

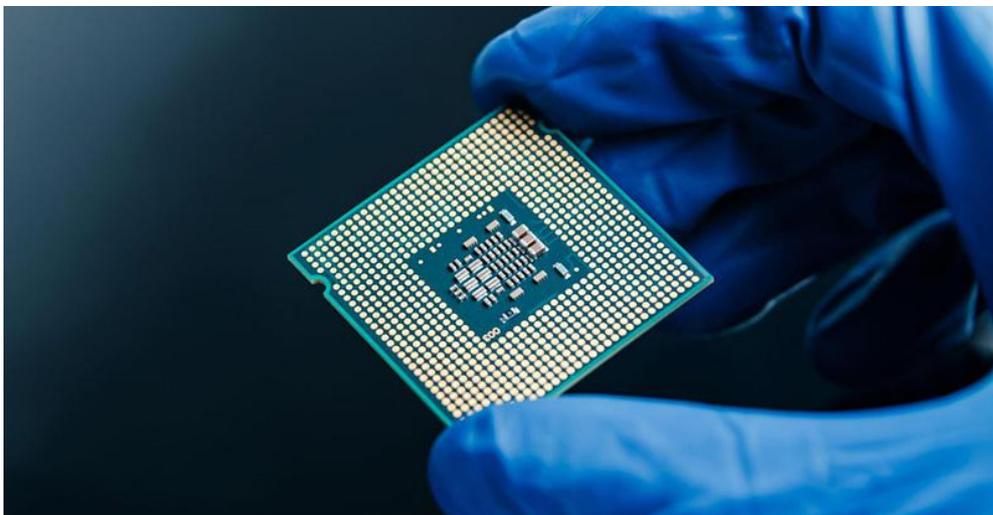
Semiconductor Chillers

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It is known that the semiconductor industry has certain standards for temperature control, and if these standards are met, higher yields will be achieved during rapid thermal processing of silicon wafers. We can design semiconductor chillers to meet this rigorous challenge and provide continuous cooling in a standard temperature range of +5° to +30°C. Featuring a low profile design, high quality non-bonding locking casters, the Semiconductor chillers offers a small footprint, superior performance and unparalleled reliability.

We can also custom design and manufacture water chillers to meet your specific needs.If you need a semiconductor chiller for your semiconductor process? [Contact Us](#)—we're here to help.



1.what is A Semiconductor Chiller ?

Semiconductor chiller are special types of refrigeration system used to cool equipment during the semiconductor production process.

Some semiconductor machines you can cool with a semiconductor chiller include:

Scanning lithography machine

Micro-nano coordinate measuring machine

scanning probe microscope

Ultra-precision instruments



Semiconductor Chiller

2.What's the Difference Between Air-cooled & Water-cooled

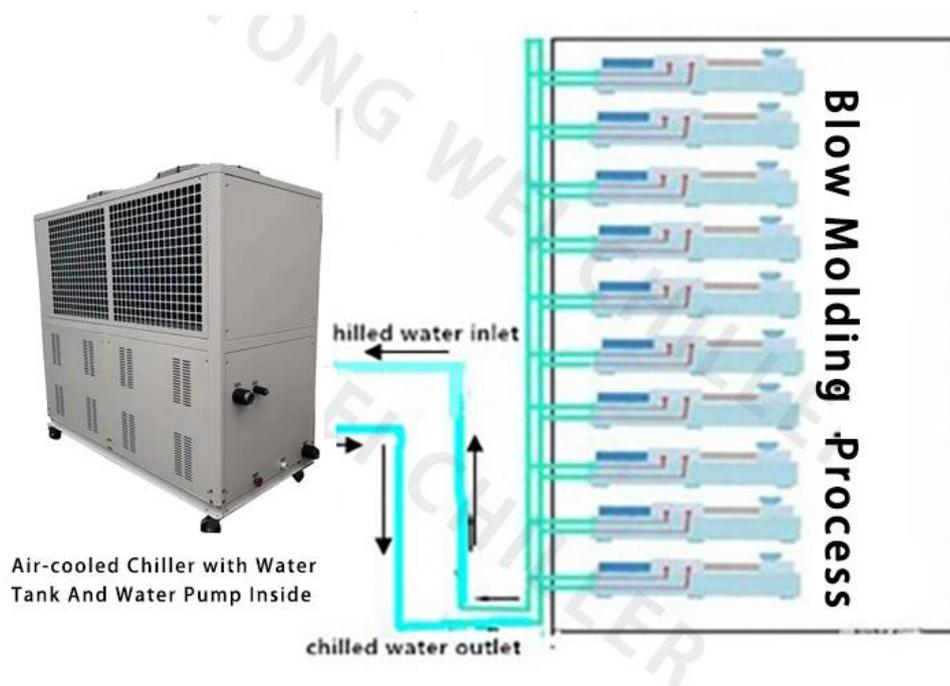
Semiconductor Chillers?

