# AIRDRY

## Adsorption Dehumidifiers

AD 270÷1700

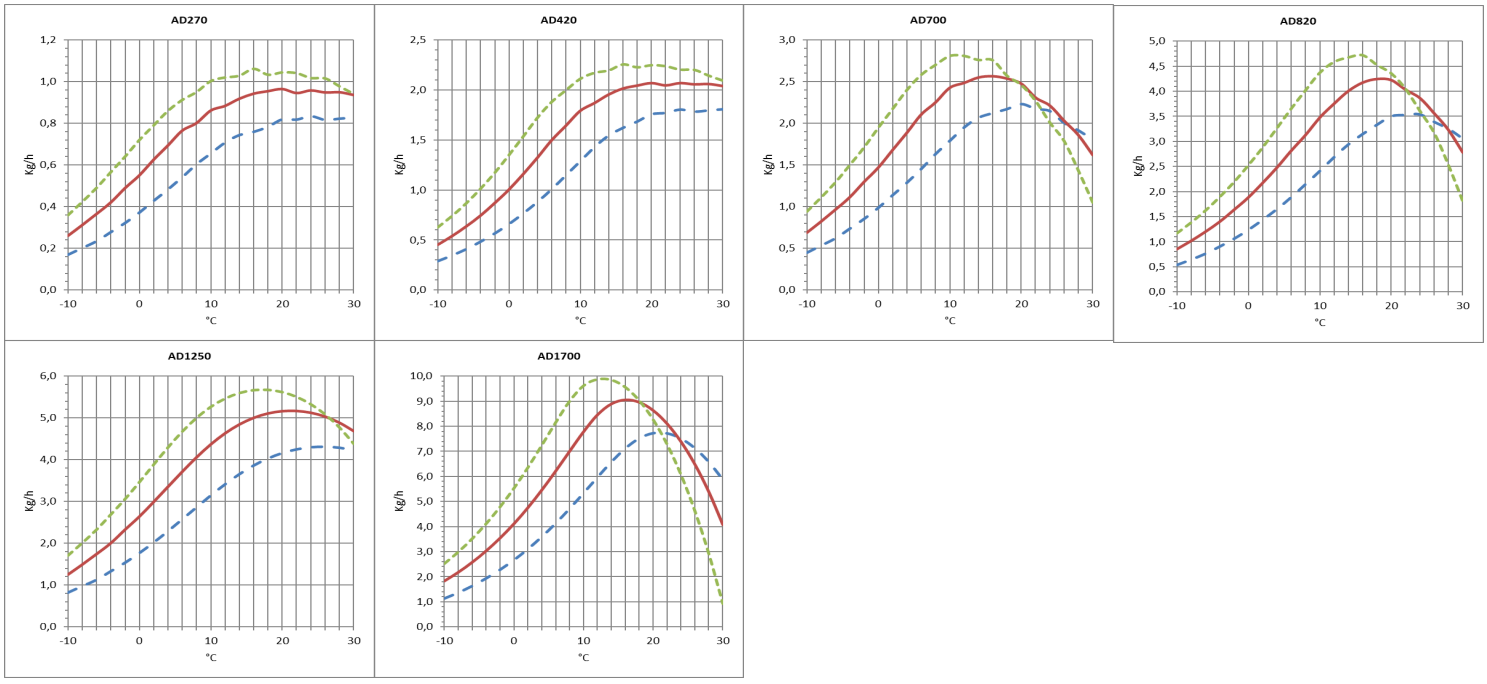

TFT
DRY AIR SOLUTIONS

| TECHNICAL DATA | | | | | | | |
|---|---|---|---|---|---|---|---|
| **MODEL** | **AD** | **270** | **420** | **700** | **820** | **1250** | **1700** |
| ***Performances*** | | | | | | | |
| Dehumidification Capacity * | Kg/h | 0,99 | 2,17 | 2,58 | 4,32 | 5,54 | 8,95 |
| ***Fans*** | | | | | | | |
| Process air flow | $m^3/h$ | 270 | 420 | 700 | 820 | 1250 | 1700 |
| Static pressure | Pa | 340 | 360 | 300 | 100 | 230 | 260 |
| Fan nominal power | W | 138 | 157 | 170 | 170 | 440 | 720 |
| Reactivation air flow | $m^3/h$ | 50 | 90 | 135 | 210 | 270 | 420 |
| Static pressure | Pa | 135 | 100 | 130 | 210 | 130 | 140 |
| Fan nominal power | W | 85 | 175 | 175 | 175 | 175 | 190 |
| ***Drive Motor*** | | | | | | | |
| Nominal power | W | 3,0 | 3,0 | 3,0 | 3,0 | 3,0 | 3,0 |
| ***Regeneration*** | | | | | | | |
| Regeneration type | | Electric | Electric | Electric | Electric | Electric | Electric |
| Installed power | KW | 1,75 | 2,6 | 3,5 | 6,6 | 6,6 | 13,2 |
| Temp. rise in the heating coil | °C | 75 | 85 | 90 | 105 | 85 | 105 |
| ***Electrical characteristics*** | | | | | | | |
| Power supply | Volt/Ph/Hz | 230/1/50 | 230/1/50 | 230/1/50 | 400/3+N/50 | 400/3+N/50 | 400/3+N/50 |
| Maximum power absorbed | KW | 1,97 | 2,93 | 3,84 | 6,95 | 7,22 | 14,12 |
| Maximum current absorbed | A | 6,6 | 12,7 | 12,9 | 12,6 | 13,6 | 21,0 |
| ***Noise level*** | | | | | | | |
| Sound pressure ** | dB (A) | 47 | 49 | 51 | 64 | 69 | 70 |
| Sound power ** | dB (A) | 75 | 77 | 79 | 92 | 97 | 98 |

