SUNRISE CHILLING PRODUCT SERIES

SUNRISE LASER CHILLERS

—— PH-LW16~72-***

USER MANUAL

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Notes

Uint conversion table

1. Cooling capacity:

1W=3.44BTU/h

1W=0.86Kcal/h

60HZ 50HZ refrigeration cooling capacity is about equal to 1.2 times.

2. Temperature (℉ ℃ K)

t(℃)5/9×[T(℉)-32]

T (℉) =9/5[t(℃)+32] t(K)=273+T(℃)

3. Pressure unit conversion table series

Pressure unit	Pa	kgf/cm^2	Bar	mmHg	atm	psi
1Pa	1	1.01972×10^{-5}	1×10^{-5}	7.50062×10^{-3}	9.86923×10^{-6}	1.45039×10^{-4}
$1kgf/cm^2$	9.80665×10^{4}	1	0.980665	735.559	0.967841	14.2235
1Bar	1×10^{5}	1.01972	1	750.062	0.986923	14.5039
1mmHg	133.322	1.35951×10^{-3}	1.33322×10^{-3}	1	1.31579×10^{-3}	0.01934
1atm	1.01325×10^{5}	1.03323	1.01325	760	1	14.6961
1psi	6894.7	0.07031	0.06895	51.7063	0.06805	1

4. Length

1inch=25.4mm 1mm=0.0394inch

5. Weight

1Lb=454g 1Kg=2.203Lb

6. Volume

1oz=28.41cc 1L=35.20oz

SUNRISE LASER CHILLER OPERATORS MANUAL

Table of Content

1 - General information

1.1 To user

Thank you for choosing Sunrise laser chiller.

Please read the manual thoroughly before operating the machine.

Please keep your manual, receipt, QC pass and warranty card for further use.

Don't spoil any label on the machine so that you can enjoy our service.

Please contact your local dealer or our service center if you need any further help.

This manual is only apply in our standard model, only reference for customized model

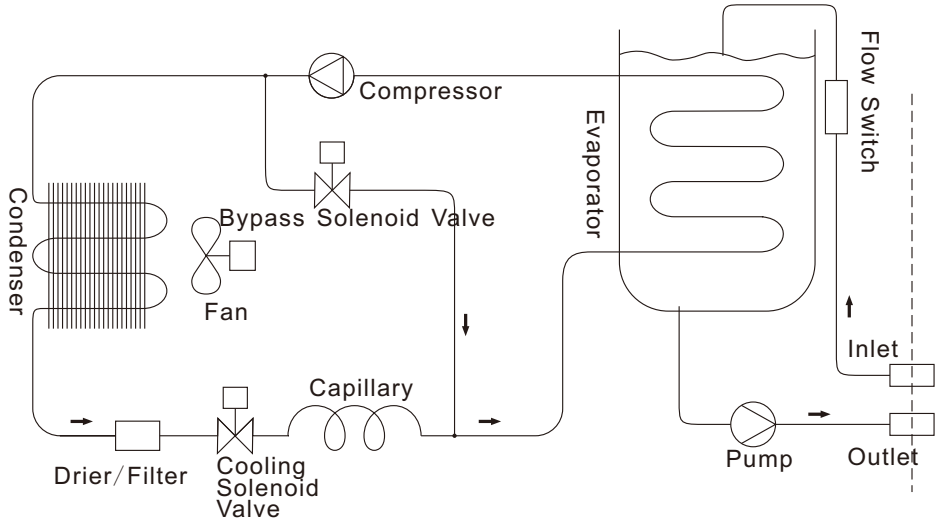
1.2 Unpacking

Your chiller is delivered in special carton package; please reserve the carton and other packing stuff before you can make sure chiller is running properly. If the chiller doesn't work, the chiller could be replaced for a new one within 7 days after you receive the chiller. If you have found any damage in the delivery, please contact logistic company and your local dealer for submitting damage claim.

	This sign marked all Safety related chapter in this manual, the sign marked on the machine is reminding for safety operation.
	This sign means high voltage danger.

