CD-SLZX-SL

Water cooled container & dry cooler (HK3)

Integrated water curtain

Installation Instructions

Version 1.0

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www.cadrolift.com

Contents

1. About the product specification 1
1.1 Scope of application 1
1.2 Intended Audience 1
1.3 Use of instructions 1
1.4 Use of symbols 1
1.5 General safety precautions 2
1.6 All safety precautions 2
1.7 Electrical safety 3
2. water curtain installation steps 4
3. Parameters and wiring mode of submersible pump 9
3.1 Parameters 9
3.2 Wiring mode 9
4. Composition and working principle of CD-BKZ01 water curtain control cabinet 10
4.1 Product Introduction 10
4.2 Product composition 10
4.3 Working principle and main component functions 12
4.4 Main technical parameters 13
5. Use and operation of CD-BKZ01 water curtain control cabinet 14
5.1 Precautions for use 14
5.2 Pre-use inspection 14
5.3 Operation Guide 14
6. Common faults and troubleshooting methods 19
7. Maintenance and service 19
7.1 Overview 19
7.2 Preventive maintenance 19

1. About the product manual

The manual mainly introduces CD-SLZX-SL-2824, CD-SLZX-SL-2321 water curtain, CD-BKZ01 water curtain control cabinet installation, working principle, troubleshooting and maintenance of the method.

The main components of the water curtain products: water curtain, submersible pump, float valve, coupling, plug and the matching control cabinet.

water curtain products are available in two specifications:

① CD-SLZX-SL-2824 (size 2824*2213*150)

② CD-SLZX-SL-2321 (size 2321*2213*150)

A set of 1 drag 2 requires 8 water curtains, ① and ② each require 4.

The product uses an integrated structure, compared with the traditional water curtain, the installation and use as well as later maintenance are more convenient. In addition, we also equipped with a new control system for the water curtain, not only can be manually controlled but also can realize automatic control.

This product is suitable for water-cooled container & dry cooler (HK3).

1.1 Scope of application

This manual is applicable to the following models: CD-SLZX-SL-2824, CD-SLZX-SL-2321 water curtain, CD-BKZ01 water curtain control cabinet.

1.2 Intended Audience

This manual is intended for specialized technicians who are required to install, operate and maintain the product. The specialized technician must meet the following requirements:

• Have certain knowledge of electronic, electrical wiring and mechanical engineering, and be familiar with electrical and mechanical schematics.

• Familiar with the composition and working principle of control cabinet and related products.

• Professional training related to the installation and commissioning of electrical products should be received.

• Ability to respond to dangerous or unexpected situations that may occur during installation or trial operation.

• Familiar with relevant standards and specifications of the country/region where the project is located.

1.3 Use of instructions

Please read the manual carefully befor using the product.

Although the content of the manual will be continuously updated and modified, there still may be errors or slight differences from the actual product. In this case, the actual product purchased shall prevail. Users can download or obtain the latest version of the manual through www.CADRO.com or sales channels.

1.4 Use of symbols

In order to ensure the safety of users' person and property when using the product and use the product more efficiently and optimally, the relevant information is provided in the instruction manual and highlighted with the following symbols.

The following list of symbols that may be used in this manual is provided for your better use. Please read it carefully.

Danger

A high potential danger .If not avoided, could result in serious accidents, such as personal injury, equipment damage, etc.

Warning

A moderate potential hazard . If not avoided, could result in serious accidents such as equipment damage.

Caution

A potential danger. if not avoided, may result in abnormal operation of the equipment.

1.5 General safety precautions

Statement: The equipment company shall not be liable in the event of any of the following circumstances.

• Not to be used under the conditions described in this manual.

• Installation and use environment exceeds the relevant international standards.

• Failure to follow the instructions and safety warnings in the product and documentation.

Equipment damage caused by abnormal natural environment.

1.6 All safety precautions

To ensure the safety of personnel and equipment, please follow all safety precautions indicated on the equipment and in the manual when installing, operating and maintaining the equipment.

The "Caution", "Warning" and "Danger" items in the manual do not represent all safety matters to be observed, but are only supplementary to all safety matters.

•Local regulations and codes

Local regulations and codes shall be observed when operating the equipment. The safety precautions in this manual are only supplementary to local safety codes.

•Basic installation requirements

The personnel responsible for installing and maintaining the equipment must be strictly trained to understand various safety precautions and master the correct operation methods before installing, operating and maintaining the equipment.

Only qualified and trained personnel are allowed to install, operate and maintain the equipment.

Replacement and modification of equipment or parts (including software) must be performed by certified or authorized technicians of the equipment manufacturer. Technicians should report faults or errors that may cause safety problems to the person in charge in a timely manner.

•Grounding requirements

The following requirements apply only to equipment that requires grounding:

When installing the equipment, it must be grounded first; when removing the equipment, the grounding wire is removed last.

Do not damage the grounding conductor.

Do not operate the equipment without installing the grounding conductor.

The equipment shall be permanently connected to the protective earth.

• personal security

No one except the operator can approach this equipment.

Before operating the equipment, you should wear insulating shoes and gloves, pay attention to protect your eyes, and remove jewelry and watches and other conductive objects, so as not to be shocked or burned.

The tool handle used needs to be insulated.

•Equipment safety

When installing, operating and maintaining, please keep the key or special tool on the cabinet door properly.

Before operation, the equipment should be reliably fixed to the floor or other stable objects such as walls or mounting frames.

When installing the panel, if screws need to be tightened, they must be operated with tools. When the equipment is installed, please remove the empty packaging material around the equipment.

1.7 Electrical safety

• High voltage

Danger

The high voltage power supply provides power for the device operation. Direct or indirect contact through damp objects (or conductors) with high voltage and alternating current (AC) mains supply may result in fatal danger.

Non-standard and improper high voltage operations may result in fire and electric shocks. Signal cables must be bound separately from strong electricity cables and high-voltage cables.

• High Electrical Leakage

Danger

1. Ground the device before powering it on. Otherwise, personal injury or device damage may be caused by high leakage current.

2. If a "high electrical leakage" tag is attached on the equipment, ground the protective ground terminal on the equipment enclosure before connecting the AC power supply; otherwise, electric shock as a result of electricity leakage may occur.

3. Bind the bare parts of power cables with insulation tapes and properly place them.

• Power Cable

Before installing or removing the power cord, you must first turn off the power switch.

Before connecting the power cable, you must first confirm that the power cable label is correct before connecting.

If the power cable is damaged, it must be replaced by the manufacturer, its business agent or similar qualified personnel to avoid risk.

Danger

Do not install or remove a cable with power on. Transient contact between the core of the cable and the conductor will generate electric arcs or sparks, which may cause a fire or hurt human eyes.

2. water curtain installation steps

Step 1. First, understand where the water curtain is mounted on the box. The water curtain mounting locations are shown in Figures 2-1 and 2-2. The small water curtain is located on the side of the dry cooler manifold.

