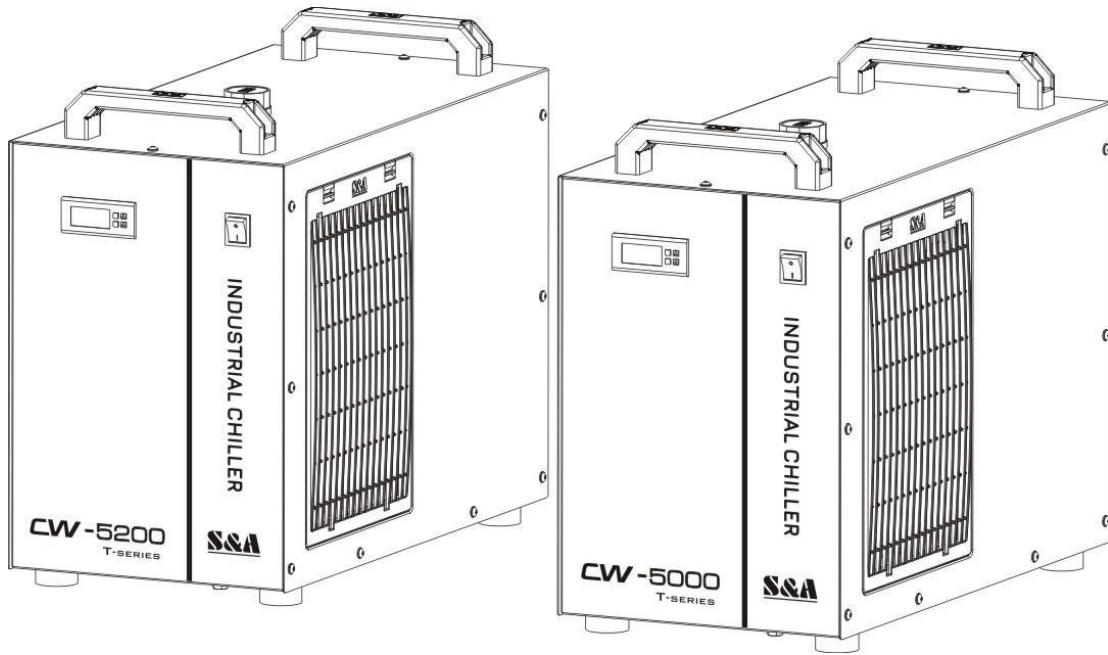


# CW-5000/5200

## Industrial Circulating Chiller

### Installation & Operation Instructions



## **FOREWORD**

Thanks for your purchase of our product. Please read this manual carefully before using and keep it properly so that you can refer to it whenever you need information.










This manual is not a quality guarantee. Our company reserves the right to the interpretation of the correction of misprint and improperly described information and product improvement. The revised content will be edited into the reprinted user manual without prior notice.






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





## Notice

Please strictly adhere to the usage guidelines and requirements provided, as accidents caused by improper operation (or use not in accordance with instructions) will be the responsibility of the user, and our company will not be held liable.

Notice		Operation Guideline
 Must-do	The operation should be carried out by professional technicians	Handling, piping installation, electrical, operation, maintenance, overhaul and other operations must be completed by personnel with professional skills.
 Forbidden	It is forbidden to be used beyond the range of specification	It is forbidden to use the equipment beyond the range of manual specifications.
 Forbidden	It is forbidden to be used in the explosive environment	It is not permitted to install the chiller in dangerous places with inflammable gas.
 Must-do	Electrical connection	a) The power supply must conform to the standard indicated in the nameplate or the manual; b) Use the standard cable, and select the standard wire diameter; c) The grounding wire must be installed and the connection must be reliable;
	It is forbidden to operate the equipment without a cover	There are live parts inside the machine. It is forbidden to operate without a cover.
	Water-proof	Do not allow the equipment to encounter water.
 Must-do	Maintenance and repair	The operation must be carried out after 3 minutes of cutting off the power supply, because the high-voltage charging part in the equipment is not discharged within 3 minutes. Prohibit touch the live parts.
	Danger High Voltage	Contact with live parts can cause serious personal injury or death.
	Scald Burn Risk	Stay away from high-temperature areas.

