

Globe Valve

**BOA-H**

**Type Series Booklet**



## **Legal information/Copyright**

Type Series Booklet BOA-H

All rights reserved. The contents provided herein must neither be distributed, copied, reproduced, edited or processed for any other purpose, nor otherwise transmitted, published or made available to a third party without the manufacturer's express written consent.

Subject to technical modification without prior notice.

© KSB SE & Co. KGaA, Frankenthal 2022-12-07

## Contents

<b>Globe Valves.....</b>	<b>4</b>
Bellows-type Globe Valves to DIN/EN .....	4
BOA-H .....	4
Main applications.....	4
Fluids handled .....	4
Operating data.....	4
Valve body materials.....	4
Design details .....	4
Product benefits .....	5
Product information .....	5
Related documents .....	5
Purchase order specifications .....	5
Pressure/temperature ratings.....	5
Materials.....	6
Variants.....	8
Colour coding system.....	9
Dimensions and weights.....	10
Installation information.....	12
Chemical resistance chart .....	13

## 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

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

#### Operating data

Table 1: 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 - 350 <sup>1)</sup>
Max. permissible pressure [bar]	16	25
Min. permissible temperature [°C]	≥ -10	≥ -10
Max. permissible temperature [°C]	≤ +300	≤ +350

<sup>1</sup> PN 25: DN 15-150

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

#### Valve body materials

##### Straight-way valve

Table 2: Overview of available materials

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

##### Angle valve

Table 3: Overview of available materials

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

##### 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

## Product benefits

- High operating comfort at no extra charge: 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 even bonnet suitable for easy and inexpensive insulation.
- Added protection against fatigue fracture: The bellows is welded to the stem, so no vibrations are transmitted from the valve disc.
- Back-up gland packing provides additional safety in case of defective bellows.
- Colour coding 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.

## Product information

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

For information as per European chemicals regulation (EC) No. 1907/2006 (REACH) see <https://www.ksb.com/en-global/company/corporate-responsibility/reach>.

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

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 (zone 2+22) to ATEX 2014/34/EU.

### 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.

## Pressure/temperature ratings

**Table 5:** Test pressure and operating pressure

PN	Material	Shell test	Leak test (seat)	Permissible operating pressure [bar] <sup>2)3)</sup>								
		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	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	

## Product information as per UK Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016

The valves do not have a potential internal source of ignition and can be used in accordance with the UK's Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zone 2+22).

## Product information as per UK Pressure Equipment (Safety) Regulations 2016

The valves satisfy the safety requirements of the UK Pressure Equipment (Safety) Regulations 2016 (PER) for fluids in Groups 1 and 2.

## Related documents

**Table 4:** Information/documents

Document	Reference number
Flow characteristics	7150.4
Operating manual	0570.8
Assembly instructions "Accessories Set: Lead-sealable Handwheel Cap"	0570.811
Installation instructions "Limit switch set"	0570.812
Typical tender for BOA-H JL	7150.521
Typical tender for BOA-H JS PN 16	7150.522
Typical tender for BOA-H JS PN 25	7150.523

## 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

<sup>2</sup> Intermediate temperatures can be derived by linear interpolation.

