parameters is not open to customer, for internal use only.

6. Clock and communication

The RTC date and time can be updated accordingly by user.



These 2 pages are used to set the RS485 communication parameters related to BMS or EMS.

a) Baudrate: The default baud rate is 9600. The value can be 4800, 9600 or 19200.

b) Stopbit: The value can be 1, 1.5 or 2.

c) Parity : The value can be None, Odd, or Even.

d) Address: The default value is 1 and the value should be between 1 ~ 255.

Note: If the BMS parameters are changed, the changes take effect only after a power restart.

4.2.4 Alarm state

Alarm page pops out when at least one alarm is active. The active alarm will be listed by the time that alarm occurs at. When all alarms are reset, alarm page shows “No Alarm”.



4.2.5 Log in and log out



There are 3 levels with different passwords. User level is the lowest level and manufacture level is the highest level. After entering the password, you can enter multiple times within 3 minutes without re-entering the password. If you do not perform any operation within 3 minutes, the system logs out. A password re-enter action is needed.

5. Operation

This chapter describes operation steps of the chiller.

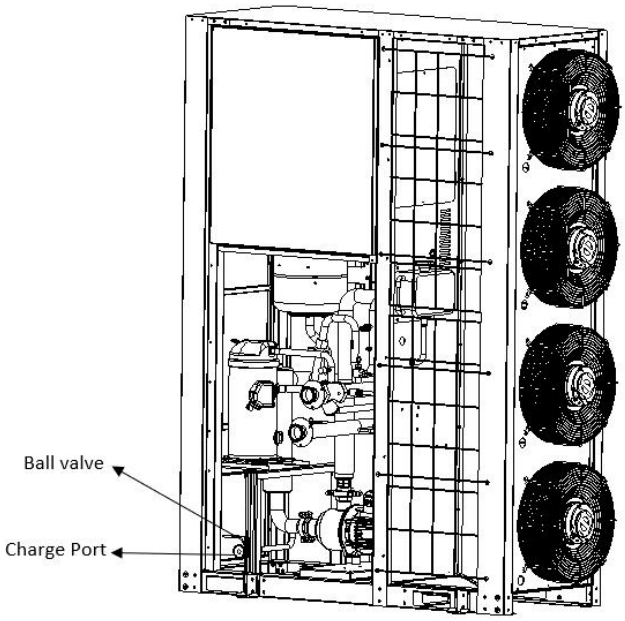
5.1 Coolant Charge

When the chiller is connected to the cooled equipment for the first time, the coolant circulation

system needs to be charged with the coolant to ensure the normal operation of the chiller.

5.1.1 Connect the supplemental pump

Take out the refill pump equipment and the suitable pipe. Connect the equipment to the charge Port of the unit and the other side to the coolant tank prepared .Then start the refill pump after open the ball valve . The refill pump can work normally and charge the coolant into the unit.



5.1.2 Coolant requirements

1. When using water-glycol mixture for cooling, it is necessary to observe whether algae, precipitation and corrosion occur in the chiller. The presence of residues will limit the performance of the chiller. Satisfactory conditions will be difficult to achieve without water treatment. The quality of the coolant must be regularly monitored and treated to ensure that precipitation and corrosion are avoided even under extreme conditions.

⚠Warning

1. In the long-term use of the chiller, the concentration of the coolant may become higher, which will lead to the low cooling efficiency of the chiller. Please check the coolant concentration in the coolant machine every 12 months. If the coolant concentration is too high, the coolant concentration can be restored to the normal range by adding an appropriate amount of deionized water.
2. In the long-term use of the chiller, the coolant may have mechanical dirt, high hardness, high chemical dirt content, biological dirt, mucus bacteria and algae. Therefore, it is necessary to test the coolant in the coolant machine system every 12 months for inspection, purification and maintenance. To avoid any damaging effects, the chiller must be reliably grounded before being switched on.
3. Ethylene glycol is a substance that pollutes groundwater, and equipment operators must abide by the relevant regulations of the state on the protection of groundwater resources.