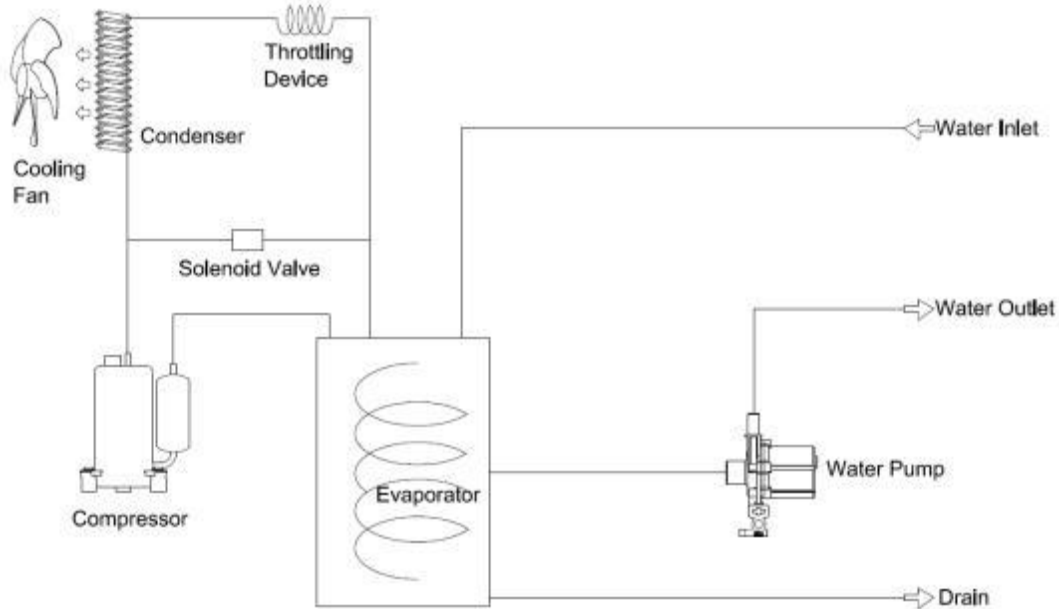
Notice		Operation Guideline
 Must-do	Transport and installation	The equipment must be firmly fixed during transport and installation. Otherwise, there will be a danger of tipping or falling.
 Must-do	Electrical protection	The power cable terminal must be equipped with the electric leakage and overload protection device according to the rated current indicated on the equipment nameplate.
 Must-do	Stop running in abnormal state	When the equipment is abnormal, if the reason for the abnormal is unknown, do not start the machine at this time.
 Forbidden	Do not put fingers or other things into the gap of the equipment	There are rotating parts inside the device. Do not put fingers or other things into the gap of the equipment.
 Must-do	Refrigerant leakage	a) When the refrigerant leaks, please make sure that the ventilation is available. b) Avoid contacting with skin.

Notice		Operation Guideline
 Forbidden	Transportation with liquid is prohibited	The equipment is not allowed to be transported with liquid to prevent internal pipeline leakage.
 Must-do	Transport	a) The equipment should be fixed firmly before transportation to prevent the equipment from moving due to vibration and external forces. If there is excessive vibration and external force, the internal equipment may be damaged. b) Tilt angle should be $\leq 45^\circ$ . Otherwise, the refrigeration system will fail.
 Forbidden	Operating environment	a) It is forbidden to use in special environments such as high temperature, humidity, strong electromagnetic interference, etc. b) The equipment must be installed in a place where there is no direct sunlight and away from the fire sources.
 Must-do	Installation	a) The equipment must be installed on a horizontal surface. Otherwise, the refrigeration system will fail; b) It is forbidden to place objects within 1 meter around the air inlet and 1.5 meters around the air outlet. If the air inlet and the air outlet are blocked, the cooling ability that the equipment should have cannot be realized.

 Must-do	Before commissioning	a) Make sure that the water supply pipe of equipment is not blocked; b) It is necessary to check the water pipe and the water pump to confirm that there is a proper amount of water entering the water pump and exhaust it through the water pump exhaust valve, otherwise it will cause damage to the water pump; c) Confirm that the state of the equipment is normal and safe. Otherwise, there may be injury and damage.
 Warning	Gently move the motor impeller if the equipment isn't used for a long time	For equipment that has not been used for a long time, it may be difficult to start the pump at the first start. Please gently move the motor impeller before the equipment is powered on.
 Forbidden	The equipment is forbidden to be trampled on	Please do not step on or sit on the equipment. Otherwise, it may cause injury accidents such as falling or overturning
 Must-do	Clean the air filter regularly	Clean the air filter at least once a week. If it is blocked, the cooling ability will decrease and the power consumption will increase, and the alarm will not work properly.
 Must-do	Equipment surface cleaning	a) Please use cleaning agents that are non-corrosive to metals and plastics; b) Please keep the cleaning agent properly after cleaning to prevent liquid leakage; c) The container for storing the cleaning agent must be sealed completely.
 Forbidden	No air blowing at the water outlet	A temp sensor is installed inside the water outlet, and it is forbidden to blow air inside the device with an air gun.
 Must-do	Wear protective gloves during maintenance, inspection and cleaning	a) The sharp edges of the condenser fins may cut the skin; b) The temperature of the internal compressor and refrigerant piping is very high, and direct skin contact may cause burns.
 Must-do	Anti-freezing	a) When the ambient temperature is lower than 2°C and the machine is shut down for a long time, it is necessary to drain the liquid and blow the water in the system away with compressed air, otherwise there is a danger of freezing and cracking the components and pipelines. b) When room temperature is lower than 2 °C, it is recommended to use antifreeze with a concentration of not more than 30% containing ethylene glycol or propylene glycol.

