



Innovation/Cooperation/Win-Win

# Direct Cooling Block Ice Machine Instruction Manual



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## Warning

<b>DANGER!!!</b>	<b>Any illegal operation may cause: equipment damage, life injury and even death!</b>
<b>Attention!!!</b>	<b>Any improper operation may cause: equipment failure, life injury and property damage!</b>

## DANGER!!!

- ◆ **When the machine is energized, it is forbidden for any part of human body to touch the charged part of the machine, and it is forbidden to touch any metal part of the machine when the charged part is not clear.**
- ◆ **tray before rising, please check carefully that the tray is free of debris and hard objects, otherwise there will be the possibility of damaging the aluminum plate evaporator, and there is no warranty for improper operation leading to equipment damage by Icema.**
- ◆ **pallet in the process of descending, the pallet is strictly prohibited to stand under the people.**
- ◆ **After the tray locking device is completely released, it is forbidden to stand under the tray.**
- ◆ **When the machine is working, it is forbidden for any part of human body to approach the rotating or moving part of the machine.**
- ◆ **No touching the red tube during the machine running or stopping, be careful of burns.**
- ◆ **If the machine is left aside for a long time and not working, please disconnect the main power supply to avoid the risk of electric shock.**
- ◆ **Please make sure the rotation direction of each motor is correct before turning on the machine, and forbid any motor reversal.**
- ◆ **prohibit the addition or connection of other electrical equipment inside the machine's electrical control box.**
- ◆ **When encountering freezing weather or freezing season, if you do not use the ice machine, please drain all the water inside the pipes and condenser of the ice machine unit, otherwise there is a danger of freezing and cracking.**
- ◆ **If the machine stops suddenly, it is forbidden to start it again without finding the correct reason for stopping.**



- ◆ **Only specially trained and experienced personnel in the maintenance and use of refrigeration equipment should operate the system.**
- ◆ **Before starting the ice machine, the power must be turned on 8 hours in advance, the main power switch and all electrical switches including the emergency stop must be turned on, the crankcase heater of the compressor must be working and the temperature inside the crankcase must be at least 5°C above the ambient temperature. Start the ice machine when the crankcase temperature is too low, it will cause serious damage to the compressor.**
- ◆ **Ice machine can only be used under standard atmospheric pressure, any high pressure or negative pressure environment will cause damage to the piping system of the ice machine.**
- ◆ **wrong or irregular electrical wiring can cause short circuit, break, electric shock, electric injury and other accidents, so it is strictly prohibited without "electrician's license" or non-refrigeration equipment maintenance personnel to repair the equipment.**
- ◆ **operator on duty should observe the operation of the equipment according to the indicator light without interruption, and solve the problems found in time.**
- ◆ **Read the instructions carefully and understand all the terms and conditions for proper installation, connection, operation, use and maintenance of the machine. Compliance with the standards in this document is important to achieve the rated operating effectiveness of the machine and to protect the safety of the operator.**
- ◆ **Read the instructions for use carefully and follow the standards strictly, and have it maintained by a suitable operator.**
- ◆ **The technical standard data contained in this manual is subject to change without notice due to technological developments.**
- ◆ **Please give this manual to the person who will ultimately use the machine.**

## **Overview of use and maintenance**

This product is the direct cooling ice machine of our ice machine series, which has been installed and tested in our factory. Our machines are made of world famous brand refrigeration parts and electrical components, which are carefully assembled by our assemblers after 3D mapping by our engineers, so that the machines can operate normally even in harsh environment and customers can use them with confidence. In order to make the machine better use and reduce your repair and maintenance costs, daily maintenance and preventive maintenance are also necessary.



Dear customers, please note that only by carefully reading and strictly following the instructions below can you install your machine correctly. Please read our instructions carefully before operation. You will find that a complete reading and memorization will bring you a lot of convenience in the installation and future use and maintenance of the machine.

## 1. Installation and operation personnel

Please hire or arrange personnel with refrigeration equipment installation experience to direct the installation on site. And hire or arrange for qualified electricians who hold the "People's Republic of China Electricity Entry and Operation Certificate" to connect the cables between the machine and the grid. The damage caused to the machine when the customer chooses to install the equipment by himself is not covered by our company's warranty.

Please hire or arrange for one or two responsible people with experience in ice making to switch on and off the machine and be responsible for the daily inspection of the machine. This person must know the entire start/stop sequence of the machine and know simple troubleshooting.

When the machine fails, please hire professional refrigeration equipment maintenance personnel or hold the "People's Republic of China electrical network operation certificate" of qualified electricians and engineers level repair. You can also call our after-sales service department directly for help. We will patiently and carefully answer any questions about the ice machine from each customer.

It is strictly forbidden to disassemble the machine indiscriminately, unreasonable operation will seriously shorten the service life of the machine and may lead to the loss of life and property.

