

# COMPRESSED AIR TREATMENT



# ALMiG COMPRESSED AIR TREATMENT

- + Generation and treatment: Everything from a single source and perfectly matched
- + ALMiG covers the entire range of compressed air treatment products.
- + ALMiG can provide the right kind of compressed air treatment product for every requirement profile.

## Highly versatile

FILTERS  
AFP, AFM, AFS, AFC

p. 4



Efficient pre-separation of condensate

AS  
CYCLONE SEPARATOR

p. 6

## Reliable condensate drain

CONDENSATE DRAIN  
ALM-D

p. 8



For oil-free condensate

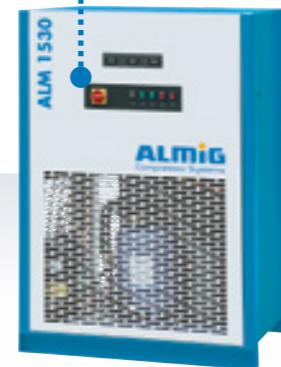
OIL/WATER SEPARATOR  
ALM-OWS

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## Reliable and robust

REFRIGERATION DRYER  
ALM

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Energy-saving compressed air drying

REFRIGERATION DRYER  
ALM-E

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## Compact and space-saving

REFRIGERATION DRYER  
ADD

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For pressure dew points of down to -70°C

ADSORPTION DRYER  
ALM-CD / ALM-CCD

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Very efficient at high performance levels

ADSORPTION DRYER  
ALM-WD

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For oil-free & taste-neutral compressed air

ACTIVE CARBON ADSORBER  
ALM-AC

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# AFP, AFM, AFS, AFC FILTERS

Compressed air filters guarantee clean compressed air to satisfy very stringent requirements.

They can be used in a multitude of applications - wherever compressed air is required clean, dry or free of oil aerosols. It's a huge undertaking, especially when you consider the fact that more than two billion particles and liquid molecules can be present in 1 m<sup>3</sup> of compressed air at a compression end pressure of 10 bar.

This is an undertaking to which the ALMiG heavy-duty filters are perfectly suited.

### Equipment features:

- Standard version including differential pressure indicator and float drain
- Premium version including
  - differential pressure gauge to display the most cost-effective time to replace the filter element
  - electronically controlled condensate drain to discharge condensate without any loss of compressed air
- Three-part housing with bayonet lock for simple replacement and installation of the filter elements
- Extremely light aluminium housing with threaded connection for volume flows of 30 - 3300 m<sup>3</sup>/h
- Alternatively, as of volume flows of 2760 - 13750 m<sup>3</sup>/h, steel housing with flange connection

### Application

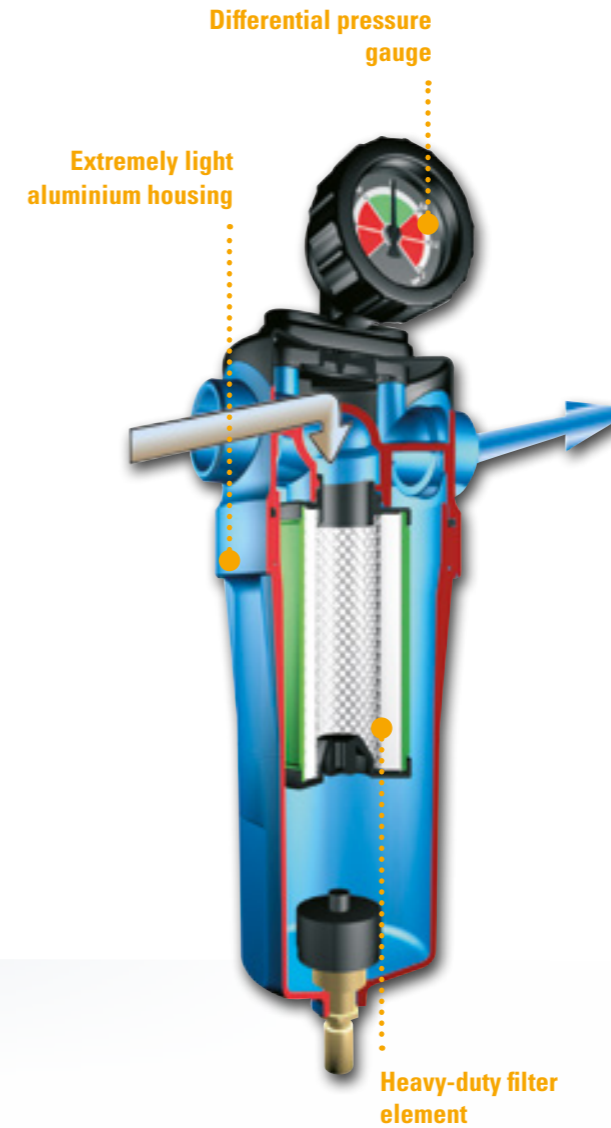
Industry

### Volume flows

30 - 13750 m<sup>3</sup>/h

### Operating temperatures

Minimum: +1 °C  
Maximum: +100 °C



- + Heavy-duty filter for clean and dry compressed air
- + Three-part housing for simple replacement of filter elements
- + Available as standard or premium version