5.1.3 Start the fluid refill manually

1. Take out the refill pump equipment and the suitable pipe, connect the pipe to the charge port

2. Power on the chiller after checking the power connection of the chiller;

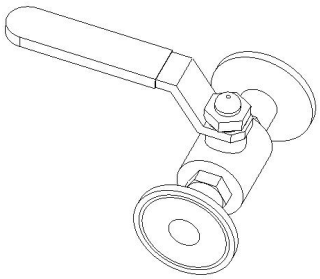
3. Locate the refill port of the chiller and open the refill port ball valve, as shown in the figure below;

4. Power on the liquid refill pump after checking the power connection of the liquid refill device;

5. After return water pressure ≧0.8 bar, Enter the menu “Information”→“Function Setting” →“Pump Only”, then return the main menu. Switch on the chiller

6. When the return water pressure reaches 1 bar, close the ball valve and then stop refill pump.

7. After replenished the coolant, Remove the parts of the replenishing device from the chiller, clean and wipe the replenishing pump and the replenishing pipe fitting, and put them in place for the next use



⚠Warning

1. Do not hit or roll the power cable of the liquid supply pump, let alone use it as the lifting rope. Do not pull the power cable at will during the operation of the liquid supply pump to avoid electric shock due to damage of the power cable.
2. When the replenishment pump is working, the safety warning sign "It is a little dangerous, people and animals are not allowed to enter" should be set up in the use site to guard against accidents.
3. If the user fails to evaluate the running time of the replenishing pump and thus cannot complete the operation of replenishing the coolant at one time, please supplement the coolant several times according to the actual situation.
4. Since the liquid replenishment device uses a check valve, there is still coolant in the pipeline between the check valve and the chiller after the coolant refill is stopped. Please pay attention to the coolant in the pipeline not to be scattered on the ground or other equipment when disassembling this section of pipeline.

5.2 Pressure retention, leak detection, vacuuming and refrigerant charging

5.2.1 Pressure retention, vacuuming

When refrigerant leakage occurs, it is necessary to find the leak point and reconnect or repair welding the leak point: when repairing or reconnecting the leak point, it is necessary to make sure that there is no refrigerant or other pressure in the system. Otherwise, it is easy to cause the copper pipe to be burst by refrigerant pressure or other pressure during welding, resulting in injury to the operator.

After the completion of leak repair, the system needs to be re-leak detection and pressure

preservation; Only after the pressure is maintained successfully to ensure that there are no new leakage points, you can re-vacuum and fill the refrigerant as required by the system. When refrigerant leakage occurs in a small space, to prevent suffocation of personnel, all vents should be opened first, or forced ventilation to discharge the refrigerant, and then related operations.

If the refrigerant leakage caused by long-term use of the unit or problems caused by installation and transportation, perform the following operations:

1. Identify and remove leaks.
2. After all leakage points in the system are removed, vacuum the system and maintain pressure.

Pressure holding and vacuuming contacts are shown in Figure 4.1. When the vacuum is pumped below 60pa for more than 30 minutes, it is considered that vacuumizing is complete.

3. Charge refrigerant

The additional refrigerant to be charged or the refrigerant to be charged after the machine is maintained must be qualified. Otherwise, the compressor may be damaged or even exposed to other risks.

When filling, R454B must be liquid.

