

Preface

This is introduction to UC - 420 type cooling water circulation device Setting, operation, failure, solution , repair and maintenance, etc.

Before using this product, please read and fully understand this instruction manual carefully.

Contents

- 1.Security considerations
- 2.Product profile
 - 2.1Usage
 - 2.2Specifications
 - 2.3Cooling capacity curve
 - 2.4Circulation capacity
 - 2.5Names of whole product
- 3.The name of the operation panel and function
- 4.Setting
 - 4.1Setting environment
 - 4.2Setting conditions
 - 4.3Setting
 - 4.4Connection of power
- 5.Operation
 - 5.1Preparing procedures.
 - 5.2Method for operation
- 6.Cause of failure and treatment
- 7.Maintenance and repair
 - Cleaning and preservation of product

Packing List

Before installation,please check the kinds of parts and quantity.

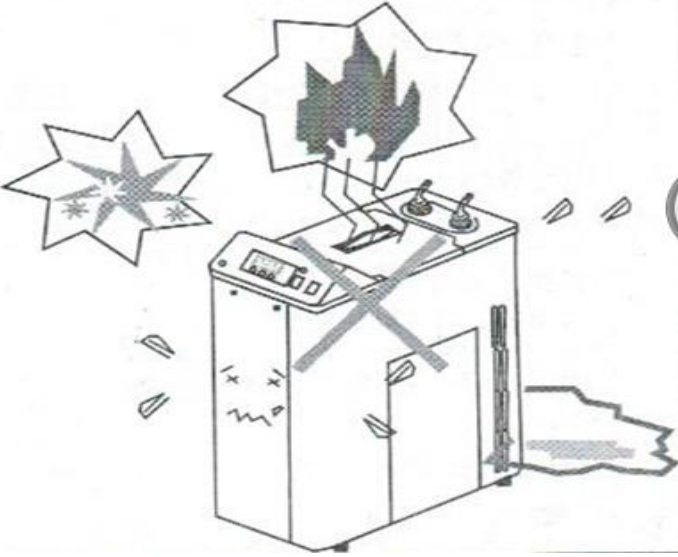
Packing contents		Qty
1.	Main Engine	1
2.	Flume cover	1
3.	Instruction Manual	1
4.	warranty card	1

Flume cover



1.Security considerations

This product is not explosion-proof structure, please be careful.

 ALARM	Be careful when using flammable and combustible liquids. They are placed under the condition of room temperature above will be volatile, in case of fire, fire, it may cause a fire, explosion, etc.Please keep ventilation. 
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2.Product profile

2.1 Usage

 ALARM	This product is the cooling water circulation device. Working principle: Using the refrigerator to make the liquid cooling,and then through the circulation pump to operate external circulation.It is mainly used in the rotary evaporation (1 L, low boiling point solvent concentration)
Please don't modify this product.Please do not use it for other purposes but specification. Modification or use it for other purposes , it will cause electric shock accident or equipment failure.	

2.2 Specifications

Name			Cooling water circulation device
Model			UC-420
Circular mode			Closed circulation
Circular temperature			5~35 ℃ ※ 1
Performance	Temperature range ※ 2		-20 ~ +20℃
	precision of temperature controlling ※ 3		±2℃
	Cooling capacity ※ 4	Condition Liquid temperature	RT 20℃
		At 10℃	450W(about 385kcal/h)
		At 0℃	350W(300kcal/h)
		At -10℃	260W(220kcal/h)
	Circulation Capacity ※ 5	Maximum pumping height	4.2/5.6m(50/60Hz)
		Maximum flow	9/10L/min(50/60Hz)
Components	Temperature control mode		Cooling machine control
	Temperature setting and display		Touching Screen
	Temperature controller		Electronic digital setting, digital display
	Temperature senor		PT100
	Cooler and refrigerant		Output power 325W(piston-type)·R134A
	Water tank		Total capacity is 4 L.Practical capacity is 3 L The material is SUS 304
	Water tank cooling coil		Copper(chromium plated)
	Diameter of cooling water nozzle		Outer diameter 11*inner diameter 7
Specification	Overall dimensions (mm)		W220*D430*H600
	Water tank dimensions (mm)		W130*D250*H130
	Voltage		AC 220V 60Hz
	Current		3.7A
	Weight		About 25kg