AFP, AFM, AFS, AFC filters

### The optimum filter for every requirement

Filter type	Type	Particle size	Residual oil content <sup>1</sup>	Residual water content <sup>2</sup> (in liquid form)
Pre-filter	AFP	5	-	present
Micro filter	AFM	1	0.1	not present <sup>3</sup>
Sub microfilter	AFS	0.01	0.01	not present <sup>3</sup>
Active carbon filter	AFC		0.003	not present <sup>3</sup>

<sup>1</sup> at inlet concentration of 3 mg/m<sup>3</sup>  
<sup>2</sup> details relate to a station with no upstream compressed air drying  
<sup>3</sup> the compressed air no longer contains residual water in a liquid form if the temperature is not reduced downstream of the filter elements (air is 100% saturated)

### Filter with threaded connection

Type AFP, AFM, AFS, AFC	Volume flow		Connection	Standard version <sup>1</sup>			Premium version <sup>2</sup>		
	Nom.	Max.		Width	Height	Weight	Width	Height	Weight
	m <sup>3</sup> /h	m <sup>3</sup> /h	G	mm	mm	kg	mm	mm	kg
30	30	37	3/8"	90	233	0.7	90	367	1.0
60	60	75	1/2"	90	233	0.7	90	367	1.0
108	108	135	3/4"	90	293	0.8	90	427	1.1
180	180	225	3/4"	90	293	0.8	90	427	1.1
204	204	255	1"	120	328	1.2	120	452	1.5
300	300	375	1"	120	328	1.3	120	452	1.6
432	432	540	1 1/2"	120	408	1.4	120	532	1.7
570	570	710	1 1/2"	120	408	1.5	120	532	1.8
750	750	935	2"	165	523	3.8	165	647	4.1
990	990	1235	2"	165	523	3.9	165	647	4.2
1140	1140	1425	2 1/2"	165	698	4.9	165	822	5.2
1320	1320	1650	2 1/2"	165	698	5.0	165	822	5.3
1680	1680	2100	3"	200	735	6.8	200	857	7.1
2100	2100	2625	3"	200	888	8.0	200	1012	8.3
2640	2640	3300	3"	200	1008	8.9	200	1132	9.2

All details relate to 1 bar (abs), 20°C, 70% RH; <sup>1</sup> Aluminium housing with threaded connection including float drain and differential pressure indicator

<sup>2</sup> Aluminium housing with threaded connection including electronically controlled condensate drain and differential pressure gauge, operating pressure: 16 bar., operating temp.: min. +1 °C, max. +100 °C (60 °C)

### Filter with flange connection

Type AFP, AFM, AFS, AFC	Nom.	Max.	Connection	Standard version <sup>1</sup>			Premium version <sup>2</sup>		
				Width	Height	Weight	Width	Height	Weight
	m <sup>3</sup> /h	m <sup>3</sup> /h		mm	mm	kg	mm	mm	kg
2760	2760	3450	PN 40	485	1139	125	485	1139	125
4200	4200	5250	PN 40	630	1130	196	630	1130	196
5700	5700	7125	PN 40	630	1235	210	630	1235	210
7500	7500	9375	PN 40	676	1277	264	676	1277	264
9300	9300	11625	PN 40	724	1320	314	724	1320	314
11000	11000	13750	PN 40	724	1330	320	724	1330	320

Operating overpressure p <sub>ü</sub> (bar)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor f <sub>pü</sub>	0.25	0.36	0.5	0.6	0.75	0.9	1	1.1	1.2	1.4	1.5	1.6	1.75	1.9	2	2.1

### Conversion factors for other operating overpressures

The volume flows stated relate to a pressure of 7 bar. Volume flows for deviating pressures can be calculated with the correction factors.

### Volume flow configuration

The volume flow through the filter element should be between 50% and 100% of the nominal volume flow. Running above or below this, impacts negatively on filter efficiency. The maximum volume flow must not be exceeded.

All details relate to 1 bar (abs), 20 °C, 70% RH.

<sup>1</sup> Steel housing with flange connection including float drain and differential pressure indicator

<sup>2</sup> Steel housing with flange connection including electronically controlled condensate drain and differential pressure gauge, operating pressure: 12 bar, operating temp.: min. +1 °C, max. +66 °C

# CYCLONE SEPARATOR AS

The cyclone separators are developed for treating compressed air in industrial areas of use. They are used to remove liquid water from the compressed air, that is drawn in the ambient air due to air humidity and precipitates in the aftercooler. This condensate also contains particles of dirt and aerosols.

It is always a good idea to use a cyclone separator when a refrigeration dryer is installed directly downstream of the compressor so that less condensate precipitates in the refrigeration dryer.

The high centrifugal forces in the cyclone separator cause the water and particles of dirt to be "slung" against the inner wall, from where they slide into a collecting space.

The conical shape of the lower filter housing section means that separated-out aerosols cannot be swept up.

The turbulence-free zone in the lower part of the filter housing prevents condensate already separated in the wet area being swept up again by the air flow.

Due to their optimised design, the three-part housings with twist insert deliver low differential pressures at high flow rates.

As an option, the cyclone separators are also available in a premium version with electronic condensate drain.

