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Единый адрес: kbs@nt-rt.ru **Веб-сайт:** www.kbs.nt-rt.ru

Запорные клапаны KSB. Техническое описание

Globe Valve

BOACHEM-ZXA

PN 10-40
DN 15-300
Gland Packing
Flanged Ends

Type Series Booklet



Legal information/Copyright

Type Series Booklet BOACHEM-ZXA

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Globe Valves

Globe valves to DIN/EN with gland packing

BOACHEM-ZXA



Main applications

- Food and beverages industry
- Petrochemical industry
- Process engineering
- Sugar industry

Fluids handled

- Aggressive fluids
- Steam
- Explosive fluids
- Flammable fluids
- Fluids containing gas
- Gas
- Hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Fluids containing mineral oils
- Oil
- Polymerising/crystallising fluids
- Feed water
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 10 - 40
Nominal size	DN 15 - 300

Characteristic	Value
Max. permissible pressure	40 bar
Min. permissible temperature	-10 °C
Max. permissible temperature	+400 °C

Selection as per pressure/temperature ratings (⇒ Page 4)

Body materials

Overview of available materials

Material	Material number	Temperature limit
GX5CrNiMo19-11-2	1.4408	Up to 400 °C

Design details

Design

- Straight-way pattern
- Throttling plug up to DN 100
- On/off disc for DN 125 and above
- Balanced plug from:
 - PN 10 DN 250
 - PN 16 DN 200
 - PN 25 DN 150
 - PN 40 DN 125
- Rotating stem
- Rising handwheel
- Back seat
- Fully confined bonnet gasket
- Stem sealed by gland packing
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Throttling plug from DN 125
- Balanced plug
- Position indicator
- Valve disc with PTFE gasket (up to 200 °C)
- Oil and grease-free
- Serrated gasket (PTFE-coated)
- PTFE packing
- Applications down to -60 °C
- Heating jacket made of 1.4541/1.4301 or 1.4571/1.4404
- Other flange designs

Product benefits

- Long service life and high functional reliability of the gland packing due to stem with burnished shank.
- Reliable sealing: bonnet gasket fully confined to prevent creep.
- Additional safety and blow-out protection by standard back seat

Related documents

- | | |
|--|---|
| <ul style="list-style-type: none"> ▪ BOACHEM-ZXAB bellows-type globe valve, see type series booklet 8150.1. ▪ BOACHEM-ZYAB bellows-type Y-pattern globe valve, see type series booklet 8151.1. ▪ BOACHEM-ZYA Y-pattern globe valve with gland packing, see type series booklet 8148.1. ▪ BOACHEM-RXA non-return valve, see type series booklet 8147.1. ▪ BOACHEM-FSA Y-pattern strainer, see type series booklet 8146.1. ▪ Operating manual 8115.8 | <ol style="list-style-type: none"> 2. Nominal pressure 3. Nominal size 4. Operating pressure 5. Differential pressure 6. Operating temperature 7. Fluid handled 8. Pipe connection 9. Variants 10. Number of type series booklet |
|--|---|

On all enquiries/orders please specify

1. Type

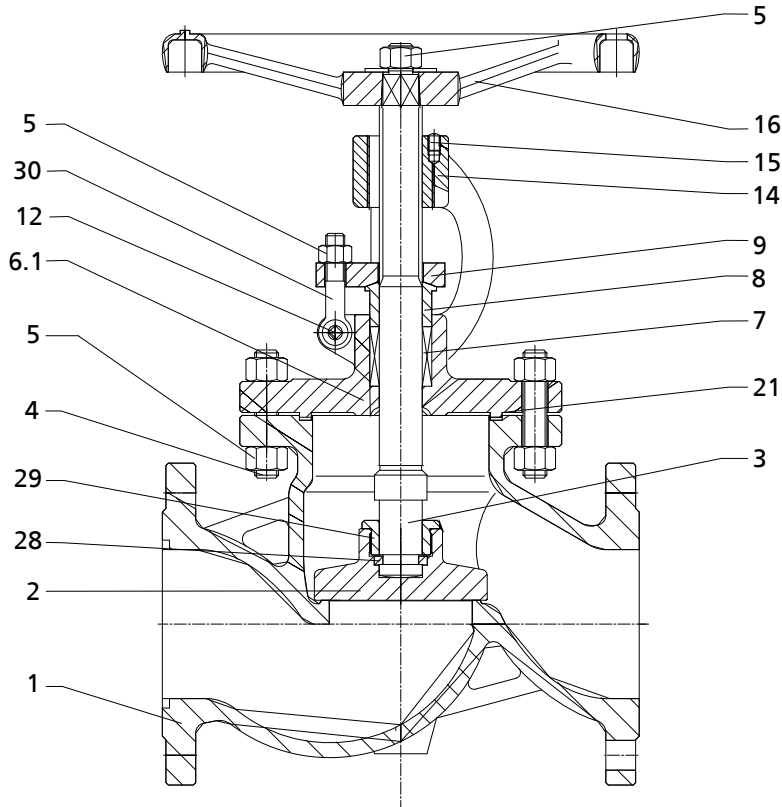
Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to EN 1092-1)¹⁾

Nominal pressure PN	Material	20	100	150	200	250	300	350	400
10	1.4408	10	10	9	8,4	7,9	7,4	7,1	6,8
16		16	16	14,5	13,4	12,7	11,8	11,4	10,9
25		25	25	22,7	21	19,8	18,5	17,8	17,1
40		40	40	36,3	33,7	31,8	28,5	28,5	27,4

¹⁾ The valves are suitable for temperatures down to -10 °C.

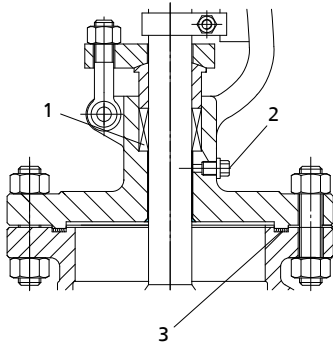
Materials



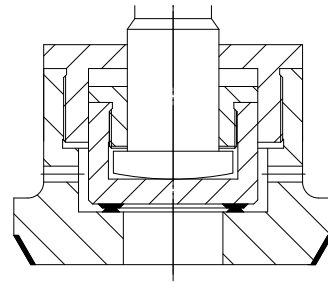
Parts list

Part No.	Description	Material	Material number
1	Body	G X 5 CrNiMo 19-11-2	1.4408
2	Valve disc	X5 CrNiMo 18-10	1.4401
3	Stem	X6 CrNiMoTi 17-12-2	1.4571
4	Bolt	A4-70	
5	Nut	A4-70	
6.1	Bonnet	G X 5 CrNiMo 19-11-2	1.4408
7	Packing	Graphite	
8	Thrust insert	X5 CrNiMo 18-10	1.4401
9	Gland follower	G X 5 CrNiMo 19-11-2	1.4408
12	Pin	X5 CrNiMo 18-10	1.4401
14	Threaded bush	Bronze	
15	Pin	ASTM A439 D2	
16	Handwheel	EN-GJL-200	5.1300
21	Gasket	CrNiSt/graphite	
28	Retaining ring	X5 CrNiMo 18-10	1.4401
29	Threaded sleeve	G-X6 CrNi 18 9	1.4308
30	Eyebolt	A4-70	

Variants

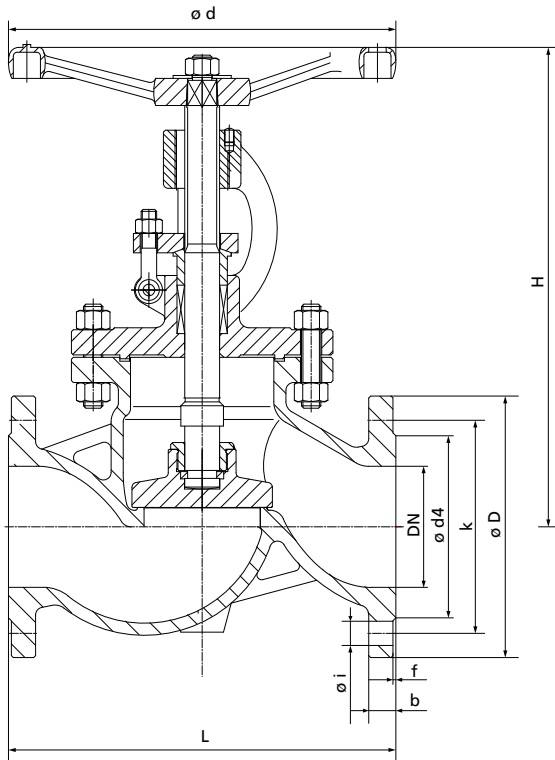


- 1) PTFE packing
- 2) Leakage detection hole
- 3) Serrated gasket



Balanced plug

Dimensions



Dimensions in mm

PN	DN	L	$\varnothing D$	k	No. of bolt holes z	$\varnothing i$	$\varnothing d_4 \times f$	b	H (closed)	H (open)	$\varnothing d$	[kg]
10-40	15	130	95	65	4	14	45 x 2	16	205	220	120	6,6
	20	150	105	75	4	14	58 x 2	18	210	235	140	7,7
	25	160	115	85	4	14	68 x 2	18	245	280	160	9,9
	32	180	140	100	4	18	78 x 2	18	265	295	160	13,2
	40	200	150	110	4	18	88 x 3	18	280	295	200	15,4
10/16	50	230	165	125	4	18	102 x 3	18	300	320	220	20,9
	65	290	185	145	4	18	122 x 3	22	320	345	260	27,3
	80	310	200	160	8	18	138 x 3	24	370	395	280	37
	100	350	220	180	8	18	158 x 3	24	410	435	300	50,4
	125	400	250	210	8	18	188 x 3	26	462	507	350	75,9
10	150	480	285	240	8	22	212 x 3	28	520	580	400	100
	200	600	340	295	8	22	268 x 3	24	650	700	450	152
16	200	600	340	295	12	22	268 x 3	26	650	700	450	152
	250	730	405	355	12	26	320 x 3	28	655	735	500	290
	300	850	460	410	12	26	378 x 4	26	685	765	600	496
25/40	65	290	185	145	8	18	122 x 3	22	320	345	260	30,8
	80	310	200	160	8	18	138 x 3	24	370	395	280	38,5
	100	350	235	190	8	22	162 x 3	24	410	435	300	59,4
	125	400	270	220	8	26	188 x 3	26	462	507	350	75,9
	150	480	300	250	8	26	218 x 3	26	520	580	400	105,6
25	200	600	360	310	12	26	278 x 3	30	650	700	450	190
	250	730	425	370	12	30	335 x 3	32	655	735	500	340
	300	850	485	430	16	30	395 x 4	34	685	765	600	567
40	200	600	375	320	12	30	285 x 3	34	650	700	450	202
	250	730	450	385	12	33	345 x 3	38	655	735	500	361
	300	850	515	450	16	33	410 x 4	42	685	765	600	678


Mating dimensions – Standards

Face-to-face lengths: EN 558-1/1, ISO 5752/1
 Flanges: Mating dimensions to DIN EN 1092-1, ISO 7005
 Flange facing: DIN EN 1092-1, type B1

Other flange designs

- E.g. groove (type D), tongue (type C), recess (type F), spigot (type E) to EN 1092-1 at both ends
- Other flange designs on request

Installation instructions

 Shut-off globe valves must be installed in the line so as to ensure that the fluid enters the valve beneath the valve disc and flows out above the valve disc. They can also be installed

in lines with alternating flow. If the max. permissible differential pressures for shut-off are exceeded for valves from DN 125 to 200, a balanced plug design is required. In this case the valve must be installed in such a way that the pressure to be sealed off lies above the valve disc. The balanced plug works on the bypass principle and can only serve its purpose if backpressure builds up after opening, so that the max. permissible differential pressures for shut-off (see table) are not exceeded.

Differential pressures in bar

DN	125	150	200
Δp bar	33	21	12

Automated Globe Valves

BOA-H Mat P

PN 16/25
DN 20-150

Type Series Booklet



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Control and 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)

Body materials

Overview of available materials

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

Design details

Design

- Straight-way pattern with horizontal seat
- Throttling plug up to DN 100
- On/off disc for DN 125 and above
- Spring-loaded PTFE V-packing up to 250 °C
- Graphite gland packing up to 350 °C
- Flanges to DIN EN 1092-2 Type 21
- Leakage rate A
- Exterior coating: blue RAL 5002
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EC (PED) for fluids in Groups 1 and 2.

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 (up to 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 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 (350 °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.

Related documents

Information/documents

Document	Reference number
Flow characteristics	7135.4
Operating manual	7525.81

Pressure/temperature ratings

Test pressure and operating pressure

PN	Material	Shell test	Leak test (seat)	Permissible operating pressure [bar] ¹⁾²⁾					
		With water		[°C]					
		Tests P10 and P11 to DIN EN 12266-1	Test P12, leakage rate A to DIN EN 12266-1						
		[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

Values [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]	Kvs value [m ³ /h]				
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	25,0	25,0	-	-
50	13,5	42,0	17,4	19,0	25,0	25,0
65	17,0	75,1	10,0	11,2	25,0	25,0
80	20,5	116,7	6,5	7,3	17,5	18,2
100	25,5	172,3	4,1	4,6	11,2	11,7
125	33,0	270,0	-	-	7,0	7,4
150	38,0	393,0	-	-	4,8	5,1

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

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

1) Intermediate temperatures can be derived by linear interpolation.

2) Static load

Characteristic	Actuator type	
	PA-N300	PA-N540
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.

