Deionized Chillers

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1.What Is Deionized Water?

Deionized(DI) water, which is water that has had mineral ions removed through a deionization process. The process involves passing water through specially designed equipment containing ion exchange resins or membranes.

In natural water sources such as rivers, lakes, and groundwater, the water contains various dissolved ions, including minerals such as calcium, magnesium, and sodium. These ions increase water hardness and can affect industrial processes, scientific experiments, and sensitive equipment.

The deionization process consists of two main steps:

Cation exchange: In this step, water passes through a resin bed containing negative charge exchange sites. These exchange points attract and remove positively charged ions (cations) such as calcium, magnesium, and sodium, replacing them with hydrogen ions (H+).

Anion exchange: After cation exchange, the water passes through another resin bed with positively charged exchange sites. These sites attract and remove negatively charged ions (anions) such as chloride, sulfate, and bicarbonate, replacing them with hydroxyl ions (OH-).

The end result is deionized water that is almost completely free of dissolved ions. However, it is important to note that although deionized water is highly purified, it may still contain trace amounts of non-ionic contaminants (e.g., organic compounds) and may not be suitable for all

applications.

Deionzied, often referred to as Deionzied, is a simplified version of Deionzied in which a piece of plastic (various forms of HIPS (high impact polystyrene) for low impact products, or ABS for bathroom shower trays, and HDPE for exterior vehicle parts, and various other types The Deionzied material) is heated to molding temperature, stretched onto a single-surface mold, and forced against the mold by vacuum. This process can be used to turn plastic into permanent objects such as toll road signs and protective covers. There is usually a draft angle (recommended minimum of 3°) in the mold design to facilitate the removal of the molded plastic parts from the mold.

The Deionzied process can be used to make most product packages, speakers and even car dashboards.

2.What is A Deionized Chiller?

"Deionized chiller" generally refers to a cooling system designed for used in processes or applications that require the use of deionized (DI) water. Deionized water is water that has had mineral ions removed through a deionization process, making it highly purified and free of dissolved ions.

In many industrial and laboratory settings, especially in sensitive applications such as electronics manufacturing, pharmaceutical production and scientific research, it is crucial to use water that is completely free of ions to prevent contamination or interference with delicate processes or equipment.

A deionized water chiller is a refrigeration system specifically designed to cool or maintain the temperature of deionized water. It must meet certain standards to ensure compatibility with deionized water, which is chemically very pure. This often includes the use of materials and components that are non-reactive and will not contaminate water.

A Deionzied chiller is a specialized type of chiller machine designed specifically for use in Deionzied processes. It is a refrigeration system that provides controlled and precise cooling to the molds and equipment used in Deionzied operations.

Deionzied chillers work by circulating coolant through the cold side of the process water system, removing excess heat from the mold and transferring the heat to the surrounding environment.

When it comes to cooling your Deionzied process, quality and reliability should be your top considerations when choosing the right Deionzied chiller.

Deionzied Chiller

3.Why NeedA Industrial Chiller Used In Deionzied Process?

In the micromachining industry, very small and delicate parts are cut using EDM (Electrical Discharge Machining), where electrodes are used to cut and shape these delicate parts. This is a highly precise process where the cut pieces are constantly exposed to a dielectric solution to keep the cut pieces from cutting. This process itself takes its toll on these parts, as they are constantly subjected to contraction and expansion from extreme temperature changes as the workpieces are flushed to remove cutting debris.

By implementing a deionization chiller, you can continuously provide deionized water solutions to enhance machine cutting capabilities and produce high-precision micromachined parts. As the name suggests, these coolers use deionized water, removing any impurities including;

- calcium
- magnesium
- Sulfate
- iron
- hydrogen
- sodium
- silicon
- chloride
- carbonate