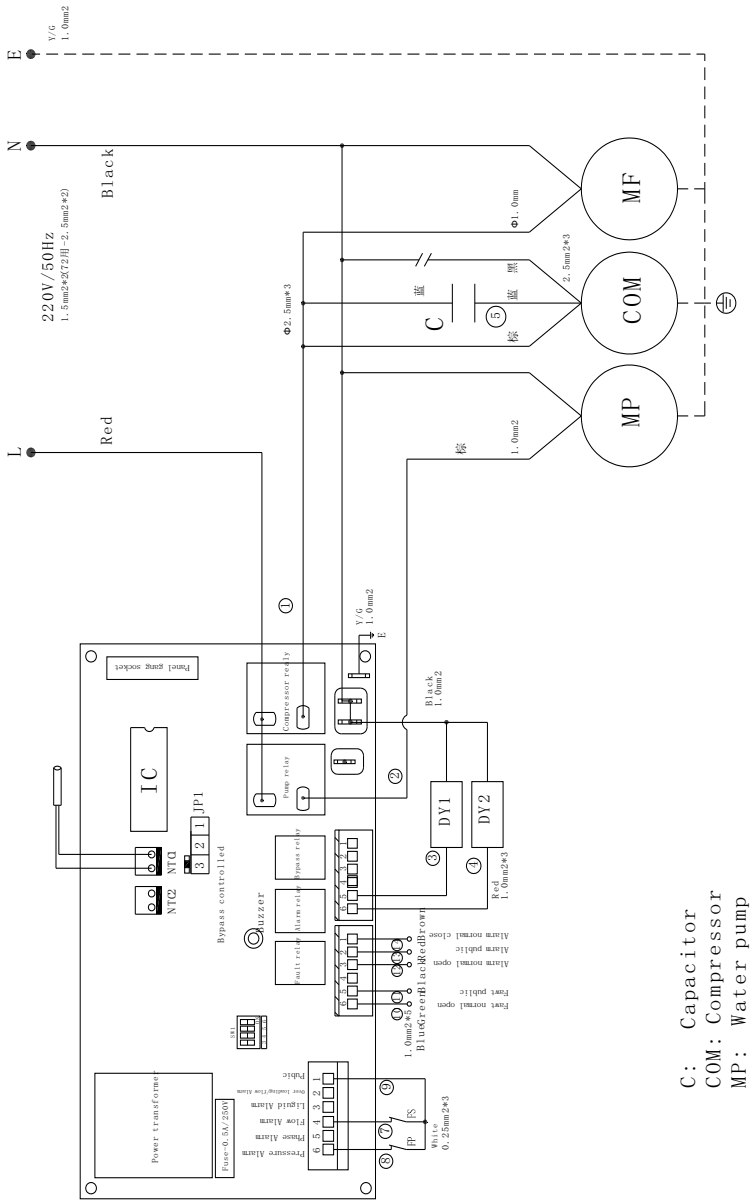
Please read all the instructions on safety notice and operation carefully.

7.2 Cooling system



7 - Maintenance and technical support

7.1 Circuit Diagram



PH-LW16~72-***Circuit Diagram

C: Capacitor
COM: Compressor
MP: Water pump
MF: Fan
FS: Flow switch
DY1: Cooling magnetic vaive
DY2: Bypass magnetic vaive

2 - General Information

2.1 Content

Laser chiller operators manual

2.2 Product introduction

2.2.1 Type Code Explanation

PH-LW 16-B H P **

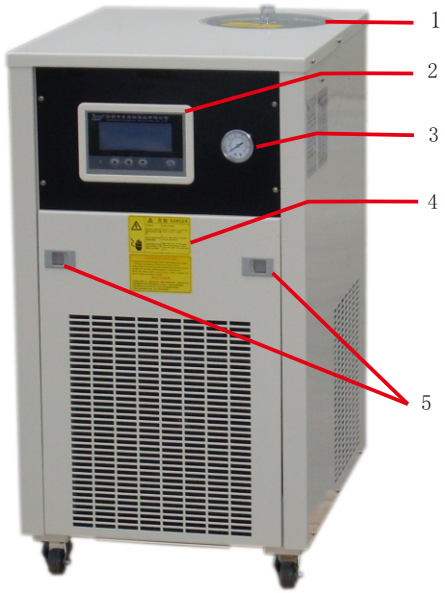
- PH-LW: Sunrise family
- 16: Usage: Water Chiller for Laser; Cooling Capacity: ×0.1KW
- B: Heat exchange: B: Back Exhausting; S: Split Type; C: Side Exhausting; W: Water Cooling
- H: Type of Pump: S: Super High Lift Pump; H: High Lift Pump; L: Low Lift Pump
- P: With Flow Switch
- **: Code for Client

