

# breathing star BSP-MT 10-95

Efficient Compressed Air Treatment System for Industrial and Medical Breathing-air



## Short description

BSP-MT10-95 heatless adsorption dryers with integral purification and catalytic stages are designed to treat compressed air reliably and efficiently to meet the medical breathing air requirements of the European Pharmacopia and other relevant specifications. The units are constructed in a compact manner and designed to be free-standing. They are equipped with built-on pre- and after filtration and are sized for volumetric flows of up to 1371 m<sup>3</sup>/h (suction capacity of the compressor referring to a compression of 13 bar<sub>e</sub>).

Compressed air first enters the validated GL pre-filter into one of two twin-vessels; both filled with a specific drying-agent. One vessel dries and removes harmful vapours from the compressed air while the other vessel undergoes regeneration. At the start of the drying-cycle, this vessel is open to atmosphere and a small proportion of dried compressed air passes through the adsorption bed, transporting the humidity and harmful vapours out. When this procedure is complete, the vessel is re-pressurised in readiness to repeat the drying procedure. Continuous, uninterrupted operation is maintained utilising so-called pressure-swing technology together with individually operated main- and exhaust valves.



Dry compressed air subsequently enters the integral purification and catalytic stage where oil-vapour, odours, gaseous vapours and traces of carbon-monoxide are reliably removed. Finally, the clean, treated air exits via the validated GL after-filter into the downstream compressed air network.

The BSP-MT10-95 breathing-air treatment system operates a fixed, timed changeover-cycle between the two

dryer vessels. Where the application requires additional monitoring, the installation of a dew point sensor is available as an option: The chosen pressure dew point settings (changeover set-point) allow the changeover times of the individual vessels to be adjusted to meet operating requirements whilst providing reliable monitoring of the dryers performance. An adjustable alarm is available via voltage-free signal.

### Scope of supply:

Breathing-air treatment system with GL pre- and after filtration; available with optional dew point dependent switching (DDS).

# Product Specification

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## Ordering – and performance data

Modell	Order No.	Volumetric flow <sup>1)</sup> in m <sup>3</sup> /h	Nominal pipe size <sup>2)</sup>	1st Pre-filter	2nd Pre-filter	After-filter	Nominal Pressure in bar <sub>e</sub>	Nominal Temp. °C
BSP-MT 10	K10/16BP2-G230M	158	1	GL9ZLD	GL9XLD	GL9ZLDH	16	50
BSP-MT 15	K15/16BP2-G230M	210	1	GL9ZLD	GL9XLD	GL9ZLDH	16	50
BSP-MT 20	K20/16BP2-G230M	274	1	GL9ZLD	GL9XLD	GL9ZLDH	16	50
BSP-MT 25	K25/16BP2-G230M	371	1 1/2	GL11ZLD	GL11XLD	GL11ZLDH	16	50
BSP-MT 35	K35/16BP2-G230M	484	1 1/2	GL11ZLD	GL11XLD	GL11ZLDH	16	50
BSP-MT 45	K45/16BP2-G230M	589	1 1/2	GL12ZLD	GL12XLD	GL12ZLDH	16	50
BSP-MT 60	K60/16BP2-G230M	839	2	GL13ZLD	GL13XLD	GL13ZLDH	16	50
BSP-MT 75	K75/16BP2-G230M	1129	2	GL13ZLD	GL13XLD	GL13ZLDH	16	50
BSP-MT 95	K95/16BP2-G230M	1371	2 1/2	GL14ZLD	GL14XLD	GL14ZLDH	16	50

<sup>1)</sup> m<sup>3</sup>/h, relating to 1 bar<sub>e</sub> and 20 °C at the compressor suction capacity. Subsequently compressed to 13 bar<sub>e</sub> and 35 °C inlet temperature to the dryer at 100 % relative humidity – for pressure dewpoint of -40 °C.

<sup>2)</sup> In accordance with DIN ISO 228 (BSP-P)

## Operating range

Site selection	frost-free indoor installation in a non-hazardous environment
Ambient temperature	1.5 to 50 °C
Compressed air inlet temperature	25 to 50 °C
Operating pressure	5 to 16 bar <sub>e</sub>
Medium	Compressed air

## Optional dew point sensor ZHM100

Pressure dew point at 7 bar <sub>e</sub>	Changeover point: -45 °C ex-factory setting; adjustable via the menu from -25 to -50 °C in 5 °C. steps alarm set-point: -40 °C ex-factory setting; always 5 °C above the changeover-point.
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## Electrical connections

