

# Thermojinn Containerized Ice Cooling Water TJ-ICW/CW Series

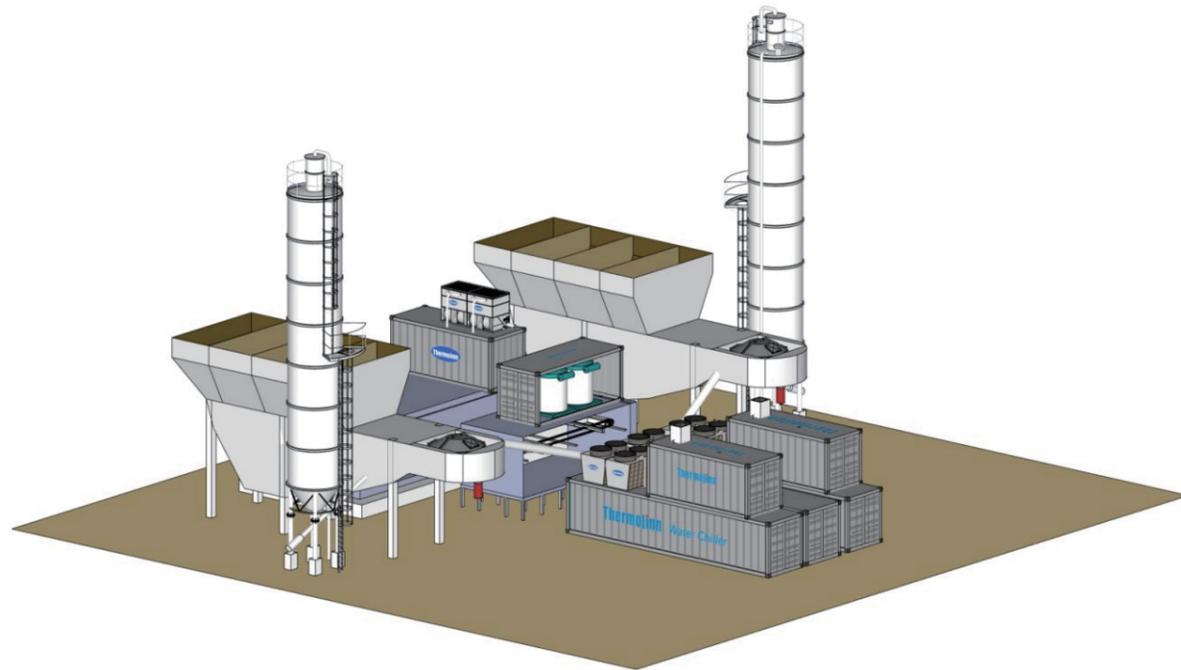


FUZHOU TENGJIE FUTURE TECHNOLOGY CO., LTD.

FU ZHOU THERMOJINN INTERNATIONAL TRADING CO., LTD

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During condensation and rigidification process of concrete, hydrated cement produces a large amount of hydration heat. When the heat accumulates, the temperature increase inside the concrete will become rapider. The concrete structure is thick and large, which has low thermal conductivity and makes the heat hard to emit, therefore, the temperature difference between the inside and the outside of the concrete is excessive and tensile stress comes up. When the tensile stress exceeds the current concrete ultimate tensile strength, the concrete surface will crack. Generally, the temperature difference between inner and outer part of the concrete should not exceed 25 °C, otherwise, there would be temperature crack to the concrete.



ThermoJinn focuses on research, manufacture and sales of the concrete cooling equipment. We have provided overall cooling and temperature reducing system for many famous sky scrapers, water conservancy projects, nuclear power projects, mines and so on. Our products mainly include ice-making system, water-chilling system and automatic flake ice storing and delivering system. ThermoJinn passed the certification of ISO900 quality system, ISO14001 environment management system and CE.

## THERMOJINN WATER CHILLER SYSTEM

ThermoJinn containerized chiller is convenient for transportation and installation. Adapt to various harsh environments. According to different application requirements, ThermoJinn chillers are mainly divided into two series: ice water system (0.5-1 °C); Cold water system ( $\leq 5$  °C). It is specially used for cooling concrete. The maximum design water inlet temperature can reach 45 °C, and it is applicable to different regions around the world.