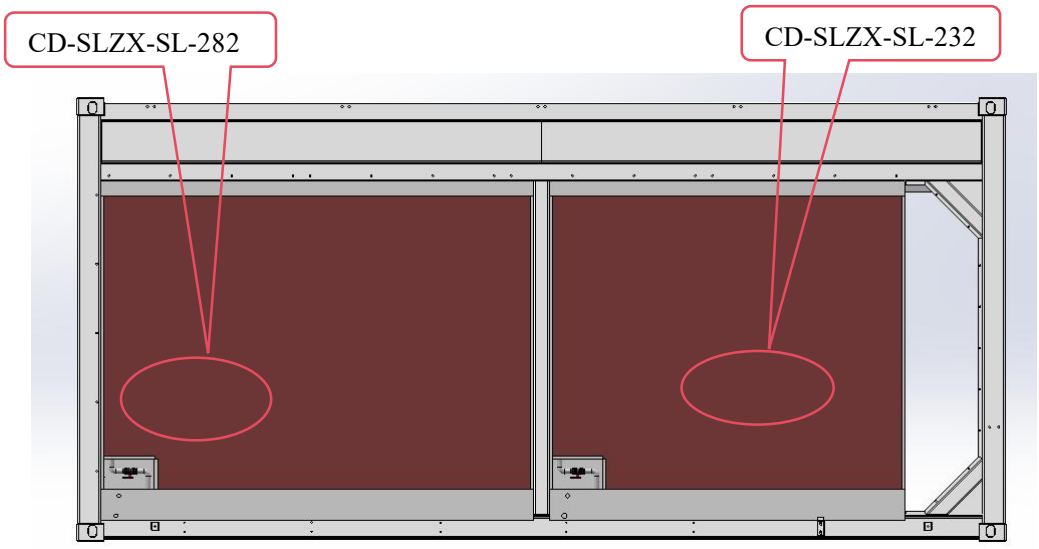


Figure 2-1 Schematic diagram of water curtain installation on one side of the box

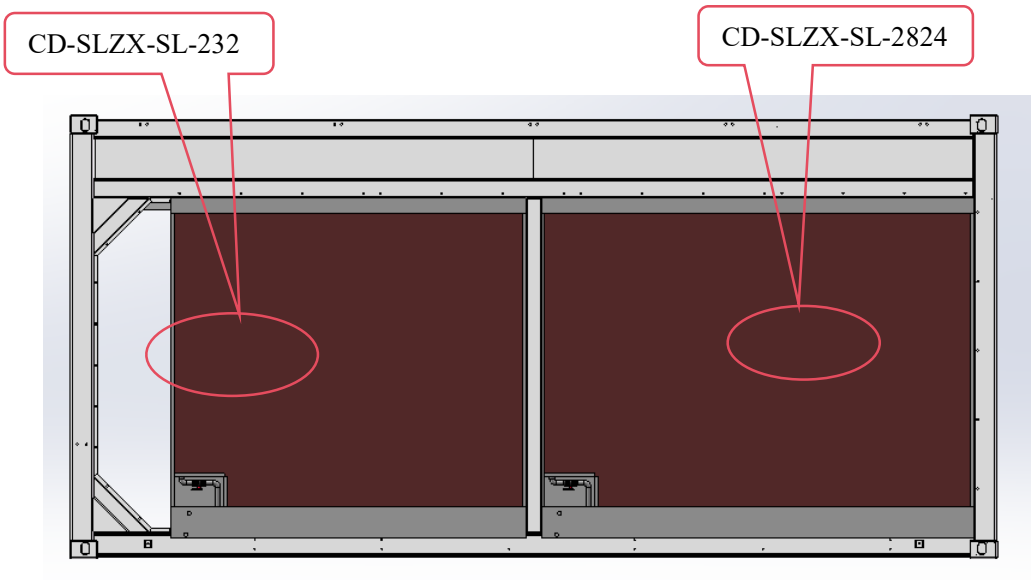


Figure 2-2 Schematic diagram of water curtain installation on the other side of the box

Step 2. Place the water curtain bottom supports on the bottom channel steel of the box, as shown in Figure 2-3. The bottom channel steel comes with M10 tapped holes and is fastened with matching M10 bolts. Each water curtain requires three bottom supports. As shown in Figure 2-4.

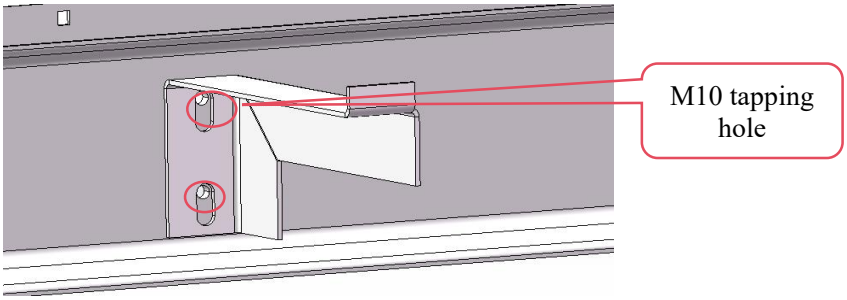


Figure 2-3 Schematic diagram of water curtain bottom supports

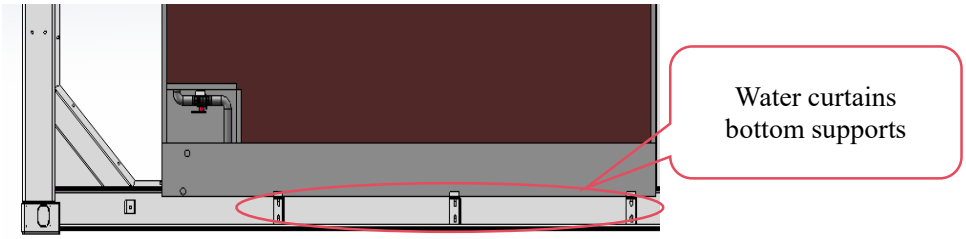


Figure 2-4 Schematic diagram of water curtain placed on the support seat

Step 3. Install the water curtains on the bottom supports,then up fasteners can be placed aligned with the M8 pull rivet nuts pre-embedded on the crossbeam of the box, and secure the fastener to the box using an M8 bolt to hold the water curtain in place, preventing it from tipping over, as shown in Figure 2-5. Each water curtain uses 4 mounting fasteners at the top.

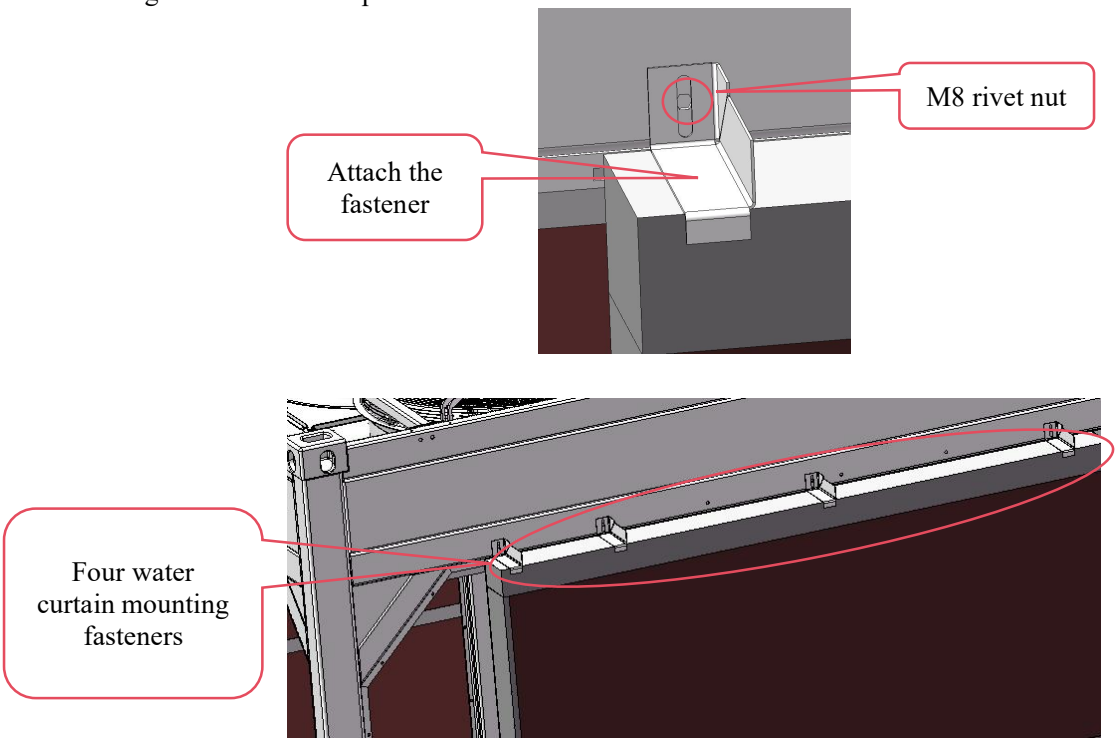


Figure 2-5 Schematic diagram of water curtain fixing

Step 4. After all the water curtains are installed, the float valve and the sewage outlet plug are installed on the water tank of the water curtain, as shown in Figure 2-6.

