



DRYBERG

Refrigeration Dryers and Adsorption Dryers

Quality product
Excellent service



Refrigeration dryer with Energy Saving

DRYBERG RF

DRYBERG RF is the new generation of energy saving refrigeration dryers, our product offering for the compressed air treatment but also reinterprets the concept of a thermal storage operation that made the international success of the Hybrid dryers.

The new Technology offers important advantages in terms of energy saving, reliability and operating costs as the RF dryer is able to adapt itself to the real needs of the compressed air system.

The regulation system of the dryer controls the dryer operation granting the most energetically effective method of compressed air drying, achieving high energy saving and ensuring at the same time an excellent dew point stability also in dynamic conditions.

- For high/medium flows, the dryer applies the Impulse Technology to regulate its drying capacity.
- For low air flows, the dryer utilizes the "thermal storage" operation.

1- Enhanced Energy Savings

New 3-in-1 high-efficiency heat exchanger with optimized fluid dynamics useful to keep the pressure drops to a minimum level. Advanced drying capacity control by impulses or by thermal storage effect. So Enhanced energy saving.

2- Reliable Drying & Separation

The Stainless steel demister separator efficiently removes the condensed moisture at all airflows (unlike centrifugal separators). This ensures a high grade of drying all the time.

3- High Operating Limits

High maximum inlet temperature +70°C lightweight maximum ambient temperature (+45°/50°C) ensure a failsafe operation at all times. High maximum operating pressure 16 bar(g).

4- Easy installation

Advanced design makes this dryer compact and lightweight. Small footprint and frontal access for all controls and refrigeration components save valuable plant floor space.

5- User-Friendly

DRYBERG RF automatically adapts itself to any operating condition, without any need to adjust or switch OFF the dryer. User-friendly digital control is standard on all the models and shows all the main parameters, providing warnings and alarms to ensure correct dryer operation.

6- Reliable operation

The simple refrigeration circuit, without hot gas by-pass valve, and the careful selection of the materials and components assure long, trouble-free service life. The condenser coil is generously sized to maintain efficiency in all environments even at high ambient temperatures.

7- Respect of Environment

DRYBERG RF's energy savings coupled with R134a and R410A non-ozone depleting refrigerants, reduce the environmental impact minimizing the energy waste. Recyclable and high-quality materials ensure respect of the environment and reduced carbon footprint.

8- Easy Serviceability

Removable frontal panel assures easy access to the main refrigeration components, thus facilitating maintenance operations also with dryer ON. There is no need of seasonal adjustments, unlike hot gas by-pass dryers. Condenser filters standard prevent mechanical equipment fouling by stopping debris.



BUILD THE BEST DRYBERG RF

1- HIGH-PERFORMANCES CONDENSER

The air-cooled condenser is designed to ensure operation up to 50 °C external temperature and to achieve very high energy efficiency values.

The maintenance activities are possible also with dryer ON.

2-REFRIGERATION COMPRESSORS FULLY HERMETIC

Piston/rotary compressors ensure high reliability and long service life. Scroll compressors (RF19 - RF77) offer reduced energy consumptions, low vibrations, less moving parts, and high reliability.

3- ENVIRONMENTALLY FRIENDLY REFRIGERANTS

R134a refrigerant: RF2 - RF10

R410A refrigerant: RF12 - RFE110

4- HIGH-EFFICIENCY 3-IN-1 HEAT EXCHANGER

3-in-1 compact aluminum heat exchanger including an Air-Air heat exchanger, the evaporator and a separator combined in a single module.

5- ELECTRIC POWER AND CONTROL PANEL

The control section is electrically isolated from the power section through a transformer.