## THERMOJINN WATER CHILLER SYSTEM FEATURES AND ADVANTAGES

- Special refrigeration system design and humanized automatic electrical system design ensure the normal and stable operation of the chiller under different working conditions.
- TLC series evaporative condenser, Special shape design, suitable for installation in containers. Double speed centrifugal fan, special-shaped coil design, efficient heat exchange effect, ensure stable and reliable operation of equipment.
- We adopt BITZER semi-hermetic piston and screw compressor, Germany. It is highly reliable. Service and components of BITZER compressor are available to you all around the world.
- The system adopts world famous brand refrigeration and electrical accessories. Ensure the high quality of equipment, facilitate maintenance, and easily obtain accessories locally.
- The evaporator adopts high-quality shell and tube type or plate exchange type, with high heat transfer coefficient, different water quality and easy maintenance.
- PLC fully automatic control, automatically adjust and control the compressor capacity according to the water temperature, improve efficiency and reduce energy consumption.

## MAIN FITTINGS OF WATER CHILLER

### Evaporative Condenser

ThermoJinn TLC Series Evaporative Condenser special design for Container installation.



- Modular design, convenient for installation and daily maintenance.
- Large heat exchange range , from 150kw to 1800kw.
- Double speed centrifugal fan, automatically adjusted according to the condensing pressure, with higher efficiency and lower energy consumption.
- The unique dimension design conforms to the container installation and transportation.

### Compressor Unit

We adopt BITZER semi-hermetic piston and screw compressor, Germany. It is highly reliable. Service and components of BITZER compressor are available to you all around the world.



- World famous brand, Widely used worldwide.
- High cooling capacity and low energy consumption.
- Low vibration, low noise and stable operation.
- Simple operation and easy maintenance.

### Shell & Tube and Plate Type Evaporator

ThermoJinn water chiller shell and tube evaporator uses the latest efficient heat exchange copper tube with high heat exchange coefficient, ensuring good refrigeration performance of the unit and meeting different water quality requirements.



ThermoJinn water chiller Plate type evaporator uses high quality stainless steel (SUS304&SUS316) plate, special welding process. The cooling capacity channel inside the evaporator is smooth and the surface is smooth. Suitable for working conditions with large flow and low outlet water temperature.

### Gauges and Control Components

All refrigeration valves and instruments required by the system, including globe valves, solenoid valves, etc. are selected from world famous brands, to ensure the most reliable performance of the equipment, the longest service life. Spare parts are available in the local market.



- World famous brand parts, easily available in the market.
- Precise control, improve efficiency and reduce energy consumption.
- Sensitive response to ensure stable operation of equipment.
- Easily realize automatic control and manual control switching.

## Switches and Control Panel

Manufacture and wiring of electric system both strictly conform to the International Electrotechnical Commission (IEC) standard. Moreover, it is equipped with best electric components available in market.

- The electric control system adopts international famous brands such as Siemens and Schneider.
- High quality, high precision, reduce equipment maintenance cost, and delay equipment service life.
- Fully automatic and precise control to improve the refrigeration performance of the system.



## Containerized Assembly

The water chilling system is installed in a new 20/40 feet container. This container is painted white both inside and outside for screening sun. Inside, there are necessary illumination and air conditioning devices installed and aluminum plates floored on the bottom.



