AIRDRY

Adsorption Dehumidifiers

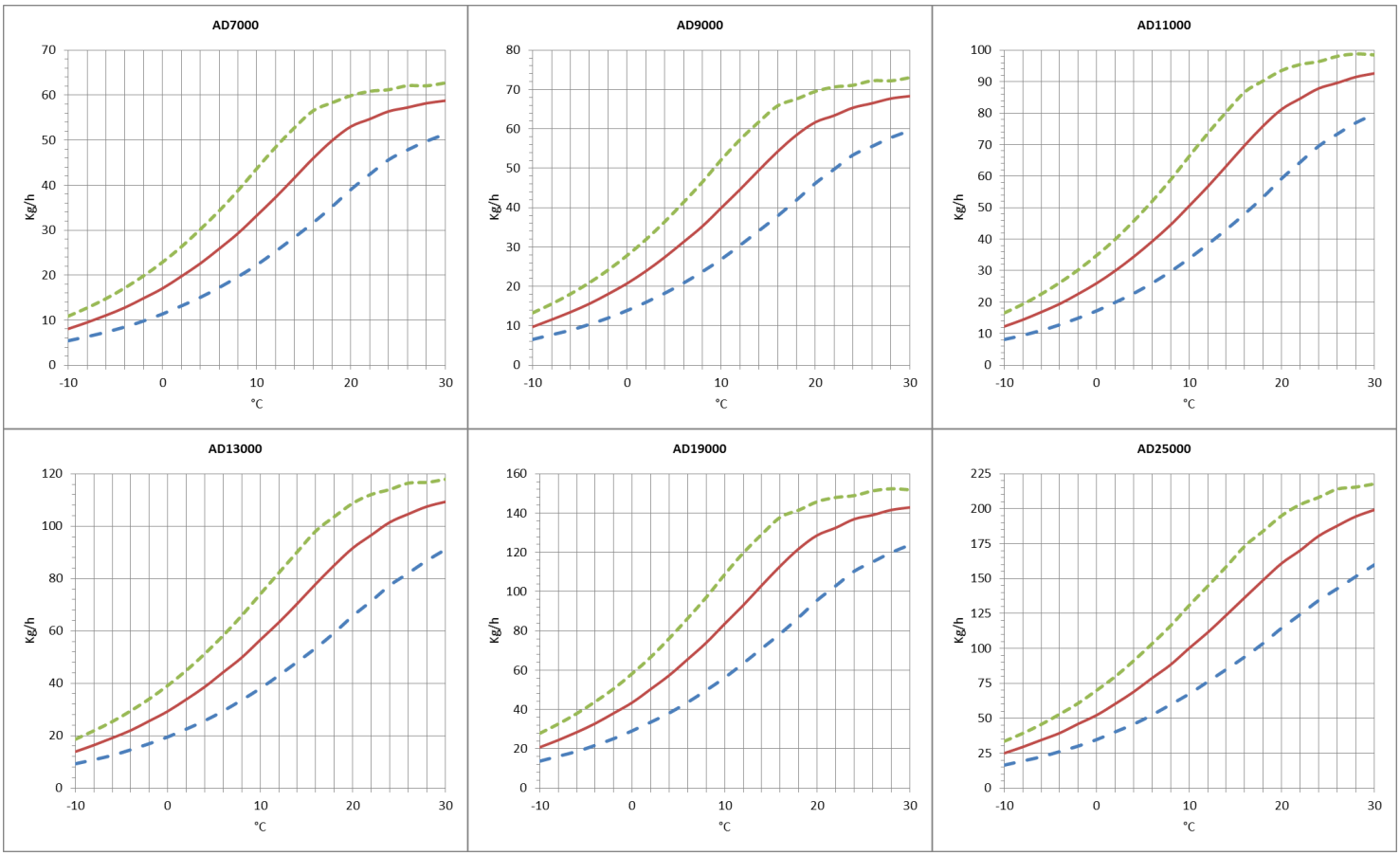
AD 7000÷25000

TFT
DRY AIR SOLUTIONS

TECHNICAL DATA							
MODEL	**AD**	**7000**	**9000**	**11000**	**13000**	**19000**	**25000**
Performances							
Dehumidification Capacity *	Kg/h	52,9	63,7	81,8	92,0	131,1	162,0
Fans							
Process air flow	m^3/h	7000	9000	11000	13000	19000	25000
Static pressure	Pa	400	400	400	400	400	400
Fan nominal power	KW	4	5,5	7,5	7,5	11	15
Reactivation air flow	m^3/h	2300	2700	3670	4300	5500	7900
Static pressure	Pa	400	400	400	400	400	400
Fan nominal power	KW	2,2	3	3	3	4	5,5
Drive Motor							
Nominal power	W	10	10	10	10	10	10
Regeneration							
Regeneration type		Electric	Electric	Electric	Electric	Electric	Electric
Installed power	KW	75,0	90,0	120,0	144,0	180,0	252,0
Regeneration type		Steam	Steam	Steam	Steam	Steam	Steam
Power output heating	KW	78,9	102,7	126,3	147,5	188,9	272,4
Steam consuption at 6Bar(a)	Kg/h	118	153	186	219	279	402
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	81,4	98,7	130,7	154,7	195,2	272,7
Maximum current absorbed standard units	A	123,5	158,6	204,3	240,8	303,2	424,5
Noise level							
Sound pressure **	dB (A)	71	72	74	74	76	76
Sound power **	dB (A)	99	100	102	102	104	104

** 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%).



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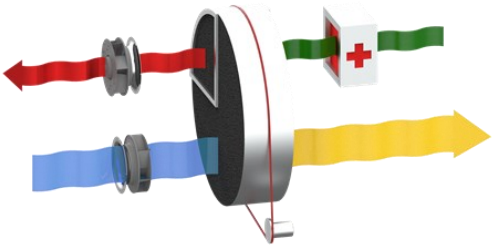
PRINCIPLE OF OPERATION



