TOBEL

# OPERATION INSTRUCTION

## IMMERSION CHILLER

ACOS series for grinding & cutting liquid/water

Ensure to read this instruction manual before use

First of all, we are very grateful for your confidence and purchase of our product. in order to keep the chiller unit"s condition for long term usage and to extend its life-time ,please ensure to read this instruction manual carefully before use . this manual will contribute a better understanding of this chiller unit that helps you to operate it at its best performance.

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## 1. Safety precautions

Before using the cooling machine, please understand the safety requirements in detail. Please comply with these safety requirements when using the cooling machine to avoid fire, electric shock or personal injury.

(1) keep the work area clean and well ventilated, and the messy or dim environment is liable to cause accidents.

(2) do not operate in dangerous environment: please do not use the cooling machine in humid, rain or potential explosive places.

(3) do not let children approach: all non operating personnel should be in the safe place outside the work area.

(4) use suitable wires: please use the power line that can withstand the rated current set by this chiller and in good condition.

(5) do not stack things on the cooling machine: please do not put anything above the cooling machine, the goods fall easily cause personal injury or mechanical damage.

(6) if there is any repair or replacement parts, please pay attention to the following matters:

(A) first, turn off the operating switch and cut off the power supply and replace the parts.

(B) if you need to use welding occasions, please avoid fire directly touch oil or oil and gas and produce fire. It is recommended that the chiller be removed from the tank before the execution and wipe the oil attached to the fuselage.

(C) if you need to cool off the refrigerant, please vent it in a well ventilated place so as not to suffocate.

## 2. Range of use

The cooling machine is for machine tools or special machine cutting, grinding liquid and emulsion system and cooling design of cooling device (see Picture 1), can provide high precision liquid temperature control. (see Picture 2)

Picture 1

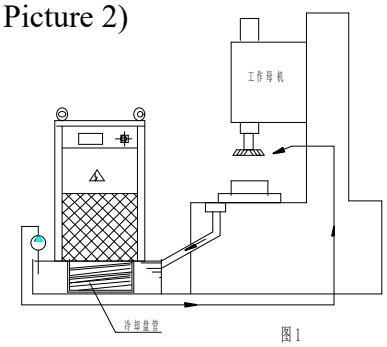



图1

Picture 2

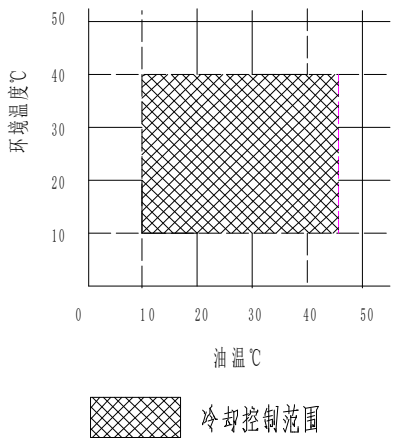



图2

### 3. Matters needing attention in transportation

(1) cooling machine handling, not upside down or excessive tilt; and avoid the bump or impact.

(2) when transporting or moving the cooling machine, please use the correct tools (such as crane), please do not carry the cooling machine empty handed.

(3) remove the power wiring before removing the cooling machine and remove the coolant in the system.

(4) moving cooling machine with overhead travelling crane:

(A) please choose the crane and rope with enough weight to support the cooling machine.

(B) pay attention to keeping the balance of the chiller.

(C) when moving the cooling machine, all the workers must keep safe distance with the crane, and the angle of the cable is less than 45 degrees. (see Picture 3)

Picture 3

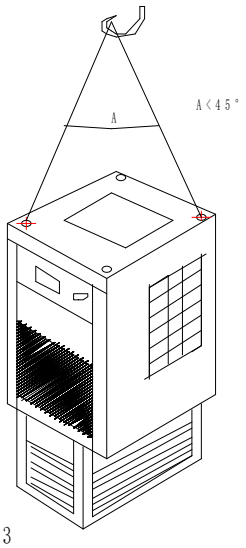



图 3

### 4. Installation settings

(1) install the chiller in a clean place and install horizontally.

(2) the cooling machine is installed in a well ventilated place, its ambient temperature is not more than 40 degrees, otherwise it will affect the cooling effect, resulting in failure.

Please go to the tank (3) injected enough oil to the specified range, with more than the oil surface cooling mechanism of coil pipe shall prevail. At the same time, the cooling coil if any debris accumulation will affect the cooling efficiency.

(4) the cooling machine is not equipped with residual current circuit breaker.

