oreon
LED. LIGHT. GROW.

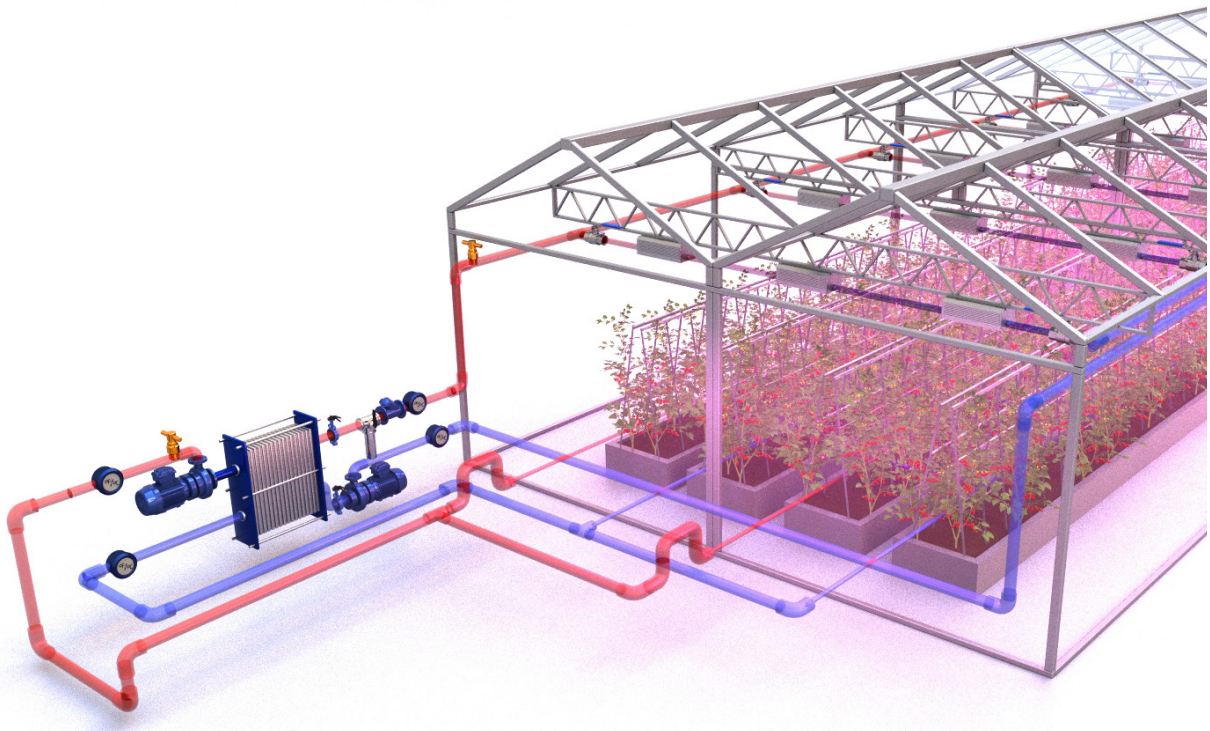
WATER COOLING SOLUTIONS

COOLING AND REUSING HEAT WITH LED FIXTURES IN A GREENHOUSE

WATER COOLING SOLUTIONS

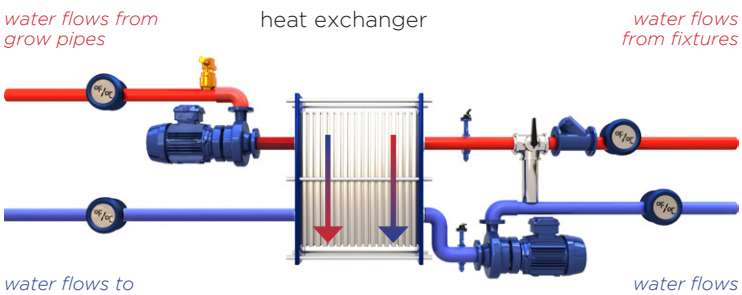
Oreon's water cooling technology can be combined with existing or new heating systems in a greenhouse. Water from the fixtures at temperatures of (up to) 45°C / 113°F can be reused in the existing grow pipes or a separately installed pipe system.

