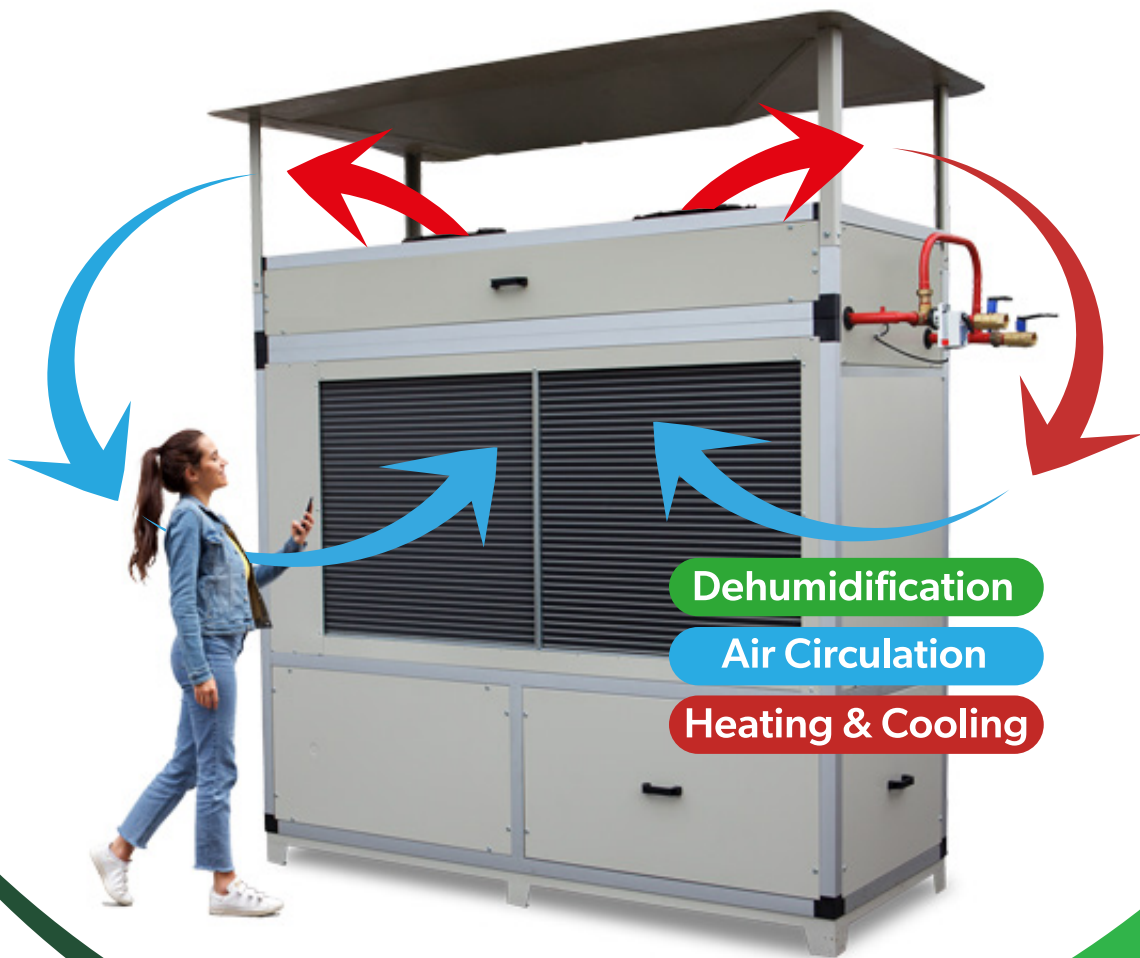




Heating & Cooling Solution

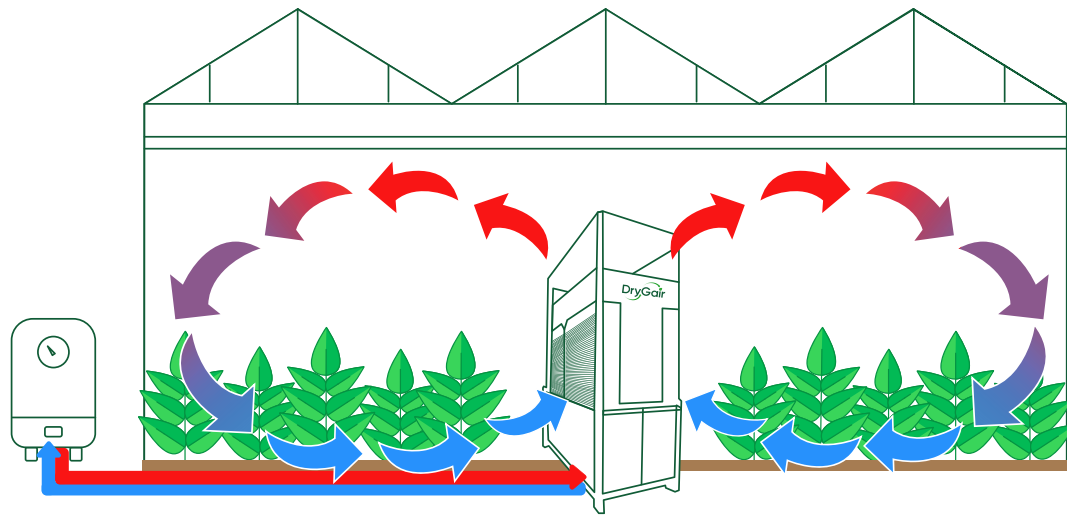
All-in-one dehumidification, heating, and cooling system
Achieve optimal climate conditions and increase yields with DryGair's energy-efficient system for humidity and temperature control.



Dehumidification

Air Circulation

Heating & Cooling



Humidity and temperature are two of the most important greenhouse climate parameters. Growing healthy plants and producing large, high-quality yields requires the right tools. To provide a complete solution, DryGair offers an energy-efficient tool to control both humidity and temperature in greenhouses.

DryGair's DG-12 and DG-6 Heating & Cooling Units Provide Multiple Functions



Dehumidification

Control humidity and prevent condensation



Air Circulation

Create optimal uniform climate conditions



Heating & Cooling

Adjust temperature with heating or cooling

Heating & Cooling with DryGair

DryGair's concept involves closing the greenhouse, deploying thermal screens (if applicable), and operating the unit inside. It creates optimal conditions inside the greenhouse by treating the air and circulating it.

Temperature Control

Heating and cooling with DryGair requires electricity, a hot or cold water source, and a drainage pipe.

It is necessary to connect the inlet and outlet water pipes on the unit to a water source (such as a boiler, chiller, heat pump, etc.). The water temperature determines the heating or cooling temperature:

Heating Mode

The coil receives hot water from the hot water source. Heat is transferred from the coil to the air passing across it before it exits the unit.

Cooling Mode

The coil receives cold water from the cold water source. A cooled coil cools air passing across it before it exits the unit.

Heating/Cooling Coil Specifications per Unit

Water Temperature Inlet - - Outlet	Heating 85°C (185°F) - - 65°C (150°F)