## 2. Basic safety guidance

All personnel involved in the operation of the machine must be familiar with the safety operating procedures for mechanical equipment, know the basic essentials of refrigeration equipment, and have read our instructions in their entirety. Ensure that these personnel thoroughly understand and fully comply with the instructions.

1. The components of the refrigerant cycle are subject to high pressure. Do not open pipes, valves or other components at will;
2. the parts will heat up when the machine is in use. burns may occur when near the red high-pressure exhaust pipe;
3. must be professionally trained in electrical knowledge and hold the "People's Republic of China Electrical Entry and Operation Certificate" before the



electrical part of the machine can be repaired;

4. must be trained and experienced refrigeration personnel with professional knowledge of refrigeration equipment before the refrigeration part of the machine can be repaired;

5. the daily use of the machine please hire or arrange for responsible and understand the basic operation of refrigeration equipment personnel management;

6. no smoking is allowed in the room where the ice machine is installed.

7. the gaseous refrigerant is more dense than the surrounding air, so the room where the machine is installed must be well ventilated in order to prevent the refrigerant from leaking and causing oxygen deprivation.

The following rules must be observed when operating valves, buttons and switches.

1. must know the function of the component and know the result brought by the opening or closing of the component;

2. Some of the pipes of the machine are high-pressure pipes, which may have high air pressure rushing out when opened suddenly, please pay attention to personal safety;

3. The pipes of the machine are equipped with refrigerant, and opening the pipes or valves at will will lead to refrigerant leakage, which can cause death in serious cases;

4. the machine will lose the ice making ability after the refrigerant leakage;

5. The switch of the electric control equipment contains AC 400 volts or even higher voltage, please do not operate it freely;

6. consider for 30 seconds before operating any of the components and make sure it can be operated before doing it;

The following rules should be followed in particular to operate the ice machine:

1. all switches in the electric control box should be opened at least 8 hours before starting the ice machine, and the emergency stop button on the electric box operating table (surface) should be turned on and the power should be turned on;

2. the main power supply should be cut off when servicing the ice machine;

3. when entering the evaporator internal maintenance, should cut off the power, close the main power switch in the electric control box, lock the door of the electric control box, and hang the warning sign of "someone work, forbidden to open the machine" on the door of the electric box;

4. Make sure all the refrigerant has been recovered to the storage tank and the isolation valve has been closed before opening the pipeline to prevent refrigerant leakage;

5. Please cut off the main power supply when you don't use the ice machine for a long time, drain the water inside the water tank, condenser and water pipe of the ice machine, recover the refrigerant to the liquid tank and close the isolation valve. But please remember to turn on the water and electricity and open the isolation valve



when you turn on the machine next time;

### 3. Power and materials

#### 3.1 Voltage

Depending on the region and the customer, ice machines may use different levels of voltage.

In China our machines use the following electricity standards:

Power: AC 380V3P+N 50Hz

Control: AC 220V1P+N 50Hz

Control: 24V DC

Please make sure that the site where the machine is installed has sufficient power and the main line voltage cannot be lower than 380 V. When the line voltage is lower than 380 V, it will lead to insufficient ice making capacity of the machine.

When the line voltage is lower than 360V, it is forbidden to turn on the ice machine, and the low voltage (commonly known as: under voltage) will easily burn the compressor, motor and other equipment.

Please refer to the machine nameplate for the specific voltage standard.

- ◆ is not covered by our warranty due to low voltage burnout of the machine.

#### 3.2 Water

##### 3.2.1 Cooling water (water-cooled type machines)

Cooling water is the water used to cool the ice machine system, it is not the same system as the water used for ice making. In principle, cooling water also needs tap water, but it can be used according to the actual situation, in order to save cost, cooling water can be used without alkali, salt and other water without corrosive agents (substances). Such as well water, river water, mountain springs and natural water.

##### 3.2.2 Ice making water

Please use fresh water such as standard tap water, purified water, and potable water as the ice making water for the machine.

- ◆ different water specifications may lead to the buildup of dirt or rust in the pipes in the water cycle. In turn, the productivity of the ice machine may be



seriously affected.

### 3.3 Refrigerants

Our machines use R22 and R404a refrigerants depending on the design. Please refer to the machine nameplate or call Icemar for assistance on which refrigerant to add to your machine.

#### 3.3.1 R22 refrigerant

R22 - if leaked in the atmosphere, it can destroy the ozone layer of the atmosphere and affect the environment, but the refrigeration performance is very consistent with R404A, and now it is not available in developed countries, but generally used in developing countries, with excellent price.

3.3.2 R404A - is an environmentally friendly refrigerant, non-polluting to the air, superior performance, safer operation, but more expensive, and is basically used in Europe and America now.



- ◆ It is strictly forbidden to add different types of refrigerant in the same machine.