GROW PIPES



Legend

- pump
- mixing valve
- ball valve
- filter
- butterfly valve
- air vent
- temperature sensor



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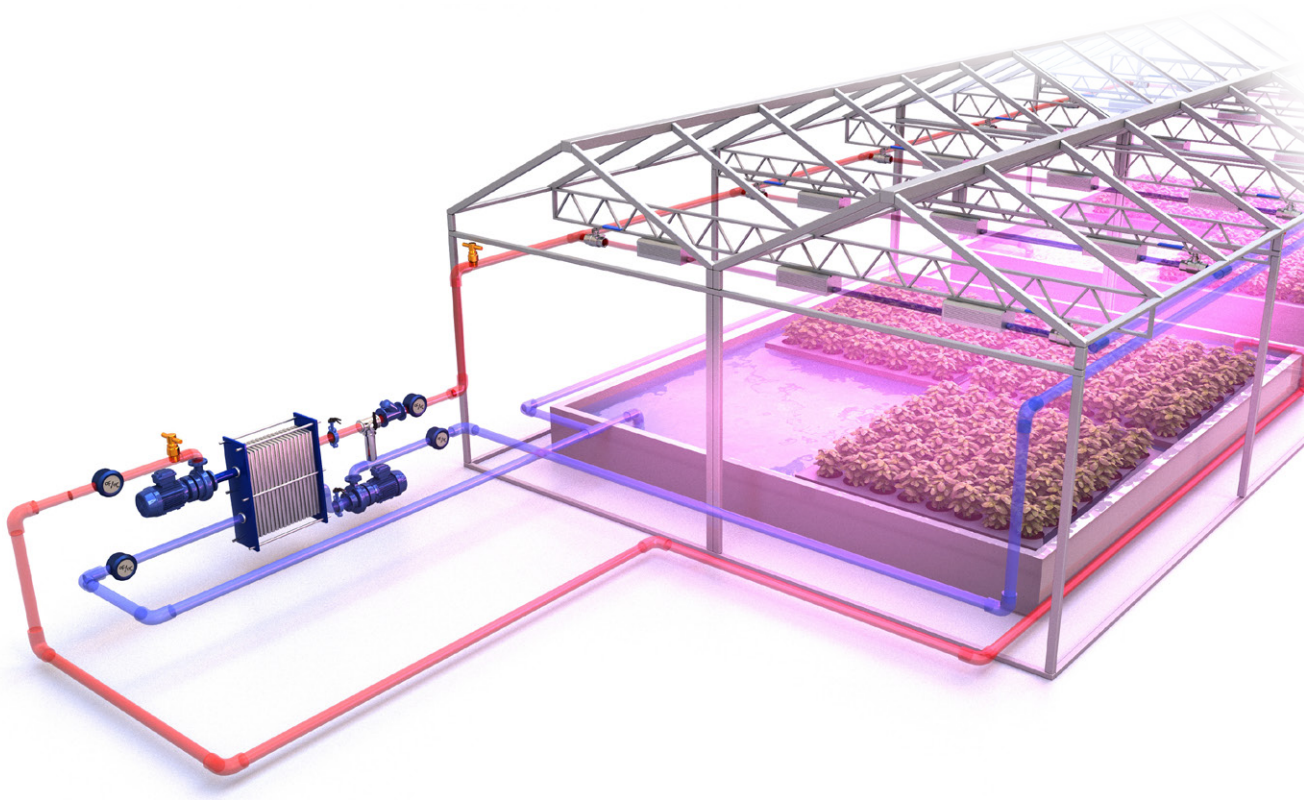
WATER COOLING SOLUTIONS

HYDROPONIC

Oreon's water cooling technology can be combined with existing or new heating systems in a greenhouse. Water from the fixtures at temperatures of (up to) 45°C / 113°F can be reused to heat the water in the cultivation ponds.



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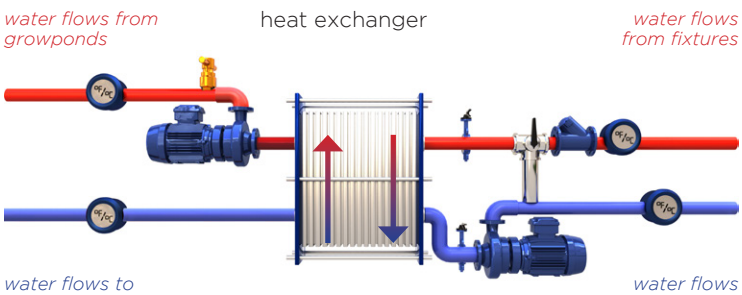