Mains voltage	230 V, 50-60 Hz
Protection class	IP65

## Materials of construction

Filters	See product-specification regarding GL filter ref: ZL and XL
Pressure vessels	Normal steel, welded
Valve blocks	Aluminium
Piping	Steel, zinc-coated
Seals	NBR
Dryer filling	Mixture of aluminium-silicates and activated alumina
Purifier filling	Mixture of activated carbon and catalyst

## Pressure vessel approvals

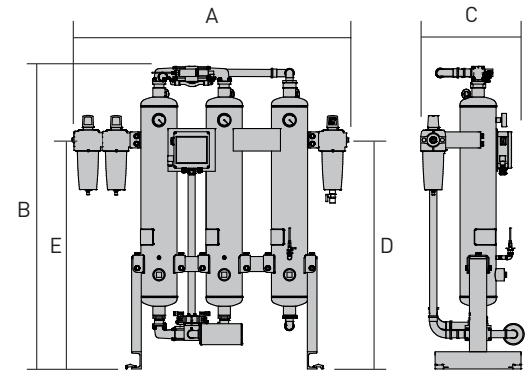
EU	Approval for fluid group 2 in accordance with the Pressure Equipment Directive 97/23/EC, module B+D: product range BSP-MT 10 to 35 in accordance with category II; product range BSP-MT 45 to 95 in accordance with category III.
AUS	AS1210
GUS	TR (formerly GOST-R)

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## Dimensions (mm) and weight (kg)

Model	A	B	C	D	E	Weight
BSP-MT 10	1300	1420	490	1070	1070	164
BSP-MT 15	1300	1750	490	1320	1320	197
BSP-MT 20	1100	1530	490	1170	1170	196
BSP-MT 25	1100	1760	530	1320	1320	237
BSP-MT 35	1390	1810	585	1320	1320	286
BSP-MT 45	1455	1820	605	1320	1320	341
BSP-MT 60	1515	1870	635	1320	1320	435
BSP-MT 75	1665	2000	635	1515	1515	562
BSP-MT 95	1715	2000	670	1515	1515	705



## Quality assurance

Development/Manufacture

DIN EN ISO 9001, DIN EN ISO 14001

## Limits for breathing air

	Industrial breathing-air				BSP-MT Breathing-air unit	Medical air
	Europe	UK	USA	Australia		Europe
	EN 12021	BS 4275	ANSI/CGA	AS 1715		European Pharmacopia
Carbon Monoxide CO	< 15 ppm	< 5 ppm	< 10 ppm	< 10 ppm	< 2 ppm	< 5 ppm
Carbon Dioxide CO <sub>2</sub>	< 500 ppm	< 500 ppm	< 1000 ppm	< 800 ppm	< 150 ppm	< 500 ppm
Humidity H <sub>2</sub> O	< 5 °C *	< 5 °C *	< 10 °F *	< 100 mg/m <sup>3</sup>	< 15 ppm **	< 67 ppm
Oxygen O <sub>2</sub>	21 (±1) %	20 – 23 %	21.5 %	–	20.8 – 21,1 %	20.4 – 21.4 %
Oil fraction	< 0.5 mg/m <sup>3</sup>	< 0.5 mg/m <sup>3</sup>	< 0.5 mg/m <sup>3</sup>	< 1.0 mg/m <sup>3</sup>	< 0.003 mg/m <sup>3</sup>	< 0.1 mg/m <sup>3</sup>
Odours/Tastes	Odourless/ Tasteless	Odourless/ Tasteless	Odourless/ Tasteless	Odourless/ Tasteless	Odourless/ Tasteless	Odourless/ Tasteless
Sulphur Dioxide SO <sub>2</sub>	–	–	–	–	< 0.1 ppm	< 1 ppm
Nitrous Gases NO/NO <sub>2</sub>	–	–	–	–	< 1 ppm	< 2 ppm

\* Pressure dewpoint below inlet temperature ; \*\*Corresponding pressure dewpoint -45 °C to -40 °C at 13 bar<sub>e</sub>.  
All values refer to customary concentration levels present in the inlet air

## Correction factor (f) in accordance with the actual minimum operating pressure in bar<sub>e</sub>

Minimum operating pressure in bar <sub>e</sub>	Breathing-air system – Inlet temperature in °C					
	25	30	35	40	45	50
5	0.47	0.46	0.44	0.40	0.36	0.34
6	0.55	0.54	0.52	0.45	0.40	0.38
7	0.63	0.62	0.60	0.50	0.44	0.43
8	0.72	0.70	0.68	0.60	0.54	0.52
9	0.79	0.78	0.75	0.63	0.60	0.55
10	0.87	0.86	0.80	0.65	0.63	0.61
11	0.80	0.79	0.75	0.64	0.61	0.59
12	0.92	0.91	0.89	0.78	0.73	0.67
13	1.03	1.02	1.00	0.91	0.82	0.79
14	1.16	1.15	1.13	1.00	0.94	0.86
15	1.30	1.28	1.26	1.08	1.03	0.99

Example: maximum inlet volumetric flow of 360 m<sup>3</sup>/h at a minimum pressure of 11 bar<sub>e</sub> and 40 °C inlet temperature:  
400 m<sup>3</sup>/h: 0.64 = 625 m<sup>3</sup>/h – suitable model BSP-MT 60.