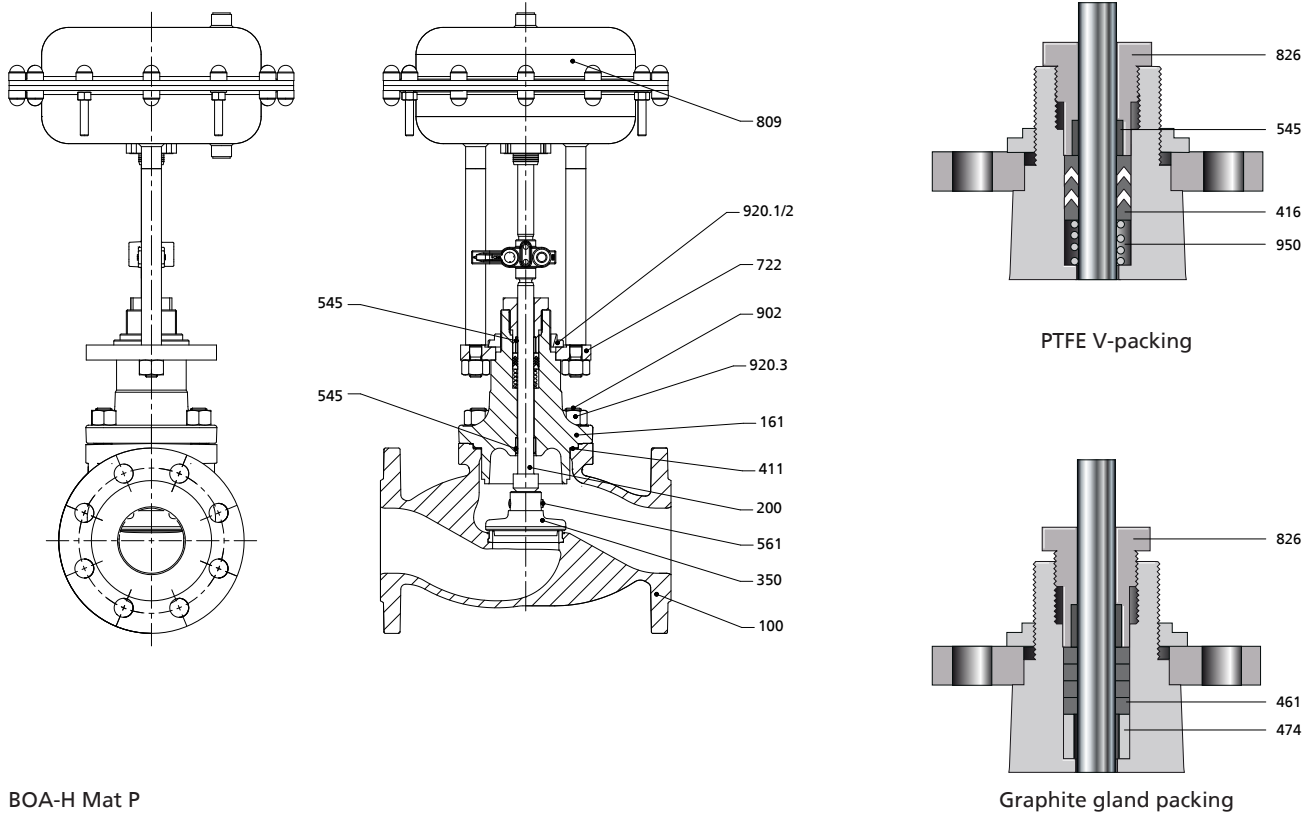
Contact the manufacturer if other control air qualities or special control media are to be used.

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



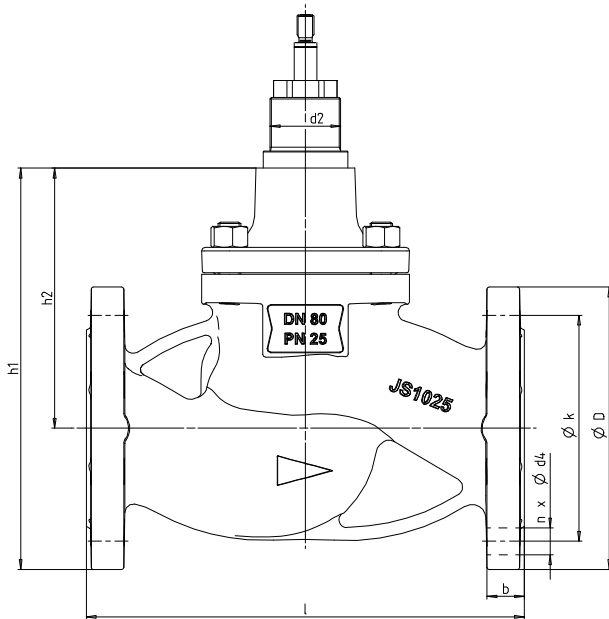
BOA-H Mat P

Parts list

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	-
452	Gland follower	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



BOA-H Mat P

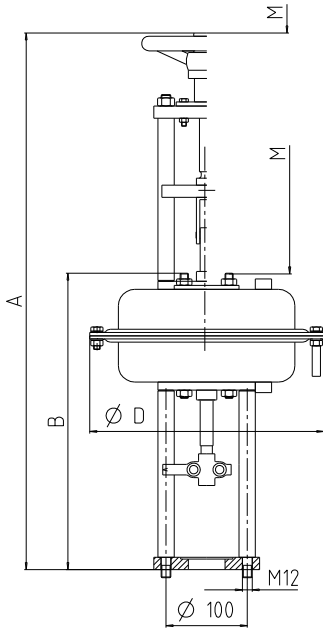
Dimensions [mm] and weights [kg]

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

Mating dimensions as per standard

Face-to-face lengths: EN 558-1/1, 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



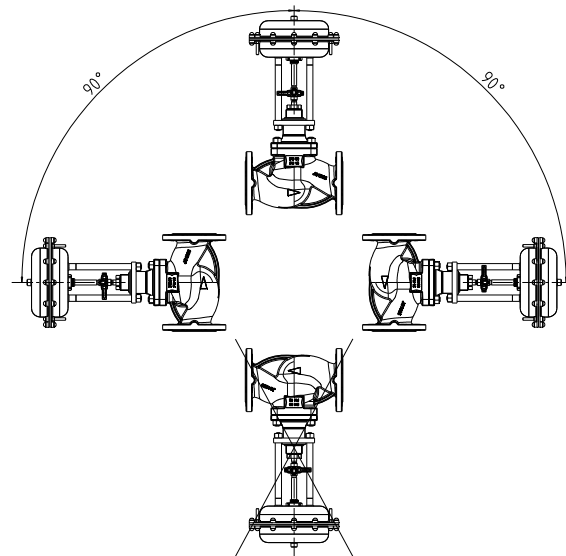
Dimensions [mm] and weights [kg]

Type	A	B	D	M ⁴⁾	[kg]
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:



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. All information provided herein, therefore, only serves as an orientation. 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 water

Fluids handled	
Brackish water ⁵⁾⁶⁾	✗
Service water ⁵⁾⁶⁾	✓
Fire-fighting water ⁵⁾	✓
Chlorinated water ($\leq 0.6 \text{ mg/kg}$) ⁵⁾	✓
Deionised water (demineralised water)	✗
Distilled water	✗
Boiler feed water ⁷⁾	✓
Hot water ⁵⁾	✓
High-temperature hot water ⁷⁾	✓
Condensate ⁷⁾	✓
Oil-free cooling water ⁵⁾	✓
Oil-containing cooling water ⁵⁾	✓
Ozonised water ($\leq 0.5 \text{ mg/kg}$) ⁵⁾	✓
Pure water ⁵⁾	✓
Seawater	✗
Scale-forming water ⁵⁾⁶⁾	○
Raw water ⁵⁾⁶⁾	✓
Partly desalinated water	✗
Fully desalinated water	✗
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	✓

Fluids handled	
Petroleum	✓
Light fuel oil	✓
Linseed oil	✓
Oil-water emulsion ⁶⁾	✓
Jet fuel	✓
Petrol	✓
Kerosene	✓

Chemical resistance chart for refrigerants

Fluids handled	
Ammonia water ($\leq 30 \%$, $\leq 25 \text{ }^\circ\text{C}$)	✓
Glycol (ethylene glycol)	✓
Propylene glycol	✓
Water-glycol mixture	✓
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) $\leq 80 \text{ }^\circ\text{C}$ ⁶⁾	○
Lye for metal cleaning $\leq 80 \text{ }^\circ\text{C}$ ⁶⁾	○

Chemical resistance chart for steam

Fluids handled	
Saturated steam	✓

Chemical resistance chart for other fluids

Fluids handled	
Sodium hydroxide ($< 50 \%$, $\leq 50 \text{ }^\circ\text{C}$)	○
Natural gas	✓
Oil-containing compressed air	✓
Dry chlorine ($\leq 30 \text{ }^\circ\text{C}$)	✓
Ammonia	✓
Butane (liquefied gas)	✓
Aqueous glycerine	✓
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✗

- 5) General limits for water to be handled by valves made of non-alloyed materials: pH 6.5 - 12; chloride ions (Cl) $< 150 \text{ mg/kg}$; chlorine (Cl₂) $< 0.6 \text{ mg/kg}$.
- 6) Without solids
- 7) Water treatment must be in compliance with the guidelines for feed water (e.g. VdTÜV 1466, TRD 611, etc.): pH ≥ 9.0 ; O₂ content $\leq 0.02 \text{ mg/l}$
- 8) Biologically treated
- 9) Non-corrosive, non-abrasive

Automated Globe Valves

BOA-H Mat E

PN 16/25
DN 20-150

Type Series Booklet



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Control and Measurement Valves

Automated Globe Valves to DIN/EN

BOA-H Mat E



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)

Body materials

Overview of available materials

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

Design details

Design

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

Actuators (technical data refers to basic configuration):

- 3-point (Open/Stop/Closed) actuators
Supply voltage: 230 V AC
Actual-position feedback: 2 limit switches (switching via limit switches in closing and opening direction)
Supply voltage: 24 V AC/DC
Actual-position feedback: 0-10 V
- After a power failure, operation is resumed in accordance with the operating data (24 V actuator).

Variants

Globe valve:

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

Actuators:

- Power back-up unit for 24 V actuators
- Heating of the motor space
- Other supply voltages on request
- Other actuators (e.g. AUMA) on request.

Product benefits

- Internal parts made of high-grade stainless steel 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 (350 °C).
- Electric actuator with 3-point actuation, available in various sizes up to 14 kN.

Related documents

Information/documents

Document	Reference number
Flow characteristics	7150.4
Operating manual	7525.81

Pressure/temperature ratings

Test pressure and operating pressure

PN	Material	Shell test	Leak test (seat)	Permissible operating pressure [bar] ¹⁾²⁾				
		With water		[°C]				
		Tests P10 and P11 to DIN EN 12266-1 [bar]	Test P12, leakage rate A to DIN EN 12266-1 [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

Actuating times

Actuating times [s]

DN	Stroke [mm]	Actuator		
		EA-C 20 to 80 24 V/230 V	EA-C 140 230 V	EA-C 140 24 V
20	7,5	15,0	-	-
25	7,5	15,0	-	-
32	11	22,0	-	-
40	12	24,0	-	-
50	13,5	27,0	-	-
65	17	34,0	26,2	37,8
80	20,5	41,0	31,5	45,6
100	25,5	51,0	39,2	56,7
125	33	66,0	50,8	73,3
150	38	76,0	58,5	84,4

Maximum permissible closing pressures
Stem sealed by PTFE V-packing

 Closing pressures if fluid approaches the valve disc from the opposite direction of valve closure; p₂ = 0 bar

Values in bar

DN	Stroke	Kvs value	Actuator (actuating forces)			
	[mm]		[m ³ /h]	EA-C 20 (2 kN)	EA-C40 (4,5 kN)	EA-C80 (8 kN)
20	7,5	8,3	25,0	-	-	-
25	7,5	13	25,0	-	-	-
32	11	19,9	16,3	25,0	-	-
40	12	27,1	10,4	25,0	-	-
50	13,5	42	6,6	17,6	25,0	-
65	17	75,1	3,6	10,4	19,8	25,0
80	20,5	116,7	2,2	6,8	13,1	24,1
100	25,5	172,3	-	4,2	8,4	15,5
125	33	270	-	2,6	5,3	9,9
150	38	393	-	1,7	3,6	6,8

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

Stem sealed by graphite gland packing

Closing pressures if fluid approaches the valve disc from the opposite direction of valve closure; p₂ = 0 bar
 Values in bar

DN	Stroke [mm]	Kvs value [m ³ /h]	Actuator (actuating forces)			
			EA-C 20	EA-C40	EA-C80	EAC-140
			(2 kN)	(4,5 kN)	(8 kN)	(14 kN)
20	7,5	8,3	25,0	-	-	-
25	7,5	13	20,6	-	-	-
32	11	19,9	12,7	25,0	-	-
40	12	27,1	8,1	24,8	-	-
50	13,5	42	5,0	16,1	25,0	-
65	17	75,1	2,4	9,2	18,7	25,0
80	20,5	116,7	1,4	6,0	12,3	23,3
100	25,5	172,3	-	3,7	7,9	15,0
125	33	270	-	2,2	4,9	9,5
150	38	393	-	1,4	3,3	6,5

Technical data
Technical data of globe valve

Technical data of BOA-H Mat E

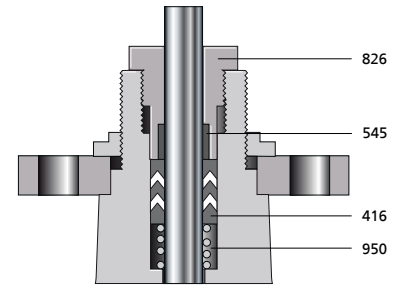
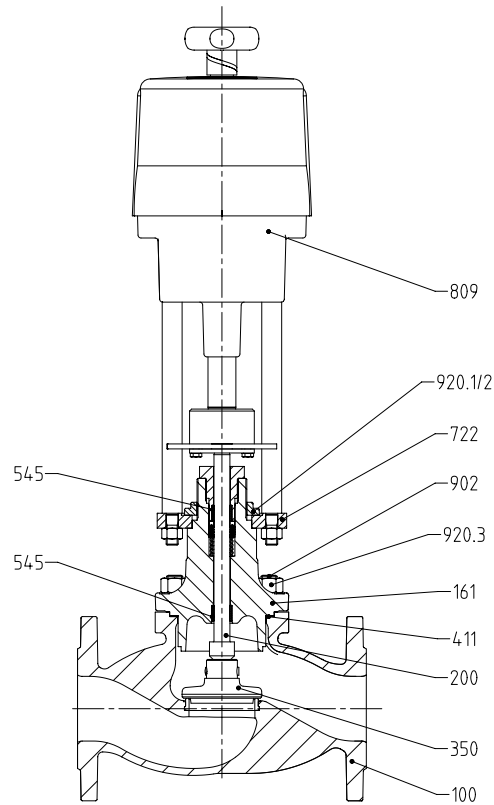
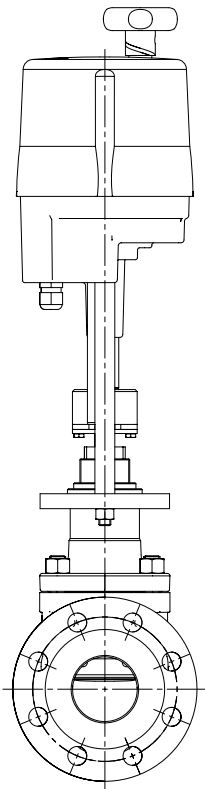
Characteristic	Value
Nominal pressure	PN 16, PN 25
Valve characteristic	Open/Close
Leakage class	Leakage rate A to DIN EN 12266-1, test P12
Permissible pressure	16 bar, 25 bar
Flanged ends	PN 16 and PN 25 to DIN EN 1092-2
Fluid temperature	-10 to +350 °C

