

AIRDRY

Adsorption Dehumidifiers

AD 3000÷6500



TET
DRY AIR SOLUTIONS

TECHNICAL DATA

MODEL	AD	3000	3500	4500T	4000	5000	6500T
Performances							
Dehumidification Capacity *	Kg/h	23	27,3	21,1	31,7	37,2	27,1
Fans							
Process air flow	m ³ /h	3000	3500	4500	4000	5000	6500
Static pressure	Pa	400	350	300	400	400	400
Fan nominal power	KW	1,65	1,65	2,4	2,2	2,2	4,0
Reactivation air flow	m ³ /h	900	1100	900	1350	1600	1100
Static pressure	Pa	200	300	300	400	350	400
Fan nominal power	KW	0,49	0,72	0,72	0,75	1,1	0,75
Drive Motor							
Nominal power	W	11	11	10	10	10	10
Regeneration							
Regeneration type		Elettrica	Elettrica	Elettrica	Elettrica	Elettrica	Elettrica
Installed power	KW	30,0	36,0	27,0	45,0	54,0	36,0
Regeneration type		Vapore	Vapore	Vapore	Vapore	Vapore	Vapore
Power output heating	KW	31,1	37,9	31,1	46,6	55,2	37,9
Steam consumption at 6Bar(a)	Kg/h	54	65	54	80	95	65
Temperature rise in the heating coil	°C	100	100	100	100	100	100
Electrical characteristics							
Power supply	Volt/Ph/Hz	400/3/50 ±5%	400/3/50 ±5%	400/3/50 ±5%	400/3/50 ±5%	400/3/50 ±5%	400/3/50 ±5%
Maximum power absorbed standard units	KW	32,3	38,5	30,3	48,1	57,5	40,9
Maximum current absorbed standard units	A	46,7	55,8	43,7	69,5	83,1	60,8
Noise level							
Sound pressure **	dB (A)	68	68	69	70	72	73
Sound power **	dB (A)	96	96	97	98	100	101