* *Conditions at 20°C 60% RH*
** *Sound pressure level calculated in free field, 1 meters from unit, direction factor Q = 2, according to ISO 9614*

## DEHUMIDIFICATION CAPACITY

Approximate capacity in Kg/h with different relative humidity values of inlet process air (RH%).

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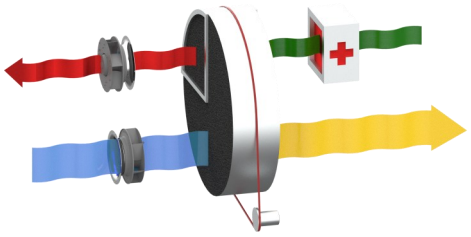
## PRINCIPLE OF OPERATION

The dehumidifier operates using two distinct airflows: the main one consists of the air to be dehumidified, while a second, smaller airflow is used for rotor regeneration. Two fans inside the unit generate these airflows, which pass through the rotor in opposite directions. The process air, meaning the air to be dehumidified, flows through the desiccant rotor impregnated with silica gel, a highly hygroscopic material capable of absorbing the water vapor present in the air. As it passes through, the air releases moisture to the rotor, which retains it. The dehumidified air is then directed into the production area or the process requiring treatment.
The dehumidification process takes place within a temperature range of -20°C to +40°C, which is specific for the correct functioning of the rotor but not as an operational limit of the unit. During the cycle, the rotor rotates slowly, driven by a transmission system with a gear motor and belt. The regeneration air, used to remove the moisture absorbed by the rotor, is heated by an internal coil up to approximately +100°C. This air passes through the rotor in the opposite direction to the process air, causing the release of the moisture accumulated by the rotor and restoring its absorption capacity. The regeneration air, now warm and humid, is expelled outside the treated environment.



## STRUCTURE

The structure of the dehumidifier is made of galvanized steel and stainless steel to ensure resistance and long-term durability. The simple panel design, without thermal insulation, provides a robust and compact construction. The top panel is easily removable, allowing quick and convenient access to electrical components and internal mechanical parts for maintenance operations. For installation, the dehumidifier is compatible with standard spiral ducts, simplifying the connection to the ventilation system.

## FANS

The fans are directly coupled to a single-phase AC or EC motor, with IP55 protection rating, class F insulation, and class B efficiency. Maintenance access is quick and easy thanks to the inspectable top panel. When the dehumidifier starts, both the process fan and the regeneration fan immediately begin operating.

## ROTOR

The dehumidifier is equipped with an adsorption rotor made of high-performance desiccant material. Its honeycomb structure, composed of heat-resistant corrugated sheets, integrates silica gel as the desiccant material, ensuring a high moisture absorption capacity in a compact volume. This design optimizes airflow, creating a large number of axial fluid streams that maximize the efficiency of the dehumidification process. The rotor is designed to withstand saturated air without damage and can tolerate sudden stoppages of the process or regeneration fan without compromising its operation. Additionally, it is non-combustible and non-flammable, ensuring maximum operational safety.

## TRANSMISSION SYSTEM

The rotor's movement is managed by a belt-driven transmission system, ensuring smooth and efficient operation. The belt applies traction to the outer edge of the rotor and is guided by a pulley connected to the gear motor. To ensure maximum reliability, a tensioning device keeps the belt in the correct position, preventing slippage and ensuring consistent operation over time. The rotation direction and proper functioning of the transmission can be easily checked by opening the top panel. The rotor is supported by ball bearings, which increase its lifespan and reduce friction, while its steel shaft provides strength and mechanical resistance even under intensive use conditions.

## REGENERATION AIR HEATING COIL

The dehumidifier is equipped with a self-regulating PTC electric regeneration heater, designed to ensure efficiency and operational safety. Thanks to PTC (Positive Temperature Coefficient) technology, the heater can self-regulate its surface temperature, keeping it constant and preventing the risk of overheating. This ensures precise control of the regeneration process, improving the system's reliability and lifespan.

## FILTERS

The dehumidifier is equipped with a G3 filter positioned at the inlet of both the process and regeneration airflows, designed to capture dust particles and air impurities. This filter ensures a clean airflow, helping to maintain the system’s operational efficiency and protecting internal components from potential damage caused by contamination.