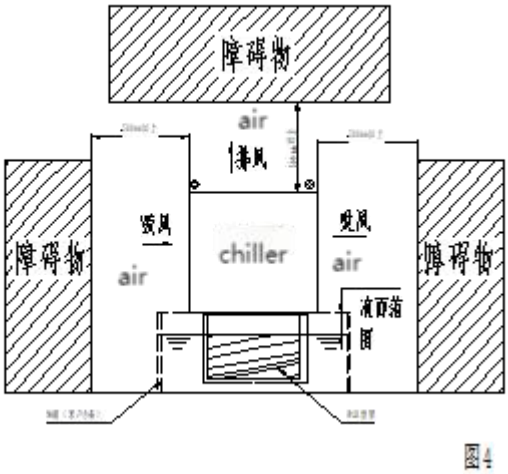
(5) avoid installation in the following places:

Room temperature exceeding 40

* the position of the air inlet or outlet is blocked

* corrosive, flammable, oil mist, conductive dust (carbon powder, metal powder) and other bad air places

(6) the space required for the installation site of the cooling machine is shown in Picture 4




Picture 4

**5. Applicable oil class**

(1) use cutting oil, grinding oil, water and water soluble emulsion and low viscosity oil

(2) the following corrosive liquids should not be used:

* drugs and edible liquids (beverages, water, etc.)
* flammable liquids such as kerosene, gasoline, etc.

**6. Electrical wiring**

(1) please pay attention to safety precautions before any wiring.

(2) connection or replacement of wiring shall comply with electrical specifications and shall be carried out by professional personnel with electrical certificates.

(3) refer to circuit diagram wiring.

(4) please do the grounding work, please do not connect the ground wire to the gas pipe, lightning rod or telephone line to avoid electric shock injury.

(5) assemble the residual current breaker by itself.

(6) remote control and alarm output:

If you want to remotely control the chiller from the machine, you can connect to the terminals 4, 5 of the chiller.

If you want to output the abnormal accident signal to the machine, please connect the 20 and 21 terminals of the cooling machine.

(7) the electrical principle diagram is attached.

**7. Operation**

**7-1** inspection before operation

Is the voltage, frequency and phase of the input power correct?

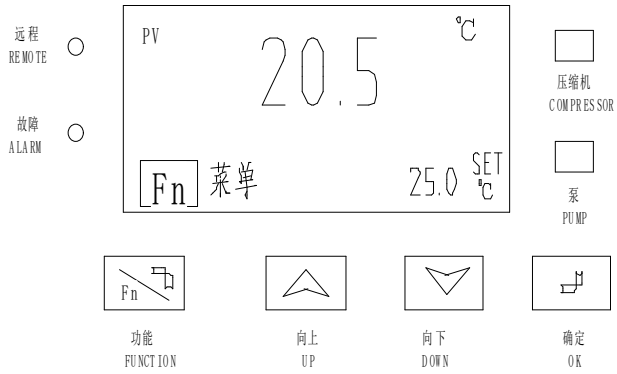
Is the liquid level within the liquid level?

Whether the liquid is in the proper viscosity range (0.5-200CST)

* the cooling machine should start running simultaneously with the working machine
* it is easy to damage the cooling machine for continuous and repeated startup. After shutdown, please turn it on after 3 minutes

**7-2** control operation

（1）control panel appearance




Panel description

(a) temperature display:

PV C: show the current liquid temperature

SET temperature: display the current temperature setting value

(b) operation indicator light:

Pump PUMP: pump group lights in operation

Compressor COMPRESSOR: lighting in compressor operation

Remote REMOTE: lighting in remote control

(c) temperature setting key

Please click the up or down arrow to set the temperature of the demand. After setting, press the confirmation key to confirm the temperature

(d) fault indicating lamp

When the condition of the cooling machine is abnormal and stops running, the fault indicator lamp is bright, and it is excluded according to the displayed Chinese fault instructions.

(E) function keys

Function FUNCTION: press and hold access menu, and can be set according to the function of Chinese display.

(2) operation instructions

Turn on the power switch after checking a few seconds after PV shows the actual temperature value, the pump and compressor indicator lights, lights flashing, when the compressor work actual temperature reaches the set temperature deviation is arranged inside the boot load plus the compressor, indicator light, when the compressor stops working or less than the actual temperature reaches the set temperature, the compressor indicator flashing lights, show that the compressor is waiting for.

(3) when the main interface appears alarm, only the OK key is used to inquire the current fault, and the current fault will be displayed on the main interface. When the fault is eliminated, then the rotating switch is turned on, and the power supply can be eliminated to return the alarm state, and then back to the main interface to display the actual temperature.

## 8. Maintenance

The safety precautions must be followed before any maintenance. In order to maintain the cooling efficiency and prolong the service life of the cooling machine, the cooling machine needs regular maintenance. To keep the cooling machine running normally, a good ventilation and no hindrance working environment is needed.