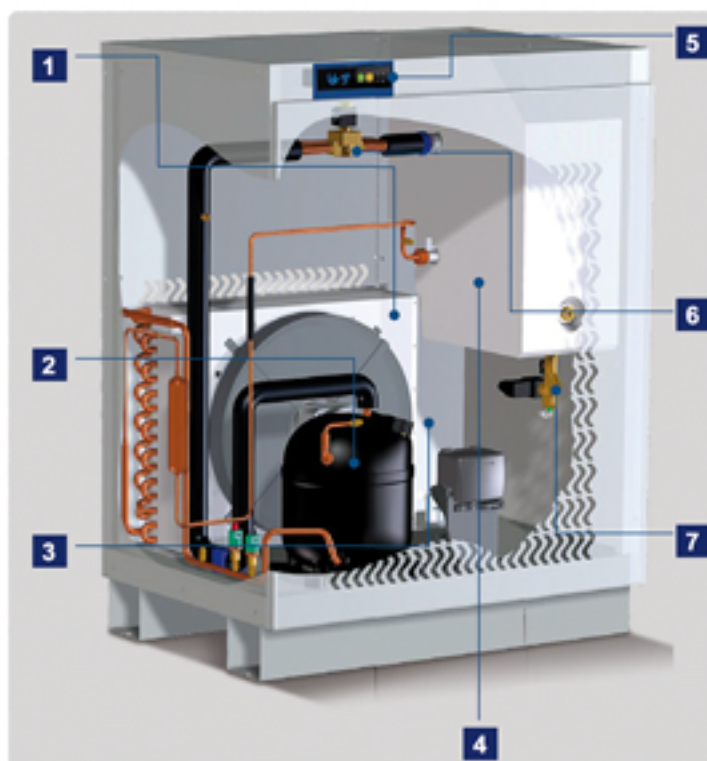
A phase monitor provides protection against phase loss and phase reversal.

6- IMPULSE TECHNOLOGY

The microprocessor adapts the working cycle to the real working conditions by controlling through "impulses" the opening and closing of the solenoid valve.

7- CONDENSATE DRAINS

All the dryers have microprocessor controlled drains. The drain open time and cycle time are fully adjustable and the settings can be locked in to avoid tampering. Zero loss drain (option): a level sensor measures the level of the condensed moisture and automatically opens a valve to drain it off, preventing any pressure loss.



IMPULSE TECHNOLOGY ENERGY SAVING

IMPULSE TECHNOLOGY FOR HIGH AND MEDIUM AIR FLOWS

The refrigerant dryer compressor is permanently ON to achieve a perfect control of the dew point.

In partial load conditions the compressor compresses less refrigerant than at peak load and therefore it consumes less energy (refrigerant flow control technology).

THERMAL STORAGE OPERATION FOR LOW AIR FLOWS

The refrigerant compressor cycles ON/OFF for maximum savings and reliability.

Since the refrigeration capacity is greater than the load, the excess capacity cools the all-in-one exchanger that acts as a thermal storage.

Innovative design ADVANCED DIGITAL CONTROL PANEL

A comprehensive digital display keeps the user fully informed. Maintenance operations are simplified, and remote supervision RS485 can easily be supplied.



NO NEED OF SEASONAL SETTING

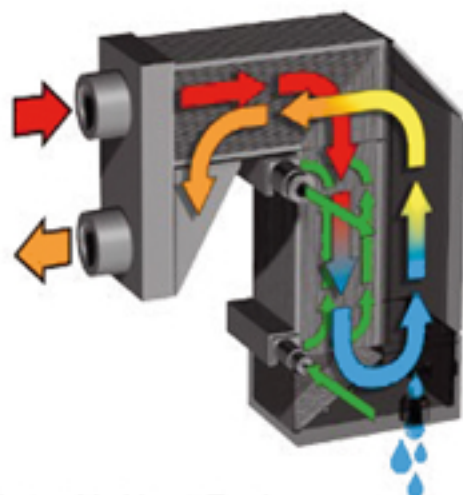
Even with variable working conditions or ambient temperature, the Impulse Technology let the DRYBERG RF to control accurately dew points without the need of any setting.