### 1. Start the ice machine

In order to heat the oil in the crankcase and evaporate the refrigerant mixed in the oil, the power must be turned on, the main power switch and other electrical switches including the emergency stop, at least 8 hours before the compressor runs to ensure that the temperature in the crankcase of the compressor is more than 5°C above the ambient temperature.

Please follow the following steps to turn on the machine:

1. Ensure that water and electricity are fully connected;
2. Make sure the compressor crankcase temperature is higher than the ambient temperature;
3. Check that each manual valve of the unit is in the correct position;
4. run through each step manually (if there is a manual function) and that they all work properly;
5. press the Reset button once before pressing the Start button;

- ◆ After the normal start-up of the machine, you need to observe the operation of the machine for at least 10 minutes. If you encounter any abnormal sound, excessive sound, violent vibration, etc., please press the emergency stop button immediately. The machine should not be turned on again until the fault is lifted.





- ◆ repeatedly turn on the ice machine with fault, the secondary damage caused to the machine is not covered by our warranty.

## 2. Ice machine operation monitoring

The operation of the ice machine requires attention to the following matters:

1. observe whether the voltage and current are within the parameters specified on the machine nameplate;
2. High pressure pressure should be within 10 bar to 20 bar, low pressure pressure should be within 1.0 bar to 4 bar;
3. The compressor sound is not abnormal;

## 3. Ice machine stop

The ice machine is stopped in three cases, namely: emergency stop, normal stop.

### 1. 6.1 Emergency stop

1. Purpose of emergency stop: Emergency stop can only be made in case of equipment and personal safety hazards;

2. Emergency stop: Press the "Emergency Stop" button on any part of the machine to stop the machine instantly;

3. When starting the machine again, please make sure that the emergency stop has been eliminated and the machine is in the correct state;

4. Please restart the machine at least 5 minutes after each emergency stop;

### 6.2 Normal Stop

A normal stop ice maker is a machine that stops each process step in a predetermined stop sequence and time by pressing the machine's "Stop" button while the machine is making ice normally.

normal shutdown does not occur as a system pressure shock. Therefore, it is recommended not to use the emergency stop button to stop the machine under normal conditions.



## 7. Touch screen screen description



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Part of product display



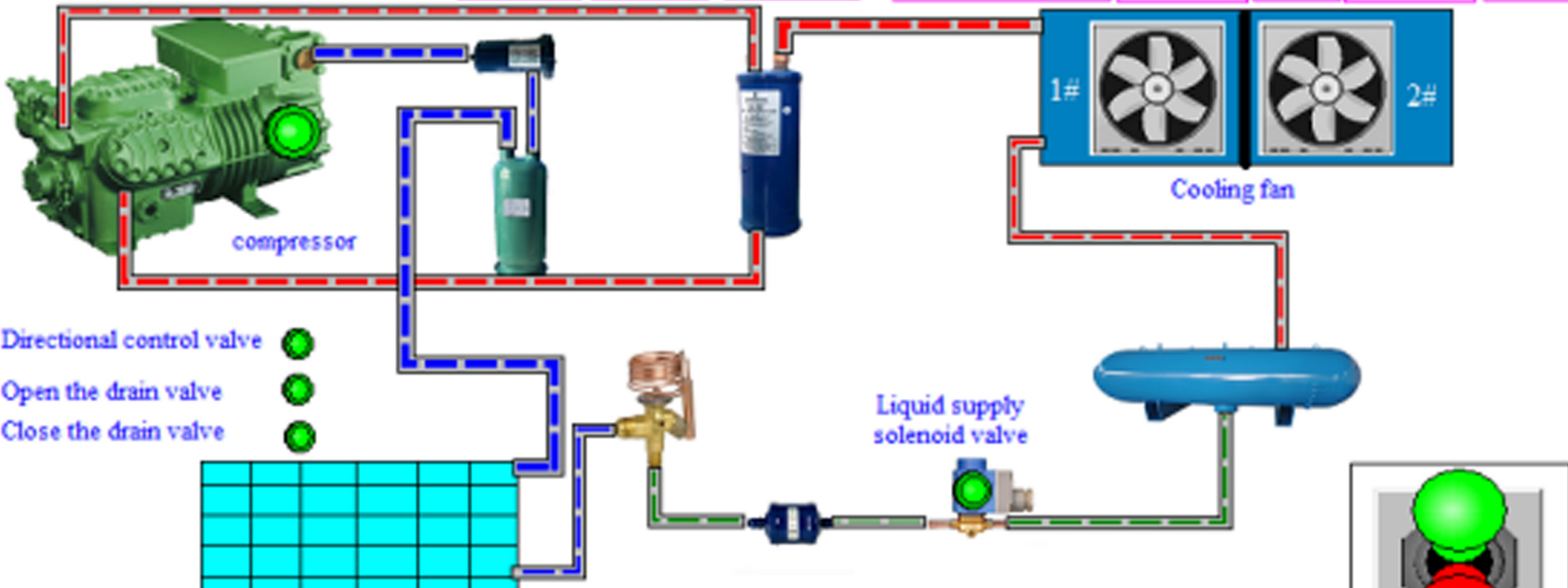
Chinese

English

ENTER

Icemar's basic information screen

Manual Screen	Fault screen	Contact Us	Date	ABCD	Time	ABCD		
Ice making time Setting	12	hours	12	minutes	Unit running time	12	hours	
Ice making time	12	hours	12	minutes	Deicing time	12	12	seconds



