BOGE
COMPRESSED AIR SYSTEMS

COMPRESSED AIR TREATMENT

COMPRESSED AIR DRYER

Over 100,000 compressed air users
expect more when it comes
to their compressed air supply.
**BOGE air provides them
with the air to work.**

If it is BOGE AIR then you can be assured that is quality air
"Made in Germany". This not only applies to the first class
energy efficient compressed air systems manufactured by
BOGE but also to the top quality compressed air treatment
products. BOGE compressed air treatment products
have been designed to work in perfect harmony with the
compressor range to provide the optimal, most effective
and efficient compressed air quality with options available
to meet the highest air quality requirements.

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Quality air pays off:
BOGE compressed air treatment.

THE CLEAN UP! FROM AIR TO BOGE QUALITY AIR.
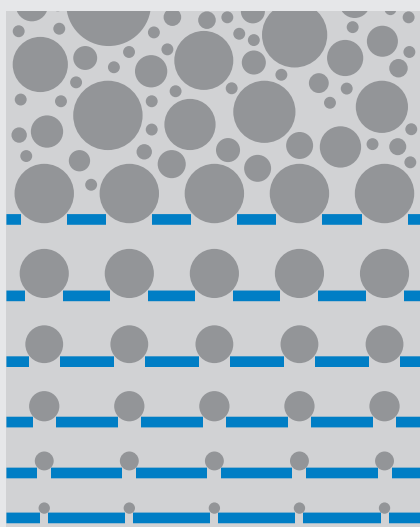
Compressed air is a versatile medium. It is widely used throughout industry and, for example, can be found in workshops and garages where untreated air is acceptable or the specialist industries where the demanding environments of the pharmaceutical and food sectors require absolutely dry, oil-free and often sterile compressed air.

Compressed air users rely on quality air from BOGE wherever the safe and efficient purification of the compresses air is required. Our compressed air specialists will do their utmost to configure a customised air treatment system to meet any given set of criteria.

1 m³ of untreated ambient air can contain up to 180 million particles of dirt as well as 50 - 80% water vapour and oil in the form of unburned hydrocarbons. During the compression process the concentration of these particles increases: at a pressure of 10 bar, for example, an eleven-fold value of 2 billion dirt particles is reached. Optimally treated BOGE compressed air is dry, dust-free, oil-free and if required sterile.

THE RIGHT BALANCE: ADVANTAGES OF BOGE COMPRESSED AIR TREATMENT.
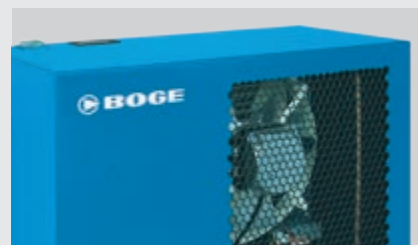

Efficiency
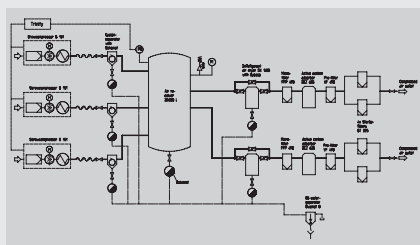
CAREFUL PLANNING AND ADVICE
An incorrectly dimensioned system can easily generate high costs in the long run. Our BOGE professionals therefore provide a thorough system analysis to ensure that the installed air treatment exactly meets the site requirements.

OPTIMAL COST-BENEFIT RATIO
Every compressed air treatment results in costs which should produce an optimal cost-benefit ratio. BOGE's range of air treatment products ensures that there is a cost effective customised solution for every application.

QUALITY "MADE IN GERMANY"
The use of high quality materials and a reduced number of wear parts ensures the BOGE air treatment systems are so efficient and reliable. BOGE is committed to the highest standards in development and manufacture, and we stand by this!

The right system for your requirements: based on your air quality requirements BOGE will take care of selecting the appropriate air treatment products to provide an optimal solution from initial assessment to system design. You are invited to contact our experts for a consultation!

IMPURITIES AND QUALITY CLASSES ACCORDING TO ISO 8573-1:2010

CLASS	Solid impurities (max. particle size per m³)			Humidity (Max. pressure dew point)	Max. oil content
	Max. particle size in µm				
	0.1 < d < = 0.5	0.5 < d < = 1.0	1.0 < d < = 5.0	°C	mg/m³
0	as specified by user				
1	≤ 20 000	≤ 400	≤ 10	< = −70 °C	< = 0.01 mg/m³
2	≤ 400 000	≤ 6 000	≤ 100	< = −40 °C	< = 0.1 mg/m³
3	A/R	≤ 90 000	≤ 1 000	< = −20 °C	< = 1 mg/m³
4	A/R	A/R	≤ 10 000	< = +3 °C	< = 5 mg/m³
5	A/R	A/R	≤ 100 000	< = +7 °C	—

Reference conditions 1 bar(a), 20 °C, relative humidity 0 %; pressure dew point for compressor final pressure 8 bar (a).

BOGE COMPRESSED AIR DRYER
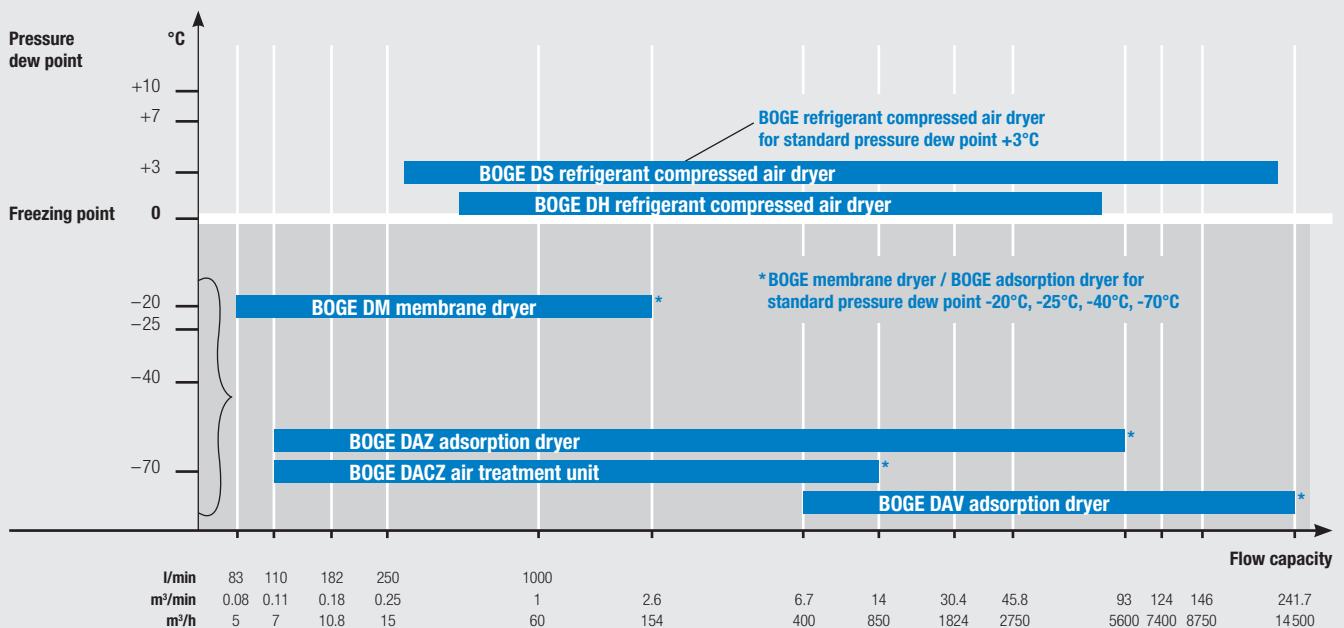
DS = Refrigerant dryer
DM = Membrane dryer
DAZ = Adsorption dryer, heatless
DAV = Adsorption dryer, heat-regeneration with vacuum cooling

