

# CNC Chiller

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Tongwei Chiller is specialized in manufacturing [\*packaged chiller\*](#) and [\*portable chiller\*](#) to reduce the temperature of CNC machine.

Now, we have installed many chillers in CNC machine cooling where our experience and expertise are meeting the needs of CNC industry around the world.

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



*CNC Machine*

## 1.What is CNC Chillers ?

CNC chillers or CNC Spindle water chillers are circulating water chillers suitable for cooling CNC spindles and CNC machines.

The heat from rotating spindles of the CNC machine is firstly collected and finally discharged from the system by chilled water or ambient air over the condenser.

Constant cooling supply to spindles by CNC Chiller can provide a stable and accurate temperature for the spindle equipment, keep the spindle within a suitable temperature range, and extend the service life, saving economic costs.

## 2.What's the Difference Between Air-cooled & Water-cooled CNC Chillers?

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

**Air-cooled CNC 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 CNC 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 cnc chiller.

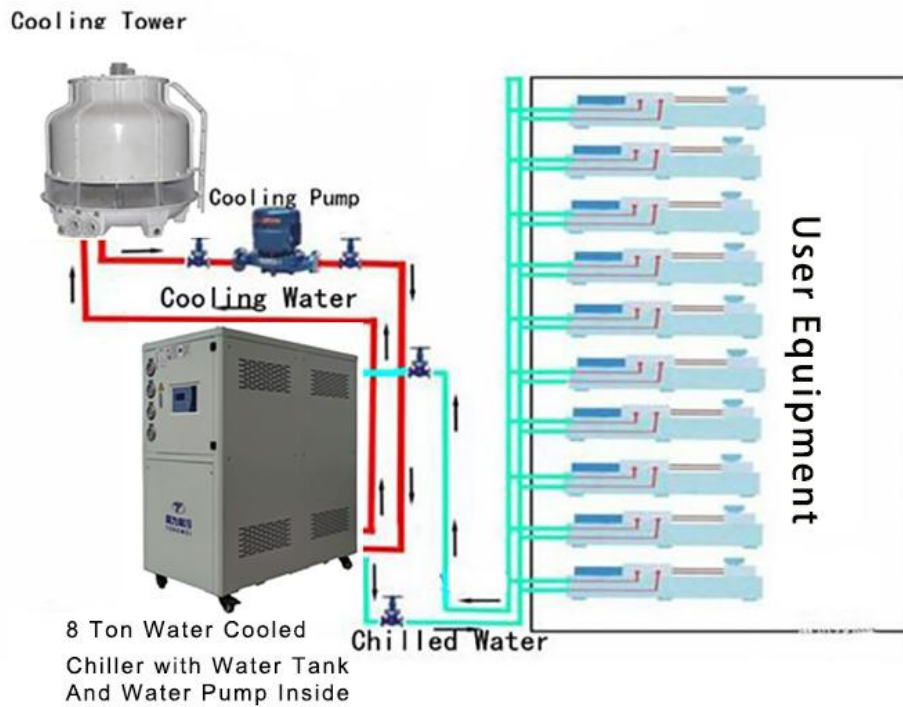
**Air Cooled Chiller Installation Drawing**