Directional control valve: ● ● ●

Open the drain valve: ●

Close the drain valve: ●

Run time clear zero

ice making

Reset

Stop

ice doffing

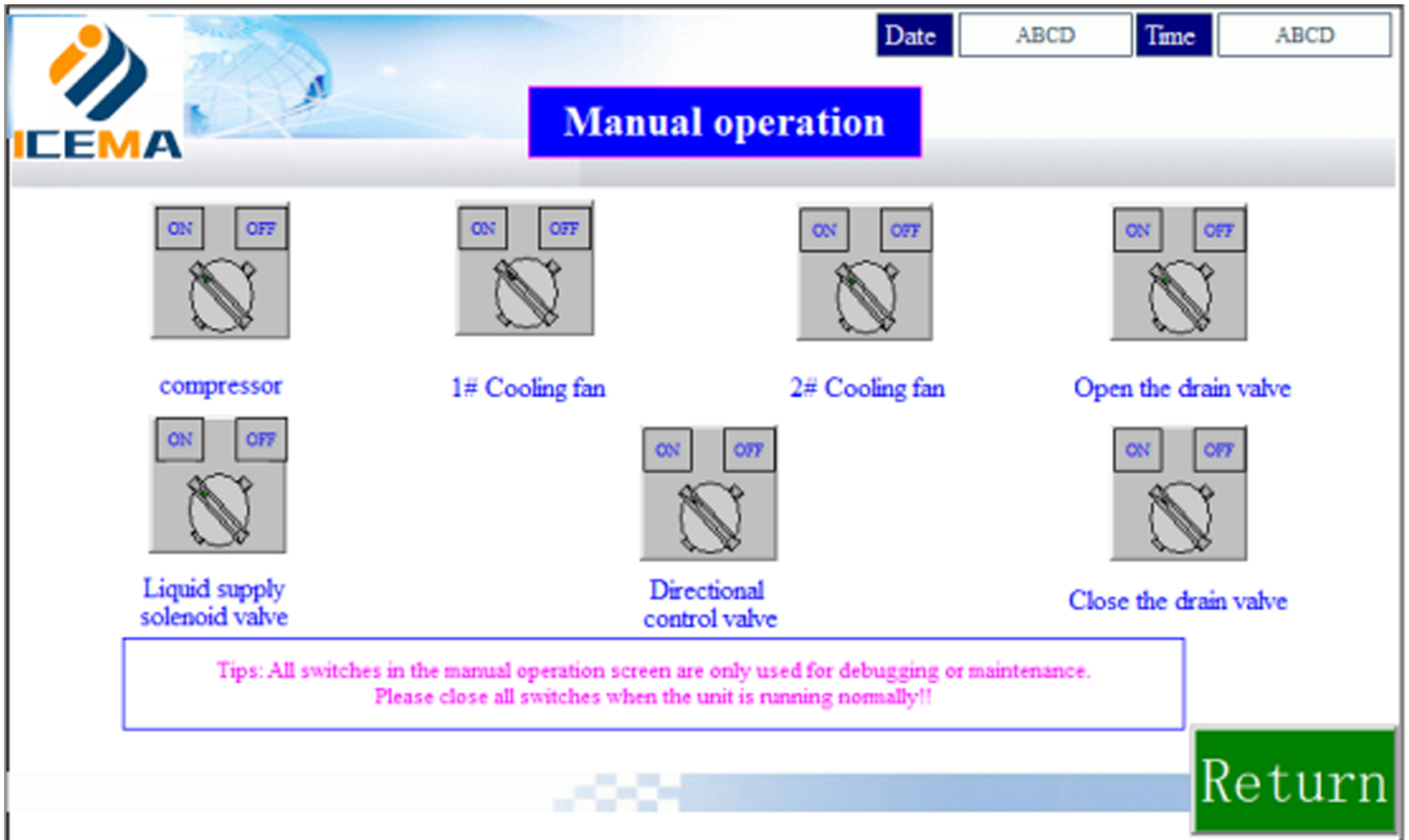
Automatic

●  
●  
 Manual/Automatic

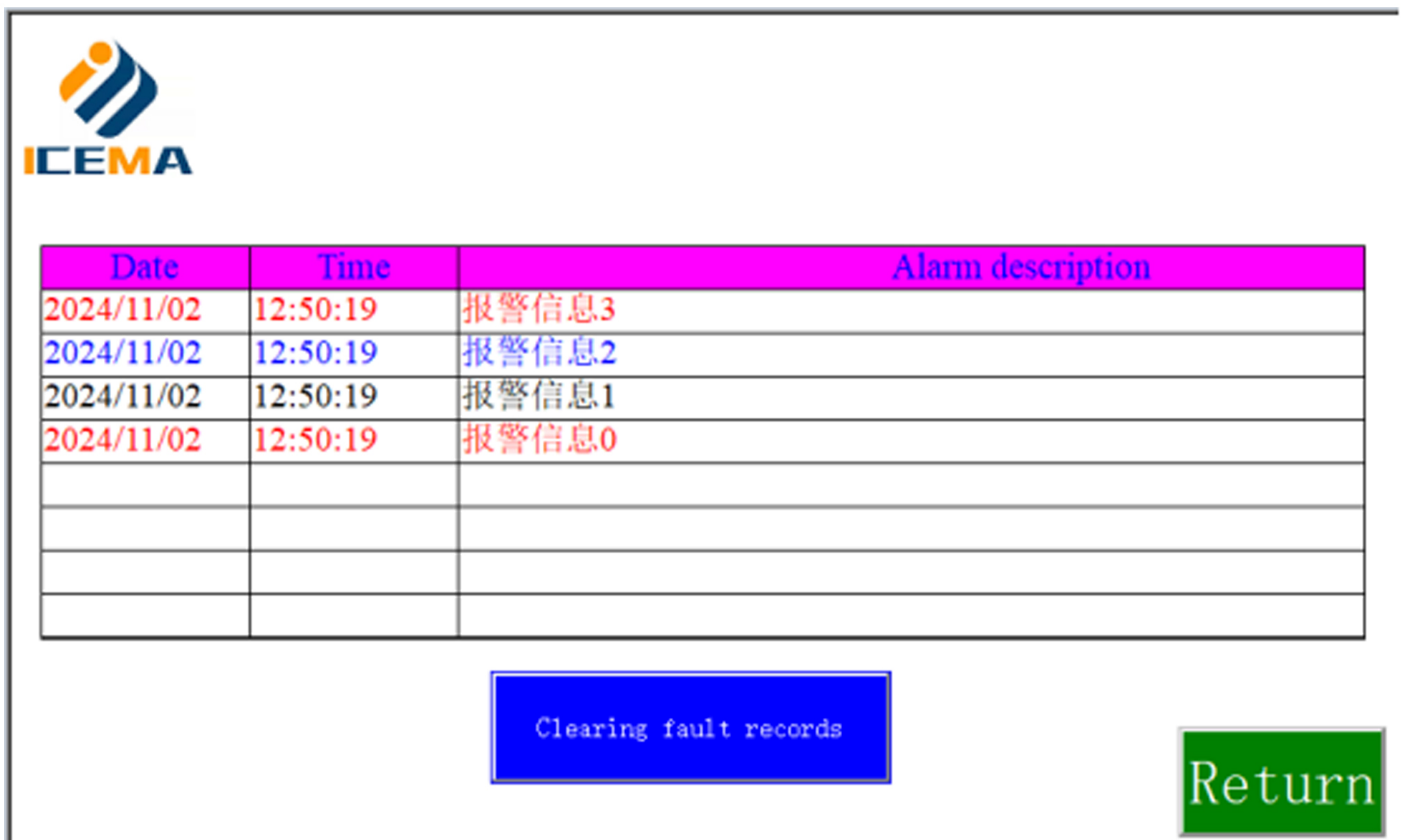
Alarm screen

Alarm screen can view current and historical faults, and press "Clear Alarm Record" button to clear historical records.





Main Screen



Alarm view screen



## 9 General Troubleshooting

Fault	Display status	Exclusion method
Motor overload	Unit emergency stop status, system error light (System Error) blinking or always on	1. check whether the three-phase winding of the motor is balanced; 2. Check whether the transmission parts are stuck, whether there is a lack of phase, undervoltage, and whether there is a loose connection between each low-voltage electrical.
High and low voltage failure	Unit emergency stop status, system error indicator (System Error) is always on or flashing	1. Check whether the pressure of the unit is high or low; 2. whether the electrical connection is disconnected and whether the high and low pressure switch contacts are intact; 3. whether the air-cooled or water-cooled condenser is normal; 4. whether the refrigerant is leaking.
Cannot be turned on	The whole machine cannot be started	1. check whether the power supply of the equipment is abnormal and whether the button contacts are intact; 2. whether there is motor overload, whether the electrical connection is disconnected or loose, whether the PLC is energized (PLC has AC and DC power)
Power indicator does not light up	The power indicator does not light up after closing the power switch, and the system cannot be started	1. Check whether the three-phase power supply of the system is missing the wrong phase and whether the emergency stop switch is intact.

regular maintenance of the equipment can greatly reduce the occurrence of malfunction, such as regular inspection, whether the motor sound is abnormal, frequently check whether the connection wires of each part are loose, keep the surface of the equipment clean, etc.

ice machine series produced by the ice machine failure instructions vary according to different models, please refer to the random manual, electrical drawings or call the company's after-sales service department.