DACZ = Air treatment unit comprising DAZ adsorption dryer, heatless with activated carbon adsorber
DH = Refrigerant dryer
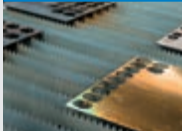
BOGE customised compressed air treatment

Areas of application for the compressed air Ambient temperature > 3 °C	Quality classes as per ISO 8573-1				Cyclone separator	Pre-filter	Refrigerant compressed air dryer	Micro-filter	Membrane dryer	Adsorption dryer	Sterile filter
	Solids	**Water**	**Oil**	**Sterile**							
Food/beverage industry											
Control air (drive air)	2	4	1	–	x	x	x	x			
Sterile air blanketing	1	4	1	yes	x	x	x	x			x
Conveying air/process air	1	3−4	1	yes	x	x		x		x	(x)
Packaging production, packaging processes and moulding air	1	4	2−4	yes	x	x	x	x			(x)
Paper/textile/chemical industries											
Control air (drive air)	2	4	2	–	x	x	x	x			
Conveying air/process air	2	4	1	–	x	x	x	x			
Breathing air	see EN 12021/Breathing air										
Metal-working/foundry/glass/plastics industries											
Control air (drive air)	2	4	2	–	x	x	x	x			
Blowing air/process air	2	4	1−2	–	x	x	x	x			
Surface treatment											
Control air	2	4	2	–	x	x	x	x			
Powder coating	2	3−4	1	–	x	x	x	x	x	x	
Blasting	–	4	2	–	x	x	x	x	x	x	
Coating	2	3−4	1	–	x	x	x	x	x	x	
Breathing air	see EN 12021/Breathing air										
Mechanical/plant engineering											
Control air	2	4	2		x	x	x	x			
Blowing air	2−3	4	2		x	x	x	x			
Drive air	2−3	4	3−4		x	x	x	x			
Process air	2	4	1		x	x	x	x			
Measurement and monitoring systems											
3D measurement systems	1−2	3−4	1		x	x	x	x	x	x	
Measurement and monitoring air	1−2	3−4	1		x	x	x	x	x	x	

Table in accordance with VDMA recommendation, Guideline 15390-1 (Draft 11/2013).
The VDMA (German Engineering Federation) standard sheet was developed by experts from the Compressed Air Technology division of the VDMA Compressors, Compressed Air and Vacuum Technology Association, in cooperation with specialists from the Fluid Power Association. It is based on the VDMA 15390:2004 standard sheet, which reflects many years of experience in the field of compressed air. The air purity classes in accordance with ISO 8573-1 refer to a specific measurement point within the compressed air network. Components such as pipes and valves influence the quality of the compressed air and must therefore be suitable for achieving a particular purity class. The processing lines shown here should therefore be used for guidance only.

BOGE AIR. THE AIR TO WORK.

Not all compressed air is alike. The different quality classes and purity requirements are as varied as the industrial applications. The perfect compressed air for use in the textile industry, for example, may be totally unsuitable for the food or surface-coating industry. This is why it is so important to adapt the compressed air treatment system precisely to the type of application. BOGE offers a wide range of system components, which ensure that you receive just the compressed air that you need, with the purity level stipulated for your industry. No more, no less, and always cost-effective.

Centralised compressed air treatment	Decentralised compressed air treatment	Solids	Water	Oil
①	–	–	7–8	–
① ② ④	–	3	4–6	3
① ② ④ ③	–	2	4–6	2
	③	1	4–6	2
① ② ④ ③ ⑧ ②	–	2	4–6	1
	③	1	4–6	1
① ③ ⑤ ②	–	2	1–2	2
	⑨ ③	1	1–2	1
① ③ ⑥ ②	–	2	1–2	1
① ③ ⑦ ⑧ ②	–	2	1–2	1
	③	1	1–2	1

Sterile filter, depending on type of application.

① Cyclone separator Z...N
② Microfilter F…P
③ Microfilter F…M
④ Refrigerant compressed air dryer DS 2 to DS 1800
⑤ Adsorption dryer with heatless regeneration
⑥ Adsorption dryer with heatless regeneration and activated carbon adsorber
⑦ Adsorption dryer with heat regeneration
⑧ Activated carbon adsorber DCZ
⑨ Activated carbon filter F...A

Refrigerant compressed air dryers
DS 2 to DS 95

Flow capacity: 0.20 – 9.5 m³/min, 7 – 335 cfm
Max. operating pressure: 16 bar, 235 psig

Installation requirements
Standard dryers are designed to operate at ambient or room temperatures of between +5°C and +50°C. Sufficient clearance must be provided on all sides of the refrigerant compressed air dryer to ensure good cooling air circulation. A suitably dimensioned drainage pipe must be installed to remove condensate.

Installation data
Flow capacity is based on the compressor's air intake (+20°C and 1 bar):
Compressed air temperature +35°C (max. +65°C possible), operating pressure 7 bar, ambient temperature +25°C (max. +50°C possible), pressure dew point +3°C (different pressure dew points are possible). Technical data according to DIN ISO 7183. Differing values on request.

Equipment:
- Illuminated operating switch
- Heat exchanger with demister
- Power plug up to DS 60
- Electronic level controlled condensate drain

Options:
- Assembly line
- Special voltages

RELIABLE PRESSURE DEW POINT
Thanks to their generously designed components, refrigerant dryers in the BOGE DS series maintain a constant pressure dew point. This ensures consistently high compressed air quality with a low pressure differential. All DS series dryers are equipped with a pressure dew point indicator.

INTELLIGENT DESIGN
These dryers incorporate proven and field tested components. The intelligent layout of the sturdy heat exchanger assembly is a guarantee for energy-saving operation. The hood is detachable for routine inspections and facilitates easy access to the complete inner workings.

MINIMAL PRESSURE LOSS
All DS dryers are characterised by their extremely low pressure loss. This allows the upstream compressor to deliver less pressure, thus avoiding overcompression. Energy savings of six percent are achieved for every bar of pressure saved – far higher than with other dryer systems.

ENVIRONMENTALLY FRIENDLY COOLANT
The R134a coolant used is ozone neutral and, in conjunction with the recyclable materials and the high energy efficiency, ensures maximum conservation of resources and modern and environmentally compatible refrigerant dryer operation.