Technical data of actuators

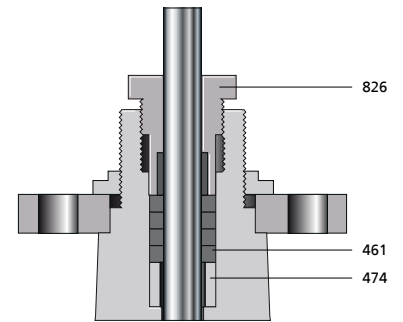
Technical data of 3-point actuators

Characteristic	Value	
Power supply	Supply voltage	230 V AC ± 10 % 24 V AC/DC ± 10 %
	Max. power input	100 VA
Functional data	Max. actuation force	EA-C 20: 2 kN EA-C 40: 4.5 kN EA-C 80: 8 kN EA-C 140: 14 kN
	Actuating speed	EA-C 20 to 80: 0.5 mm/s EA-C 140: 230 V ~ 0.45 mm/s; 24 V ~ 0.65 mm/s
Signal inputs	Binary input	230 V AC/24 V AC
Enclosure to EN 60529		IP65
Ambient conditions	Ambient temperature	-20 to +60 °C
	Storage temperature	-20 to +80 °C
	Humidity	5 to 95 % rH
Dimensions	See (⇒ Page 8)	
Electrical connection		Direct connection to printed circuit board ≤ 2.5 mm ²

Materials



PTFE V-packing



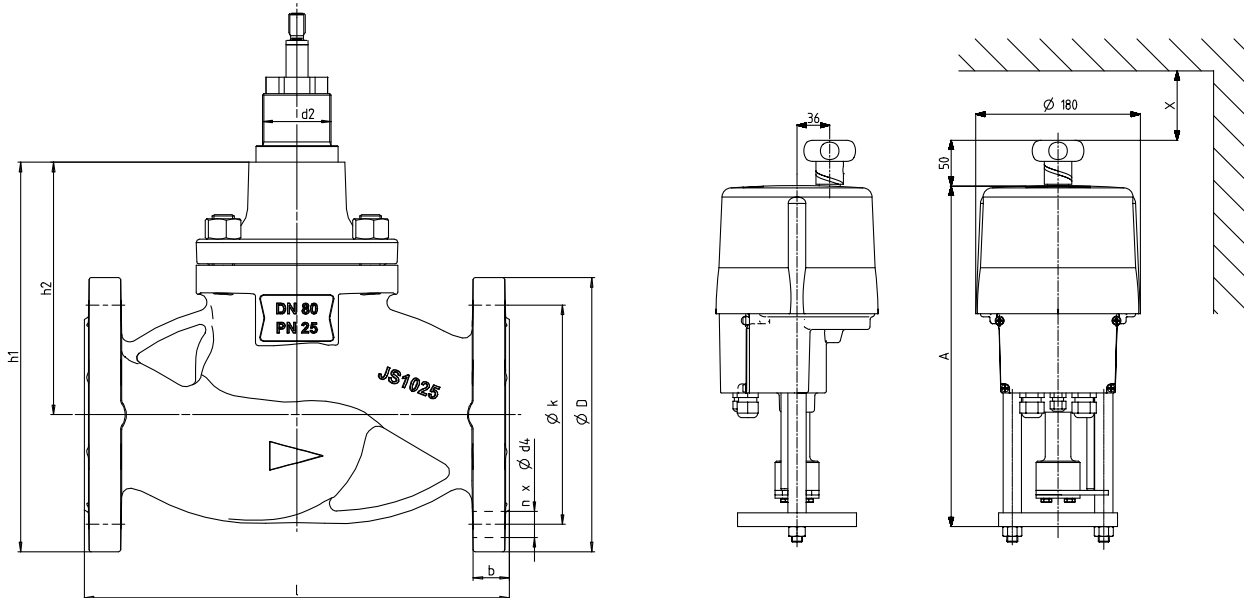
Graphite gland packing

BOA-H Mat E

Overview of available materials

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	-
452	Gland follower	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 of BOA-H Mat E globe valve

Dimensions [mm] and weights [kg]

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

Dimensions of electric actuator types EA-C 20 to EA-C 140

Actuator	Actuating force [N]	A [mm]	X [mm]	[kg]	
				3-point 24 V AC	3-point 230 V AC
EA-C 20	2000	425	120	6,0	7,0
EA-C 40	4500	425	120	6,0	7,0
EA-C 80	8000	455	120	9,0	10,0
EA-C 140	14000	520	120	10,0	10,0

Mating dimensions as per standard

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

Installation instructions

- 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:

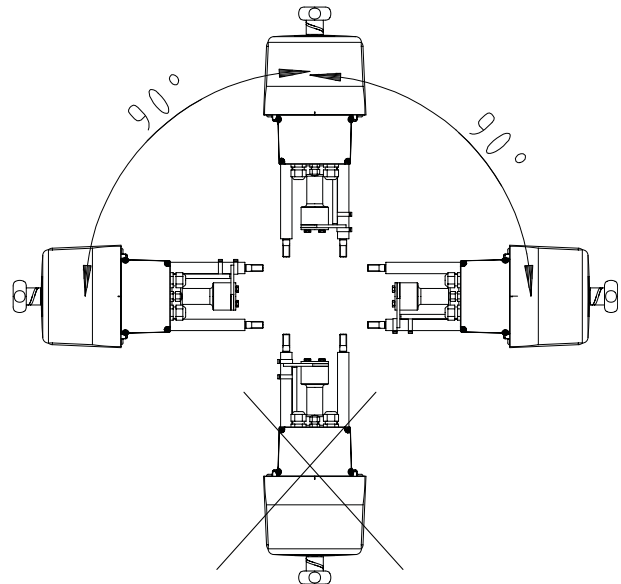


Fig. 1: Actuator installation positions

Wiring diagrams

Terminal configuration EA-C 20 to 140

3-point 24 V AC with terminal box

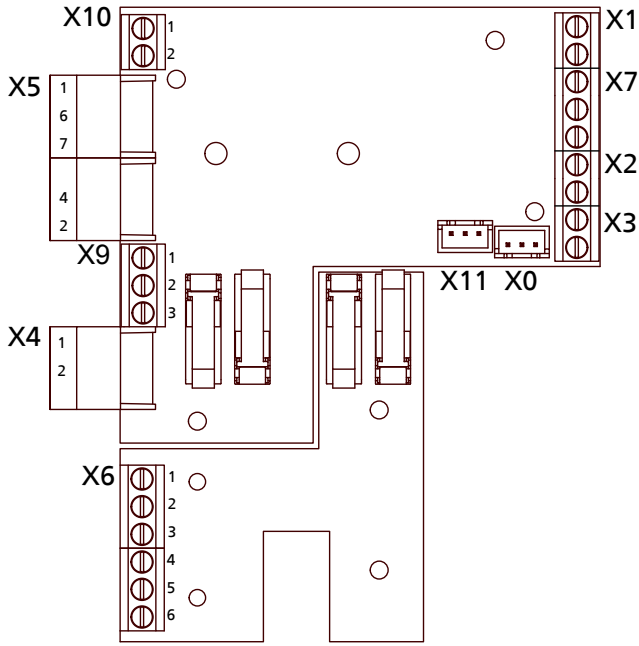
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			RJ-45 TTL	Push-Button	
↑	↑	↑	↓	↓	↓	↑↓	↑↑	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑	↑↓	↑↓	↑↓	↑↓	↑	↑				
+0(2) - 10 V	+0(4) - 20 mA	GND	+0(2) - 10 V	+0(4) - 20 mA	GND		Max. load 100 mA at 24 VDC	L OPEN	N	L CLOSE	L (24 V AC/DC)	N (24 V AC/DC)	21-40 V DC / 100 mA	+0(2) - 10 V	+0(4) - 20 mA	GND	(Optional)	(Optional)	(Optional)	(Optional)	L (see name plate)	N (see name plate)	PE	(Optional)			
A			B			C		D			E		F		G		H			I		J		K	L	M	
N												O				P											

i In 3-point (Open/Stop/Closed) configuration, only the terminals in columns B, D and J are active!

Key

A	Setpoint input	I	Open
B	Active actual-position feedback	J	Power supply
C	Volt-free fault message (optional)	K	Field bus connection
D	Binary control (standard 24 V AC/DC)	L	Communication with PC
E	Power failure signal	M	Commissioning
F	Supply (unregulated, 21 - 40 V DC)	N	Galvanically isolated 1 kV
G	Actual value	O	Process sensor
H	Closed	P	Limit switch, volt-free contact

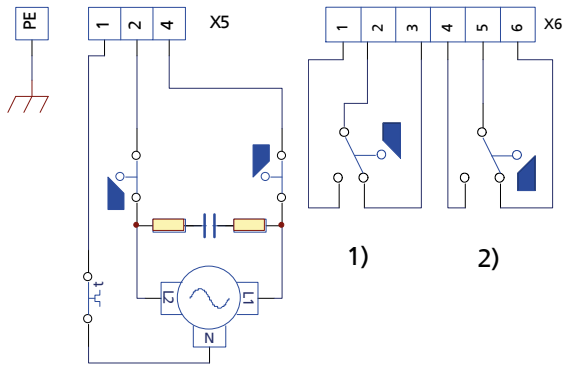
3-point 230 V AC



PE

Fig. 2: Terminal configuration on printed circuit board

X1	Internal wiring
X2	Internal wiring
X3	Internal wiring
X4	Potentiometer 1
X5/1	Neutral
X5/2	Motor phase to open
X5/4	Motor phase to close
X5/6 and X5/7	Thermal circuit breaker as volt-free contact
X6	Additional limit switches
X7	Not used
X8	Heating resistor
X9	Potentiometer 2
PE	Earth connection on housing



Terminal configuration of power supply

Terminal configuration of additional limit switches

1)	Closed	2)	Open
----	--------	----	------

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. All information provided herein, therefore, only serves as an orientation. 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 water

Fluids handled	
Brackish water ³⁾⁴⁾	✗
Service water ³⁾⁴⁾	✓
Fire-fighting water ³⁾	✓
Chlorinated water ($\leq 0.6 \text{ mg/kg}$) ³⁾	✓
Deionised water (demineralised water)	✗
Distilled water	✗
Boiler feed water ⁵⁾	✓
Hot water ³⁾	✓
High-temperature hot water ⁵⁾	✓
Condensate ⁵⁾	✓
Oil-free cooling water ³⁾	✓
Oil-containing cooling water ³⁾	✓
Ozonised water ($\leq 0.5 \text{ mg/kg}$) ³⁾	✓
Pure water ³⁾	✓
Seawater	✗
Scale-forming water ³⁾⁴⁾	○
Raw water ³⁾⁴⁾	✓
Partly desalinated water	✗
Fully desalinated water	✗
Municipal waste water ⁴⁾⁶⁾	✓
Industrial waste water ⁴⁾⁷⁾	✓

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	✓
Oil-water emulsion ⁴⁾	✓

Fluids handled	
Jet fuel	✓
Petrol	✓
Kerosene	✓

Chemical resistance chart for refrigerants

Fluids handled	
Ammonia water ($\leq 30 \%$, $\leq 25 \text{ }^\circ\text{C}$)	✓
Glycol (ethylene glycol)	✓
Propylene glycol	✓
Water-glycol mixture	✓
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) $\leq 80 \text{ }^\circ\text{C}$ ⁴⁾	○
Lye for metal cleaning $\leq 80 \text{ }^\circ\text{C}$ ⁴⁾	○

Chemical resistance chart for steam

Fluids handled	
Saturated steam	✓

Chemical resistance chart for other fluids

Fluids handled	
Sodium hydroxide ($< 50 \%$, $\leq 50 \text{ }^\circ\text{C}$)	○
Natural gas	✓
Oil-containing compressed air	✓
Dry chlorine ($\leq 30 \text{ }^\circ\text{C}$)	✓
Ammonia	✓
Butane (liquefied gas)	✓
Aqueous glycerine	✓
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✗

- 3) General limits for water to be handled by valves made of non-alloyed materials: pH 6.5 - 12; chloride ions (Cl) $< 150 \text{ mg/kg}$; chlorine (Cl₂) $< 0.6 \text{ mg/kg}$.
- 4) Without solids
- 5) Water treatment must be in compliance with the guidelines for feed water (e.g. VdTÜV 1466, TRD 611, etc.): pH ≥ 9.0 ; O₂ content $\leq 0.02 \text{ mg/l}$
- 6) Biologically treated
- 7) Non-corrosive, non-abrasive

Globe Valve

ECOLINE GLC 150-600

Class 150-600
NPS 2"-12"
Cast Steel / Stainless Steel
Bolted Bonnet
Flanged Ends

Type Series Booklet



Globe Valves

Globe Valves with Gland Packing to ANSI/ASME

ECOLINE GLC 150-600



Main applications

- Boiler feed applications
- Fossil-fuelled power stations
- Petrochemical industry
- Pipelines and tank farms
- Refineries
- Process engineering

Fluids handled

- Steam
- Fluids containing gas
- Fluids containing mineral oils
- Gas
- Hot water
- Feed water
- Oil

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 150 - 600
Nominal size	NPS 2" - 12"
Max. permissible pressure	106 bar / 1500 PSI
Min. permissible temperature	0 °C / 32 °F
Max. permissible temperature	816 °C / 1500 °F

Temperatures < 0 °C on request

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

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 216 WCB	Up to 427 °C / 800 °F
ASTM A 217 WC6	Up to 593 °C / 1100 °F
ASTM A 217 WC9	Up to 593 °C / 1100 °F
ASTM A 217 C5	Up to 649 °C / 1200 °F
ASTM A 217 C12	Up to 649 °C / 1200 °F
ASTM A 352 LCB	Up to 343 °C / 650 °F
ASTM A 352 LCC	Up to 343 °C / 650 °F
ASTM A 351 CF8	Up to 816 °C / 1500 °F
ASTM A 351 CF8M	Up to 816 °C / 1500 °F

Other materials on request.