<sup>3</sup> Static load

## Materials

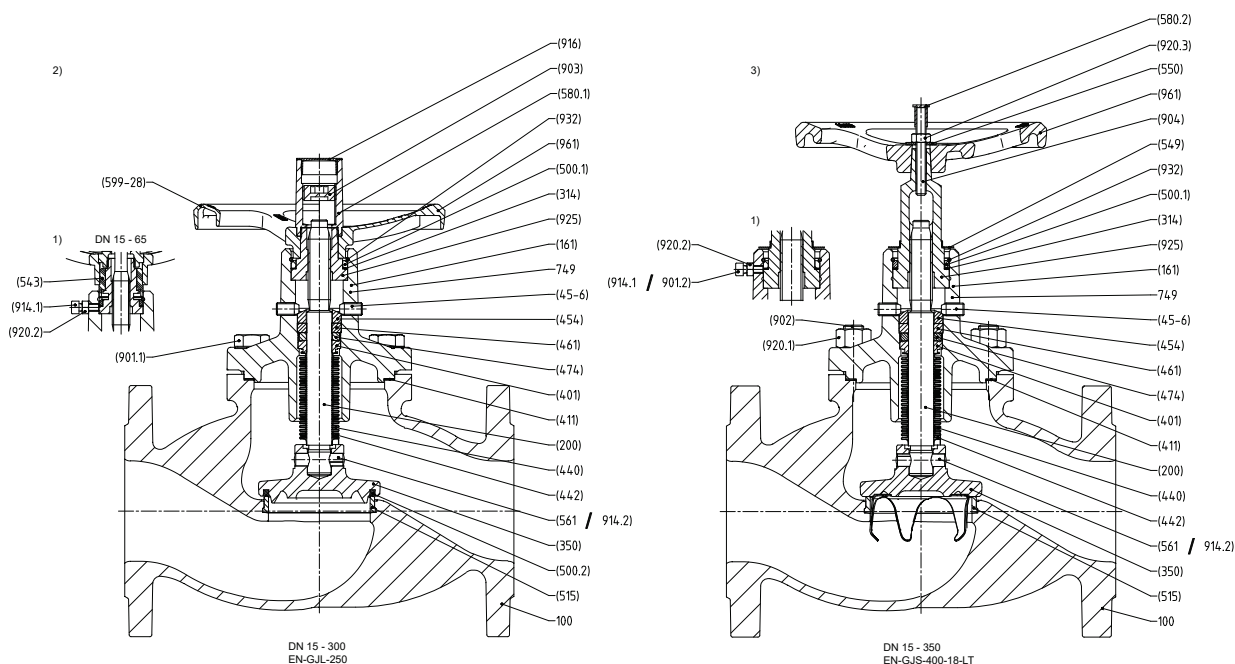


Fig. 1: Sectional drawings; 1) shown rotated by 90°; 2) variant with PTFE ring on valve disc; 3) variant with V-port plug

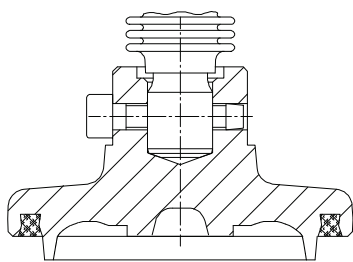
Table 6: Parts list

Part No.		Description	Material	Variant	Note
100 <sup>4)</sup>		Body assembly, complete			
	100	Body	EN-GJL-250 (5.1301)	EN-GJL-250	-
			EN-GJS-400-18-LT (5.3103)	EN-GJS-400-18-LT	-
	411 <sup>4)</sup>	Joint ring	CrNi steel/graphite 1 F	-	-
	515	Seat ring	1.4104+A+SH	-	DN 15 - 25
			1.4301	-	DN 32 - 350
	901.1	Hexagon head bolt	8.8	EN-GJL-250	-
	902	Stud	C35E+QT	EN-GJS-400-18-LT	-
	920.1	Hexagon nut	C35E+N	EN-GJS-400-18-LT	-
749 <sup>4)</sup>		Bonnet assembly, complete			
	161	Body bonnet	EN-GJL-250 (5.1301)	EN-GJL-250	-
			EN-GJS-400-18-LT (5.3103)	EN-GJS-400-18-LT	-
	350	Throttling plug	1.4104+QT650	Basic design	DN 15 - 40
		V-port plug	1.4104+QT650	Variant with V-port plug	DN 15 - 40
350 <sup>4)</sup>		Valve disc assembly, complete with grooved pin			
	350	Throttling plug / On/off disc	1.4021+QT800	Basic design	DN 50 - 150
		On/off disc	1.0402 / 1.4370	Basic design	DN 200 - 350
		Balanced plug	1.4021+QT800	Variant with balanced plug	DN 200 - 350
		Throttling plug / On/off disc / PTFE	1.4021+QT800	Variant with PTFE valve disc	DN 50 - 150
		On/off disc / PTFE	1.0402 / 1.4370	Variant with PTFE valve disc	DN 200