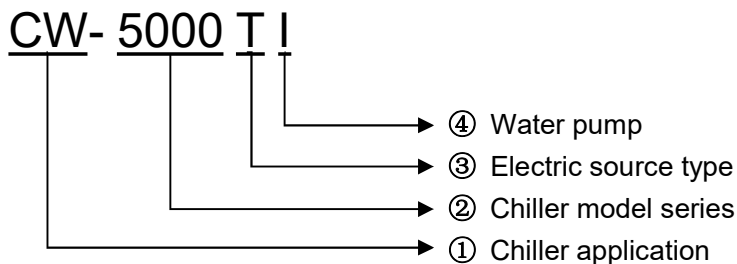
## I. Overview

This product is an industrial cooling device designed and manufactured for laser cutting, laser welding, laser marking, laser engraving and other equipment that uses laser processing. It can provide a temperature-stable cooling medium for the above application scenarios.



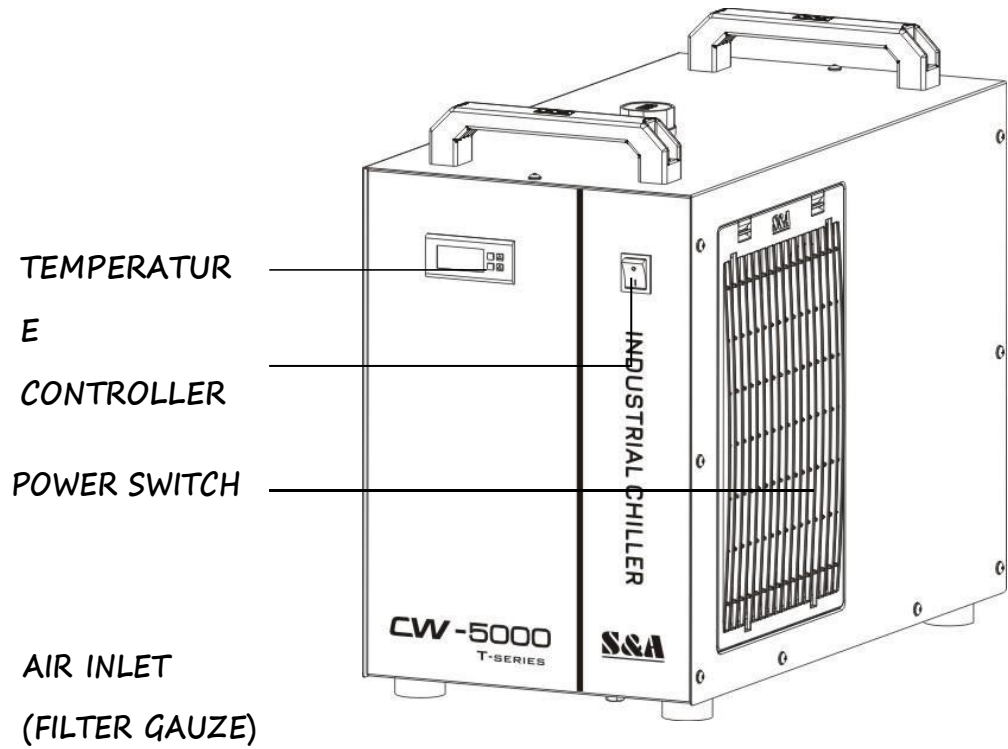
The chiller is composed of a compressor, a condenser, a throttling device (expansion valve or capillary), an evaporator, and a water pump. Its working principle is that the chiller's refrigeration system cools the water, and the water pump delivers the low-temperature cooling water to the equipment that needs to be cooled. Then the cooling water will take away the heat, heat up and return to the chiller, and then be cooled again and transported back to the equipment. In the refrigeration system of a chiller, the refrigerant in the evaporator coil absorbs the heat of the return water and vaporizes into steam. The compressor continuously extracts the generated steam from the evaporator and compresses it. The compressed high-temperature, high-pressure steam is sent to the condenser and later will release heat (heat extracted by the fan) and condense into a high-pressure liquid. After being reduced by the throttling device, it enters the evaporator to be vaporized, absorbs the heat of the water, and the whole process circulates constantly. Users can set or observe the working status of the water temperature through the temperature controller.