High Efficiency Heat Exchanger for DRYBERG RF

NEW ADVANCED 3-IN-1 HEAT EXCHANGER

3-in-1 compact aluminum heat exchanger including an Air-Air heat exchanger, the evaporator and a separator combined in a single module.

The new internal geometry allowed to optimize the fluid dynamics of the heat exchanger, increasing the exchange capacity with the same surface area, keeping pressure losses to a mini-mum level.



Air-to-Air Heat Exchanger

Hot and moist air enters the Air-to-Air heat exchanger where it exchanges heat in total counter flow with the outgoing cold air. Precooling saves energy by reducing the heat load on the evaporator section.

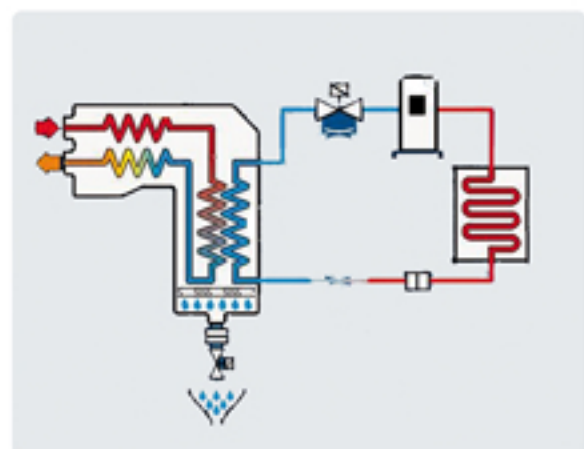
Evaporator (Air-to-Refrigerant Heat Exchanger)

The pre-cooled air enters the evaporator where it is cooled to the required dew point by exchanging heat in counter flow with the evaporating refrigerant, allowing maximum thermal exchange. The dew point temperature is held within its optimum performance range by the microprocessor even under differing ambient conditions.

How DRYBERG RF Works

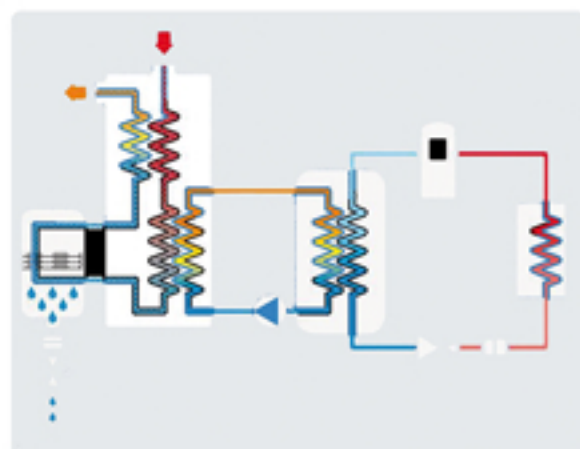
Hot moist compressed air enters the Air-to-Air heat exchanger (1) where it is pre-cooled by the dry air leaving the dryer. The refrigerant compressor (3) compresses the refrigerant gas and push it through the condenser (4) where it is condensed in high-pressure liquid. The refrigerant liquid then passes through a capillary/calibrated orifice (5) that meters it into the evaporator (2) as a low-pressure liquid. The microprocessor adapts the working cycle to the real working conditions by controlling through "impulses" the opening and closing of the solenoid valve (6). In partial load conditions only a small portion of the refrigerant flows through the calibrated orifice of the solenoid valve (7) to the compressor that therefore consumes less energy.

The pre-cooled air enters the evaporator (2) where it is cooled to the required dew point by the incoming refrigerant liquid that changes phase and becomes a low-pressure gas suitable to continue the process as it returns to the suction side of the refrigerant compressor (3). The cold dry compressed air then returns to the Air-to-Air heat exchanger (1) where it is re-heated by the incoming air, to prevent sweating in your plant.



