Atlas Copco

Membrane air dryers

SMD 3-35

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The problem with moisture

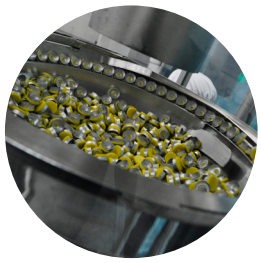
Moisture in your compressed air can quickly turn into a very big, very costly problem:

- **Corrosion** throughout your compressed air system and of your pneumatic equipment can also affect your end products.
- **Leaks** caused by moisture-related damage, a real issue for compressed air systems.
- **Microorganisms**, such as fungi, mold and bacteria. They thrive in humid conditions and pose the greatest danger to your products, especially if they are consumed by customers.

Why you should dry your compressed air

Moisture is an inevitable byproduct of the compression process. And it can have a harmful impact on your air system, your production equipment, and your end products.

The ambient air that a compressor uses is never completely dry. When this air is compressed, its water content also increases in volume. In fact, the air that comes out of a compressor is almost 100% saturated. Air treatment equipment such as aftercoolers deals with much of this moisture, but it still leaves water vapors traveling through your air system. This is where dryers come in.



Measuring air quality

How much moisture can or should your compressed air contain? ISO 8573-1 is the internationally recognized compressed air quality standard. It is divided into air quality classes for the three main types of contaminants – particles, oil and moisture.

Class	Solid Particle Maximum number of particles per m³			Water Pressure Dew point (°C)	Oil (incl. Vapor mg/m³)
	0.1-0.5 micron	0.5-1.0 micron	1-5 micron		
0	As specified by the equipment user or supplier and more stringent than Class 1.				
1	≤ 20000	≤ 400	≤ 10	≤ -70 (-94 °F)	≤ 0.01
2	≤ 400000	≤ 6000	≤ 100	≤ -40 (-40 °F)	≤ 0.1
3	Not Specified	≤ 90000	≤ 1,000	≤ -20 (-4 °F)	≤ 1
4	Not Specified	Not Specified	≤ 10,000	≤ +3 (38 °F)	≤ 5
5	Not Specified	Not Specified	≤ 100,000	≤ +7 (45 °F)	NA
6	Not Specified	Not Specified	Not Specified	≤ +10 (50 °F)	NA

Introducing the SMD

If you're looking for effective, low-maintenance air drying performance, the Atlas Copco SMD is your ideal solution. Thanks to its simple design, our membrane dryer is quiet, efficient and easy to operate. It has no moving components, which makes it 100% maintenance free. With its low pressure drop and purge air use, the SMD provides real energy savings without compromising on drying effectiveness.

Advanced drying technology

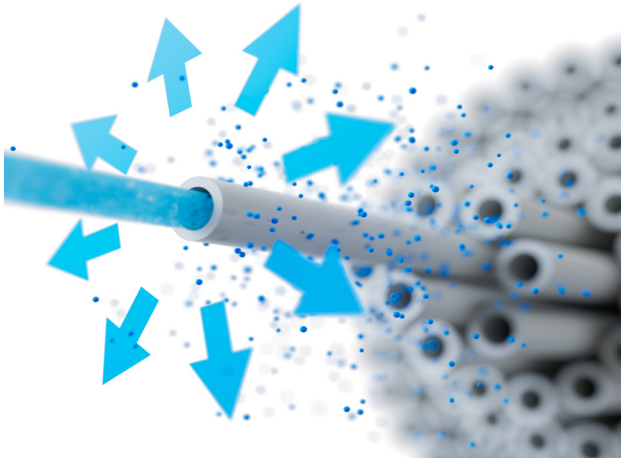
Compared to conventional membrane dryers, the SMD's unique coating increases separation efficiency with a low air leakage and purge air loss to give you maximum energy efficiency.

A choice of membranes

SMD dryers come with two types of membranes, each offering a different pressure dew point suppression level. This ensures that regardless of your production environment and demands, there is an SMD dryer to meet your needs.

Low air resistance saves energy

Due to the simple design of the SMD, the compressed air travels straight through the dryer – ensuring minimal pressure drop and maximum drying efficiency.