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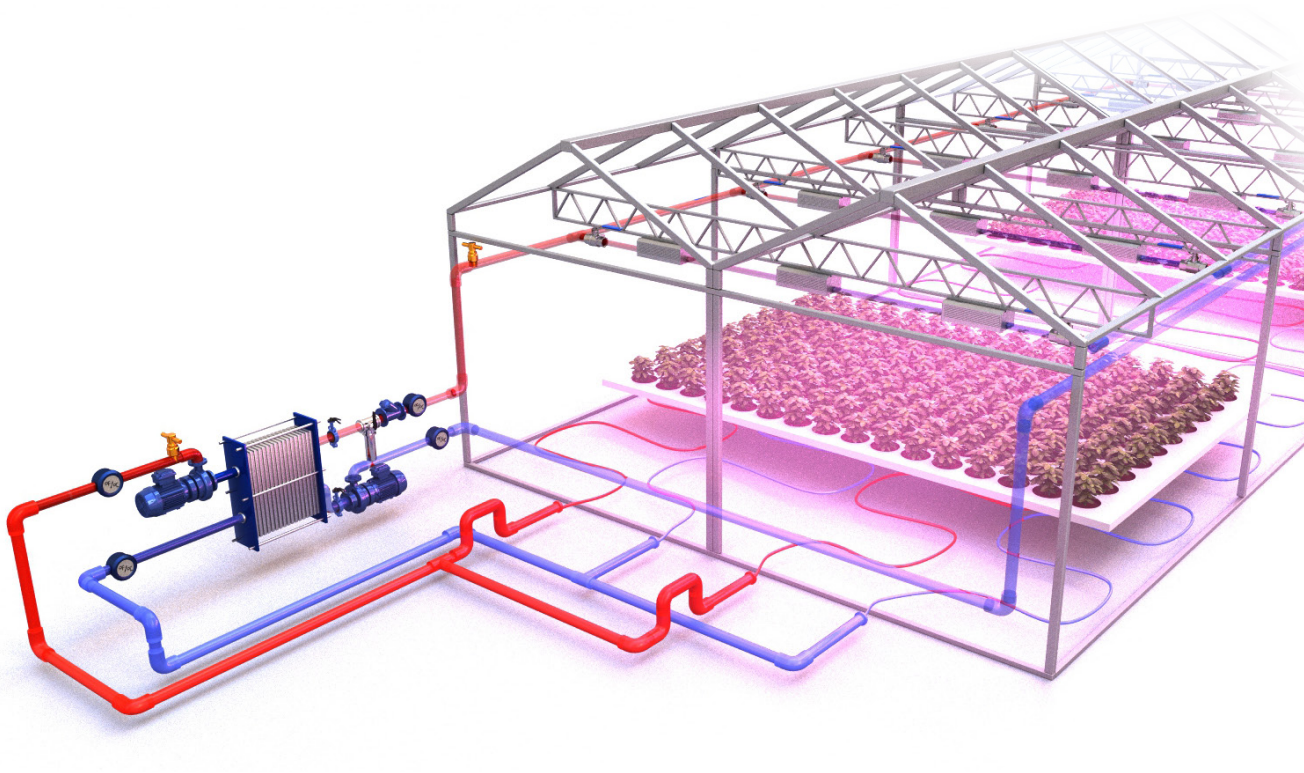
WATER COOLING SOLUTIONS

UNDER BENCH

Oreon's water cooling technology can be combined with existing or new heating systems in a greenhouse. Water from the fixtures at temperatures of (up to) 45°C / 113°F can be reused to raise the temperature under the grow benches. The hot water flows through a pipe network under the benches and heats the crop from below.