**Chiller Built with Water Tank Inside**

*Air-cooled CNC Chiller Installation Drawing*

## Water Cooled Chiller Installation Drawing



## Water-cooled CNC Chiller Installation Drawing



*Air-cooled CNC Scroll Chiller*



*Water-cooled CNC Scroll Chiller*

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

### 3.What Are The Main Components of CNC Chillers?

#### 3.1 Compressor

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

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



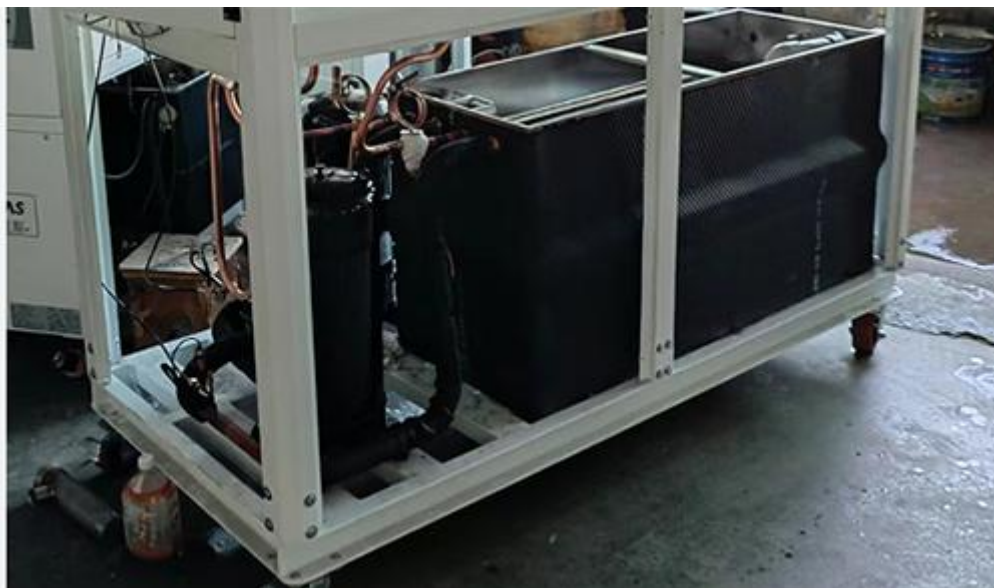
*Panasonic Compressor*

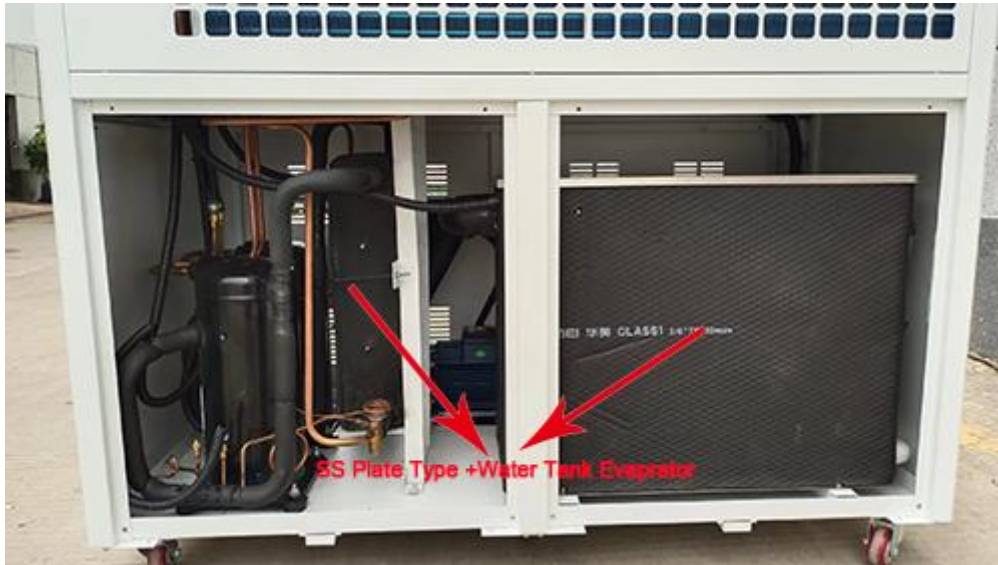


*Danfoss Compressor*

### 3.2 Evaporator

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



*Shell and Tube Evaporator*

### 3.3 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*

### 3.4 Condenser

The condenser for air-cooled CNC chiller 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 brewery chiller*

The condenser for water-cooled CNC chiller 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 CNC chiller*



### 3.5 Controller Panel

CNC 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*

## 4. What are the Key Features of a CNC 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
- PHE type efficient heat exchanger

## 5.How to Choose Right CNC Chiller for Your CNC Process?

### How to calculate right cooling capacity for your CNC 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 CNC Chiller ranges from 2KWto 50KW.

Let's see the below formula.

Cooling Capacity(kw)= Flow Rate(m<sup>3</sup>/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 5m<sup>3</sup> water from 25°C to 15 °c in 1 hour?

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

Water Flow Rate = 5 m<sup>3</sup>/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 CNC chiller system?

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

**6.Contact Us to Learn More About Our CNC Chillers**

Don't delay in making the best decision for your manufacturing business and your future by increasing your production capabilities with an cnc chiller. Contact us today for more information on a cnc chiller.

Our professional team will help you with any questions you have on our cnc chiller units. We look forward to hearing from you!