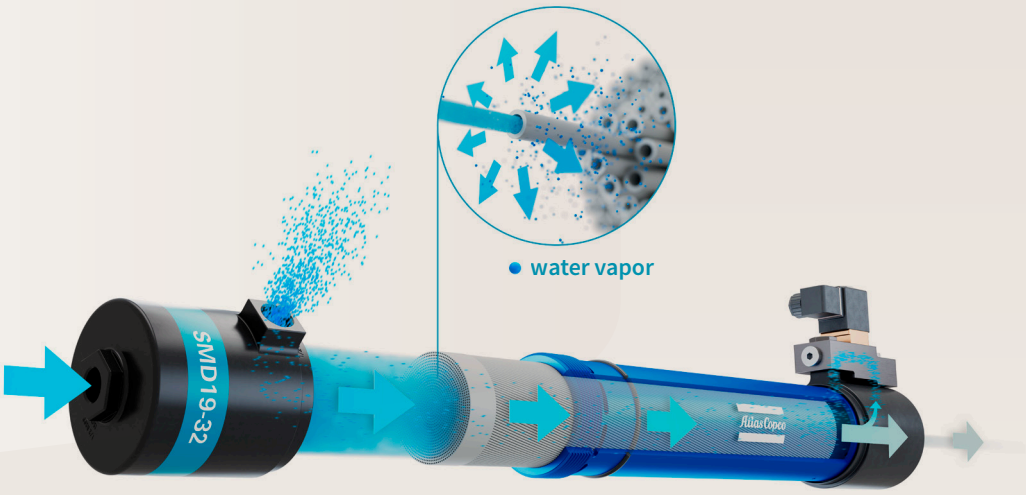


Your choice of performance

SMD 3-32 up to SMD 35-32:
PDPS of 32˚C at reference conditions.

SMD 2-55 up to SMD 23-55:
PDPS of 55˚C at reference conditions.

The dryers come configured as standard with optimized purge nozzle for 3 pressure variants: 7 bar(e)/101.5 psig, 10 bar(e)/145 psig, and 13 bar(e)/188 psig.



How a membrane dryer works

A membrane dryer consists of a cylinder that houses thousands of tiny hollow polymer fibers with an inner coating. These fibers remove water vapor through a process called “selective permeation.” As wet compressed air enters the cylinder, the membrane coating allows water vapor to permeate through the membrane wall and collect between the fibers. In the meantime, the dry air continues through the fibers in the cylinder towards the outlet. A small amount of dry purge air carries the rejected water vapor and vents it through a purge outlet.

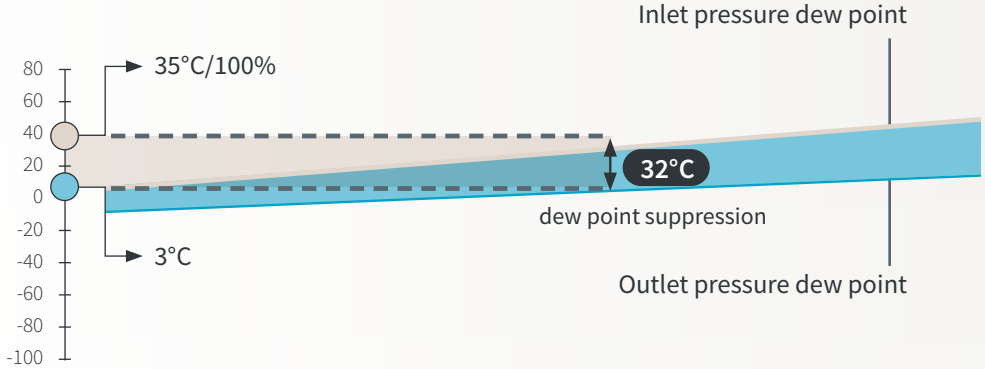
Pressure Dew Point (PDP)

Pressure dew point (PDP) is used to define the water content in compressed air. Essentially, it is the temperature at which water vapor condenses into water at the current working pressure. Low PDP values indicate small amounts of moisture in the compressed air. To make that happen, you need the right dryer. And to choose the optimal technology for your application, you first have to know the dew point requirement of your application(s).

PDP suppression (PDPS)

Membrane dryers reduce the moisture content of compressed air without significantly changing its temperature. Instead of delivering a fixed outlet dew point, they provide dew point suppression (PDPS), which means they lower the dew point relative to the inlet air.

For example, if the inlet air is 35°C and 100% saturated, the inlet dew point is also 35°C. With a membrane dryer offering a -32°C PDPS, the outlet dew point would be approximately 3°C, while the air temperature remains around 35°C. This results in a much lower relative humidity at the outlet – in this case, about 12.6%.



The right dryer for your production

When comparing types of air dryers, you'll likely come across three main options, refrigerated ("fridge"), desiccant ("adsorption"), and membrane. A refrigerated dryer is the most common type.
But is it right for your application? You'll want to pay attention to the pressure dew point (PDP) capability of each dryer, the requirements of your application, as well as your working conditions.

Below you'll find a comparison on how each serves different needs.

Refrigerated

PDP: +3°C

These dryers cool hot air with a refrigerant circuit. Similar to an air conditioner, this allows the moisture to condense and drain. The air is then heated to room temperature before use.