Fan Motor 2X30W=60W, Circulating Pump: 10W

※ 1 **Condition**

- Environment temperature range is 5~35℃ under the temperature adjusting range from -50℃ to 50℃.

※ 2 **Condition**

- This machine have no built-in heater.

※ 3 **Condition**

- RT : 20℃
- Circulation volume : maximum
- Voltage : AC220V 50Hz
- The temperature control precision depend on , liquid circulation volume, kinds of refrigerant, heat load and temperature etc. Because of other factors, It may not get the prescribed scope.

※ 4 **Condition**

- RT : 20℃
- Circulation volume : maximum
- Voltage : AC220V 60Hz
- Refrigeration capacity is $\pm 5\%$ by expressing ability
- The temperature control precision depend on , liquid circulation volume, kinds of refrigerant, heat load and temperature etc. Because of other factors, It may not get the prescribed scope.

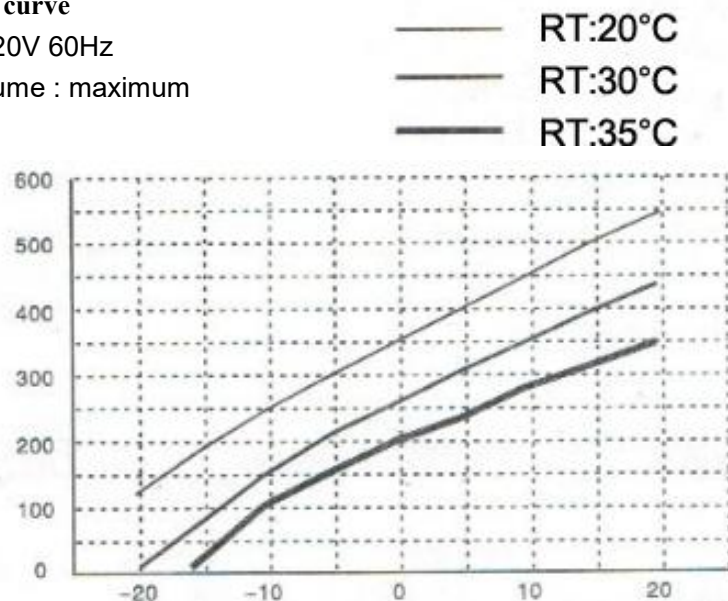
※ 5 **Condition**

- RT : 20℃
- Circulation volume : maximum
- Voltage : AC220V 60Hz
- Circulating capacity is $\pm 10\%$ by expressing ability
- Circulation capacity depend on the two kinds of refrigerants conditions of use.

2-3 Cooling capacity curve

- Condition 220V 60Hz
- Circulation volume : maximum

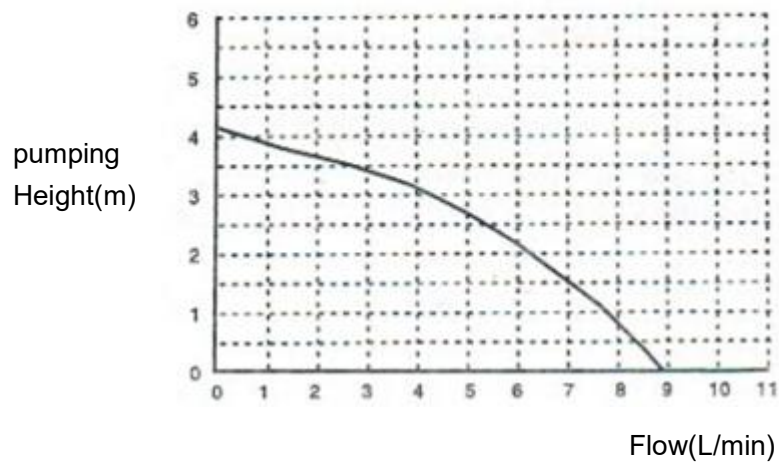
Refrigerating
Capacity(W)