	Cooling 7°C (45°F) - - 13°C (55°F)
Flow Rate	~80 L/min (~21 G/min)
Pipe Diameter	1 ¼" BSP
Resistance to Flow	~100 kPa

An internal thermostat is used to set the desired air temperature. With a smart valve and bypass function, the pipes ensure water enters the unit at the right temperature. The unit's humidistat

can be set to adjust humidity, or the unit can be connected to a climate control system to control humidity remotely.

Heating/Cooling Capacity

The heating/cooling capacity of the unit depends on:

- Input water temperature
- Water flow rate
- Greenhouse climate conditions

Heating Mode

A lower indoor air temperature increases the unit's heating capacity. It can replace a heating system because of its high heating capacity. Climate control through this simple system can replace alternatives to conventional heating systems without requiring heavy infrastructure, maintenance, or high costs.

Cooling Mode

Higher indoor air temperatures mean a higher cooling capacity for the unit. During the DryGair unit's operation, a portion of the cooling capacity goes to neutralize the heat released.

When plants experience heat stress, DryGair's cooling can provide a solution. In contrast to hot days, the cooling solution creates cooler nighttime conditions that are better for plant growth. By cooling the greenhouse at night, the plant's respiration rate decreases, and more of the valuable resources it produces during the day are directed to where they are needed,

such as flowers and fruits. When combined with cooling, DryGair can reduce temperature during nighttime operation, reducing humidity while gradually cooling the greenhouse. In comparison to wet pad and fan systems, which raise humidity levels to cool, causing plant disease, or costly HVAC systems, which use a lot of energy to lower indoor temperatures, this is a significant advantage.

