



Air-cooled Screw Chiller

Operation Manual

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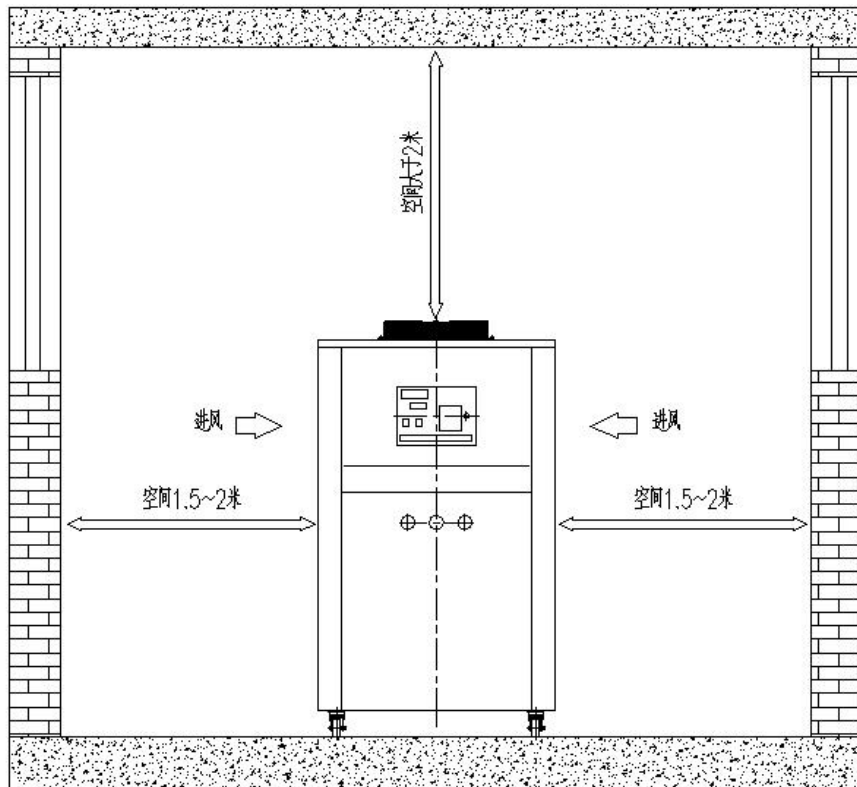
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一、 The Unit Installation

1、 Installation Location Selection

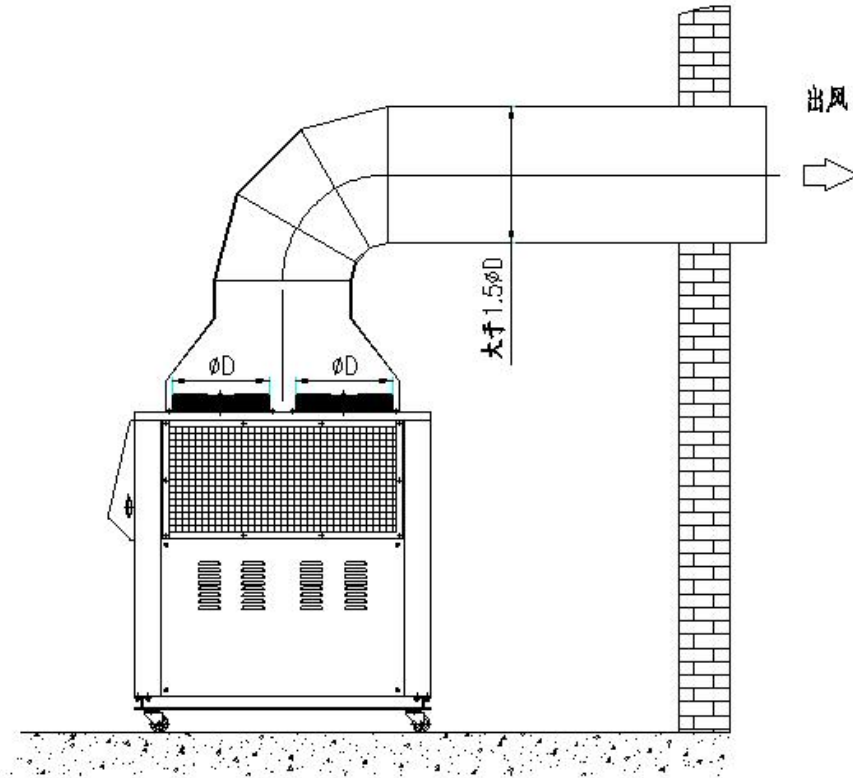
Box type chillers are suitable for installation in rainproof sheds or indoors with good ventilation conditions to the outside environment. The space in the exhaust direction should not be less than 2.0m, so that the hot air discharged by the cooling fan during refrigeration work can be dissipated into the outside environment. There should be a space of 1.5-2 meters in the inlet direction of the condenser on the side of the chiller to ensure the normal working environment of the chiller. The unit is required to be placed on a level and solid concrete foundation of no less than 20cm. For units above 10HP, shock absorption devices should be installed and fastened with anchor bolts; A certain working space should be left around the unit for easy operation, inspection, and maintenance.