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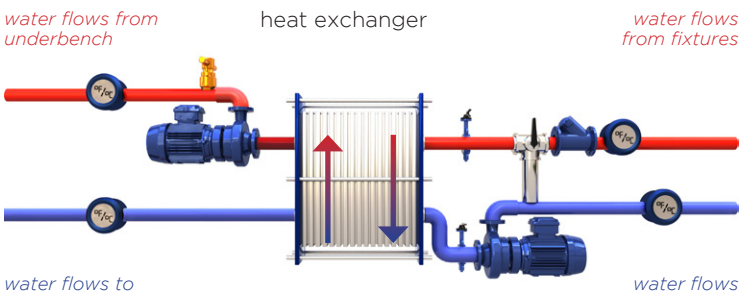

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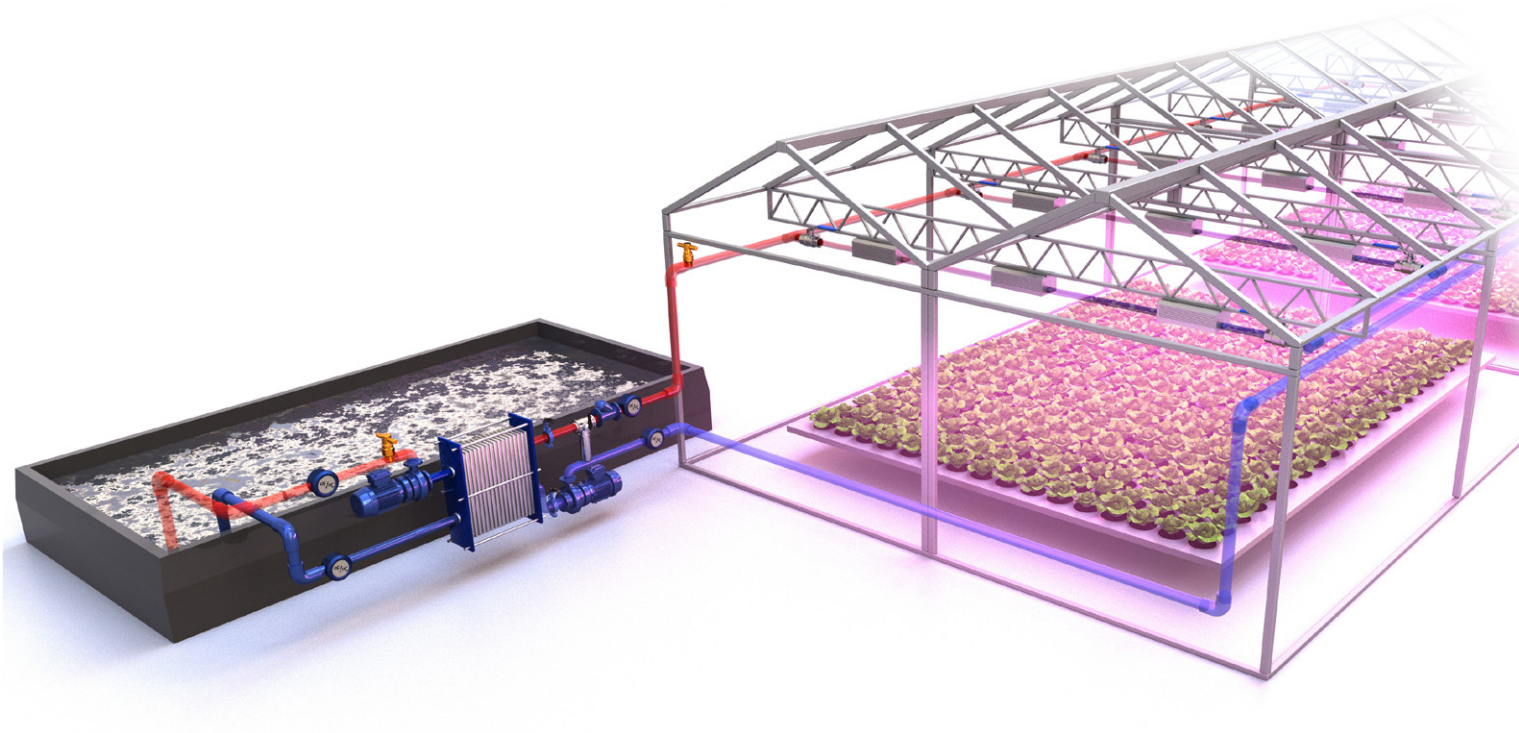
WATER COOLING SOLUTIONS

BASIN

Oreon's water cooling technology can be combined with existing or new systems in and outside the greenhouse. The heat from the fixtures can be reused. However, when there is a heat surplus, the temperature of the hot water (coming from the fixtures) can also be lowered, for example, by using the cold water from the basin.