CONSISTENT ENERGY SAVING
The exceptionally low pressure differential of dryers in the DS series means there is less pressure loss to be made up for by the compressor. Every bar reduction in overcompression saves 6% in energy costs. The DS series sets to work where potentials are highest and saves energy in new ways that traditional dryers cannot.

The most efficient method of drying compressed air: Compressed air is cooled to just above freezing point which means that water and oil aerosols contained in the air will condense. The two major cost factors involved are energy use and compensating for any pressure loss. The DS series incorporates particularly energy-saving components which markedly reduce these costs over the entire life of the compressed air system by exploiting the greatest saving potentials without sacrificing reliability.

BOGE Type	Flow capacity			max. pressure	Pressure differential at full load		Electr. power consumption		Installed power		Compressed air connection	Cooling air required		Dimensions W x D x H	Weight
	m³/min	m³/h	cfm	bar	bar	psig	kW	HP	kW	HP		m³/h	cfm	mm	kg
DS 2	0.20	12	7	16	0.004	0.058	0.12	0.16	0.26	0.35	G 1/2	90	53	450 x 210 x 430	19
DS 4	0.40	24	14	16	0.015	0.218	0.13	0.18	0.26	0.35	G 1/2	90	53	450 x 210 x 430	19
DS 6	0.60	36	21	16	0.031	0.450	0.17	0.23	0.26	0.35	G 1/2	90	53	450 x 210 x 430	19
DS 9	0.90	54	32	16	0.032	0.464	0.25	0.34	0.35	0.48	G 1/2	220	129	500 x 210 x 506	24
DS 12	1.20	72	42	16	0.055	0.798	0.25	0.34	0.35	0.48	G 1/2	220	129	500 x 210 x 506	24
DS 18	1.80	108	64	16	0.101	1.465	0.49	0.67	0.59	0.80	G 3/4	270	159	520 x 225 x 565	27
DS 22	2.20	132	78	16	0.172	2.494	0.57	0.78	0.76	1.03	G 3/4	380	223	520 x 225 x 565	31
DS 30	3.00	180	106	16	0.259	3.756	0.78	1.06	0.92	1.25	G 3/4	550	323	520 x 225 x 565	35
DS 40	4.00	240	141	16	0.137	1.987	0.71	0.97	0.95	1.29	G 1 1/2	540	318	555 x 425 x 600	52
DS 50	5.00	300	177	16	0.230	3.335	0.85	1.16	1.10	1.50	G 1 1/2	760	447	555 x 425 x 600	58
DS 60	6.00	360	212	16	0.322	4.669	1.05	1.43	1.37	1.86	G 1 1/2	1100	647	555 x 425 x 600	60
DS 75	7.50	450	265	14	0.130	1.887	0.90	1.20	1.40	1.90	G 1 1/2	2830	1666	703 x 562 x 945	83
DS 95	9.50	570	335	14	0.210	3.048	1.38	1.88	2.00	2.72	G 1 1/2	2830	1666	703 x 562 x 945	83

Conversion factors

According to DIN ISO 7183, refrigerant dryers are designed for 7 bar operating pressure, an ambient temperature of 25 ºC and an inlet temperature of 35 ºC. For different operating pressures and temperatures, the following conversion factors should be used.

Ambient/cooling water temperature	°C	**25**	30	35	40	45	50							
Factor	f_1	**1.00**	0.94	0.88	0.81	0.75	0.68							
Inlet temperature	°C	30	**35**	40	45	50	55	60	65					
Factor	f_2	1.22	**1.00**	0.83	0.69	0.58	0.49	0.46	0.43					
Operating pressure	bar	3	4	5	6	**7**	8	9	10	11	12	13	14	15	16
Factor	f_3	0.73	0.83	0.90	0.95	**1.00**	1.03	1.07	1.09	1.12	1.13	1.15	1.17	1.18	1.19
Pressure dew point	°C	**3**		5		7								
Factor	f_4	**1.00**		1.20		1.24								

Example (for dew point 3°C)

Delivery volume	m³/h	90		Factor
Ambient temperature (f_1)	°C	35	=	0.88
Inlet temperature (f_2)	°C	45	=	0.69
Operating overpressure (f_3)	bar	13	=	1.15

$$= \frac{V}{f_0 \times f_1 \times f_2 \times f_3} = \frac{90}{1 \times 0.88 \times 0.69 \times 1.15} = 129 = \textbf{DS 22}$$

Refrigerant compressed air dryers
DS 120 to DS 1800

Flow capacity: 12.00 – 180 m³/min, 720 – 6356 cfm
Max. operating pressure: 14 bar, 203 psig

With integrated energy-saving function

Installation requirements
Standard dryers are designed to operate at ambient or room temperatures of between +5°C and +50°C. Sufficient clearance must be provided on all sides of the refrigerant compressed air dryer to ensure good cooling air circulation. A suitably dimensioned drainage pipe must be installed to remove condensate.

Installation data
Flow capacity is based on the compressor's air intake (+20°C and 1 bar):
Compressed air temperature +35°C (max. +60°C possible), operating pressure 7 bar, ambient temperature +25°C (max. +50°C possible), pressure dew point +3°C. Technical data according to DIN ISO 7183.

Equipment:
- Illuminated operating switch
- Heat exchanger with demister
- Electronic level controlled condensate drain
- Serial, MODBUS-compatible RS 485 interface on the rear of the control
- Signals can be transmitted to an external master display
- Remote control option

Options:
- Assembly line
- Water-cooled option from DS 220

RELIABLE PRESSURE DEW POINT
The pressure dew point is conveniently displayed in the control. A reliable pressure dew point provides a consistently high quality compressed air.

INTELLIGENT DESIGN
These dryers incorporate proven and field tested components. The intelligent layout of the sturdy heat exchanger assembly is a guarantee for energy-saving operation. The complete inner workings are easily accessible for routine inspections.

INTEGRATED ELECTRONIC LEVEL CONTROLLED CONDENSATE DRAIN
All models are fitted with an electronic level controlled condensate drain as standard. The condensate drain system is compactly integrated in the heat exchanger.

ENVIRONMENTALLY FRIENDLY COOLANT
The R134a coolant used is ozone neutral and, in conjunction with the recyclable materials and the high energy efficiency, ensures maximum conservation of resources and modern and environmentally compatible refrigerant dryer operation.

CONSISTENT ENERGY SAVING
Dryers in the DS series have an integrated energy-saving function. The temperature measurements obtained are transmitted by the various sensors to the dryer control. The self teaching algorithm of this control then regulates when the dryer is switched on and off.

Compressed air drying can be so convenient: Due to the effective control, this series enables absolutely cost-efficient compressed air drying. Their extremely low pressure loss due to the generously designed components prevents overcompression. Compressor energy savings of six percent are achieved for every bar of pressure saved. Displaying energy use helps the operator to fully exploit the greatest saving potential – and arrive at the most efficient way to obtain dry compressed air.

