

AIRMIX ACTIVE

hybrid climate control



Climate systems

Description

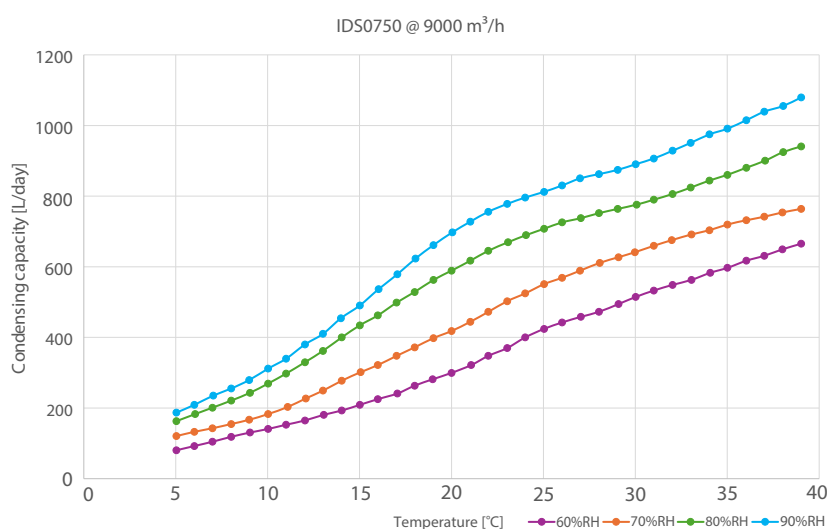
The Airmix Active is an addition to the Airmix product line. Together with the Airmix models T and G, the Airmix Active provides a complete solution for optimal climate control in the greenhouse, year-round. The Airmix Active combines active and passive dehumidification in a single solution.

During passive dehumidification, the Airmix Active uses dry air above the shade cloth to ventilate and dehumidify the greenhouse in an energy-efficient manner. In this respect, the system functions similarly to the Airmix models T and G. When passive dehumidification does not provide sufficient capacity to maintain the desired climate, the Airmix Active switches to active dehumidification.

In this process, with the screen closed, greenhouse air is circulated inside the growing area, and moisture is actively removed from the air. This keeps the greenhouse climate stable, even during periods of high humidity.

The Airmix Active's combination of active and passive dehumidification ensures an optimal greenhouse climate while minimizing energy consumption, thanks to its flexibility.

Depending on the screen configuration, the Airmix Active can draw air from above the first or second screen. Below is a graphical representation of the dehumidification capacity per unit:





Advantages

The power of the Airmix Active lies in its unique combination of passive and active dehumidification. In 70 to 80 percent of the time, the air above the screen fabric is dry and cool enough to naturally ventilate, cool, and dehumidify.

As a result, the Airmix Active can dehumidify passively by drawing in dry air from above the screen fabric. By using this dry air above the screen fabric, the Airmix Active dehumidifies just like the Airmix Model T or G, with very low energy consumption.

In addition, during periods of high humidity (due to outdoor conditions), the Airmix Active can switch to active dehumidification. This allows the system to dehumidify even during humid weather conditions with the screen closed, thereby maintaining an optimal greenhouse climate.

Thanks to this hybrid dehumidification system in the Airmix Active, the screen can remain closed longer, resulting in less heat loss. This way, the grower benefits from lower electricity consumption through passive dehumidification for most of the year, while active dehumidification is available during periods when conditions require it. This results in a stable greenhouse climate and energy savings.

Optionally, the Airmix Active can be equipped with a heat recovery system (heat recovery circuit). This allows heat from the greenhouse to be recovered and stored in a heat buffer via the district heating network.

Operation

Broadly speaking, the Airmix Active consists of a fan, a dehumidification circuit filled with a refrigerant (F-gas), an integrated valve mechanism, and a condensate drain. The hermetically sealed dehumidification circuit—hereinafter referred to as the refrigerant circuit—consists of, among other components, a compressor, an expansion valve, an evaporator, and a condenser.

During active dehumidification, the humid greenhouse air is directed over the evaporator, which extracts heat from the air. This causes the moisture (water) in the air to condense, after which it is collected in the condensate collection tray; the condensate can optionally be drained using a pump. The air then passes through the condenser, which heats it before it is blown back into the greenhouse. This reduces the relative humidity and increases the discharge temperature.

In addition to this dehumidification functionality, the system can optionally be equipped with a heat recovery system (HRS).

