Pharmaceutical Chillers

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1.What is A Pharmaceutical/Medical Chiller?

Pharmaceutical Chillers are cooling machines providing low-temperature cooling water, reduce the temperature of pharmaceutical cooling processing.

The pharmaceutical industry prepares medicines by processing through different heating and cooling parameters as blending, extrusion, mixing firmly adjusted by the unique efficient working of Pharmaceutical Chiller.

Pharmaceutical /Medical Chiller

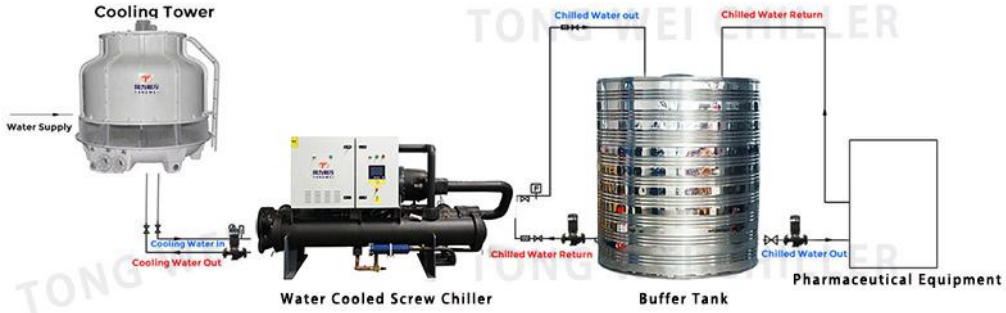
2.Why Pharmaceutical Industry Need Chillers?

Pharmaceutical chillers are reliable refrigeration solutions with constant cooling output,which are used for thermostatic and temperature control in the pharmaceutical industry.Depending on the form of the final drug product, factories use different manufacturing processes to produce their products, such as blenders, extrusion or hot-melt extrusion equipment, mixers, or jacketed vessels. In the manufacturing process, almost every process requires heating, cooling or both, so temperature control is one of the most important steps in the pharmaceutical production process, which is why chillers for pharmaceutical production are the best choice for pharmaceutical cooling best solution.

Pharmaceutical Process

3.How Does A Pharmaceutical Chiller Work?

Air-Cooled Pharmaceutical Chiller installation



Water-Cooled Pharmaceutical Chiller installation

4.What's the Difference Between Air-cooled & Water-cooled Pharmaceutical Chillers?

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

Air-cooled Pharmaceutical 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 Pharmaceutical 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 Pharmaceutical chiller.

Should you choose an air-cooled or water-cooled Pharmaceutical chiller? *Contact Us* for help determining the best solution for you.

5.What is the Difference Between Pharmaceutical Scroll Chiller and PRT Screw Chiller?

Pharmaceutical Scroll Chiller	**Pharmaceutical Screw Chiller**
▪1/2HP-60HP(2KW-170KW)	Above 60HP(Above 170KW)
▪Danfoss/Panasonic Scroll Compressor	Hanbell/Bitzer Screw compressor
▪Built with water tank and water pump	Without water tank and water pump

Air-cooled Pharmaceutical Scroll Chiller

Air-cooled Pharmaceutical ScrewChiller

6.What Are The Main Components of Pharmaceutical Chillers?