BOGE Type	Flow capacity			max. pressure	Pressure differential at full load		Electr. power consumption		Installed power		Com- pressed air con- nection	Cooling air required		Dimensions W x D x H	Weight
	m³/min	m³/h	cfm	bar	bar	psig	kW	HP	kW	HP		m³/h	cfm	mm	kg
DS 120	12.00	720	424	14	0.130	1.885	1.13	1.54	2.38	3.42	G 2	2800	1646	706x1046x1064	145
DS 140	14.00	840	494	14	0.180	2.610	1.14	1.55	2.38	3.42	G 2	2800	1646	706x1046x1064	145
DS 180	18.00	1080	636	14	0.230	3.335	1.46	1.99	3.02	4.11	G 2	4000	2352	706x1046x1064	155
DS 220	22.00	1320	777	14	0.090	1.305	1.68	2.28	3.41	4.64	G 2 1/2	7050	4145	806x1166x1316	230
DS 260	26.00	1560	918	14	0.130	1.885	2.19	2.98	4.47	6.08	G 2 1/2	7050	4145	806x1166x1316	240
DS 300	30.17	1810	1065	14	0.170	2.465	2.41	3.28	5.27	7.17	G 2 1/2	7050	4145	806x1166x1316	245
DS 350	35.00	2100	1236	14	0.240	3.480	3.06	4.16	6.26	8.51	G 2 1/2	7050	4145	806x1166x1316	250
DS 460	46.00	2760	1624	14	0.140	2.030	3.14	4.27	6.26	8.51	DN 100	7050	4145	1007x1245x1723	470
DS 520	52.00	3120	1836	14	0.180	2.610	3.54	4.81	7.46	10.15	DN 100	7050	4145	1007x1245x1723	490
DS 630	63.00	3780	2225	14	0.260	3.770	4.64	6.31	9.92	13.49	DN 100	14100	8291	1007x1657x1810	580
DS 750	75.00	4500	2648	14	0.160	2.320	5.73	7.79	11.32	15.40	DN 150	14100	8291	1007x1657x1810	670
DS 900	90.00	5400	3178	14	0.230	3.335	7.63	10.38	16.26	22.11	DN 150	19000	11172	1007x1657x1810	690
DS 1200	120.00	7200	4237	14	0.230	3.335	8.92	12.13	19.26	26.19	DN 150	19000	11172	1007x1657x1807	830
DS 1500	150.00	9000	5297	14	0.200	2.900	12.35	16.80	25.64	34.87	DN 200	28500	16758	1007x2257x2208	1100
DS 1800	180.00	10800	6356	14	0.260	3.770	15.96	21.71	31.04	42.21	DN 200	28500	16758	1007x2257x2208	1190

Conversion factors

According to DIN ISO 7183, refrigerant compressed air dryers are designed for 7 bar operating pressure, an ambient temperature of 25 ºC and an inlet temperature of 35 ºC.

For different operating pressures and temperatures, the following conversion factors should be used.

Ambient/cooling water temperature	°C	20	**25**	30	35	40	45	50					
Factor	f_1	1.06	**1.00**	0.94	0.88	0.82	0.76	0.70					
Inlet temperature	°C	30	**35**	40	45	50	55	60					
Factor	f_2	1.21	**1.00**	0.84	0.70	0.59	0.49	0.41					
Operating pressure	bar	3	4	5	6	**7**	8	9	10	11	12	13	14
Factor	f_3	0.74	0.83	0.90	0.96	**1.00**	1.03	1.06	1.08	1.10	1.12	1.13	1.14
Pressure dew point	°C	**3**		5			10						
Factor	f_4	**1.00**		1.10			1.40						

Example (for dew point 3°C)

Delivery volume	m³/h	5000		Factor
Ambient temperature (f_1)	°C	30	=	0.94
Inlet temperature (f_2)	°C	40	=	0.84
Operating overpressure (f_3)	bar	10	=	1.08

$$= \frac{V}{f_1 \times f_2 \times f_3} = \frac{5000}{0.94 \times 0.84 \times 1.08} = 5863 = \textbf{DS 1200}$$

High pressure refrigerant compressed air dryers **DH 4** to **DH 630**

Flow capacity: 0.42 – 63 m³/min, 15 – 2225 cfm
Max. operating pressure: 50 bar, 725 psig

Installation requirements
Standard dryers are designed to operate at ambient or room temperatures of between +5°C and +50°C. Sufficient clearance must be provided on all sides of the refrigerant compressed air dryer to ensure good cooling air circulation. A suitably dimensioned drainage pipe must be installed to remove condensate.

Installation data
Flow capacity is based on the compressor's air intake (+20°C and 1 bar):
Compressed air temperature +35°C (max. +65°C possible), operating pressure 40 bar, ambient temperature +25°C (max. +50°C possible), pressure dew point +3°C (different dew points possible). Technical data according to DIN ISO 7183. Differing values on request.

Equipment
• Illuminated operating switch
• Heat exchanger with demister
• Power plug up to DH 90

Options:
• Assembly line
• Special voltages

RELIABLE PRESSURE POINT
Thanks to their generously designed components, refrigerant dryers in the DH series maintain a reliable pressure dew point. This ensures consistently high compressed air quality with a low pressure differential. All dryers are equipped with a pressure dew point indicator.

INTELLIGENT DESIGN
These dryers incorporate proven and field tested components. The complete inner workings are easily accessible for routine inspections thanks to the removable hood. The intelligent layout of the sturdy heat exchanger assembly is a guarantee for energy-saving operation.

MINIMAL PRESSURE LOSS
All DH dryers are characterised by their extremely low pressure loss. This allows the upstream compressor to deliver less pressure, thus avoiding overcompression, and the consistently low pressure setting extends the life of the dryer system.

ENVIRONMENTALLY FRIENDLY COOLANT
The R134a or R407c coolant used is ozone neutral and, in conjunction with the recyclable materials and the high energy efficiency, ensures maximum conservation of resources and environmentally compatible refrigerant dryer operation.

CONSISTENT ENERGY SAVING
The exceptionally low pressure differential of dryers in the DH series means there is less pressure loss to be made up for by the compressor. Every bar reduction in overcompression saves 6% in energy costs. The DH series sets to work where potentials are highest and saves energy in new ways that traditional dryers cannot.

The most effective way to dry compressed air: DH series high pressure refrigerant compressed air dryers are characterised by their extremely low energy consumption and exceptionally low pressure differential. This is how both of the largest cost factors in compressed air drying are eliminated – for maximum efficiency.