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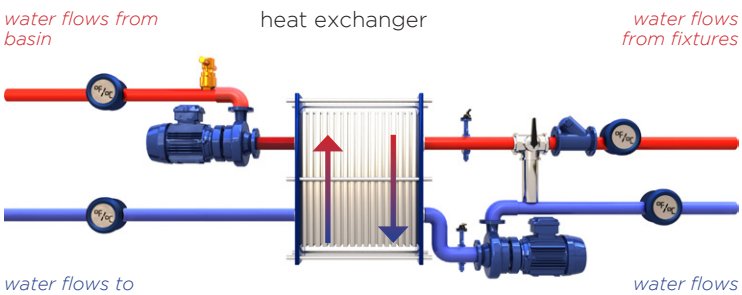

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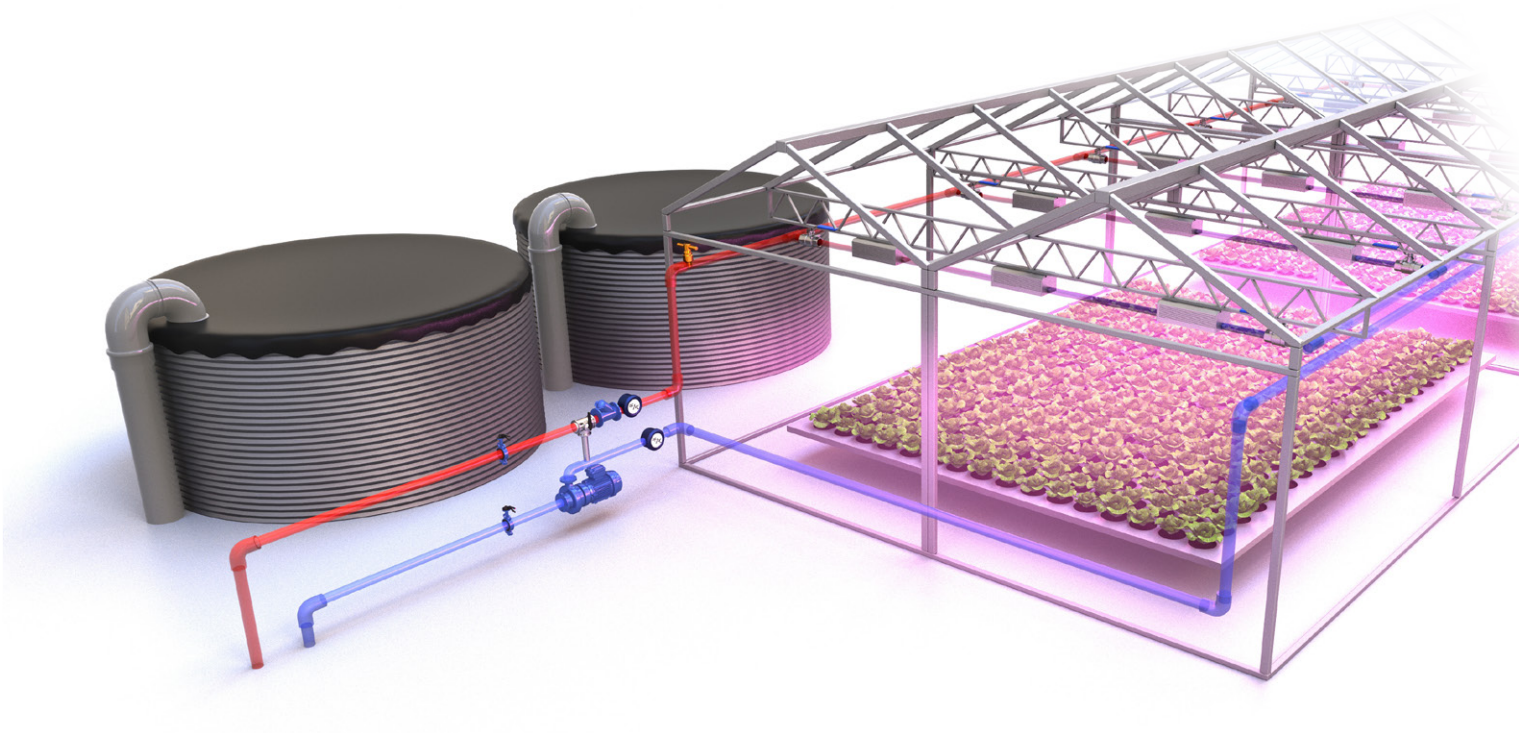
WATER COOLING SOLUTIONS

SILO

Oreon's water cooling technology can be combined with existing or new systems in and outside the greenhouse. The heat from the fixtures can be reused. However, when there is a heat surplus, the temperature of the hot water (coming from the fixtures) can also be lowered, for example, by using the cold water from the silo.