**Equipment features:**

- Standard version including float drain
- Premium version including electronically controlled condensate drain to discharge condensate without any loss of compressed air

Application

Industry

Volume flows

30 - 13800 m<sup>3</sup>/h

Max. operating pressure

16 bar

Operating temperatures

Minimum: +1 °C

Maximum: +66 °C

**Cyclone separator**

	AS						
	TYPE	Volume flow Nom. m <sup>3</sup> /h	Volume flow Max. m <sup>3</sup> /h	Connection G	Width mm	Height mm	Weight kg
Aluminium housing/ threaded connection	30	30	37	3/8"	90	220	0.6
	60	60	75	1/2"	90	220	0.6
	180	180	225	3/4"	90	280	0.7
	300	300	375	1"	120	310	1.1
	570	570	710	1 1/2"	120	390	1.3
	990	990	1235	2"	165	505	3.6
	1320	1320	1650	2 1/2"	165	680	4.7
Steel housing/ flange connection	2700	2700	3375	3"	200	718	6.2
	2400	2400	2760	DN 100	420	1030	41
	3000	3000	3450	DN 125	445	1040	55
	6600	6600	7500	DN 150	523	1095	81
	7500	7500	8630	DN 175	606	1180	117
	12000	12000	13800	DN 200	657	1275	157

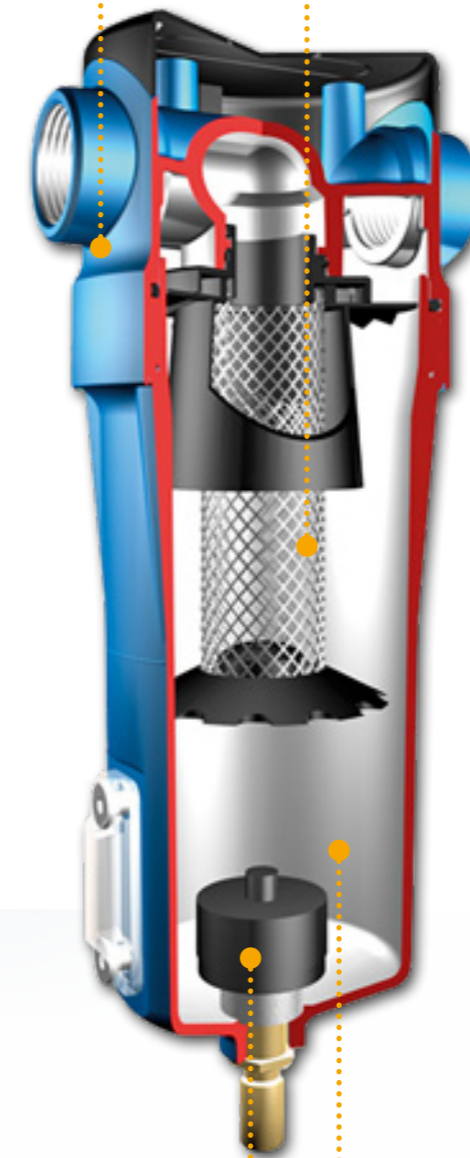
**Cyclone separator - premium version**

	AS TYPE						
	Volume flow Nom. m <sup>3</sup> /h	Volume flow Max. m <sup>3</sup> /h	Connection G	Width mm	Height mm	Weight kg	
Aluminium housing/ threaded connection	30	30	37	3/8"	90	295	0.8
	60	60	75	1/2"	90	295	0.8
	180	180	225	3/4"	90	355	0.9
	300	300	375	1"	120	380	1.3
	570	570	710	1 1/2"	120	460	1.5
	990	990	1235	2"	165	575	3.8
	1320	1320	1650	2 1/2"	165	750	4.9
Steel housing/ flange connection	2700	2700	3375	3"	200	785	6.4
	2400	2400	2760	DN 100	420	940	41
	3000	3000	3450	DN 125	445	950	55
	6600	6600	7500	DN 150	523	1005	81
	7500	7500	8630	DN 175	606	1090	117
	12000	12000	13800	DN 200	657	1185	157

All details relate to 1 bar (abs), 20 °C, 70% RH.

**Three-part housing**  
resulting in low differential pressures

**Heavy-duty cyclone separator**



**Turbulence-free zone**  
Prevents condensate from being swept up

**Float drain**

- + Low differential pressures with high flow rates
- + Separated-out aerosols cannot be swept up
- + Available as standard or premium version



AS cyclone separator

# ALM-D CONDENSATE DRAIN

You cannot avoid producing condensate when generating compressed air. The condensate contains oil and particles of dirt and may cause corrosion in the receiver, compressed air lines and on the consumer if not reliably drained. The ALM-D condensate drains from ALMiG deliver reliable condensate drainage. Avoiding compressed air losses can result in huge energy savings.

## Level-controlled condensate drain

### ALM-D 10

The ALM-D 10 is a level-controlled condensate drain without compressed air losses for smaller compressed air systems. The ALM-D 10 features a reliable, directly controlled valve with FPM seal and covers pressure ranges of between 0 and 16 bar (up to 230 PSI).

With an inlet height of just 74 mm, the ALM-D 10 is a very compact solution offering unique installation flexibility and reliability.

Given its very compact size and low weight of less than 500 grammes, it is typically used in refrigeration dryers and filters. The maximum compressor capacity of this drain is 10 m<sup>3</sup>/min (350 CFM).

### Equipment features:

- Compact solution with no compressed air losses.
- Very light.
- One model covers all capacities up to a compressor capacity of 10 m<sup>3</sup>/min.
- The inlet height of just 74 mm makes for simple installation.
- The fact that the valve is located externally means that maintenance is quick and easy.
- Robust, corrosion-resistant aluminium housing.
- Integrated clever valve self-cleaning mode.
- Voltage options: 230/115/24 VAC, 24 VDC.
- DIN 43650-B plug connection.
- IP65 protection class.