Liquid temperature(°C)

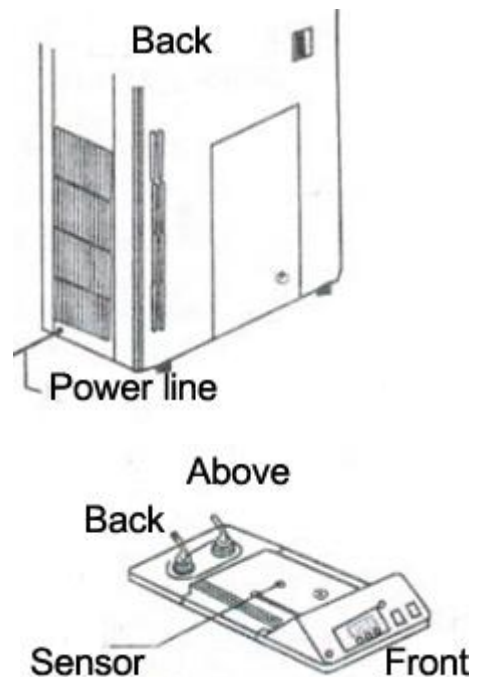
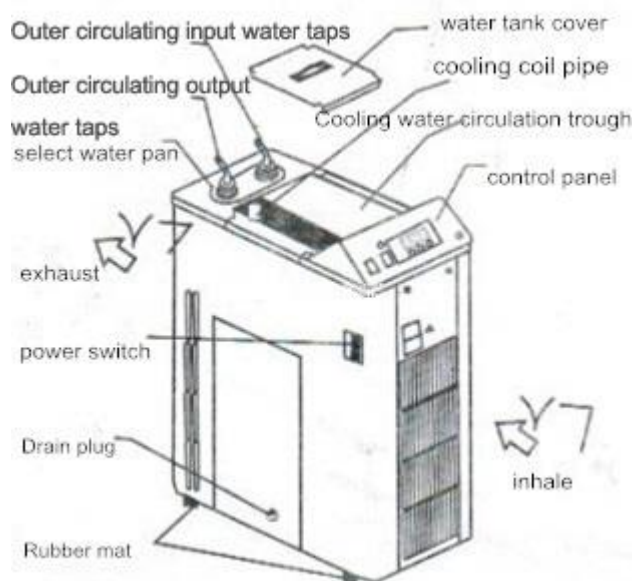
2.4 circulation capacity

Condition • 220V • Water temperature • 20℃



Circulation capacity depending on the state of piping, the kinds of refrigerant .
If the device no-load, it will lead to pump failure.

2.5 Names of whole product

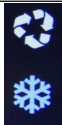


* Water Tap means Pagoda Mouth

Component part of the device adopted the nonmetallic material, compared with the metal, the plastic, rubber products will occur deformation, discoloration and broken easily within heated, the sun or contact solvent, circulation fluid, cleaning agents and so on.