NOTE: In case of no the above code, means the function is not provided.

2.2.2 Product Characteristics

Our chillers are equipped with digital display electronic temp. Controller, one key operation for varies settings and malfunction prompt function, other steps will be realized by memories automatically.

In order to optimize and improve cooling efficiency and performance, adjustable cooling system is also available for our chiller, which outstandingly prolonged the life time of the compressor and enhanced temp. Control Stability.



Front/Top

1.Water tank Cover
2.Temp. Controller panel
3.Water Pressure gauge
4.Label
5.Buckle

Back

6.Drain
7. Wheel
8.Water inlet
9. Water outlet

SUNRISE LASER CHILLER OPERATORS MANUAL

6 - Trouble shooting

⚠	Warning: For qualified staff only, danger voltage exists after power on!

6.1 System not working (No cooling or pump not working)
Whether the power wire is connected to the socket
Whether the power is ready
Whether the power switch on the panel is on

6.2 Pump not working properly
Check water level, whether the pump is pumping water or not.
Check whether the motor of the pump is working
Check whether the recirculation system is blocked

6.3 Pump insufficient pumping
Please check whether the voltage is too low
Please check whether the diameter of the pipe is too small
Please check whether the fluid viscosity is too high
Please check the connection tube carefully

6.4 insufficient cooling or No cooling
Please check whether the voltage is too high or too low
Please check whether the air discharge side has been blocked
Please check ambient temp., high ambient temp. will make the compressor halt for a short time.

Solution for no error codes display

Ⅰ. Insufficiency cooling:

① Please check whether the condenser radiator and air filter is dirty

② Whether the temp. of the installation site is too high and ventilation condition is bad

③ Slightly refrigerant leakage(E3 error has been reported yet)

④ Whether the chiller has exceeded its designed lifetime, replace a new compressor might be a solution

Ⅱ. Unstable temperature:

If the chiller is keeping chilling or the water temperature is keep rising, please check the voltage of power supply (Normal voltage range: 197~242V), since over-low voltage will make the cooling magnetic valve and bypass magnetic valve fail to alternate.

Ⅲ. No water flow or low water flow:

Please check below:

Whether there's air inside the water pump, check whether the filter under the water tank is blocked, whether the pump capacitor is working and the pump relay is closed.

5 - Maintenances

Required periodic maintenance

5.1 Condenser, vent hole, air filter

Condenser, vent hole, air filter should keep clean and periodically inspect in order to optimize the performance of cooling

5.2 Pure water filter

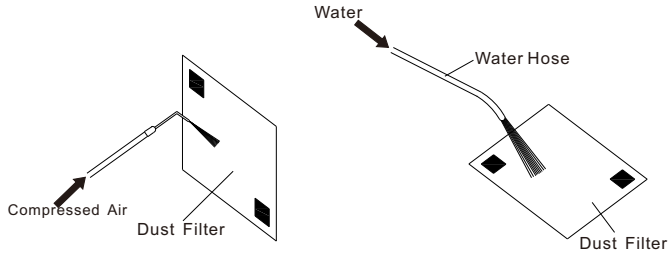
Please rinse and replace the filter periodically.

5.3 Liquid level

Please check the water level periodically, the water level should be above the coil, water supplement is necessary if the water level is lower than the coil; please replace the water frequently based on the actual water condition. If the water flow is not normal, please press the red button on the water filter to discharge the air inside the water circuit. Please check whether the back water circuit is leakage and the water level is lower, when there're bubbles in the soft tube and back water inlet.