The box type chiller requires an installation environment temperature of $-10\text{ }^{\circ}\text{C}$ to $43\text{ }^{\circ}\text{C}$, and a relative humidity of no more than 80%.



2、 Air Duct

For rooms with poor ventilation conditions, air ducts should be added to guide the hot air discharged from the unit out of the room. The following figure is for reference only:



3、 Pipeline Installation

The unit has undergone strict testing and inspection before leaving the factory. Users only need to install the unit and connect the frozen water and cooling water circulation pipeline system properly; The air-cooled unit can be used as long as the chilled water system is connected and the power supply is connected as required.

A water flow switch must be installed in the chilled water system to avoid accidents caused by "ice blockage" in the evaporator when there is no water on the chilled water side of the unit. For box type units, it is recommended to install it outside the unit.

二、Electrical Appliances Installation

1. The chiller unit is equipped with a temperature controller and a low-voltage electrical control box when leaving the factory, and the client only needs to directly introduce the power supply to use it;

2. If the customer wants to add other controls (such as installing an air switch), please follow the relevant local electrical regulations and standards, and equip other control appliances to ensure the safe and stable operation of the unit;

3. It is recommended to select and design the wire diameter of the box type chiller based on 1.25~1.3 times the total current of the chiller and other auxiliary equipment (such as water pumps).

4. Unit power distribution requirements

Power supply voltage: within $\pm 10\%$ of rated voltage. Power frequency: Within $\pm 2\%$ of rated frequency. When the voltage fluctuation exceeds the specified range, it is not allowed to start the chiller, otherwise it will be deemed as improper operation, and the damage caused by this is not within the maintenance scope of our company.

5. The water flow switch, water pump motor, cooling tower fan motor, and other control appliances of the water system should be interlocked with the control circuit of the box type chiller to ensure that the start-up and shutdown sequence of the chiller and its auxiliary equipment can be accurately achieved.

三、Operation Debugging

1. Preparation before startup

A. Check for any abnormalities around the unit.

B. Check if the power supply connection of the unit is appropriate (whether the phase voltage meets the voltage requirements of the chiller).

C. Check whether the chilled water valve has been opened and whether the chilled water pump is in a fault free standby state after pressure testing, sewage discharge, air release, and trial operation.

D. Check whether the water tank of the chiller is filled with water, whether the water replenishment interface of the water tank is connected, and whether the overflow interface is connected to the sewer.

2. Chiller system operation

A. Frozen water should be treated for water quality, as high alkaline water can exacerbate corrosion of copper pipes and reduce the service life of heat exchangers. The pH value of the system water should be within the range of 7.0-8.5.