3.The name of the operation panel and function



NO	Name	Function
1.	PV Value	Display current temperature
2.	SV Value	Display the temperature and into the state of setting.
3.	Circulating ON	Press this key, the circulating pump will work
4.	Circulating OFF	Press this key, the circulating pump will stop
5.	Cooling ON	Press this key, the Cooling will work
6.	Cooling OFF	Press this key, the Cooling will stop
7.	Timing	Chiller can work according to time set
8.		Chiller is circulating and cooling

4. Setting

4.1 Setting environment

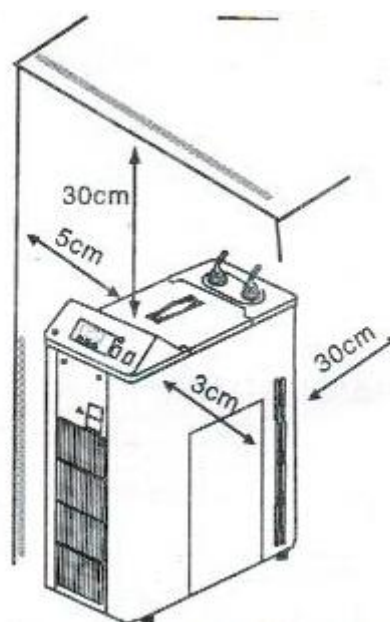
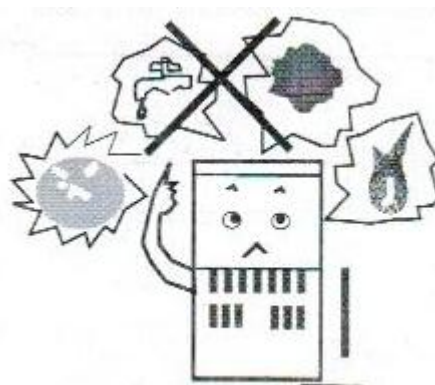
	ALARM
Pay attention to the environment, especially the set place, air conditioning and ventilation. This product adopt air cooled type, discharge heat from device. In order to avoid environmental temperature increased because the discharge quantity of heat, please select a well-ventilated place. Or there be equipped with air conditioning. Ambient temperature is too high that reduce the operation efficiency and affect the cooling capacity. Moreover, The malfunction occurred easily in refrigerator within high temperature and high pressure .	

4.2 Setting conditions

	ALARM
Make sure there is a certain space around equipment, in order to ensure product's performance, keep some space between the roof and wall, as shown as picture in the right..	
	ALARM
Please do not put things on the instrument.	
	ALARM
Products have a certain weight, please pay attention when handling. UC-420 about 25kg	

Please select follow place when setting device:

- There is no direct sunlight .
 - Well ventilated, or where there is plenty of ventilation
 - There is no combustible solid, liquid and gas nearby.
 - No condensation
 - Low humidity or not easily drop of water drops.
 - Less dust
 - Smooth place
- (When handling, please confirm the weight of the product)



4.3 Setting

 ALARM
Main engine can not tilt exceed 15 °. This device carries compressor. Don't be laid flat or tilted more than 15 °.

4.4 Connection of power

 ALARM
Confirm the power supply voltage, number of phase and current are properly . connected.If the power supply connection is wrong, it will cause fire or get an electric shock accident.
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Confirm the power supply voltage, number of phase and current are properly . connected.If the power supply connection is wrong, it will cause fire or get an electric shock accident.

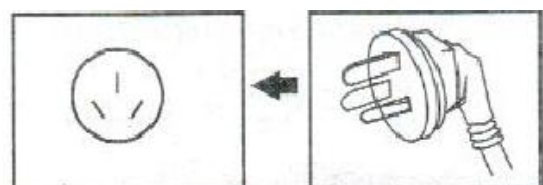
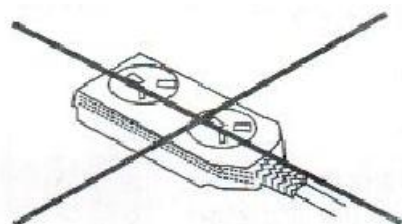
 ALARM
Please connect ground wire correctly. In order to prevent electric shock accident, please do not connect the ground wire with the gas pipe or water pipe.

- ① Please confirm the product model and the connection with the supply voltage, phase number of phase and the electric current.

Model	Power supply	
	Voltage	Current
UC-420	AC220V	10A

The required power supply as shown as the right picture.

