

Laboratory Chiller

Contents Table

- ▷ 1.What is Laboratory Chiller?
- ▷ 2. How Does Laboratory Water Chiller Work?
- ▷ 3.What's the Difference Between Air-cooled & Water-cooled Laboratory Chillers?
- ▷ 4.What Are The Main Components of Laboratory Water Chillers?
 - 4.1 Compressor
 - 4.2 Evaporator
 - 4.3 Water Pump
 - 4.4 Condenser
 - 4.5 Controller Panel
- ▷ 5.What are the Key Features of a Laboratory Chiller?
- ▷ 6.How to Choose Right Laboratory Chiller for Your Laboratory Process?
- ▷ 7.Get a Quote on Industrial Laborator Water Chillers Now

Tongwei Chiller is specialized in manufacturing [packaged chiller](#) and [portable chiller](#) to reduce the temperature of laboratory process.

Now, we have installed many chillers in laboratory cooling where our experience and expertise are meeting the needs of Laboratory process around the world.

We can also custom design and manufacture lab recirculating chiller to meet your specific needs.If you need a industrial recirculating water chiller for a different Laboratory process? **Contact Us**—we're here to help.



Laboratory Working

1.What is Laboratory Chiller?

Laboratory chiller, which is also called lab equipment chiller or lab recirculating chiller or recirculating water chiller , is a type of cooling water that can provide constant temperature, constant flow, and constant pressure to laboratory equipment. This laboratory equipment cools materials by removing heat from a liquid through a compressed vapor device or an absorption refrigeration cycle.The convenience and accuracy of laboratory chillers are becoming more and more common in laboratories.



Small Laboratory Water Chiller

2.How Does Laboratory Water Chiller Work?

Laboratory recirculating Chiller is an important cooling equipment used to cool laboratory instruments.

It works on the principle of vapor absorption and vapor compression.

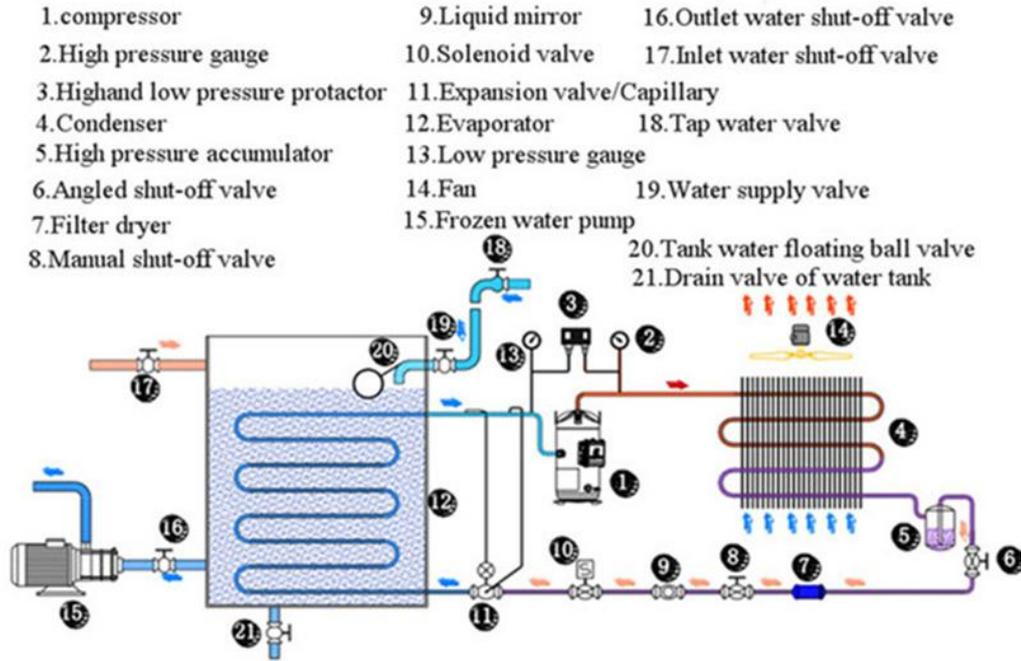
A lab recirculating water chiller provide a constant flow of coolant to a water system at a specific temperature.

