

KUMARK

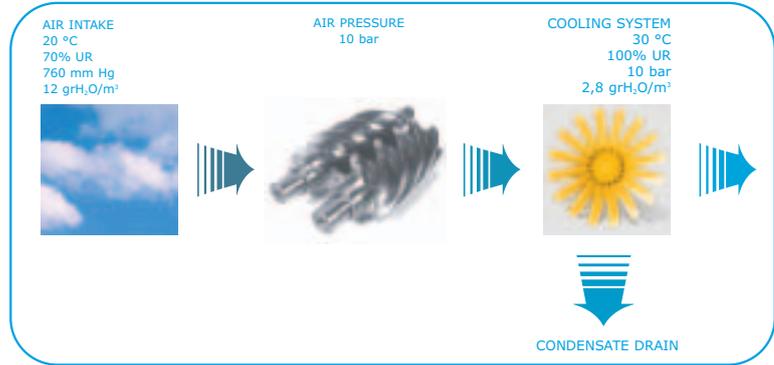


ADSORPTION AIR DRYERS
ADS 1 ÷ 170

T E C H N O L O G Y Y O U C A N T R U S T

Because

A compressor that operates in an ambient temperature of 20°C and 70% relative humidity takes in 12g of water for every Nm³ of air.



Compressed air is cooled at 30°C and condensed water vapour is separated, while 2,8 g of water for every Nm³ of air that can condense remains in the air (compressed at 10 bar as in the example) in vapour form.

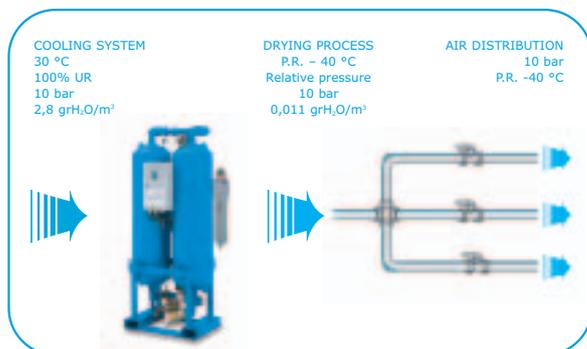
In the event of particularly rapid expansion and/or particular ambient conditions, compressed air for the application may be cooled to such an extent that the temperature drops below its Dew Point

If the temperature falls below its dew point (*), further condensation takes place resulting in separation of humidity and formation of condensate.

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Over time, this may lead to:

- serious damage to the distribution network, the machines using the compressed air and the final product.
- plugs of ice forming in the tubing in certain situations.



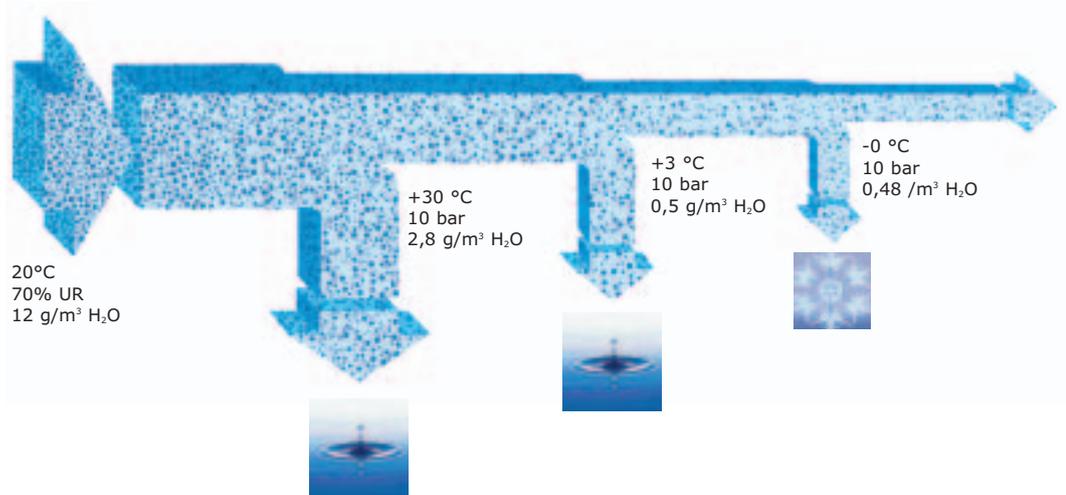
Today compressed air is a primary and essential source of energy for most production processes, from small businesses to large industries.