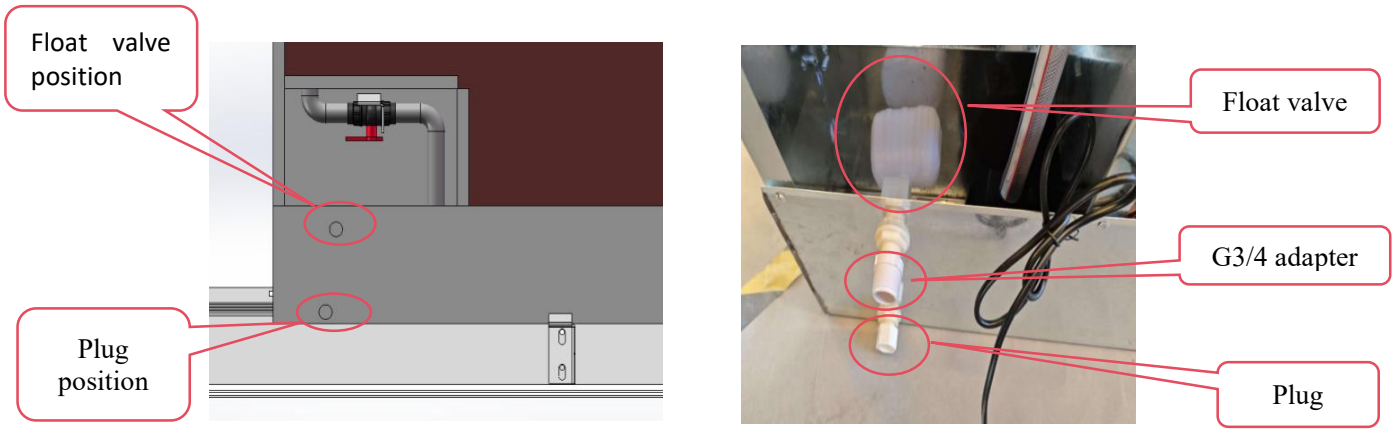


Figure 2-6 Schematic diagram of float valve and sewage outlet plug installation

Note: Adjust the float valve to the appropriate position by turning the knob and then tighten it before installation,

as shown in Figure 1-8. The installation position should be horizontal and the float should be deflected downward**.**

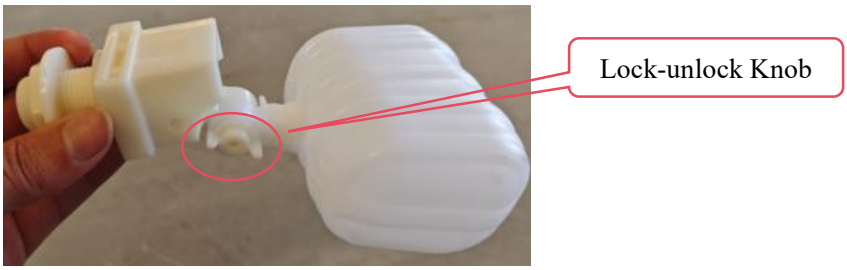


Figure 2-7 Schematic diagram of float valve

Step 5. Remove the submersible pump and the outlet joint, and screw the outlet joint to the outlet of the submersible pump. As shown in Figure 2-8.

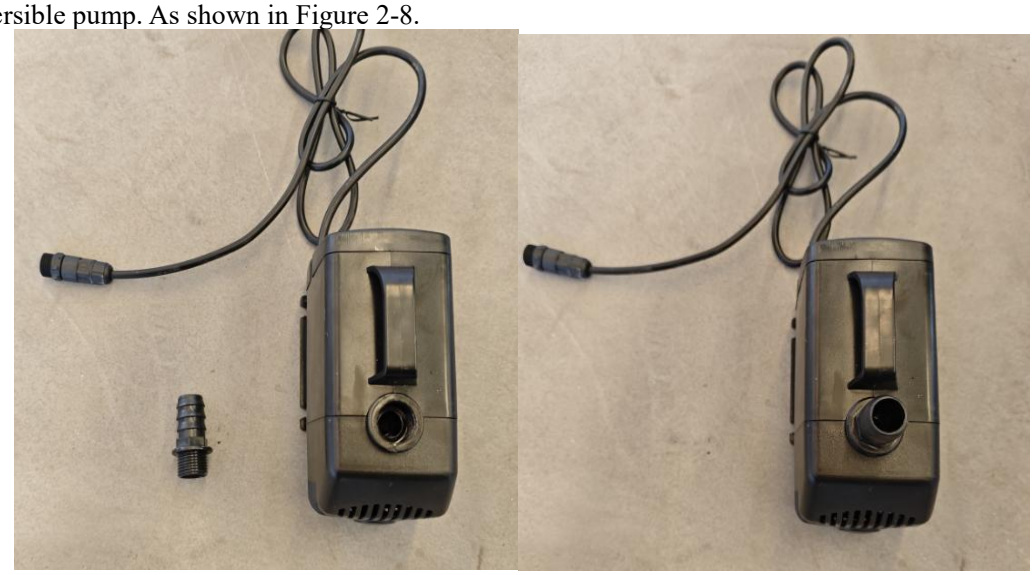


Figure 2-8 Schematic diagram of outlet joint

Step 6. Connect the outlet fitting of the submersible pump to the hose at the end of the water curtain piping and place the submersible pump in a suitable location in the sink when finished. As shown in Figure 2-9 and 2-10.