Based on an outlet temperature that can be adjusted via the climate computer, the Airmix Active automatically controls the balance between dehumidification and heat recovery. In the refrigerant circuit, based on the supply air temperature control, the refrigerant is distributed between the dehumidification circuit and the water-side HRV circuit. The following applies: the lower the supply air temperature, the more heat is recovered from the growing room. The higher the supply air temperature, the more refrigerant is used to dehumidify the air.

For the operating modes listed below, the integrated valve mechanism must be set to the correct valve position via the climate computer.

The valve mechanism is mechanically linked. This means that 100% top intake results in 0% rear intake, and 0% top intake results in 100% rear intake.

The Airmix Active features five different operating modes for optimal climate control:

- o **Circulation** (passive dehumidification, see Figure 1)
 - Active dehumidification disabled
 - 100% rear intake
- o **Ventilation** (passive dehumidification, see Figure 2)
 - Active dehumidification disabled
 - 100% top intake
- o **Modulating ventilation** (passive dehumidification, see Figure 3)
 - Active dehumidification disabled
 - 0 – 100% damper position, modulating
- o **Active dehumidification** (see Figure 4)
 - Actieve ontvochtiging
 - WTW uitgeschakeld
 - 100% achter aanzuiging
- o **Active dehumidification + heat recovery ventilation** (see Figure 5)
 - Active dehumidification
 - Heat recovery ventilation enabled
 - 100% rear intake

The Airmix Active is mounted on two grid trusses using a mounting bracket. The top of the Airmix Active is positioned as close as possible to the screen fabric.