- Nitrate
- Hydroxyl

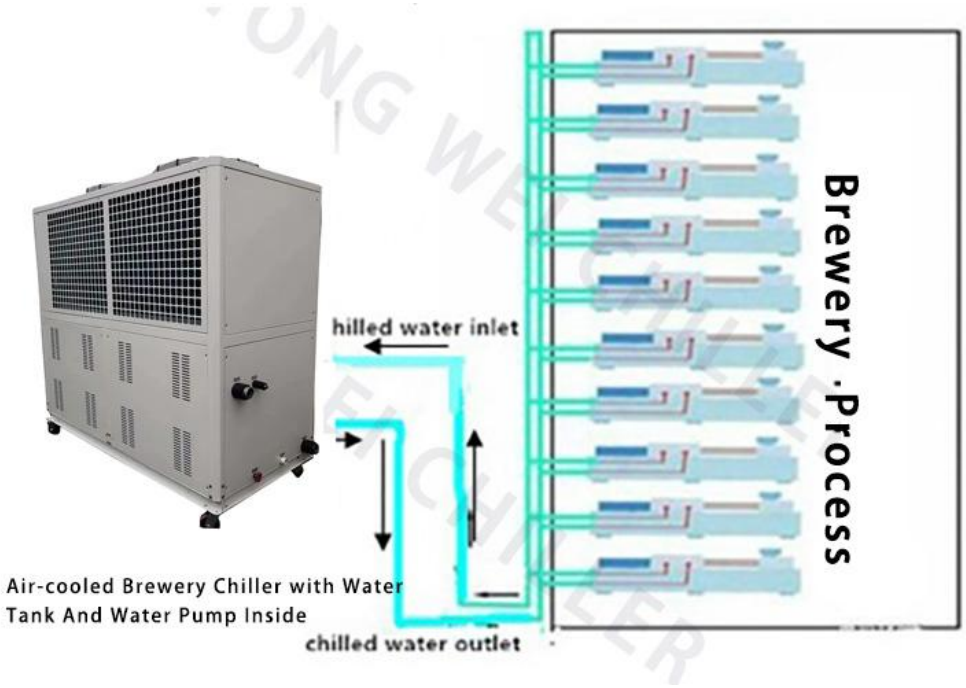
By eliminating these elemental ions, deionized water can be used in high-voltage applications because it resists the flow of electrical current. Deionized water is highly corrosive to stainless steel and should only be used in deionized water chillers.

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

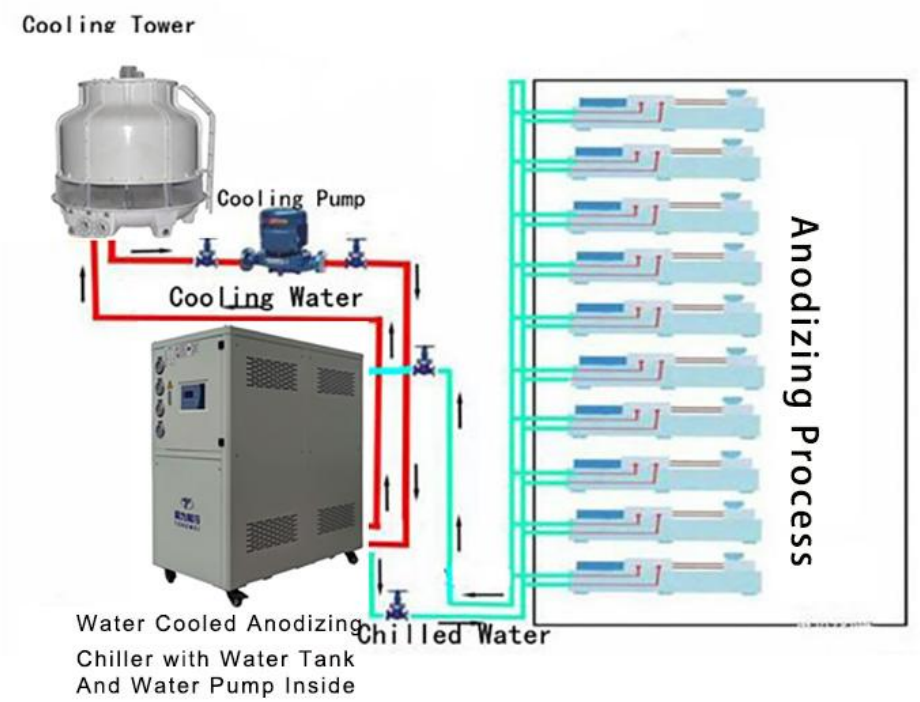
There are two types of Injection Moldingchiller: one is **air-cooled Deionzied chiller** ,the other is **water-cooled Deionzied chiller** ;

Air-cooled Deionzied 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 Deionzied 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 Deionziedchiller.