Design details

Design

- Globe valve to BS 1873
- Tested to API 598
- Body made of cast steel or stainless steel
- Bolted bonnet
- Outside screw
- Rotating stem
- Non-rotating stem (8" and 10" Class 300/600)
- Rising stem
- Stem with burnished shank
- Solid flat disc (plug-type valve disc for 8" and 10" Class 600)
- Stem sealed by gland packing
- Two-piece self-aligning gland follower
- Stem nut made of nickel steel
- Valve seat made of wear-resistant and corrosion-proof materials
- Back seat
- Hardened back seat bush
- Die-moulded graphite gland packing, packing end rings made of braided graphite
- Stainless steel/graphite gaskets
- Outside yoke
- Yoke head suitable for mounting electric and pneumatic actuators (DIN ISO 5210)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Position indicator
- Position switch(es)
- Locking device
- Throttling plug
- Hard-faced back seat
- Drain plug
- Bypass

- Version in compliance with TA-Luft (German Clean Air Act) to VDI 2440 for temperatures up to 400 °C
 - Version with free stem end and top flange to ISO 5210
 - Gearboxes
 - Electric actuators
 - Non-destructive testing, e.g. radiographic testing
 - Inspections to technical codes such as AD2000 or IBR
 - NACE standard
 - Other flanged end designs or butt weld ends to ASME B16.25
 - Larger nominal sizes and other variants on request
- 10. Actuation frequency
 - 11. Pipe connection
 - 12. Pipe schedule
 - 13. Variants
 - 14. Number of type series booklet

Product benefits

Long gland life and high functional reliability

- Stem with shank burnished to a surface finish of 0.2 µm for reduced friction, lower actuating torque and improved sealing to atmosphere.
- Packing end rings enable higher compressive force by gland follower and prevent extrusion of middle graphite packing rings.
- Two-piece self-aligning gland follower prevents distortion on stem surface caused by improper assembly.

Reliable sealing and longer service life

- Hard-faced body seat and solid disc seat made of wear-resistant and corrosion-proof materials for handling all kinds of corrosive and erosive fluids.
- Male/female joint between body and bonnet prevents excessive compression of fully confined gasket, resulting in longer gasket life and improved sealing performance.

Additional safety and blow-out protection

- Standard metal back seat prevents blow-out of stem and other internal components from the valve body and bonnet as a result of fluid pressure inside the valve body.

Versatile application

- Stem nut made of nickel steel is suitable for numerous applications, particularly fluids which must not come into contact with component materials containing copper.

Extended maintenance-free service life

- Hard-facing applied to valve disc and seat rings by deposit welding provides extra wear allowance and ensures reliable long-term shut-off even with frequent opening/closing cycles.

Related documents

- Operating manual 7362.81

On all enquiries/orders please specify

1. Type
2. Class
3. Nominal size
4. Pressure/temperature rating
5. Operating pressure
6. Operating temperature
7. Differential pressure
8. Material
9. Fluid handled

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to ASME B16.34)

Class	Material	-29 to 38	93	149	204	260	316	343	371	399	427	454	482	510	538	566	593	621	649	677	704	732	760	788	816	
150	A 216 WCB ¹⁾	19,7	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4											
300		51,0	46,9	45,2	43,8	41,7	39,3	37,9	36,5	34,8	28,3	22,1	15,9	9,3	5,9											
600		102,0	93,8	90,3	87,2	83,1	78,3	75,8	73,1	70,0	56,9	44,1	31,7	19,0	11,7											
150	A 217 WCB ²⁾	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾									
300		51,7	51,7	49,6	47,9	45,9	41,7	40,7	39,3	36,5	35,2	33,4	31,0	22,1	14,8	10,0	6,6									
600		103,4	103,4	99,6	95,5	91,7	83,4	81,0	78,3	73,4	70,0	67,2	62,1	44,1	29,6	20,0	13,1									
150	A 217 WC9	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾									
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7	39,3	36,5	35,2	33,4	31,0	26,5	18,3	12,1	7,6									
600		103,4	103,4	100,3	97,2	91,7	83,4	81,0	78,3	73,4	70,0	67,2	62,1	52,1	36,9	24,1	15,2									
150	A 217 C5	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,0 ³⁾							
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7	39,3	36,5	35,2	33,4	25,9	19,0	13,8	10,0	6,9	4,1	2,4							
600		103,4	103,4	100,3	97,2	91,7	83,4	81,0	78,3	73,4	70,0	67,2	51,4	37,9	27,6	20,0	13,8	8,6	4,8							
150	A 217 C12	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾							
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7	39,3	36,5	35,2	33,4	31,0	25,9	17,6	11,7	7,9	5,2	3,4							
600		103,4	103,4	100,3	97,2	91,7	83,4	81,0	78,3	73,4	70,0	67,2	62,1	52,1	34,8	23,8	15,5	10,3	7,2							
150	A 352 LCB ⁴⁾	18,3	17,6	15,9	13,8	11,7	9,7	8,6																		
300		47,9	45,5	44,1	42,4	40,3	37,9	36,9																		
600		96,2	91,0	87,9	84,8	81,0	76,2	73,4																		
150	A 352 LCC	20,0	17,9	15,9	13,8	11,7	9,7	8,6																		
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7																		
600		103,4	103,4	100,3	96,6	91,7	83,4	81,0																		
150	A 351 CF8 ⁵⁾	19,0	15,9	14,1	13,1	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	
300		49,6	41,4	37,2	34,1	32,1	30,3	29,6	29,0	28,6	27,9	27,2	26,9	26,2	24,5	22,4	17,6	14,1	11,4	9,3	7,9	6,6	5,2	4,1	2,8	
600		99,3	82,7	74,1	68,6	64,1	61,0	59,6	58,3	56,9	55,8	54,5	53,8	52,7	49,0	44,8	35,5	28,3	22,8	18,3	15,5	12,8	10,3	7,9	5,9	
150	A 351 CF8M ⁵⁾	19,0	16,2	14,8	13,4	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,0 ³⁾	
300		49,6	42,7	38,6	35,5	33,1	31,0	30,3	30,0	29,3	29,0	29,0	28,6	26,5	25,2	24,8	21,0	16,2	12,8	10,0	7,9	6,6	5,2	4,1	2,8	
600		99,3	85,5	77,2	70,7	65,8	62,1	61,0	60,0	59,0	58,3	57,6	57,2	53,4	50,0	49,6	42,1	32,8	25,5	20,3	16,2	13,1	10,3	7,9	5,9	

Permissible operating pressures in PSI at temperatures in °F (to ASME B16.34)

Class	Material	-20 to 100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
150	A 216 WCB ¹⁾	285	260	230	200	170	140	125	110	95	80	65	50	35	20										
300		740	680	655	635	605	570	550	530	505	410	320	230	135	85										
600		1480	1360	1310	1265	1205	1135	1100	1060	1015	825	640	460	275	170										
150	A 217 WCB ²⁾	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾								
300		750	750	720	695	665	605	590	570	530	510	485	450	320	215	145	95								
600		1500	1500	1445	1385	1330	1210	1175	1135	1065	1015	975	900	640	430	290	190								
150	A 217 WC9	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾								
300		750	750	730	705	665	605	590	570	530	510	485	450	385	265	175	110								
600		1500	1500	1455	1410	1330	1210	1175	1135	1065	1015	975	900	755	535	350	220								
150	A 217 C5	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	15 ³⁾						
300		750	750	730	705	665	605	590	570	530	510	485	375	275	200	145	100	60	35						
600		1500	1500	1455	1410	1330	1210	1175	1135	1065	1015	975	745	550	400	290	200	125	70						
150	A 217 C12	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾						
300		750	750	730	705	665	605	590	570	530	510	485	450	375	255	170	115	75	50						
600		1500	1500	1455	1410	1330	1210	1175	1135	1065	1015	975	900	755	505	345	225	150	105						
150	A 352 LCB ⁴⁾	265	255	230	200	170	140	125																	
300		695	660	640	615	585	550	535																	

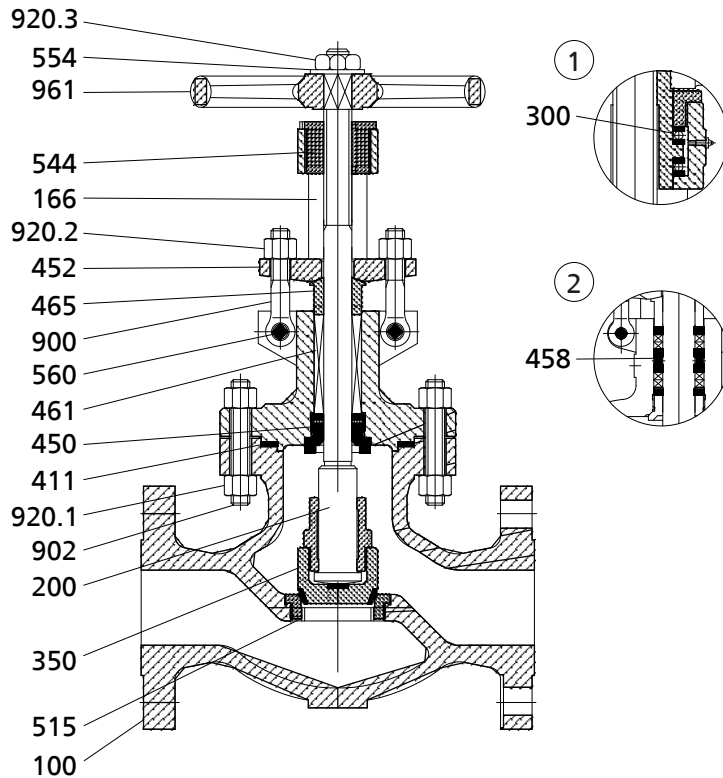
1) Permissible but not recommended for prolonged use above 427 °C (800 °F).
2) Cannot be used for temperatures above 593 °C (1100 °F).
3) For butt weld end valves only. Flanged end ratings terminate at 538 °C (1000 °F).
4) Cannot be used for temperatures above 343 °C (650 °F).
5) At temperatures over 538 °C (1000 °F), use only when carbon content is 0.04% or higher.

Class	Material	-20 to 100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500		
600		1395	1320	1275	1230	1175	1105	1065																			
150	A 352 LCC	290	260	230	200	170	140	125																			
300		750	750	730	705	665	605	590																			
600		1500	1500	1455	1405	1330	1210	1175																			
150		A 351	275	230	205	190	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	15 ³⁾
300	CF8 ³⁾	720	600	540	495	465	440	430	420	415	405	395	390	380	355	325	255	205	165	135	115	95	75	60	40		
600		1440	1200	1075	995	930	885	865	845	825	810	790	780	765	710	650	515	410	330	265	225	185	150	115	85		
150	A 351 CF8M ³⁾	275	235	215	195	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	15 ³⁾	
300		720	620	560	515	480	450	440	435	425	420	420	415	385	365	360	305	235	185	145	115	95	75	60	40		
600		1440	1240	1120	1025	955	900	885	870	855	845	835	830	775	725	720	610	475	370	295	235	190	150	115	85		

Test pressures

Test	Test medium	Class 150		Class 300		Class 600	
		bar	psi	bar	psi	bar	psi
Shell	Water	32	450	78	1125	153	2225
Leak test (back seat)		23	315	56	815	112	1630
Leak test (seat)		23	315	56	815	112	1630

Materials



- ① ° Bearing (8"-12" Class 300, 6"-12" Class 600)
- ② ° Lantern ring (optional)

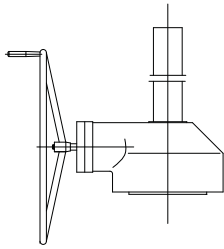
Parts list

Part No.	Description	Material								
		A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A 352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M
100	Body	A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M
166	Yoke	A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M
350	Lower valve disc section	A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M
515	Seat ring	A 105	A 182 F11	A 182 F22	A 182 F5	A 182 F9	A 182 LF2	A 350 LF2	A 182 F304	A 182 F316
200	Stem	See "Trim materials" table								
450	Back seat bush	See "Trim materials" table								
465	Lower gland section	13Cr	13Cr	13Cr	13Cr	13Cr	304	304	304	316
452	Gland follower	A 216 WCB	A 216 WCB	A 216 WCB	A 351 CF8	A 351 CF8	A 351 CF8	A 351 CF8	A 351 CF8	A 351 CF8
544	Threaded bush	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C
902	Stud	A 193 B7	A 193 B16	A 193 B16	A 193 B16	A 193 B16	A 320 L7	A 320 L7	A 193 B8	A 193 B8
920.1	Nut	A 194 2H	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 8	A 194 Gr. 8
461	Gland packing	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
411	Joint ring	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel
900	Eyebolt	A 307 B	A 193 B16	A 193 B16	A 193 B16	A 193 B16	A 320 L7	A 320 L7	A 193 B8	A 193 B8
920.2	Nut	A 194 2H	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 8	A 194 Gr. 8
560	Pin	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
961	Handwheel	Nodular cast iron or malleable cast iron or cast steel								
920.3	Handwheel nut	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
554	Washer	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
300	Bearing	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel
458	Lantern ring	13Cr	13Cr	13Cr	13Cr	13Cr	304	304	304	316

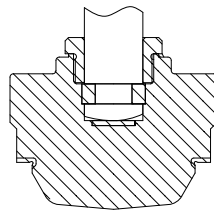
Trim materials

Part No.	Description	Trim 1	Trim 2	Trim 5	Trim 8	Trim 10
		13% chrome steel (Cr) / 13% chrome steel (Cr)	304 / 304	Stellite / Stellite	Stellite / 13% chrome steel (Cr)	316 / 316
350	Lower valve disc section	13% chrome steel (Cr)	304 stainless steel	Stellite	13% chrome steel (Cr)	316 stainless steel
515	Seat ring	13% chrome steel (Cr)	304 stainless steel	Stellite	Stellite	316 stainless steel
200	Stem	13% chrome steel (Cr)	304 stainless steel	13% chrome steel (Cr)	13% chrome steel (Cr)	316 stainless steel
450	Back seat bush	13% chrome steel (Cr)	304 stainless steel	13% chrome steel (Cr)	13% chrome steel (Cr)	316 stainless steel

