BOGE AIR. THE AIR TO WORK.

BOGE
COMPRESSED AIR SYSTEMS

Refrigerant Dryers

DS Series

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 it 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.

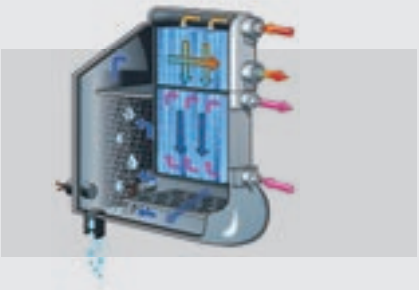
BOGE compressed air treatment products have been designed to work in perfect harmony with the compressor range to provide the optimal, most effective and efficient compressed air quality with options available to meet the highest air quality requirements.

Efficiency in every detail:
The DS series refrigerant dryers.

REALISING THE FULL POTENTIAL

When it comes to energy efficient compressed air drying, not only is the energy consumption of the dryer a key factor but the power consumption of the compressor is of even greater importance. Just a small decrease in pressure loss across the dryer means a reduction in generation pressure which in turn saves energy.

Due to the compact layout design coupled to the built in energy saving components the BOGE DS series dryers are able to operate with extremely low pressure differentials compared to traditional refrigerant dryers. And, don't forget; each one bar reduction in generation pressure saves around six percent in energy consumption. The DS series dryers are therefore not only inherently energy efficient but they will also reduce the energy consumption of the compressor itself.

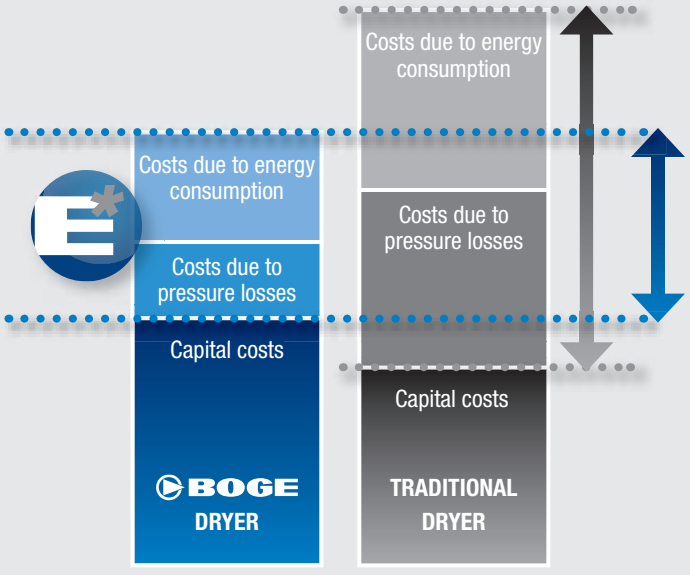


LOW PRESSURE LOSS

The DS series refrigerant dryers are extremely energy efficient. The patented design of the heat exchanger and its particularly generously dimensioned and optimal airflow not only ensure an energy efficient drying process but also extremely low pressure differentials which consequently reduce the power consumption of the compressor. This creates a larger savings potential than just the dryer alone.

LOW POWER CONSUMPTION

The DS series is equipped with an innovative control including an integrated energy saving function which ensures a particularly low power consumption of the dryer. It is also able to adapt the energy consumption to the actual prevailing operating conditions. Temperature fluctuations – due to seasonal variations and other factors – are measured by sensors and sent to the control system. The energy saving control unit serves to minimise the energy consumption and to reduce costs – at a constant pressure dew point.



The BOGE efficiency edge: a total cost comparison shows that reduced pressure losses and low energy consumption ensure a rapid pay back period on the DS series dryers – a clear advantage for both the environment and your investment.

Refrigerant Dryers **DS 2 – DS 60** Series

Flow capacity: 0.20 – 6.00 m³/min, 7 – 212 cfm
Max. operating pressure: 16 bar, 235 psig

Installation instructions

To install the standard designed dryers, the room and/or ambient temperature may not exceed +50°C and not fall below +5°C. Sufficient clearance must be provided on all sides of the dryer to ensure good cooling air circulation. A suitably dimensioned drainage pipe must be installed to remove condensate.

Design conditions

The flow capacity rate is determined in relation to the air intake condition of the compressor (+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 (higher dew points possible). Technical data according to DIN ISO 7183.
Other values available on request.

Features:

- Illuminated operating switch
- Heat exchanger with demister
- Mains plug up to DS 60 model

Options:

- Standard bypass line
- Special voltages

RELIABLE PRESSURE DEW POINT

Due to its generously dimensioned components, the DS series is able to ensure a reliable dew point along with a consistently high compressed air quality as well as a low pressure differential. The generation pressure can therefore be optimised. The DS series dryers are equipped with a pressure dew point indicator.

INTELLIGENT DESIGN

All components are time proven and field tested. The intelligent layout of the robust heat exchanger package is engineered to guarantee energy saving operation. A removable canopy ensures easy access for routine inspections.

LOWEST POSSIBLE PRESSURE LOSS

All DS series dryers are characterised by their extremely low pressure differential. This means that the generation pressure of upstream compressor can be optimised. Remember each one bar reduction in generation pressure saves around six percent in energy consumption – much more than with any other dryer systems.