BOGE Typ	Flow capacity			max. pressure	Pressure differential at full load		Electr. power consumption		Installed power		Com-pressed air	Cooling air required		Dimensions W x D x H	Weight
	m³/min	m³/h	cfm	bar	bar	psig	kW	HP	kW	HP	connection	m³/h	cfm	mm	kg
DH 4	0,42	25,4	15	50	0,06	0,87	0,13	0,17	0,26	0,35	¹/₂″ BSPT-F	360	212	450x430x210	22,0
DH 6	0,61	36,6	22	50	0,03	0,44	0,17	0,23	0,26	0,35	¹/₂″ BSPT-F	360	212	450x430x210	22,0
DH 12	1,25	75,2	44	50	0,06	0,87	0,25	0,34	0,35	0,48	¹/₂″ BSPT-F	540	318	555x600x425	26,5
DH 22	2,18	130,8	77	50	0,04	0,58	0,57	0,77	0,59	0,80	¹/₂″ BSPT-F	550	323	555x600x425	29,5
DH 30	3,00	180,0	106	50	0,16	2,32	0,53	0,72	0,90	1,22	1¹/₄″ BSPT-F	2100	1235	703x945x562	83,0
DH 45	4,50	270,0	159	50	0,33	4,79	0,55	0,74	0,90	1,22	1¹/₄″ BSPT-F	2100	1235	703x945x562	83,0
DH 65	6,50	390,0	230	50	0,32	4,64	1,33	1,80	2,12	2,88	1¹/₄″ BSPT-F	1800	1058	703x945x562	83,0
DH 90	9,00	540,0	318	50	0,31	4,50	1,37	1,86	2,12	2,88	1¹/₄″ BSPT-F	1800	1058	703x945x562	83,0
DH 120	12,00	720,0	424	50	0,13	1,88	1,41	1,92	3,02	4,11	1¹/₄″ BSPT-F	2000	1176	706x1064x1046	152,0
DH 160	16,00	960,0	565	50	0,21	3,04	1,44	1,96	3,02	4,11	1¹/₄″ BSPT-F	2000	1176	706x1064x1046	152,0
DH 200	20,00	1200,0	706	50	0,30	4,35	1,47	1,99	3,02	4,11	1¹/₄″ BSPT-F	2000	1176	706x1064x1046	152,0
DH 230	23,00	1380,0	812	50	0,38	5,51	1,52	2,06	3,02	4,11	1¹/₄″ BSPT-F	2000	1176	706x1064x1046	152,0
DH 290	29,00	1740,0	1024	50	0,18	2,61	2,85	3,88	6,26	8,51	ANSI 2¹/₂″	5600	3293	1007x1690x1097	356,0
DH 380	38,00	2280,0	1342	50	0,28	4,06	3,16	4,30	6,26	8,51	ANSI 2¹/₂″	5600	3293	1007x1690x1097	356,0
DH 460	46,00	2760,0	1625	50	0,38	5,51	3,44	4,68	6,26	8,51	ANSI 2¹/₂″	5600	3293	1007x1690x1097	356,0
DH 630	63,00	3780,0	2225	50	0,33	4,79	4,12	5,60	7,36	10,00	ANSI 2¹/₂″	11200	6586	1007x1690x1657	455,0

The output figures shown refer to air cooled models with air suction at (FAD) 20°C and 1bar (a) under the following operating conditions:
Air suction at 25°C/6% relative humidity, 40 bar operating excess pressure, 25°C cooling air temperature, 35°C compressed air inlet temperature, pressure dew point acc. to DIN ISO8573-1.
All data referred to the directive DIN ISO 7183. DH models 4 to 22 are filled with R134a coolant, the models DH 30 to DH 630 are filled with R407c coolant..
All models are designed for operation up to 50 bar excess pressure. Data given for 50 Hz models. Please contact us for further information.

Conversion factors for air flow rate under variable working conditions

Ambient/cooling water temperature	°C	20	**25**	30	35	40	45	50	
Factor	f_1	1.02	**1.00**	0.98	0.95	0.93	0.90	0.86	
Inlet temperature	°C	30	**35**	40	45	50	55	60	65
Factor	f_2	1.18	**1.00**	0.87	0.77	0.69	0.62	0.56	0.50
Operating pressure	bar	15	20	25	30	35	**40**	45	50
Factor	f_3	0.85	0.91	0.94	0.97	0.99	**1.00**	1.01	1.01
Pressure dew point	°C	**3**		5		7			
Factor	f_4	**1.00**		1.20		1.24			

Exemple

Delivery volume	m³/h	90		Factor
Ambient temperature (f_1)	°C	35	=	0.95
Inlet temperature (f_2)	°C	45	=	0.77
Operating overpressure (f_3)	bar	40	=	1.00
Dew point (f_4)	°C	3	=	1.00

$$\frac{V}{f_1 \times f_2 \times f_3 \times f_4} = \frac{90}{0.95 \times 0.77 \times 1.00 \times 1.00} = 123 = \textbf{DH 22}$$

Membrane dryers
DM 05 V to DM 14 V

Flow capacity: 125 – 2730 l/min, 4 – 96 cfm
Max. operating pressure: 7 – 15 bar, 100 – 220 psig

Membrane Dryer Layout
A: Head (inlet / outlet)
B: Filter housing
C: Nano-filter
D: Membrane element including
   main body
E: Nozzle with adapter
F: Float drain

(1) Saturated compressed air enters via the dryer cap (A) and flows down the central tube (D). **(2)** The nano-filter (C) removes any remaining aerosols and particles, separated condensate is drained (F). The saturated compressed air flows through the inside of the membranes. **(3)** A part of the compressed air is diverted and expands to atmosphere at the nozzle (E). **(4)** This very dry purge air is lead across the outside of the membranes (D). **(5)** Thus the saturated compressed air flows on the inside and the dry purge air on the outside. Due to the differences in humidity, moisture diffuses from the compressed air to the purge air. **(6)** The dry compressed air exits. **(7)** The purge air escapes to the atmosphere.

INTEGRATED CYCLONE SEPARATOR
The integrated cyclone separator assures optimal functioning of the membrane dryer by way of pre-filtration.
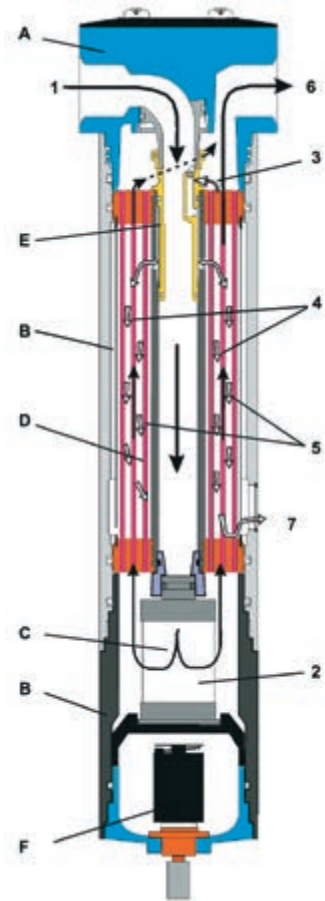
INTEGRATED COMPRESSED AIR FILTER
A standard compressed air filter is included to provide technically oil free compressed air.

ENERGY EFFICIENT
As the membrane dryer does not have a motor or any moving parts it does not need any additional energy.

COMPACT
Thanks to its compact and space-saving design, it can be used everywhere as a terminal station dryer.