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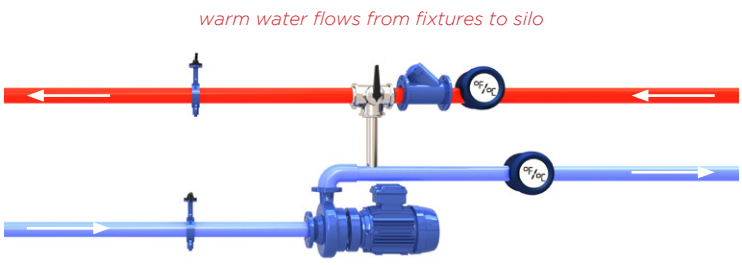

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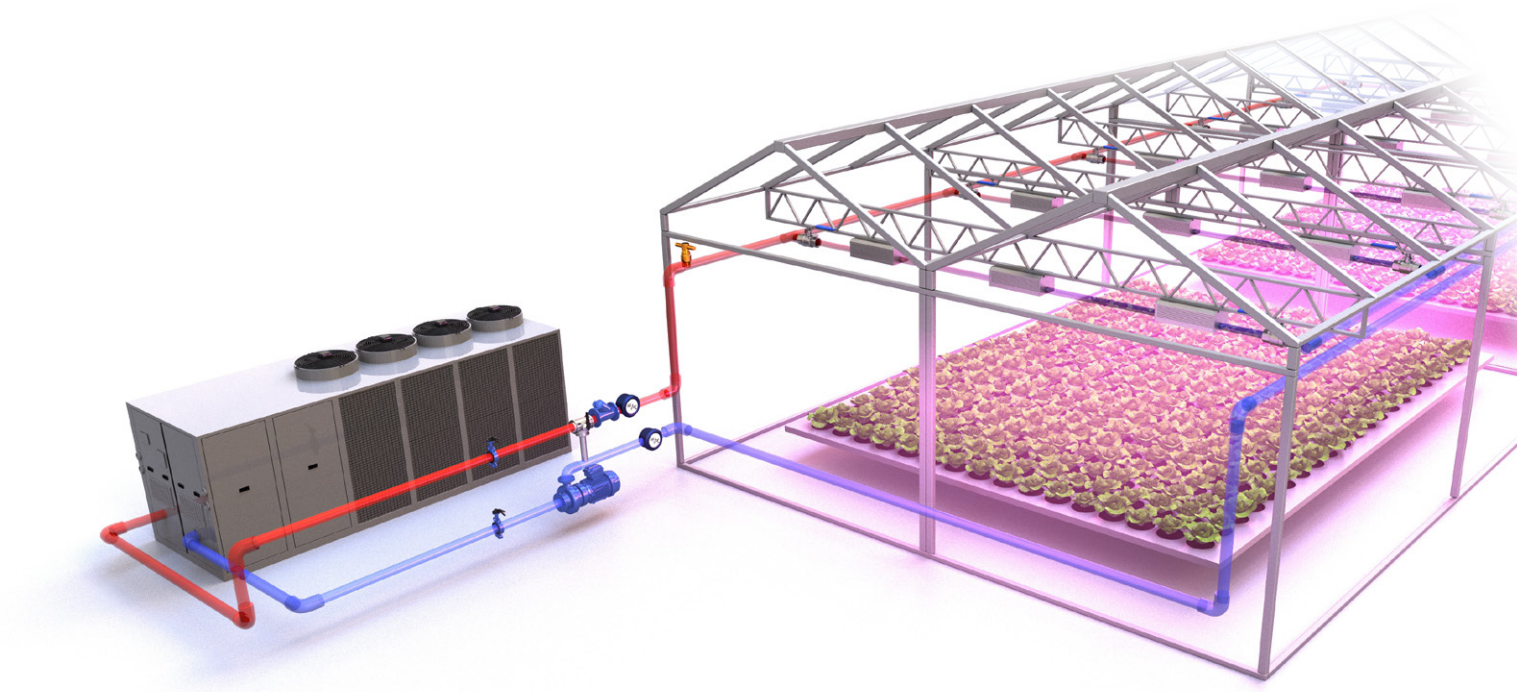
WATER COOLING SOLUTIONS

Oreon's water cooling technology can be combined with existing or new systems in and outside the greenhouse. The heat from the fixtures can be reused. However, when there is a heat surplus, the temperature of the hot water (coming from the fixtures) can also be lowered, for example, by using a chiller.