**8-1** clean up

Do not clean and maintain under the running of the cooling machine. Any parts removed in the operation of the cooling machine will cause personnel injury or machine damage.
Components that need regular cleaning:
* airframe
* condenser
* air filter screen
* refrigeration coil
Please refer to the detailed steps:
(1) airframe
(a) remove the dirt on the surface of the cooling machine with neutral detergent. Don't use alkali, acid, milling, steel brush, hot water and so on to keep the paint complete.
(b) clean the cooling body: don't let the water splash into the electrical parts during the cleaning process.
(c) wring dry cloths when wiping parts of electrical appliances.
(2) condenser
Check whether the condenser is blocked by dirt, please regularly use compressed air or air conditioning dedicated dust to remove the condenser dust.
(3) air filter screen
(a) lift the air filter up and draw it out, and then remove it. (Picture 5)

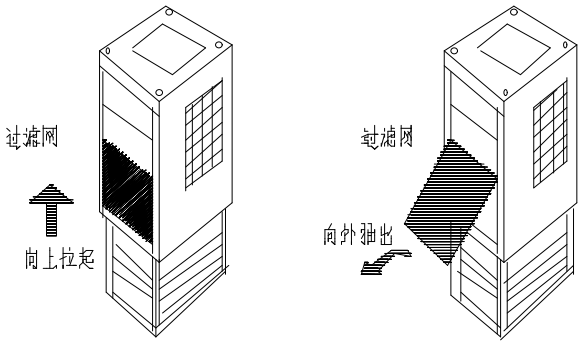
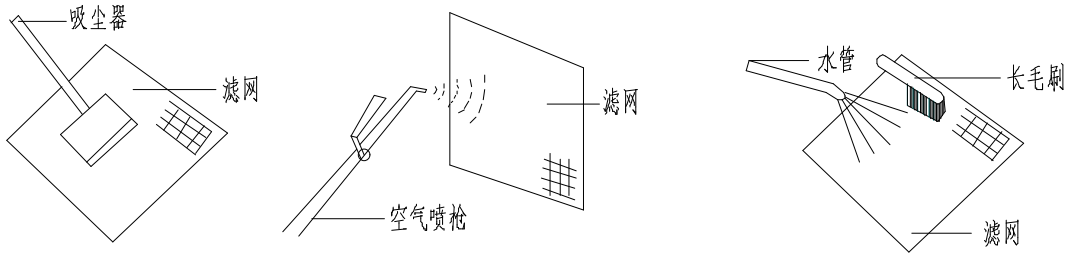



图5

Picture 5

(b) use dust collector, air spray gun, water pipe and long hair brush to remove dust from the filter net. After cleaning, the filter net is dried and then installed. Please clean it once a week. If the dirt is serious, clean it with neutral detergent.




(4) refrigeration coil
Cooling machine coil surface has cutting powder, cutting chips and other foreign matter, easy

to cause refrigeration capacity decline, so please regularly brush with clean, and avoid impact refrigeration coil.

**8-2** storage

If you stop using for a long time, please pay attention to protect the inside of the machine and the condenser to prevent the moisture of Egypt

(1) place the machine away from the dust.

(2) wipe the power line clean.

(3) use protective cover to prevent dust and moisture adhesion.

(4) store the machine in a flat, dry and cool place.

## 9. Troubleshooting

Exclude any maintenance and fault, please follow the safety instructions and have experienced professionals to carry out, when a fault or abnormal cooling machine, cooling machine will stop running and Chinese display alarm information, please refer to the following information will be removed in reboot recovery operation.

* exception alarms and troubleshooting

(1) the cooling machine suddenly stops running and shows the fault signal

| | | |
|---|---|---|
| Fault display:<br><br>Short circuit of probe | Possible causes | * probe disconnection or poor contact<br>* controller failure |
| | Inspection method | * check if the probe is broken,<br>*If there is no disconnection or bad contact, the controller fault is explained |
| | Condition exclusion | * rewiring<br>*Replacing defective goods |
| Fault display:<br><br>*Compressor high pressure<br>*Compressor low voltage | Possible causes | *Too much or too much refrigerant<br>* cooling system blockage or leakage<br>* clogging of condenser or air filter<br>*Bad heat dissipation<br>*Fan fault |
| | Inspection method | * the copper tubes on the low pressure side of the compressor are not cold<br>* the heat sink of the condenser is not hot<br>*Dry filter surface temperature is too low<br>*Is the fan motor faulty? |
| | Condition exclusion | *Please contact the maintenance personnel of the cooling system for the trouble of cooling system<br>*Regularly clean the condenser or air filter screen to increase heat dissipation efficiency and remove vent obstruction.<br>*Replace the faulty fan motor |