Air-Cooled Deionzied Chiller installation



Water-Cooled Deionzied Chiller installation

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

5.What Are the Differences Between Deionzied Scroll Chiller and Deionzied Screw Chiller?

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

Air-cooled Deionzied Scroll Chiller

ir-cooled Deionzied Screw Chiller

Water-cooled Deionzied Scroll Chiller

Water-cooled Deionzied Screw Chiller

6.What Are The Main Components of Deionzied 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) Deionzied chiller , which is with **Panasonic** or **Danfoss brand Scroll compressor** ,

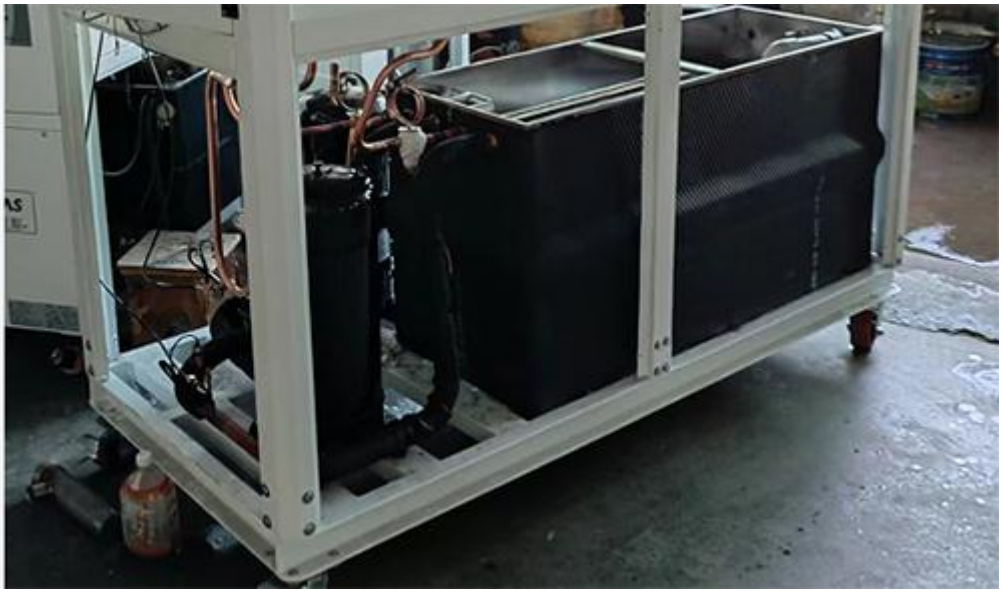
Above 60HP Deionzied chiller,which is with **Hanbell** or **Bitzer screw compressor**;