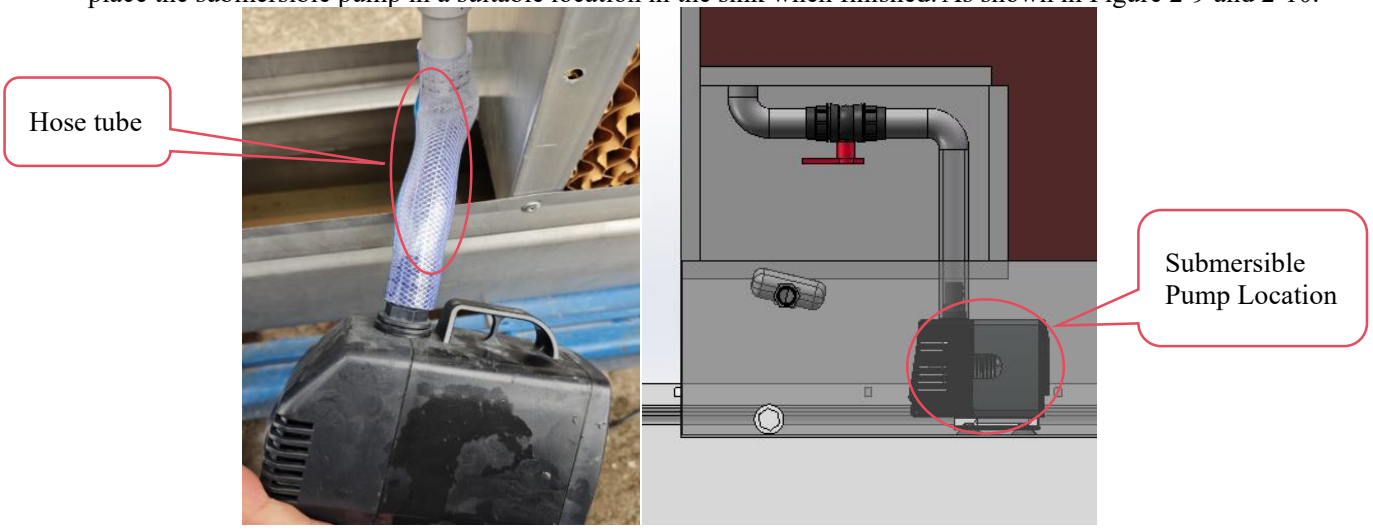


Figure 2-9, Figure 2-10 Schematic diagram of submersible pump installation

Step 7. The installation of the water curtain control cabinet is recommended. The recommended installation position of the control cabinet is shown in Figure 2-11. The best distance between the bottom of the control cabinet and the ground is 1-1.2m.

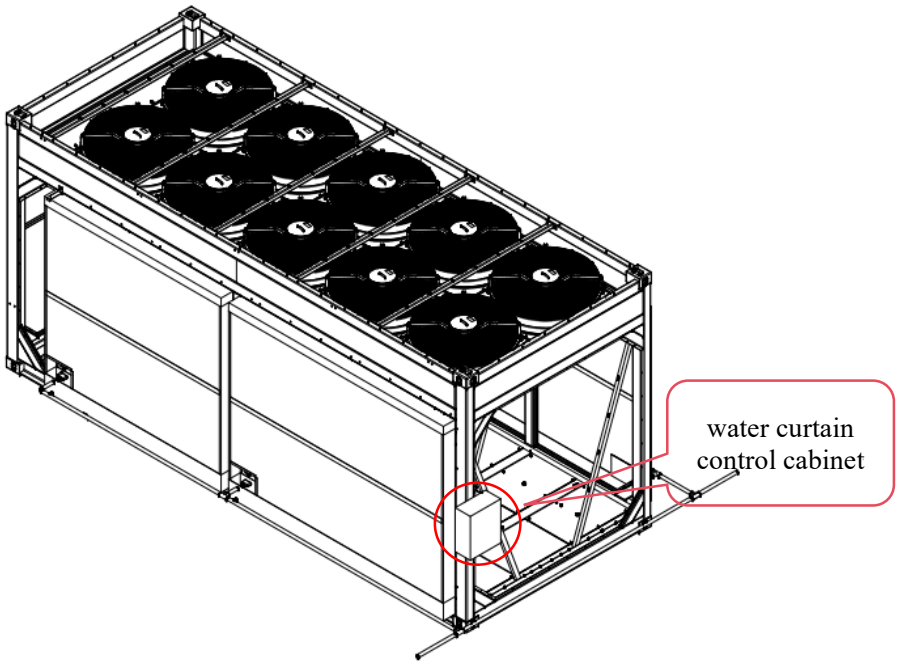


Figure 2-11 Schematic diagram of the installation position of the control cabinet

Step 8. After all the installation is completed, connect the float valve to the external water pipe to achieve the effect of replenishment. The installation method of the external water pipe can be flexibly installed according to the site conditions. The recommended inlet direction and inlet position of the external pipe are shown in Figure 2-12 and 2-13.