| | | |
|---|---|---|
| Fault display:<br><br>*Excessive current in the press<br>*Too low current in the press | Possible causes | *Rated current setting is not reasonable<br>* incorrect wiring or unstable interface<br>*Too much refrigerant<br>*The cooling system is blocked<br>* clogging of condenser or air filter<br>*Bad heat dissipation<br>*Fan fault |
| | Inspection method | *See the compressor current setting<br>*Check whether the compressor wiring is correct and firm<br>* the heat sink of the condenser is not hot<br>*Is the fan motor faulty? |
| | Condition exclusion | *Reset the current according to the rated value of the compressor<br>* reconnect the press power line or the fastening line<br>*Please contact the maintenance personnel of the cooling system for the trouble of cooling system<br>*Regularly clean the condenser or air filter screen to increase heat dissipation efficiency and remove vent obstruction.<br>*Replace the faulty fan motor |
| Fault display:<br><br>*Too low temperature<br>*Over temperature warning<br>*Over temperature alarm | Possible causes | * ambient temperature is too low * liquid temperature exceeds the set limit * cooling capacity of the chiller is insufficient* temperature sensitive contact failure * cooling system fault or refrigerant blockage or leakage |
| | Inspection method | * check whether the boot temperature is too low. Check whether the liquid temperature exceeds the set limit<br>* re calculate the required cooling capacity is more than the refrigerator temperature load * check whether normal contact<br>* the copper tubes on the low pressure side of the compressor are not cold<br>* the heat sink of the condenser is not hot<br>*Dry filter surface temperature is too low |
| | Condition exclusion | *Keep the liquid temperature above 1 centigrade<br>* keep the liquid temperature below the set limit<br>*Replace the temperature sensitive contact<br>* replace the larger cooling capacity of the chiller<br>*Contact the maintenance personnel of the cooling system |
| Fault display:<br><br>*Excessive cooling current<br>*The cooling current is too low | Possible causes | * incorrect wiring or unstable interface of mixing motor<br>* the attachment of the stirring piece<br>*The setting of rated current of mixer motor is unreasonable<br>* mixer motor failure |
| | Inspection method | *Look at the current setting value of the stirring motor<br>*Check whether the wiring of the stirring motor is correct and firm<br>* check if there is debris in the stirring piece<br>* is the mixing motor faulty? |
| | Condition exclusion | *Reset the current according to the rated value of the stirring motor<br>* re connect the power line of the stirring motor or fasten the wire<br>*Regular cleaning of stirring piece sundries<br>*Replace the trouble stirring motor |

| | | |
|---|---|---|
| Fault display:<br><br>Power failure | Possible causes | * input power reverse phase, phase missing<br>* temperature controller failure |
| | Inspection method | *Check whether the main power supply and the three-phase connection are correctly connected<br>*If the power supply is connected properly, that is the temperature controller fault |
| | Condition exclusion | *Replacing any two phases of the main power supply<br>*Replace the temperature controller |

(2) the cooling machine suddenly stops running and does not show the fault signal

| | |
|---|---|
| phenomenon | Power input, switch on, temperature control panel does not display |
| Possible causes | *The main power supply is not connected properly or the circuit breaker is disconnected<br>* temperature controller failure |
| Inspection method | * check whether the power supply is normal<br>* check whether the electrical wiring is normal<br>* check whether the circuit breaker is on or not<br>*If the above is normal, the temperature controller may fail |
| Condition exclusion | * reconnect the wiring<br>*Replacing defective goods |
| phenomenon | The temperature control panel is normal, and the pump and refrigeration do not act |
| Possible causes | * remote control connection is bad or the host does not have remote action<br>*The connection of pump or compressor is correct or the wiring is not stable |
| Inspection method | * check the remote wiring is correct or firm, check whether the host output remote signal<br>*Check whether the connection of pump or compressor is correct and firm |
| Condition exclusion | * reconnect wiring or tighten wiring<br>*Host remote signal re output |
| phenomenon | The cooling system doesn't work |
| Possible causes | *The liquid temperature reaches the set temperature, and the compressor stops working<br>*Bad heat dissipation |
| Inspection method | * check whether the liquid temperature reaches the set point<br>* check the internal temperature of the chiller |
| Condition exclusion | *When the liquid temperature reaches the set temperature, the compressor stops working is normal<br>*Improve the working environment and create a good ventilation place |
| phenomenon | The liquid temperature is not up to the set temperature, and the refrigeration system does not stop working |
| Possible causes | * load exceeds refrigeration capacity<br>*Bad heat dissipation<br>*Refrigerant leakage<br>* temperature controller failure |
| Inspection method | * check whether the required cooling capacity exceeds the load of the cooling machine<br>* check the internal temperature of the chiller<br>*Compressor low side copper tube is not cool<br>*If the above is normal, the temperature controller may fail |
| Condition exclusion | * replace the chiller with relatively large cooling capacity<br>* improve working conditions and create good ventilation conditions<br>*Please keep in touch with the maintenance personnel of the cooling system<br>*Replace the temperature controller |

## Circuit Diagram