How DRYBERG RFE Works

DRYBERG RF dryer integrates a three-stage module with a strong industrial chiller providing cold storage and high energy savings. Hot moist compressed air enters the heat exchanger module Air-to-Air side, where it is pre-cooled by the dry air leaving the dryer. The pre-cooled air enters the Air-to-Fluid exchanger where it is further cooled to the required dew point by the thermal mass fluid (glycol-water mixture). Thanks to this cooling effect, water vapor condenses out of the air and is efficiently separated by the demister, then removed by the condensate drain. The cold dry compressed air then returns to the Air-to-Air heat exchanger where it is reheated by the incoming air above the dew point, to prevent sweating in the piping. The thermal mass fluid circulates through the chiller evaporator where heat is removed by the cold liquid refrigerant flowing through the chiller from the refrigeration system. The excess refrigeration capacity that is not needed to cool the compressed air is used to cool the storage medium. Once the thermal mass has been chilled to a pre-determined temperature, the microprocessor turns the refrigeration compressor off. The air is now dried solely by the thermal medium. After the thermal mass fluid warms up, the microprocessor restarts the refrigeration compressor. RFE evaporator is totally immersed in the chiller reservoir eliminating radiant heat loss while preventing dew point spikes.



Refrigeration dryers with Energy Saving

ADVANCED DIGITAL CONTROL & ENERGY MANAGEMENT SYSTEM

DRYBERG RFE features an advanced and easy to use microprocessor control IC208CX. The user interface features a comprehensive digital display by an icon based interface. The control manages the operation of the dryer and monitors its energy consumption.

Main features

- Thermostatic control of the process fluid;
- Dynamic Dewpoint Function;
- Energy saving monitoring;
- Condensate drain programming; Manual drain test;
- Management of the automatic rotation of the starting sequence of compressors.



Alarms

- High Dew Point; High inlet air temperature;
- Capacitive zero loss drain fault alarm;
- Low coolant temperature and evaporation pressure
- High condensing pressure;
- Fans thermal protections trip;
- Tank level alarm; Compressor fault;
- Sensors fault; Service warning;
- Potential-free general alarm contact.

Digital Display Readouts

- Pressure dew point temperature;
- Air inlet /outlet temperatures;
- Ambient temperature;
- Display LEDs: dryer ON, common alarm, drain status, alarms codes;
- Energy saving level.

High Efficiency Heat Exchanger for DRYBERG RFE

ADVANCED HEAT EXCHANGER

RFE dryers feature a 2-in-1 extremely robust aluminum heat exchanger including an Air to Air heat exchanger, the Air to chilled mass heat exchanger with a water separator externally connected by Victaulic joints. This advanced heat exchanger has been engineered specifically to maximize the heat transfer coefficient. Oversized demister separator it ensures optimum dew point performance and guarantees industry-leading pressure drops.



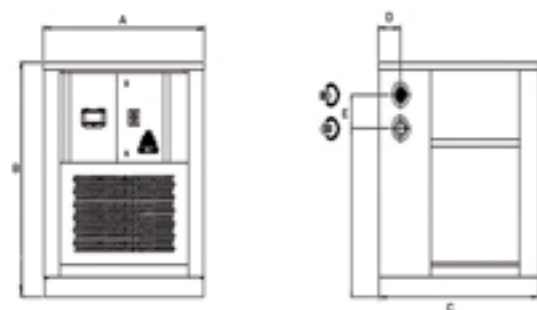
Air-to-Air Heat Exchanger

Hot and moist air enters the Air-to -Air heat exchanger where it exchanges heat in total counter flow with the outgoing cold air. Precooling saves energy by reducing the heat load on the evaporator section. The cold dry compressed air passes through the secondary side of the Air-to -Air heat exchanger where it is reheated by the hot inlet air it is precooling.