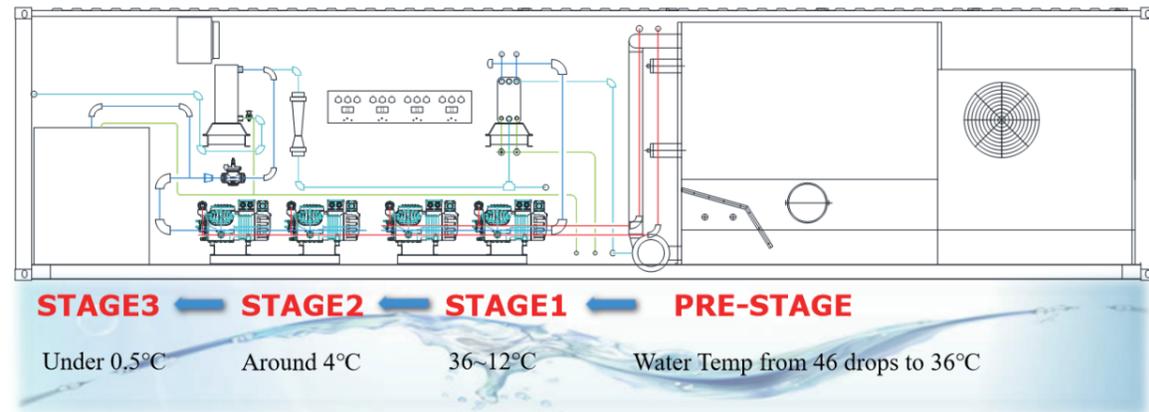
## GENERAL CHARACTERS OF WATER CHILLER

ThermoJinn water chilling system is containerized, which makes it convenient to move and suitable for work site with atrocious working conditions. It is specialized in cooling down water for the batching plant from 46 °C to 0.5 °C (the water-in temperature can be higher, according to client's actual situation). Evaporative condenser and 4-stage water cooling system.

ThermoJinn water chiller has high efficiency. It adopts 3 or 4-stage cooling system. Evaporative condenser is hot galvanized. The plate exchanger is equipped with gauges and operation panel. At least 2 sets of compressor in parallel connection are equipped, which consumes less energy (more than 25%) than usual water chiller. Each set of water chiller is also equipped with one set of cold water circulation pump, which can cool down the water temperature from 45-50°C to 0-0.5 °C in atrocious conditions. Highly effective plate heat exchanger is opted, which is energy saving, useful for controlling working conditions, has small volume and small size, etc. It is reliable, especially the 3rd stage plate heat exchanger. It can produce 0.5 °C cold water without freezing, which can avoid ice jam danger.

The refrigeration system can adjust the compressor load and unload automatically according to the water temperature (suction pressure) to ensure constant cold water out temperature.

## WATER COOLING PROCEDURE



### 1st cooling stage

The raw water will be cooled down from 46 °C to 36 °C , after entering the evaporative condenser, especially obvious in the middle east bay countries. Without starting the refrigeration system, the raw water js cooled down to 36 °C directly inside the evaporative condenser. It improves the efficiency of water chilling system.

### 2nd cooling stage

Water temperature is cooled down from 36C to 12 °C inside the heat exchanger through the refrigeration of the 1st team of compressor.The heat exchanger is highly effective stainless steel plate type heat exchanger or shell and tube type heat exchanger.

### 3rd cooling stage

In this stage, the water is cooled down from 12 °C to 4 °C inside the heat exchanger. The heat exchanger is highly effective stainless steel plate type heat exchanger or shell and tube type heat exchanger.

### 4th cooling stage

In this last cooling stage,the water is cooled down from 4 °C to 0.5 °C inside the specially made immersion type or falling film type heat exchanger. Inside the water tank, there are stainless steel plate heat exchanger and water and air distribution system to ensure constant water out temperature.

### Backwater Cooling

Containerized ice water system is equipped with a backwater re-cooling system. When the water in the cold water tank has not been used for a long time, the water temperature will rise up to a certain temperature (can be set). And then the re-cooling system will start automatically to cool down the water temperature inside the cold water tank..