## II. Model Illustration

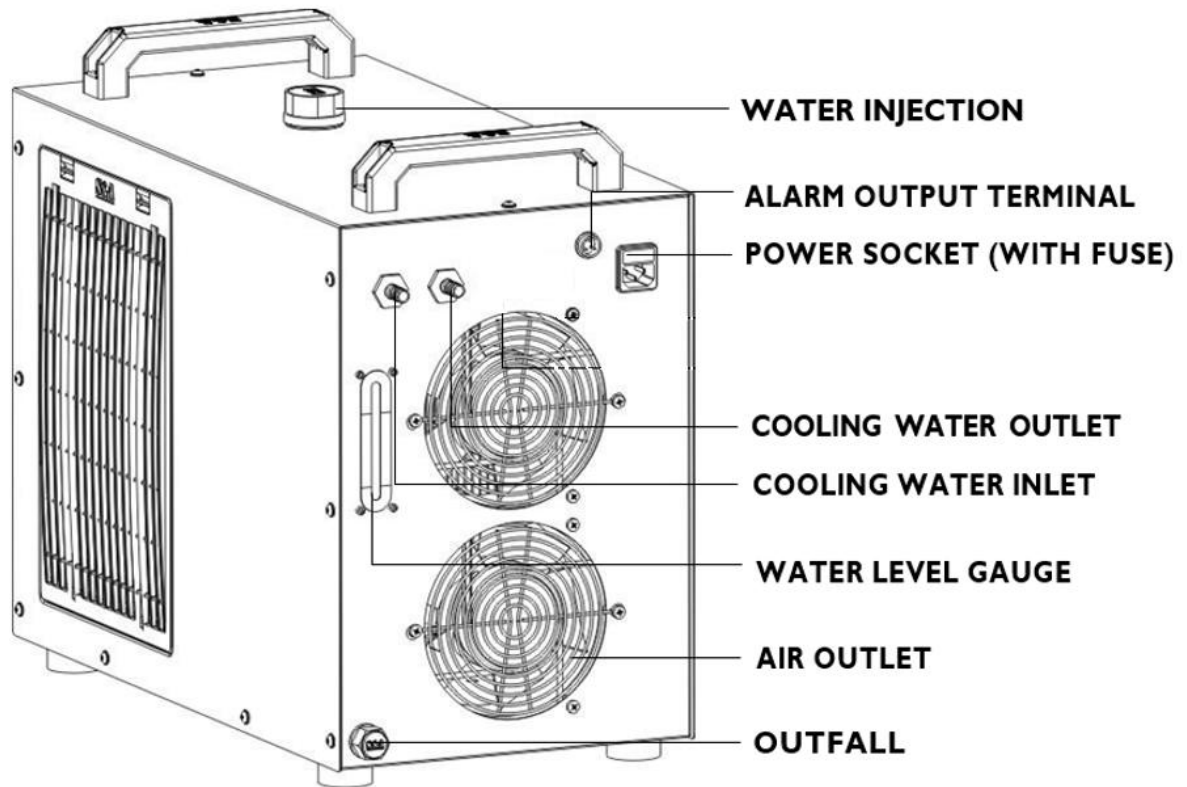


**Note:** This model description only contains the description of the company's main product codes, not all of them are listed. Please confirm with our company before ordering the specific model, our company has the final interpretation right about it.

### III. Product Outlines & Parts







**Note:** The above-mentioned product outlines and part names are only for one of the models, and they will be slightly different in different models.

## IV. Installation

**1. Open the package and check whether the machine is in good condition and whether the accessories are complete.**

**2. Please ensure that the working voltage of the chiller is stable and normal.**

Because the refrigeration compressor is sensitive to the power supply voltage, the normal working voltage of our company's standard products is 210~240V (110V model is 100~120V). If wider operating voltage range is necessary, customization is available.

### 3. Equipment installation conditions and requirements

(1) It must be installed on a horizontal surface and not tilted.

(2) The air outlet of the chiller should be at least 1.5m away from the obstacle, and the air inlet must be at least 1m away from the obstacle (See below diagram).

(3) Do not install in harsh environments such as corrosive, flammable gas, dust, oil mist, conductive dust, high temperature and humidity, strong magnetic field, direct sunlight, etc.