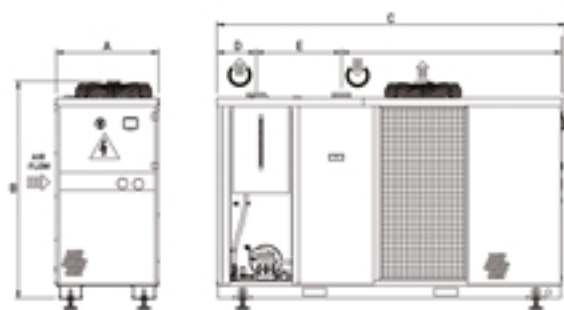
Air-to-chilled mass Heat Exchanger

The pre-cooled air enters the Air-to-chilled mass Heat Exchanger where it is cooled to the required dew point by exchanging heat in counterflow with the cold thermal mass fluid, allowing maximum thermal exchange.

RF2 - RF32



RFE37 - RFE110



Type	Nominal absorption power KW	Power supply V/Ph/Hz	Nominal air flow		Dimensions					Air connection	Weight
			m3/min	m3/h	A	B	C	D	E	Rp	Kg
RF 2	0.47	230/1/50	2.6	156	380	514	625	70	76	1"	39
RF 3	0.56	230/1/50	3.2	192	380	514	625	70	76	1"	42
RF 4	0.74	230/1/50	4	240	680	511	860	80	79	1"	68
RF 6	0.84	230/1/50	6	360	680	511	860	120	96	1 1/2"	76
RF 8	1.1	230/1/50	8	480	755	555	995	150	104	1 1/2"	94
RF 10	1.33	230/1/50-60	10	600	883	721	1107	150	123	2"	138
RF 12	1.09	230/1/50	12	720	883	721	1107	150	123	2"	140
RF 14	1.28	230/1/50	14	840	1170	939	1180	200	165	2 1/2"	247
RF 19	1.98	400/3/50	19	1140	1170	939	1180	200	165	2 1/2"	255
RF 23	2.24	400/3/50	23	1380	1170	939	1180	200	165	2 1/2"	252
RF 27	2.7	400/3/50	27	1620	1170	939	1180	200	165	2 1/2"	276
RF 32	3.56	400/3/50	32	1920	1170	939	1180	200	165	2 1/2"	285
RFE 37	3.8	400/3/50	37	2220	662	1404	2256	253	552	100[4"]	537
RFE 45	4.5	400/3/50	45	2700	662	1404	2256	253	552	100[4"]	546
RFE 52	5	400/3/50	52	3120	662	1404	2256	254	504	125[5"]	628
RFE 60	6.6	400/3/50	60	3600	662	1422	2256	254	504	125[5"]	655
RFE 77	8.1	400/3/50	77	4620	662	1422	2256	254	504	125[5"]	655
RFE 90	8.4	400/3/50	90	5400	761	1469	2936	198	640	150[6"]	1005
RFE 110	10.2	400/3/50	110	6600	761	1469	2936	198	640	150[6"]	1010

Working pressure bar [g]	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor K1	0.71	0.82	0.9	0.96	1	1.04	1.07	1.09	1.11	1.13	1.15	1.16	1.18	1.19

Air inlet temperature °C	30	35	40	45	50	55	60	65	70
Correction factor K2	1.23	1	0.81	0.66	0.57	0.52	0.48	0.44	0.4

Ambient temperature °C	20	25	30	35	40	45	50
Correction factor K3	1.05	1	0.95	0.89	0.84	0.78	0.72



It is mandatory to install a General Filter before dryer to prevent module and drainer clogging.

Adsorption Dryer

DRYBERG ADS

Cold Regeneration Adsorption Dryers

Operating pressure 4 to 16 bar

Inlet air temperature range 2 to 60°C

Pressure dew points -40°C (-29°C /-70°C)

Flow rate 150 to 1000 Nm³/h

Avg. compressed air consumption 15-20%

DESCRIPTION

AD|ADS adsorption dryers are designed for continuous separation of water vapour from the compressed air to reduce the pressure dew point. AD series dryer consists of two columns, filled with desiccant beds, controller with LCD display, valves, manometers, support construction and suitable filter housings with the required filter element. Adsorption takes place under pressure in the first column while the second column regenerates with a portion of already dried compressed air at ambient pressure.