B. After the installation of the unit and its auxiliary equipment is completed, water pipe cleaning and drainage, pressure testing and leakage detection, air release, and trial operation of the chilled water system should be carried out. The unit debugging and trial operation can only be carried out after everything is normal.

C. Operation of the operating system

- a. Power on the unit for no less than 12 hours before startup;
- b. Start sequence of air-cooled unit: chilled water pump → unit;
- c. Shutdown sequence of air-cooled unit: unit → chilled water pump;

D. Setting of frozen water temperature

Press the "SET" button on the temperature controller once, and the display screen will display the current temperature controller setting value. At this time, press the "▲" and "▼" buttons on the temperature controller to adjust the temperature controller setting value. After adjustment, press the "SET" button again to confirm the new temperature controller setting value. Attention: Do not set the temperature of the frozen water too low. If the temperature is too low, it will reduce the refrigeration efficiency of the unit and may cause the low temperature protection action to alarm and shut down. Adjust the water temperature to slightly lower than the required temperature.

E. After starting up, observe the index of the high and low pressure gauge to determine whether the unit is operating normally.

a. When starting an air-cooled unit, it should be checked whether the direction of rotation of the fan is correct. If it is turned forward, it can be started and operated. If it is reversed, it indicates that the power wiring is in reverse phase, and the phase sequence must be changed before starting.

b. The set values of various protection devices for the unit have been adjusted in the factory, and users are not allowed to change them arbitrarily.

c. When the unit experiences a fault alarm and shuts down, first press the stop button of the unit (the alarm light will turn off), and then check the cause of the fault. It is not allowed to forcibly start and run until the fault is resolved.

d. If it is not an emergency, it is not allowed to shut down the unit by cutting off the main power supply; If the unit is stopped for a long time in winter, first turn off the unit, then turn off the main power supply, and drain the water in the system.

e. To maintain the cleanliness and good ventilation of the computer room, regular cleaning and masonry removal of the condenser should be carried out to ensure the normal and stable operation of the unit.

3. Unit maintenance

A. For air-cooled chillers, please keep the surface of the cooling coil (condenser) of the chiller clean, ensure the surrounding air circulation, and regularly clean the scale on the coil to ensure good heat exchange effect.

B. If the high/low pressure switch trips and alarms or the cooling capacity decreases after using the chiller for a period of time, please arrange for staff to clean the condenser.

C. (Applicable to chillers below 5 horsepower) If the chiller is out of service for a period of time, the water pump blades may solidify due to the accumulation of water pollutants. When restarting, the water pump rotor must be loosened first to avoid the pump blades not rotating, which may cause fuse burning.

四、Common Faults

Faults	Possible Reason	Troubleshooting
The unit cannot start or immediately stops after starting	1. Power outage or low voltage 2. Improper setting of the temperature controller causing the contact to remain open 1. Overload protection not reset after	1. Eliminate circuit faults and power on according to unit requirements 2. Readjust the temperature control settings 3. Press the overload protection reset button
Excessive high pressure during unit operation	1. The copper tube of the condenser has a lot of fouling and poor heat exchange effect 2. Excessive refrigerant 3. The opening of the expansion valve is too small	1. Clean the condenser 2. Discharge some refrigerant 3. Adjust the opening of the expansion valve appropriately
Low pressure during unit operation	1. Insufficient refrigerant 2. Filter blockage 3. The opening of the expansion valve is too small	1. Leak detection, refrigerant replenishment, or adjustment of expansion valve 2. Clean or replace the filter 3. Adjust the opening of the expansion valve appropriately
Frost on the return pipe and compressor casing	1. Excessive opening of expansion valve 2. Excessive refrigerant 3. The heat load is too small	1. Adjust the expansion valve 2. Discharge some refrigerant 3. Increase heat load
The freezing pump does not discharge water	1. Reverse direction of water pump rotation 2. Impeller blockage	1. Correct the rotation of the water pump motor 2. Clean the water pump impeller
Insufficient water pump flow	1. Impeller or water pipe blockage 2. Impeller damage	1. Clean the impeller or water pipe 2. Replace the impeller