5.4 Clean the air filter periodically

The air filter could be removed easily from both sides, use gentle detergent to remove the dust, clean the filter with clean water, and fix the filter back after it's dry.



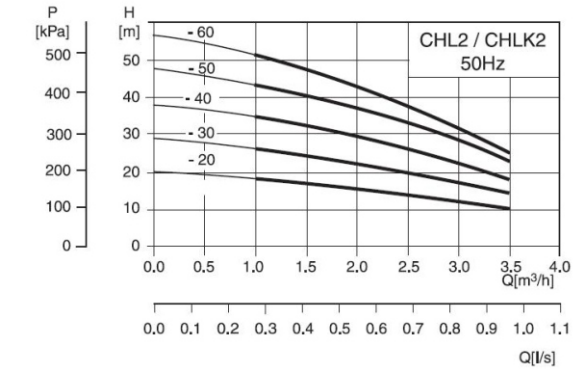
View of Dust Filter cleaning

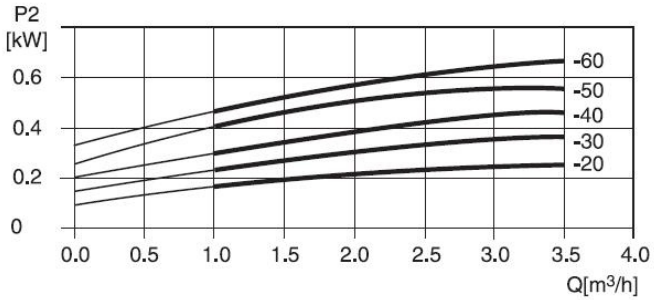
2.3 Chiller Spec. and pump performance

General spec. (for all models)

Temp. Control Stability		±0.1℃
Water temp. Stability		±0.3℃～±0.5℃
Temp. unit		℃
Water pressure	Pressure unit	PSI or kgf/cm2
	Pressure Stability	2PSI or 0.2kgf/cm2
Refrigerant Pressure	Pressure unit	Bar
	Pressure Stability	0.2bar(LP) 1bar(HP)
	Pressure display Stability	±1.2% of 16bar(LP)
		±2.8% of 35bar(HP)
Pump inlet & outlet		1" inner thread

Characteristic performance curve of pump





2.4 Technical Specifications

Model		PH-LW16-		PH-LW27-			PH-LW36-			PH-LW52-			PH-LW72-		
		BLP	BHP	BSP	BLP	BHP	BSP	BLP	BHP	BSP	BLP	BHP	BSP	BLP	BHP	BSP
Cooling capacity	W	1600			2700			3600			5200			7200		
	Btu/h	5024			9288			12384			17888			24768		
	Kcal/h	1376			2322			3096			4472			6192		
Power Supply		1PH-220V/50Hz														
Refrigerant		R22														
Compressor Power HP		1/2			1			1.5			2			2.75		
Rated Air Discharge m³/h		600			1400			2000			2000			2700		
Rated Heat Discharge W		2200			3700			4100			7200			10000		
Fan Power W		36			2×36			2×86			2×86			2×110		
Reservoir Storage L		8.5			11.2			15			15			17		
Inlet/Outlet		Inner Teeth DN15(1/2")						Inner TeethDN20 (3/4")								
Drain		Inner Teeth DN15 (1/2")														
Pump Power W		370	550	550	370	550	550	370	550	550	370	550	550	370	550	550
Rated Lift m		14	21	35	14	21	35	14	21	35	14	21	35	14	21	35
Rated Flow m³/h		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rated Working Current A			5.6			5.8			8.2			11.8			14	
Flow work point L/min		2						5								
Net weight		69			71			95				98			115	
L×W×H(mm)		424×524×765			474×574×805			504×624×905			504×624×905			526×715×955		
Noise dBA		52			56			57			57			58		
Filter		5 inch									10 inch					

NOTICE: Water temperature stability is ±0.5℃. The max. ambient temperature is 35℃. water temperature setting range is 5~25℃. The material of filter core is polypropylene and the diameter of micron is 5μm. Nominal conditions: ambient temperature is 30℃, output water temperature is 22℃. All the specifications are subject to revise without further notice.