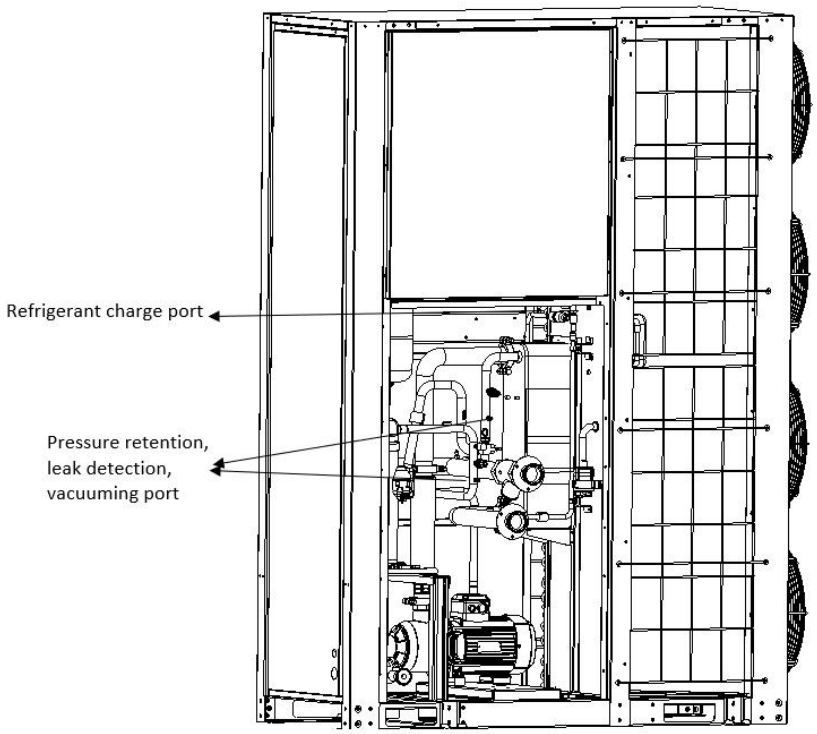


Figure 4.1 Position of pressure retaining and refrigerant charging port

5.2.2 Charge refrigerant to the unit

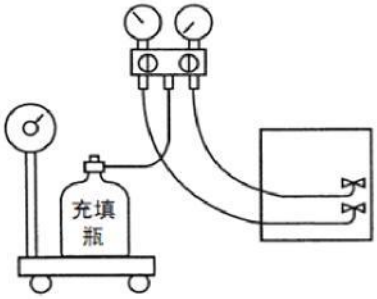
After vacuuming, charge refrigerant to the system. The refrigerant should be charged through the refrigerant port as shown in Figure 4.1. The charge amount is marked according to the nameplate of the unit.

If the refrigerant charged is less than the nameplate value, charge the refrigerant at the suction side when you need to start the machine to replenish the refrigerant. Special attention: When filling refrigerant, the refrigerant valve should be opened small, so that the refrigerant in the

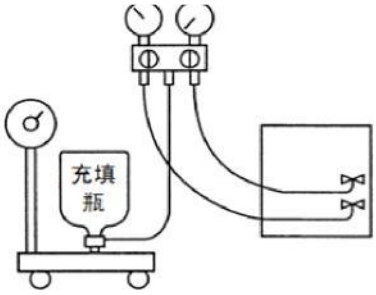
Attention
If a filling bottle with a siphon is used, there is no need to reverse the filling bottle when filling liquid R454B. Check the type of filling bottle before filling.

cylinder slowly into the system, to prevent liquid percussion.

Filled bottle with siphon



Filled bottle without siphon







⚠Warning
The chiller use R454B as the refrigerant which is belong to A2L level. Please pay more attention to the follow items when repair the refrigerant system.

1. Detection of flammable refrigerants:

Under no circumstances should a potential ignition source be used when finding or detecting refrigerant leaks. It is necessary to select the appropriate leak detector and ensure that the detector is not a potential source of ignition

Note: Examples of leak detection are

– bubble method,

– fluorescent method agents.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

2. **Removal and evacuation**

When breaking into the refrigerant circuit to make repairs – or for any other purpose –conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

– safely remove refrigerant following local and national regulations;

– purge the circuit with inert gas (optional for A2L);

– evacuate (optional for A2L);

– open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants,the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times.Compressed air or oxygen shall not be used for purging refrigerant systems.. This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

3. **Charging procedures**

In addition to conventional charging procedures, the following requirements shall be followed.

• Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.

• Cylinders shall be kept in an appropriate position according to the instructions.

• Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.

• Label the system when charging is complete .

• Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site

5.3 Preparation before startup

5.3.1Precautions must be taken when using the machine on

1. Before starting up in winter, the main power switch needs to be energized more than 24 hours in advance to preheat the compressor.
2. When heating and shutting down in winter, the main power switch of the unit cannot be powered off, otherwise the anti-freezing function of the unit will fail, and the unit will be damaged by freezing and cracking.
3. Water system Y-type water filter must be cleaned at least once a year. frequently.
4. Check the water system regularly: Check whether the water system exhaust and water refill are normal.
5. Ensure that the water temperature meets the requirements of the operating range.

5.3.2 Waterway inspection and pump test run

When the strong current and weak current of the unit are all connected, let the chiller run at the pump only mode . After the chiller pump is running, check whether there is leakage in the waterway.