Pressure dew point reduction in a compact package: The BOGE menbrane dryer is used where the pressure dew point needs to be reduced between 20 and 50 Kelvin. it requires little space and can be installed at minimal cost – ideally between the compressor and the receiver.

BOGE Type	Max. operating pressure		Flow volume Dry inlet		Purge air			Flow volume Dryer outlet		Compressed air connection	Dimensions L x W x H	Weight
	bar	psig	l/min	cfm	Δt	l/min	cfm	l/min (air used)	cfm	IN/OUT	mm	kg
DM 05 V	7	100	300	11	20 K	30	1	270	10	G ³/₈	167 x 60 x 522	3,0
DM 05 V	9	130	420	15	20 K	38	1	382	13	G ³/₈	167 x 60 x 522	3,0
DM 05 V	15	220	750	26	20 K	62	2	688	24	G ³/₈	167 x 60 x 522	3,0
DM 05 V	7	100	180	6	35 K	30	1	150	5	G ³/₈	167 x 60 x 522	3,0
DM 05 V	9	130	250	9	35 K	38	1	212	7	G ³/₈	167 x 60 x 522	3,0
DM 05 V	15	220	460	16	35 K	62	2	398	14	G ³/₈	167 x 60 x 522	3,0
DM 05 V	7	100	125	4	55 K	30	1	95	3	G ³/₈	167 x 60 x 522	3,0
DM 05 V	9	130	175	7	55 K	38	1	137	5	G ³/₈	167 x 60 x 522	3,0
DM 05 V	15	220	320	11	55 K	62	2	258	9	G ³/₈	167 x 60 x 522	3,0
DM 06 V	7	100	400	14	20 K	40	1	360	13	G ³/₈	167 x 60 x 582	3,2
DM 06 V	9	130	560	20	20 K	50	2	510	18	G ³/₈	167 x 60 x 582	3,2
DM 06 V	15	220	950	34	20 K	80	3	870	31	G ³/₈	167 x 60 x 582	3,2
DM 06 V	7	100	240	8	35 K	40	1	200	7	G ³/₈	167 x 60 x 582	3,2
DM 06 V	9	130	335	12	35 K	50	2	285	10	G ³/₈	167 x 60 x 582	3,2
DM 06 V	15	220	605	21	35 K	80	3	525	19	G ³/₈	167 x 60 x 582	3,2
DM 06 V	7	100	170	6	55 K	40	1	130	5	G ³/₈	167 x 60 x 582	3,2
DM 06 V	9	130	235	8	55 K	50	2	185	7	G ³/₈	167 x 60 x 582	3,2
DM 06 V	15	220	425	15	55 K	80	3	345	12	G ³/₈	167 x 60 x 582	3,2
DM 09 V	7	100	600	21	20 K	60	2	540	19	G ³/₄	210 x 80 x 592	4,5
DM 09 V	9	130	835	29	20 K	75	3	760	27	G ³/₄	210 x 80 x 592	4,5
DM 09 V	15	220	1470	52	20 K	125	4	1345	47	G ³/₄	210 x 80 x 592	4,5
DM 09 V	7	100	360	13	35 K	60	2	300	11	G ³/₄	210 x 80 x 592	4,5
DM 09 V	9	130	505	18	35 K	75	3	430	15	G ³/₄	210 x 80 x 592	4,5
DM 09 V	15	220	890	31	35 K	125	4	765	27	G ³/₄	210 x 80 x 592	4,5
DM 09 V	7	100	245	9	55 K	60	2	185	7	G ³/₄	210 x 80 x 592	4,5
DM 09 V	9	130	345	12	55 K	75	7	270	10	G ³/₄	210 x 80 x 592	4,5
DM 09 V	15	220	650	23	55 K	125	4	525	19	G ³/₄	210 x 80 x 592	4,5
DM 13 V	7	100	800	28	20 K	80	3	720	25	G ³/₄	210 x 80 x 642	4,8
DM 13 V	9	130	1110	39	20 K	105	4	1005	35	G ³/₄	210 x 80 x 642	4,8
DM 13 V	15	220	1820	64	20 K	155	5	1665	59	G ³/₄	210 x 80 x 642	4,8
DM 13 V	7	100	485	17	35 K	80	3	405	14	G ³/₄	210 x 80 x 642	4,8
DM 13 V	9	130	675	24	35 K	105	4	570	20	G ³/₄	210 x 80 x 642	4,8
DM 13 V	15	220	1150	41	35 K	155	5	995	35	G ³/₄	210 x 80 x 642	4,8
DM 13 V	7	100	330	12	55 K	80	3	250	9	G ³/₄	210 x 80 x 642	4,8
DM 13 V	9	130	465	16	55 K	105	4	360	13	G ³/₄	210 x 80 x 642	4,8
DM 13 V	15	220	820	29	55 K	155	5	665	23	G ³/₄	210 x 80 x 642	4,8
DM 14 V	7	100	1050	37	20 K	120	4	930	33	G ³/₄	210 x 80 x 712	5,1
DM 14 V	9	130	1470	52	20 K	150	5	1320	47	G ³/₄	210 x 80 x 712	5,1
DM 14 V	15	220	2730	96	20 K	250	9	2480	88	G ³/₄	210 x 80 x 712	5,1
DM 14 V	7	100	710	25	35 K	120	4	590	21	G ³/₄	210 x 80 x 712	5,1
DM 14 V	9	130	990	35	35 K	150	5	840	30	G ³/₄	210 x 80 x 712	5,1
DM 14 V	15	220	1780	63	35 K	250	9	1530	54	G ³/₄	210 x 80 x 712	5,1
DM 14 V	7	100	485	17	55 K	120	4	365	13	G ³/₄	210 x 80 x 712	5,1
DM 14 V	9	130	680	24	55 K	150	5	530	19	G ³/₄	210 x 80 x 712	5,1
DM 14 V	15	220	1320	47	55 K	250	9	1070	38	G ³/₄	210 x 80 x 712	5,1

Adsorption dryers **DAZ 4-2** to **DAZ 1021-2**
Adsorption dryer units **DACZ 4-2** to **DACZ 1021-2**

Flow capacity: 8 – 6100 m³/h, 5 – 3587 cfm
Max. operating pressure: 10 bar and 16 bar, 150 and 230 psig

DAZ 4-2 – DAZ 14-2

Adsorption dryer
DAZ-2
heatless with pre- and after-filters

MICROPROCESSOR CONTROL
The microprocessor control enables energy efficient control of the adsorption dryer. An optional dew point control is available that adapts the way the system operates and in doing so reduces operating costs.