Desiccant

PDP: typically around -40°C, as low as -70°C

A tower filled with desiccant material like silica gel adsorbs moisture from compressed air. Since this material needs to be regenerated, these dryers typically feature a twin tower design, with one drying the air and the other regenerating its desiccant.

Membrane

PDPS of -32°C or -55°C, depending on the variant and the inlet conditions.

These dryers have no moving parts and use a cylinder with hollow polymer fibers to filter moisture from compressed air.

Membrane dryers are ideal for:

- Demanding conditions:
  - Small spaces
  - Flexible mounting
  - High-vibration
  - Fluctuating temperatures
- Critical conditions:
  - Low-flow
  - Without electrical supply
  - When explosion safety requirements apply
  - Noise-sensitive
  - Corrosion-prone

Technical specifications

Variant	PDPs		Capacity			Pressure		Membrane dimensions				Horizontal installation			
								A		B		C		D	
	°C	°F	l/s	m³/h	cfm	bar	psi	mm	in	mm	in	mm	in	mm	in
SMD 3-32	32	90	3	6	6	7	102	73	3	325	13	500	20	300	12
SMD 3-32	32	90	4	8	8	10	145	73	3	325	13	500	20	300	12
SMD 3-32	32	90	5	18	11	13	189	73	3	325	13	500	20	300	12
SMD 5-32	32	90	5	18	11	7	102	73	3	389	15	564	22	300	12
SMD 5-32	32	90	7	25	15	10	145	73	3	389	15	564	22	300	12
SMD 5-32	32	90	9	31	18	13	189	73	3	389	15	564	22	300	12
SMD 9-32	32	90	9	32	19	7	102	73	3	605	24	780	31	300	12
SMD 9-32	32	90	12	43	25	10	145	73	3	605	24	753	30	300	12
SMD 9-32	32	90	14	50	30	13	189	73	3	605	24	753	30	300	12
SMD 14-32	32	90	14	50	30	7	102	100	4	389	15	537	21	303	12
SMD 14-32	32	90	19	68	40	10	145	100	4	389	15	537	21	355	14
SMD 14-32	32	90	22	79	47	13	189	100	4	389	15	537	21	355	14
SMD 19-32	32	90	19	68	40	7	102	100	4	541	21	690	27	355	14
SMD 19-32	32	90	25	90	53	10	145	100	4	541	21	690	27	355	14
SMD 19-32	32	90	32	115	68	13	189	100	4	541	21	690	27	355	14
SMD 25-32	32	90	25	90	53	7	102	100	4	618	24	830	33	421	17
SMD 25-32	32	90	34	122	72	10	145	100	4	618	24	830	33	421	17
SMD 25-32	32	90	42	151	89	13	189	100	4	618	24	830	33	421	17
SMD 35-32	32	90	35	126	74	7	102	126	5	602	24	819	32	421	17
SMD 35-32	32	90	44	158	93	10	145	126	5	602	24	819	32	421	17
SMD 35-32	32	90	55	198	117	13	189	126	5	602	24	819	32	421	17
SMD 2-55	55	131	2	5	3	7	102	73	3	325	13	500	20	300	12
SMD 2-55	55	131	2	7	4	10	145	73	3	325	13	500	20	300	12
SMD 2-55	55	131	3	9	5	13	189	73	3	325	13	500	20	300	12
SMD 4-55	55	131	4	13	7	7	102	73	3	478	19	653	26	300	12
SMD 4-55	55	131	5	16	10	10	145	73	3	478	19	653	26	300	12
SMD 4-55	55	131	6	20	12	13	189	73	3	478	19	653	26	300	12
SMD 6-55	55	131	6	22	13	7	102	100	4	541	21	690	27	303	12
SMD 6-55	55	131	8	29	17	10	145	100	4	541	21	690	27	303	12
SMD 6-55	55	131	10	36	21	13	189	100	4	541	21	689	27	303	12
SMD 9-55	55	131	9	32	19	7	102	100	4	618	24	765	30	303	12
SMD 9-55	55	131	12	43	25	10	145	100	4	618	24	765	30	303	12
SMD 9-55	55	131	15	54	32	13	189	100	4	618	24	765	30	303	12
SMD 13-55	55	131	13	47	28	7	102	126	5	602	24	764	30	315	12
SMD 13-55	55	131	18	65	38	10	145	126	5	602	24	764	30	315	12
SMD 13-55	55	131	23	83	49	13	189	126	5	602	24	764	30	368	14
SMD 17-55	55	131	17	61	36	7	102	126	5	602	24	764	30	368	14
SMD 17-55	55	131	22	79	47	10	145	126	5	602	24	764	30	368	14
SMD 17-55	55	131	28	101	59	13	189	126	5	602	24	764	30	368	14
SMD 23-55	55	131	23	83	49	7	102	126	5	602	24	764	30	368	14
SMD 23-55	55	131	35	126	74	10	145	126	5	602	24	830	33	421	17
SMD 23-55	55	131	45	162	95	13	189	126	5	602	24	830	33	421	17