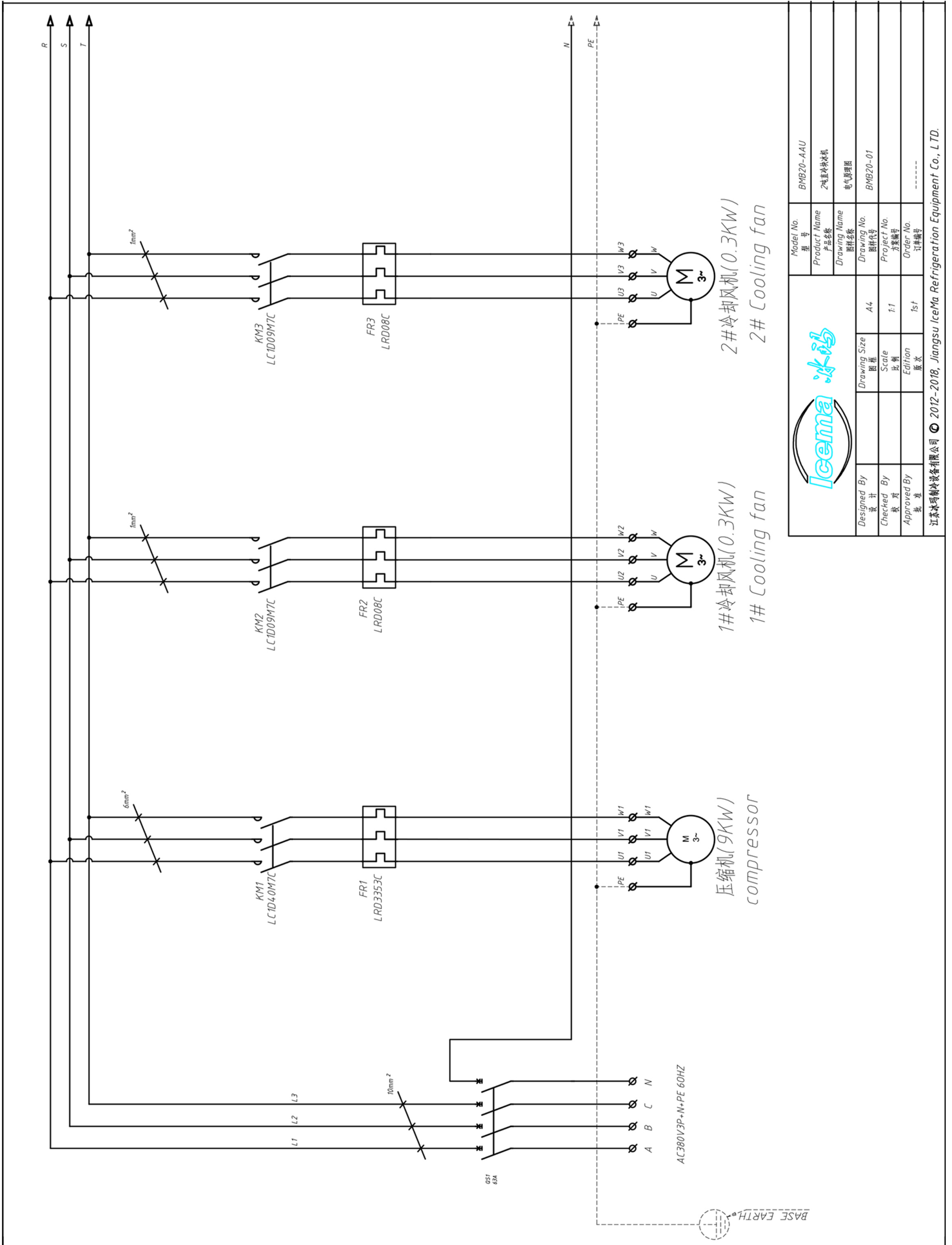


## **10 Attachment (electrical drawings)**

### **11. Instructions for the use of cooling towers**

- 1、 After the customer receives the goods, first check whether each part of the unit is damaged due to transportation, and if so, it should be repaired first;
- 2、 The equipment should be placed in a horizontal position with sufficient operation and maintenance space around it;
- 3、 The equipment should not be placed in the open air and should be protected from rain and sunlight;
- 4、 Equipment should be energized and connected to the corresponding power switch of the unit with 3\*25+2\*16 square copper-core cable, and ensure that the power phase sequence is correct, and two lights are on to indicate the correct phase sequence;
- 5、 Connect the pipes between the cooling tower, cooling water pump and the unit as shown in the following pictures, the arrow of the cooling water pump should point to one end of the unit, and connect the water supply pipe of the cooling tower;
- 6、 connect the cooling water pump and cooling fan power line, according to the drawing into the corresponding terminal of the electrical box, and adjust the operation direction in manual mode;
- 7、 according to the actual situation at the site connected to the water pipeline and water pump (water pump provided, power 2.2 million below), the control line into the corresponding terminal of the electrical box, and debug the direction of operation;
- 8、 Fill the water tank with glycol solution, the liquid level should be higher than the level switch in the water tank, in the process of use, if it is lower than the level switch, it should be replenished in time.