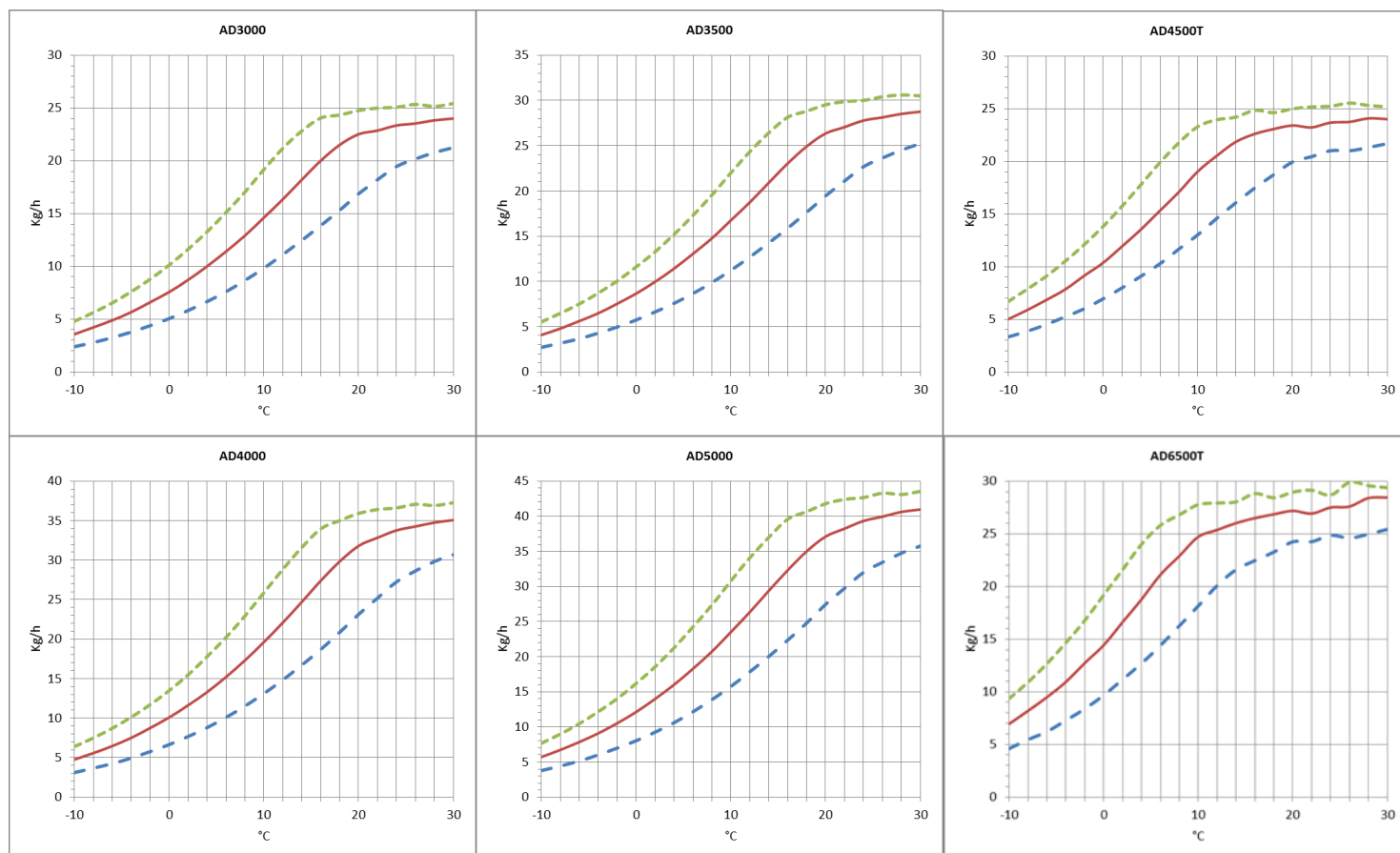
* Conditions at 20°C 60% RH

** Sound pressure level calculated in free field, 10 meters from unit, direction factor Q = 2, according to ISO 9614

DEHUMIDIFICATION CAPACITY

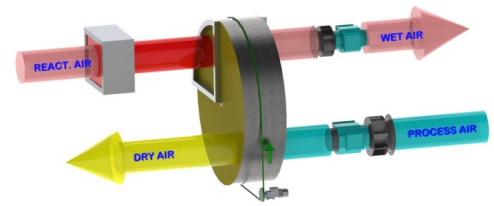
Approximate capacity in Kg/h with different relative humidity values of inlet process air (RH%).

— 40% RH — 60% RH — 80% RH



PRINCIPLE OF OPERATION

The dehumidifier works using two air flows; the main one is the air to be dehumidified, while a second flow - of lower flow rate - is used to regenerate the dehumidification rotor. Two fans inside the dehumidifier create these two air flows that cross the rotor in opposite directions. The air to be dehumidified, also called "process air", passes through the desiccant rotor impregnated with silica gel. Silica gel is a highly hygroscopic material that absorbs water vapour from the air. As it passes through the rotor, the air transfers its moisture content to the rotor itself. The dehumidified air is then sent to the production room or process to be dehumidified. The dehumidification process can take place between -30°C and $+40^{\circ}\text{C}$. During the process, the rotor rotates very slowly and is equipped with a drive system with a reduction gear and belt. The so-called "regeneration air", is used by the system to remove the absorbed moisture and take it outside: it is heated by a battery inside the dehumidifier, up to about $+100^{\circ}\text{C}$ and crosses the rotor in the opposite direction to the process air and submits it to a reverse process, for which the rotor gives up its moisture content and is restored to its initial absorption capacity. The regeneration air is expelled warm and humid and must be sent outside the treated environment.



STRUCTURE

The structure of the dehumidifier is made of painted galvanized steel and/or AISI304 steel with sandwich panels. The upper panel can be removed for maintenance of the electrical components, while to access all the internal mechanical parts just remove the front panel. The connections to the dehumidifier can be made with standard spiral channels.

FANS

Fans are directly coupled to single-phase or three-phase motors rated at IP55, ISO F, class B. They are accessible for maintenance by removing a second internal panel so that in operation risk of injury is mitigated. The fans can be controlled by an optional frequency converter to control rotation speed and match performance with specific requirements. As standard, the process fan is set at fixed speed, but it can be configured to run at variable speeds from an external signal, or pressure sensor.

ROTOR

The dehumidifier has a rotor made of desiccant material. The rotor has an alveolar structure made of heat-resistant corrugated sheets containing the silica gel desiccant material, which creates a high number of axial fluid threads and at the same time a high absorption surface in a small volume. The rotor is constructed to withstand saturated air without being damaged, so it can be coupled with a pre-cooling coil. Furthermore, the rotor is not damaged if the process or regeneration fan should stop due to a fault during operation. The rotor is non-combustible and non-flammable.

TRANSMISSION SYSTEM

A belt drive system controls the movement of the rotor. The belt carries out its traction action on the outer edge of the rotor and is driven by a pulley on the gear motor. A special device maintains the correct tension of the belt to prevent slippage of the belt itself. The correct direction of rotation and transmission can be checked by opening the front panel. The rotor is equipped with ball bearings. The rotor shaft is made of steel.

REGENERATION AIR HEATING COIL

Electrical. The electric regeneration battery has steel elements, connected in a star and divided into 2, 3 or more groups for step regulation with sequential insertion to have a power modulation. On request, continuous modulation (PWM) with proportional power control can be used to increase dehumidifier field efficiency and save energy.

Steam. The steam regeneration battery is built with stainless steel tubes 304 and aluminium fins (versions with other materials can be requested as an option), and includes a 2-way valve (supplied as an option) with modulating servomotor, to ensure greater efficiency of the dehumidifier's output, acting on the steam flow rate.

FILTERS

The dehumidifier has two separate G4 filters: one on the process air inlet and the other on the high temperature regeneration air inlet. On request, higher grade filters can be supplied.