五、Electric Control Operation Manual

Warning

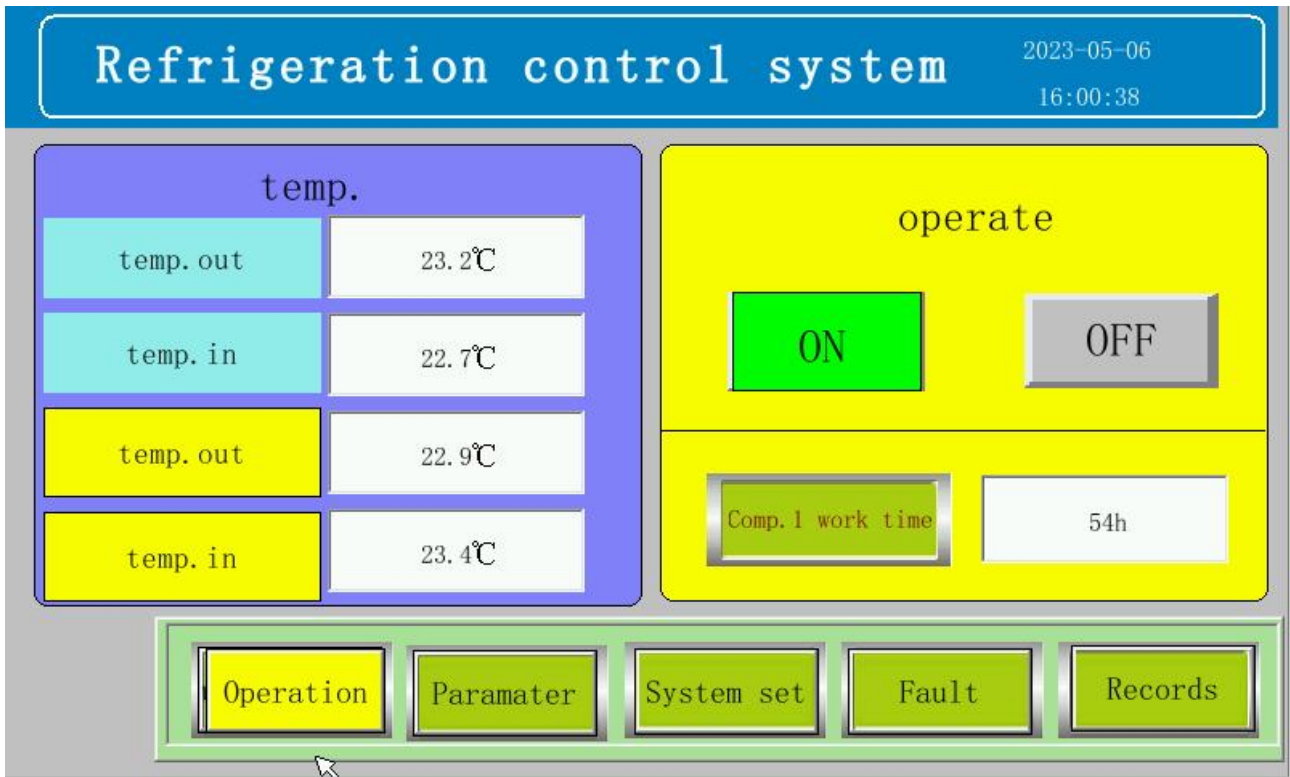


- When used incorrectly, it can cause dangerous situations and may result in personal injury or death
- Even if it is a caution, it may cause danger due to changes in the situation
- Please install it on a metal or other non combustibile board and firmly install it to prevent it from falling due to vibration;
- Do not install controllers that are damaged or missing components;
- Do not expose to direct sunlight, strong airflow, and water mist during installation;



