

Automated Globe Valves

BOA-H Mat P

Type Series Booklet



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Type Series Booklet BOA-H Mat P

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Control Valves / Measurement Valves

Automated Globe Valves to DIN/EN

BOA-H Mat P



Main applications

- Hot-water heating systems
- Air-conditioning systems
- Boiler feed applications
- Boiler recirculation
- Chemical industry
- Process engineering
- Heat recovery systems
- Sugar industry

Fluids handled

- High-temperature hot water
- Saturated steam
- Thermal oil
- Liquids not chemically or mechanically aggressive to the valve materials

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 16/25
Nominal size	DN 20 - 150
Max. permissible pressure [bar]	25
Min. permissible temperature [°C]	≥ -10
Max. permissible temperature [°C]	≤ +350

Selection as per pressure/temperature ratings (⇒ Page 5)

Valve body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJS-400-18-LT	5.3103	≤ 350 °C

Design details

Design

Globe valve:

- Straight-way pattern with horizontal seat
- Throttling plug ≤ DN 100
- On/off disc ≥ DN 125
- Spring-loaded PTFE V-packing ≤ 250 °C
- Graphite gland packing ≤ 350 °C
- Flanges to DIN EN 1092-2 Type 21
- Leakage rate A
- Exterior coating: blue, RAL 5002

Actuators (technical data refers to basic configuration):

- Spring-to-close or air-to-close design (on request)
- Max. control pressure 6 bar
- Mechanical or inductive limit switches

Variants

Globe valve:

- Valve disc with PTFE gasket (≤ 200 °C)
- Other flange designs
- High-temperature resistant paint (grey aluminium)
- Certification to customer specification

Product benefits

- Internal parts made of high-grade stainless steel (1.4571) for long service life and high chemical resistance
- Risk of leakage minimised by fully confined bonnet gasket
- Available with two types of stem seal: maintenance-free PTFE V-packing (< 250 °C) or adjustable graphite gland packing (450 °C)
- Pneumatic actuator with 3/2 directional control valve and either inductive or mechanical limit switches. Actuating forces of up to 11 kN with spring-to-close design or up to 26 kN with air-to-close design.

Product information

Product information as per Regulation No. 1907/2006 (REACH)

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see <http://www.ksb.com/reach>.

Product information as per Pressure Equipment Directive 2014/68/EU (PED)

The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.

Product information as per Directive 2014/34/EU (ATEX)

ATEX-compliant version on request.

Related documents

Information/documents

Document	Reference number
Flow characteristics	7150.4
BOA-CVE H operating manual	7525.81
Electric actuators, operating manual	7525.83
Typical tender for BOA-H Mat E	7135.521

Pressure/temperature ratings

Test pressure and operating pressure

PN	Material	Shell test	Leak test (seat)	Permissible operating pressure [bar] ¹⁾²⁾				
		With water						
		Tests P10 and P11 to DIN EN 12266-1	Test P12, leakage rate A to DIN EN 12266-1	[°C]				
		[bar]	[bar]	-10 to +120	200	250	300	350
16	EN-GJS-400-18-LT	24	Δp	16	14,7	13,9	12,8	11,2
25	EN-GJS-400-18-LT	37,5	Δp	25	23	21,8	20	17,5

Maximum permissible closing pressures

Fluid approaches the valve disc in closing direction; p₂ = 0 bar

DN	Actuator:		PA-N300		PA-N540	
	Spring range [bar]:		1,6 - 2,8		2,0 - 3,7	
	Control pressure required [bar]:		2,9		3,8	
	Stem seal:		Graphite gland packing	PTFE V-packing	Graphite gland packing	PTFE V-packing
	Stroke [mm]	K _{vs} value [m³/h]	[bar]	[bar]	[bar]	[bar]
20	7,5	8,3	25,0	25,0	-	-
25	7,5	13,0	25,0	25,0	-	-
32	11,0	19,9	25,0	25,0	-	-
40	12,0	27,1	24,3	25,0	-	-
50	13,5	42,0	15,6	17,2	25,0	25,0
65	17,0	75,1	8,6	9,8	24,8	25,0
80	20,5	116,7	5,5	6,2	16,4	17,1
100	25,5	172,3	3,3	3,6	10,4	10,8
125	33,0	270,0	-	-	6,4	6,7
150	38,0	393,0	-	-	4,3	4,5

Technical data
Technical data of globe valve

Technical data of BOA-H Mat P

Characteristic	Value
Nominal pressure	PN 16, PN 25
Valve characteristic	Open/Close
Leakage class	Leakage rate A to DIN EN 12266-1, test P12
Permissible pressure	16 bar, 25 bar
Flanged ends	PN 16 and PN 25 to DIN EN 1092-2
Fluid temperature	-10 to +350 °C

- Intermediate temperatures can be derived by linear interpolation.
- Static load

Technical data of actuators

Actuators

Characteristic	Actuator type	
	PA-N300	PA-N540
Diaphragm area [cm ²]	300	540
Max. control pressure [bar]	6	6
Stroke [mm]	32	50
Total volume [l]	1,0	3,7
Stroke volume [l]	0,6	2,2
Air supply connection	NPT 1/4	NPT 1/2
Weight without handwheel [kg]	13	32
Weight with handwheel [kg]	16	51
Ambient temperature	-30 to +80 °C ³⁾	
Function	Either spring-to-close or spring-to-open	

The maximum operating pressure of the actuators is 6 bar.