If you need to turn off the water pump, close the chiller.

5.3.3 Waterway exhaust air

Before unit operation, be sure to exhaust the air in the waterway. Specific methods are as follows:

1. Ensure to keep the exhaust valve at the chiller pipe and the waterway open.
2. Turn on the water pump;

3. If the water pressure is within 1 ~ 1.5bar and does not shake, and no gas is discharged from the air exhaust valve, it is considered that the air exhaust is over.

5.3.4 Parameter Setting

Table4.1 User parameter setting table

Ite	Parameter Setting	Max	Min	regulation	factory settings
1	Setting temperature of	30	13	1	15
2	Setting temperature of	30	0	1	10

⚠Warning

Do not modify parameters without the guidance of professional personnel. Incorrect parameter modification may result in freezing of the unit and frequent protection of the unit. As a result, the unit cannot work normally.

5.3.5 Range of voltage

The power supply of the unit must conform to the operating power supply marked on the nameplate of the unit, and the voltage imbalance between the power supply and each phase must be within 2%. The voltage of each phase shall be measured within the allowable tolerance of voltage (±10%) as shown on the nameplate of the unit. If the voltage between any two phases is not within this tolerance, the power company should be notified of improvement before operation of the unit. Improper voltage will cause control malfunction, shorten the life of various electrical parts and compressor motor.

5.3.6 Voltage unbalance

The voltage imbalance between phases in three-phase power system is too large, which will cause motor overheating and motor failure. The maximum allowable unbalance voltage is 2%. The unbalance voltage is defined as follows:

Voltage unbalance degree % = 100 x (| Va - Vd |)/Va

Where,Va=(V1+V2+V3)/3, the average voltage (V1,V2,V3 are the voltage between lines)

Vd= the maximum interline voltage deviation from Va

5.3.7 Flow of water

The water flow through the unit must basically meet the rated heat transfer flow requirements

(Table 4.2 water flow range), and the deviation should be as small as possible. If the water flow into the evaporator is too low, the water flow will be discontinuous, the heat transfer effect will be reduced, and the expansion valve will be out of control or the abnormal low-pressure jump. On the contrary, if the water flow is too large, it will erode the parts inside the evaporator. For the condenser, if the flow rate is too low, there will be high pressure protection or high exhaust temperature, so that the machine can not work normally, affecting the service life of the unit.

Table 4.2 Range of water flow

Unit model	Minimum flow rate(m3/h)	Rating flow (m3/h)	Maximal flow rate(m3/h)
EGCA028EADCA	8	15.0	16

The change range of the flow rate is as follows: Lower limit =55% x rated flow rate; Upper limit =105% x rated flow.

5.3.8 Temperature Control

The chiller controls the temperature according to the cooling or heating requirements.

Parameter	Default	Set range	unit	Setpoint Description
Cooling setting value	15	13-30	℃	Cooling starting point
Refrigeration sensitivity	1	1-10	℃	Sensitivity of temperature control
Heating set point	10	0-30	℃	Temperature point for heating operation
Heating sensitivity	5	1-10		Sensitivity of temperature control

Note:

For reliable operation and maximum energy efficiency, it is not recommended that users arbitrarily change the temperature set point.

For different models, the default values of cooling parameters are factory default values.

5.3.9 Operation mode

Cooling Operation

Cooling stop point = cooling set point - WSH2_tar. When the water outlet temperature of the chiller is lower than the cooling stop point, the refrigeration operation will stop. When the water outlet temperature of the chiller or the average temperature of the core is higher than the cooling set point+ WSH1_tar, the refrigeration operation will start.

Heating Operation

Heating stop point = heating set point + WSH3_tar. When the outlet water temperature of the

chiller is higher than the heating stop point, the heating operation will stop; when the outlet water temperature of the chiller or the average cell temperature is lower than the heating set point, the heating operation will start.