Filtered compressed air is no longer sufficient. Modern industries require compressed air that is increasingly filtered and low in condensate.

Maintaining the correct dew point for compressed air ensures correct operation throughout the production process.

MARK, has over 30 years' experience in drying compressed air, and offers the optimum solution to satisfy any demand.

Drying process



The cooling process does not allow the temperature to fall below 0°C (solidification of water). However, specific applications or particular ambient conditions require dew point temperatures of below 0°C.

Only adsorption dryers can achieve this, because condensate separation takes place WITHOUT lowering the temperature of the compressed air or gas.

Principle

(drying phase: S/L)

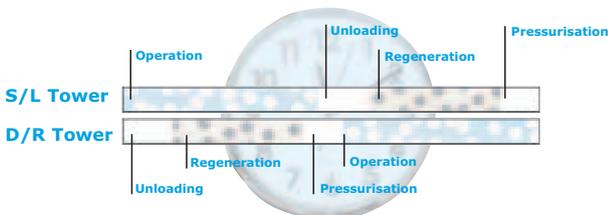
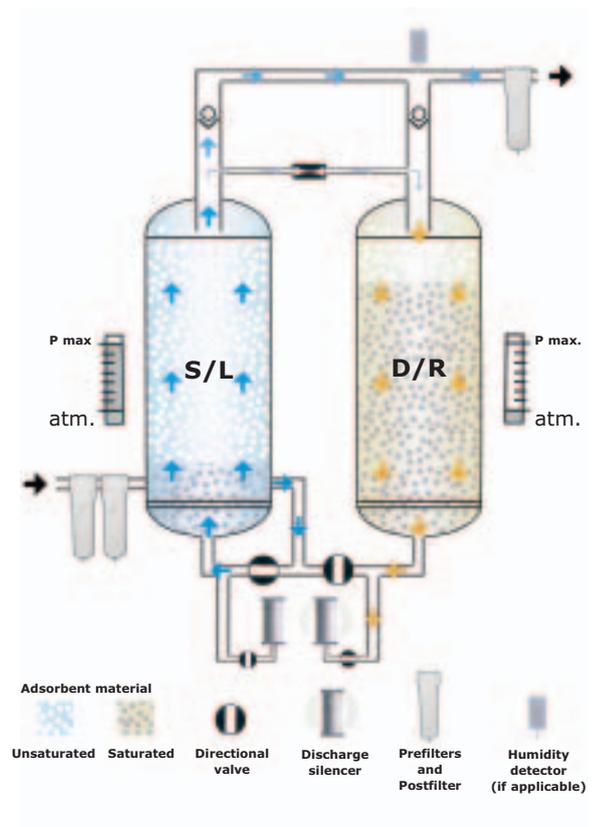
Moist oil-free compressed air passes through a layer of dry adsorbent material in the dry S/L flowing from low to high and is separated from the water vapour molecules that are trapped by the adsorbent material.

(regeneration phase: D/R)

Once the adsorbent material is saturated, it must be regenerated by extracting the trapped water vapour.

(pressurization phase: D/R)

Once regeneration has taken place, the double riser is pressurized to operational levels before inversion.



The next cycle starts with the inversion process. The moist compressed air passes through the regenerated pipe ^(S/L), while the moist pipe ^(D/R) begins its own regeneration.

ADS dryer

The ADS dryer is a complete unit for the filtration and drying of compressed air. It is a simple structure comprising (depending on its size):



- ① Oil removal prefilter/s are designed to prevent any oil entering the adsorbent layer.
- ② Distribution block for the inversion process.
- ③ Pipes containing the sequence-constructed adsorbent (***) material comply with prevailing EEC directives.
- ④ Blow-off silencers for silent operation.
- ⑤ Calibrated nozzle regulating through-flow of purged air.
- ⑥ Non-return valve (one per riser).
- ⑦ Dust postfilter at discharge port.
- ⑧ Control unit.
- ⑨ Sturdy structure with attachments makes it easy to move using tow ropes.
- ⑩ Metal base with attachments makes it easy to move using forklifts.