- Do not expose to corrosive or contaminated gases during installation, such as sulfide gases and salt mist.
- Please ensure that the temperature of the electrical box is between $-10\text{ }^{\circ}\text{C}\sim+50\text{ }^{\circ}\text{C}$ during installation, and add an exhaust fan if necessary.
- Please confirm whether the power input is in the OFF state when wiring.
- Please ask electrical personnel for wiring operations during wiring.
- When wiring, the input terminal is a passive switch signal, do not connect to the power supply.
- Please increase system level protection during wiring to avoid danger caused by controller failure.
- Please follow the principle of separating strong and weak currents when wiring.
- Please use wires that meet technical specifications when wiring.
- Please use parallel grounding when wiring, and the grounding wire should be as thick as possible.
- When fixing screws during wiring, please use an appropriate screwdriver. Screwdrivers that are too large or too small can easily cause the screw head to slip.
- Set relevant parameters according to machine configuration to ensure normal operation of the machine
- According to the machine configuration, set the relevant jumper/unplug switch to ensure the normal operation of the machine
- After confirming that the wiring is correct during operation, input the power supply again.
- During operation, ensure that the environmental conditions and power supply voltage are within allowable conditions before starting up and running.
- Do not check the signal during operation.
- During operation, do not change the parameter settings arbitrarily.
- During operation, do not approach the machine too closely.
- If users have any repair needs, please contact the manufacturer and do not repair on their own.
- Do not pull or twist the power and communication cables to avoid serious faults.
- Do not touch the control board components directly with your hands to avoid being damaged by static electricity.
- The company has the right to repair the consequences caused by defects in the controller software, but is not obligated to assume any responsibility.
- Our company is not obligated to bear any consequences caused by improper use.
- Our company has the right to provide on-site services to end users, but has no obligation

1.1 Main window

After booting up, the main window will be displayed to view the current temperature of chilled water inlet and outlet, running time, etc. through the main window.



1.2 ON/OFF

Press  on the main page and the start button will turn green, indicating that the unit has been turned on. If press  and the shutdown button turns red, it indicates that the unit has been shut down.

Attention: After the unit is shut down, the water pump will delay stopping to take away the remaining energy of the unit.

1.3 User parameter settings

Press  on the main page to set options such as outlet temperature and temperature return difference.

1.3.1 User parameter settings

The screenshot shows the 'Refrigeration control system' interface. At the top, a blue header contains the title 'Refrigeration control system' and the date '2023-05-06' and time '16:01:10'. Below the header, the word 'Parameter' is centered. The main area is a light blue panel with several control elements:

- On the left, there is a 'Operation' label and a small icon of a monitor and fan.
- The central panel contains several buttons and text boxes:
 - 'Tempe. out set' with a value of '0.0°C'
 - 'economizer open' with a value of '3.5bar'
 - 'Tempe. deviation set' with a value of '2.0°C'
 - 'economizer close' with a value of '4.0bar'
 - 'Temp. too low' with a value of '-2.0°C'
 - Language selection buttons for 'Chinese' and 'English'.
- At the bottom right, there is a 'NEXT' button and a numeric input field containing '0'.