When the first column is saturated to a certain level column switch-over is carried out and the process of adsorption continues in the second column without any drop of pressure at the outlet of the dryer. Regeneration of saturated desiccant is possible because a small portion of already dry compressed air is decompressed and when expanded it becomes extremely dry.

- + Outstanding low operating cost
- + High operational reliability
- + Long lifetime of adsorption material
- + Plug and play installation
- + Easy maintenance



Drying via the latest system technology

Tried and tested process engineering, paired with the latest control technology, stand for the three variable basic concepts that work ideally worldwide in any climate zone. We have comprehensive spirited into 12 performance levels from 150 to 2,500 m³/h. Higher volume flow rates can also be realized at the customer's request.

In the universal DRYBERG AD that can be used worldwide, desorption takes place in a counter-flow to the direction of adsorption with low compressed air and cooling by means of a relieved partial flow from the flow of dried compressed air.

Type	Connection	Nominal volume flow		Dimensions			Mass kg
		Inlet	Outlet	A	B	C	
	"	Nm3/h	Nm3/h				
AD 20	G 1"	150	117.5	707	422	1897	156
AD 30	G 1"	200	157	707	471	1664	196
AD 40	G 1"	260	204	707	471	1914	236
AD 50	G 1 1/2"	320	251	860	535	1742	274
AD 70	G 1 1/2"	410	321.5	854	535	1989	295
AD 100	G 1 1/2"	590	462.5	854	671	2051	392
AD 130	G 2"	770	603.5	1059	701	2080	507
AD 170	G 2"	1000	784	1051	701	2140	597
AD 200	DN50	1200	936	1210	850	2170	820
AD 250	DN65	1500	1170	1535	950	2210	980

Dew Point - Correction factors

Operating temperature (°C)	-25	-40	-70
Correction factors	1.1	1	0.7

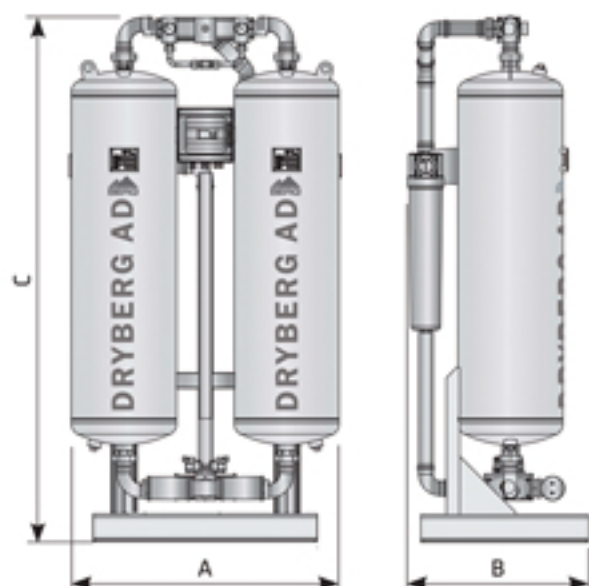
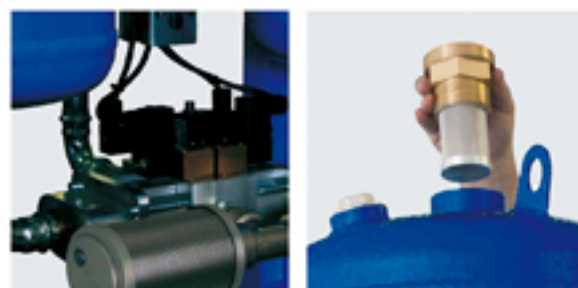
Operating temperature - Correction factors