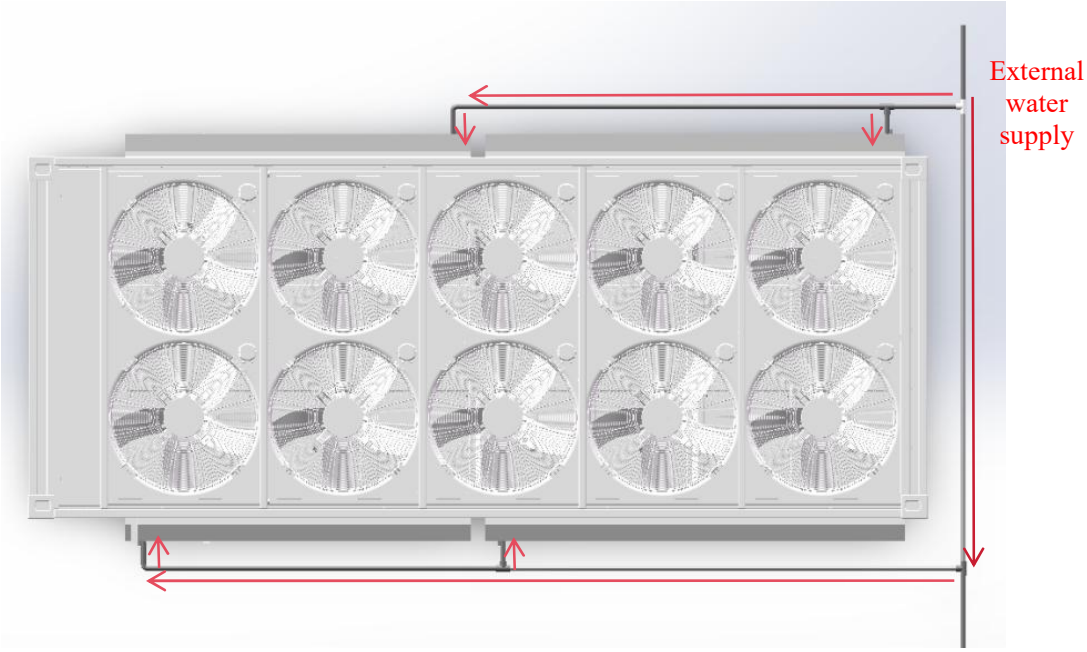


Figure 2-12 Schematic diagram of external water pipe installation

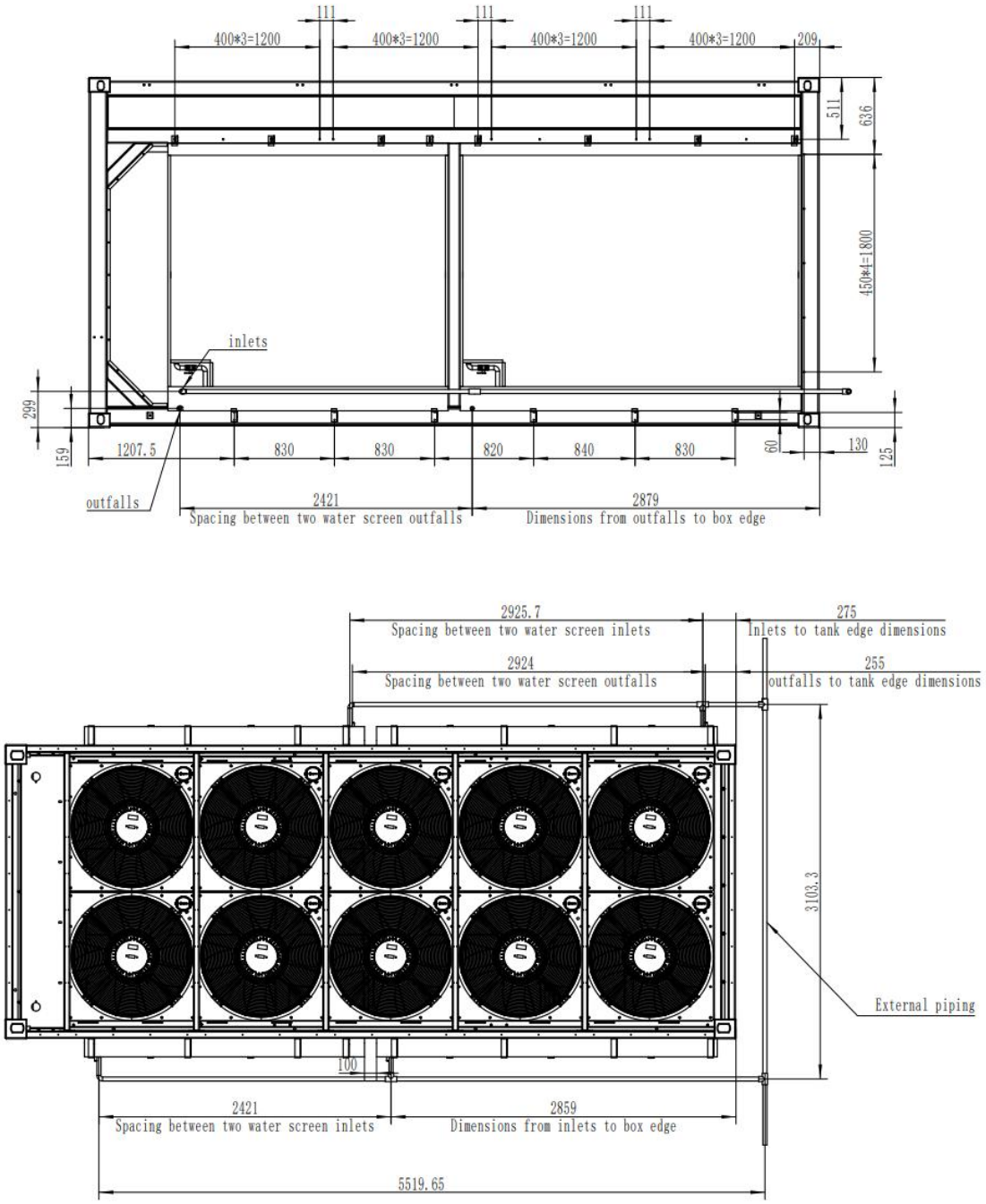


Figure 2-13 Schematic diagram of the inlet position

Note: After connecting the external pipeline, ensure stable water supply for the well and timely replenishment of the water tank.

3. Parameters and wiring mode of submersible pump

3.1 Parameters

The shape of the submersible pump is shown in Figure 3-1.

Voltage: 220V-240V

Frequency: 50/60Hz

Power: 80W

Flow rate: 3500L/H

Maximum head: 3.5m

Outer interface diameter: 20mm/0.79inch



Figure 3-1 Schematic diagram of submersible pump

3.2 Wiring mode

In order to facilitate the installation of users, we are equipped with aviation plugs (as shown in Figure 3-2). When using, you only need to plug the submersible pump into the control cabinet (as shown in Figure 3-3).



Figure 3-2 Schematic diagram of aviation plug



Figure 3-3 Schematic diagram of aviation plug

4. Composition and working principle of CD-BKZ01 water curtain control cabinet

4.1 Product Introduction

The CD-SLZX-SL integrated water curtain is equipped with two sets of CD-BKZ01 water curtain control cabinets, each controlling one dry cooling tower, corresponding to four water curtains and four pumps, as shown in Figure 4-1. The dimensions of the control cabinet are 500mm (H) × 400mm (L) × 200mm (D) (excluding cable protection sleeves and temperature probe covers). The control cabinet can be fixed on the column of the dry cooling tower via its built-in mounting plate. The control cabinet features automatic temperature control and manual/automatic functions. When the ambient temperature exceeds the system-set temperature, the pump starts automatically to begin water extraction. When the ambient temperature falls below the system-set temperature, the pump stops running.

4.2 Product composition

1) See Figure 4-1 for the appearance of CD-BKZ01 water curtain control cabinet, and figure 4-2 for the operation panel and main components.