## Electronically level-controlled condensate drain

### ALM-D 100

The ALM-D 100 removes all kinds of condensate from compressed air systems of up to 100 m<sup>3</sup>/min without any air losses.

The compact and robust aluminium housing, the 2/2-way directly controlled valve with a large aperture and the integrated strainer make the ALM-D 100 the most reliable solution available for all compressed air solutions.

### Equipment features:

- Compact solution with no compressed air losses.
- Alarm function (NO or NC) integrated as standard.
- Capacitive level control technology saves compressed air, energy and money.
- Robust, corrosion-resistant aluminium housing, EP paintwork.
- Directly controlled valve ensures a reliable condensate drain.
- Integrated stainless steel strainer.
- Voltage options: 230/115/24 VAC, 24 VDC.
- DIN 43650-B plug connection.
- IP65 protection class.

### Application

#### Industry

#### Max. compressor capacity

ALM-D 10: 10 m<sup>3</sup>/min

ALM-D 100: 100 m<sup>3</sup>/min

#### Min./max. System pressure

0 - 16 bar

#### Valve type

2/2-way, directly controlled

#### valve aperture

ALM-D 10: 2 mm

ALM-D 100: 4 mm

#### Inlet / outlet

1/2" inlet union /  
1/4" outlet union

#### Medium temperature / ambient temperature

1 - 50 °C



- + Incredibly compact
- + Corrosion-resistant aluminium housing
- + Condensate drain free of compressed air losses
- + Unique installation flexibility and reliability

# OIL-WATER SEPARATOR

## ALM-OWS

Condensate is produced when generating compressed air. This condensate is contaminated with oil, which is drawn in from the surrounding air and used in the compressor stage for cooling. Because the contaminated condensate must not be discharged into the sewer system, it has to be separated from the oil.

The ALM-OWS series of oil-water separators reliably removes oil from any condensate produced in compressed air systems.

In order to reliably separate the oil from the water, the condensate passes through several stages of separation and is filtered by several filter elements.

The oil-adsorbing elements combine various kinds of adsorption technology to achieve a residual oil content of less than 10 ppm.

The first oil-adsorbing element has a saturation indicator and provides an optical check, allowing the separator to be monitored visually (even from a distance). The combinations of elements are always analysed and put together on the basis of the latest range of adsorption technologies.

The last stage contains specially selected active carbon for separating the remaining contaminants.

**Equipment features:**

- Quick and easily replacement of elements.
- Several condensate inlets.
- Test bottle and test drain for taking samples.
- Use of heavy-duty filter elements.
- Simple, quick and clean installation and replacement process.
- Successful separation of mineral oil, synthetic oil and stable condensate emulsions by heavy-duty elements – for maximum reliability.
- Brass hose humps ensure quick and easy installation and maintenance.
- Simple to dispose of in line with environmental requirements.
- All types and designs of condensate drain can be used.
- Compact design and small footprint.

Achievable residual oil content  
**<10 ppm**

Maximum compressor capacity  
**2 - 60 m<sup>3</sup>/min**

Separation of  
**mineral oil  
synthetic oil  
condensate emulsions**

Input connection  
**1/2" (2")**

Output terminal  
**1"**

ALM-OWS							
TYPE	Compressor capacity	Max. oil absorption of elements	Heavy-duty elements	Active carbon elements	Overflow warning indicator	Indicator showing element's service life	Maintenance drain valve
	m <sup>3</sup> /min	Litres					
02	2	2	1	1	No	No	No
05	5	5	2	1	Yes	Yes	No
10	10	10	2	1	Yes	Yes	Yes
20	20	15	2	1	Yes	Yes	Yes
30	30	25	2	1	Yes	Yes	Yes
60	60	50	2	2	Yes	Yes	Yes

- + Simple, quick and clean installation and replacement process.
- + Successful separation of mineral oil, synthetic oil and stable condensate emulsions.

**Optical display**  
Separator can even be monitored from a distance

**Quick and easy replacement of elements**



**Water drain valves**  
to simply empty the individual towers



ALM-OWS 60

# REFRIGERATION DRYER ALM

Refrigeration dryers are important in cases where you need dry compressed air to protect against corrosion in the compressed air lines and on the compressed air consumer.

The refrigeration dryers remove the air humidity from the air by cooling it so that the water precipitates as condensate.

The powerful refrigeration dryers of the ALM series have proven themselves in countless applications.

They deliver impressive value for money and operational reliability at inlet temperatures of up to +55 °C and a pressure dew point of +3 °C.

The series also features very large heat exchanger surfaces, guaranteeing a constant pressure dew point and good water separation even under extreme operating conditions.