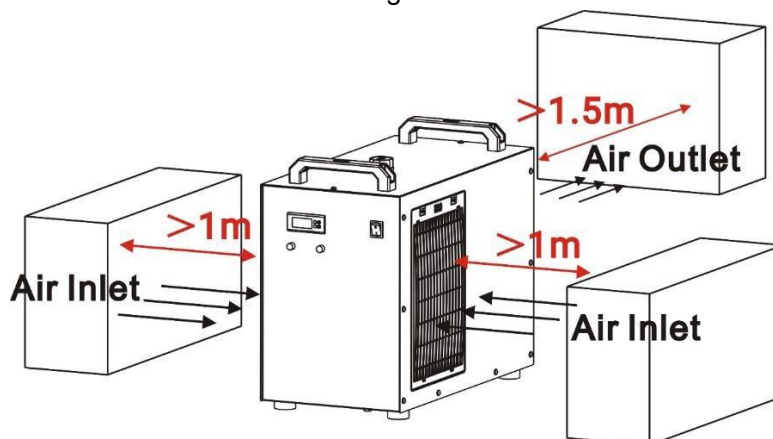
(4) Operating Environment

Ambient Temperature	Ambient Humidity	Altitude
0~40℃	≤90%RH	≤3,000m

(5) Medium Requirements

Cooling medium allowed by the chiller includes purified water, distilled water, high-purity water and other softened water. It is forbidden to use oily liquids, liquids containing solid particles, corrosive liquids, etc. Clean the filter element and replace the cooling water regularly (about three months is recommended) to ensure the normal operation of the chiller.

When the chiller is stored with water at room temperature lower than 2℃, it is necessary to add anti-freezer in the chiller water tank. It is recommended to use antifreeze with a concentration of not more than 30% containing ethylene glycol or propylene glycol. After the temperature warms up, change to purified water, distilled water or other suggested cooling media, let the chiller run for 30 minutes to remove the residual anti-freezer and drain it, and then refill with unused circulating water.



**4. Determine the direction of the pipeline layout according to the water inlet and outlet of the chiller, and ensure that the waterway is clean and free of impurities, so as to prevent impurities from entering the waterway and causing blockage or pump failure.**

**5. Plug in the power cord and turn on the power switch (It is forbidden to start without water).**

(1) After turning on the power switch, the circulating pump of the chiller starts to work. When the new machine is turned on for the first time, there will be more air bubbles in the pipeline, which will cause the machine to alarm occasionally, and it will return to normal after a few minutes of operation.

(2) After starting the machine for the first time, check if the water pipes leak immediately.

(3) After turning on the power, if the water temperature is lower than the set temperature, it is normal that the cooling fan and other devices of the machine do not work. The temperature controller will automatically control the working status of compressors, solenoid valves, cooling fans and other components according to the set parameters.

(4) It takes a certain time to start over the compressor and other components. The start-up time may range from seconds to minutes according to different conditions. Therefore, please do not turn off and turn on the power too frequently.

## 6. Electrical connection

(1) Please select the cable based on the max. rated current indicated on the label of the chiller.

(2) Recommended reference standard for power cord diameter selection.

Rated current/ A	≤5	≤10	≤15	≤25	≤35	≤50
Wire diameter (copper wire)/ mm <sup>2</sup>	1.0	1.5	2.5	4.0	6.0	10.0

**Note: This data is provided according to IEC 60204-1 standard and only for reference. Standard cables must be used in the power cord.**

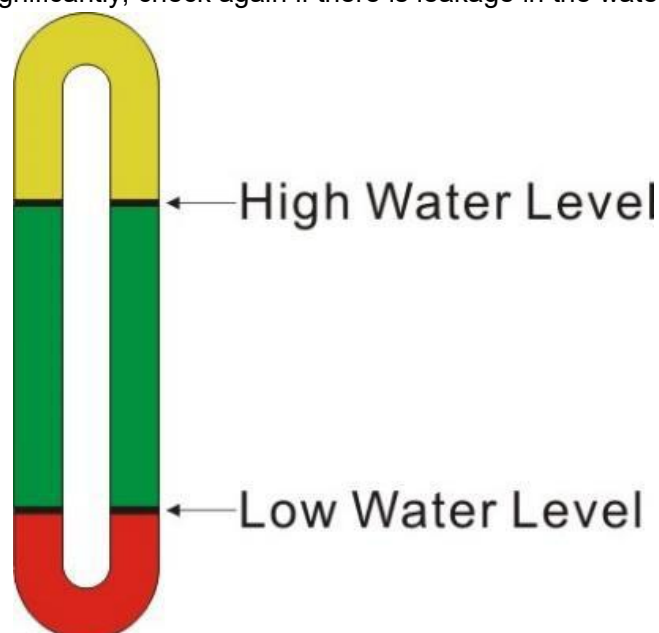
(3) The main circuit of the power supply must be equipped with appropriate electric leakage and overload protection devices, and the chiller must be well grounded.

(4) Less than ±10% of power supply voltage fluctuation and less than ±1Hz of frequency fluctuation are allowed, and keep away from electromagnetic interference sources.

## 7. Fill Water & Exhaust Air

(1) Fill Water

After the new machine is turned on, the air in the water pipe is emptied, and the water level of the water tank will drop slightly. In order to keep the water level in the green area, you can add water again. Observe and write down the current water level. After the chiller has been running for a period of time, observe the water level gauge again. If the water level drops significantly, check again if there is leakage in the water pipes.