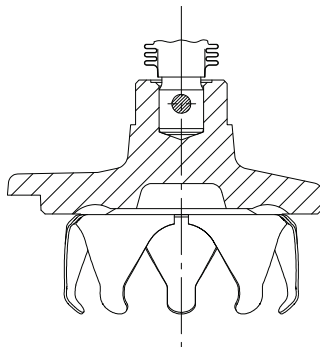
<sup>4)</sup> Spare part

Part No.		Description	Material	Variant	Note
	350	V-port plug	1.4021+QT800 / 1.4301	Variant with V-port plug	DN 50 - 150
			1.0402 / 1.4370 / 1.4310	Variant with V-port plug	DN 200 - 350
	500.2 <sup>4)</sup>	Ring	PTFE	Variant with PTFE valve disc	DN 15 - 200
	561	Grooved pin	45 H+A2A	-	DN 50 - 300
	411 <sup>4)</sup>	Joint ring	CrNi steel/graphite 1 F	-	-
	<b>440</b>	<b>Bellows assembly</b>			
	200	Stem	Stainless steel, min. 13 % chrome (Cr)	-	-
	401	Weld ring	1.4021+QT800	-	-
	442	Bellows	1.4541	-	-
	45-6	Stuffing box screw	45 H	-	-
	454	Stuffing box ring	46S20+C	-	-
	461	Gland packing	GH1,4-IA	-	-
	474	Thrust ring	1.4104	-	-
	549	Collar bush	DC01-B	EN-GJS-400-18-LT	DN 15 - 150
	550	Disc	ST A2A	EN-GJS-400-18-LT	DN 15 - 150
	580.1	Cap	1.4027	EN-GJL-250	DN 200 - 300
	580.2	Protective cap	TPE	EN-GJS-400-18-LT	-
	<b>599-28<sup>4)</sup></b>	<b>Handwheel spare parts kit assembly, material variant: EN-GJL-250</b>			
	543 <sup>4)</sup>	Spacer bush	-	EN-GJL-250	DN 15 - 65
	<b>580.1<sup>4)</sup></b>	<b>Cap assembly incl. travel stop, material variant: EN-GJL-250</b>			
	580.1	Cap	PA 66-GF 35	EN-GJL-250	DN 15 - 150
	903	Screw plug	ST+GAL ZN	EN-GJL-250	DN 15 - 150
	916	Plug	PE-LD	EN-GJL-250	DN 15 - 150
	961 <sup>4)</sup>	Handwheel	AC-46200F-D	EN-GJL-250	DN 15 - 150
	900.1	Screw	1.4021+QT 800	EN-GJL-250	DN 200 - 300
	904	Grub screw	45 H+A2A	EN-GJS-400-18-LT	-
	<b>914.1</b>	<b>Locking device assembly, material variant: EN-GJL-250</b>			
	914.1	Hexagon socket head cap screw	8.8+A2A	EN-GJL-250	DN 50 - 300
	920.2	Hexagon nut	8 +A2A	EN-GJL-250	-
	914.2	Hexagon socket head cap screw	8.8+A2A	EN-GJL-250	DN 15 - 40
	<b>914.1</b>	<b>Locking device assembly, material variant: EN-GJS-400-18-LT</b>			
	901.2	Hexagon head bolt	8.8	EN-GJS-400-18-LT	DN 125 - 350
	914.1	Hexagon socket head cap screw	8.8+A2A	EN-GJS-400-18-LT	DN 15 - 100
	920.2	Hexagon nut	8 +A2A	EN-GJS-400-18-LT	-
	916	Plug	PE-LD	EN-GJL-250	DN 200 - 300
	920.2	Hexagon nut	8+A2A	EN-GJS-400-18-LT	-
	<b>925</b>	<b>Stem nut assembly</b>			
	314	Thrust bearing	Steel/PTFE	-	-
	500.1	Ring	ST+GAL ZN	-	-
	925	Stem nut	46S20+C	-	-
	932	Circlip	1.4310	-	-
	961 <sup>4)</sup>	Handwheel	EN-GJL-250	-	DN 200 - 350
	961 <sup>4)</sup>	Handwheel	EN-GJL-200	EN-GJS-400-18-LT	DN 15 - 350

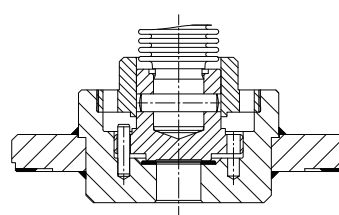
## Variants



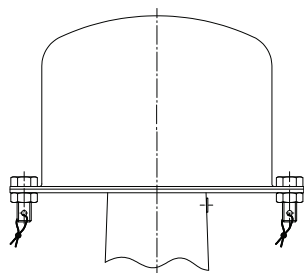
Throttling plug with PTFE gasket,  
DN 15 - 100