6.1 Compressor

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

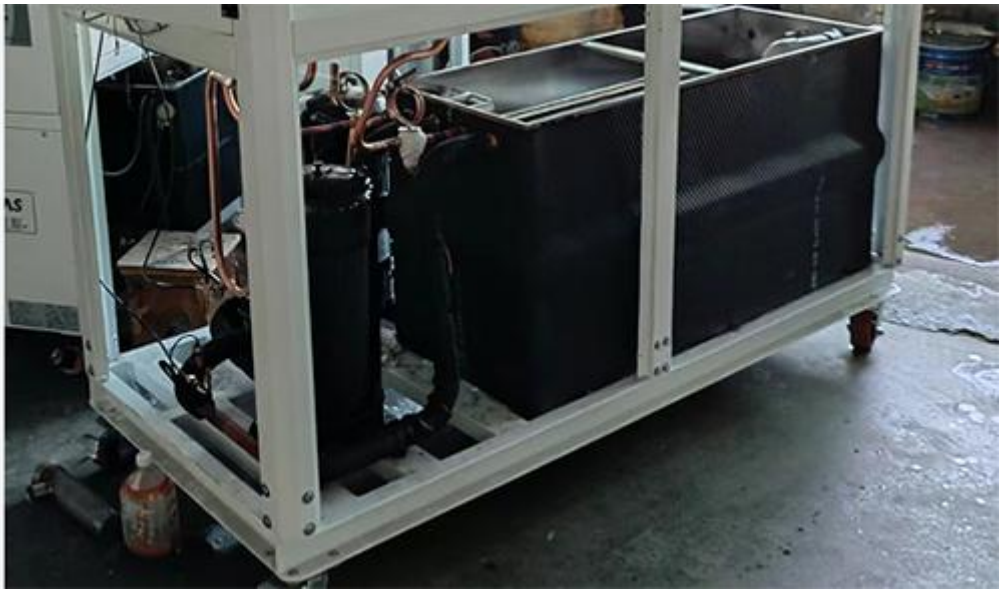
From 1/2HP(1/2 Ton) to 60HP(5oTon) waterjet cutting chiller , which is with **Panasonic** or **Danfoss brand Scroll compressor** ,

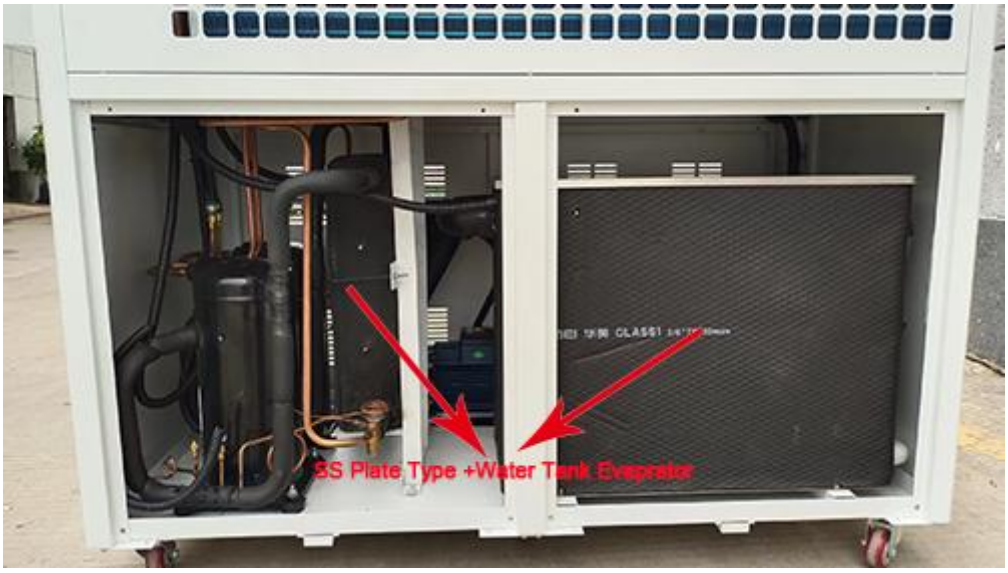
Panasonic Compressor

Danfoss Compressor

6.2 Evaporator

The evaporator is a crucial component of air-cooled 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.**