Note: WSH2_tar , WSH1_tar , WSH3_tar is water temperature deviation

Cooling Mode

In cooling mode:

1. When the chiller needs refrigeration, start the refrigeration operation, the inner circulation water pump and compressor run, and the water pump runs at a rated speed; The system has no cooling requirements, the inner circulating water pump runs at a rated speed, and the compressor is shut down.
2. When cooling is running, start the inner circulating water pump and start the compressor 30 seconds later.
3. When the system needs heating, only the inner circulating water pump is turned on, and the water pump runs at rated speed. Other components, such as the electric heating tube, do not run.

Heating Mode

In heating mode:

a) When the chiller has the heating demand, start the heating operation, the inner circulating water pump and electric heating tube run, the water pump runs at rated speed; There is no heating demand in the system. The inner circulating water pump runs at rated speed and the electric heating tube is closed.

b) During heating operation, the inner circulating water pump should be started first, and the electric heating tube should be opened after 30s.

c) When the system needs cooling, only the internal circulation water pump is started. The water pump runs at rated speed, and other components, such as the compressor, do not run.

Pump Only Mode

In the pump only mode, the chiller only runs the inner circulation pump, the water pump runs at rated speed, and other components do not run.

Auto Mode

In fully automatic mode, the chiller can operate at cooling or heating mode and maintain self-circulation when there is no need for cooling or heating.

5.3.10 Communication

The control system uses RS485 interface to communicate with the device over Modbus Protocol.

6. Fault code and corresponding removal method

The table of fault codes is as follows. The instructions should be inquired according to the fault codes, or the after-sales personnel of the manufacturer should be contacted to solve the problem.

Index	English description	Analysis and exclusion
3	Inlet Water Pressure is too Low	Water system inlet water pressure is too low. When the chiller system is lower than the pump inlet pressure in the alarm set value , the controller will send hydrating alarm, until inlet pressure is higher than set value. Alarm automatically cancelled. When the alarm appears, please connect filling water device and manually supplement coolant
4	Ambient Temp. is Lower than Nominal Range	When the environment temperature is below - 31 ℃, unit will remind the environment temperature is too low.
5	Outlet Water Pressure Sensor Error	Water side pressure sensor fault alarm including water inlet pressure sensor & water outlet sensor failure. When the pressure sensor can't normally detect pressure, the pressure values on the screen display is ""* * *"", the controller will send water pressure sensor failure alarm, until the water pressure sensor can detect pressure, alarm automatically remove. When water inlet & outlet pressure sensor failure alarm, please check electrical cable terminal whether it is loose and there is no damage to cable. If yes, need to replace new water pressure sensors, please contact the after-sales maintenance services.
6	Inlet Water Pressure Sensor Error	
7	PTC_Thermostat Overload	When the temperature of electrical heater is too high, exceed the temperature set point, the controller display PTC Thermostat Overload alarm, alarm will remove until the temperature lower than setting value. Check whether the water temperature probe is in good situation, at the same time check whether water heater power supply voltage is correct, check whether any damage to the water heater, etc."
8	Ambient Temp. Sensor Error	Temperature sensor open circuit, or short circuit leads to abnormal temperature display. When there is a temperature sensor failure alarm, please check whether the electric wiring of the temperature sensor is loose and there is no damage to cable, without loosening and damage, change a new temperature sensor.
9	Inlet Water Temp. Sensor Error	
10	Outlet Water Temp. Sensor Error	
11	Electrical Box Temp. Sensor Error	Temperature sensor open circuit, short circuit leads to abnormal temperature display.