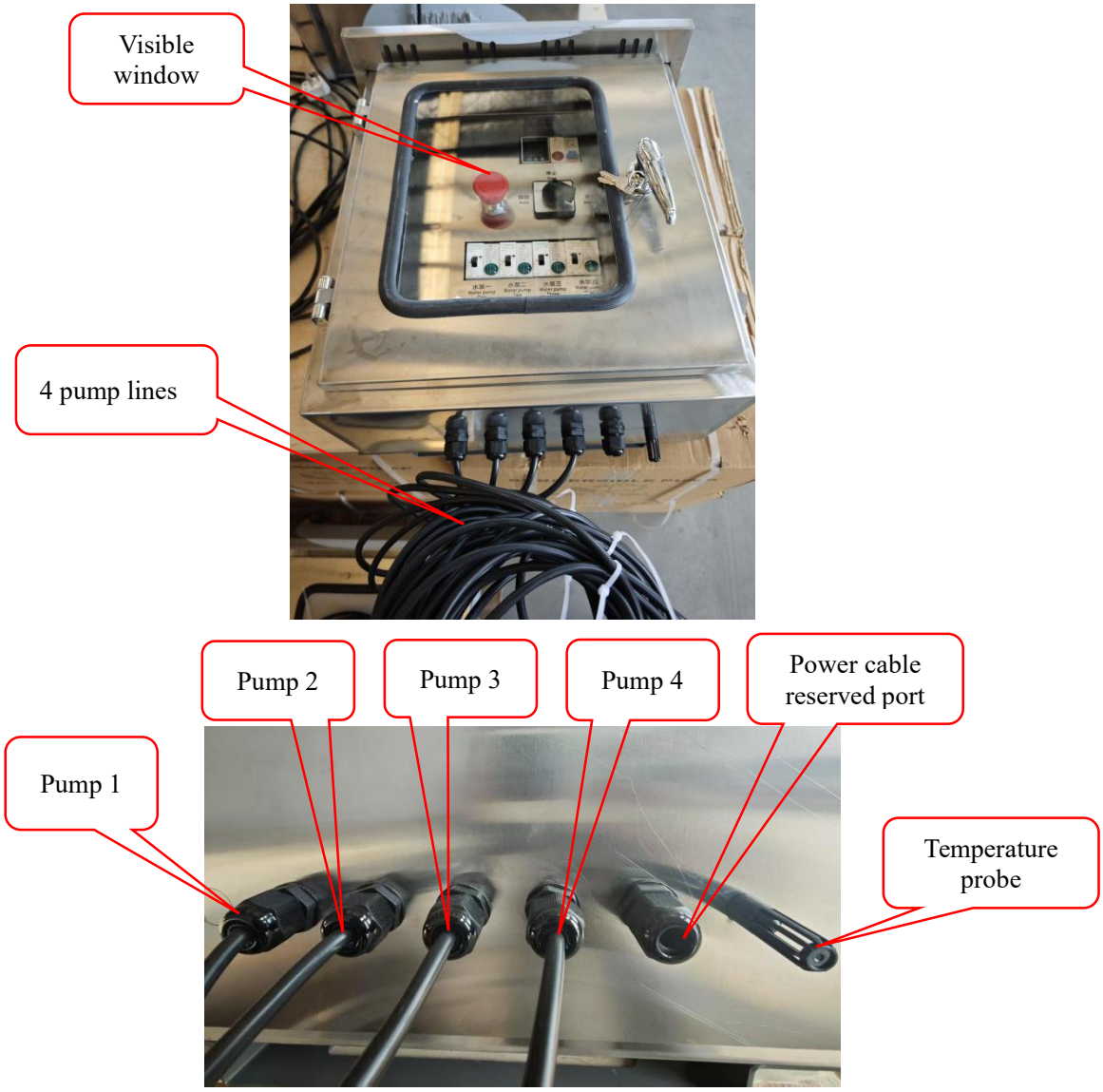


Figure 4-1 water curtain control cabinet appearance

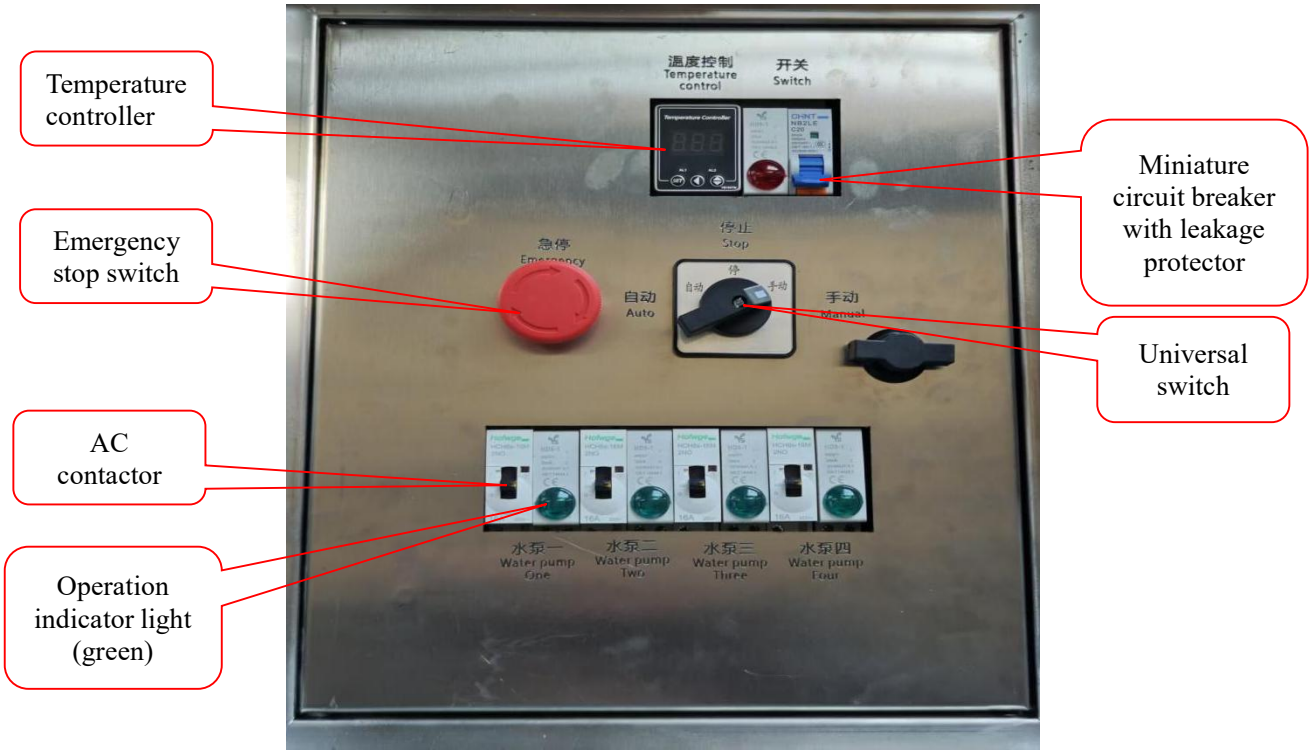


Figure 4-2 Operation panel and main components

2) The composition of CD-BKZ01 water curtain control cabinet is shown in Table 4-1.

Table 4-1 Main components of water curtain control cabinet

system	Major components	Schematic diagram symbol	function	quantity
Power distribution and control systems	Miniature circuit breaker	FA1	Main switch	1
	temperature controller	TC	Automatic mode controls the start and stop of the pump	1
	Universal switch (three levels)	SA	Manual, automatic, stop switching mode	1
	Emergency stop switch	SB1	Cut off the main circuit	1
	Power light	HR1	Main circuit power on indicator	1
	Run the indicator light	HG1-4	Water pump operation instructions	4

	AC contactor	KM1-4	Control the operation of the pump (Controllable pump)	4
	Terminal board	XT1-7	Grounding Neutral wire	7
	Immersible pump	M1-4	Draw water	4
	Aviation plug	XP1-4	Plug the pump wire into it	4

4.3 Working principle and main component functions

This control cabinet has four independent channels, which can control four water pumps at the same time or separately. See Figure 4-3 for electrical schematic diagram.

The external power supply enters the electrical control cabinet and is connected to the emergency stop switch, micro-break and leakage protector, universal switching switch, temperature controller and contactor in turn.

The universal switch has three positions: automatic, manual and stop, corresponding to automatic mode, manual mode and stop.

In automatic mode, the thermostat controls the contactor's on-off state by sensing the ambient temperature. When the detected ambient temperature exceeds the set point, the pump starts automatically; otherwise, it stops running. In manual mode, the start and stop of the pump can be controlled manually. Whether in automatic or manual mode, the corresponding contactor toggle for the pump can be manually operated to cut off power and stop the pump.

At any time, the operation of four pumps can be stopped by pressing the emergency stop switch, disconnecting the microswitch or turning the transfer switch to stop (STOP).

The power indicator light shows whether the distribution cabinet is powered on. If powered on, it will be red. The operation indicator light shows the running status of the corresponding motor. If running, it will be green.

This control cabinet has overload, short circuit and leakage protection.