Application

Industry

Power consumption

0.24 - 13.4 kW

Volume flow

20 - 5100 m³/h

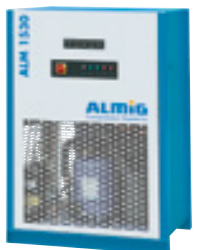
ALM refrigeration dryer								
ALM TYPE	Volume flow*	Cooling air requirement	Compressed-air connection	Power consumption	Width	Height	Depth	Weight
	m³/h	m³/h		kW	mm	mm	mm	kg
25	20	-	3/8"	0.24	384	382	320	15
35	30	-	3/8"	0.24	340	382	320	19
65	60	-	3/4"	0.34	368	568	419	29
85	80	-	3/4"	0.42	368	568	419	29
110	100	-	3/4"	0.58	500	568	525	41
150	140	1020	1"	0.58	393	601	891	50
180	160	1020	1"	0.60	393	601	891	53
260	240	1020	1"	0.87	393	601	951	58
350	315	1980	2"	1.10	483	761	1011	72
400	360	1980	2"	1.30	483	761	1011	78
500	470	2640	2"	1.48	483	761	1011	86
640	580	2640	2"	1.90	533	811	1191	100
740	680	4500	2"	2.45	533	811	1191	112
900	820	4500	2"	2.55	533	811	1291	134
1100	1000	4500	2"	2.70	533	811	1291	155
1320	1200	3500	2 1/2"	2.55	1129	1510	857	314
1530	1400	4400	2 1/2"	2.95	1129	1510	857	327
1850	1700	4500	3"	5.70	1110	1510	857	354
2150	2000	5000	3"	5.80	1110	1510	857	384
2400	2200	6500	DN 100	5.50	1243	2116	1386	690
2650	2500	9900	DN 100	7.00	1243	2116	1386	690
3550	3200	9900	DN 150	8.70	1400	2112	1584	880
4000	3650	10800	DN 150	9.20	1400	2112	1584	880
4900	4600	11400	DN 150	10.80	1400	2112	1584	1050
5300	5100	16200	DN 150	13.40	1400	2112	1584	1200

Pressure dew point of +3 °C based on ambient temperature of +25 °C and compressed air inlet temperature of 35 °C at 7 bar (overpressure); refrigerant: R 134 a, R 407 c, R 404 a  
\*at maximum throughput (100%)

- + Great value for money
- + Excellent reliability
- + Powerful and highly efficient
- + Also available as energy-saving version



ALM 150



ALM 1530



ALM 2400

If pressures or temperatures deviate, multiply volume flow by the following conversion factors ( $f_{tu}$  and  $f_{pd}$ ):

Correction factors for volume flow for ALM 25 - 5300* refrigeration dryers												
Ambient temperature $t_u$ (°C)	25	30	35	40	45							
Correction factor $F_{c2-f_{tu}}$	1	0.94	0.89	0.83	0.78							
Operating overpressure $p_{ü}$ (bar)	3	4	5	6	7	8	9	10	11	12	13	14
Correction factor $F_{c1-f_{pd}}$	0.79	0.87	0.92	0.96	1	1.03	1.07	1.1	1.13	1.16	1.18	1.21

If operating pressures deviate, multiply pressure loss by the following conversion factors ( $f_{dp}$ ):

Correction factors for pressure loss for refrigeration dryer ALM 25 - 5300															
Operating overpressure $p_{ü}$ (bar)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor $F_{c1-f_{dp}}$	2.3	1.8	1.5	1.3	1.1	1	0.9	0.8	0.75	0.7	0.65	0.62	0.6	0.55	0.52

\*No correction factor is needed with the ALM25 - ALM110 models for deviating ambient temperatures.

# REFRIGERATION DRYER ALM-E

## Energy-saving refrigeration dryer ALM-E 140 - 1000

The ALM-E series provides cost-effective energy savings as the amount of power used is directly related to the air requirement. Linear load adaptation is achieved with a requirement of 0% to 100%.

Dryers in the ALM-E series are equipped with 3-in-1 heat exchangers and a Phase Change Material (PCM) encapsulated between the refrigeration and compressed air circuits, which serves as a highly efficient cooling reservoir.

The ALM-E refrigeration dryers automatically switch the refrigeration compressor on or off in response to the prevailing load statuses. With partial volume flows (partial load), the energy needed to dry the air is taken from the cooling reservoir.

## Energy-saving refrigeration dryer ALM-E 1320 - 5300

Speed control is integrated in refrigeration dryer ALM-E 1320 - 5300. The energy requirement of the ALM-E series is thereby adapted to the compressed air volume in the refrigeration dryer.

This delivers a potential energy saving of up to 50% with a stable pressure dew point.

Application

Industry

Power consumption

0 - 13.4

Volume flow

127 - 5100 m<sup>3</sup>/h

- Control is easy to operate** with LCD
- Energy saving** Directly visible
- Semi-hermetic refrigerant compressor**
- 3-in-1 heat exchanger** made from soldered stainless steel with phase change material reservoir
- Efficient cooling air guide** with exhaust air discharged upwards

- + Energy savings of up to 90% compared with conventional refrigeration dryers
- + Energy-saving thanks to use of Phase Change Material (PCM) and/or speed control
- + Constant pressure dew point
- + Little servicing needed
- + Short payback period



Fig.: ALM-E 140-1000 series (by way of example)

If pressures or temperatures deviate, multiply volume flow by the following conversion factors ( $f_{tu}$  and  $f_{pu}$ ):

Correction factors for volume flow for ALM 140 - 5300 refrigeration dryers												
Ambient temperature $T_u$ (°C)	25	30	35	40	45							
Correction factor $F_{c2} - f_{Tu}$ (models > 1000 m <sup>3</sup> /h)	1	0.94	0.89	0.83	0.78							
Correction factor $F_{c2} - f_{Tu}$ (models < 1000 m <sup>3</sup> /h)	1	0.92	0.85	0.8	0.78							
Operating overpressure $p_{ü}$ (bar)	3	4	5	6	7	8	9	10	11	12	13	14
Correction factor $F_{c1} - f_{pü}$	0.79	0.87	0.92	0.96	1	1.03	1.07	1.1	1.13	1.16	1.18	1.21