For trouble-free operation, the control air (6 bar max.) required for actuation must meet the following requirements:

- Instrument air quality to DIN ISO 8573.1 with a maximum particle size of 5 µm, a maximum particulate concentration of 5 mg/m³ and Quality Class 3.
- Water content: max. dew point 2 °C (Quality Class 4); a different dew point applies if the actuator is operated at a high-altitude site or at low ambient temperatures.
- Oil content: max. 25 mg of oil in 1 m³ of air (Quality Class 5) to DIN ISO 8573.1. If the actuator is operated at temperatures below 0 °C, dry control air must be used.

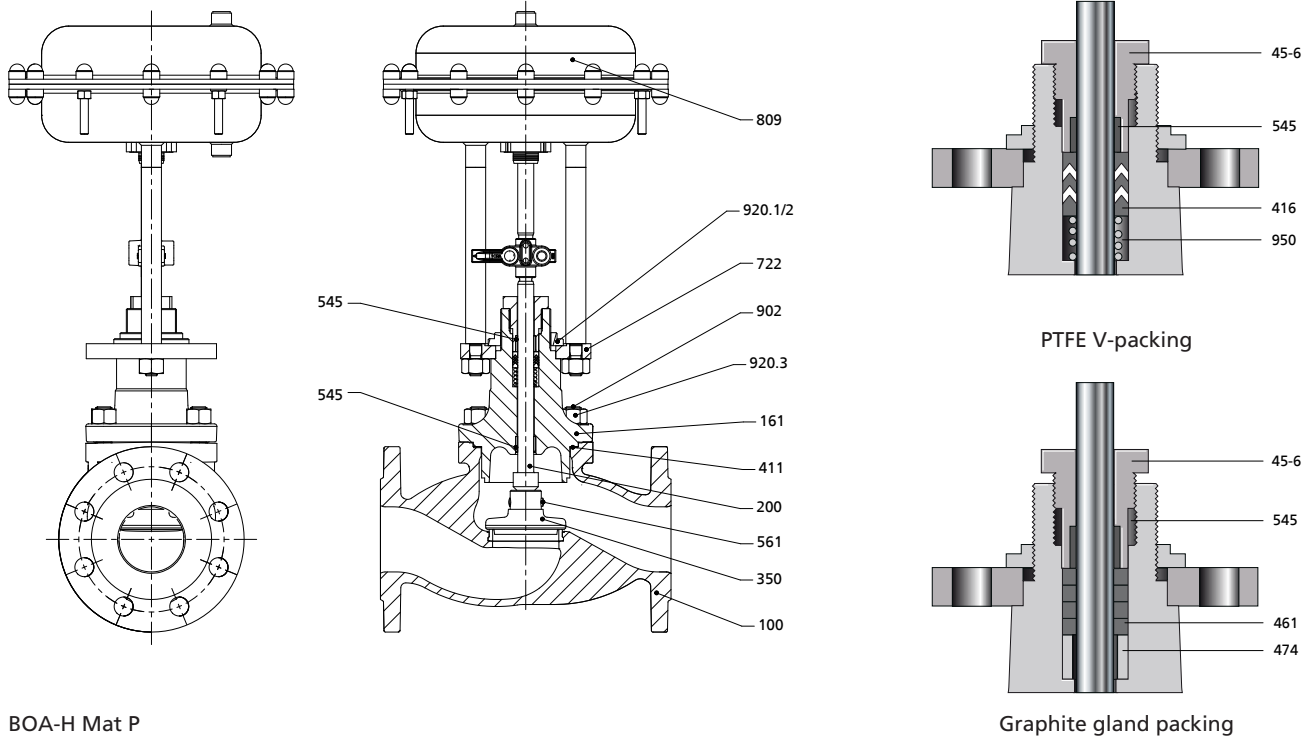
Contact the manufacturer if other control air qualities or special control media are to be used.

Requirements on ambient air:

- The actuators comply with Category C2 of DIN EN 12944-2.
- Contact the manufacturer if the actuators are to be used in an aggressive ambient atmosphere.

3) The temperature is limited by the materials of the diaphragm and sealing elements.