The dehumidifier operates with 2 airflows. The main airflow, the PROCESS AIR is what is dehumidified and a second, smaller, airflow is used to regenerate the rotor material. Two high efficiency fan and motor assemblies inside the machine create these separate airflows in opposite directions through the rotor. The PROCESS AIR is taken trough the dehumidification rotor and moisture is taken up by the desiccant material bonded to the rotor structure. Mainly Silica Gel is used, which is a hygroscopic material capable of holding many times its weight in moisture, but always as a vapour and with no free water. As it passes through the rotor, the moisture in the air is absorbed by the Silica Gel and sent from the machine as a dry air stream for onward processing, or direct to a conditioned room as required.
This dehumidification process is reliable between extremes of temperature, from as low as -30°C and as high as +40°C.
During the process the rotor is turned very slowly by a small motor and reduction gearbox, driving a belt with friction contact direct to the rotor surface.
The separate REGENERATION AIR stream is taken through the dehumidifier in the opposite direction, through a heater bank where the temperature is raised typically by +100°C above ambient. This heating increases the capacity of the air to hold moisture and as a result of the vapour pressure differentials between this air stream and the rotor surface, moisture is given back to the regeneration air stream and passed out of the building as a vapour.
The rotor is then ready to absorb more moisture as it is turned and the whole process can continue.

STRUCTURE

The dehumidifier casework is made from painted galvanized steel insulated sandwich panels as standard, or in AISI304 stainless steel if required by the process. The top panel is removeable for maintenance and access to electrical components whilst access to internal components is through the front. Connections for the airflows to and from the dehumidifier would typically be in standard galvanised spiral ducting.

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 is used to turn the rotor. This movement is typically between 6 and 12 rph, and uses a powerful direct drive motor and reduction gearbox, operating on a belt with frictional contact with the outer rim of the rotor drum. A belt tensioning system is used to maintain correct belt tension and avoid slip. The rotation of the rotor is visible by removal of the front access panel so correct operation can be determined. The rotor is suspended on ball bearings around a central steel shaft.

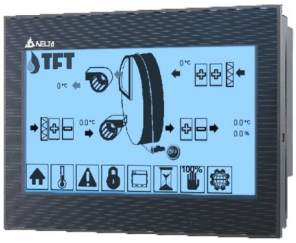
REGENERATION AIR HEATING COIL

Electrical. The electric regeneration coil has steel elements, star connected, and divided into 2, 3 or more sequential control banks for power modulation. On demand, a continuous modulation with proportional power control can be used to increase the efficiency of the dehumidifier and save energy.
Steam. Steam regeneration coils are made of 304 grade stainless steel tubes with aluminium fins (options are available for other materials), and include a 2-port valve with modulating actuator to control the steam flow and thus the dehumidifier performance.

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 provided with PLC control. The PLC controls the following functions: regeneration temperature regulation, thermal protection, regeneration cool down timing, component start sequence, alarm resets, RH or dewpoint control (dependant on control required) and control of pre and post-cooling or heating. The user interface display can be positioned remotely. The PLC is set for heater control from an external humidistat. On request, it can be adapted for connection to remote BMS systems. Operation with various MODBUS protocols can be discussed with the technical department if this is what is required by the process.

ELECTRICAL PANEL

The electric panel is made in compliance with European regulations 73/23 and 89/336. Access to the electrical panel is from the top after the panel is removed. All units include the following components as standard: mains switch, magneto thermal switches (for fan and electric resistance protection), fan relays, gearmotor relays and electric resistance relays (if any). The panel is also equipped with a terminal block with clean contacts for remote ON-OFF control and clean contact for general alarm.

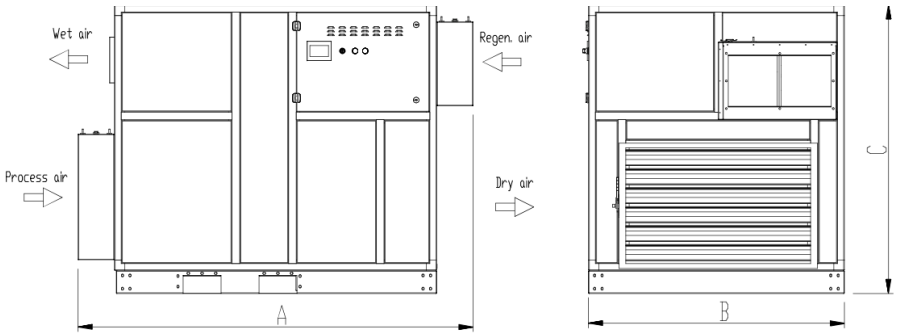
VERSIONS

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)

Model AD	Code	7000	9000	11000	13000	19000	25000
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	7000	9000	11000	13000	19000	25000
A	mm	2350	2350	3050	3050	3850	3850
B	mm	1350	1350	1600	1600	1950	1950
C	mm	1750	1750	1850	1850	2150	2150
Empty weight	Kg	680	700	1350	1390	1980	2150
Connections							
Process air inlet	mm	1155 x 560	1155 x 560	1250 x 600	1250 x 600	1500 x 800	1500 x 900
Dry air outlet	mm	1155 x 560	1155 x 560	1250 x 600	1250 x 600	1500 x 800	1500 x 900
Reactivation air inlet	mm	560 x 460	560 x 460	600 x 600	600 x 600	800 x 800	800 x 800
Wet air outlet	mm	Ø 350	Ø 350	Ø 400	Ø 400	Ø 500	Ø 630

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