Operating temperature (°C)	30	35	40	45	50	55	60
Correction factors	1	1	0.97	0.87	0.8	0.64	0.51

Operating pressure - Correction factors

Operating pressure [bar]	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factors	0.38	0.5	0.63	0.75	0.88	1	1.13	1.25	1.38	1.5	1.63	1.75	1.88	2	2.13

Voltage, frequency	230V, 50
Power consumption	<60 W
Protection Class	IP 65
Filter (inlet)	Super fine - 0.01 µm
Filter (outlet)	Dust filter - 1 µm
Input for stand-by	standard



Heat Regenerating Adsorption Dryer

DRYBERG ADP

Operating pressure 4 to 11 bar
Inlet air temperature range 2 to 42°C
Pressure dew points -40°C (-20°C / -70°C)
Flow rate 390 to 11000 Nm³/h
Avg. compressed air consumption 2%

APPLICATIONS

- Breathable and medical air
- Chip production and instrument air
- Bottling plants
- Glass manufacture
- Packaging machines
- Sprinkler systems
- Pneumatic control systems
- Optical measuring machines
- Measuring containers
- Painting plants
- Food industry, bagging of hygrosc-

DESCRIPTION

ADP adsorption dryers are designed for continuous separation of moisture from compressed air.

DRYBERG ADP dryers have two columns that operate alternately. Adsorption takes place under pressure in the first column while the second column regenerates. ADP type of dryer is suitable for applications where low PDP is required at hotter and more humid ambient conditions and where compressed air can be utilized for cooling.

A dryer consists of two columns, filled with desiccant beads, a blower, heater, controller with an LCD display, valves, manometers, and a support construction. A proven and robust design enables efficient and reliable operation, fast installation and simple maintenance.



Protection Class	IP 54
Filter (inlet)	Super fine - 0.01 µm
Filter (outlet)	Dust filter - 1 µm
column insulation	Optional
Blower suction conditions	Max 50°C, 35% RH

A1-2	pressure vessel	R0	regeneration air outlet
F1	inlet filter (super fine coalescing)	ES1-2	expansion silencer
F2	outlet filter (dust)	CV1-2	check valve
V1-6	ball valve with pneumatic actuator	TT1-4	temperature transducer
V7-10	angle seated valve with pneumatic actuator	PI1-2	pressure indicator
GI	air inlet	PT1-2	pressure transducer
GO	air outlet	DT1	dewpoint transducer
RI	regeneration air inlet	M1	blower
		H1	heater
		F3	regeneration air filter