		When there is a temperature sensor failure alarm, please check whether the electric wiring of the temperature sensor is loose and there is no damage to cable, without loosening and damage, need to change a new temperature sensor.
12	1# Discharge Temp. Sensor Error	Temperature sensor open circuit, or short circuit leads to abnormal temperature display. When there is a temperature sensor failure alarm, please check whether the electric wiring of the temperature sensor is loose and there is no damage to cable, without loosening and damage, change a new temperature sensor.
13	1# Suction Temp. Sensor Error	
14	1# Discharge Pressure Sensor Error	Discharge pressure sensor and Suction pressure open or short circuit, Alarm will display. When sensors can't normally detect pressure, pressure value displayed on the screen is ""* * *"", Alarm will recover when sensor can detect pressure. When failure alarm display, Check the electrical wiring of sensor whether it is loose and make sure there is no damage to cable. please contact the after-sales maintenance services to change new pressure sensors if without loosening and damage.
15	1# Suction Pressure Sensor Error	
16	1# Discharge Pressure is too High	“Discharge Pressure is too High” means discharge pressure is too high and compressor will reduce working frequency. Check below issue: a) environment temperature is too high b) condenser is dirty c) inlet and outlet is obscured. d) The cooling fan operate abnormally e) over charge refrigerant
17	1# Suction Pressure is too Low	“Suction Pressure is too Low” means suction pressure is too low. Check below issue: a) whether the water pressure is too low b) pump operation is abnormal. c) refrigerant leakage, d) expansion valve coil is installed & at right position
18	1# Discharge Temp. is too High	“Discharge Temp. is too High” means discharge is too high. Check below issue: a) environment temperature is too high b) unit condenser is dirty, inlet and outlet is obscured c) The cooling fan operate abnormally
19	1# High Pressure Switch Open	“High Pressure Switch Open” means discharge exceed protect pressure value. Check below issue: a) environment temperature is too high b) unit condenser is dirty, inlet and outlet is obscured c) The cooling fan operate abnormally d) over charge refrigerant

20	1# Discharge Superheat is too Low	“1# Discharge Superheat is too Low” may cause by: a) EXV or coil lose function b) Too small water flow rate c) Suction temperature sensor fault is abnormal
21	1# Comp. is Out of Step	“1# Comp. is Out of Step” means driver or compressor lose function, please contact Essent after-sales.
22	1# Comp. Power Phase is Lose	“1# Comp. Power Phase is Lose” check the unit three power supply.
23	1# Comp. Driver Board Error	“1# Comp. Driver Board Error” means compressor drive hardware lose its function. contact Essent after-sales."
24	1# Comp. IPM Temp. is too High	“1# Comp IPM Temp. is too High” means compressor load is too high. Check below issue: a) voltage is too low b) environment temperature is too high c) the cooling fan operate normally d) over charge refrigerant
25	1# Comp. Current is too High	“1# Comp. Current is too High” means compressor currents is large than target. Check below issue: a) voltage is too low, b) unit environment temperature is too high. c) compressor damage
26	1# Comp. Bus Voltage is too High	“1#Comp. Bus Voltage is too High” means compressor currents is large than target. Check below issue: a) voltage is too high, b) driver damage
27	1# Comp. Bus Voltage is too Low	“1# Comp. Bus Voltage is too Low” means driver DC input voltage is too low. Check below issue: a) voltage is too low b) driver damage
28	Communication Failure between 1# Comp. Driver Board and Main Board	“Communication Failure between 1# Comp. Driver Board and Main Board” means main board can not communicate with driver board, check below issue: a) main board and driver board is power on b) check the communications lines, c) confirm the program version is correct. d) main board or driver board damage
30	Pump is Out of Step	“Pump is Out of Step” mean pump does not operation properly. check below issue: a) pump damage b) pump driver damage
31	Pump Power Phase is	“Pump Power Phase is Lose” means pump driver lose one phase,

	Lose	check the unit three power supply.
32	Pump Driver Board Error	“Pump Driver Board Error” means pump driver may damage, contact Essent after-sales service to replace driver.
33	Pump IPM Temp. is too High	“Pump. IPM Temp. is too High”. Check below issue: a) voltage is too low b) lack of air flow through driver heat sink c) driver damage
34	Pump Current is too High	“Pump Current is too High” means pump currents is large than target. Check below issue: a) voltage is too low, b) pump or driver damage
35	Pump Bus Voltage is too High	“Pump Bus Voltage is too High” means pump currents is large than target. Check below issue: a) voltage is too high, b) driver damage
36	Pump Bus Voltage is too Low	“Pump Bus Voltage is too Low” means driver DC input voltage is too low. Check below issue: a) voltage is too low b) driver damage
37	Communication Failure between Pump Driver Board and Main Board	“Communication Failure between 1# Pump Driver Board and Main Board” means main board can not communicate with driver board, check below issue: a) main board and driver board is power on b) check the communications lines, c) confirm the program version is correct. d) main board or driver board damage
39	Pump_Thermostat Overload	“Pump_Thermostat Overload” means pump current is too large. Check whether pump stuck