System function view
cooling only (bypass)

4.2.6 startup option, press up and down button to choose "yes" or "no"

Startup mode
Whether automatically startup when power on X

4.3 Load factory default setting

Factory default setting
Please confirm to load factory default setting?
Yes: keep pressing set button for 5sec
No: press power button to exit

4.4 Software version

Version information
DLY-619-V1.0-XX

5 Alarm prompt, the LCD screen flashes when alarming, on & off every 1sec

Phase reversal alarm
Change any two of three live wires after power cut off, please trouble shoot and restart the system.

Liquid level alarm!
Low liquid level or liquid level switch malfunction, fill more water or replace liquid level switch; press return/power button to release alarm.

High temp. alarm!
Water temp. exceeds the max. setting value, fill cooling water or stop the system. press return/power button to release alarm.

Overload alarm!
Wire error or heavy load, please let professional troubleshoot! press return/power button to release alarm.

Pressure alarm!
Refrigerating system leakage, track down the leakage point and recharge refrigerant. press return /power button to release alarm.

Low temp. alarm!
Water temp. lower than min setting value. Fill normal temp. water or stop system! Press return/power button to release alarm.

Water flow alarm!
Low water flow or flow switch, water pump breakdown please check water circuit or replace component! Press return/power button to release alarm.

System standby
water tank temp: xx℃
setting temp: xx℃
Temp differential: xx℃

(default value: 20℃)
(default value: 0.1℃)

4. Press set button to enter function option, chosen option flashes, press set button to enter next level setting.

Function operation
Temp differential Admin setting
Default setting System version

4.1 xx flashes, press up and down button to adjust value, 0.1℃ for each press, press set button to switch.

Temp. Differential setting
setting temp: xx℃
temp differential: xx℃

(default value: 20℃)
(default value: 0.1℃)

4.2 Function select menu to enter admin setting interface

Admin parameters setting
Alarm delay
high & low temp. Alarm
Temp. Compensation
compressor switch delay
Function view Startup model

4.2.1 xx flashes, press up & down button, 1min for each press

High & low temp alarm setting
Delay xx min.

(default: 1min)

4.2.2 High & low temp. Alarm flashes, press set button to swich

High & low temp. Alarm setting
High temp. alarm: xx℃
Low temp. alarm: xx℃

(default value: 40℃)
(default value: 5℃)

4.2.3 Temp. Compensation interface

Temp. Inaccuracy compensation
Compensation temp: xx℃

(default value: 0℃)

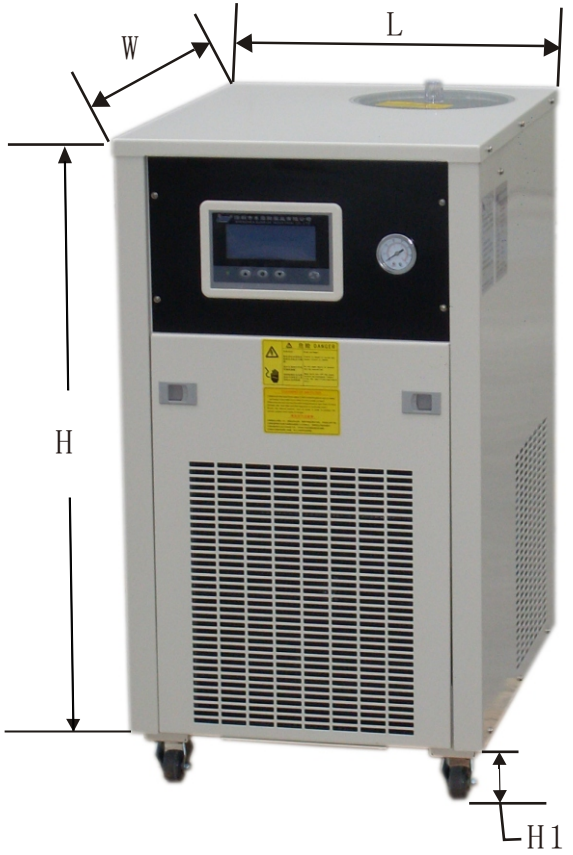
4.2.4 Compressor delay switch, xx flashes up & down button, 1min for each press

Compressor switch delay setting
Delay xx min.