- ② Please make sure the socket of the setting place. Two phase with ground wire
 At this time, do not let it powered on .



5.Operation

5.1 Preparing procedures



ALARM

Be careful when use the flammable combustible liquid.

Some flammable combustible liquid will easily evaporate under the condition of above room temperature (individual is under room temperature) .In case of fire source.it may cause a fire, explosion, etc.Please ventilated well .



NOTES

Hose should not be too long .

Resistance of hose is large, It will reduce the circulation volume of water.Affect the cooling effect, cause uneven temperature distribution in circulating tank.In addition to compressor, increase the extra load to circulating pump and easy to cause failure.



NOTES

Do not use corrosive liquid to circulating line.

Device internal circulating line material is copper (plating), stainless steel, brass (plating), ptfe, polyacetal, silicon rubber, polystyrene brace ether, polypropylene, ethylene propylene rubber, NBR.Please choose the no corrosive liquid to above material .When corrosion is serious, the circulation line components may be damaged.



NOTES

Equipment can't no-load operate and interrupt the flow.

It may cause circulation pump failure.

The connection of pipe, rubber hose.Loosen the fixed nut of water taps, check whether the sealing ring are put in the sealing ring grooves .Fasten the water taps, adjust water taps direction before fixed , tighten the nut to avoid leakage.

- Make the outer circulating output water taps, outer circulating input water taps and need to cooling equipment connect together with hose(inner diameter :9mm).

- Hose should be fixed with a clamp to prevent falling off.

(Hose and clamp are not accessories.)

- Please don't screw water taps too strong.

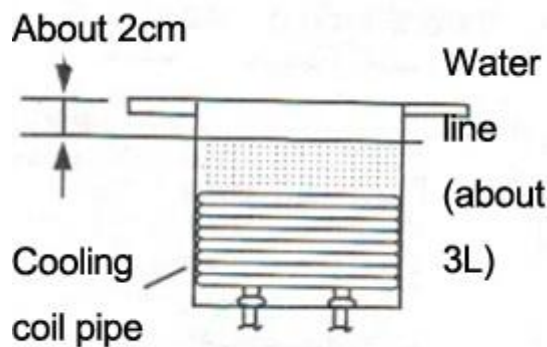
- In order to avoid leakage, breakage, please do not adjust the direction of the mouth taps when operating.

- Choose appropriate hose with compression and heat resistance, It's not easy to be corrode .

When pull the hose,Please do not bend or break it.

2. Injection of medium

- ① Confirm whether the drain cock fall off from the drain-pipe.
- ② Adding medium to the cooling circulating tank.(About 3L)



- Please use antifreeze when temperature is less than +7°C.

But when using glycol and indirect refrigerants, it will be a higher viscosity under the condition of low operating temperature. And flow has decreases, There is uneven distribution of temperature in circular groove. please add some of water. (Different concentrations have different frozen temperature)

- Please do not use with the foreign body circulating fluid, it will cause the machine breakdown.

- ③Put the tank cover on the host.



NOTES

Please do not drip water to the control panel.

Do not drip water to the control panel when add water to the water tank.

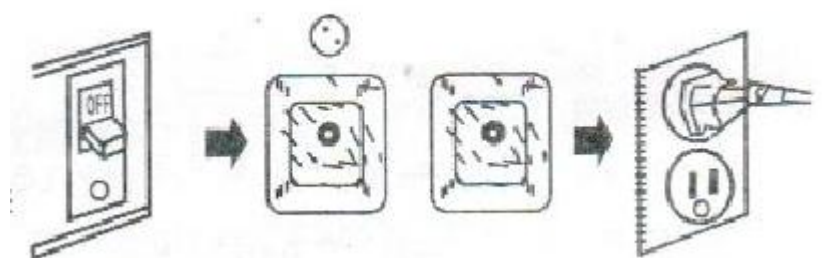
Otherwise,

It will cause the malfunction of control panel and also getting an electric shock accident.