## ELECTRICAL PANEL

The electrical panel of the dehumidifier is designed and manufactured in compliance with European regulations 73/23 and 89/336, ensuring high standards of safety and efficiency. Access to the panel is simple and secure by removing the unit's top panel.
Each unit comes standard with a main switch, ammeter, hour counter, and a connector for connecting an external humidistat. Additionally, an energy meter can be installed as an option to monitor electrical consumption.
The electrical panel is also equipped with a switch for manual or automatic control of the dehumidification process. It allows configuring the continuous operation of the process fan, even when the desired humidity level has been reached, provided the external humidistat is connected and in automatic mode.

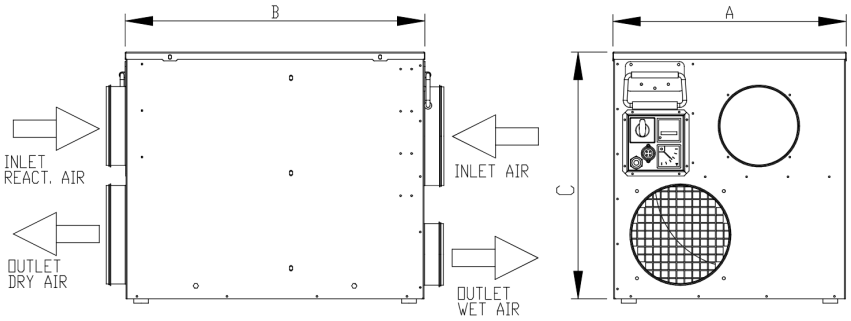
## VERSION

AD… Standard
AD…/HR Version with heat recuperator for regeneration air (50%-80% recovery).

| Model AD | Code | 270 | 420 | 700 | 820 | 1250 | 1700 |
|---|---|---|---|---|---|---|---|
| Painted steel frame | | ○ | ○ | ○ | ○ | ○ | ○ |
| Satin-finished304 stainless steel frame | | ● | ● | ● | ● | ● | ● |
| Cover box for outdoor installation | ADKOPB | ○ | ○ | ○ | ○ | ○ | ○ |
| Regeneration air heat recovery | /HR | ○ | ○ | ○ | ○ | ○ | ○ |
| Turbo box for increase available head | ADKTBP | ○ | ○ | ○ | ○ | ○ | - |
| Power switch | | ● | ● | ● | ● | ● | ● |
| G3 process and regeneration filters | | ● | ● | ● | ● | ● | ● |
| Filters F5, F7, F9 | | - | - | - | - | - | - |
| Pre- and Post-treatment of Air | | - | - | - | - | - | - |
| PLC electronic control and touch-screen terminal | | - | - | - | - | - | - |
| Different supply voltage | | ○ | ○ | ○ | ○ | ○ | ○ |
| Dirty process air filter warning | ALFP | - | - | - | - | - | - |
| Dirty regeneration air filter warning | ALFR | - | - | - | - | - | - |
| Electronic wall-mounted humidistat 1 step | ADKHW230+ | ○ | ○ | ○ | ○ | ○ | ○ |
| probe from duct or wall relative humidity 0÷100% | ADKH1D/W | ○ | ○ | ○ | ○ | ○ | ○ |
| wall probe relative humidity 10÷95% | ADKH2W | ○ | ○ | ○ | ○ | ○ | ○ |
| Electronic wall-mounted 1-step humidistat with RH% probe | ADKHTW1 | ○ | ○ | ○ | ○ | ○ | ○ |
| Mechanical humidistat from duct and wall 15÷95% | ADKMH1 | ○ | ○ | ○ | ○ | ○ | ○ |
| Mechanical wall-mounted humidistat 30÷90% | ADKMH2 | ○ | ○ | ○ | ○ | ○ | ○ |

● *standard*, ○ *optional*, – *unavailable*.

## Dimensions




| Model | AD | 270 | 420 | 700 | 820 | 1250 | 1700 |
|---|---|---|---|---|---|---|---|
| A | mm | 407 | 475 | 475 | 581 | 581 | 710 |
| B | mm | 450 | 609 | 609 | 745 | 745 | 1150 |
| C | mm | 428 | 509 | 509 | 740 | 740 | 860 |
| Empty weight | Kg | 23 | 35 | 37 | 57 | 62 | 118 |
| **Connections** | | | | | | | |
| Process air inlet | mm | Ø 125 | Ø 200 | Ø 200 | Ø 250 | Ø 250 | Ø 315 |
| Dry air outlet | mm | Ø 125 | Ø 200 | Ø 200 | Ø 250 | Ø 250 | Ø 315 |
| Regeneration air inlet | mm | Ø 125 | Ø 160 | Ø 160 | Ø 160 | Ø 160 | Ø 200 |
| Wet air outlet | mm | Ø 80 | Ø 125 | Ø 125 | Ø 160 | Ø 160 | Ø 200 |

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