(default: 1min)

4.2.5 Function view

2.5 Dimensions



Note: No filter

Dimensions / Model	L(mm)	W(mm)	H(mm)	H1(mm)
PH-LW16-***	424	524	765	50
PH-LW27-***	474	574	805	70
PH-LW36-***	504	624	905	70
PH-LW52-***	504	624	905	70
PH-LW72-***	526	715	955	70

3 - Installation and start up

3.1 Safety Notes

①Please ask our dealer or professional staff to install the chiller
The person who installs the chiller must be certified by government recognized licensor, if the chiller was not installed properly, water leakage, fire, and wound, electric shock may occur.

②Take proper measures to prevent suffocation caused by refrigerant leakage
If the machine is installed indoor, ventilation well could avoid of suffocation hazard caused by gas leakage.

③Make sure the machine is properly grounded.
Electric shock may occur if the machine is installed without grounded.

④Don't stretch anything into the equipment.
The high speed fan will be damaged by foreign material.

⑤In case of abnormal running appear, cut off the power, contact our local dealer for instructions.
Fire hazard, electric shock etc. might occur if keep running the machine under abnormal conditions.

⑥Don't operate the machine with wet hands.
Electric shock may occur.

⑦Don't repair the chiller by yourself
In safety sake, please ask our dealer or a professional staff to repair it.

⑧Don't install the chiller in a flammable and explosive place

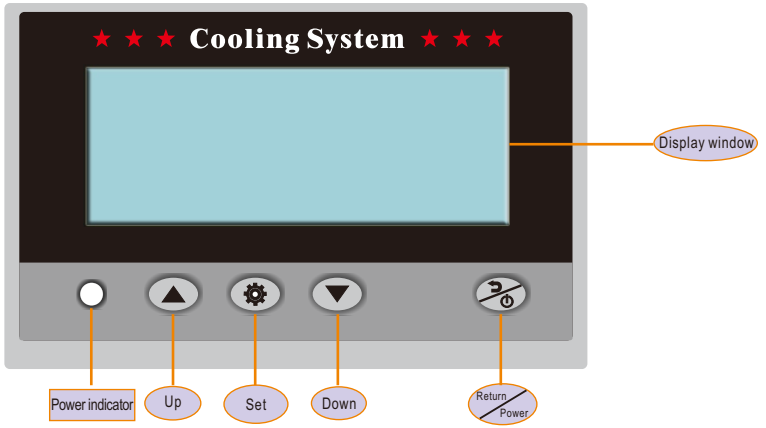
⑨Neutral liquid and liquid whose gravity and heat transmission are similar with water are required, in order to protect the water pump, water with solid particles are not allowed.

⑩when replace the liquid please note the pump can't be run without water.

⑪In cold areas, proper anti-freezing measures should be done.

4 - Operation

4.1 Temp. Controller instruction



Function summary

Up button (press to increase setting value, keep pressing to continuous increase)
Enter system menu or switch setting option
Down button (press to decrease setting value, keep pressing to continuous decrease)
Power switch / save & return
①. In all setting interface, the temp. controller will save current parameters and exit setting interface for 10sec without operation;
②. If you want to change the setting when alarm is showing, press on/off button to shut down the output.
③. Press Return/Power button to save and exit in any setting interface.
④. Power off: Press Return/Power button for 3sec at any operation interface to halt system.