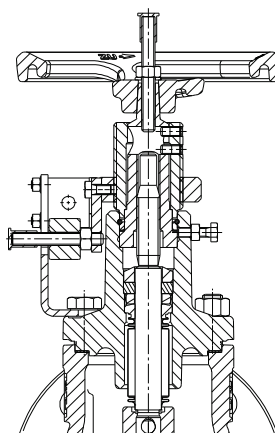
V-port plug



Balanced plug from DN 200



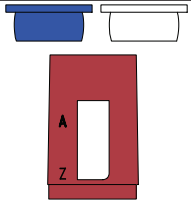

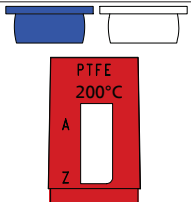
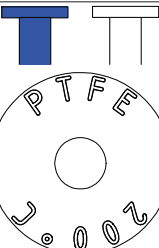

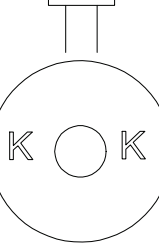
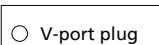
Lead-sealable cap (prevents  
unauthorised actuation) as assembly  
set



Limit switch

Fig. 2: Sectional drawings of variants

### 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
	Cap colour: purple red up to DN 150				
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
	Cap colour: vermilion up to DN 150			Sheet metal disc	
V-port plug (DN 15 - 300)			V-port plug (DN 15 - 150)		
Tag on handwheel					White plug
				Sheet metal disc	
			V-port plug (DN 200 - 350)		
			Tag on handwheel		