Heating/ Cooling Capacity Examples:

Heating

At greenhouse climate conditions of 18°C (64°F), 80% RH, when hot water is supplied at 85°C (185°F) at a flow rate of 80 L/min (21 G/min)

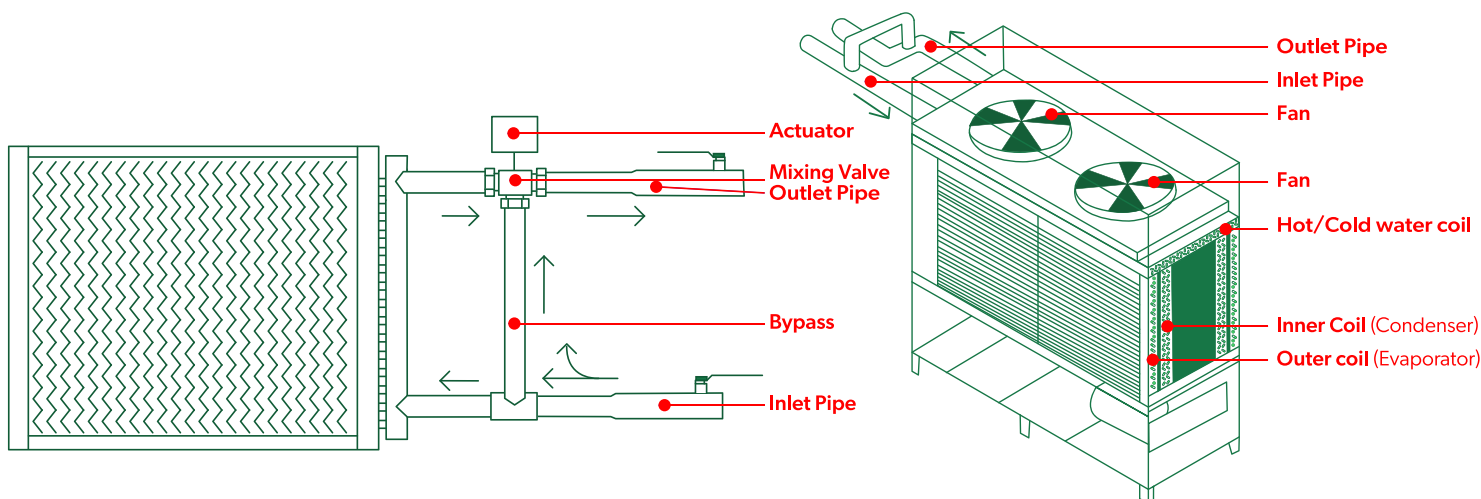
- DG-12 unit will produce a net** heating capacity of ~115 kW (392,000 BTU/h)
- DG-6 unit will produce a net** heating capacity of ~90 kW (307,000 BTU/h).

Cooling

At greenhouse climate conditions of 24°C (75°F), 80% RH, when cold water is supplied at 7°C (45°F) at a flow rate of 80 L/min (21 G/min):

- DG-12 unit will produce a net** cooling capacity of ~32 kW (110,000 BTU/h).
- DG-6 unit will produce a net** cooling capacity of ~26 kW (88,700 BTU/h).**

**The net capacity kW calculation takes into account the additional heat generated by the unit during the dehumidification process.



Dehumidification

As air passes over the evaporator coils, water condenses.

- DG-12 unit extracts water at a rate of 45L/h (12 G/h) utilizing 10kW of electricity.*
- DG-12 EU unit extracts water at a rate of 48L/h utilizing 12 kW of electricity.*
- DG-6 unit extracts water at a rate of 24 L/h (6 G/h) of water utilizing 6kW of electricity.*
- DG-6 EU unit extracts water at a rate of 25 L/h of water utilizing 6.5 kW of electricity.*

Heat energy harvested from condensation and from the operation of the unit is transferred to the expelled dry air, making it warmer.

*At designed conditions of 18°C, 80% RH

Advantages

The combined heating & cooling units follow the same principles as the other DryGair units. In addition to reduced pesticide use, less working hours, and reusable water, the DryGair concept offers numerous benefits for growers.

- Heating/cooling systems require less initial investment
- Dehumidification, heating, cooling, and air circulation all in one unit
- Optimal climate conditions wherever they are

needed. As opposed to most alternatives, which deliver treated air at floor level, this unit delivers the air to the tops of plants, where growth occurs.

- Due to the high water extraction per kWh (4.5 L/kWh or 1.2 G/kWh), working in a closed greenhouse, and distribution and circulation of air, energy efficiency is achieved.
- Infrastructure is simple and minimized compared to alternatives such as extensive heating pipes and ducts. With DryGair, maintenance costs are lower and workspaces are clearer.
- An easy integration process. The units can be hung or positioned along the aisles, in rows, or on the side of the greenhouse. This unit can operate independently or be connected to a climate control system. The unit is available in three sizes: standard, small, and split.

In Summary

DryGair's unique patent is its ability to regulate humidity and temperature in an agricultural environment in an energy-efficient manner. Combining both elements in one unit optimizes the growing conditions and improves financial results (fast returns on investment).



HORTICULTURE DEHUMIDIFIERS
a new way to grow.



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