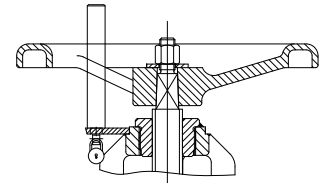
Variants



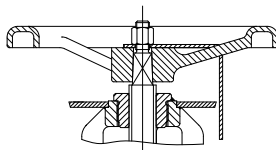
Gearbox
(6"-12" Class 600)



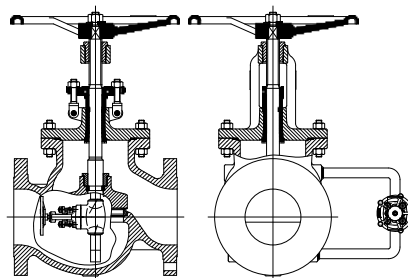
Throttling plug



Locking device

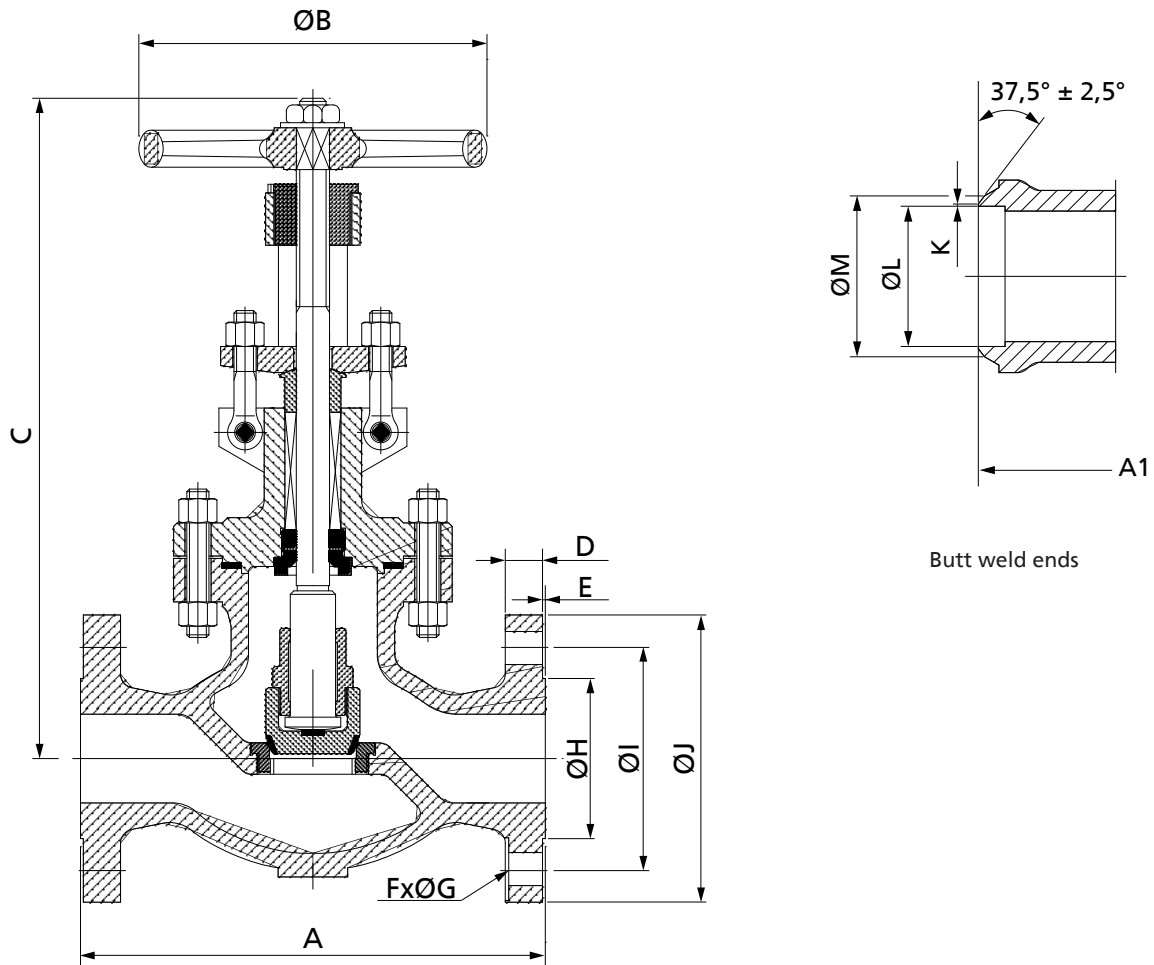


Position indicator



Bypass

Dimensions



Dimensions in mm

Class	NPS	A	C ⁶⁾	ØB	D	E	ØH	ØI	ØJ	F	ØG	A1	[kg]
150	2"	203	338	200	14,3	2	92,1	120,7	150	4	19,1	203	19
	2 ½"	216	415	200	15,9	2	104,8	139,7	180	4	19,1	216	32
	3"	241	406	250	17,5	2	127,0	152,4	190	4	19,1	241	35
	4"	292	468	350	22,3	2	157,2	190,5	230	8	19,1	292	55
	6"	406	560	350	23,9	2	215,9	241,3	280	8	22,4	406	115
	8"	495	672	450	27,0	2	269,9	298,5	345	8	22,4	495	140
	10"	622	858	500	28,6	2	323,8	362,0	405	12	25,4	622	255
300	12"	698	862	640	30,2	2	381,0	431,8	485	12	25,4	698	539
	2"	267	355	200	20,7	2	92,1	127,0	165	8	19,1	267	27
	2 ½"	292	474	250	23,9	2	104,8	149,2	190	8	22,4	292	48
	3"	318	430	250	27,0	2	127,0	168,3	210	8	22,4	318	48
	4"	356	500	350	30,2	2	157,2	200,0	255	8	22,4	356	70
	6"	444	607	450	35,0	2	215,9	269,9	320	12	22,4	444	125
	8"	559	828	500	39,7	2	269,9	330,2	380	12	25,4	559	290
600	10"	622	914	500	46,1	2	323,8	387,4	445	16	28,4	622	365
	12"	711	1032	650	49,3	2	381,0	450,8	520	16	31,8	711	632
	2"	292	300	250	25,4	7	92,1	127,0	165	8	19,1	292	35
	2 ½"	330	540	250	28,6	7	104,8	149,4	190	8	22,4	330	70
	3"	356	488	350	31,8	7	127,0	168,3	210	8	22,4	356	65
	4"	432	555	350	38,1	7	157,2	215,9	275	8	25,4	432	105

6) Open

Class	NPS	A	C ⁶⁾	ØB	D	E	ØH	ØI	ØJ	F	ØG	A1	[kg]
	6"	559	777	500	47,7	7	215,9	292,1	355	12	28,4	559	215
	8"	660	915	610	55,6	7	269,9	349,2	420	12	31,8	660	530
	10"	787	1113	610	63,5	7	323,8	431,8	510	16	35,1	787	780
	12"	838	1280	610	66,7	7	381,0	489,0	560	20	35,1	838	900

Butt weld end dimensions in mm

NPS	Pipe OD	K	ØM	ØL for various pipe schedules												
				10	20	30	40	60	80	100	120	140	160	STD	XS	XXS
2"	60,30	1,6 ±0,8	60,30	54,79			52,51		49,25				42,85	Sch 40	Sch 80	38,19
2 ½"	73,03	1,6 ±0,8	75,2	66,93			62,71		59,00				53,98	Sch 40	Sch 80	44,98
3"	88,90	1,6 ±0,8	91,2	82,80			77,93		73,66				66,65	Sch 40	Sch 80	58,42
4"	114,30	1,6 ±0,8	117,3	108,20			102,26		97,18		92,05		87,07	Sch 40	Sch 80	80,06
6"	168,28	1,6 ±0,8	172,2	161,47			154,05		146,33		139,73		131,75			
8"	219,08	1,6 ±0,8	223,0	211,56	206,38		202,72	198,45	193,68	188,90	182,55	177,83	173,05	Sch 40	Sch 80	174,63
10"	273,05	1,6 ±0,8	277,9	264,67	260,35		254,51	247,65	242,87	236,52	230,17	222,25	215,90	Sch 40	Sch 60	Sch 140
12"	323,85	1,6 ±0,8	329,4	314,71	311,15		303,23	295,30	288,90	280,97	273,05	266,70	257,20	304,80	298,45	Sch 120

Mating dimensions - Standards

Face-to-face lengths: ASME B16.10
 Flanges: ASME B16.5
 Butt weld ends: ASME B16.25

Notes on installation

The valve bodies are marked with an arrow indicating the flow direction.

Globe valves should always be installed in such a way that the actual flow direction of the fluid matches the arrow on the body, unless otherwise requested by the customer.

Differential pressures in bar (psi) (standard valve disc)

Class	NPS	Δp bar (psi)			
		Handwheel	Handwheel and bypass	Gearbox	
150	2"	20 (290)	20 (290)	20 (290)	
	3"				
	4"				
	6"				
	8"				
	10"				7 (101)
300	2"	52 (750)	52 (750)	52 (750)	
	3"				
	4"				
	6"				29 (241)
	8"				14 (203)
	10"				6 (87)
600	2"	103 (1500)	103 (1500)	103 (1500)	
	3"				
	4"				44 (638)
	6"				25 (363)
	8"				10 (145)
	10"				2 (29)

⁶⁾ Open

Globe Valve

BOA-H

PN 16/25
DN 15-350

Type Series Booklet



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Type Series Booklet BOA-H

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Globe Valves

Bellows-type Globe Valves to DIN/EN

BOA-H



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

- Hot water
- Saturated steam
- Thermal oil
- Liquids and gases not chemically or mechanically aggressive to the valve materials.
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value	
	EN-GJL-250	EN-GJS-400-18-LT
Nominal pressure	PN 16	PN 16/25
Nominal size	DN 15 - 300	DN 15 - 300 ¹⁾
Max. permissible pressure [bar]	16	25
Min. permissible temperature [°C]	-10	-10
Max. permissible temperature [°C]	+300	+350

1) PN 25: DN 15-150

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

Body materials

Overview of materials available for straight-way valve

Material	Material number	Temperature limit
EN-GJL-250	5.1301	≤ 300 °C
EN-GJS-400-18-LT	5.3103	≤ 350 °C

Overview of materials available for angle valve

Material	Material number	Temperature limit
EN-GJL-250	5.1301	≤ 300 °C

Design details

Design

- Straight-way or angle pattern with horizontal seat
- Throttling plug ≤ DN 100
- On/off disc ≥ DN 125
- All nominal sizes with position indicator, locking device and travel stop
- Compact bonnet
- Maintenance-free bellows-type stem seal with back-up gland
- Non-rising handwheel
- Flanges to DIN EN 1092-2 Type 21
- Exterior coating: blue, RAL 5002
- 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.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.
- Type-tested to the specifications of Germanischer Lloyd and Bureau Veritas.

Variants

- V-port plug (seat-guided throttling plug for maximum requirements) for DN 15 to 300
- Valve disc with PTFE ring (≤ 200 °C, throttling plug for DN 15 to 100, on/off disc for DN 125 to 200)
- Lead-sealable cap (prevents unauthorised actuation) as assembly set
- Balanced plug ≥ DN 200
- High-temperature resistant paint (grey aluminium)
- Either one or two limit switch(es) as assembly kit for globe valves of DN 15 to 150 made of EN-GJS-400-18-LT
- Oil-free and grease-free: lubricated exclusively by mineral oil free lubricants approved by the German Federal Office for Materials Testing (Bundesanstalt für Materialforschung und -prüfung, BAM)
- Other flange designs
- Low-temperature steel bolts for temperatures down to -30 °C (EN-GJS-400-18-LT only) up to 0.75 x PN (max.)
- Certification to customer specification
- Globe valve with gland packing and electric actuator
- Globe valve with gland packing and pneumatic actuator

Product benefits

- High operating comfort at no extra charge due to position indicator with travel stop and locking device outside the insulation. Valve disc position can be checked at any time.
- Optimum start-up and throttling due to standard throttling plug up to DN 100 (seat-guided V-port plug optionally available for all valve sizes to meet maximum throttling requirements).
- When the valve is fully open, the bellows is confined within the valve body, protected from pressure surges.
- Little heat loss during operation due to short and smooth bonnet suitable for easy and cheap insulation.
- Added protection against fatigue fracture: The bellows is welded to the stem, so no vibrations are transmitted from the valve disc to the bellows.
- Back-up gland packing provides additional safety in case of defective bellows.
- Position indicator with colour coding system for identification of valve design during replacement work. The disc type and seat/disc interface material can be verified without removing the insulation.
- Space-saving non-rising handwheel.
- Reduced maintenance costs due to replaceable valve disc. Instead of replacing the complete upper section, only the valve disc is replaced, if necessary.