# Product Specification

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## Product key

Series	Range*	Nominal pressure	Version	Generation	Connections*	Mains voltage*	Controls	Options*
K	10 to 95	/16	BP	2	- G	230	M	T
<b>Example</b>								
K	35	/16	BP	2	- G	230	M	
BSP-MT 35 standard version, with G1 1/2" (BSP-P) connections, 230V/50-60Hz Multitronic-plus controls								
K	75	/16	BP	2	- G	230	M	T
BSP-MT 75 with G2" (BSP-P) connections, 230V/50-60Hz Multitronic-plus controls and mounted dew point sensor ZHM100								

\* variable information

## Service-kits: Preventative maintenance kits

Order No.	Suitability	Maintenance interval	Scope of supply
SKK10-K20/BP2/12	BSP-MT 10 to BSP-MT 20	12 and 36 month	Re-set module, silencer, filter elements, pilot-valve
SKK25-K35/BP2/12	BSP-MT 25 to BSP-MT 35	12 and 36 month	
SKK45/BP2/12	BSP-MT 45	12 and 36 month	
SKK60-K75/BP2/12	BSP-MT 60 to BSP-MT 75	12 and 36 month	
SKK95/BP2/12	BSP-MT 95	12 and 36 month	
SKK10-K20/BP2/24	BSP-MT 10 to BSP-MT 20	24 and 48 month	Re-set module, silencer, filter elements, inlet-, outlet- & non-return valves, solenoid-coils
SKK25-K35/BP2/24	BSP-MT 25 to BSP-MT 35	24 and 48 month	
SKK45/BP2/24	BSP-MT 45	24 and 48 month	
SKK60-K75/BP2/24	BSP-MT 60 to BSP-MT 75	24 and 48 month	
SKK95/BP2/24	BSP-MT 95	24 and 48 month	

## DESPACs: Required quantity of adsorption material packs per model for preventative maintenance after 12 months

Pressure vessel	Order No.	BSP-MT 10	BSP-MT 15	BSP-MT 20	BSP-MT 25	BSP-MT 35	BSP-MT 45	BSP-MT 60	BSP-MT 75	BSP-MT 95
<b>Dryer</b> (Vessel 1+2)	DESPAC6EF	2		1						
	DESPAC20EF	1	2	2	3	4	5	7	9	12
<b>Purifier</b> (Vessel 3)	DESPAC3AK	2	3		1	2		2		
	DESPAC10AK			1	1	1	2	2	4	5
	DESPAC4KTY	2	2	3	4	6	7	10	12	18
0,4 kg	DESPAC1KTY	1	7	4	5	-	5	2	2	-

## Accessories (lose)

Order No.	Function	Suitability	Order No.	Function	Suitability
VASDPD/K1-K95	Dew point measurement	BSP-MT 10 to 95	VASVPB/K10-K20/25	Start-up device G1i	BSP-MT 10 to 20
VASMBS420	Signal duplicator 4-20 mA	BSP-MT 10 to 95	VASVPB/K25-K45/40	Start-up device G1 1/2i	BSP-MT 25 to 45
VASFSS/K10-K15	Fine-filtration silencer	BSP-MT 10 to 15	VASVPB/K60-K75/50	Start-up device G2i	BSP-MT 60 to 75
VASFSS/K20-K25	Fine-filtration silencer	BSP-MT 20 to 25	VASVPB/K95/65	Start-up device G2 1/2i	BSP-MT 95
VASFSS/K35-K60	Fine-filtration silencer	BSP-MT 35 to 60	VASRGR/K10-K95	Purge-air return	BSP-MT 10 to 95
VASFSS/K75-K95	Fine-filtration silencer	BSP-MT 75 to 95	VASNOZ/K1-K95	Purge-orifice-kit	BSP-MT 10 to 95

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BULBSPMT10-95-03-EN

### EMEA Product Information Centre

Free phone: 00 800 27 27 5374

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### US Product Information Centre

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