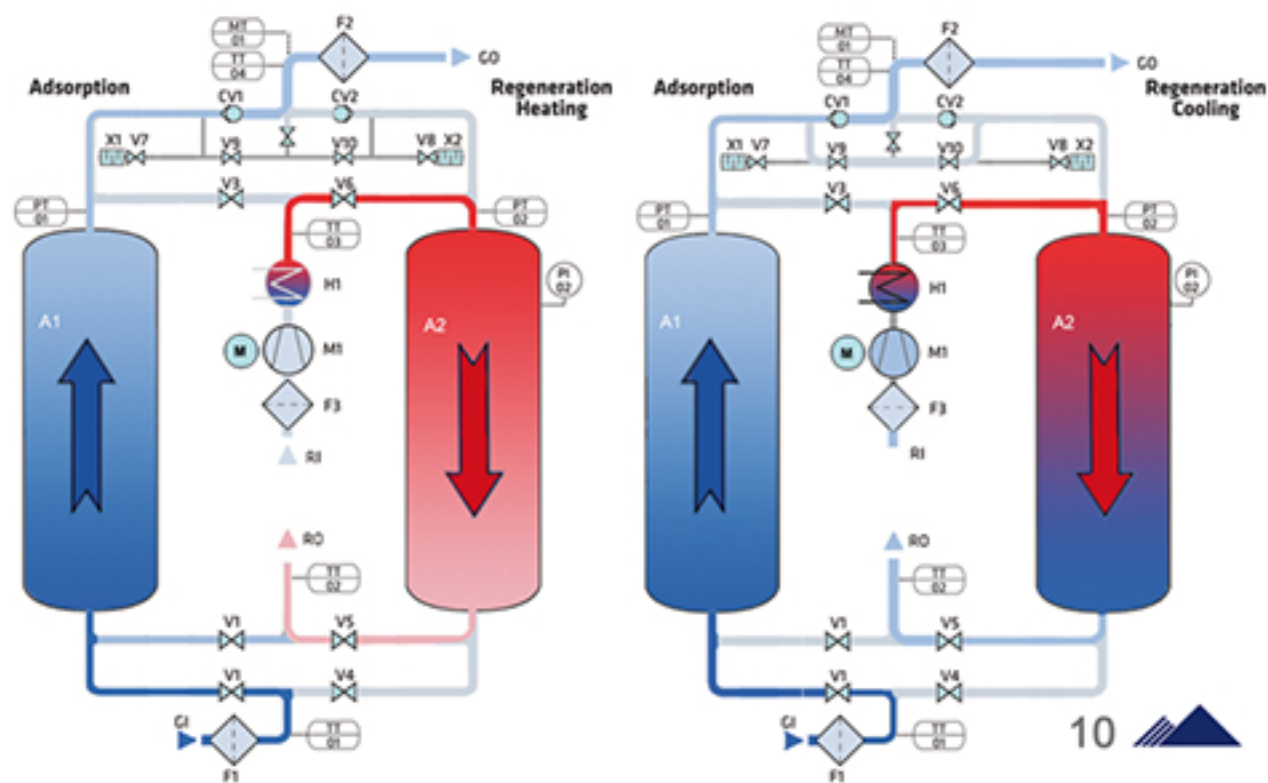
Type	Connection DN	Nominal volume flow Nm ³ /h	Blower power Kw	Heater power Kw	Dimensions			Mass kg	Almost Zero Purge Average approx. 2% Inlet Temperature 5°C – 44°C Temperature 5°C – 40°C Operating Pressure 4–10 bar [g] Power Supply 3ph 400V 50Hz Protection IP 54 , IEC 529 Designed for Fully automatic, continuous operation, indoor installation
					A	B	C		
ADP 65	DN50	390	1.3	3.5	1200	850	2250	1000	
ADP 100	DN50	590	1.6	5.5	1500	900	2350	1400	
ADP 130	DN50	780	1.6	7	1750	1000	2450	1800	
ADP 155	DN50	930	1.6	8	1750	1250	2450	1900	
ADP 200	DN80	1150	1.6	10	1900	1150	2450	2200	
ADP 270	DN80	1600	4	14	1900	1350	2500	2600	
ADP 330	DN100	1950	4	17	2200	1150	2600	3400	
ADP 440	DN100	2530	7.5	22	2350	1150	2750	3800	
ADP 500	DN100	2990	8.5	26	2500	1150	2750	4000	
ADP 600	DN100	3680	8.5	32	2800	1350	2850	4800	
ADP 700	DN125	4100	8.5	35	3000	1350	2850	5100	
ADP 850	DN125	4990	15	45	3200	1450	2950	5900	
ADP 1010	DN150	6550	15	56	3520	1750	3050	7200	
ADP 1280	DN150	7700	15	70	3700	2000	3100	7900	
ADP 1650	DN200	10250	22	95	4300	2200	3550	12000	

Operating pressure - Correction factors

Operating pressure (bar)	4	5	6	7	8	9	10	11
Correction factors	0.63	0.75	0.88	1	1.13	1.25	1.38	1.5

Operating temperature - Correction factors

Operating temperature °C	25	30	35	40	42	45
Correction factors	1	1	1	0.70	0.57	0.50





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