CHILLER



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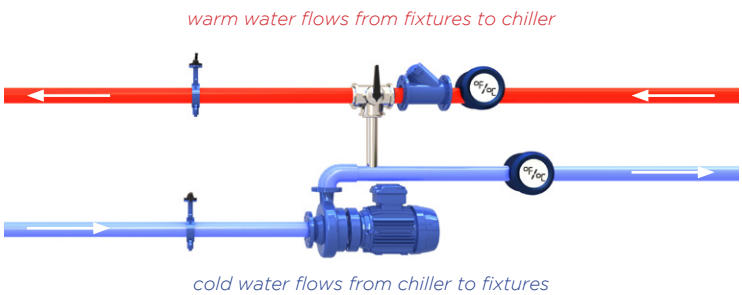

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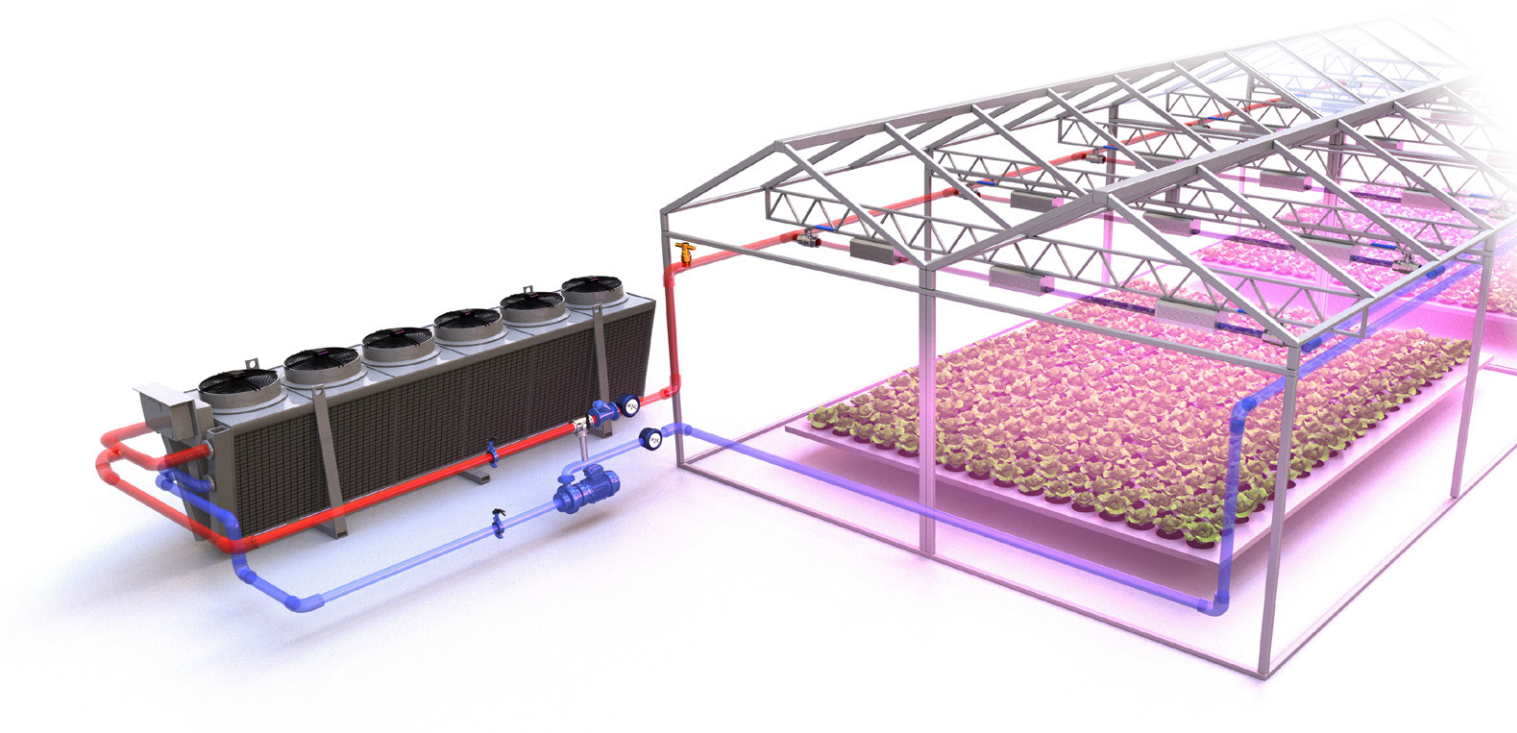
WATER COOLING SOLUTIONS