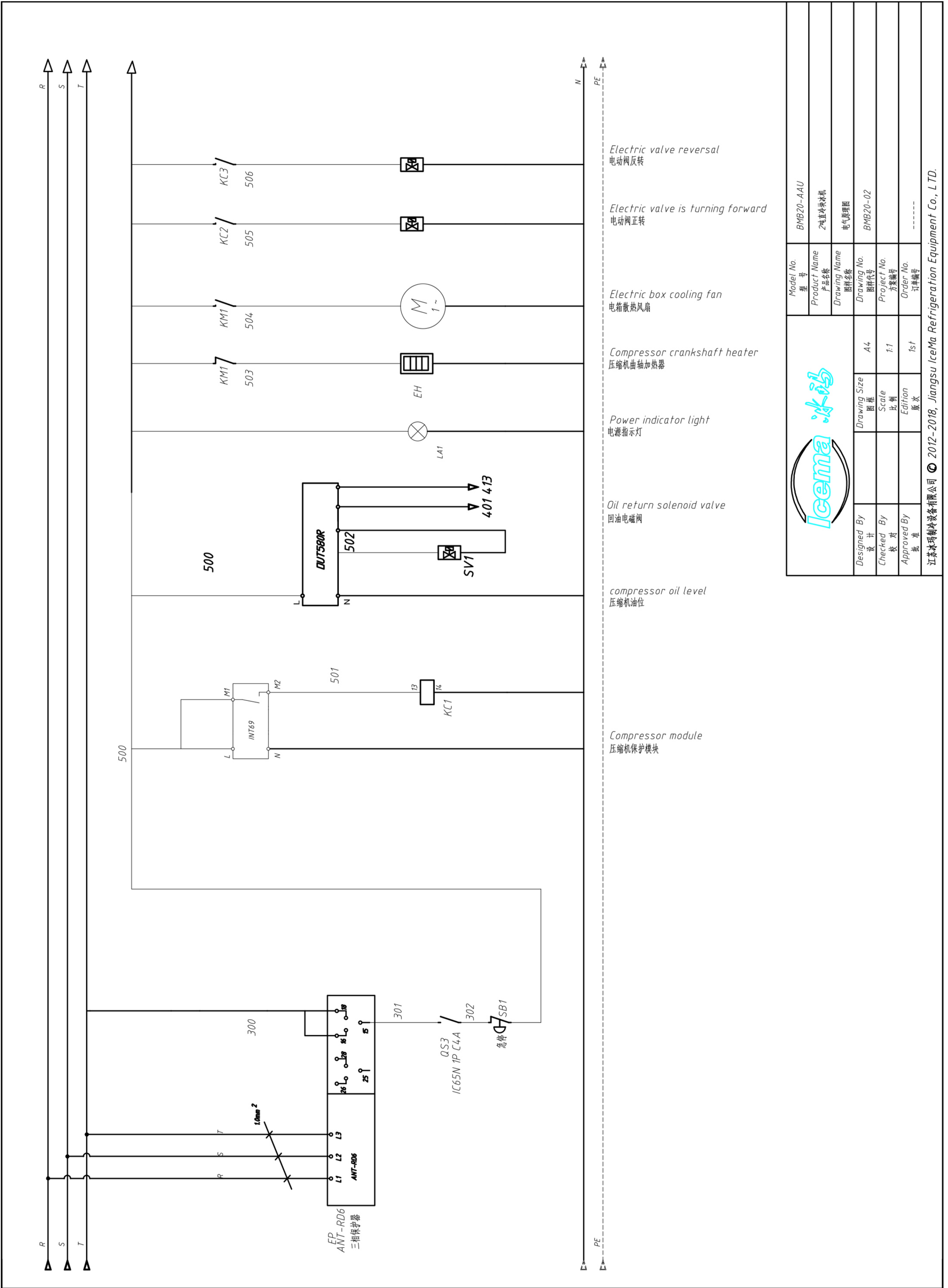


		Model No. 型号	BMB20-AAU
		Product Name 产品名称	2吨直冷式冰机
Designed By 设计	Drawing Size 图框	Drawing Name 图样名称	电气原理图
Checked By 校对	Scale 比例	Drawing No. 图样代号	BMB20-01
Approved By 批准	Edition 版次	Project No. 方案编号	
		Order No. 订单编号	-----