If operating pressures deviate, multiply pressure loss by the following conversion factors ( $f_{dp}$ ):

Correction factors for pressure loss for refrigeration dryer ALM 140 - 5300															
Operating overpressure $p_{ü}$ (bar)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor $F_{c1} - f_{dp}$	2.3	1.8	1.5	1.3	1.1	1	0.9	0.8	0.75	0.7	0.65	0.62	0.6	0.55	0.52

ALM-E energy-saving refrigeration dryer							
ALM-E TYPE	Volume flow	Compressed-air connection	Power consumption	Width	Height	Depth	Weight
	m <sup>3</sup> /h		kW	mm	mm	mm	kg
140	127	1"	0 - 0.43	324	751	562	62
180	170	1"	0 - 0.43	324	711	741	69
280	255	2"	0 - 0.59	404	761	861	81
370	340	2"	0 - 0.85	404	761	921	82
560	509	2"	0 - 1.3	454	911	1071	126
750	680	2"	0 - 1.66	454	911	1071	153
1000	935	2"	0 - 2.0	450	1031	1160	178
1320	1200	2 1/2"	0.8 - 2.1	1129	1510	857	330
1530	1400	2 1/2"	0.8 - 2.7	1129	1510	857	345
1850	1700	3"	1.5 - 4.3	1110	1510	857	370
2150	2000	3"	1.5 - 5.2	1110	1510	857	400
2400	2200	DN 100	2.0 - 5.3	1243	2116	1386	715
2650	2500	DN 100	2.0 - 6.7	1243	2116	1386	715
3550	3200	DN 150	3.1 - 8.6	1400	2112	1584	910
4000	3650	DN 150	3.1 - 9.2	1400	2112	1584	910
4900	4600	DN 150	3.9 - 10.5	1400	2112	1584	1090
5300	5100	DN 150	3.9 - 13.4	1400	2112	1584	1240

Pressure dew point of +3 °C based on ambient temperature of +25 °C and compressed air inlet temperature of 35 °C at 7 bar (overpressure)  
Refrigerant: R 134 a, R 407 c, R 404 a



# REFRIGERATION DRYER ADD

The refrigeration dryers of the ADD series can be used flexibly in numerous applications and can be accommodated anywhere thanks to their compact design.

Can be used

- as a stand-alone unit
- for wall mounting or
- as part of a set (compressor plus refrigeration dryer)

These refrigeration dryers cut your production costs and improve productivity.

A powerful, three-stage heat exchange system guarantees reliable dryer operation up to an inlet temperature of +55 °C and a pressure dew point of +3 °C.

Advantages:

- Compact and space-saving
- Variable pressure dew point, can be set using microswitch
- Low maintenance costs
- Simple installation / operation
- Constant pressure dew point

Conversion factors:

In accordance with DIN ISO 7183, refrigeration dryers are designed for an operating overpressure of 7 bar, an ambient temperature of 25 °C and an inlet temperature of 35 °C. The conversion factors provided below apply at deviating operating pressures and temperatures.

Application

Industry

Power consumption

0.18 - 1.04 kW

Volume flow

23 - 310 m<sup>3</sup>/min

ADD refrigeration dryer				
ADD TYPE	Volume flow	Cooling air requirement	Compressed air connection	Power consumption
	m <sup>3</sup> /h	m <sup>3</sup> /h		kW
23	23	300	1/2"	0.18
50	50	300	3/4"	0.20
69	69	540	3/4"	0.29
96	96	540	3/4"	0.47
140	140	720	1"	0.61
150	150	720	1"	0.61
204	204	800	1"	0.86
310	310	2300	1 1/2"	1.04

If pressures or temperatures deviate, multiply volume flow by the following conversion factors ( $f_{tu}$  and  $f_{pi}$ ):

Correction factors for volume flow for ADD refrigeration dryers															
Operating overpressure $p_{ü}$ (bar)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor $F_{c1-f_{pi}}$	0.6	0.7	0.78	0.86	0.94	1	1.06	1.11	1.15	1.19	1.22	1.24	1.25	1.26	1.26
Ambient temperature $t_a$ (°C)							25	30	35	40					
Correction factor $F_{c2-f_{tu}}$							1	0.97	0.93	0.88					

If operating pressures deviate, multiply pressure loss by the following conversion factors ( $f_{dp}$ ):

Correction factors for pressure loss for ADD refrigeration dryers															
Operating overpressure $p_{ü}$ (bar)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor $F_{c1-f_{dp}}$	2.3	1.8	1.5	1.3	1.1	1	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5

Pressure dew point of +3 °C based on ambient temperature of +25 °C and compressed air inlet temperature of 35 °C at 7 bar (overpressure); refrigerant: R 134 a

- + Reliable and low-maintenance
- + Footprint of less than 1 m<sup>2</sup> is needed
- + Low noise level thanks to exceptional acoustic insulation



ADD wall mounting



"PLUS" variant with coupled compressed air refrigeration dryer, can also be produced at later date for selected series (on request)

# ALM-CD / ALM-CCD ADSORPTION DRYER

Adsorption dryers are used in cases where drier compressed air is needed than can be achieved with a refrigeration dryer. In these dryers, the water vapour is deposited on and bound to a desiccant and the humidity thereby removed from the compressed air. The cold-regenerative ALM-CCD/CD adsorption dryers are used wherever compressed air is being dried to a pressure dew point of -20 °C, -40 °C or -70 °C.