## (2) Exhaust Air

After adding water for the first time or replacing water, exhaust the air in the water pump to start use, otherwise the equipment will be damaged. The exhaust method is as follows:

Method 1: Under the state of shutting down, after adding water, remove the water outlet and connect the water pipe, drain for 2 minutes, and then install it firmly.

Method 2: Open the water supply inlet, after starting the machine (water flows), repeatedly press and fold the water pipe several times to drain the air from the pipe.

## 8. Test-run Check

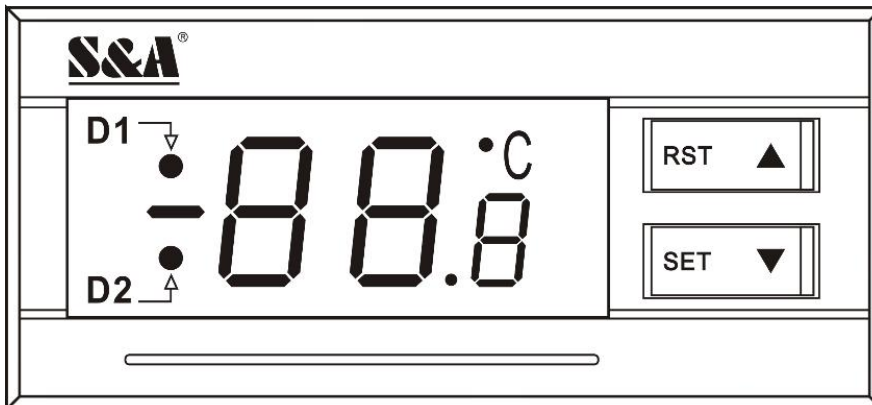
- (1) Check whether the water pipe connection is correct, and there must be no bubbling or water leakage;
- (2) Check whether the valve of water outlet is closed.
- (3) Check the liquid level of the water tank;
- (4) Confirm that the electrical wiring of the equipment is connected correctly;
- (5) Confirm whether the equipment is grounded.

## V. Operating States & Parameter Adjustment

The new T-503D intelligent temperature controller is designed with intelligent control mode. It will self-adjust controlling parameters according to room temperature for meeting equipment cooling requirements.

The new T-504D intelligent temperature controller is designed with constant temperature control mode with water temperature maintained at 25°C. Users can adjust it as needed. T-503D and T-504D controllers are of same functions and structure except factory setting.

### 1. Temperature control panel introduction



- (1) Indicators D1, D2 (as shown) of thermostat working state
  - D1 ON: thermostat works in the intelligent control mode;
  - D1 OFF: thermostat works in the temperature control mode;
  - D1 FLASHES: thermostat works in the parameters setting mode or displays value of room temperature;
  - D2 ON: chiller works in the refrigerating state;
  - D2 OFF: chiller works in the insulation working state;
  - D2 FLASHES: chiller works in the energy-saving state;
- (2) Press ▼ button: the room temperature will be shown. Press this button for 6 seconds, the restored defaults will be shown. Meanwhile, D1 is flashing, displaying the room temperature.
- (3) ▲ ▼ keys are for adjusting the display status of the controller, parameters selection and adjustment.
- (4) RST key: enter key.
- (5) SET key: function setting key.

### 2. Restore to factory settings

Before starting the machine, press and keep holding ▲ ▼ button then turn on the chiller, and don't release the buttons until the controller displays rE. The controller works in

normal state in 6s and is restored to factory settings.

### 3. Press ▼ key to show t1

Press ▼ key again to show room temperature (Meanwhile D1 is flashing, displaying room temperature);

Press ▼ key again to show t2 and press ▼ key again to show flow rate 1.(Unit: L/min);

Press ▼ key again to show t3 and press ▼ key again to show flow rate 2.(Unit: L/min);

Press ▼ key again to exit display or to restore water temperature display in 6 seconds if no key is pressed.

### 4. Alarm function

(1) Alarm Display:

When alarm occurs, the error code and the water temperature will be alternately displayed.

E1	E2	E3	E4	E5	E6	E7
Ultra-high room temperature	Ultra-high water temperature	Ultra-low water temperature	Room temperature sensor failure	Water temperature sensor failure	Flow rate 1 alarm	Flow rate 2 alarm

(2) To suspend the alarm:

In alarming state, the alarm sound could be suspended by pressing any button, but the alarm display remains until the alarm condition is eliminated.

### 5. General settings adjustment

Press SET button (SET) to enter the user-defined state. Meanwhile, D1 flashes and indicates that the controller is in parameter setup status.

(1) Under the intelligent mode, the control panel displays the temperature difference between the temperature of water and room (Factory setting is -2).

(2) At this moment, press ▲▼ key to change settings. After modifying the value, press the ENTER button (RST) to save and exit, then the new parameters take effect, or press SET key (SET) to exit without saving the parameters. If there is no more action within 20 seconds, the chiller will automatically exit the modifying status without saving the new parameters.