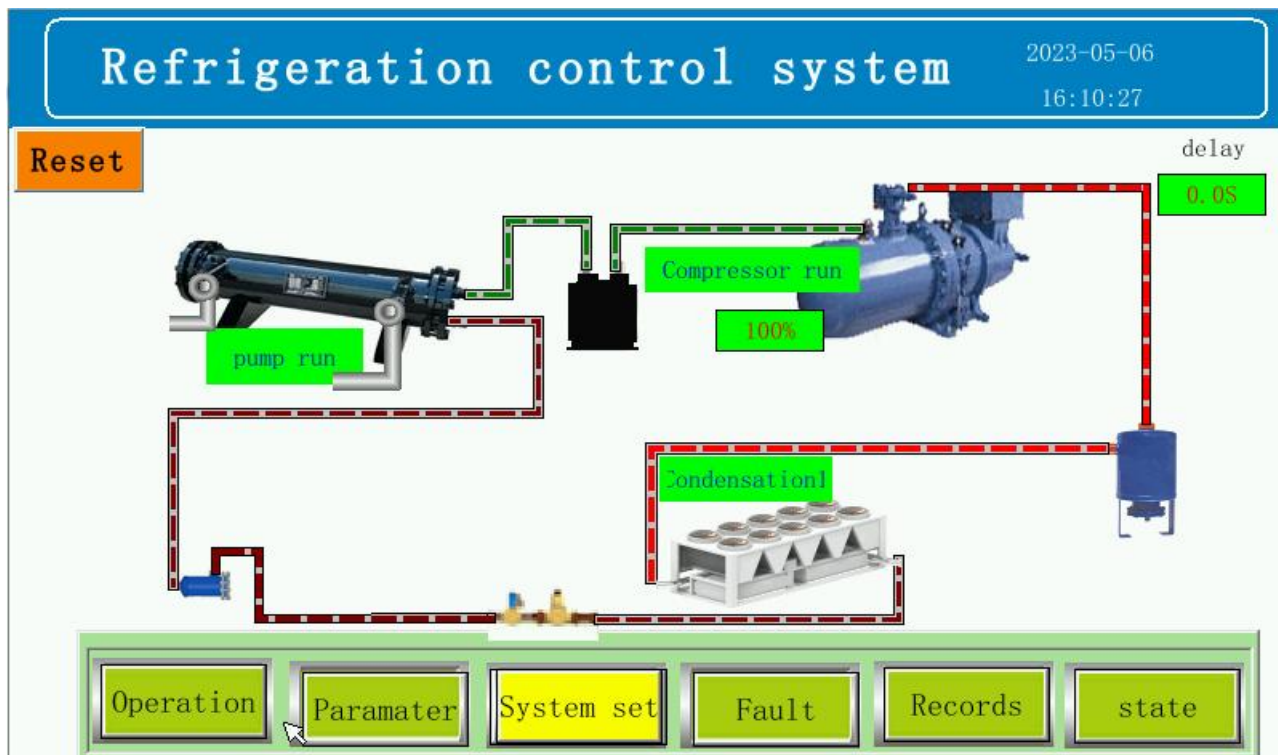
Enter password 1234 in the bottom right corner to jump to the temperature correction page.

The screenshot shows the 'Refrigeration control system' interface. At the top, a blue header contains the title 'Refrigeration control system' and the date '2023-05-06' and time '16:08:22'. Below the header, the word 'SYSTEM' is centered. The main area is a light blue panel with several control elements:

