

DHM

Adsorption Dryer for High Pressure up to 350 bar



DHM - Adsorption Dryer for High Pressure Applications

Application

Adsorption dryers of series DHM dry compressed air as well as nitrogen to pressure dew-points from -25 °C to -55 °C. Thanks to their construction mode they work with high working pressures up to 350 bar.

Therefore, the DHM is suited for various applications. One example would be the navy. The compact design is a huge advantage on ships allowing the installation in small machine rooms without much space.

Furthermore, the product is easy to maintain: every replacement element is easy accessible from the front of the dryer. Thanks to the fast access to those components the time needed for maintenance can be reduced, resulting in a shorter downtime of the dryer.

Another possible application of the dryer is the filling of pressure bottles for divers. Bottles are filled with the breathing air needed for diving under high pressure.

Operation

The product works by using the principles of heatless regenerated adsorption drying. Thus, the vessels switch between adsorption (drying of the compressed air) and regeneration (of the desiccant) with an interval of 10 minutes. A part of the dried compressed air is used for the heatless regeneration. This part is being relaxed to ambient pressure and afterwards directed to the vessel that needs to be regenerated.

Our well-known C1-microprocessor-control is applied for valve control. The dryer is equipped as standard with this C1 control as well as a pre- and after-filter.

Advantages

Apart from the design and friendly maintenance that were already mentioned, another advantage of the DHM dryer is its operational reliability.

In case of a blackout the dryer rebuilds up pressure gently as soon as power is back allowing a fast re-start of the dryer. Thus, the product will not suffer any damage caused by blackout.

The dryer is quiet and works with reduced noise emissions thanks to the 2-level expansion. This is highly valued in surroundings in which many machines are operating.

Moreover, the dryer possesses valve technique of our own production. FST has optimized the performance of drying by combining the process of drying and valve technique.

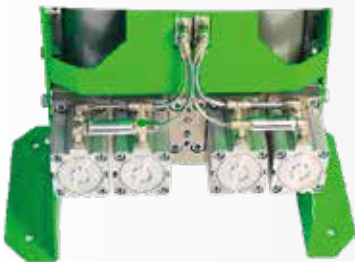
Finally, the valves have large flow sections above average. These flow sections minimize pressure losses, which results in a more efficient operation of the dryer.



Series DHM

Regeneration type: heatless
 Pressure dew-points: -25°C to -55°C
 Nominal volume flow: 160 m³/h to 2000 m³/h
 Connection: G 1/2 to G 3/4

Advantages



- ✓ **Compact Design**
– installation in small rooms possible without any difficulty
- ✓ **Easy Maintenance**
– every replacement element is easily accessible from the front
- ✓ **Operational Reliability**
– gentle pressure build-up
– blackout safety: after power has returned, the dryer operates again



- ✓ **2-level Expansion**
– quiet dryer
– operates with reduced noise emissions
- ✓ **Valve Technique of Own Production**
– own development and production by FST
- ✓ **Large Flow Sections**
– minimizes pressure losses
– optimizes the performance of drying

.. result in a dryer offering ..



- ✓ maximum operational reliability
- ✓ minimum total operating costs
- ✓ long lifetime
- ✓ easy maintenance

Basic data

Model	Nominal volume flow* ¹	Min./Max. operational pressure	Min./Max. operating temperature
DHM 8 / 100	160 m ³ /h	30 - 100 bar	+2°C - +60°C
DHM 13 / 100	215 m ³ /h		
DHM 18 / 100	270 m ³ /h		
DHM 26 / 100	325 m ³ /h		
DHM 31 / 100	415 m ³ /h		
DHM 41 / 100	540 m ³ /h		
DHM 52 / 100	635 m ³ /h		
DHM 59 / 100	735 m ³ /h		
DHM 66 / 100	860 m ³ /h		

*¹ – referred to 1 bar(a) and 20°C at 100 bar operating pressure, inlet temperature 35°C, and pressure dew-point at outlet -40°C

Model	Nominal volume flow* ²	Min./Max. operational pressure	Min./Max. operating temperature
DHM 8 / 350	300 m ³ /h	30 - 350 bar	+2°C - +60°C
DHM 13 / 350	400 m ³ /h		
DHM 18 / 350	500 m ³ /h		
DHM 26 / 350	600 m ³ /h		
DHM 31 / 350	765 m ³ /h		
DHM 41 / 350	1260 m ³ /h		
DHM 52 / 350	1490 m ³ /h		
DHM 59 / 350	1720 m ³ /h		
DHM 66 / 350	2000 m ³ /h		

*² – referred to 1 bar(a) and 20°C at 350 bar operating pressure, inlet temperature 35°C, and pressure dew-point at outlet -40°C