The series offer a compact design and a simple operation.

Design:

$$V_{nom} = 2000 \text{ m}^3/\text{h}$$

Inlet temperature = 30 °C

Operating overpressure = 10 bar

$$V_{corr} = \frac{V_{nom}}{f_p \cdot f_T}$$

$$V_{corr} = \frac{2000 \text{ m}^3/\text{h}}{1.18 \cdot 1.05} = 1615 \text{ m}^3/\text{h}$$

Calculated dryer size: ALM-CD 1900

Application

Industry

Pressure dew point

ALM-CCD: -40 °C, -70 °C  
ALM-CD: -20 °C, -40 °C, -70 °C

Nominal throughput at inlet

up to 9400 m<sup>3</sup>/h

Operating pressure

4 - 16 bar

Ambient temperature

+5 °C to +50 °C

ALM-CCD / ALM-CD							
TYPE	Nominal throughput at inlet <sup>1</sup>	Average controlled air flow -40 °C	Width	Height	Depth	Weight	Connection
ALM-CCD	m <sup>3</sup> /h	m <sup>3</sup> /h	mm	mm	mm	kg	G
10	9	1.8	516	775	157	29	R3/8"
20	17	3.4	516	775	157	37	R3/8"
30	25	5	516	775	157	51	R3/8"
40	35	7	669	775	208	69	R3/8"
50	45	9	669	775	208	71	R1/2"
ALM-CD							
110	100	15	750	1950	750	180	R3/4"
170	160	24	750	1950	750	220	R3/4"
320	300	45	1150	1980	750	400	R1"
430	400	60	1150	1980	750	430	R1 1/2"
650	600	90	1150	1990	750	540	R1 1/2"
800	750	113	1150	1990	750	645	R2 "
1000	950	143	1150	2000	750	815	R2"
1200	1150	172	1500	1930	1300	1020	DN 80
1600	1450	217	1500	1950	1400	1275	DN 80
1900	1750	262	1500	2070	1450	1430	DN 80
2300	2100	315	1500	2090	1500	1650	DN 80
2600	2450	367	1500	2190	1700	2000	DN 80
3000	2800	420	1700	2220	1750	2300	DN 80
4000	3700	555	1950	2300	1900	3230	DN 100
6200	5800	870	2400	2500	2040	4500	DN 100
8000	7500	1125	2690	2610	2300	5750	DN 150
10000	9400	1410	2820	2510	2560	6800	DN 150

<sup>1</sup>Refers to intake status of 1 bar (abs) and 20 °C, 7 bar (overpressure) and 35 °C inlet temperature, pressure dew point -40 °C; Pressure dew point: ALM-CCD -40 °C at 100%, -70 °C at approx. 85% nominal load; ALM-CD -20 °C, -40 °C, -70 °C at 100% nominal load; operating overpressure: ALM-CCD 3 - 10 bar; ALM-CD 4 - 10 bar, 16-bar version on request

Alternating regenerating receivers



- + Cold regeneration
- + Compact and space-saving
- + Simple installation and operation
- + Low maintenance costs

Easy to maintain structure

### Correction factors for ALM-CCD adsorption dryer

Operating overpressure p <sub>ü</sub> (bar)	3	4	5	6	7	8	9	10
Correction factor f <sub>pü</sub>	0.25	0.39	0.56	0.77	1	1.13	1.25	1.38

### Correction factors for ALM-CD adsorption dryer

Operating overpressure p <sub>ü</sub> (bar)	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor f <sub>pü</sub>	0.78	0.86	0.93	1	1.06	1.12	1.18	1.23	1.28	1.33	1.38	1.43	1.47

Inlet temperature T (°C)	10	20	30	35	40	45	50
Correction factor f <sub>T</sub>	1	1	1	1	0.98	0.94	0.88

Inlet temperature T (°C)	10	20	30	35	40	45	50
Correction factor f <sub>T</sub>	1.33	1.17	1.05	1	0.96	0.92	0.89

# ALM-WD ADSORPTION DRYER

The heat-regenerative ALM-WD adsorption dryer is the right solution for all uses requiring a constant pressure dew point of -40 °C.

At higher ratings in particular, heat-regenerative adsorption dryers are more efficient and most notably more cost effective to run than cold-regenerative ones because virtually no compressed air is lost as a result of aftercooling or regeneration of the desiccant.

This is because, with heat-regenerative adsorption dryers, the desiccant is not dried with compressed air but by a heating element, which is heated to 150 °C.