The coolant in the chilled water is then sent to your application to remove the heat from it.

When the heat is removed, then the water becomes very hot and the hot water is then recirculated throughout the system.

It uses a mechanical vapor compression cooling system connected to a device called an evaporator.

Laboratory recirculating chillers use refrigerants that circulate throughout the systems to provide coolant.



3.What's the Difference Between Air-cooled & Water-cooled Laboratory Chillers?

There are two types of Laboratory water chiller: one is **air-cooled Laboratory chiller**, the other is **water-cooled Laboratory chiller**;

Air-cooled Laboratory chillers use ambient air to dissipate heat from the brewing processes. They are energy-efficient, space-saving, and less maintenance that helps save money.

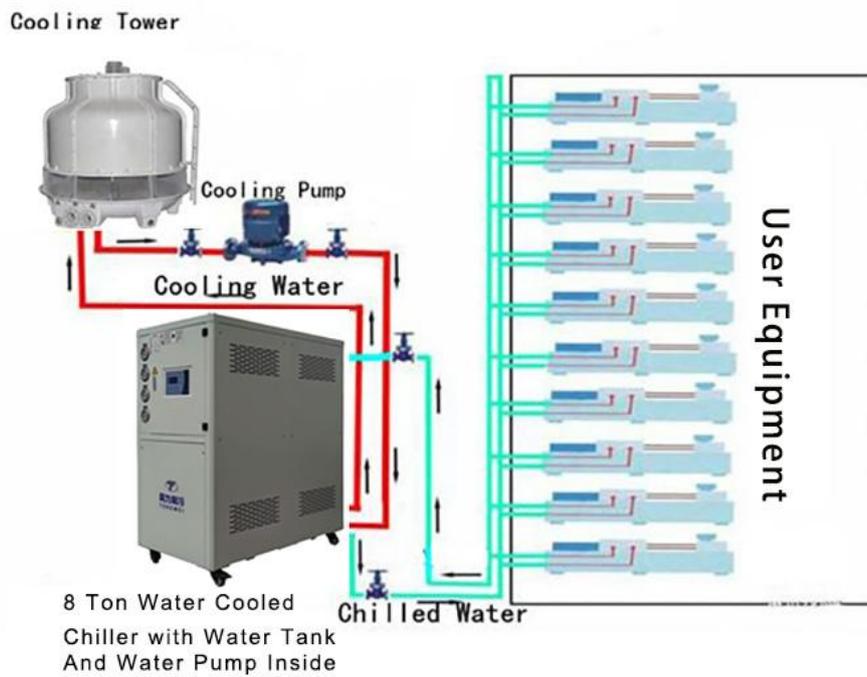
Water-cooled Laboratory chillers use water from an external water cooling tower to dissipate heat from the brewing processes. These systems are longer lifespan, Relatively quiet, and more consistent cooling performance than the air-cooled Laboratory chiller.

Air Cooled Chiller Installation Drawing



Air-cooled Laboratory Chiller Installation Drawing

Water Cooled Chiller Installation Drawing



Water-cooled Laboratory Chiller Installation Drawing



Air-cooled Laboratory Scroll Chiller



Water-cooled Laboratory Scroll Chiller

Should you choose an air-cooled or water-cooled Laboratorychiller? [Contact Us](#) for help determining the best solution for you.

4.What Are The Main Components of Laboratory Water Chillers?

4.1 Compressor

The compressor is the key mover in Laboratory water chiller because it produces pressure variations to stir the refrigerant around.

From 1/2HP(1/2 Ton) to 60HP(5oTon) Laboratorychiller , which is with **Panasonic** or **Danfoss** brand **Scroll** compressor ,