Purity classes according to ISO 8573-1

Contamination	
Solid particles * ³	(Class 2)
Water content * ³	Class 2-3 * ⁴
Total oil content * ³	Class 1 * ⁵

*³ - typical result, assuming that the suitable inlet concentrations and operating and marginal conditions are given

*⁴ - best possible pressure dew-point = -55°C

*⁵ - the oil vapor content is not taken into account, it may reduce the purity class

Maintenance rules

	Maintenance interval and maintenance activities
Every model	<ul style="list-style-type: none"> • Once a week: <ul style="list-style-type: none"> - Check differential pressure on the pre-filter and after-filter (if installed) - Check operation of condensate drain on the pre-filter (if installed) • Every 12 months: <ul style="list-style-type: none"> - Replace filter elements on pre-filter and after-filter - Check expansion silencer, clean or replace, if required - Calibrate dew-point sensor (option H) (interchange principle possible) • Every 24 months: <ul style="list-style-type: none"> - Replace seat and seals of control valves and non-return valves (maintenance kit art.-nr.: SK-VVB/DHM420/24-03) - Replace desiccant *⁶*⁷ (art.-nr. SEDAFILL-DHM ... / ...)

*⁶ - The regular service life of the desiccant is 2 - 3 years, however, it depends on the contamination level of the incoming compressed air and the operating temperature.

In order to achieve the specified service life of the desiccant, it is important to exchange the filter elements as described above.

*⁷ - The desiccant has to be disposed of according to the European waste code. A possible oil contamination needs to be taken into account.

Product specific data

Specification	
Pressure dew-points	-25°C / -40°C / -55°C
Electrical connection	230V 50/60 Hz, alternative 115V 50/60Hz or 24V DC
Power consumption	< 10 Watt
Protection class	IP 65 (Nema 4)

Materials	
Component	
Vessel and screw taps	Stainless steel 1.4301 (304)
Frame and supports	C-Steel, 1-component powder coating on epoxy/polyester basis, approx. 80µ layer thickness
Desiccant support screen	Stainless steel 1.4301 (304)
Preload spring	Stainless steel 1.4301 (304)
Internal outlet filter	Aluminum end caps, stainless steel cloth 1.4301 (304), 3...5 µm
Valve block	Aluminum AlMg, anodized
Valve seats	Stainless steel (1.4301, 1.4401) PEEK
Sealing materials	NBR, PEEK
Screws	8.8 Steel, zinc-plated
Pipe connections of dryer	None (flow paths are integrated in the valve block)
Pipe connections to pre- and after-filter	High pressure tubes and fittings C-steel zinc-plated
Desiccant filling	Molecular sieve 4A
Mounted pre- and after-filter	see product data sheets for filter housing and filter elements

DHM: Connections, dimensions and weight (including pre- and after-filter)

Model (100 bar and 350 bar)	Connection	Height	Width incl. pre- & after-filter	Depth	Weight	
					100 bar version	350 bar version
DHM 8	G 1/2	1100 mm	715 mm	320 mm	149 kg	191 kg
DHM 13	G 1/2	1250 mm	715 mm	320 mm	159 kg	218 kg
DHM 18	G 1/2	1400 mm	715 mm	320 mm	168 kg	241 kg
DHM 26	G 1/2	1550 mm	715 mm	320 mm	178 kg	264 kg
DHM 31	G 1/2	1800 mm	715 mm	320 mm	194 kg	303 kg
DHM 41	G 3/4	1750 mm	715 mm	320 mm	292 kg	402 kg
DHM 52	G 3/4	1950 mm	715 mm	320 mm	314 kg	444 kg
DHM 59	G 3/4	2150 mm	715 mm	320 mm	336 kg	483 kg
DHM 66	G 3/4	2400 mm	715 mm	320 mm	364 kg	535 kg

Classification according to Pressure Equipment Directive 2014/68/EU for group 2 fluids

Model 100 bar	Volume	Category	Marking
DHM 8 / 100	6,42 l	II	CE
DHM 13 / 100	8,28 l	II	
DHM 18 / 100	10,13 l	III	
DHM 26 / 100	11,99 l	III	
DHM 31 / 100	15,08 l	III	
DHM 41 / 100	19,71 l	III	
DHM 52 / 100	23,08 l	III	
DHM 59 / 100	26,45 l	III	
DHM 66 / 100	30,66 l	IV	

Model 350 bar	Volume	Category	Marking
DHM 8 / 350	3,3 l	III	CE
DHM 13 / 350	4,26 l	III	
DHM 18 / 350	5,21 l	III	
DHM 26 / 350	6,16 l	III	
DHM 31 / 350	7,75 l	III	
DHM 41 / 350	12,78 l	IV	
DHM 52 / 350	14,97 l	IV	
DHM 59 / 350	17,16 l	IV	
DHM 66 / 350	19,89 l	IV	



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