**Advantages:**

- Ideal positioning of heating elements in drying bed
- Optimum use of regenerative energy
- Low maintenance costs
- Simple installation/operation
- Constant pressure dew point

**Design:**

$$V_{nom} = 2000 \text{ m}^3/\text{h}$$

$$\text{Inlet temperature} = 30 \text{ }^\circ\text{C}$$

$$\text{Operating overpressure} = 10 \text{ bar}$$

$$V_{corr} = \frac{V_{nom}}{f_p \cdot f_T}$$

$$V_{corr} = \frac{2000 \text{ m}^3/\text{h}}{1.37 \cdot 1} = 1460 \text{ m}^3/\text{h}$$

Calculated dryer size: ALM-WD 2200

Pressure dew point

-40 °C at 100% nominal load

Nominal throughput

245 - 4280 m<sup>3</sup>/h

Operating pressure

4 - 16 bar (overpressure)

Ambient temperature

+5 °C to +50 °C

- + Heat-regenerative adsorption dryer
- + No fan or external blower needed
- + Simple installation and operation
- + Energy Management System (EMS) available as an option

Efficient heat regeneration

Optional EMS

Energy management system



ALM-WD							
TYPE	Nominal throughput at inlet <sup>1</sup>	Average controlled air flow – -40 °C	Width	Height	Depth	Weight	Connection
ALM-WD	m <sup>3</sup> /h	m <sup>3</sup> /h	mm	mm	mm	kg	G
280	245	5	760	2170	450	290	R1"
450	400	9	1000	2280	500	435	R1 1/2"
730	653	14	1050	2620	550	670	R1 1/2"
880	785	17	1200	2750	600	740	R2"
1200	1026	23	1250	2750	650	760	R2"
1500	1282	28	1400	3050	700	1450	DN80
2200	1916	42	1550	3050	800	1670	DN80
2500	2250	50	1650	3050	900	1900	DN80
3000	2670	58	1850	3175	950	2300	DN100
4000	3590	79	1950	3175	1050	3000	DN100
4800	4280	94	2000	3175	1100	3300	DN100

Correction factors for ALM-WD adsorption dryer																	
Operating overpressure p <sub>ü</sub> (bar)	4	5	6	7	8	9	10	11	12	13	14	15	16				
Correction factor f <sub>pü</sub>	0.63	0.75	0.88	1	1.12	1.15	1.37	on request									
Inlet temperature T (°C)	10	20	30	35	40	45	50										
Correction factor f <sub>T</sub>	1	1	1	1	0.60	0.38	0.25										

<sup>1</sup>Refers to intake status of 1 bar (abs) and 20 °C, 7 bar (overpressure) and 35 °C inlet temperature, pressure dew point -40 °C

# ACTIVE CARBON ADSORBER ALM-AC

The ALM-AC active carbon adsorber supplies absolutely oil-free, taste- and odour-neutral compressed air. The special active carbon ensures that oil vapour is adsorbed from the compressed air.

The ALM-AC active carbon adsorber guarantees:

- Freedom from oil with a residual oil content  $\leq 0.003$  mg/m<sup>3</sup> through high adsorption of oil vapour. Inlet requirements: DTP +3 °C.
- Active carbon life of around 10,000 operating hours.
- Complete operational reliability.
- Maximum performance, safety and quality.
- Constant efficiency.

Key data:

- Residual oil content:  $\leq 0.003$  mg/m<sup>3</sup>
- Volume flows: 70 - 9300 m<sup>3</sup>/h
- Operating pressure: 5 - 16 bar (overpressure)
- Ambient temperature: +2 to +45 °C

Design:

$$V_{nom} = 200 \text{ m}^3/\text{h}$$

$$\text{Inlet temperature} = 30 \text{ }^\circ\text{C}$$

$$\text{Operating overpressure} = 10 \text{ bar}$$

$$V_{corr} = \frac{V_{nom}}{f_p \cdot f_T}$$

$$V_{corr} = \frac{200 \text{ m}^3/\text{h}}{1.7 \cdot 1.17} = 101 \text{ m}^3/\text{h}$$

Calculated dryer size: ALM-AC 120

Application

Industry

Nominal throughput  
70 - 9300 m<sup>3</sup>/h

Operating pressure  
5 - 16 bar  
(overpressure)

Ambient temperature  
+2 to +45 °C

ALM-AC						
TYPE	Nominal throughput at inlet <sup>1</sup>	Width	Height	Depth	Weight	Connection
ALM-AC	m <sup>3</sup> /h	mm	mm	mm	kg	
75	70	350	1950	750	90	R1/2"
120	110	350	1950	750	110	R3/4"
170	160	350	1970	750	130	R3/4"
220	200	350	1980	750	160	R1"
320	300	550	1980	750	170	R1"
480	450	550	1990	750	215	R1 1/2"
690	650	550	1990	750	260	R11/2"
850	800	550	2000	750	330	R2"
1100	1000	899	2210	800	305	DN80
1300	1250	899	2500	800	340	DN80
1700	1600	1019	2380	960	325	DN80
2000	1900	1012	2380	1010	450	DN80
2400	2250	1077	2795	1010	480	DN100
2900	2700	1202	2830	1010	500	DN100
3800	3600	1202	2830	1010	520	DN100
5500	5150	1505	2830	1540	690	DN100
7500	7100	1565	2950	1540	960	DN150
9900	9300	1780	3265	1580	1150	DN150

<sup>1</sup>Refers to intake status of 1 bar (abs) and 20 °C, 7 bar (overpressure) and 35 °C inlet temperature



- + Complete operational reliability
- + Maximum performance, safety and quality
- + Constant efficiency

Correction factors for ALM-AC adsorption dryer												
Operating overpressure p <sub>ü</sub> (bar)	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor f <sub>pü</sub>	0.75	0.88	1	1.06	1.12	1.17	1.22	1.27	1.32	1.37	1.41	1.46
Inlet temperature T (°C)	25	30	35	40	45	50	55	60				
Correction factor f <sub>T</sub>	3.1	1.7	1	0.57	0.33	0	0.11	0.061				

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Subject to errors and modifications

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