Related documents

Information/documents

Document	Reference number
Flow characteristics	7150.4
Operating manual	0570.8
Installation instructions "Accessories set for capped valves"	0570.811
Installation instructions "Limit switch set"	0570.812
BOA-H Mat E type series booklet	7135.1

Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Nominal pressure
3. Nominal size
4. Material
5. Variants
6. Reference number

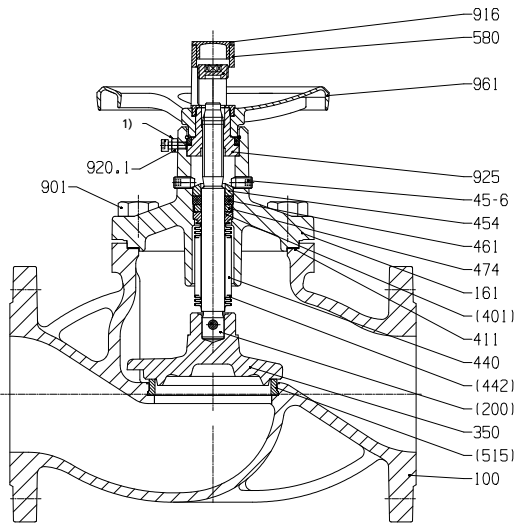
Pressure/temperature ratings

Test pressure and operating pressure

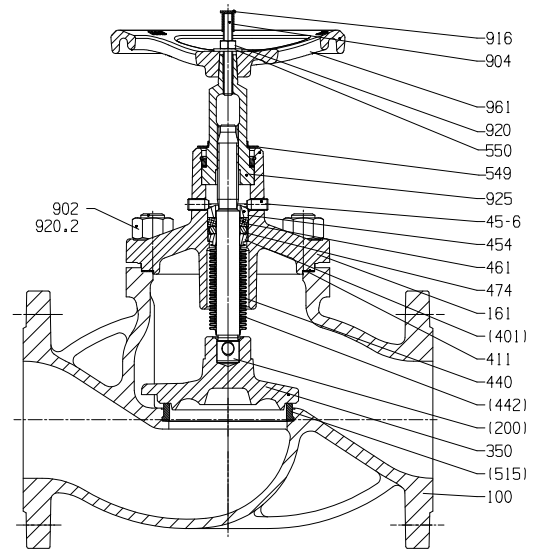
PN	Material	Shell test	Leak test (seat)	Permissible operating pressure [bar] ²⁾³⁾								
		With water		[°C]								
		Tests P10 and P11 to DIN EN 12266-1 [bar]	Test P12, leakage rate A to DIN EN 12266-1 [bar]	-10 to +120	150	180	200	230	250	300	350	
16	EN-GJL-250	24	17,6	16	14,4	13,4	12,8	11,8	11,2	9,6	-	
	EN-GJS-400-18-LT	24	17,6	16	15,5	-	14,7	-	13,9	12,8	11,2	
25	EN-GJS-400-18-LT	37,5	27,5	25	24,3	-	23	-	21,8	20	17,5	

2) Intermediate temperatures can be derived by linear interpolation.
3) Static load

Materials



EN-GJL-250 (5.1301)



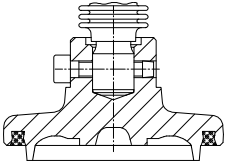
EN-GJS-400-18-LT (5.3103)

Parts list

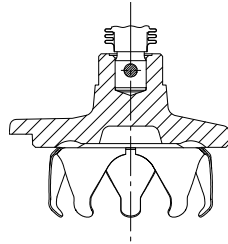
Part No.	Description	DN	Material	Material number	
100 ⁴⁾	Body	15-300	EN-GJL-250	5.1301	
		15-350	EN-GJS-400-18-LT	5.3103	
161	Body bonnet	15-300	EN-GJL-250	5.1301	
		15-350	EN-GJS-400-18-LT	5.3103	
350 ⁴⁾	Valve disc	15-150	X 20 Cr 13	1.4021+QT (1.4021)	
		200-350	C 22/X 15 CrNi 18 8	1.0402/1.4370	
411 ⁴⁾	Joint ring	-	CrNi steel/graphite	-	
440	Bellows set consisting of:				
	200	Stem	-	Stainless steel (min. 13 % chrome)	-
	401	Weld ring	-	Stainless steel (min. 13 % chrome)	-
	442	Bellows	-	X 6 CrNiTi 18 10	1.4541
454	Stuffing box ring	-	Steel	-	
45-6	Stuffing box screw	-	Steel	-	
461	Gland packing	-	Pure graphite	-	
474	Thrust ring	-	Stainless steel	-	
515	Seat ring	-	Stainless steel	-	
543	Spacer bush	15-65	Plastic, glass-fibre reinforced	-	
549	Collar bush	-	Stainless steel	-	
550	Disc	-	Steel	-	
580 ⁴⁾	Cap	15-150	Plastic, glass-fibre reinforced, impact-resistant	-	
		200-350	Steel	-	
901 ⁴⁾	Hexagon head bolt	-	8.8 on EN-GJL-250 variant	-	
902 ⁴⁾	Stud	-	C 35 E on EN-GJS-400-18-LT variant	-	
904 ⁴⁾	Grub screw	-	Steel	-	
916 ⁴⁾	Plug	-	Plastic	-	
920 ⁴⁾	Hexagon nut	-	C 35 on EN-GJS-400-18-LT variant	-	
925	Stem nut	-	Coated steel	-	
961 ⁴⁾	Handwheel	15-150	Die-cast aluminium on EN-GJL-250 variant	-	
		200-300	EN-GJL-200 on EN-GJL-250 variant	5.1300	
		15-350	EN-GJL-200 on EN-GJS-400-18-LT variant	5.1300	

4) Spare part

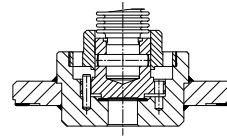
Variants



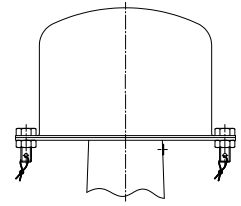
Throttling plug with PTFE ring, DN 15-100



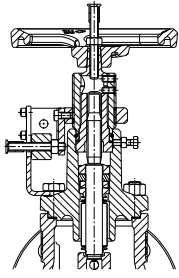
V-port plug



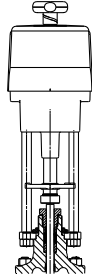
Balanced plug design from DN 200



Lead-sealable cap (prevents unauthorised actuation) as assembly set

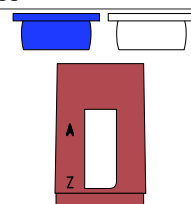
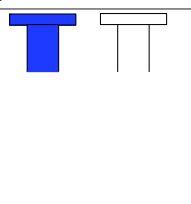
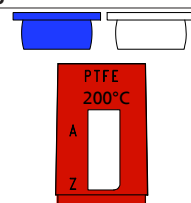
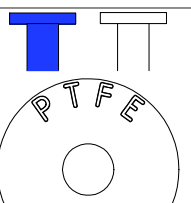
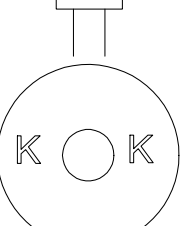


Limit switch(es)



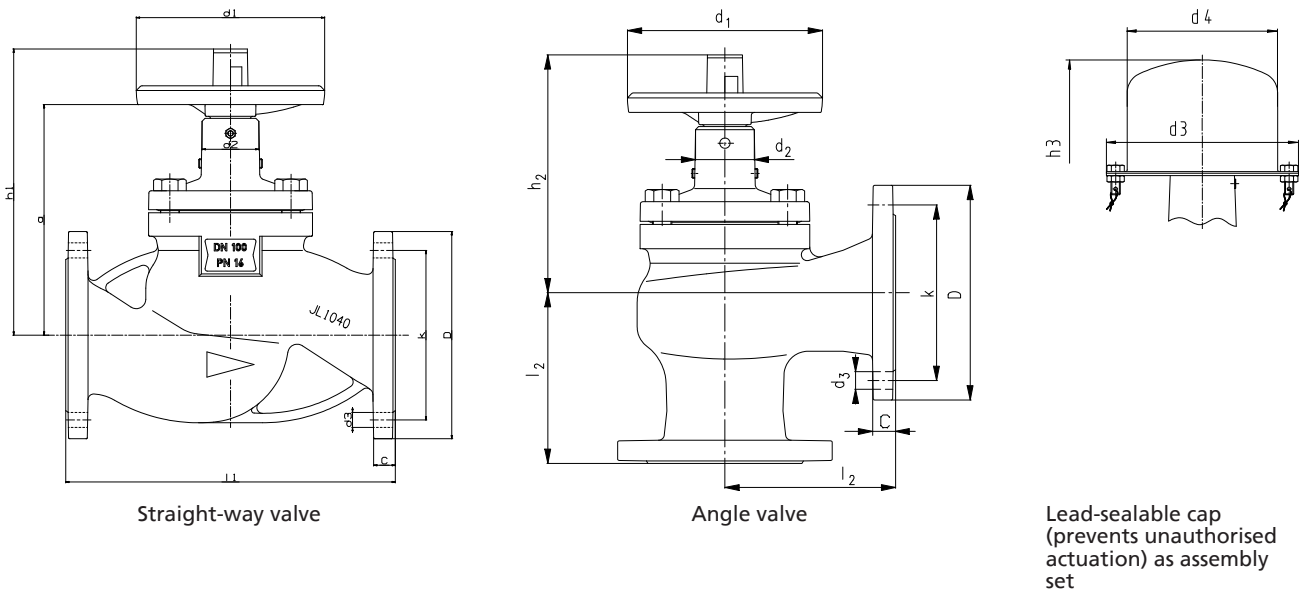
BOA-H Mat E

Colour coding system

Body made of EN-GJL-250			Body made of EN-GJS-400-18-LT		
Metal-seated valve disc			Metal-seated valve disc		
Blue plug Design: on/off disc		White plug Design: throttling plug	Blue plug Design: on/off disc		White plug Design: throttling plug
	Crimson cap				
Valve disc with PTFE gasket			Valve disc with PTFE gasket		
Blue plug Design: on/off disc		White plug Design: throttling plug	Blue plug Design: on/off disc		White plug Design: throttling plug
	Red orange cap			Sheet metal disc	
V-port plug (DN 15-300)			V-port plug (DN 15-150)		
Tag on handwheel	<input type="checkbox"/> Kronenkegel				White plug
				Sheet metal disc	
			V-port plug (DN 200-350)		
			Tag on handwheel	<input type="checkbox"/> Kronenkegel	

Dimensions and weights

Dimensions and weights PN 16, EN-GJL-250



Dimensions [mm] and weights [kg]

PN	DN								Flange					Capped valve				
		l ₁	l ₂	h ₁	h ₂	d ₁	d ₂	a	D	k	n × d ₃	C	[kg]		d ₃	d ₄	h ₃	
													DF ⁵⁾	EF ⁶⁾			DF ⁵⁾	EF ⁶⁾
16	15	130	90	175	150	125	47	137	95	65	4 × 14	14	3,1	3,2	166	130	204	179
	20	150	95	178	153	125	47	140	105	75	4 × 14	16	4	4	166	130	207	182
	25	160	100	184	151	125	47	146	115	85	4 × 14	16	4,7	4,8	166	130	213	180
	32	180	105	205	170	125	47	161	140	100	4 × 19	18	7,3	7,5	166	130	228	193
	40	200	115	210	172	125	47	166	150	110	4 × 19	18	7,7	7,7	166	130	233	208
	50	230	125	235	198	160	51	190	165	125	4 × 19	20	10,2	9,6	210	170	298	260
	65	290	145	246	198	160	51	201	185	145	4 × 19	20	17	16,3	210	170	309	272
	80	310	155	282	226	200	60	223	200	160	8 × 19	22	22	21,8	270	220	390	342
	100	350	175	304	244	200	60	245	220	180	8 × 19	24	32	30,8	270	220	412	356
	125	400	200	390	316	250	86	310	250	210	8 × 19	26	54	48,3	390	340	479	405
	150	480	225	408	320	250	86	328	285	240	8 × 23	26	70,5	65,7	390	340	497	409
	200	600	275	570	468	400	100	440	340	295	12 × 23	30	130	114,2	-	-	-	-
	250	730	325	606	480	400	100	476	405	355	12 × 28	32	230	180,5	-	-	-	-
300	850	375	660	510	400	93	530	460	410	12 × 28	32	328	267,5	-	-	-	-	

Mating dimensions as per standard

Face-to-face lengths: Straight-way valve: DIN EN 558/1, ISO 5752
Angle valve: DIN EN 558/8, ISO 5752

Flanges: DIN EN 1092-2, flange type 21 for EN-GJL-250
DIN EN 1092-2, flange type 21-2 for EN-GJS-400-18-LT

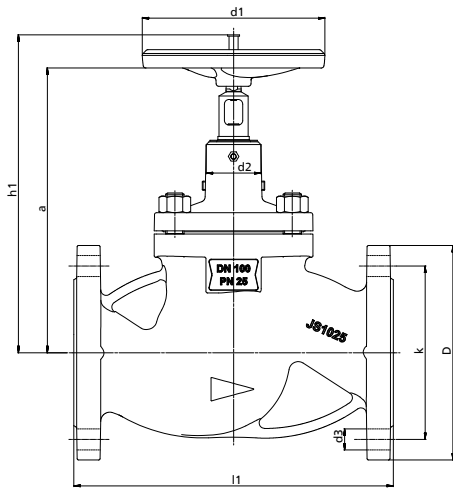
Flange facing: DIN EN 1092-2, type B

Other flange designs

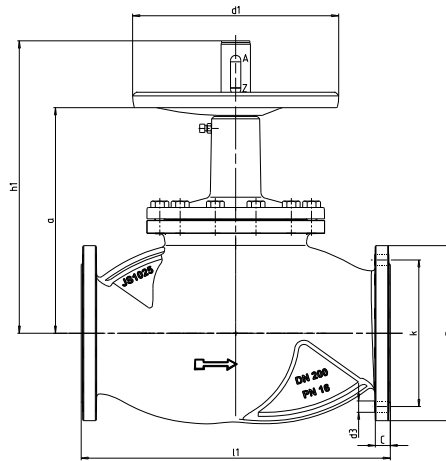
- Undrilled, DN 200-300 drilled to PN 10, drilled to PN 6 (DIN EN 1092-2), drilled to ANSI Class 150, tongue (type C), groove (type D), spigot (type E), recess (type F) at both ends (to DIN EN 1092-1)
- Other flange designs on request

5) Straight-way valve
6) Angle valve

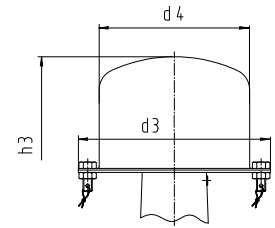
Dimensions and weights PN 16 and PN 25, EN-GJS-400-18-LT



PN 16/25 up to DN 150



PN 16 DN 200-350



Lead-sealable cap
(prevents unauthorised
actuation) as assembly
set

Dimensions [mm]