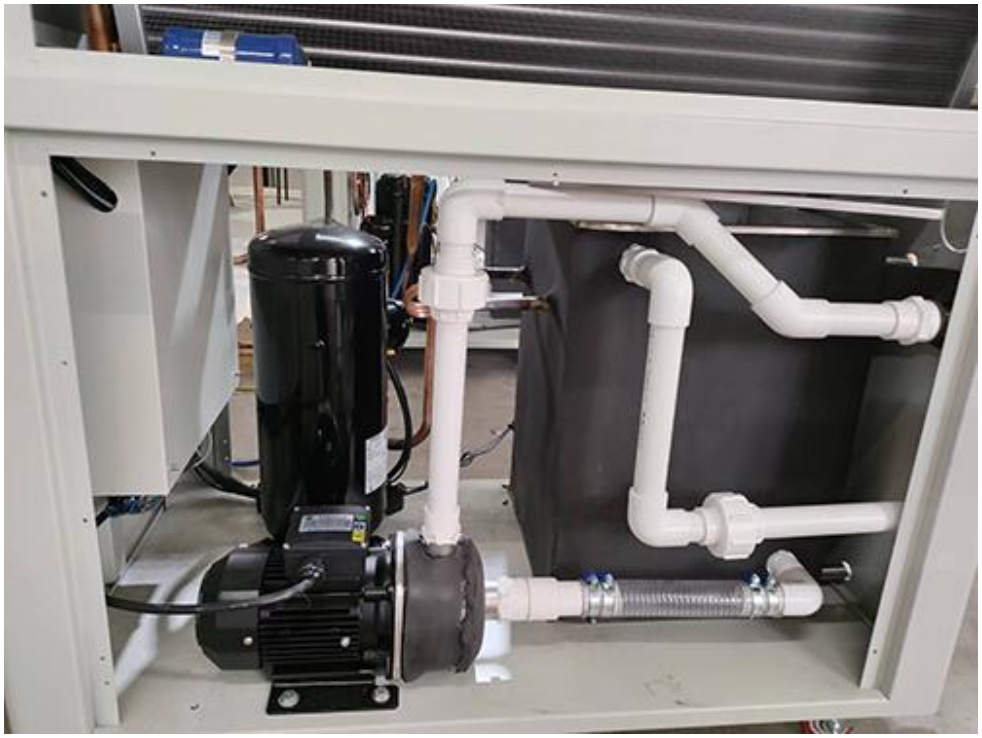


SS Plate Type+ Water Tank Evaporator

6.3 Water Pump

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

Pharmaceutical Chiller is used with 304 Stainless Steel Water pump.



Water Pump

6.4 Condenser

The condenser for air-cooled Pharmaceutical 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 Pharmaceutical chiller

The condenser for water-cooled Pharmaceutical 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 Pharmaceutical chiller

6.5 Controller Panel

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

7. What are the Key Features of a Pharmaceutical Chiller?

- Energy-efficient Panasonic/Danfoss/Hanbell/Bitzer compressor
- 304 Stainless steel water pump
- Chilled 0utlet water temperature control 7℃ to 25℃
- 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 /Shell And tube as evaporator

8.How to Choose Right Pharmaceutical Chiller for Your Pharmaceutical Process?

How to calculate right cooling capacity for your Pharmaceutical 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 laser Chiller ranges from 1/2KW to 100KW.

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 (℃) T2:Required Chilled Water Temperature(℃)

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

Temperature Differential = 25℃-15℃=10℃
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 Pharmaceutical chiller system?
There are two types of chiller :**Air Cooled Pharmaceutical Chiller** and **Water Cooled** Pharmaceutical **Chiller**.
Water cooled chiller needs a separated water cooling tower and water cooling pump ,if you don't have exsiting water cooling tower,we suggest you use air cooled chiller; But if your ambiemt temperature is very high above 55℃ ,we suggest you use water cooled chiller , as it is easier to dissipate heat for water cooled chiller with water cooling tower.
But Most customers use air cooled Pharmaceutical chiller ,which is more easily install and save space.

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;

9.Get a Quote on Industrial Pharmaceutical Chillers Now

As a leading *industrial chiller manufacturer*,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 Pharmaceutical water chillers or learn about the other *air-cooled chillers* and *water-cooled chillers*.