1. System on when power connects, initial interface show for 1.5sec.

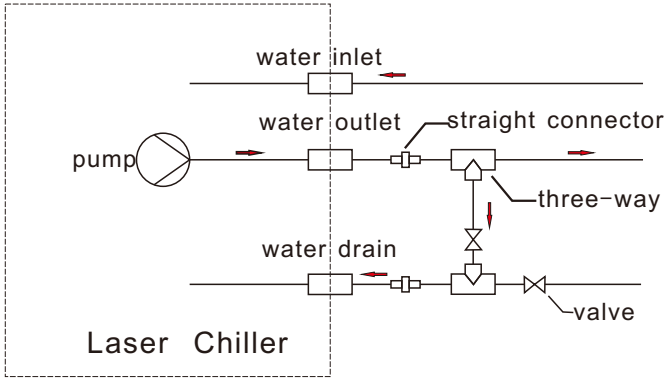
Thank you for using
Sunrise water chiller,
system is starting up,
please waiting

2. Standby

System standby
water tank temp: xx℃
setting temp: xx℃
press power button to
start system

3. System running

Connecting of water bypass and accessaries for water circulation.



3.5 Water supplement

Please add clean liquid in the water tank, the water level should above the coil, then cover the water tank.

3.6 Closed loop system or bypass setting

Please connect the chiller with peripheral equipment, the liquid flow direction is determined by the way of connecting; liquid was pumped into chiller from outlet and pumped out from water outlet.

3.7 Start up

Cooling fluid

Choose proper cooling fluid

Notice: Cooling fluid which is safe, healthy, environment-friendly and compliance with our chiller is necessary, fluid which is erosive and inflammable is not allowed.

⚠	Warning: erosive and inflammable liquid is not allowed!!!

⚠	Warning: Anti-freezing liquid is necessary for operation under 8℃

⚠	Warning: Power off button can only turn the machine into standby mode.

⚠	Warning: please cut off the power before installation!!

3.2 Site requirements:

Ambient temperature and relative humidity (RH)

Our chiller suitable for install indoors, ambient temp. from 5℃ to 35℃, RH less than 80%(No condensation).

Location

The chiller should be installed on solid horizontal surface, the closer to the laser equipment, the better cooling performance will achieve; keep the chiller off the heating source at least 4inch (1.4meters), such as heating tube and boiler.

Please install the chiller at place where drainage system is available in order to keep the installation place clean in case of any leakage occurs, please don't install the chiller in erosive gas, humidity, dusty places or indoors with high temp..

Our chiller is equipped with wheel, which makes it easier for installation and operation; the front wheel could be locked to secure the unit. Avoid voltage drops by using properly grounded power outlets wired with 14 gauges or larger diameter wire. If possible, be close to the power distribution panel. Using an extension cord may cause low line voltage problems, the voltage loss should be with 10% from the extension cord if this is inevitable.

The heating discharged by the fan is 1.4 times than the rated cooling capacity, so the air- draft and air discharge side shouldn't be too close to wall. The air discharge side should reserve at least 0.8m, the installation site should ventilate well, the air-draft and air discharge volume of the site should be a bit large than the chiller, or use air-condition with larger cooling capacity than the heat discharge of the chiller to cool the installation site.

3.3 Power connection

Make sure the power wire rightly connected and current, frequency should be match with the requirements marked on the label which was pasted on the back of the chiller.

3.4 Connection accessories

Process pipeline

There are 2 inner thread interfaces for water pipe connection and water inlet and outlet adapter is designed for connecting the accessories and working pipeline.

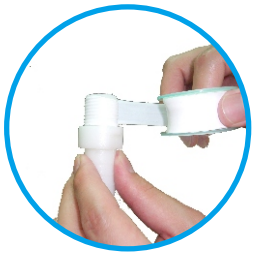
为确保安全的工作场所并避免液体泄漏，在选择软管和接头时应格外小心。
用户应负责连接到冷水机的软管和配件与液体的温度和所要求的压力相匹配。
当冷水机与激光器相距2m以上时，要把连接软管管径加大，否则管阻偏大影响水流量。
如果环境温度高、湿度大,则建议把连接管道做保温处理。

激光冷水机水过滤器安装示意图

Water inlet & outlet installation diagram：

PTFE seal tape

PVC connection



1.First wrap 3-4 circles as shown above;

2. Strain the seal tape and twist around the connection 7-8 circles;

3. Stretch the seal tape to its normal width,then wrap the connection for 3-4 circles,tighten up the seal tape before installation;screw the connection gently in order to avoid PVC connection break.