Component part of the device adopted the nonmetallic material, compared with the metal, the plastic, rubber products will occur deformation, discoloration and broken easily within heated, the sun or contact solvent, circulation fluid, cleaning agents and so on.

3. Connection of power plug

Before connect the power plug with the socked please confirm power switch, host switch and circulating pump switch are closed.



5-2 Method of operation
Control panel



- | | |
|--------------------|-------------------------------------|
| 1. PV Value | 5. Cooling ON |
| 2. SV Value | 6. Cooling OFF |
| 3. Circulating ON | 7. Timing |
| 4. Circulating OFF | 8. Circulating and cooling's symbol |
| 9. Power Switch | |



1.Please open the main engine switch(Power Switch)

Open the Power Switch , the display will show the current temperature, and display set value before out of factory, and Circulating OFF, Cooling OFF.

*When the liquid temperature setting value(SV) is higher than PV Value, frozen the opportunity to start automatically, do not start .Set the desired temperature.

*Officially we set SV is lower than PV value before out of factory.

2.Operation

After Press Power Switch,then step into running state,PV window displays the current temperature ,press SET key(Any position of SV) for setting desired temperature,



(Any Position of SV) will show following:



When the controller of the sensor is broken,PV upper part display window show“□ □ □ □”,When the sensor short,PV bottom display window show“□ □ □ □”,Please carefully check the sensor like the above situation , or directly replace the sensor .

3.Inter parameter

Thanks it is simple touching screen controller, we have set all inner parameters before out factory, so we don't suggest customers to use inner parameters when they are operating.

4.Cooling operation

Determination of temperature is higher than the set temperature, the compressor started. When the temperature drops below the set temperature, the compressor stops running.

*In the beginning because of environmental temperature conditions of use run-time, chiller start up sound is higher, it is not unusual.

5.Please connect the pump switch(Circulating ON)

Circulating pump indicator lights, pump starts circulating liquid

At this time, please confirm the connection hose, if the faucet installation leak

*If don't liquid,the pump inlet air,then exhaust air

The exhaust operation

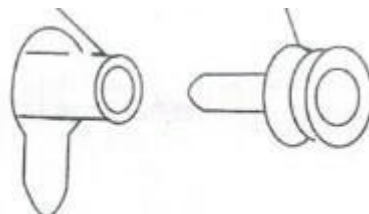
*Unplug the drainage pipe embolism ,ensure the cooling fluid from the drain outflow after embolization, then plug in.

*Next, Circulating OFF repeated circulation pump 2-3 times, which will air out

*the circulating pump can be worked repeatly when it is getting air exhaust. other operations do not open and close the switches in a short period of time, so as to avoid the fault switch and equipment, accidents happen

pipe weep
embolism

Drainage pipe



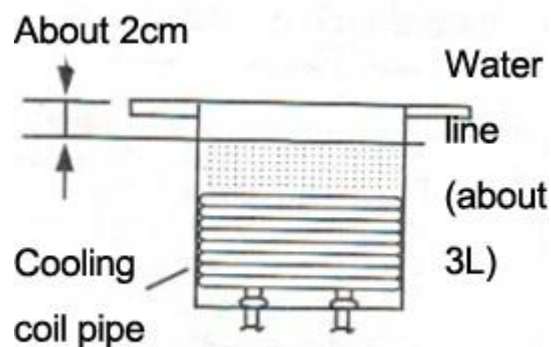
6.Circulatory system started to send liquid, water levels will decline, so you need to supplement the amount of cooling liquid. Replenish cooling liquid, please refer to the picture in the right.adding cooling liquid to water line position.

If the cooling coil pipe above the cooling liquid, it will affect refrigeration capacity .

* Cooling Liquid we often suggest the Ethanol

7.In the end of work,firstly closed the Circulating, Cooling,and then closed the host switch.