PN	DN	Flange									[kg]	Capped valve		
		l ₁	h ₁	d ₁	d ₂	a	D	k	n × d ₃	C		d ₃	d ₄	h ₃
16	15	130	211	125	47	179	95	65	4 × 14	14	3,1	166	130	222
	20	150	214	125	47	182	105	75	4 × 14	16	4,1	166	130	225
	25	160	220	125	47	188	115	85	4 × 14	16	4,6	166	130	231
	32	180	238	125	47	203	140	100	4 × 19	18	8,1	166	130	246
	40	200	243	125	47	208	150	110	4 × 19	18	8,5	166	130	251
	50	230	266	160	51	240	165	125	4 × 19	20	11	210	170	298
	65	290	290	160	51	250	185	145	4 × 19	20	17	210	170	308
	80	310	324	200	60	290	200	160	8 × 19	22	21	270	220	391
	100	350	348	200	60	312	220	180	8 × 19	24	31	270	220	415
	125	400	460	250	80	400	250	210	8 × 19	26	51	390	340	480
	150	480	479	250	80	418	285	240	8 × 23	26	68,5	390	340	499
	200	600	570	400	93	440	340	295	12 × 23	30	139	-	-	-
	250	730	606	400	93	476	405	355	12 × 28	32	239	-	-	-
	300	850	660	400	93	530	460	410	12 × 28	32	343	-	-	-
350	980	660	400	93	530	520	470	16 × 28	36	390	-	-	-	
25	15	130	211	125	47	179	95	65	4 × 14	14	3,1	166	130	222
	20	150	214	125	47	182	105	75	4 × 14	16	4,1	166	130	225
	25	160	220	125	47	188	115	85	4 × 14	16	4,6	166	130	231
	32	180	238	125	47	203	140	100	4 × 19	18	8,2	166	130	246
	40	200	243	125	47	208	150	110	4 × 19	18	8,5	166	130	251
	50	230	266	160	51	240	165	125	4 × 19	20	11	210	170	298
	65	290	290	160	51	250	185	145	8 × 19	20	17	210	170	308
	80	310	324	200	60	290	200	160	8 × 19	22	28,9	270	220	391
	100	350	348	200	60	312	235	190	8 × 23	24	40	270	220	415
	125	400	460	250	80	400	270	220	8 × 28	26	65	390	340	480
150	480	479	250	80	418	300	250	8 × 28	26	89	390	340	499	

Mating dimensions as per standard

- Face-to-face lengths: Straight-way valve: DIN EN 558/1, ISO 5752
Angle valve: DIN EN 558/8, ISO 5752
- Flanges: DIN EN 1092-2, flange type 21 for EN-GJL-250
DIN EN 1092-2, flange type 21-2 for EN-GJS-400-18-LT
- Flange facing: DIN EN 1092-2, type B

Other flange designs

- PN 16:
undrilled, DN 200-300 drilled to PN 10, drilled to PN 6 (DIN EN 1092-2), drilled to ANSI Class 150, tongue (type C), groove (type D), spigot (type E), recess (type F) at both ends (to DIN EN 1092-1)
- PN 25:
undrilled (DIN EN 1092-2), drilled to ANSI Class 150, tongue (type C), groove (type D), spigot (type E), recess (type F) at both ends (to DIN EN 1092-1)
- Other flange designs on request

Installation instructions


Flow through globe valves should be in the direction of the embossed arrow on the valve body. An alternating direction of flow is permissible for valves with standard valve disc, but not for valves fitted with a balanced plug.

If the following differential pressures are exceeded on BOA-H globe valves from DN 200 upwards, a balanced plug design is required.

Differential pressures [bar]

PN	DN	Δp
16	150	-
16	200	12
16	250	9
16	300/350	6
25	150	21 ⁷⁾
25	200	12
25	250	9
25	300/350	6

The balanced plug only takes effect if the pressure to be sealed lies above the valve disc. Therefore, flow through valves with balanced plug must be reversed (embossed flow direction arrow is reversed).

 In steam pipelines the valve must not be installed with the stem pointing downwards (risk of steam hammer).

7) No balanced plug available.

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. All information provided herein, therefore, only serves as an orientation. 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 water⁸⁾

Fluids handled	A ⁹⁾	B ¹⁰⁾
Brackish water ¹¹⁾	✘	✘
Service water ¹¹⁾	✓	✓
Fire-fighting water	✓	✓
Chlorinated water (≤ 0.6 mg/kg)	✓	✓
Deionised water (demineralised water) ¹²⁾	○	○
Distilled water ¹²⁾	○	○
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 ¹¹⁾	○	○
Raw water ¹¹⁾	✓	✓
Partly desalinated water ¹²⁾	○	○
Fully desalinated water ¹²⁾	○	○
Municipal waste water ¹¹⁾¹³⁾	✓	✓
Industrial waste water ¹¹⁾¹⁴⁾	✓	✓

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

Fluids handled	A ⁹⁾	B ¹⁰⁾
Vegetable oils	✓	✓
Mineral oils	✓	✓
Synthetic oils	✓	✓
Crude oil	✓	✓
Petroleum	✓	✓
Light fuel oil	✓	✓

Fluids handled	A ⁹⁾	B ¹⁰⁾
Linseed oil	✓	✓
Oil/water emulsion ¹¹⁾	✓	✓
Jet fuel	○ ¹⁵⁾	✓
Petrol	○ ¹⁵⁾	✓
Kerosene	○ ¹⁵⁾	✓

Chemical resistance chart for refrigerants

Fluids handled	A ⁹⁾	B ¹⁰⁾
Ammonium hydroxide (≤ 30 %, ≤ 25 °C)	✓	✓
Glycol (ethylene glycol)	✓	✓
Propylene glycol	✓	✓
Water/glycol mixture (≤ 50 %, ≤ 40 °C)	✓	✓
Inorganic cooling brine, pH 7.5	✓	✓

Chemical resistance chart for thermal oils

Fluids handled	A ⁹⁾	B ¹⁰⁾
Synthetic thermal oils	✓	✓
Mineral-based thermal oils	✓	✓

Chemical resistance chart for acids

Fluids handled	A ⁹⁾	B ¹⁰⁾
Hydrochloric acid	✘	✘
Sulphuric acid (pure, technical, concentrated)	✘	✘
Sulphurous acid	✘	✘
Fatty acid	✘	✘
Nitric acid	✘	✘

Chemical resistance chart for cleaning agents

Fluids handled	A ⁹⁾	B ¹⁰⁾
Lye for bottle rinsers (e.g. P3) ≤ 80 °C ¹¹⁾	○	○
Lye for metal cleaning ≤ 80 °C ¹¹⁾	○	○

Chemical resistance chart for steam

Fluids handled	A ⁹⁾	B ¹⁰⁾
Saturated steam	○ ¹⁵⁾	✓

Chemical resistance chart for other fluids

Fluids handled	A ⁹⁾	B ¹⁰⁾
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)	✘	✘

- 8) General criteria for water to be handled by valves 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!
- 9) EN-GJL-250, T_{max.} +300 °C
- 10) EN-GJS-400-18-LT, T_{max.} +350 °C
- 11) Without solids
- 12) 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 ≤ 0.02 mg/l are also recommended.
- 13) Biologically treated
- 14) Non-corrosive, non-abrasive
- 15) EN-GJS-400-18-LT is recommended for safety reasons (ductility).

Globe Valve

BOA-H/HE/HV/HEV

PN 25/40
DN 10-350
Bellows
Flanged/Butt Weld Ends
or Socket Weld Ends

Type Series Booklet



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Type Series Booklet BOA-H/HE/HV/HEV

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Globe Valves

Bellows-type globe valves to DIN/EN

BOA-H/HE/HV/HEV



Main applications

- Process engineering
- Chemical industry
- Petrochemical industry
- Sugar industry
- Heat recovery systems
- Boiler recirculation
- Boiler feed applications

Fluids handled

- Water
- Steam
- Thermal oil
- Other non-aggressive fluids such as gas or oil on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 25/40
Nominal size	DN 10 - 350 ¹⁾
Max. permissible pressure	40 bar
Min. permissible temperature	-10 °C
Max. permissible temperature	+450 °C

Selection as per pressure/temperature ratings (⇒ Page 4)

1) DN 250-350 Type BOA-HV/HEV

Design details

Design

- Straight-way pattern
- On/off disc
- Seat/disc interface made of wear-resistant and corrosion-proof chrome (Cr) steel or chrome nickel (CrNi) steel
- Outside screw
- Back seat
- Stem sealed by double-walled bellows and back-up gland packing
- EC type-tested (Module B), component mark TÜ.A./AR-291
- Exterior coating: blue RAL 5002
- The valves meet the requirements specified in TA-Luft (German Technical Guidelines on Air Quality Control, VDI 2440).
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Throttling plug
- Balanced plug for DN 250-350 (for DN 125-200 NORI 40)
- Position indicator (standard for DN 250-350)
- Studs and nuts of A4-70 (low-temperature steel)
- Cap
- Oil and grease-free (wetted parts)
- Other flange designs or butt weld end designs
- Inspections to technical codes such as TRD/TRB/AD2000 – German Steam Boiler / Pressure Vessel Regulations – or to customer specification

Body materials

Overview of available materials

Material	Material number	Temperature limit
P 250 GH	1.0460	Up to 450 °C
GP 240 GH+N	1.0619+N	Up to 450 °C

Product benefits

- Reliable sealing: bonnet gasket fully confined to prevent creep.
- Improved energy efficiency of the system. Short, easy-to-insulate bonnet minimises heat losses.
- Additional stem seal for emergency operation and blow-out protection by standard back seat as well as back-up gland packing made of pure graphite.
- Hard-faced valve seat made of wear-resistant and corrosion-proof materials for long service life and high functional reliability.

- Corrosion-resistant and easy to repair due to olive-chromated nuts and bolts/screws.

Related documents

- We recommend using our maintenance-free DN 10-200 NORI 40 globe valves, types ZXLB and ZXSB, if actuators are to be mounted (see type series booklet 7165.1).
- Operating manual 0570.82

2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet

On all enquiries/orders please specify

1. Type

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to EN 1092-1)²⁾

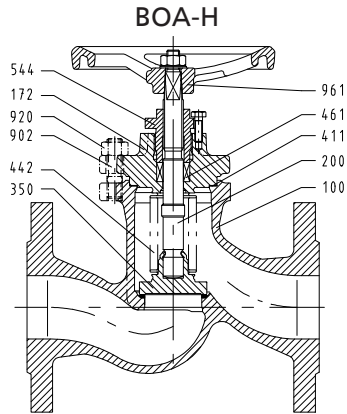
Nominal pressure PN	Material	RT ³⁾	100	150	200	250	300	350	400	450
25	P 250 GH - 1.0460	25,0	23,2	22,0	20,8	19,0	17,2	16,0	14,8	8,2
40		40,0	37,1	35,2	33,3	30,4	27,6	25,7	23,8	13,1
40	DN 250-350 ⁴⁾ GP 240 GH+N - 1.0619+N	27,0	27,0	23,0	22,0	21,0	19,0	18,0	17,0	13,0

²⁾ Operating pressures to DIN 2401 are also permissible

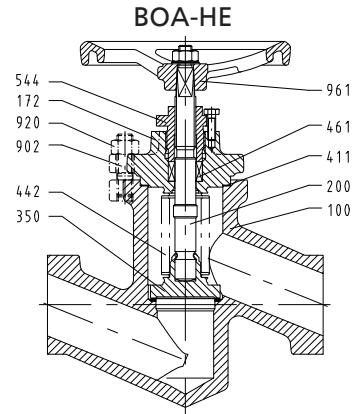
³⁾ RT: room temperature (-10 °C to +50 °C)

⁴⁾ Values deviating from EN 1092-1

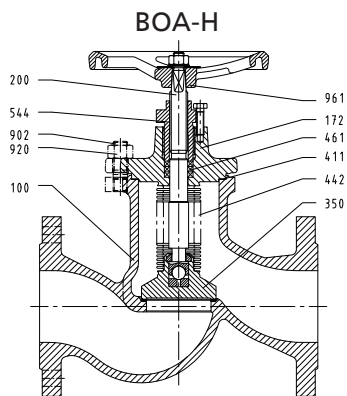
Materials



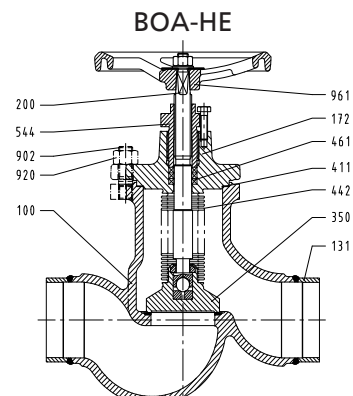
DN 10-50⁵⁾



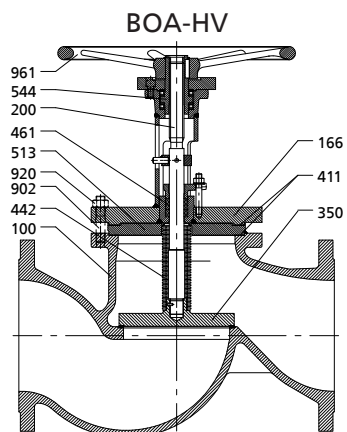
DN 10-50



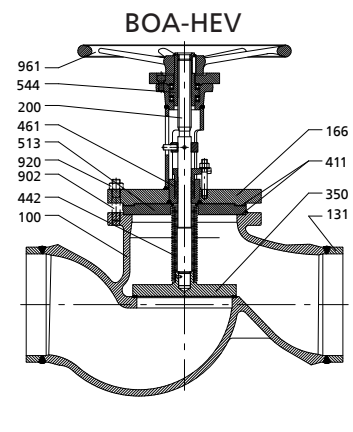
DN 65-200



DN 65-200



DN 250-350



DN 250-350

Overview of available materials

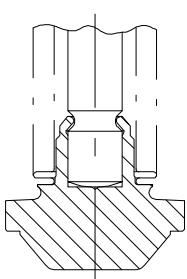
Part No.	Description	Material	Material number	Note
100	Body	P 250 GH	1.0460	Hard-faced with stainless steel (1.4370)
		GP 240 GH+N	1.0619+N	
131	Connection branch	P 235 GH	1.0305	BOA-H ≥ DN 50, BOA-HE ≥ DN 65
166	Yoke	P 250 GH	1.0460	≥ DN 65 DN 250

⁵⁾ DN 10 to 40 with forged body

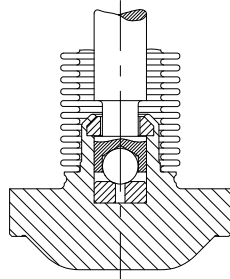
Part No.	Description	Material	Material number	Note	
		P 265 GH	1.0425	≥ DN 300	
172	Bonnet	P 250 GH	1.0460		
200 ⁶⁾	Stem	X 20 Cr 13	1.4021	Nitrided (DN 10-100)	
350 ⁶⁾	Valve disc	X 20 Cr 13	1.4021		
		P 250 GH	1.0460	≥ DN 125	Hard-faced (1.4115)
442 ⁶⁾	Bellows	X 6 CrNiMoTi 17-12-2	1.4571		
544 ⁶⁾	Threaded bush	11 SMn 30+C	1.0715	Nitrided	
		X 39 CrMo 17-1	1.4122	Nitrided, ≥ DN 250	
411 ⁶⁾	Joint ring	CrNi steel/graphite			
461 ⁶⁾	Gland packing	Graphite			
513	Insert ring	P 250 GH	1.0460	≥ DN 250	
902	Stud	21 CrMoV 5-7	1.7709		Olive-chromated
920	Hexagon nut	25 CrMo 4	1.7218		
961	Handwheel	JL1030	0.6020		