## Dimensions and weights

### Dimensions and weights PN 16, EN-GJL-250

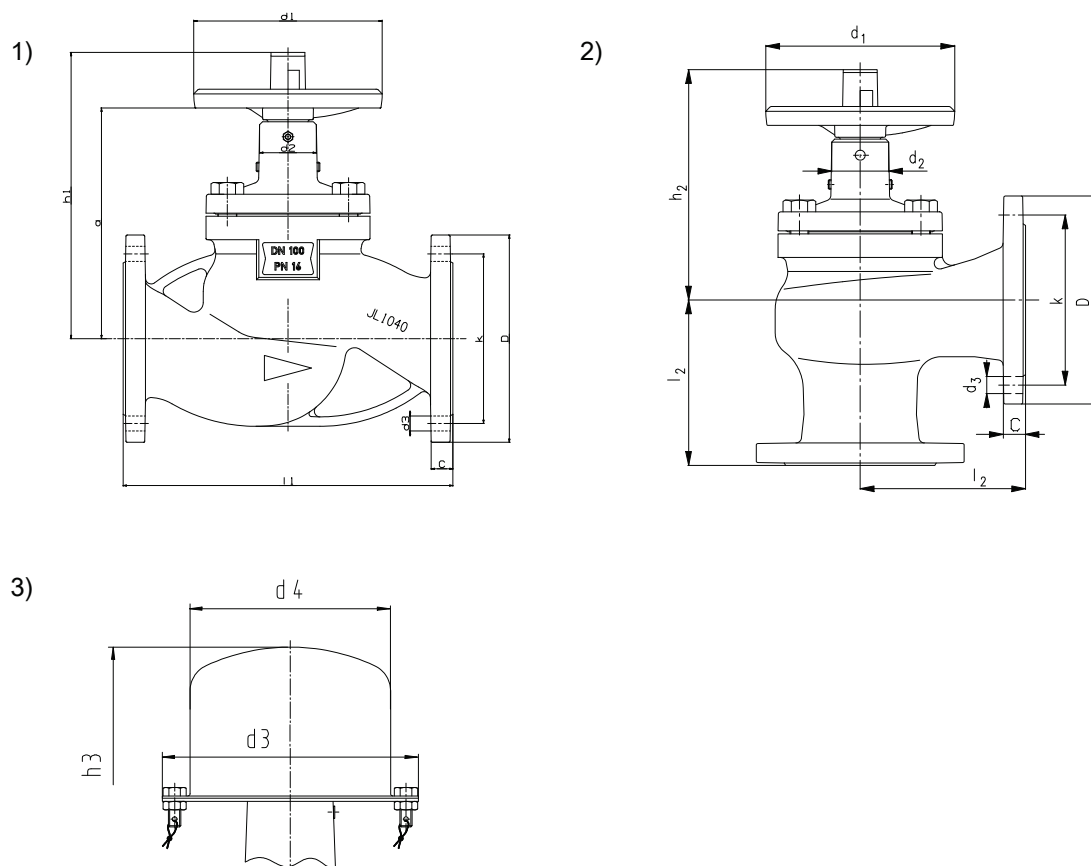


Fig. 3: 1) Straight-way valve; 2) Angle valve; 3) Lead-sealable cap (prevents unauthorised actuation) as assembly set

Table 7: Dimensions and weights

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

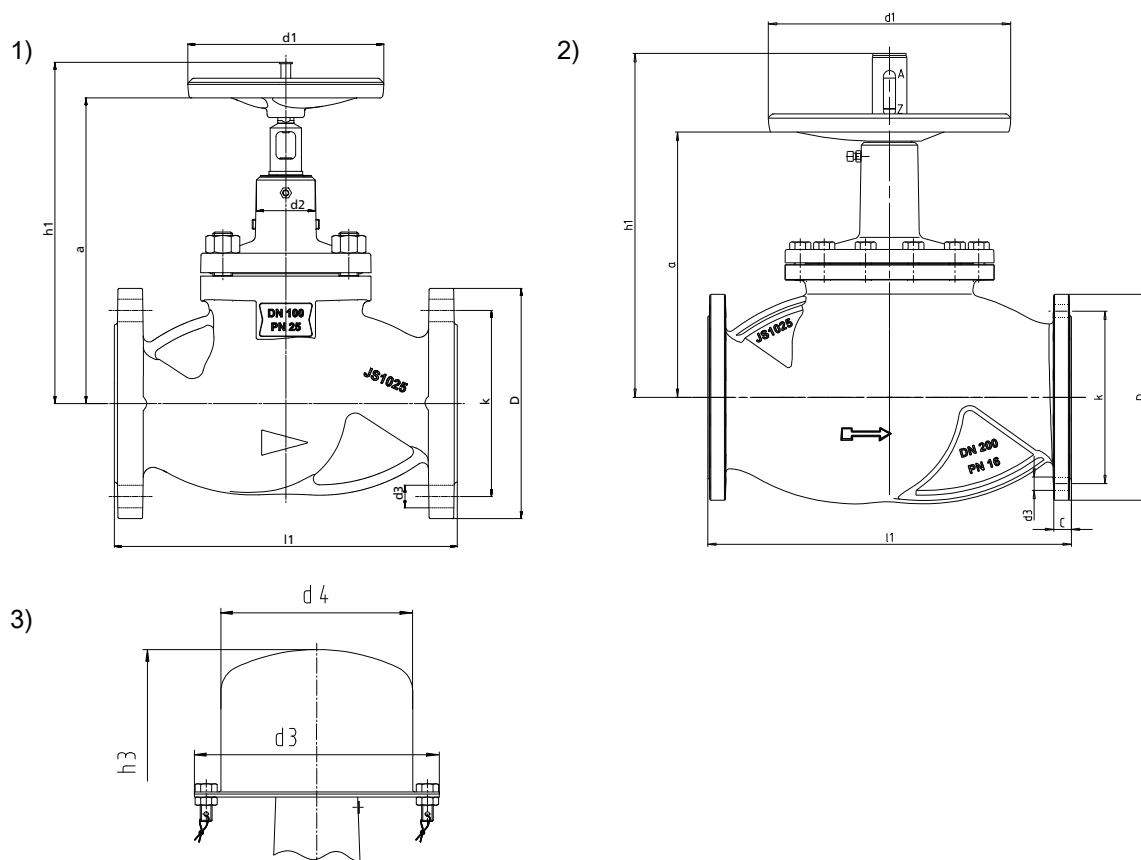
**Mating dimensions as per standard**

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); 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

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



**Fig. 4:** 1) PN 16/25 up to DN 150; 2) PN 16 DN 200 - 350; 3) Lead-sealable cap (prevents unauthorised actuation) as assembly set