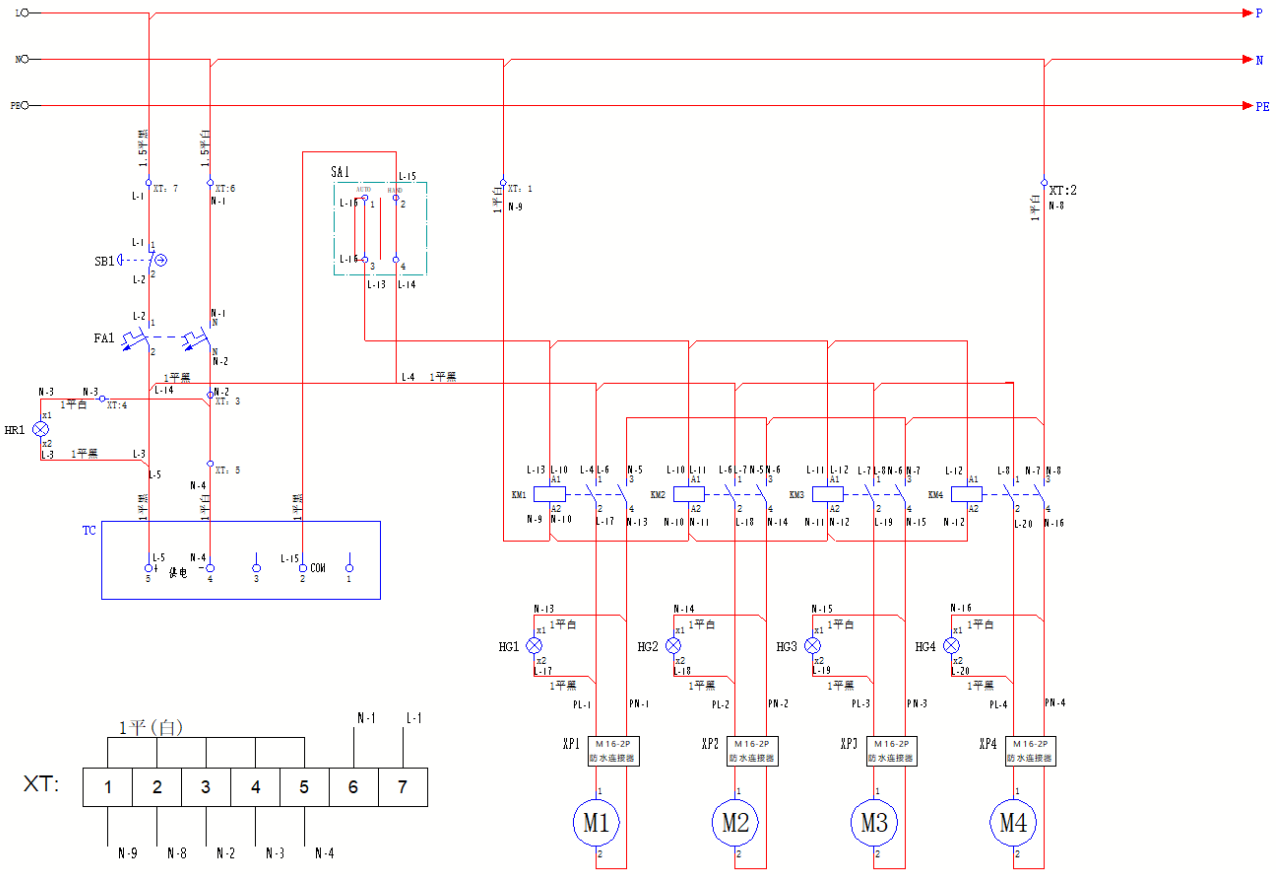


Figure 4-3 Electrical schematic diagram of water curtain control cabinet

4.4 Main technical parameters

Table 4-2 Technical parameters table

project	parameter
import	220-240VAC,50/60Hz
power	300W*4
weight	15KG
product size	500mm（H）×400mm（L）×200mm（D）

5. Use and operation of CD-BKZ01 water curtain control cabinet

5.1 Precautions for use

a) The equipment should avoid intermediate winding;

b) If there is any abnormal situation (burning, etc.) of the equipment, stop the power supply, disconnect the power supply and check;

c) The power supply must be disconnected before maintenance or repair of the equipment;

d) Do not operate with wet hands, otherwise it is easy to cause electric shock accidents. Do not place debris randomly on the top of the water curtain control cabinet.

5.2 Pre-use inspection

a) The overall structure of the water curtain control cabinet is firm and not loose;

b) Check whether the power supply voltage (AC 240V) of the equipment is normal;

c) Check whether the appearance of the control cabinet is normal and whether each part is installed firmly.

5.3 Operation Guide

1) The power supply of the water curtain control cabinet is taken from the backup circuit inside the liquid cooling box control cabinet, and the back end of the 1P circuit breaker for lighting or heater (no less than 16A), while the neutral wire and ground wire are connected to the neutral row and ground row in the liquid cooling box cabinet.

The power supply cable provided comes in three cores: Live wire (L), Neutral wire (N), and Ground wire (PE), as shown in Figure 5-1. The cables are bundled and cut to the required length. The power cables pass through the reserved waterproof conduit into the water curtain control cabinet. The neutral wire connects to XT:7, the live wire to XT:6, and the ground wire to the grounding post of the enclosure, as shown in Figures 5-2, 5-3, and 5-4.

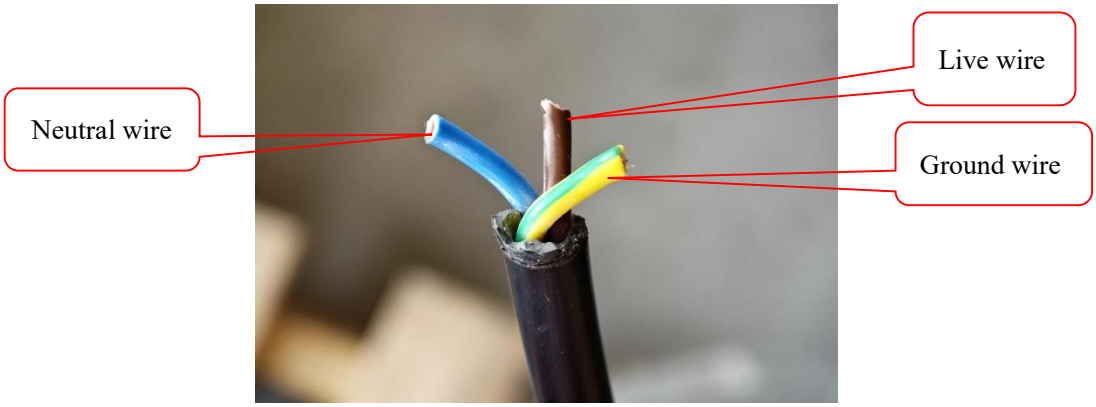


Figure 5-1 Power line indicator

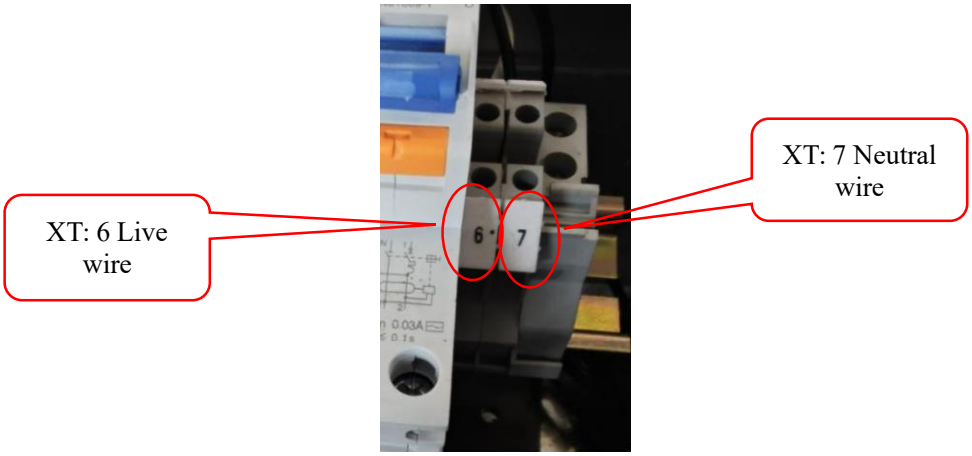


Figure 5-2 Power line wiring diagram

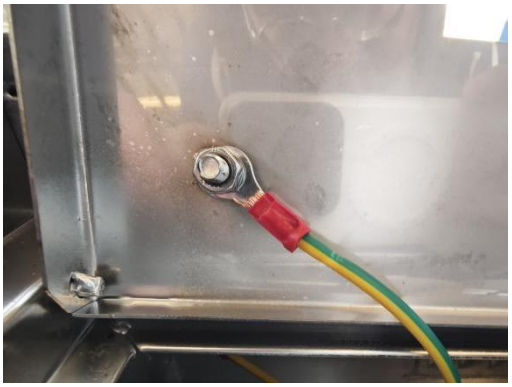


Figure 5-3 Inner door grounding post

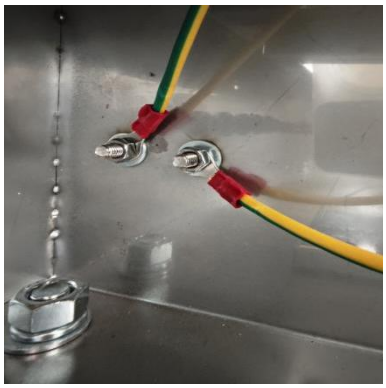


Figure 5-4 Grounding column in cabinet

2) Plug the public head of the pump power cable into the female head of the control cabinet pump power cable, as shown in Figure 5-5.