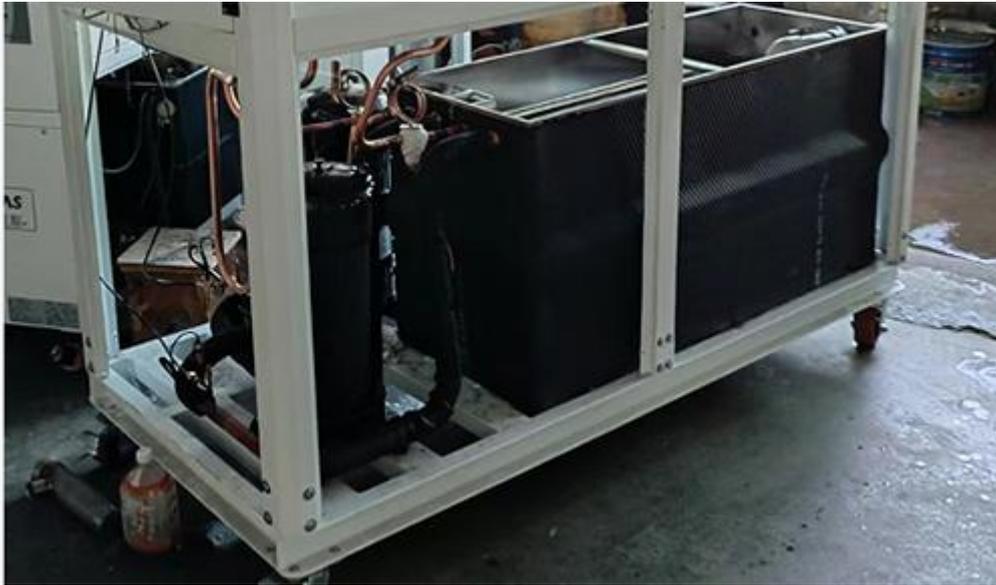
Panasonic Compressor



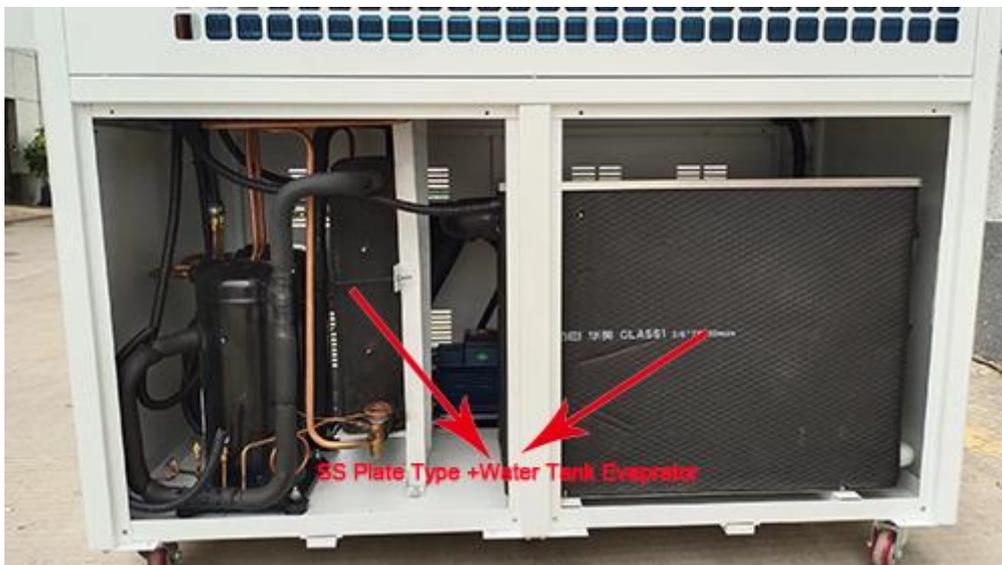
Danfoss Compressor

4.2 Evaporator

The evaporator is a crucial component of air-cooled Laboratory water chiller, as it is responsible for extracting heat from the liquid being cooled, it is located between the compressor and the expansion valve. There are three types of evaporators : **coil in water tank evaporator** , **shell and tube evaporator**, **304SS stainless steel plate type evaporator**.



Coil in SS Water Tank Evaporator



SS Plate Type+ Water Tank Evaporator



Shell and Tube Evaporator

4.3 Water Pump

The water pump is designed to increase the pressure and the flow of the chilled water in a closed space.



Water Pump



High Pressure Water Pump

4.4 Condenser

The condenser for air-cooled Laboratory cooler is equipped with efficient cross-seam fins and female threaded copper tubes for high heat exchange efficiency and good stability. Its function is to cool down the refrigerant steam released from the compressor into a liquid or gas-liquid mixture.