Vertical installation				Inlet filter			Connections			
E		F		Type	G		Inlet		Outlet	
mm	in	mm	in		mm	in	G	NPT	G	NPT
567	22	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
567	22	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
567	22	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
628	25	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
628	25	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
628	25	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
845	33	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
855	34	239	9	UD15+	106	4	1/2"	1/2"	1/2"	1/2"
855	34	239	9	UD15+	106	4	1/2"	1/2"	1/2"	1/2"
630	25	226	9	UD15+	106	4	1/2"	1/2"	1/2"	1/2"
687	27	226	9	UD25+	106	4	1/2"	1/2"	1/2"	1/2"
687	27	226	9	UD25+	106	4	1/2"	1/2"	1/2"	1/2"
837	33	226	9	UD25+	106	4	1/2"	1/2"	1/2"	1/2"
837	33	226	9	UD25+	106	4	1/2"	1/2"	1/2"	1/2"
837	33	226	9	UD25+	106	4	1/2"	1/2"	1/2"	1/2"
974	38	286	11	UD45+	135	5	3/4"	3/4"	1/2"	1/2"
974	38	286	11	UD45+	135	5	3/4"	3/4"	1/2"	1/2"
974	38	286	11	UD45+	135	5	3/4"	3/4"	1/2"	1/2"
956	38	299	12	UD45+	135	5	3/4"	3/4"	1"	1"
956	38	299	12	UD45+	135	5	3/4"	3/4"	1"	1"
956	38	299	12	UD45+	135	5	3/4"	3/4"	1"	1"
565	22	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
565	22	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
565	22	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
718	28	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
718	28	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
718	28	246	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
782	31	253	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
782	31	253	10	UD7+	106	4	1/2"	1/2"	1/2"	1/2"
783	31	253	10	UD15+	106	4	1/2"	1/2"	1/2"	1/2"
855	34	226	9	UD15+	106	4	1/2"	1/2"	1/2"	1/2"
855	34	226	9	UD15+	106	4	1/2"	1/2"	1/2"	1/2"
855	34	226	9	UD15+	106	4	1/2"	1/2"	1/2"	1/2"
856	34	239	9	UD15+	106	4	1/2"	1/2"	1"	1"
856	34	239	9	UD15+	106	4	1/2"	1/2"	1"	1"
911	36	239	9	UD25+	106	4	1/2"	1/2"	1"	1"
911	36	239	9	UD25+	106	4	1/2"	1/2"	1"	1"
911	36	239	9	UD25+	106	4	1/2"	1/2"	1"	1"
911	36	239	9	UD25+	106	4	1/2"	1/2"	1"	1"
911	36	239	9	UD25+	106	4	1/2"	1/2"	1"	1"
956	38	236	9	UD45+	135	5	3/4"	3/4"	1"	1"
956	38	236	9	UD45+	135	5	3/4"	3/4"	1"	1"

Notes:

For higher flows, please contact your Atlas Copco sales representative.
For lower ambient temperatures down to -20°C/-5°F, please contact your Atlas Copco sales representative.

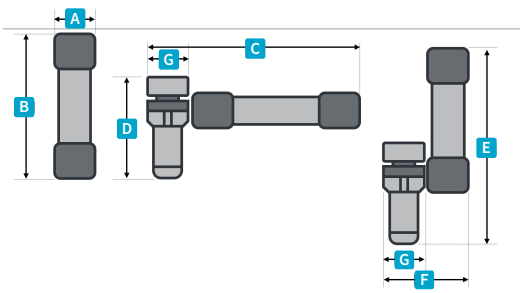
Reference conditions:

Air inlet temperature: 35°C
Air ambient temperature: 25°C
Inlet relative humidity: 100%
Inlet pressure: variant dependent (7, 10 or 13 bar)

Operating limits:

Maximum compressed air inlet pressure: 13 bar(g)
Minimum compressed air inlet pressure: 4 bar(g)
Maximum ambient temperature: 60°C
Minimum ambient temperature: 1°C
Maximum compressed air inlet temperature: 60°C
Minimum compressed air inlet temperature: 1°C

- For pressures other than the ones mentioned above, correction factors give the correct flow.
- Pressure dew point suppression of 15°C (27°F) to as much as 95°C (171°F) is possible. Correction factors give the correct flows.
- The performance of the SMD membrane dryer range is independent of ambient temperature and inlet temperature; it is only dependent of inlet dew point.



Options

- Wall-mounting kit

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