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Electrical Diagram





Model No. 型号		BMB20-AAU	
Product Name 产品名称		2线直启冰机	
Drawing Name 图纸名称		电气原理图	
Drawing No. 图样代号		BMB20-02	
Project No. 方案编号		-----	
Order No. 订单编号		-----	
Designed By 设计	Checked By 校对	Approved By 批准	
Drawing Size 图框	Scale 比例	Edition 版次	
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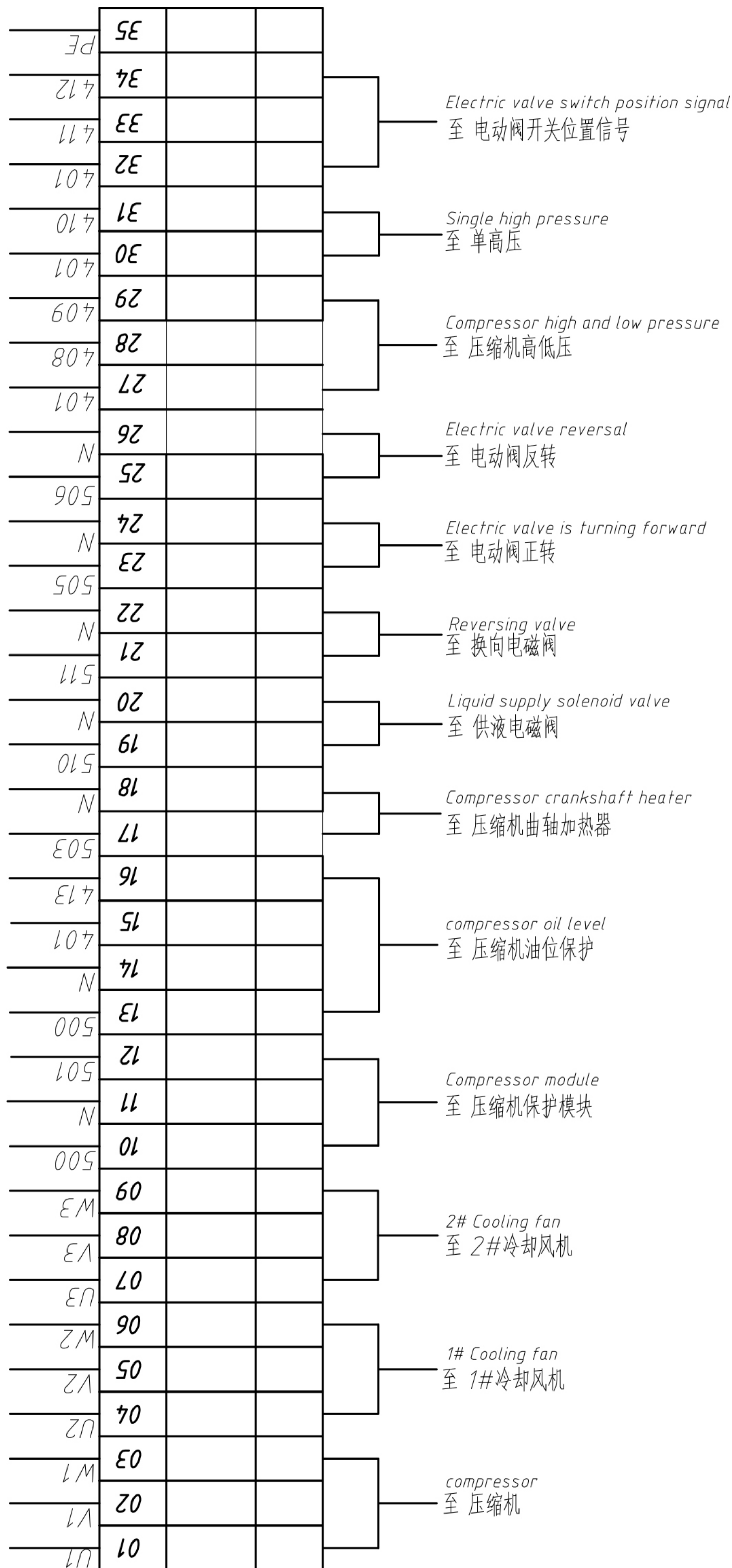
2012-2018, Jiangsu IceMa Refrigeration Equipment Co., L.TD.

Electrical Diagram









Model No. 型号		Product Name 产品名称		Drawing Name 图样名称		Drawing No. 图样代号		Project No. 方案编号		Order No. 订单编号	
BMB20-AAU		2吨直冷式冰机		电气原理图		BMB20-04		-----		-----	
IceMa 冰玛				Drawing Size 图框		Scale 比例		Edition 版次			
				A4		1:1		1st			
Designed By 设计		Checked By 校对		Approved By 批准							
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