## THERMOJINN ICE WATER CHILLER SYSTEM

### Design Condition of TJ-ICW

- Maximum temperature: +55 °C
- Wet-bulb temperature: +30 °C
- Water inlet temperature: +46 °C
- Ice water outlet temperature: +0.5 °C
- Power Supply: 380V/3P/50(60)HZ
- Operating time: 24Hours
- Refrigerant: R22/R404A/R507

### Standard Configuration of TJ-ICW

- 1、 Outside is standard white 20/40 feet new container;inside is decorated with air conditioner, illumination and aluminum alloy floor ;
- 2、 Refrigerating compressor unit is semi-hermetic screw or piston compressor;
- 3、 Evaporative condenser with double speed fan;
- 4、 The 1st and 2nd stage is highly effective stainless steel plate heat exchanger or shell and tube evaporator;
- 5、 The 3rd stage is stainless steel immersion plate heat exchanger with air pump;
- 6、 Necessary refrigeration system control, protect components and refrigeration pipeline connection;
- 7、 Valves and sub-cooling back water pump of water line system inside with flow indication and low water flow alarm indication;
- 8、 electrical control components and electric box with operator inter face for displaying the five stage water temperature;
- 9、 Raw water tank and cold water tank level display are optional.

### Containerized Ice Water Unit(TJ-ICW) Parameter

| Model                           | Unit               | TJ-ICW60 | TJ-ICW 120 | TJ-ICW 180 | TJ-ICW 240 | TJ-ICW 312 | TJ-ICW 360 |
|---------------------------------|--------------------|----------|------------|------------|------------|------------|------------|
| Daily capacity                  | Tons/day           | 60       | 120        | 180        | 240        | 312        | 360        |
| Ice water flow                  | m <sup>3</sup> /hr | 2.5      | 5          | 7.5        | 10         | 13         | 15         |
| Necessary Refrigeration         | kw                 | 124      | 260        | 390        | 520        | 675        | 780        |
| Installed Refrigeration         | kw                 | 139.1    | 289.4      | 441        | 571.7      | 725        | 815.4      |
| Installed Power                 | kw                 | 36.8     | 66.1       | 97.6       | 121.6      | 165.8      | 196.8      |
| Running Power                   | kw                 | 27.6     | 52.9       | 78.1       | 97.3       | 132.6      | 157.4      |
| System COP                      | kw/kw              | 3.99     | 4.13       | 3.87       | 4.14       | 3.68       | 4.15       |
| Container Specification         | ft                 | 20       | 20         | 40         | 40         | 40         | 40         |
| Water tank (supply by customer) | m <sup>3</sup>     | 20       | 40         | 60         | 80         | 100        | 100        |

### Containerized Ice Water Unit(TJ-ICW) Major Equipment

| Model     | Container Size | 1st Stage Heat exchanger | 2nd Stage Heat exchanger | 3rd Stage Heat exchanger | 1st Stage Compressor | 2nd &3rd Stage Compressor | Evaporative Condenser |
|-----------|----------------|--------------------------|--------------------------|--------------------------|----------------------|---------------------------|-----------------------|
| TJ-ICW60  | 20'FT          | Shell&Tube               | Shell&Tube               | Plate                    | 4NES-20Y             | 4NES-20Y                  | TVC45                 |
| TJ-ICW120 | 20'FT          | Shell&Tube               | Shell&Tube               | Plate                    | 6HE-35Y              | 6HE-35Y                   | TVC90                 |
| TJ-ICW180 | 40'HQ          | Shell&Tube               | Shell&Tube               | Plate                    | 6GE-40Y              | 6HE-35Y                   | TLC-650               |
| TJ-ICW240 | 40'HQ          | Shell&Tube               | Shell&Tube               | Plate                    | CSH7563-80Y          | CSH7553-70Y               | TLC-800               |
| TJ-ICW312 | 40'HQ          | Shell&Tube               | Shell&Tube               | Plate                    | CSH7573-90Y          | CSH7573-90Y               | TLC-1020              |
| TJ-ICW360 | 40'HQ          | Shell&Tube               | Shell&Tube               | Plate                    | CSH8553-110Y         | CSH8553-110Y              | TLC-1200              |

## THERMOJINN COLD WATER CHILLER SYSTEM

### Design condition of TJ-CW

- Maximum temperature: +55 °C
- Wet-bulb temperature: +30 °C
- Water inlet temperature: +46 °C
- Ice water outlet temperature: +4 °C
- Power Supply: 380V/3P/50(60)HZ
- Operating time: 24Hours
- Refrigerant: R22/R404A/R507