ENVIRONMENTALLY FRIENDLY COOLANT

The R134a coolant does not have any ozone depleting characteristics. That, in conjunction with the use of recyclable materials and the in-built energy efficiency provides a true environmentally friendly product for the drying of compressed air.

ENERGY EFFICIENT

The DS dryers have exceptionally low pressure differentials across the range. Remember each one bar reduction in generation pressure saves around six percent in energy consumption. The DS series therefore realises savings where potentials are highest and at the same time develops further saving potentials that traditional dryers cannot reach.

The most efficient method of drying compressed air: when compressed air is cooled near to freezing point, water and oil vapours create condensate. This method of drying is expensive to the end user as it uses energy and creates pressure losses. Because of its energy saving components, the DS series is capable of substantially reducing such costs over the entire lifetime of the compressed air system by combining savings potentials with maximum reliability.

BOGE Model	Flow capacity			Max. operating pressure	Pressure differential at full load		Electr. power consumption		Installed power		Compressed air connection	Cooling air requirement		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	450x210x 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	450x210x 430	19
DS 6	0.60	36	21	16	0.031	0.450	0.17	0.23	0.26	0.35	G /2	90	53	450x210x 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	500x210x 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	500x210x 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	520x225x 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	520x225x 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	520x225x 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	555x425x 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	555x425x 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	555x425x 600	60

Conversion factors

According to DIN ISO 7183, refrigerant dryers are designed for 7 bar operating pressure, an ambient temperature of +25°C and an inlet temperature of +35°C. For differing 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	bar	**3**		5		7										
Factor	f_4	**1.00**		1.20		1.24										

Example (for dew point 3°C)

Volume flow	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 Dryers **DS 75 – DS 1800** Series

Flow capacity: 7.58 – 180 m³/min, 268 – 6356 cfm
Max. operating pressure: 14 bar, 203 psig

RELIABLE PRESSURE DEW POINT

From the DS 120 model, the pressure dew point is displayed on the control panel. A reliable dew point is essential for a consistently high compressed air quality and a low pressure differential. The generation pressure can therefore be optimised.

INTELLIGENT DESIGN

All components are time proven and field tested. The intelligent layout of the robust heat exchanger package is engineered to guarantee energy saving operation. A removable canopy ensures easy access for routine inspections.

Installation instructions

To install the standard designed dryers, the room and/or ambient temperature may not exceed +50°C and not fall below +5°C. Sufficient clearance must be provided on all sides of the dryer to ensure good cooling air circulation. A suitably dimensioned drainage pipe must be installed to remove condensate.

Design conditions

The flow capacity rate is determined in relation to the air intake condition of the compressor (+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. Technical data according to DIN ISO 7183.

Options:

- Standard bypass line
- Water cooled design from the DS 220

INTEGRATED CONDENSATE DRAIN

All models come standard with an electronic level controlled condensate drain. Both the DS 75 and DS 95 are equipped with a Bekomat 32. From the DS 120 model, a condensate drain is integral to the heat exchanger and linked to the dryer control in order to save space – for even more safety and efficiency.

ENVIRONMENTALLY FRIENDLY COOLANT

The R407c coolant does not have any ozone depleting characteristics. That, in conjunction with the use of recyclable materials and the in-built energy efficiency provides a true environmentally friendly product for the drying of compressed air.

ENERGY EFFICIENT

The DS dryers have exceptionally low pressure differentials across the range. Remember each one bar reduction in generation pressure saves around six percent in energy consumption. The DS series therefore realises savings where potentials are highest and at the same time develops further saving potentials that traditional dryers cannot reach.

Extremely energy efficient compressed air drying: Owing to its efficient control, this range ensures absolutely economical compressed air drying. The generously dimensioned components are designed to ensure extremely low pressure differentials and to optimise pressure generation. Remember each one bar reduction in generation pressure saves around six percent in energy consumption.

BOGE Model	Flow capacity			Max. operating pressure	Pressure differential at full load		Electr. power consumption		Installed power		Compressed air connection	Cooling air requirement		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 75	7.58	455	268	14	0.130	1.885	0.90	1.22	1.42	1.93	G 1 1/2	2830	1664	703x562x945	83
DS 95	9.50	570	335	14	0.210	3.045	1.38	1.88	2.00	2.72	G 1 1/2	2830	1664	703x562x945	83
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 dryers are designed for 7 bar operating pressure, an ambient temperature of +25°C and an inlet temperature of +35°C. For differing 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	bar	**3**		5					10					
Factor	f_4	**1.00**		1.10					1.40					

Example (for dew point 3°C)

Volume flow	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

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

BOGE COMPRESSED AIR SYSTEMS

BOGE AIR. THE AIR TO WORK.

For four generations, customers from mechanical engineering, industry and trade have relied on BOGE know-how when it comes to planning, developing and manufacturing compressed air systems. They are fully aware of the fact that BOGE AIR is more than just ordinary compressed air: utmost safety, outstanding efficiency, excellent quality, maximised flexibility along with dependable service are the ingredients to transform BOGE AIR into air to work with – in Germany, in Europe and in more than 80 countries around the world.

Our ranges of services include the following:

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

GLC CERTIFIED ISO 9001

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