### 6. Advanced parameters adjustment examples

Order	Code	Items	Value in Case 1	Value in Case 2
1	F0	Temperature setting		25
2	F1	Temperature Difference Values	-3	
3	F2	Refrigeration return difference	0.5	2.0
4	F3	Way of control	1	0
5	F4	Alarm for over high water temperature	15	5
6	F5	Alarm for over low water temperature	15	10
7	F6	Alarm for over high room temperature	45	45

8	F7	Password	8	8
9	F8	The allowed highest water temperature	31	30
10	F9	The allowed lowest water temperature	25	5
11	F10	Sensor pulse frequency alarm	8	8

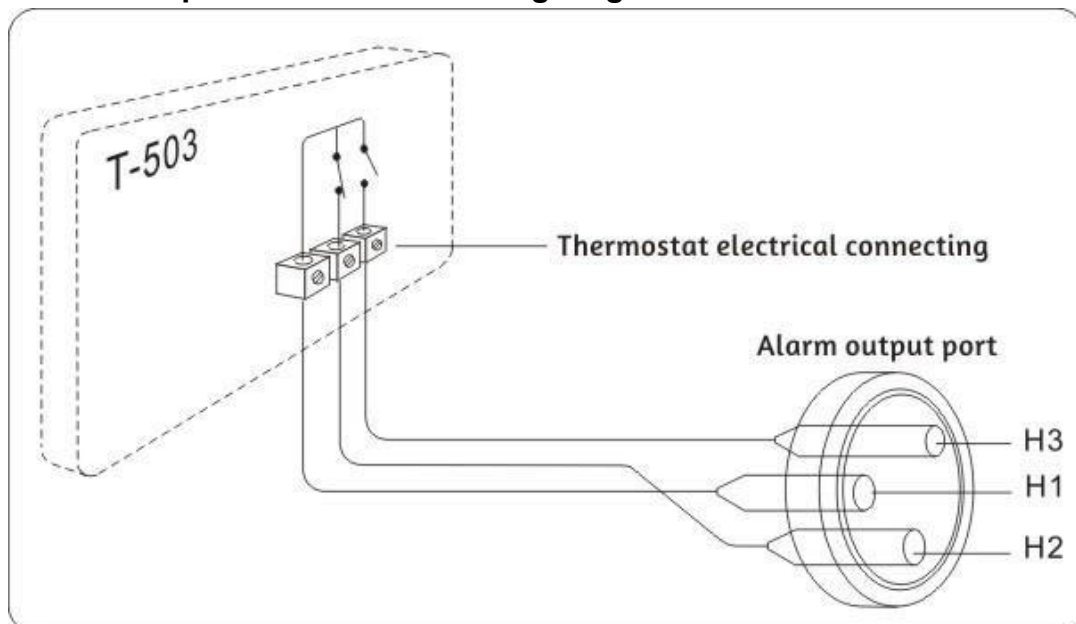
Case 1: The cooling water temperature is controlled by the intelligent mode. The required water temperature is from 25°C to 31°C and the set water temperature is 3°C lower than the room temperature. Under the condition of constant room temperature, the fluctuation should not exceed  $\pm 0.5^\circ\text{C}$ . (e.g., There will be an alarm when the water temperature is 15°C lower or higher than the target temperature. If the room temperature is 30.0°C, cooling water temperature is between 27.5 °C to 26.5°C, if the air temperature is up to 30.5°C, water temperature will be between 28.0°C to 27.0°C).

Case 2: The cooling water temperature is controlled by the constant mode. It is required that the water temperature is kept constant at 25°C, and the fluctuation should not exceed  $\pm 2^\circ\text{C}$ . There will be an ultra-high water temperature alarm when the water temperature is 5°C higher than the target temperature; and there will be an ultra-low temperature alarm when the water temperature is 10°C lower than the target temperature. The water temperature setting can be easily adjusted from 5°C to 30 °Cs by user setting.

## VI. Alarm & Output Terminal

In order to guarantee that the equipment will not be affected if abnormal situation happens to the chillers, the chillers has been designed with an alarm protection function.