FUNCTION DISPLAY
A functional display at the front of the control cabinet permanently indicates operational status. The ten-minute cycle can save up to six percent of energy. The compressor synchronising control can also offer further energy savings potential.
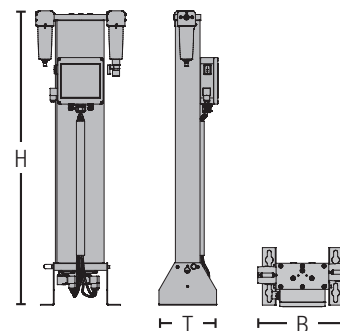

DAZ 18-2 – DAZ 161-2

Treatment system
DACZ-2
The **DAZ-2** adsorption dryer combined with a **DCZ-2** activated carbon adsorber

FILTRATION
The entire range is equipped with both pre and after filter as standard. Even before drying, all solids and aerosols up to 0,01 µm are removed from the compressed air supply – assuring best possible quality.
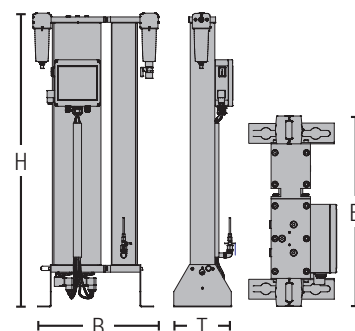
LOW RESIDUAL OIL CONTENT
The DACZ series is equipped with an activated carbon adsorber to ensure a residual oil content of only 0,003 mg/m³ – for the highest quality compressed air.
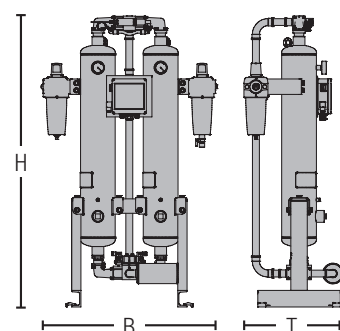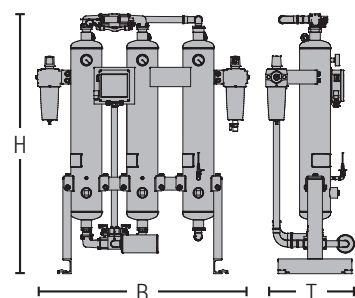

DACZ 4-2 – DACZ 14-2

DACZ 18-2 – DACZ 161-2

The all-in one package for dry compressed air: The ideal solution for compressed air pressure dew points below +3°C. The heatless BOGE adsorption dryers can reach dew points of -70°C (standard -40°C). The twin tower system allows regeneration simultaneously with the adsorption eliminating the need for any external power supply.

BOGE Type	Capacity* m³/h	cfm	Dimensions W X D X H mm	Connection	Weight kg**	BOGE Type	Capacity* m³/h	cfm	Dimensions W X D X H mm	Connection	Weight kg**
DAZ 4-2	8	5	326 x 216 x 400	G $\frac{1}{4}$	11.5	DACZ 4-2	8	5	459 x 225 x 400	G $\frac{1}{4}$	15
DAZ 5-2	15	9	326 x 216 x 575	G $\frac{1}{4}$	15.5	DACZ 5-2	15	9	459 x 225 x 575	G $\frac{1}{4}$	20
DAZ 6-2	25	15	326 x 216 x 825	G $\frac{1}{4}$	25.0	DACZ 6-2	25	15	459 x 225 x 825	G $\frac{1}{4}$	28
DAZ 8-2	35	21	326 x 216 x 1075	G $\frac{1}{4}$	48.0	DACZ 8-2	35	21	459 x 225 x 1075	G $\frac{1}{4}$	35
DAZ 9-2	56	33	495 x 300 x 1203	G $\frac{3}{8}$	48.0	DACZ 9-2	56	33	685 x 300 x 1430	G $\frac{1}{2}$	68
DAZ 11-2	72	42	495 x 300 x 1428	G $\frac{3}{8}$	56.5	DACZ 11-2	72	42	685 x 300 x 1205	G $\frac{1}{2}$	81
DAZ 14-2	86	50	495 x 300 x 1628	G $\frac{1}{2}$	62.5	DACZ 14-2	86	50	685 x 300 x 1630	G $\frac{3}{4}$	92
DAZ 18-2	105	62	820 x 480 x 1420	G 1	120.0	DACZ 18-2	105	62	1140 x 467 x 1070	G 1	161
DAZ 26-2	145	85	820 x 480 x 1750	G 1	142.0	DACZ 26-2	145	85	1140 x 467 x 1320	G 1	193
DAZ 36-2	200	118	660 x 480 x 1730	G 1	143.0	DACZ 36-2	200	118	920 x 490 x 1730	G 1	193
DAZ 46-2	255	150	630 x 530 x 1760	G 1$\frac{1}{2}$	173.0	DACZ 46-2	255	150	940 x 530 x 1760	G 1$\frac{1}{2}$	234
DAZ 61-2	350	206	790 x 585 x 1810	G 1$\frac{1}{2}$	210.0	DACZ 61-2	350	206	1220 x 585 x 1810	G 1$\frac{1}{2}$	283
DAZ 71-2	420	247	820 x 605 x 1820	G 1$\frac{1}{2}$	249.0	DACZ 71-2	420	247	1250 x 605 x 1820	G 1$\frac{1}{2}$	334
DAZ 101-2	620	365	860 x 635 x 1860	G 2	277.0	DACZ 101-2	620	365	1310 x 635 x 1870	G 2	428
DAZ 126-2	750	441	950 x 640 x 2000	G 2	408.0	DACZ 126-2	750	441	1450 x 635 x 2000	G 2	555
DAZ 161-2	940	553	1000 x 670 x 2020	G 2$\frac{1}{2}$	510.0	DACZ 161-2	940	553	1500 x 670 x 2020	G 2$\frac{1}{2}$	698
DAZ 201	1200	706	1060 x 840 x 2075	DN 50	640.0						
DAZ 261	1550	912	1270 x 900 x 2120	DN 65	830.0						
DAZ 341	2000	1176	1350 x 990 x 2160	DN 65	955.0				**Upon request**		
DAZ 421	2500	1470	1530 x 1040 x 2210	DN 80	1075.0						
DAZ 501	3000	1764	1600 x 1100 x 2255	DN 80	1500.0						
DAZ 646	3800	2235	1875 x 1200 x 2385	DN 100	1990.0						
DAZ 811	4850	2852	1925 x 1250 x 2660	DN 100	2410.0						
DAZ 1021	6100	3587	2160 x 1565 x 2820	DN 125	2850.0						

* Capacity in m³/h at 1 bar to DIN ISO 7183   ** from DAZ 201 weight without filter

Max. operating pressure   DAZ/DACZ 4-2 – DAZ/DACZ 161-2 **16 bar**
                               DAZ 201 – DAZ 1021   **10 bar**

Electrical connection 230 V; 50 Hz; 0.021 kW
(Dimensions and weights for models DAZ/DACZ 201 onwards do not include pre-filters and after filters)

Conversion factors to determine dryer size for DTP to –40 °C

Dryer inlet temperature	Pressure bar (e)											
	5	6	7	8	9	10	11	12	13	14	15	16
35 °C	0.75	0.89	**1.00**	1.08	1.26	1.31	1.36	1.49	1.62	1.70	1.79	1.90
40 °C	0.64	0.78	0.91	**1.00**	1.08	1.16	1.24	1.35	1.47	1.57	1.67	1.77
45 °C	0.61	0.73	0.82	0.94	1.03	1.07	1.10	1.22	1.35	1.46	1.57	1.66
50 °C	0.59	0.67	0.79	0.86	0.99	1.03	1.07	1.18	1.29	1.37	1.46	1.55

Operating pressure less than 5 bar (e) upon request or alternatively heat regenerated adsorption dryers. Higher inlet temperatures available upon request.