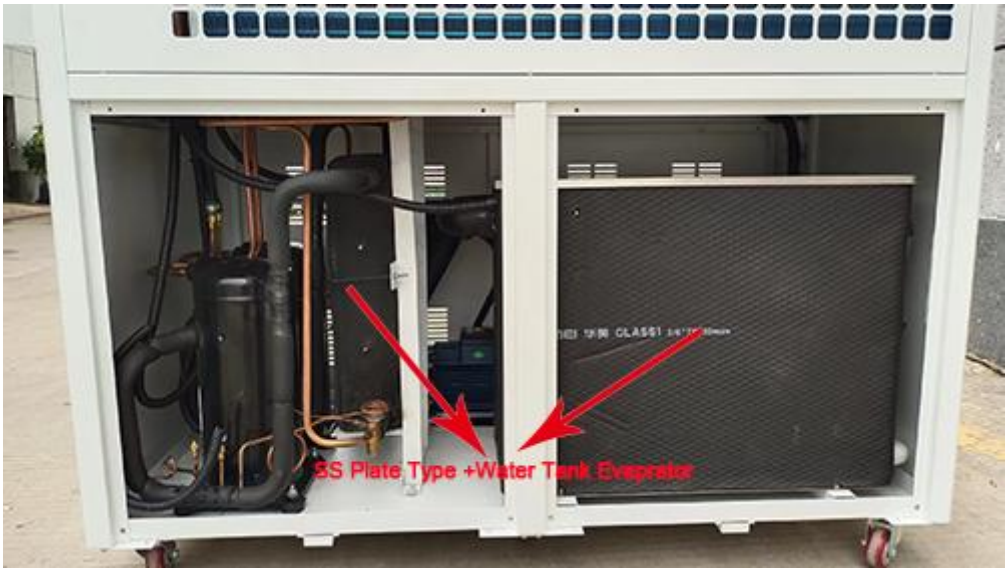
Panasonic Compressor

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.**

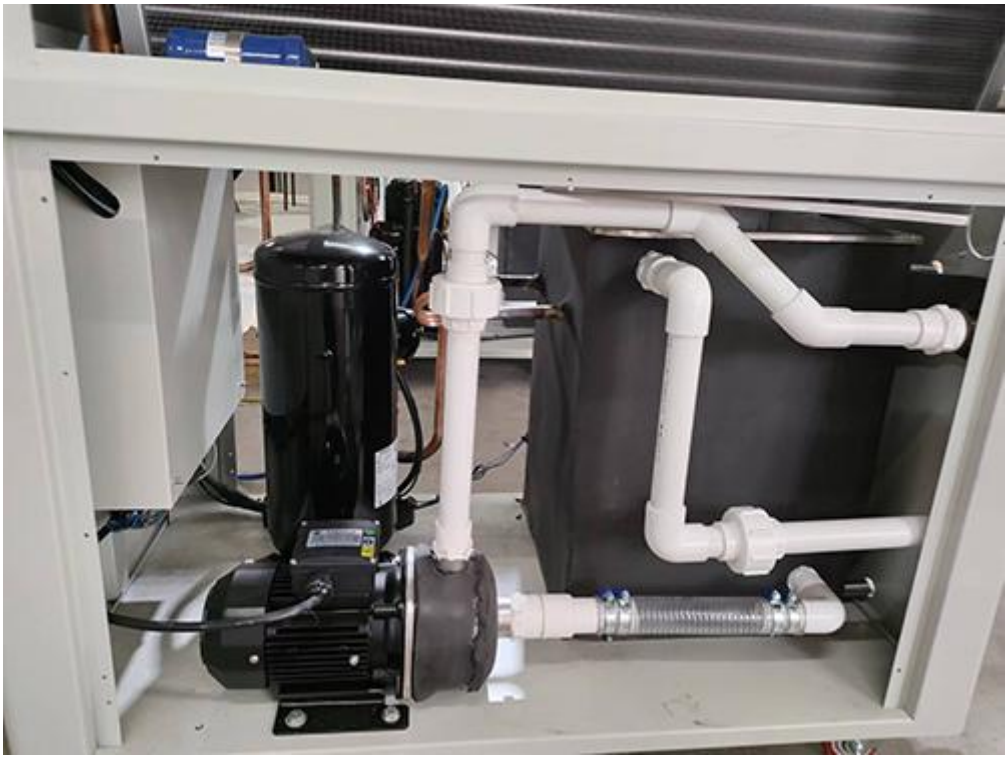




SS Plate Type+ Water Tank Evaporator

6.3 Water Pump

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



Water Pump

6.4 Condenser

The condenser for air-cooled Deionzied 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 Deionziedchiller

The condenser for water-cooled Deionzied 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 Deionziedchiller

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 Deionzied Chiller?

- Energy-efficient Panasonic/Danfoss/Hanbell/Bitzer compressor
- 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.What Application Does Deionzied Water Chiller Use In ?

By using this high-purity water, which has no ability to conduct electrical current, you can provide an extra layer of protection for very expensive and delicate materials. Deionzied chiller create an ideal situation where accurate laboratory results are crucial, as well as saving energy and providing a constant operating temperature for processing workpieces, for example;

- glass manufacturing
- car engine
- aquarium
- Pressure cleaning equipment
- fire extinguisher
- industrial machinery

- Biotechnology
- pharmaceutical
- EDM and laser
- laboratories

Do you need a deionzied chiller for an application not mentioned here? *Contact us* and we'll customize an affordable solution for your exact demands.

9.How to Choose Right DeionziedChiller for Your Deionzied Process?

How to calculate right cooling capacity for your Deionzied 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 Injection Moldingchiller system?

There are two types of chiller :**Air Cooled Deionzied Chiller** and **Water Cooled** Deionzied **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 Injection Moldingchiller ,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;

10.*Get a Quote* on Industrial Deionzied 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 deionized water chillers or learn about the other *air-cooled chillers* and *water-cooled chillers*.