(***) Depending on the type of adsorbent material used and the cycles, three different dew points can be obtained: -20, -40 and -70 °C.

⑧ Optional Energy Saving Control DewPoint

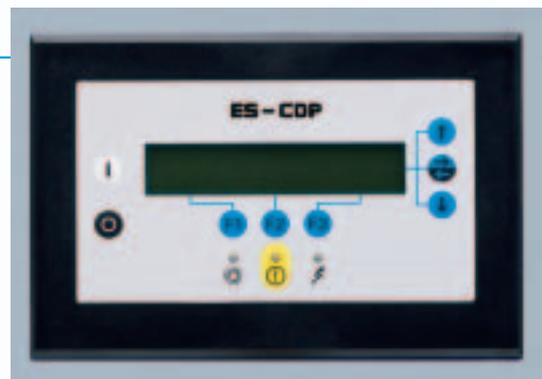
a small investment

The ES-CDP is an advanced control system that regulates the operating cycle of adsorption air dryers.

The system automatically lengthens and/or reduces the drying cycle according to the delivery dew point temperature whilst other functions remain unchanged.

This reduces the average consumption of purified air and leads to a significant reduction in operating costs.

The ES-CPD is now available for the range of ADS 40 ÷ 170 dryers.



The operation principles of adsorbent dryers are based on the chemical and physical characteristics of the adsorbent material used to trap the water vapour particles.

Cold **regeneration** of the ADS dryers, without heat application and using part of the dry compressed air, in counterflow within the saturated vapour.

Discharge **pressure** is continuous and constant under all load conditions.

MARK has 17 models covering an application range between 120 and 16800 l/1' and dew point temperatures under pressure from -20 to -40°C, and up to -70°C as an optional.

ADS range

Three models
Three dew point temperatures
17 models
From 0,120 to 16,800 m³/min.
Fitted with Prefilters and Postfilters



ADS 1 ÷ 3

- Innovative for its features, regulation and design.
- Versatile installation with Multi-port system and 6 possible connections.
- Easy to maintain:
 - maintenance operations can be performed without disconnecting tubing,
 - adsorbent cartridge with built-in postfilter.
- Automatic electronic control with optional remote control, for energy savings during long idling periods.

Ideal for use with OEM and/or OEM applications, with:

- capacities from 0,120 to 0,300 m³/min.
- 11 bar pressure (optional 16 bar)
- dew point -40°C (optional -70 °C)
- low leakage rate (less than 0.07 bar / 1 psi).



ADS 4 ÷ 36

- Compact, original, simple design.
- Easy to install thanks to:
 - multi-port intake and discharge system,
 - wall-mounting up to model 20,
 - prefilters and postfilters that can be applied directly to the IN/OUT connections,
 - small sizes.
- Suction and discharge manifolds in anticorrosive aluminium, with self-cleaning spool valve for inversion phases.
- Housing has built-in high-efficiency silencer.
- Automatic control system or timer card with optional remote control

Can be used for applications and/or to create small air treatment stations offering:

- capacities from 0,420 to 3,600 m³/min.
- 11 bar pressure (optional 16 bar)
- dew point -20°C (optional -40 and -70°C)
- low leakage rate (less than 0.15 bar / 2 psi).



ADS 40 ÷ 170

- Reliable operation with standard components tested for continuous service.
- Easy to move using either a simple pallet truck or a forklift truck
- Easy to install, with:
 - option of varying the direction of in/out connections,
 - minimum floor space requirements.
- Package unit with built-in set of oil removal intake filters and discharge dust filter.
- Automatic control system or timer card with optional remote control.

Ideal for creating complete air treatment stations, with capacities from 3,900 to 16,800 m³/min.

- 11 bar pressure (optional 16 bar)
- dew point -40°C (optional -70 °C)
- low leakage rate (less than 0.20 bar / 2.9 psi)
- Low air speed for maximum adsorbent efficiency.

Advantages of the ADS

A wise choice

Low dew point temperature.

Humidity separation without condensate.

Dry, clean, oil-free compressed air always available for the applications.

Units tested and approved, guaranteeing full operation in all climates.

Ready to use.

A complete, reliable, noiseless range for any industrial requirements with low leakage rates.

Immediate advantages

Low power consumption.

Easy access to any component.

Occupies minimal floor space.

Easy to install, easy to move, adjustable direction of in/out connections.

Continuous, automatic operation with reliable performance 24 hours a day.

Energy savings with Energy Saving Control Dew Point.



Higher profits for companies

- The distribution unit costs less and can be installed without slopes to drain points, without separators and without condensate drains, but with simple slopes coming directly from the main line
- Higher productivity because of fewer breakdowns in production owing to machine faults.
- Lower maintenance costs:
 - for the distribution network, as there is no need to clean line separators or check the operation of the unloaders.
 - for machine applications and pneumatic tools, as the absence of condensate eliminates the main cause of breakdowns.
- Longer life for pneumatic equipment, as the use of dry air guarantees reliable performance over time.
- Energy savings due to fewer line pressure drops.

Better company image

- Higher final product quality both for applications where compressed air comes directly into contact with the product and where the air acts purely to assist movement of the machine's servomechanisms.

Dry air

Condensate is the main cause of the deterioration of tubing, breakdown of applications and interruption of processes.

Today's applications and production processes increasingly require clean, dry compressed air.

The removal of all pollutants such as condensate, oil, dust etc. is essential for preventing breakdown in production or damage to the final product.

Standard separation systems are no longer sufficient, making progress vital.

Refrigeration and adsorbent dryers are the most common solutions for the elimination of condensate.

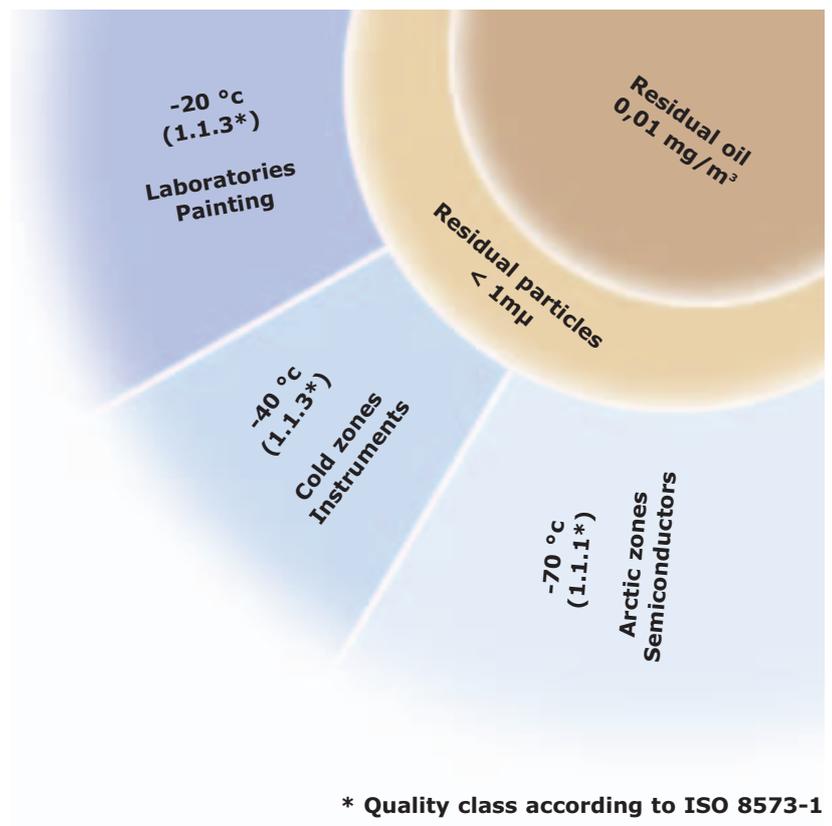


The adsorbent dryer is crucial to all processes that require a dew point temperature lower than zero centigrade under pressure.

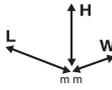
Quality Air with the ADS dryer

particularly for:

- The Chemical and Pharmaceutical Industries
- Petrochemical Plants
- Food Industry
- Transportation of hygroscopic materials
- Quality painting
- Textile production
- Semiconductors
- Cable pressurization
- Beer and drinks production
- Applications in low-temperature environments



TECHNICAL DATA

Type												
	bar	psi	m³/min	m³/h	cfm	°C	V/Hz/ph	gas	L	W	H	kg
ADS 1	11	159	0,120	7,2	4,2	-40	230/50/1	3/8"	281	92	445	13
ADS 2	11	159	0,180	10,8	6,3	-40	230/50/1	3/8"	281	92	504	14
ADS 3	11	159	0,300	18	10,6	-40	230/50/1	3/8"	281	92	635	17
ADS 4	11	159	0,420	25,2	14,8	-20	230/50/1	1/2"	290	176	855	26
ADS 8	11	159	0,720	43,2	25,4	-20	230/50/1	1/2"	290	176	855	27
ADS 11	11	159	1,020	61,2	36,0	-20	230/50/1	1/2"	290	176	1055	32
ADS 15	11	159	1,440	86,4	50,9	-20	230/50/1	1/2"	385	227	1100	50
ADS 20	11	159	1,920	115	67,8	-20	230/50/1	1"	385	227	1100	54
ADS 27	11	159	2,640	158	93,2	-20	230/50/1	1"	484	406	1255	125
ADS 36	11	159	3,600	216	127	-20	230/50/1	1 1/4"	488	406	1255	130
ADS 40	11	159	3,900	234	138	-40	230/50/1	1 1/2"	715	664	1512	230
ADS 50	11	159	4,800	288	170	-40	230/50/1	1 1/2"	715	664	1512	250
ADS 60	11	159	6,000	360	212	-40	230/50/1	1 1/2"	715	664	1627	280
ADS 85	11	159	8,400	504	297	-40	230/50/1	1 1/2"	732	690	1642	340
ADS 105	11	159	10,200	612	360	-40	230/50/1	1 1/2"	764	723	1651	430
ADS 140	11	159	13,800	828	488	-40	230/50/1	2"	947	808	1728	500
ADS 170	11	159	16,800	1008	594	-40	230/50/1	2"	947	808	1740	550

CORRECTION COEFFICIENT

Operating temperature	°C	20	25	30	35	40	45	50			
	A	1,00	1,00	1,00	1,00	0,84	0,71	0,55			
Operating pressure	Bar (psi)	4(58)	5(73)	6(87)	7(100)	8(116)	9(130)	10(145)	11(157)		
	B	0,62	0,75	0,87	1,00	1,12	1,25	1,37	1,50	(ADS 1 ÷ 3)	
		0,47	0,68	0,84	1,00	1,12	1,25	1,37	1,50	(ADS 4 ÷ 170)	

Coefficient K = A x B

The new value for nominal capacity is calculated by dividing the real capacity of air to be dried by the coefficient K relative to the actual operating conditions. the coefficient K.

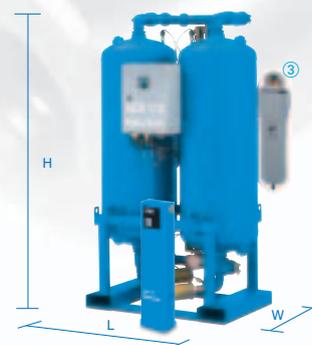
The company reserves the right to perform eventual modifications due to a steady improvement of the product.

Notes:

- Sizes without packaging
- Reference conditions:
 - Operating pressure : 7 bar (100psi)
 - Maximum pressure : 11 bar (159 psi)
 - Operating temperature : 35°C
 - Relative humidity : 100 %

On demand:

- Operating pressure : 16 bar (232 psi)
- Dew point : - 40; - 70 °C
- Safety valves : for CE / MOM model
- Protection : IP 54
- Normative (ove applicabili) : ASME; CSA/UL; UDT; MOM; DIR
- Regulations (where applicable) : ASME; CSA/UL; UDT; MOM; DIR
- Clogging indicator / Differential gauge ③.



According to