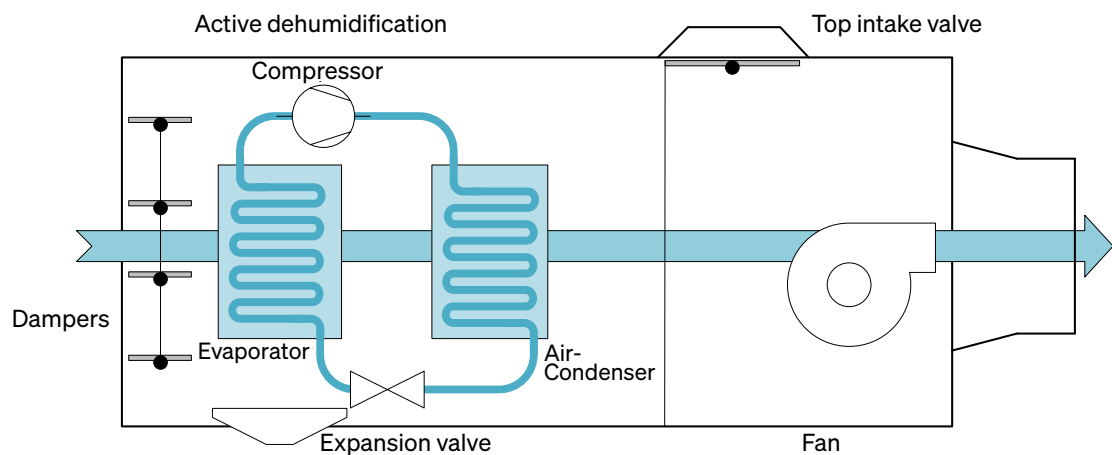


Figure 1: Circulation

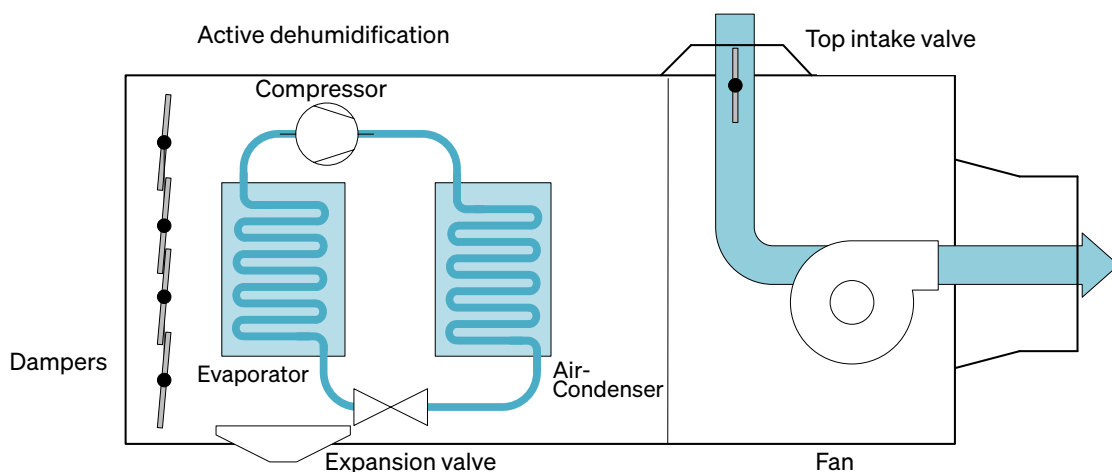


Figure 2: Ventilation

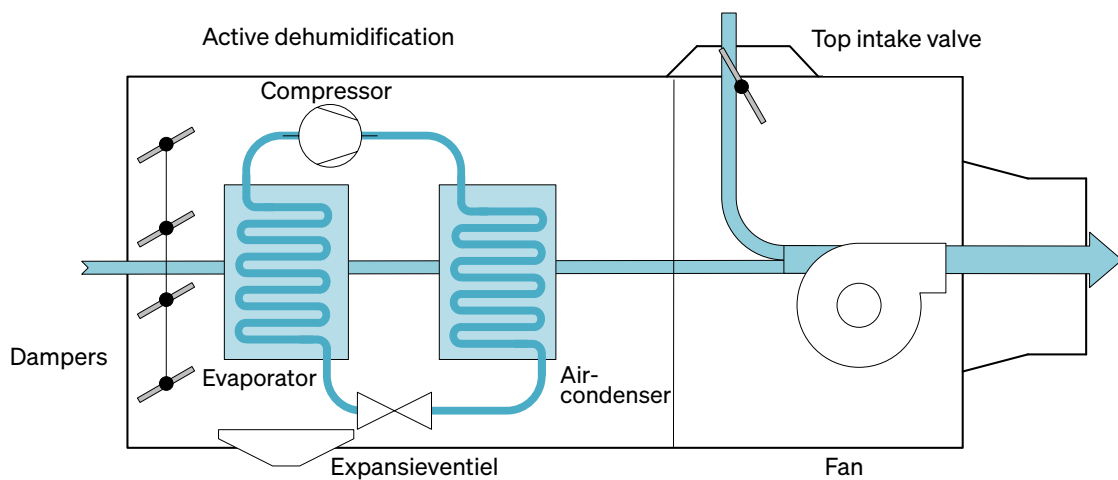


Figure 3: Modulating

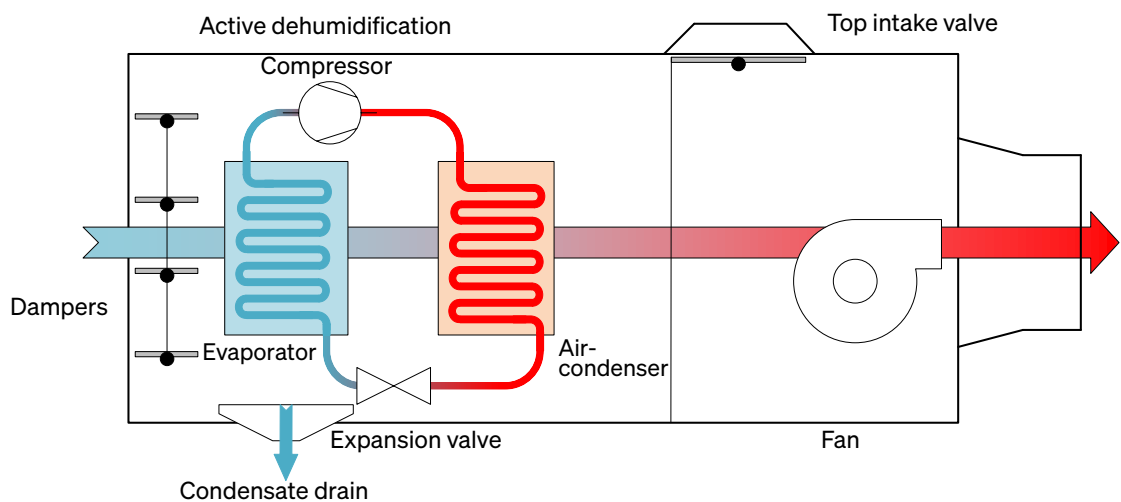


Figure 4: Active dehumidification

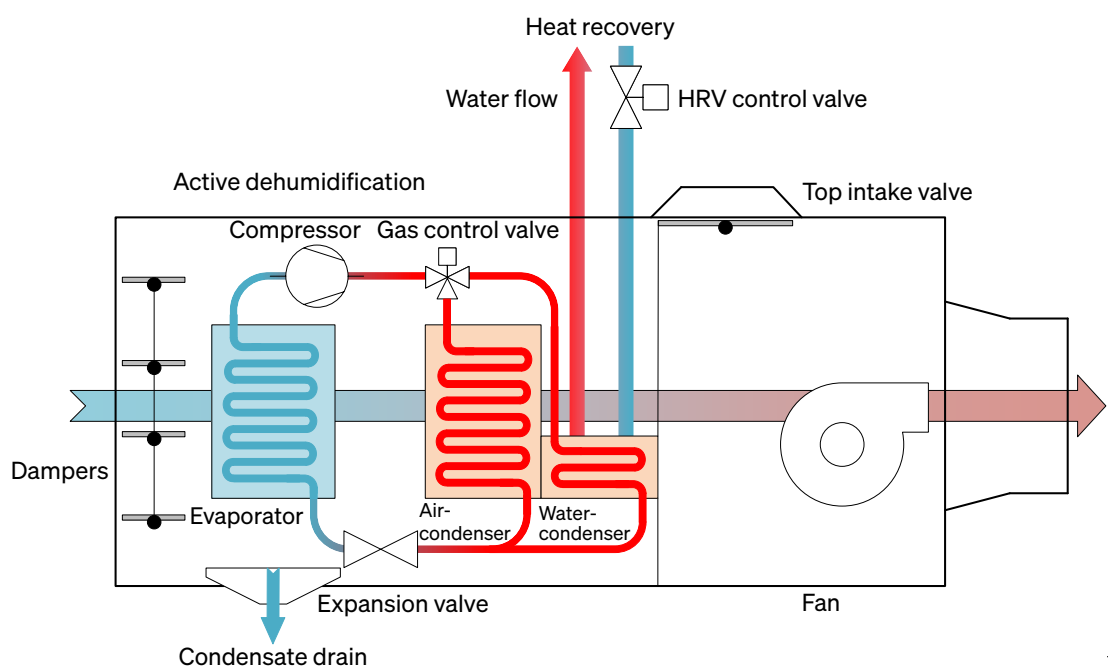


Figure 5: Active dehumidification + heat recovery ventilation



Airmix Active specifications

GENERAL	
TYPE	IDS0750
DIMENSIONS IDS0750	1200×1150×700 mm (LxWxH)
DIMENSIONS OF IDS0750 INCLUDING MOUNTING BRACKET	5100 × 1380 × 830 mm (LxWxH) (customer-specific)
WEIGHT	270 kg
TOTAL WEIGHT (INCL. ACCESSORIES)	390 kg
NOISE LEVEL *	78 dB (A)
OPERATING TEMPERATURE	8 – 41 °C
OPERATING RANGE %RH	40 – 90 % RH
REFRIGERANT CIRCUIT	
CIRCUIT TYPE	Hermetically sealed system
COMPRESSOR TYPE	Scroll
REFRIGERANT	R454C
REFRIGERANT WEIGHT	4 kg
GWP	148
CO ₂ EQUIVALENT	0,59 metric tons
THERMODYNAMIC PROPERTIES	
DEHUMIDIFICATION CAPACITY **	750 liters / 24 hours
ELECTRICAL SPECIFICATIONS	
RATED POWER	7,6 kW
NOMINAL CURRENT	18,3 A
MAX. POWER CONSUMPTION	12,5 kW
MAX. CURRENT DRAW (FLA)	24,8 A