### 1. Alarm output terminals and wiring diagram



## 2. Alarm causes and working status table

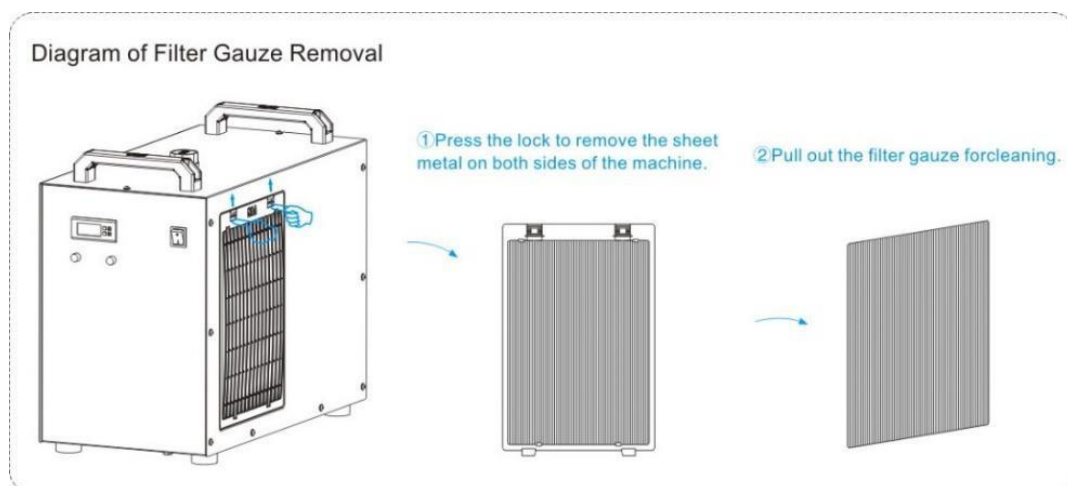
Condition	Display	Alarm code	Buzzer	H1 and H2	H1 and H3
Circulating pump works properly				open circuit	connected
Ultra-high room temp		E1	sounds	connected	open circuit
Ultra-high water temp		E2	sounds	connected	open circuit
Ultra-low water temp		E3	sounds	connected	open circuit
Room temp sensor failure		E4	sounds	connected	open circuit
Water temp sensor failure		E5	sounds	connected	open circuit
Flow rate 1 alarm		E6	sounds	connected	open circuit
Flow rate 2 alarm		E7	sounds	connected	open circuit
Chiller power supply interruption				connected	open circuit

**Note:** the alarm output port is connected with a set of normally open or normally closed contacts of the relay inside the machine. The working current is required to be less than 3A while the working voltage is less than 300V.

## VII. Maintenance

For equipment maintenance, firstly the machine must be stopped and the power must be cut off. Wait 3 minutes before starting the maintenance process, otherwise there will be a risk of electric shock. When the ambient temperature is lower than 2°C, the internal water must be drained when the machine is shut down for a long time.

Disassemble the dust filter regularly for cleaning and use a compressed air gun to blow off the dust accumulated in the condenser. (It is recommended to clean it once a week, and the chiller should not work without the dust filter, except for a very quick cleaning process.)





## VIII. Simple Troubleshooting

Failure	Failure Cause	Approach
<b>Machine turned on but unelectrified</b>	Power cord is not plugged in place.	Check and ensure the power interface and the power plug is plugged in place and in good contact.
	Fuse blown	Pull out the fuse box from the power supply interface of the chiller, check the fuse, replace with spare fuse if necessary, and check whether the power supply voltage is stable. Check and ensure the power interface and the power plug is plugged in place and in good contact.
<b>Flow Alarm, connecting the water outlet and inlet with a water pipe directly, but still no water flow</b>	Water level in the storage water tank is too low	Check the water level gauge display, add water until the level shown in the green area; And check whether the water circulation pipe leaks.
<b>When connecting the chiller with the machine to be cooled, flow alarm is triggered; but when connecting the water outlet and inlet with a water pipe directly, water flows and the flow alarm is not triggered.</b>	Water circulation pipes are blocked or a pipe is bent or deformed	Check the water circulation pipe.
<b>Ultra-high temperature alarm</b>	Blocked dust gauze, bad thermolysis	Disassemble and clean the dust gauze regularly.
	Poor ventilation for air outlet and inlet	Ensure a smooth ventilation for air outlet and inlet.
	Voltage is extremely low or unstable	Improve the power supply circuit or use a voltage regulator.
	Improper parameter settings on thermostat	Reset the controlling parameters or restore the factory setting.
	Switch the power on and off frequently	Ensure the time for the refrigeration process after starting the chiller (at least 5 minutes).
	Excessive heat load	Reduce the heat load or use other model with larger cooling capacity.
<b>Alarm for ultra-high room temperature</b>	The working ambient temperature is too high for the chiller	Improve ventilation and ensure that the machine is operated below 40°C.
<b>Serious problem of condensate water</b>	Water temperature is much lower than ambient temperature and the ambient humidity is high	Increase water temperature or insulate pipes.
<b>Water drains slowly from outfall during water changing</b>	Water supply inlet is not open	Open the water supply inlet



Brand: 特域机电 S&A

Product Name: Water Chiller

Manufacturer's Company Name: Guangzhou TEYU Electromechanical Co., Ltd

Manufacturer's Address: No. 50, Zhongchuang Road, Shengshi Industrial Zone, Zhongcun Town, Panyu District, Guangzhou

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