Materials



BOA-H Mat P

List of components

Part No.	Description	Material	Material number
100	Body	EN-GJS-400-18-LT	5.3103
161	Body bonnet	EN-GJS-400-18-LT	5.3103
200	Stem	X20Cr13	1.4021+QT
350	Valve disc	X20Cr13	1.4021+QT
411	Bonnet gasket	CrNiSt graphite	-
416	V-packing	Carbon PTFE	-
45-6	Stuffing box screw	X5CrNi18-10	1.4301
461	Gland packing	Graphite	-
474	Thrust ring	X5CrNi18-10	1.4301
545	Bearing bush	Sint A50	-
722	Top flange	Steel	-
809	Actuator	-	-
902	Stud	CK 35 V	-
920.1	Hexagon nut	Galvanised steel	-
920.2	Slotted round nut	Galvanised steel	-
920.3	Hexagon nut	C35	-
950	Spring	X5CrNi18-10	1.4301

Dimensions and weights

Dimensions and weights of BOA-H Mat P globe valve

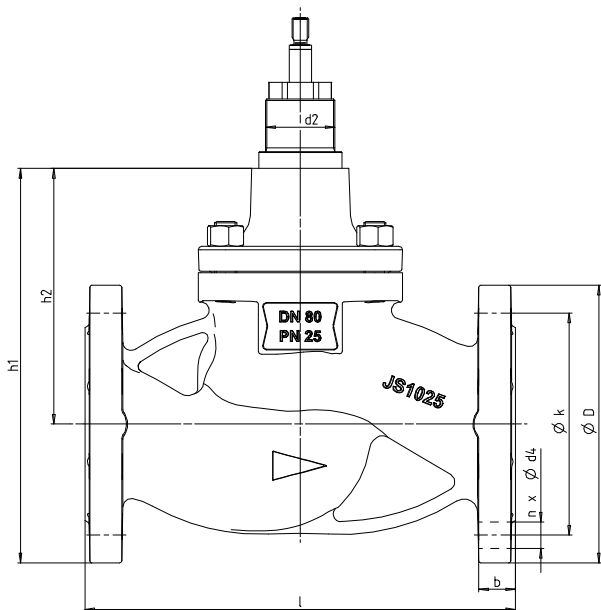


Fig. 1: Dimensions

BOA-H Mat P

Dimensions and weights

PN	DN	b	d ₂	d ₆	D	h ₁	h ₂	k	l	n	[kg]
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
16	20	16	M39	14	105	153,5	101,0	75	150	4	6,3
	25	16	M39	14	115	164,5	107,0	85	160	4	6,9
	32	18	M39	19	140	216,0	146,0	100	180	4	10,4
	40	18	M39	19	150	226,0	151,0	110	200	4	11,6
	50	20	M39	19	165	227,0	144,5	125	230	4	13,8
	65	20	M50	19	185	272,5	180,0	145	290	4	22,3
	80	22	M50	19	200	284,0	184,0	160	310	8	28,4
	100	24	M50	19	220	328,0	218,0	180	350	8	38,4
	125	26	M50	19	250	384,5	259,5	210	400	8	60,5
	150	26	M50	23	285	403,5	261,0	240	480	8	83,0
25	20	16	M39	14	105	153,5	101,0	75	150	4	6,3
	25	16	M39	14	115	164,5	107,0	85	160	4	6,9
	32	18	M39	19	140	216,0	146,0	100	180	4	10,4
	40	18	M39	19	150	226,0	151,0	110	200	4	11,6
	50	20	M39	19	165	227,0	144,5	125	230	4	13,8
	65	20	M50	19	185	272,5	180,0	145	290	8	22,3
	80	22	M50	19	200	284,0	184,0	160	310	8	32,4
	100	24	M50	23	235	335,5	218,0	190	350	8	42,4
	125	26	M50	28	270	394,5	259,5	220	400	8	67,5
	150	26	M50	28	300	411,0	261,0	250	480	8	91,5

Mating dimensions as per standard

Face-to-face lengths: DIN EN 558/1, ISO 5752/1
Flanges: DIN EN 1092-2, flange type 21-2
Flange facing: DIN EN 1092-2, type B

Dimensions and weights of pneumatic actuator types PA-N300 and PA-N540

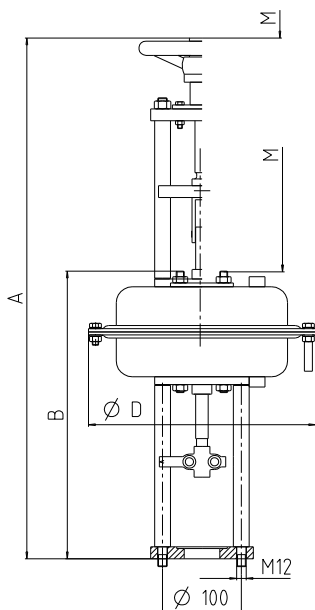


Fig. 2: Pneumatic actuator

Dimensions and weights

Type	A	B	D	M ⁴⁾	[kg]
	[mm]	[mm]	[mm]	[mm]	
PA-N300	656	347	284	600	13
PA-N540	865	534	380	600	43

Notes on installation

- Flow through globe valves is in the direction of the embossed arrow on the valve body as standard. An alternating direction of flow is permissible; however, if fluid flow does not comply with the flow direction arrow on the valve body, the actual throughflow will be lower than the maximum throughflow indicated on the name plate.
- Recommendation: A strainer fitted upstream of the globe valve will further enhance the globe valve's functional reliability.