STARTING CURRENT (LRA)	145 A
POWER SUPPLY	400V / 3~ / 50 Hz
RECOMMENDED FUSE TYPE	32A Type C
HEAT RECOVERY (HR)	
TOTAL WATER-SIDE RESISTANCE ***	40 kPa
WATER-SIDE RESISTANCE AIRMIX ACTIVE	10 kPa
WATER-SIDE RESISTANCE OF THE HEAT RECOVERY CONTROL VALVE	30 kPa
INLET WATER TEMPERATURE	35 °C
OUTLET WATER TEMPERATURE	45 °C
LOWEST OUTLET TEMPERATURE	10 °C
UPPER LIMIT OF OUTLET TEMPERATURE	25 °C
FILTER	
MATERIAL	Galvanized metal wool, (Coarse 30%)
FAN SPECIFICATIONS	
NUMBER OF FANS	1
MAX. AIR CAPACITY	9000
STATIC PRESSURE (CIRCULATION) ****	500
VALVE MECHANISM	
STROKE SPEED	110 s

* The sound pressure level is measured 1 m away from the unit in free-field conditions, calculated according to ISO 3744 and an available static pressure of 50 Pa.

** Dehumidification capacity, cooling capacity, current, and electrical power are specified at an ambient temperature of 30 °C/80% RH, nominal flow rate + 50 Pa available

*** This pressure drop applies at a water capacity of 3,000–3,500 L/hour with 100% heat recovery at a cabinet temperature of 20 °C.

Working drawings