Example: Compressed air to be dried

		a) To calculate the specific dryer capacity	**b)** To calculate the max. dryer capacity

Volume flow   375 m³/h
Min. operating overpr. 8 bar (ü)
Max. Inlet temp.   +35 °C
Pressure dew point   –40 °C
Factor from table   1.08

a) To calculate the specific dryer capacity

$$\frac{\text{eff. capacity}}{\text{Factor from table}} = \frac{375 \text{ m}^3/h}{1.08} = 347 \text{ m}^3/h$$

Selected type DAZ 61-2.

b) To calculate the max. dryer capacity
Nominal capacity x factor from table
(DAZ 61-2) = 350 m³/h x 1.08 = 378 m³/h

Adsorption dryers **DAV 75** to **DAV 1035**
externally heated with vacuum regeneration
including pre-filter and after-filter

Flow capacity: 420 – 14500 m³/h, 241 – 8359 cfm
Max. operating pressure: 10 bar, 150 psig

DAV 75 – DAV 1035

Equipment:
- Two-layer desiccant bed, efficiently balanced between water resistance and high efficiency water retention
- Active heating under vacuum vaporizing temperature at 98°C.
- Low regeneration temperature for the desorption of humidity from the desiccant bed under vacuum
- Efficient cooling is achieved through generating a vacuum without introducing the heat generated by the vacuum pump into the dryer
- Pressure is built up using moist compressed air; dry purge air is not required
- Changeover without pressure dew point peak. Moisture in the regeneration air and cooling phase never reaches the drying zone of the regeneration medium.

FILTRATION
The entire range is equipped with a microfilter. Which means before drying, all solids and aerosols up to 0,01 µm are removed from the compressed air supply – assuring best possible quality.

PRESSURE DEW POINT
The pressure dew point is extremely reliable because the regeneration ambient air is drawn through the dryer inlet in the same direction as the air to be dried.
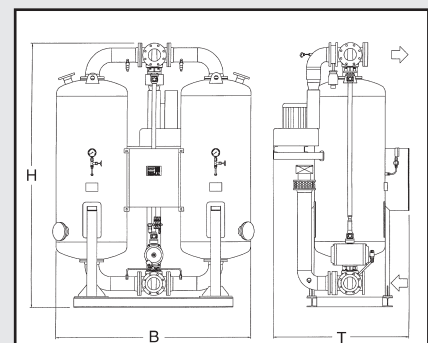
FUNCTIONAL DISPLAY
The innovatively designed controller, clearly displays operating parameters such as pressure, temperature, cycle, vacuum pump, and changeover – for safe and efficient operation.

MODULAR SYSTEM
The dryer is equipped with controlled regeneration air. It can optionally be equipped with a thyristor controlled heater and a frequency controlled vacuum pump.

Dry compressed air with low energy system: Heat regenerated adsorption dryers are ideally suited for higher outputs and pressure dew points up to -70°C (standard -25°C or -40°C). Ambient air is taken and heated under vacuum to regenerate the desiccant. A sophisticated system taking advantage of physical conditions enables efficient compressed air drying resulting in energy savings of up to 25 percent in comparison with traditional systems.

BOGE Type	Volume of flow*			Connection	Width W	Height H	Depth D	Weight without filter	Power required
	m³/min	m³/h	cfm		mm	mm	mm	kg	kWh/h
DAV 75	7.0	420	241	DN 40	1215	1955	992	460	3,5
DAV 85	8.5	510	293	DN 40	1214	2204	992	560	3,7
DAV 105	10.7	640	370	DN 50	1306	2247	1082	750	5,1
DAV 145	14.2	850	487	DN 50	1360	2271	1120	800	6,6
DAV 200	19.7	1180	681	DN 80	1560	2664	1264	1150	8,9
DAV 250	25.0	1500	863	DN 80	1610	2680	1279	1350	12,0
DAV 330	33.0	1980	1141	DN 80	1700	2730	1585	1720	13,2
DAV 390	39.2	2350	1353	DN 100	2020	2845	1447	1880	18,1
DAV 455	48.8	2930	1688	DN 100	2080	2870	1580	2350	22,4
DAV 555	59.2	3550	2047	DN 100	2170	2940	1740	2850	27,1
DAV 685	68.3	4100	2365	DN 150	2450	3190	1780	4000	31,6
DAV 790	79.0	4740	2735	DN 150	2550	3210	2110	4100	33,6
DAV 875	87.5	5250	3029	DN 150	2550	3230	1955	4200	35,5
DAV 1035	103.5	6210	3582	DN 150	2600	3500	1910	4950	49,3

* m³/h referred to 1bar to DIN 7183. Higher capacities and lower pressure dew points down to -70°C upon request.
  Receiver as per PED individual acceptance / CE standard

Conversion factors, depending on pressure and temperature

Temperature	Operating pressure bar (ü)						
	4	5	6	7	8	9	10
30 °C	0.69	0.80	0.90	1.02	1.06	1.17	1.29
35 °C	0.44	0.62	0.80	**1.00**	1.05	1.16	1.28
40 °C	0.28	0.42	0.59	0.70	0.79	0.88	0.96

Example: Compressed air to be dried.

a) To calculate the specific dryer capacity

Volume flow	3000 m³/h
Min. operating overpr.	5 bar (ü)
Max. Inlet temp.	+30 °C
Pressure dew point	−25 °C
Factor from table	0.80

$$\frac{\text{eff. capacity}}{\text{Factor from table}} = \frac{3000 \text{ m}^3/\text{h}}{0.80} = 3750 \text{ m}^3/\text{h}$$

Selected type DAV 685.

b) To calculate the max. dryer capacity
Nominal capacity x factor from table
(DAV 685) = 4100 m³/h x 0.80 = 3280 m³/h

c) Reserve dryer capacity
max. dryer capacity − volume flow
3280 m³/h − 3000 m³/h = 280 m³/h

BOGE
COMPRESSED AIR SYSTEMS

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Best
Of
German
Engineering

All around the globe, customers place their trust in premium compressed air systems with the BOGE brand name. These four letters stand for more than just the name of our company founder. BOGE also stands for the Best Of German Engineering – because we have been putting our experience in innovative solutions and outstanding products into action for four generations and for more than 100 years. Those who favour German engineering ingenuity opt for BOGE quality – worldwide.

OUR RANGES OF SERVICES INCLUDE THE FOLLOWING:

• Energy efficient systems development
• Plant design and engineering
• System control and visualisation
• Oil-free piston and screw compressors
• Oil injected screw compressors
  and oil lubricated piston compressors
• Compressed air treatment
• Compressed air distribution and storage
• Compressed air accessories
• Compressed air service

GL   ISO 9001
        ISO 14001

GL Systems Certification