Installation positions:

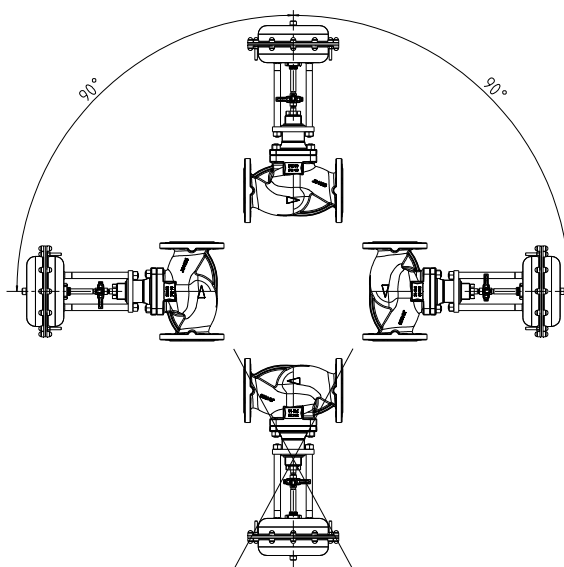


Fig. 3: Actuator installation positions

4) Min. clearance for removal

Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. The information provided in this list is for orientation only. Warranty claims may not be asserted on the basis of this list.

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials.
✗	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The materials and/or the valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

Chemical resistance chart for water⁵⁾

Fluids handled	
Brackish water ⁶⁾	✗
Service water ⁶⁾	✓
Fire-fighting water	✓
Chlorinated water (≤ 0.6 mg/kg)	✓
Deionised water (demineralised water) ⁷⁾	○
Distilled water ⁷⁾	○
Boiler feed water	✓
Hot water	✓
High-temperature hot water	✓
Condensate	✓
Oil-free cooling water	✓
Oil-containing cooling water	✓
Ozonised water (≤ 0.5 mg/kg)	✓
Pure water	✓
Seawater	✗
Scale-forming water ⁶⁾	○
Raw water ⁶⁾	✓
Partly desalinated water ⁷⁾	○
Fully desalinated water ⁷⁾	○
Municipal waste water ⁶⁾⁸⁾	✓
Industrial waste water ⁶⁾⁹⁾	✓

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	
Vegetable oils	✓
Mineral oils	✓
Synthetic oils	✓
Crude oil	✓
Petroleum	✓
Light fuel oil	✓
Linseed oil	✓

Fluids handled	
Oil/water emulsion ⁶⁾	✓
Jet fuel	✓
Petrol	✓
Kerosene	✓

Chemical resistance chart for refrigerants

Fluids handled	
Ammonium hydroxide (≤ 30 %, ≤ 25 °C)	✓
Glycol (ethylene glycol)	✓
Propylene glycol	✓
Water/glycol mixture (20 % $\leq c \leq 50$ %, ≤ 90 °C)	✓
Inorganic cooling brine, pH 7.5	✓

Chemical resistance chart for thermal oils

Fluids handled	
Synthetic thermal oils	✓
Mineral-based thermal oils	✓

Chemical resistance chart for acids

Fluids handled	
Hydrochloric acid	✗
Sulphuric acid (pure, technical, concentrated)	✗
Sulphurous acid	✗
Fatty acid	✗
Nitric acid	✗

Chemical resistance chart for cleaning agents

Fluids handled	
Lye for bottle rinsers (e.g. P3) ≤ 80 °C ⁶⁾	○
Lye for metal cleaning ≤ 80 °C ⁶⁾	○

Chemical resistance chart for steam

Fluids handled	
Saturated steam	✓

Chemical resistance chart for other fluids

Fluids handled	
Sodium hydroxide (≤ 50 %, ≤ 50 °C)	○
Natural gas	✓
Oil-containing compressed air	✓
Dry chlorine (≤ 30 °C)	✓
Ammonia	✓
Butane (liquefied gas)	✓
Aqueous glycerine	✓
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✗

- 5) General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl-) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded.
- 6) Without solids
- 7) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 8) Biologically treated
- 9) Non-corrosive, non-abrasive



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