If the machine be not used for long time,closed the power switch and pull up the plug.



In addition,discharge water from water tank and pipeline. (Notes:Freeze-proofing in winter.)

* we mentioned the water, in fact we suggest customer to use ethanol for cooling.

Other product

Select protection suite to prevent get water in the surface.

The material of hose is silicon rubber.

Protection suite for cold hose

Length	1m		
Inner diameter	9.0mm	12.0m m	15.0m m

As the circulation liquid, sometimes we will use high volatile liquid, such as methanol . But water cover is plastic products, it compared with the corrosion resistance, ageing resistance performance of metal is worse.

Some flammable combustible liquid will easily evaporate under the condition of above room temperature (individual is under room temperature) .In case of fire source.it may cause a fire, explosion, etc.Please ventilated well .

Stainless steal:SUS304

6.Cause of failure and treatment

Malfunction phenomenon	Reason	Exclusion methods
Turn on the host and cooling switch , it don't display.	The plug have been pulled or not plug tight.	Pull the power plug to socket again.
	There is no power supply or fuse.	Close the panel circuit breakers and mount fuse.
	The host switch occur malfunction.	Replace new host switch.
	Temperature regulator occur malfunction .	Contact to seller.
	Do not fold the protector.	Fold protector.
Compressor(Cooling) do not work	Compressor occur malfunction.	Check whether the compressor is work and the fan is rotating.
	Compressor overload and relay starting holding circuit.	Chiller heat load is big and environment temperature is high, reduce load and adjust room temperature less than 35 degrees.
	Water level is low, condenser pipe has leakage and overload operation	Adding circulating liquid to the cooling circulating tank.
It cannot cool down	The setting temperature is not appropriate.	Confirm the setting temperature.
	Compressor do not work	Check the power supply.
	Compressor fan do not rotate.	Whether the fans are powered-on or get struck.
Compressor is not good	Refrigerant has leakage	Contact to the seller
	Environment temperature rises to more than 35 °	Control the Environment temperature less than 30°
	Heat load is too large	Control the heat load within the range.
Cooling liquid can not circulate	There is gas in the pump.	Pull the release switch, so that the cooling fluid release from the hole, and then plug the discharge switch, turn on and off 2-3 times to discharge the air.
Circulation volume is small	Water pipe burst	Replace the new water pipe

7.Maintenance and repair

 ALARM
Please do not disassemble the device With internal voltage or high temperature parts in device, Disassemble the device will get an electric shock or injuries.

 NOTES
Please use the right method and appliance to clean and maintenance. During the cleaning and maintenance to our product.. please don't splash water to outer or inner of equipment directly,or use household cleanser, diluent, oil, kerosene, acid and similar products to clean it.It will getting an electric shock or damage to equipment.

 NOTES
Do not touch the heat sink In the maintenance, please don't touch heat sink with. Due to the heat sink is very too sharp .easily to scratch hand .

 NOTES
Please turn off the power when clean and maintenance. During the cleaning and maintenance to our product.. please turn off the power and pull the plug. Otherwise it will getting an electric shock or damage to equipment.

1.Cleaning

Cleaning of the product

When cleaning the host, please use a soft cloth with less water to clean it.

please use neutral detergent to clean stubborn stain.and then wipe up with cloth.

2.Before and after use, please check whether the pipe is leaking, relaxation, conduit ageing.

the ageing of water pipe and water cycle are depending on the conditions of use.

According to the inspection situation, please be replaced.

The cold tube, water mouth sealing is expendable.

The status of circulating water mouth, tank cover, the discharge switch and other plastic products based on the different conditions of use, please change according to the maintenance situation.

Component part of the device adopted the nonmetallic material, compared with the metal, the plastic, rubber products will occur deformation, discoloration and broken easily within heated, the sun or contact solvent, circulation fluid, cleaning agents and so on.