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

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

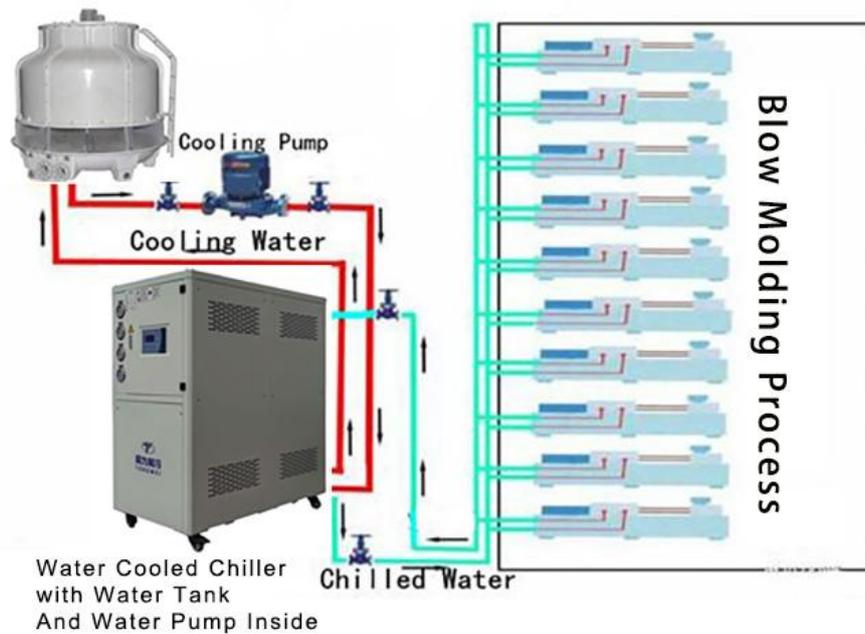
Water-cooled Semiconductor chillers use water from an external water cooling tower to

dissipate heat from the brewing processes. These systems are longer lifespan, Relatively quiet, and more consistent cooling performance than the air-cooled Semiconductor chiller.



Air-Cooled Semiconductor Chiller installation

Cooling Tower



Water-Cooled Semiconductor Chiller installation

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

3.What Are the Differences Between Semiconductor Scroll Chiller and Semiconductor Screw Chiller?

Semiconductor Scroll Chiller

- 1/2 HP-60HP (2KW-170KW)
- Danfoss/Panasonic Scroll Compressor
- Built with water tank and water pump

Semiconductor Screw Chiller

- Above 60HP(Above 170KW)
- Hanbell/Bitzer Screw compressor
- Without water tank and water pump



Air-cooled Semiconductor Scroll Chiller



Air-cooled Semiconductor Screw Chiller



4.What Are The Main Components of Semiconductor Chillers?

4.1 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(50Ton) Semiconductor chiller , which is with **Panasonic** or **Danfoss brand Scroll compressor** ,