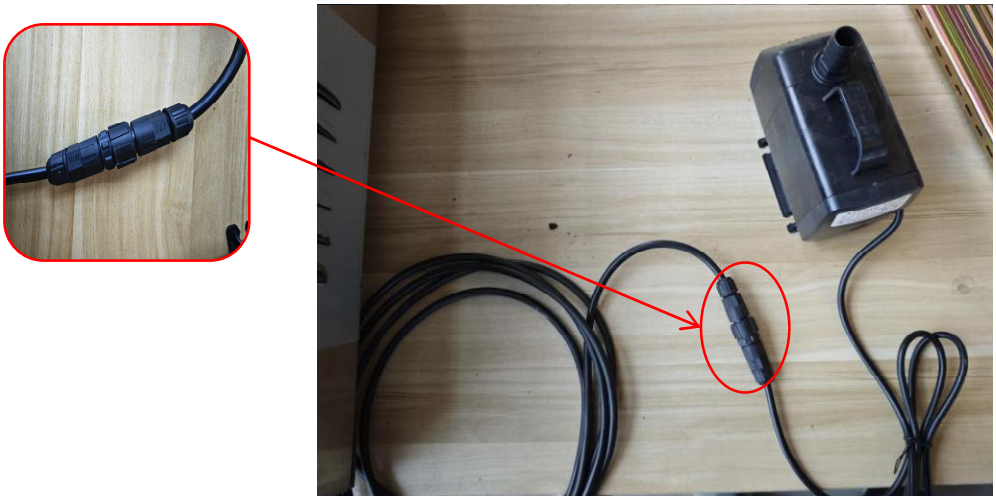


Figure 5-5 Schematic diagram of aviation plug pair

3) Power on the water curtain control cabinet, push the circuit breaker up, and see Figure 5-5 for the power supply status of the equipment, and figure 5-6 for the AC contactor blade.



Figure 5-5 Power state diagram

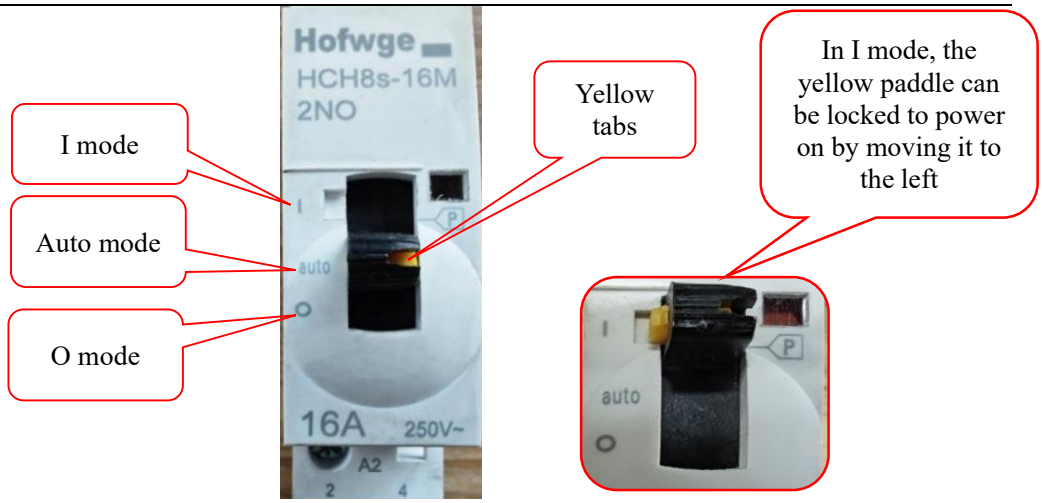


Figure 5-6 AC contactor blade diagram

Gear description:

I: Manual closing is connected. In I mode, the yellow paddle can be locked to power on by moving it to the left

AUTO: Automatic operation mode.

O:Manual forced disconnection.

4）Automatic mode: The initial temperature setting of the temperature controller is 30℃, turn the rotary switch to automatic, move the AC contactor to Auto, when the ambient temperature is higher than the set temperature, the AC contactor is engaged, the green light is on, and the water pump starts running; when the ambient temperature is lower than the set temperature, the AC contactor is disconnected, the green light is not on, and the water pump stops running.



Figure 5-7 Automatic mode operation diagram



Figure 5-8 Automatic mode stop diagram

Instructions for use of temperature controller:



Figure 5-9 Temperature controller panel

Parameter Settings:

a) In normal display mode, long press the SET key to enter the setting mode; each press of the SET key switches a mode. Switch to AL1 mode, press the "shift key" to enter, and the parameter correction bit flashes;

b) Each time you press the "up and down key", the value will be added to the top. If you press the "up and down key" continuously, the value will be added to the top; if you release the key and press the "up and down key" again, the value will be subtracted from the top continuously; if you release the key, each time you press the "up and down key", the value will be subtracted from the top;

(Note, long press can cycle the addition and subtraction direction, or you can move the modified bit through the "shift key" to adjust the value);

c) After the parameters are modified, press the SET key to return to the previous level, and then press the SET key to switch the setting mode until returning to the normal display mode (Note: in the setting mode, 30 seconds without button operation will automatically return to the normal display mode);

5) Manual mode: rotate the switch to manual (the pump is not started at the preset temperature value of the pump), and the status is as shown in the figure below;



Figure 5-10, manual mode diagram

6) The emergency stop switch cuts off the main circuit. The power supply can be cut off by operating the transfer switch to the stop position or operating the miniature circuit breaker(FA1);

7) Operate the switch of one or more AC contactors to "O" to forcibly cut off the power supply of the pump, no matter what mode, the pump cannot run.



Figure 5-11 Forced disconnection state diagram

6. Common faults and troubleshooting methods

Common faults and troubleshooting methods are shown in the table below.

Table 6-1 Common faults and troubleshooting methods

Type	Cause	Solution
Power indicator fault	Indicator light is bad or wiring problem	1. Replace the indicator light 2. Line inspection
The operation indicator light is faulty	Indicator light is bad or wiring problem	1. Replace the indicator light 2. Line inspection
Contactor forced open fault	Contactor fault	Replace the AC contactor
Automatic mode is not responsive	1. The thermostat AL1 cannot be sucked in 2. Universal switch failure 3. Check whether the line is connected correctly	1. Replace the thermostat 2. Replace the universal switch 3. Line inspection
Manual mode is not responsive	1.AC contactor fault 2.Universal switch failure 3.Check whether the line is connected correctly	1. Replace the AC contactor 2. Replace the universal switch 3. Line inspection
The float valve does not work	Check whether the float valve is damaged	Replace the float valve
The submersible pump is faulty	1. Motor failure 2. Wiring fault	1. Replace the submersible pump 2. Wiring inspection
The plug is leaking	1. No gasket 2. Plug damage	1. Add sealing pad 2. Replace the plug

7. Maintenance and service

7.1 Overview

Preventive maintenance refers to maintenance at predetermined intervals or in accordance with prescribed guidelines to assess the likelihood of product failure or to prevent degradation of function, and consists mainly of adjustments, periodic inspections, and necessary repairs. Make the equipment maintenance, the operator familiar with the performance principle of the product structure, the use of methods and precautions, so that the equipment to play the proper function.

Do maintenance work to ensure that the equipment is in working condition.

7.2 Preventive maintenance

1) Operator monitoring

The operator monitors the configuration of the equipment during normal use to detect potential failures.

Once the operator finds an abnormality in the equipment, he should quickly confirm and check the fault to find out the cause of the fault.

2) Check before use

When the equipment is in normal use, the operator shall carry out quality inspection according to the plan to determine whether the product has the specified function.

a) Check whether the inlet pipeline and power supply line are well connected;

b) Check the appearance and humidity of the equipment.