7. Fault maintenance

7.1 Fan fault

Phenomenon	Possible causes	Inspection items or treatment methods
External circulating fan does not operate	1.The chiller is not powered on； 2.The circuit breaker trips due to lightning stroke；	1.Check whether the power input terminal of the chiller is energized； 2.Check whether the internal circuit breaker of the chiller is closed.。

	The power input of the chiller is abnormal, such as power overvoltage and power undervoltage.	Connect the display through modbus communication to determine whether the chiller has corresponding alarm and correct it.
	The chiller is in standby mode	Under normal conditions, the chiller is powered on and enters into automatic control logic after 30s of standby.
	Fan stuck	Check whether there are foreign matters blocking the fan.
	Loose terminals	Check whether the connecting terminal of the fan is loose.
	Compressor not started	The external fan can only be started after the compressor is started.
Abnormal sound of external circulating fan	Fan bearing worn	Replace the fan.
	Fan blade scrapes other objects	Check whether there is any cable interference with the fan blade.

7.2 Refrigeration system fault

Phenomenon	Possible causes	Inspection items or treatment methods
Compressor does not start	No power on (standby)	Check the main power switch, and check whether the operation display interface has been turned on.
	Loose circuit connections	Tighten the circuit connector.
	The compressor motor is burnt out	Check the motor and replace it immediately if any defect is found.
Compressor does not work	No cooling demand	Check the outlet water temperature display and the output state of the compressor in the operation interface.
	Stop delay	The compressor has the shortest shutdown time under normal conditions. If the temperature rises to the starting point again during this period, the compressor will still start in a delayed manner.
High exhaust pressure	Condenser is dirty and blocked	Clean the condenser.
	External circulating fan does not work	Refer to the table above.

7.3 Cooling medium circulation system fault

Phenomenon	Possible causes	Inspection items or treatment methods
The internal circulating water circulating pump does not start	No power on (standby)	Check the main power switch, and check whether the operation display interface has been turned on.
	Loose circuit connections	Tighten the circuit connector.
	The pump body is burnt	Check the water pump and replace it immediately if it is burnt out.
Electric heating tube does not work	No heating demand	Check whether the outlet water temperature and heating set point are set reasonably.

	Loose circuit connections	Tighten the circuit connector.
	Electric heating of pipeline is burnt out	Check the electric heating of the pipe, and replace it immediately if it is burnt out.

7.4 Check Plan

The maintenance and servicing work should be completed by qualified professionals. In order to enable the unit to operate normally, prolong the service life of the unit and reduce the possibility of failure, please regularly implement the following spot check items, make adjustments and necessary maintenance, and keep records, which is helpful for maintenance personnel to diagnose the unit failure.

Check list	Installtion for the first time	Every half year	Once a year
Coolant System			
Is there any unusual noise	●	●	
Whether there is leakage	●	●	
Whether the pump runs mormally		●	
Check Coolant Filter			●
Check coolant concentration			●
Check the water level of the refill tank		●	
Check the expansion tank's pressure		●	
Mechanical system			
Clean or replace the air filter		●	
Check for abnormal noise		●	
Refrigerant system			
Whether the pressure is within the normal range			●
Electronic control system			
Check whether the wiring harness terminal is loose			●
Check whether the terminals on the control board and the driver are loose			●
Check the insulation of the device			●

7.5 Inspection and cleaning of condenser

1. To ensure the effective operation of the condenser, its outer layer must be free of any fallen leaves, cotton thread, insects, slag shells and other pollutants. If there is dirt on the condenser, it will not only increase the power consumption, but also cause problems such as high system operating pressure, machine failure and shutdown.
2. If the condenser needs to be cleaned, blow the compressed air from the inside to the outside in parallel to the aluminum foil heat exchanger, which is just opposite to the air flow direction of normal unit operation. For external cleaning, a vacuum cleaner can be used. Do not damage the aluminum foil heat exchanger. Be careful not to be scratched by fins during cleaning.
3. The condenser can also be cleaned with a brush or water column. When cleaning with water column, please flush the condenser from inside to outside. If the pipe rack is too dirty, please

⚠Warning
Never use steam to clean the condenser, otherwise the internal pressure will rise and the refrigerant will leak out from the safety valve.

contact a professional cleaner.