### Standard Configuration of TJ-ICW

- 1、 Outside is standard white 20/40 feet new container; inside is decorated with air conditioner, illumination and aluminum alloy floor;
- 2、 Refrigeration compressor unit is semi-hermetic screw or piston compressor;
- 3、 Evaporative condenser with double speed fan;
- 4、 The 1st and 2nd stage is highly effective stainless steel plate heat exchanger or shell and tube evaporator;
- 5、 Necessary refrigeration system control, protect components and refrigeration pipeline connection;
- 6、 Valves and sub-cooling backwater pump of water line system inside with flow indication and low water flow alarm indication;
- 7、 Electrical control components and electric box with operator interface for displaying the five stage water temperature;
- 8、 Raw water tank and cold water tank level display are optional

### Containerized Cooling Water Unit(TJ-CW) Parameter

| Model                           | Unit               | TJ-ICW60 | TJ-ICW 120 | TJ-ICW 180 | TJ-ICW 240 | TJ-ICW 312 | TJ-ICW 360 |
|---------------------------------|--------------------|----------|------------|------------|------------|------------|------------|
| Daily capacity                  | Tons/day           | 60       | 120        | 180        | 240        | 312        | 360        |
| Ice water flow                  | m <sup>3</sup> /hr | 2.5      | 5          | 7.5        | 10         | 13         | 15         |
| Necessary Refrigeration         | kw                 | 110.8    | 221.7      | 332.5      | 443.3      | 576.3      | 665        |
| Installed Refrigeration         | kw                 | 118.3    | 232.3      | 349        | 466.5      | 603        | 697        |
| Installed Power                 | kw                 | 27.3     | 53.9       | 82.2       | 111        | 154.8      | 157.9      |
| Running Power                   | kw                 | 21.8     | 43.1       | 65.8       | 88.8       | 123.8      | 126.3      |
| System COP                      | kw/kw              | 4.3      | 4.3        | 4.2        | 4.2        | 3.9        | 4.4        |
| Container Specification         | ft                 | 20       | 20         | 40         | 40         | 40         | 40         |
| Water tank (supply by customer) | m <sup>3</sup>     | 20       | 40         | 60         | 80         | 100        | 100        |

### Containerized Cooling Water Unit(TJ-CW)Major Equipment

| Model     | Container Size | 1st Stage Heat exchanger | 2nd Stage Heat exchanger | 1st Stage Compressor | 2nd &3rd Stage Compressor | Evaporative Condenser |
|-----------|----------------|--------------------------|--------------------------|----------------------|---------------------------|-----------------------|
| TJ-ICW60  | 20'FT          | Shell&Tube               | Shell&Tube               | 4NES-20Y             | 4PES-15Y                  | TVC45                 |
| TJ-ICW120 | 20'FT          | Shell&Tube               | Shell&Tube               | 6HE-35Y              | 6GE-30Y                   | TVC90                 |
| TJ-ICW180 | 40'HQ          | Shell&Tube               | Shell&Tube               | 6GE-40Y              | 6GE-30Y                   | TLC-650               |
| TJ-ICW240 | 40'HQ          | Shell&Tube               | Shell&Tube               | CSH7563-80Y          | CSH7563-60Y               | TLC-800               |
| TJ-ICW312 | 40'HQ          | Shell&Tube               | Shell&Tube               | CSH7573-90Y          | CSH7583-80Y               | TLC-1020              |
| TJ-ICW360 | 40'HQ          | Shell&Tube               | Shell&Tube               | CSH8553-110Y         | CSH7583-100Y              | TLC-1200              |

\* Heat Exchanger have stainless steel plate or Shell&tube type optional.  
\* Parameters may change due to equipment upgrade without notice.



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[Https:// www.thermojinn.com](https://www.thermojinn.com)  
TEL:+86 591 8789 9520  
Email: [info@thermojinn.com](mailto:info@thermojinn.com)

Distributor: