

# AD Adsorption Dryers



AD 7 to 1300

**ALUP**  
Kompressoren

# ALUP

Driven by technology. Designed by experience.

*Alup Kompressoren has over 85 years of industrial experience. It is our ambition to offer compressed air solutions that ensure we are first in choice for our customers. To reach this goal we need continuous investment in our product development to make sure that we are always able to offer:*

- High performance and excellent quality
- Integrated engineered solutions
- Full energy efficiency
- Total cost of ownership
- Environmental care.

[www.alup.com](http://www.alup.com)



## The benefits of adsorption dryers

*During the compression process, a compressor turns humidity in the intake air into condensate. This will cause wear and corrosion to the compressed air network and downstream equipment. The results are costly interruption to production, and reduction in the efficiency and service life of the equipment used. Adsorption dryers provide a solution to prevent these negative impacts.*

### Clean and dry air

- Residual water is adsorbed by the desiccant material, protecting the air network from corrosion, rust and leakages.
- Higher final product quality.
- Increased overall productivity.
- Adsorption dryers remove the remaining g/m<sup>3</sup> air water content in the compressed air that might condense downstream of a refrigerant dryer.



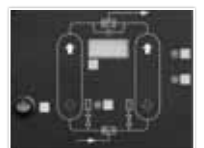
### Easy installation

- Ready to install, with the possibility of integrated filtration solutions (AD 7 - 60).
- Compact solution that takes up minimal space.
- Multiport inlet and outlet (AD 7 - 60).
- Forklift slots (AD 115 - 1300).



### User-friendly operation

- User-friendly communication display indicates air quality and maintenance requirements (sensor).
- Compatible with any compressor technology.



### Cost-efficient solution

- Control dew point management solution available to minimize energy consumption (AD 115 - 1300).
- Long maintenance interval.
- Reduced risk of wear, corrosion and rust, lowering maintenance costs.
- Increased lifetime of pneumatic equipment.



# Multiple air treatment solutions from ALUP

## Oil and dust filtration

Our network filters are ideal for the treatment of residual oil and dust particles. Depending on the filtration level, our ALUP filters capture and eliminate:

- Particles down to 0.01 micron such as smoke and dust.
- Oil particles at concentrations as low as 0.05 ppm.

## Water separation

Our air drying solutions eliminate the water vapor that can potentially condense in your compressed air system. Select the drying solution that best meets your needs:

- The ADQ refrigeration dryer eliminates water down to a pressure dew point of 3°C.
- The AD adsorption dryer eliminates moisture down to a dew point as low as -40°C or -70°C depending on the dryer type.

## Condensate treatment

- Capacitive condensate drains allow easy discharge of condensate throughout the complete compressed air chain to ensure zero air loss.
- Our OWS oil-water separator will clean the removed condensate in order to be in line with local environmental legislations.

# How the AD adsorption dryer works

The adsorption drying principle is based on the ability of the desiccant material to adsorb water vapor from the compressed air. Filters before the dryer protect it, while filters after the dryer eliminate desiccant dust. The drying process consists of three phases:

## Drying phase

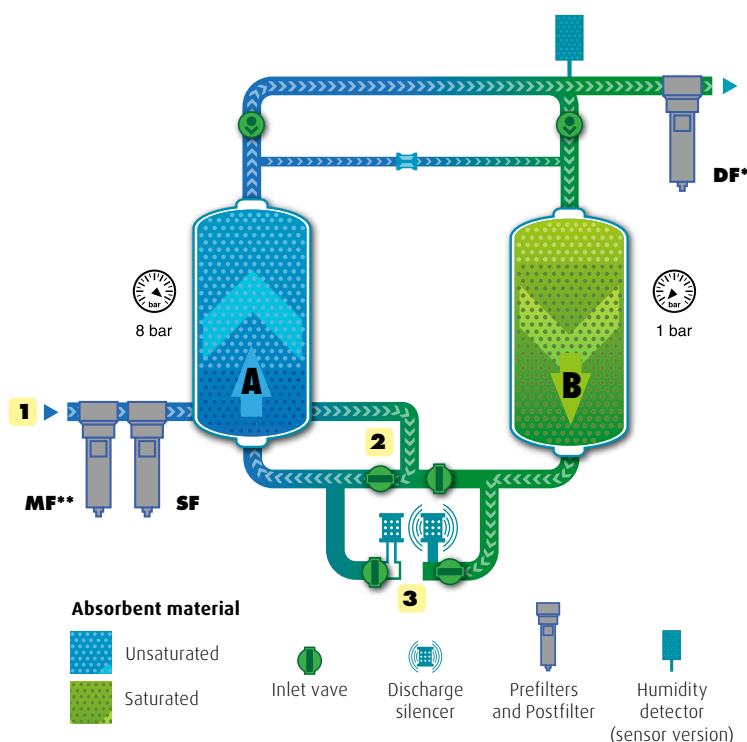
Wet air from the compressor passes through the **inlet filters (1)** which remove the oil. The air then enters into tower A. The desiccant contained in tower A adsorbs the water vapor molecules. After a fixed (timer) or variable (sensor) time the **inlet valve (2)** deviates the air flow from tower A to tower B, which then becomes the operational tower.

## Regeneration phase

During the drying phase in tower A, some dry air is deviated into the top of tower B, where it extracts the trapped water vapor from the desiccant material. During this phase, tower B is open to the atmosphere, allowing the purge air to expand. The **silencers (3)** on the outlet ensure quiet operation.

## Pressurization phase

Once regeneration has taken place and tower B is pressurized, the **inlet valve (2)** changes the air flow again.



Notes:

\* On AD 7 - 60 the outlet filter is built inside the desiccant cartridge.

\*\* Recommended but not included on AD 7 - 645.

# AD Adsorption Dryers: Multiple models, multiple benefits

## AD 7 - 60



### Technical info

### AD 7 - 60

Capacity at 7 bar (-40°C)	7-59 m³/h
Dew point	Standard -40°C
Maximum working pressure	16 bar
Working pressure range	4-16 bar
Voltages	12-24 V - DC 50/60 Hz 100-115-230 V - AC 50/60 Hz
Easy installation	Multiport inlet and outlet
Dew point sensor	Not available
Dew point -70°C	By derating the air capacity



### Fast and easy installation

- Multiport inlet and outlet arrangement ensures easy and fast installation.
- Unit can be installed horizontally and vertically. It can stand on the floor or can be mounted to the wall (optional mounting kit).
- The inlet pre-filter SF is delivered loose with the dryer but can be directly fixed on it.
- The outlet post-filters DF are integrated in the desiccant cartridges.



### User-friendly and durable operation

- Electronic control offers:
  - Regeneration cycle management.
  - Regulation status.
  - Default diagnosis.
  - Remote default report.
- Each tower is fitted with a high-efficiency silencer for quiet operation
- Aluminium head, base and cylinders prevent corrosion.
- Standard dew point is -40°C but can be set at -70°C by derating the FAD.



### Easy and quick maintenance

- Use of desiccant cartridges with two integrated post-filters DF.
- Cartridge replacement in the inlet pre-filter SF done in no time.



AD 7 - 60

## AD 115 - 645



### Technical info

### AD 115 - 645

Capacity at 7 bar (-40°C)	115-684 m³/h
Dew point	Standard -40°C
Maximum working pressure	14.5 bar
Working pressure range	4-14.5 bar
Voltages	115-230 V - AC 50/60 Hz
Easy installation	Forklift slot
Dew point sensor	Available
Dew point -70°C	Available (-70°C as an option together with derating the air capacity)



### Robust and space-saving

- Base frame makes it easy to transport by forklift.
- Compact dryer can be installed on the floor (standard floor mounting kit).



### User comfort

- Low noise level due to high-efficiency silencers with integrated safety valve.
- Easy pressure check thanks to pressure gauges.



### Reliable performance

- Standard components tested for continuous service.
- Inlet pre-filter SF and outlet post-filter DF are included but not pre-mounted. They have to be mounted on the air distribution line.

### Cost-efficient solution

- Control dew point management solution (sensor) available to minimize energy consumption (as an option).
- Standard dew point -40°C (-70°C as an option together with derating the air capacity).





## AD 650 - 1300 (timer): Electronic timer control

## AD 650 - 1300 (sensor): Dew point management system



Technical info	AD 650 - 1300 (timer/sensor)
Capacity at 7 bar (-40°C)	648-1296 m³/h
Dew point	Standard -40°C
Maximum working pressure	11 and 14.5 bar
Working pressure range	4-11 bar and 11-14.5 bar
Voltages	230 V - AC 50/60 Hz
Easy installation	Forklift slots
Dew point sensor	Available
Dew point -70°C	Available (-70°C as an option together with derating the air capacity)

AD 650 - 1300 (timer) / AD 650 - 1300 (sensor)



### Smooth operation and user comfort

- Pressure dew point digital display (AD sensor)
- Two manometers integrated in control panel to show pressure in vessels A and B.
- High-efficiency silencers with integrated safety valve.



### Cost-efficient solution

- Pressure dew point sensor (AD 650 - 1300 sensor).
- Standard dew point is -40°C (-70°C as an option together with derating the air capacity).



### Durable and efficient performance

- Galvanized piping with flanged connections.
- Inlet valves with long service interval.
- Wide vessels ensure a low air speed and a longer contact time for an available drying phase.



### Easy installation and compact design

- Robust frame including forklift slots.
- The unit is rather low for its capacity due to flanges built into the vessels.



## Regeneration phase: How to decrease your consumption

One feature of AD adsorption dryer technology is the small amount of air required to eliminate water previously adsorbed by the desiccant material during the air drying phase. This process ensures a constant dew point of  $-40^{\circ}\text{C}$  and optimum air quality. For these reasons, there are two types of AD dryers available



### AD timer (Timer controlled)

**Constant purge air calculated to operate in the most demanding conditions.**

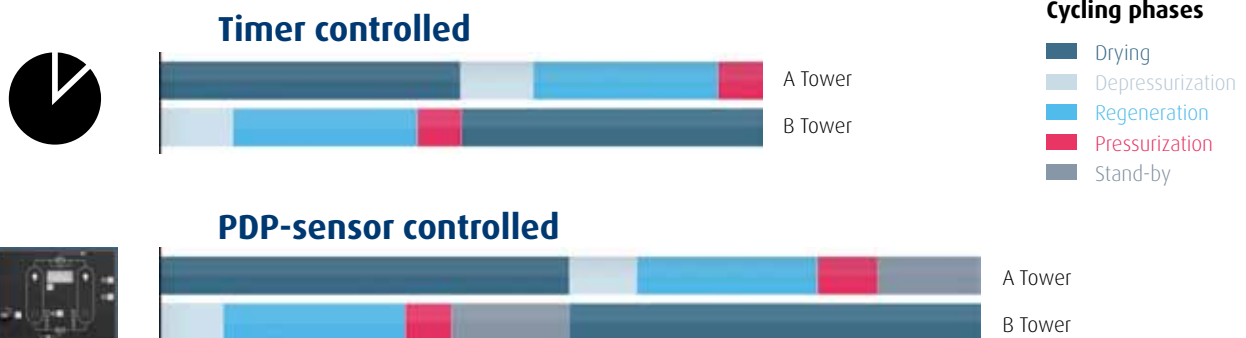
The drying and regenerating process is controlled by a timer, which fixes the drying, regeneration and re-pressurization times. Regeneration air flow depends on the dryer size and is a fixed value.

### AD sensor (PDP-sensor controlled)

**Purge air flow is variable and is based on achieving a constant dew point for significant energy savings.**

The electronic Pressure Dew Point control (sensor) extends the drying phase of the dryer's cycle. It is done by measuring PDP of compressed air on the dryer outlet and only switching the columns when the desiccant in the active tower is saturated. The regeneration part of the cycle stays fixed. As most of the time the compressor and dryer run at less than 100% load, this results in significant extension of the drying time and a reduction in purge air consumption. Typically, the extra investment in Pressure Dew Point control is paid back in a few months by savings made on dryer running costs.

**Dew point control of the regeneration air volume is therefore a guaranteed return on investment.**



## Application areas

- Chemical and pharmaceutical industries.
- Petrochemical plants.
- Food industry.
- Transportation of hygroscopic materials.
- Quality painting.
- Textile production.
- Semiconductors.
- Cable pressurization.
- Beer and drinks production.
- Low temperature environments.
- Whenever a pressure dew point less than 3°C is required.



## Technical specifications

	Regulating pressure	Air inlet capacity m³/h (1)		Working pressure range	Filters (2)			Inlet/Outlet connections	Dimensions (A x B x H)	Weight
		Dew point under pressure			D/M 0.1 micron 0.1 mg/m³	D/S 0.01 micron 0.01 mg/m³	D/D 1 micron n.a. mg/m³			
Type	bar	-40°C	-70°C	bar	Pre-filters		Post-filter	Gas	mm	kg
AD 7	7	7	5.0	4-16	n.a.	SF 60	Integrated in the dryer	3/8"	281 x 92 x 445	13
	9.5	9.2	6.4							
	12.5	11.8	8.3							
AD 11	7	10	7	4-16	n.a.	SF 60		3/8"	281 x 92 x 504	14
	9.5	13.1	9.2							
	12.5	16.9	11.8							
AD 18	7	17	11.9	4-16	n.a.	SF 60		3/8"	281 x 92 x 504	17
	9.5	22.3	15.6							
	12.5	28.6	20.1							
AD 25	7	26	18	4-16	n.a.	SF 60		3/8"	281 x 92 x 815	20
	9.5	34.1	24							
	12.5	43.8	31							
AD 40	7	42	29	4-16	n.a.	SF 60		3/8"	281 x 92 x 1065	24
	9.5	55	39							
	12.5	70.8	50							
AD 60	7	59	41	4-16	n.a.	SF 60		3/8"	281 x 92 x 1460	31
	9.5	77.3	54							
	12.5	99.4	70							
AD 115	7	115	81	4 - 14.5	n.a.	SF 120	DF 120	1"	550 x 242 x 998	64
	9.5	151	105							
	12.5	194	136							
AD 145	7	144	101	4 - 14.5	n.a.	SF 120	DF 120	1"	550 x 242 x 998	64
	9.5	189	132							
	12.5	243	170							
AD 160	7	162	113	4 - 14.5	n.a.	SF 200	DF 200	1"	550 x 242 x 1243	78
	9.5	212	149							
	12.5	273	191							





	Regulating pressure	Air inlet capacity m³/h (1)		Working pressure range	Filters (2)			Inlet/Outlet connections	Dimensions (A x B x H)	Weight
		Dew point under pressure			D/M 0.1 micron 0.1 mg/m³	D/S 0.01 micron 0.01 mg/m³	D/D 1 micron n.a. mg/m³			
Type	bar	-40°C	-70°C	bar	Pre filters		Post filter	Gas	mm	kg
AD 215	7	234	164	4 - 14.5	n.a.	SF 200	DF 200	1"	550 x 242 x 1611	98
	9.5	307	215							
	12.5	394	276							
AD 250	7	270	189	4 - 14.5	n.a.	SF 340	DF 340	1"	550 x 358 x 998	133
	9.5	354	248							
	12.5	455	319							
AD 325	7	324	227	4 - 14.5	n.a.	SF 340	DF 340	1"	550 x 358 x 1243	158
	9.5	424	297							
	12.5	546	382							
AD 360	7	378	265	4 - 14.5	n.a.	SF 510	DF 510	1"	550 x 358 x 1611	256
	9.5	495	347							
	12.5	637	446							
AD 470	7	468	328	4 - 14.5	n.a.	SF 510	DF 510	1"	550 x 358 x 1611	256
	9.5	613	429							
	12.5	789	552							
AD 575	7	576	403	4 - 14.5	n.a.	SF 510	DF 510	1" 1/2	550 x 520 x 1611	310
	9.5	755	529							
	12.5	971	680							
AD 645	7	684	479	4 - 14.5	n.a.	SF 800	DF 800	1" 1/2	550 x 520 x 1611	310
	9.5	896	627							
	12.5	1153	807							
AD 650 11 bar	7	648	454	4-11	MF 800	SF 800	DF 800	1" 1/2	1040 x 840 x 1760	445
	9.5	810	567							
AD 650 14.5 bar	12.5	774	542	11-14.5						
AD 800 11 bar	7	792	554	4-11	MF 800	SF 800	DF 800	1" 1/2	1040 x 840 x 1760	445
	9.5	990	693							
AD 800 14.5 bar	12.5	954	668	11-14.5						
AD 1080 11 bar	7	1080	756	4-11	MF 1000	SF 1000	DF 1000	2"	1046 x 894 x 1876	600
	9.5	1350	945							
AD 1080 14.5 bar	12.5	1296	907	11-14.5						
AD 1300 11 bar	7	1296	907	4-11	MF 1500	SF 1500	DF 1500	2"	1100 x 923 x 1914	650
	9.5	1620	1134							
AD 1300 14.5 bar	12.5	1548	1084	11-14.5						

**Notes:**

(1) Data measured at reference conditions: Air inlet temperature = 35°C, relative humidity = 100%, regulating pressure (see technical data table).

(2) Filters are delivered loose with the dryer.

AD 7 up to 60: the filters can be directly fixed on the dryer.

AD 115 up to 1300: the filters have to be mounted on the air distribution line.

For other conditions than the reference conditions, use the below correction factor table.

## Correction factors

AD/14.5 or 16 bar (max. working pressure)													
Air inlet pressure (bar)	4	5	6	7	8	9	10	11	12	13	14.5	15	16
AD 7 - 60	0.62	0.75	0.87	1	1.12	1.25	1.37	1.5	1.62	1.75	1.93	2	2.12
AD 115 - 645	0.62	0.75	0.87	1	1.12	1.25	1.37	1.5	1.62	1.75	1.93	-	-

AD/11 bar (max. working pressure)										AD/14.5 bar (max. working pressure)				
Air inlet pressure (bar)	4	5	6	7	8	9	10	11	11	12.5	13	14	15	14.5
AD 650 - 1300	0.47	0.68	0.84	1	1.1	1.2	1.3	1.38	0.89	1	1.04	1.11	1.19	1.15

Air inlet temperature (°C)	20	25	30	35	40	45	50
AD 7 - 60	1.07	1.06	1.04	1	0.88	0.78	0.55
AD 115 - 1300	1	1	1	1	0.84	0.71	0.55

Pressure dew point (°C)	-40	-70
AD 7 - 1300	1	0.7





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