7.6 Inspection and cleaning of evaporator

Please regularly check the water temperature at the inlet and outlet of the evaporator, and compare it with the saturated evaporation temperature during refrigeration. The difference between the average water temperature at the inlet and outlet of an effective evaporator and the saturated evaporation temperature of refrigerant during refrigeration shall be 3-4℃. If the difference is greater than this range, it indicates that the working efficiency of the heat exchanger has decreased.

As some chemical treatment is required in the process of cleaning the heat exchanger, the cleaning work must be completed by professionals.

8. Environmental protection

8.1 Name and content of harmful substances in the product

Part name	**Hazardous substances**					
	Lea	Mercur	Cadmi	Hexavalent chromium	Polybrominated biphenyls	Polybrominated diphenyl ether
Electric machinery	×	○	×	○	○	○
Heat exchanger core	○	○	○	○	○	○
Filter	○	○	○	○	○	○
Fasteners such as screws and bolts	○	○	○	○	○	○
Sheet metal	○	○	○	○	○	○
Thermal insulation and	○	○	○	○	○	○
Plastic parts	○	○	○	○	○	○
Foaming	○	○	○	○	○	○
Rubber parts	○	○	○	○	○	○
Power line and connecting line	×	○	○	○	○	○
Printed circuit board and electrical	×	○	×	○	○	○

Printed copy	○	○	○	○	○	○
Controller class (controller/battery,	×	○	×	○	○	○
Controller class	○	○	○	○	○	○
Other imprints	○	○	○	○	○	○

This form is prepared in accordance with **SJ/T 11364**.

○：It means that the content of the harmful substance in all homogeneous materials of the component is below the limit specified in **GB/T 26572**.

×： Indicates that the content of the hazardous substance in at least one homogeneous material of the component exceeds the limit specified in GB/T 26572; However, with the existing technical conditions, it is temporarily impossible to realize that the product parts do not contain the above-mentioned harmful substances at all, and the content of harmful substances will be gradually reduced with the progress of alternative technologies.

8.2 Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely.Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically.

c) Before attempting the procedure, ensure that:

• mechanical handling equipment is available, if required, for handling refrigerant cylinders;

• all personal protective equipment is available and being used correctly;

• the recovery process is supervised at all times by a competent person;

• recovery equipment and cylinders conform to the appropriate standards.

d) Pump down refrigerant system, if possible.

e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

f) Make sure that cylinder is situated on the scales before recovery takes place.

g) Start the recovery machine and operate in accordance with instructions.

h) Do not overfill cylinders (no more than 80 % volume liquid charge).

i) Do not exceed the maximum working pressure of the cylinder, even temporarily.

j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

8.3 Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

8.4 Recovery

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or

other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

8.5 Environmental protection and safety warning

⚠Caution
Please follow the following rules. Any violation may cause irreversible damage to the unit: **1.** If you need to add refrigerant, please contact our designated after-sales service agency for confirmation. **2.** Do not add additives to the refrigeration system. **3.** The refrigerant oil and refrigerant must be replaced after the compressor is burnt out.

⚠Caution

Please consider environmental protection factors when repairing or scrapping the unit:

1. When overhauling the water system, please consider whether there are additives such as ethylene glycol in the system, and invite qualified suppliers for disposal.

2. When overhauling the refrigerant system, invite qualified suppliers to dispose of the refrigerant and refrigerant oil in the system.

3. When scrapping units or parts, please consider the impact on environmental resources and invite qualified suppliers for disposal.

Category	Handling method
Iron and steel parts	Recyclable
Copper products	Recyclable
Aluminum products	Recyclable
Refrigerant	Recycling by qualified suppliers
Refrigeration oil	Hazardous waste disposal supplier
Rubber products	Hazardous waste disposal supplier
Electronic component	Electrical and electronic waste recycling enterprise

⚠Caution

The following wastes are hazardous wastes and the Owner shall dispose them according to the relevant requirements of the local environmental protection department:

1. Waste refrigerant oil generated during the maintenance, replacement and disassembly of refrigeration compression equipment (HW08 waste mineral oil and waste containing mineral oil 900 ° 219-08).

2. Waste acid produced by acid cleaning (HW34 waste acid 900-300-34).

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