DRY-AIR COOLER

Oreon's water cooling technology can be combined with existing or new systems in and outside the greenhouse. The heat from the fixtures can be reused. However, when there is a heat surplus, the temperature of the hot water (coming from the fixtures) can also be lowered, for example, by using a dry-air cooler.



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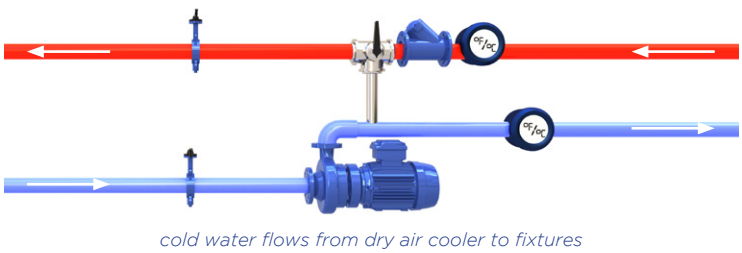

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Why cooling?

For various reasons, it is extremely important for LED fixtures to be properly cooled. At a low temperature, LED fixtures last longer and deliver a higher and constant light output over their lifespan. In addition, a lower operating temperature is also important for the other components in an LED fixture. To a certain extent you can say: the cooler the better.

Water cooling

Oreon's LED fixtures are water-cooled. Water cooling is by far the most efficient way to cool LED fixtures. The low junction temperature (the hottest point) of the LEDs (approx. 45°C / 113°F) in combination with the relatively small fixture proves that. In addition, the driver, which provides the power supply in the fixture, is continuously cooled by the water.

The Oreon system

Over the past 12 years, Oreon has partnered with renowned installers to develop a water cooling technology that can be used in almost any greenhouse or indoor facility. It is a high-tech solution that can be installed easily according to the "plug-and-play" principle.

In most cases, the water cooling system consists of two circuits separated by a heat exchanger. The first circuit provides a constant flow of water from the heat exchanger to and from the fixtures. Cool water (just above dew temperature) is pumped to the fixtures. There the water absorbs the excess heat from the fixtures. This heated water flows back to the heat exchanger. In the heat exchanger, the heated water is cooled by a second circuit (separate from the first).

The water from the second circuit can come from a pond, but can also be actively cooled by a dry-air cooler, an HVAC or a silo. There are various options, and together with the installer it is determined which solution best suits the specific business operations of the grower.

Reusing heat

In addition to efficient LED lighting, the heat from the LED fixtures can also be reused. There are several options; for example, the heat can be reused directly in a grow pipe or hose, the spray water can be heated or the gained heat can be stored in the ground for use at a later time.

Water temperature

The temperature of the return water (from the fixtures) depends, among other things, on the number of fixtures in one row. On average, the water is heated by approximately 0.25°C - 0.3°C / 32.45°F - 32.54°F per fixture (Monarch). For example, with 30 fixtures suspended in a row, the water after the last fixture is heated up to a maximum of 30 x 0.3°C = 9°C. The maximum water temperature (after the last fixture in a string) is 45°C / 113°F.

Materials

In collaboration with installers and manufacturers, Oreon has selected installation materials (connectors, pipes, etc.) that ensure that the LED fixtures and the cooling installation can be installed quickly and easily.

Many advantages

Active water cooling ensures that the individual LEDs and LED fixtures have a long lifespan. Additionaly, it provides maximum flexibility and allows more lighting hours per day. Because the fixture is compact, there is less shade in the greenhouse and the grower can make optimal use of sunlight. In addition, water cooling makes heat and light independent of each other and ensures that there is a better balance in the climate in the greenhouse.

For the most optimal solution, contact Oreon or your installer.

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