Variants

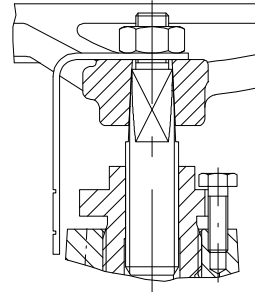
BOA-H/HE



DN 10-50



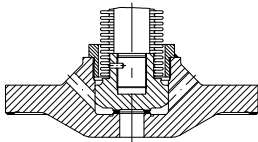
DN 65-200



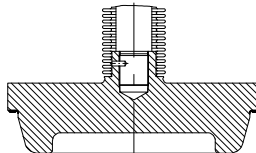
DN 10-200
Position indicator

Throttling plug

BOA-HV/HEV



Balanced plug

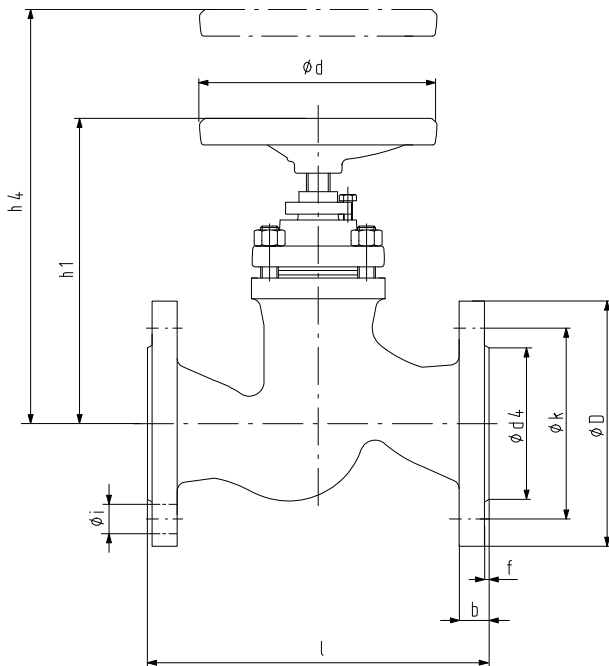


Throttling plug

⁶⁾ Recommended spare parts

Dimensions

BOA-H dimensions



Dimensions in mm

PN	DN	l	ø D	ø k	No. of bolt holes z	Bolt hole dia. i	ø d ₄ x f	b	h ₁ ⁷⁾	h ₄ ⁸⁾	Travel	ø d	[kg]
25/40	10	130	90	60	4	14	40 x 2	16	140	210	4,0	125	3.8
	15	130	95	65	4	14	45 x 2	16	140	210	4,0	125	3.3
	20	150	105	75	4	14	58 x 2	18	165	260	6,5	125	4.8
	25	160	115	85	4	14	68 x 2	18	165	260	6,5	125	5.4
	32	180	140	100	4	18	78 x 2	18	190	290	8,0	160	9.1
	40	200	150	110	4	18	88 x 3	18	200	300	10,0	160	10.2
	50	230	165	125	4	18	102 x 3	20	220	330	12,5	160	13.2
	65	290	185	145	8	18	122 x 3	22	270	420	16,5	200	19.8
	80	310	200	160	8	18	138 x 3	24	305	480	20,0	200	27
	100	350	235	190	8	22	162 x 3	24	345	550	25,0	250	41.7
	125	400	270	220	8	26	188 x 3	26	395	580	31,5	315	66
150	480	300	250	8	26	218 x 3	28	430	620	37,5	315	88	
25	200	600	360	310	12	26	278 x 3	30	500	760	47,5	400	144.6
40	200	600	375	320	12	30	285 x 3	34	500	760	47,5	400	175

Mating dimensions - Standards

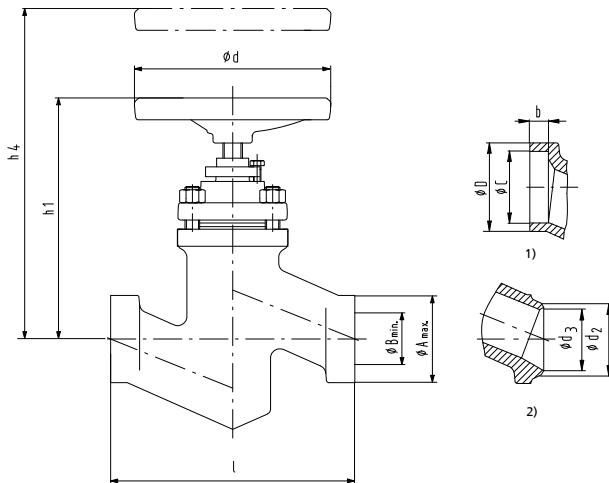
Face-to-face lengths: EN 558-1/1, ISO 5752/1
 Flanges: Mating dimensions to DIN EN 1092, ISO 7005
 Flange facing: DIN EN 1092-2, type B

Other flange designs

- E.g. groove (type D), tongue (type C), recess (type F), spigot (type E) to EN 1092-1 at both ends
- Other flange designs on request

7) Open
 8) Vertical clearance for removal

BOA-HE dimensions



1)	2)
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Dimensions in mm

PN	DN	I	Butt weld ends, unmachined		Butt weld ends to DIN EN 12627			Socket weld ends to DIN EN 12760			h ₁ ⁹⁾	h ₄ ¹⁰⁾	Travel	ø d	[kg]
			ø A _{max.}	ø B _{min.}	ø d ₂	ø d ₃	Associated pipe dimensions	ø D _{-0,5}	ø C ^{+0,2}	b _{min.}					
25/40	10	130	37	10	18	13	17,2 x 2,0	25	17,6	10	165	260	4,0	125	3
	15	130	37	15	22	17	21,3 x 2,0	30,5	21,7	10	165	260	4,0	125	2.9
	20	130	37	20	28	22	26,9 x 2,3	36,5	27,1	13	165	260	6,5	125	3.3
	25	130	37	24	34	28,5	33,7 x 2,6	44,5	33,8	13	165	260	6,5	125	3.2
	32	160	60	33	43	37	42,4 x 2,6	53,5	42,5	13	200	290	8,0	160	5.5
	40	180	60	38	49	43	48,3 x 2,6	60,5	48,7	13	200	300	10,0	160	5.5
	50	210	73	48	61	54	60,3 x 3,2	73,5	61,1	16	220	330	12,5	160	8.3
	65	290	76,1	64,9	76,1	69	76,1 x 3,6				270	420	16,5	200	17
	80	310	88,9	79,9	88,9	81	88,9 x 4,0				305	480	20,0	200	30
	100	350	114,3	100,1	114,3	104	114,3 x 5,0				345	550	25,0	250	40
	125	400	139,7	125,5	139,7	130,5	139,7 x 4,5				395	580	31,5	315	60
	150	480	168,3	148,3	168,3	156,5	168,3 x 5,6				430	620	37,5	315	80
200	600	219,1	199,1	219,1	204,5	219,1 x 7,1				500	760	47,5	400	130	

Mating dimensions - Standards

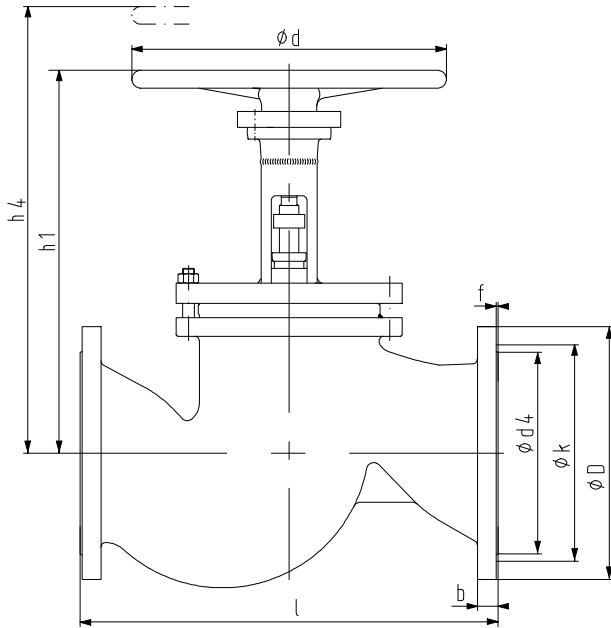
Face-to-face lengths: EN 12982/64
 Butt weld ends: DIN EN 12627 Fig. 2
 Socket weld ends: DIN EN 12760

Different designs of butt weld ends, socket weld ends and welding groove types are possible, but only within the dimensions A_{max.} and B_{min.}.

Butt weld ends to DIN 3239, type 1, or socket weld ends to ASME B16.11/DIN 3239/2 possible.

9) Open
 10) Vertical clearance for removal

BOA-HV dimensions



Dimensions in mm

PN	DN	l	ø D	ø k	No. of bolt holes z	Bolt hole dia. i	ø d ₄ x f	b	h ₁ ¹¹⁾	h ₄ ¹²⁾	ø d	[kg]
25	250	730	425	370	12	30	335 x 3	32	705	1035	500	270
	300	850	485	430	16	30	395 x 4	34	785	1145	630	385
	350	980	555	490	16	33	450 x 4	38	950	1400	800	630
40	250	730	450	385	12	33	345 x 3	38	705	1035	500	300
	300	850	515	450	16	33	410 x 4	42	785	1145	630	430
	350	980	580	510	16	36	465 x 4	46	950	1400	800	660

Mating dimensions - Standards

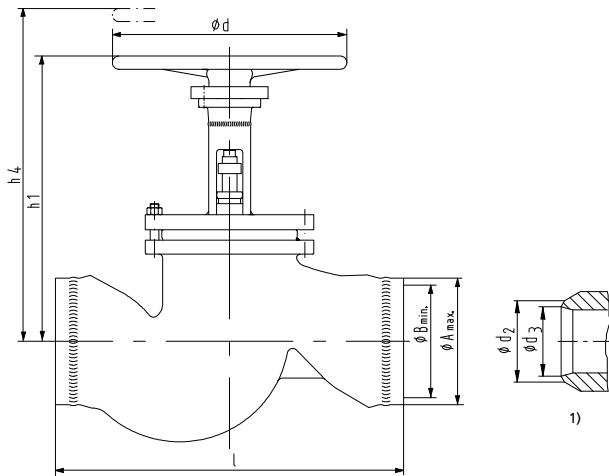
Face-to-face lengths: EN 558-1/1, ISO 5752/1
 Flanges: Mating dimensions to DIN EN 1092, ISO 7005
 Flange facing: DIN EN 1092-2, type B

Other flange designs

- E.g. groove (type D), tongue (type C), recess (type F), spigot (type E) to EN 1092-1 at both ends
- Other flange designs on request

11) Open
 12) Vertical clearance for removal

BOA-HEV dimensions



1) Butt weld end

Dimensions in mm

PN	DN	I	Butt weld ends, unmachined		Butt weld ends to DIN EN 12627			h ₁ ¹³⁾	h ₄ ¹⁴⁾	ø d	[kg]
			ø A _{max.}	ø B _{min.}	ø d ₂	ø d ₃	Associated pipe dimensions				
25/40	250	730	273	251	273	256,5	273,0 x 8,0	705	1035	500	260
	300	950	345	305	323,9	306,5	323,9 x 8,8	785	1145	630	290
	350	1100	385	335	355,6	336,5	355,6 x 10,0	950	1400	800	600

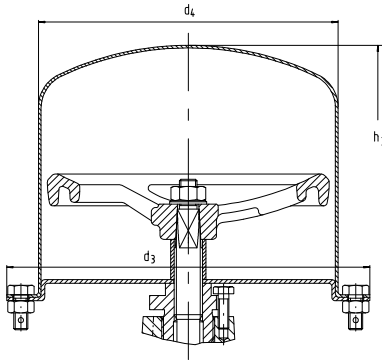
Mating dimensions - Standards

Face-to-face lengths: EN 12982/64 (for DN 250)
or as per table (for DN 300, 350)
Butt weld ends: DIN EN 12627 Fig. 2

Different designs of butt weld ends, socket weld ends and welding groove types are possible, but only within the dimensions A_{max.} and B_{min.}.

13) Open
14) Vertical clearance for removal

Dimensions of lead-sealable cap



Lead-sealable cap (prevents unauthorised closing)

Dimensions in mm

Nominal size DN	d ₃	d ₄	h ₃		[kg]
			BOA-H	BOA-HE	
10	165	130	185	205	0,8
15	165	130	185	205	0,8
20	165	130	205	205	0,8
25	165	130	205	205	0,8
32	205	170	265	275	1,6
40	205	170	275	275	1,6
50	205	170	295	295	1,6
65	256	220	385	385	2,5
80	256	220	415	415	2,5
100	390	340	455	455	6,5
125	390	340	495	495	6,5
150	390	340	520	520	6,5
200	470	420	550	550	9,0

Installation instructions

Shut-off globe valves must be installed in the line so as to ensure that the fluid enters the valve beneath the valve disc and flows out above the valve disc. They can also be installed in lines with alternating flow.

If the max. permissible differential pressures for shut-off are exceeded for valves from DN 125 to 350, a balanced plug design is required. In this case the valve must be installed in such a way that the pressure to be sealed off lies above the valve disc.

The balanced plug works on the bypass principle and can only serve its purpose if backpressure builds up after opening, so that the max. permissible differential pressures for shut-off (see table) are not exceeded.

If a balanced plug design is required for DN 125 to 200, a NORI 40 ZXLBV/ZXSbv or ZXLB/ZXSb shut-off valve must be used.

Differential pressures in bar (standard valve disc)

DN	125	150	200	250	300	350
Δp [bar]	33	21	14	9	6	4,5

For globe valves with throttling plug, detailed information about the operating mode is required for optimum valve selection.

По вопросам продаж и поддержки обращайтесь:

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	Самара (846)206-03-16	

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