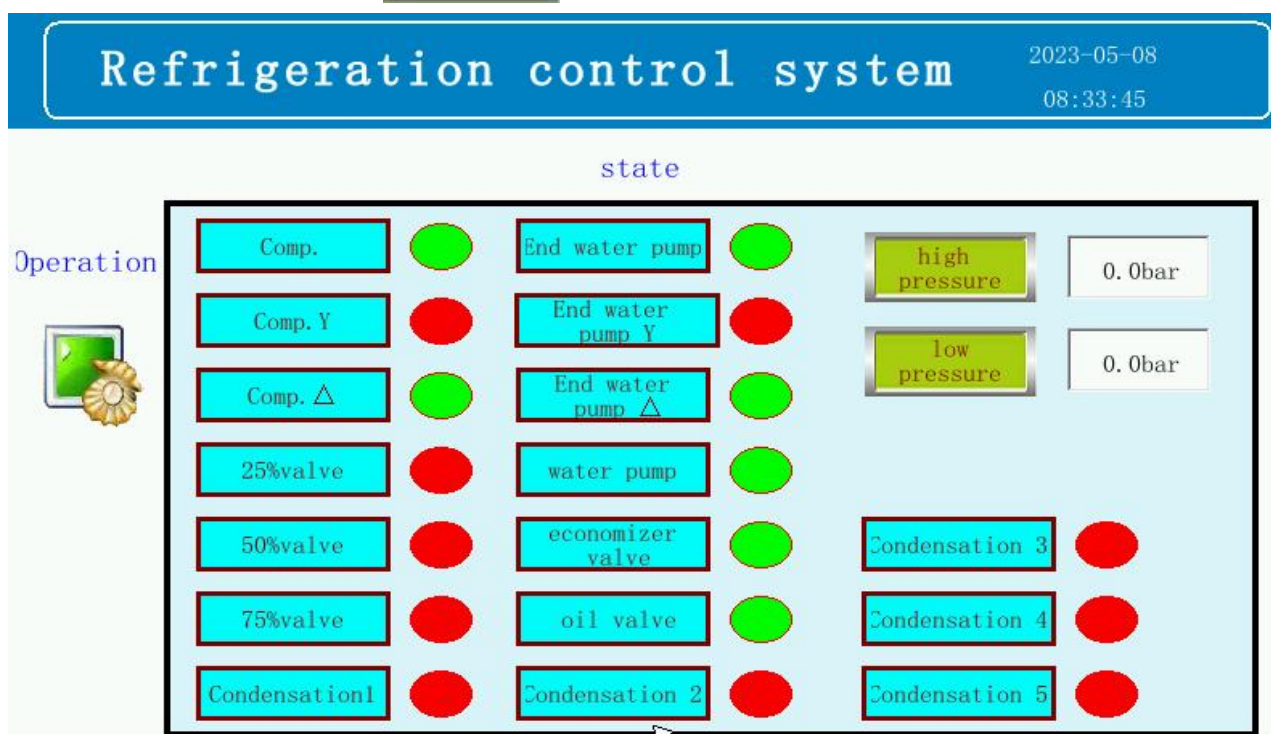
- On the left, there is a 'Operation' label and a small icon of a monitor and fan.
- The central panel contains several buttons and text boxes:
 - 'Chilled temp. out' with a value of '23.1°C'
 - 'Adjustment temp.' with a value of '0.0°C'
 - 'Chilled temp. in' with a value of '22.5°C'
 - 'Adjustment temp.' with a value of '0.0°C'
 - 'Chilled temp. out' with a value of '22.8°C'
 - 'Adjustment temp.' with a value of '0.0°C'
 - 'Chilled temp. in' with a value of '23.3°C'
 - 'Adjustment temp.' with a value of '0.0°C'
- At the bottom left, there is a large circular button with a play symbol and the word 'Operation' next to it.
- At the bottom right, there is a 'NEXT' button and a numeric input field containing '0'.

1.3.2 Input and output status viewing

Click " **System set** " On the main page to monitor the current system operation status.



Click on the bottom right corner **state** to display the current output running status.



1.4 Viewing temperature and humidity data and curves

Click **Records** on the bottom right corner on the main page to view the temperature report.

The screenshot displays the 'Refrigeration control system' interface. At the top, a blue header bar contains the system name and the date '2023-05-06' and time '16:11:29'. Below this, the 'Records' section features a table with the following data:

serial nu	time	temp. out	temp. in	temp. out	temp. in
1	2023-05-06 16:09	23.1°C	22.5°C	22.8°C	23.3°C
2	2023-05-06 16:06	23.0°C	22.4°C	22.7°C	23.3°C
3	2023-05-06 16:03	23.1°C	22.6°C	22.8°C	23.3°C

Below the table, there are control buttons: 'return' (value 0), 'schedule' (value 0), 'time-on' (2011/01/01 12:00:00), and 'End Time' (2112/01/01 12:00:00). A 'To USB drive' button is also present. At the bottom, a navigation bar contains five buttons: 'Operation', 'Paramater', 'System set', 'Fault', and 'Records'.

Data can be exported from a USB drive.

1.4.1 Fault inquiry and historical records

If the device malfunctions, press **System set** on the main page to view the current fault. Press

Fault to view historical faults.