Aluminum fin+fan Condenser for air-cooled Lab chiller

The condenser for water-cooled Laboratory cooler is shell and tube, with the internal copper tubes employing an outer thread embossing process. This design effectively enhances the heat exchange efficiency between the refrigerant and water during the process. Compared to traditional smooth

copper tubes, the outer thread embossing process increases the surface area of the copper tubes, thereby expanding the contact area for heat exchange and improving the thermal conductivity of the condenser. This optimization design allows the condenser of the water-cooled chiller to transfer heat from the refrigerant to the water more rapidly and consistently, enabling the water to carry away the heat.



Shell and tube Condenser for water-cooled Laboratory chiller

4.5 Controller Panel

Laboratory Water chillers use precision digital temperature controller, it RS485 communication port, which can do remote monitoring and control. Simple operation, low failure rate, high safety factor, easy installation.



Controller Panel

5. What are the Key Features of a Laboratory Chiller?

- Energy-efficient Panasonic/Danfoss compressor
- Water filters for water cleaning
- Chilled Outlet water temperature control 7°C to 25°C
- Precise temperature controller
- Environment-friendly refrigerant R407c/r410a
- PID temperature controller
- Easy installation ,operation and low cost of maintenance
- 304 Stainless Steel Coil in SS water tank as evaporator

6.How to Choose Right Laboratory Chiller for Your Laboratory

Process?

How to calculate right cooling capacity for your lab recirculating chillers?

One of the most frequently ask about how we can know the cooling capacity for chillers.

The range of a chiller at which it can discharge heat from a heated fluid is called cooling capacity.

The cooling capacity of a LaboratoryChiller ranges from 1/2KW to 50KW.

Let's see the below formula.

Cooling Capacity(kw)= Flow Rate(m³/h)*Temp Change(T1-T2)/0.86

Heat Load= C(specific heat)* M(quality output per hour)*Temp Change(T1-T2)

Oversize the chiller by 20% Ideal Size in KW = KW x 1.2

Noted : T1:Incoming Water Temperature (°C) T2:Required Chilled Water Temperature(°C)

For example, what size of chiller is required to cool 5m³ water from 25°C to 15 °c in 1 hour?

Temperature Differential = 25°C-15°C=10°C

Water Flow Rate = 5 m³/hour

Cooling Capacity in KW = 5 x 10 ÷ 0.86 = 58,14 KW

Oversize the chiller = 58.14 x 1.2 = 69.76 KW

69.96kw cooling capacity for chiller is required.

Types of Lab circulating chiller system?

There are two types of chiller :**Air Cooled Laboratory Chiller** and **Water Cooled Laboratory**

Chiller.

Water cooled chiller needs a separated water cooling tower and water cooling pump ,if you don't have existing water cooling tower,we suggest you use air cooled chiller; But if your ambient temperature is very high above 55°C ,we suggest you use water cooled chiller , as it is easier to dissipate heat for water cooled chiller with water cooling tower.

Whether chillers need built-in Tank or not?

In a chiller system, a tank is usually equipped to buffer the thermal load of the chiller.

But should we choose a built-in type of tank or an external type of tank?

A chiller with a built-in tank is easier to install and can be used simply by connecting a water pipe to your application.

But it has a limited capacity and is not suitable for applications with larger chilled water demands.External tank's capacity can be customized according to specific needs.

It can buffer a larger heat load, store more chilled water, but the installation will be more troublesome.

If you don't have external water tank ,we suggest our chiller built-with water tank ,which is easy for you to install.

Cooling capacity unit conversion?

1 KW=860 kcal/h ;

1 TON=3.517 KW;

1 KW=3412 Btu/h;

7.Get a Quote on Industrial Laborator Water Chillers Now

We engineer and produce high-quality process chillers compatible with a broad range of industrial processes.

Depending on your needs, we also offer *custom chillers* to ensure that each client receives the industrial chiller best suited to their unique process.

[Request a quote now](#) on our Laboratory water chillers or learn about the other *air-cooled chillers* and *water-cooled chillers* we offer.