PLC CONTROL WITH TOUCH-SCREEN TERMINAL

All standard units are supplied with PLC control and touch-screen terminal. The PLC controls the following functions: regeneration temperature control, thermal protection, post-cooling regeneration timing, component start sequence, alarm reset, moisture dehumidification/humidification control, pre- and post-cooling/heating control. The display for the user interface can be remotely controlled. The PLC is set up for step management from an external humidistat, and accepts analogue signals from humidity sensors. On request, the microprocessor can be connected to remote BMS control systems. The technical department is available to study, together with the customer, different solutions using MODBUS protocols.

ELECTRICAL PANEL

The electrical panel is manufactured in compliance with European standards 73/23 and 89/336. The electrical panel is accessible from the front of the unit by means of a special key for opening. The following components are installed in all the units as standard: main switch, thermal magnetic switches (to protect the fans and the electrical resistances), fan relays, gearmotor relays, electrical resistance relays (if present). The panel is also equipped with a terminal board with dry contacts for remote ON OFF control and dry contacts for general alarm.



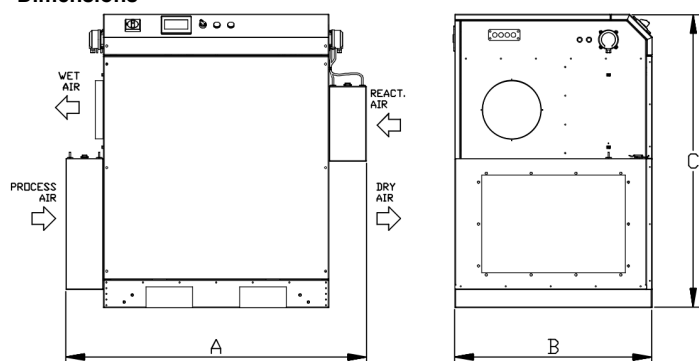
VERSIONS

AD...	Standard
AD.../TX	Version with external satin stainless steel frame 304
AD.../TTX	Version with steel frame completely inox304 interior and exterior satin
AD.../STC	Construction version, with pivoting wheels
AD.../M	Handed version (Process and Regeneration airflows are reversed)

AD Model	Code	3000	3500	4500T	4000	5000	6500T
Painted steel frame		●	●	●	●	●	●
Satin stainless steel frame 304	TX	○	○	○	○	○	○
Frame totally stainless steel304 and satin finish outside	TTX	○	○	○	○	○	○
Construction site version with pivoting wheels	STC	○	○	○	○	○	○
Frame Handed version	M	○	○	○	○	○	○
Filters G4 process and reactivation		●	●	●	●	●	●
Filters F5, F7, F9		○	○	○	○	○	○
Recovery regeneration heat	RCFX	○	○	○	○	○	○
Purge area for low Dew Point	LDP	-	-	-	-	-	-
Pre-cooling water coil	W	○	○	○	○	○	○
Post-cooling water coil	PW	○	○	○	○	○	○
Post-heating water coil	PHW	○	○	○	○	○	○
Proportional 3way-valve for pre/post-treatments (supply only)	3WSF	○	○	○	○	○	○
Proportional 3way-val. for pre/post-treatments (with assembly)	3WCM	○	○	○	○	○	○
PLC electronic control and touch-screen display		●	●	●	●	●	●
Remote terminal	TR	○	○	○	○	○	○
Different power supply voltage		○	○	○	○	○	○
Proportional control PWM regenerationheaters	PWM	○	○	○	○	○	○
Proportional 2way-valve for steam regeneration	2VS	○	○	○	○	○	○
Process fan inverter (VFD)	VFP	○	○	○	○	○	○
Regeneration fan inverter (VFD)	VFR	○	○	○	○	○	○
Process filter alarm	ALFP	○	○	○	○	○	○
Regeneration filter alarm	ALFR	○	○	○	○	○	○
Circular spigot connections for processes/regeneration	CP	○	○	○	○	○	○
Temperature sensor / RH%, Absolute Humidity, DewPoint	ST / H	○	○	○	○	○	○
Serial RS485 ModBus Interface		●	●	●	●	●	●
TCP-IP ModBus Interface		●	●	●	●	●	●
Other protocols and other accessories on request		○	○	○	○	○	○

● standard, ○ optional, – not available.

Dimensions



Model	AD	3000	3500	4500T	4000	5000	6500T
A	mm	1500	1500	1500	1895	1895	1895
B	mm	1020	1020	1020	1115	1115	1115
C	mm	1395	1395	1395	1500	1500	1500
Empty weight	Kg	350	360	360	490	530	545
Connections							
Process air inlet	mm	825 x 500	825 x 500	825 x 500	800 x 520	800 x 520	800 x 520
Dry air outlet	mm	825 x 500	825 x 500	825 x 500	800 x 520	800 x 520	800 x 520
Reactivation air inlet	mm	355 x 290	355 x 290	355 x 290	415 x 350	415 x 350	415 x 350
Wet air outlet	mm	Ø 280	Ø 280	Ø 280	Ø 315	Ø 315	Ø 315