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



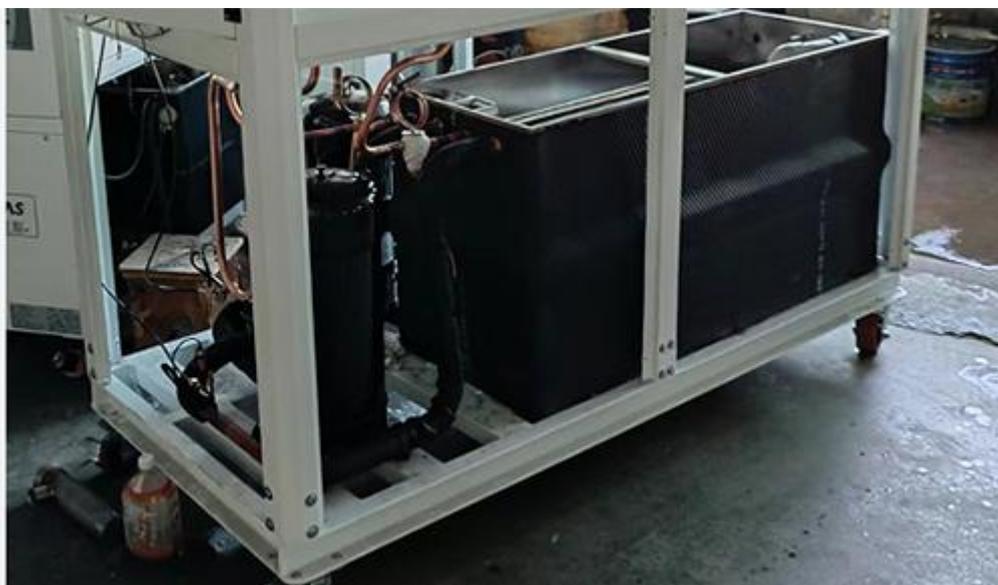
Panasonic Compressor

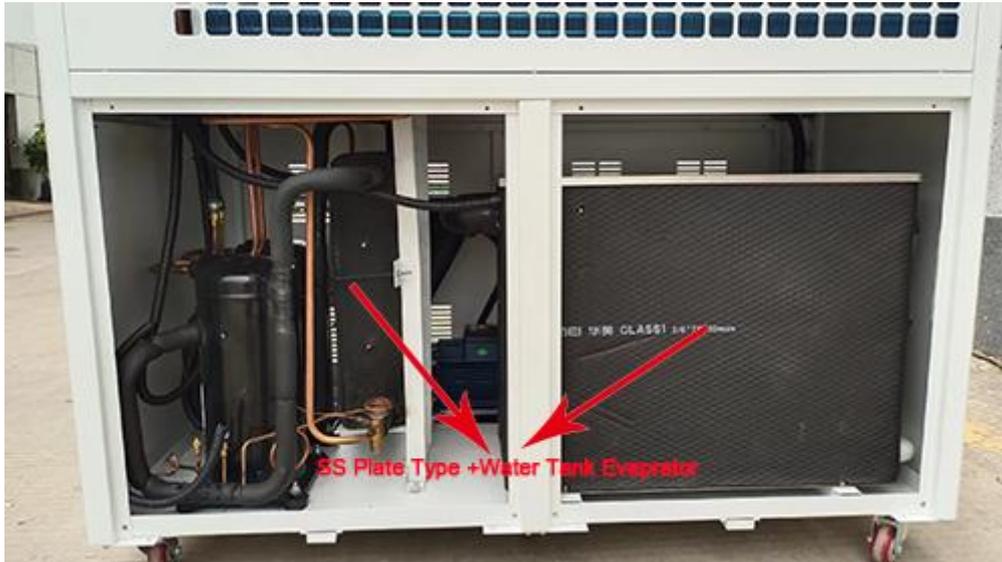


Danfoss Compressor

4.2 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

4.3 Water Pump

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

Semiconductor Chiller is used with 304 Stainless Steel Water pump.



Water Pump

4.4 Condenser

The condenser for air-cooled Semiconductor 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 Semiconductor chiller

The condenser for water-cooled Semiconductor 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 Semiconductor chiller

4.5 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

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

- Energy-efficient Panasonic/Danfoss/Hanbell/Bitzer compressor
- 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 /Shell And tube as evaporator

6.How to Choose Right Semiconductor Chiller for Your Semiconductor Process?

How to calculate right cooling capacity for your Semiconductor 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 (°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 Semiconductor chiller system?

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

But Most customers use air cooled Semiconductor 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



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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 Semiconductor 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 Semiconductor water chillers or learn about the other *air-cooled chillers* and *water-cooled chillers*.