**Table 8: Dimensions and weights**

PN	DN	a	d <sub>1</sub>	d <sub>2</sub>	h <sub>1</sub>	l <sub>1</sub>	Flange				[kg]	Capped valve		
		[mm]	[mm]	[mm]	[mm]	[mm]	C	D	k	n × d <sub>3</sub>		d <sub>3</sub>	d <sub>4</sub>	h <sub>3</sub>
							[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]
16	15	179	125	47	211	130	14	95	65	4 × 14	3,1	166	130	222
	20	182	125	47	214	150	16	105	75	4 × 14	4,1	166	130	225
	25	188	125	47	220	160	16	115	85	4 × 14	4,6	166	130	231
	32	203	125	47	238	180	18	140	100	4 × 19	8,1	166	130	246
	40	208	125	47	243	200	18	150	110	4 × 19	8,5	166	130	251
	50	240	160	51	266	230	20	165	125	4 × 19	11	210	170	298
	65	250	160	51	290	290	20	185	145	4 × 19	17	210	170	308
	80	290	200	60	324	310	22	200	160	8 × 19	21	270	220	391
	100	312	200	60	348	350	24	220	180	8 × 19	31	270	220	415
125	400	250	80	460	400	26	250	210	8 × 19	51	390	340	480	

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


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.

**Table 9:** Differential pressures [bar]

PN	DN	Δp
16	150	-
16	200	12
16	250	9
16	300/350	6
25	150	21 <sup>5)</sup>

The balanced plug only takes effect if the pressure to be sealed lies above the plug. 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).

<sup>5</sup> 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. The information provided in this list is for orientation only. Warranty claims may not be asserted on the basis of this list.

**Table 10: 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.

**Table 11: Chemical resistance chart for water<sup>6)</sup>**

Fluids handled	A <sup>7)</sup>	B <sup>8)</sup>
Brackish water <sup>9)</sup>	✗	✗
Service water <sup>9)</sup>	✓	✓
Fire-fighting water	✓	✓
Chlorinated water (≤ 0.6 mg/kg)	✓	✓
Deionised water (demineralised water) <sup>10)</sup>	○	○
Distilled water <sup>10)</sup>	○	○
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 <sup>9)</sup>	○	○
Raw water <sup>9)</sup>	✓	✓
Partly desalinated water <sup>10)</sup>	○	○
Fully desalinated water <sup>10)</sup>	○	○
Municipal waste water <sup>9)</sup> <sup>11)</sup>	✓	✓
Industrial waste water <sup>9)</sup> <sup>12)</sup>	✓	✓

**Table 12: Chemical resistance chart for oils (aromatic content 5 mg/kg)**

Fluids handled	A <sup>7)</sup>	B <sup>8)</sup>
Vegetable oils	✓	✓
Mineral oils	✓	✓
Synthetic oils	✓	✓

Fluids handled	A <sup>7)</sup>	B <sup>8)</sup>
Crude oil	✓	✓
Petroleum	✓	✓
Light fuel oil	✓	✓
Linseed oil	✓	✓
Oil/water emulsion <sup>9)</sup>	✓	✓
Jet fuel	○ <sup>13)</sup>	✓
Petrol	○ <sup>13)</sup>	✓
Kerosene	○ <sup>13)</sup>	✓

**Table 13: Chemical resistance chart for refrigerants**

Fluids handled	A <sup>7)</sup>	B <sup>8)</sup>
Ammonium hydroxide (≤ 30 %, ≤ 25 °C)	✓	✓
Glycol (ethylene glycol)	✓	✓
Propylene glycol	✓	✓
Water/glycol mixture (20 % ≤ c ≤ 50 %, ≤ 90 °C)	✓	✓
Inorganic cooling brine, pH 7.5	✓	✓

**Table 14: Chemical resistance chart for thermal oils**

Fluids handled	A <sup>7)</sup>	B <sup>8)</sup>
Synthetic thermal oils	✓	✓
Mineral-based thermal oils	✓	✓

**Table 15: Chemical resistance chart for acids**

Fluids handled	A <sup>7)</sup>	B <sup>8)</sup>
Hydrochloric acid	✗	✗
Sulphuric acid (pure, technical, concentrated)	✗	✗
Sulphurous acid	✗	✗
Fatty acid	✗	✗
Nitric acid	✗	✗

**Table 16: Chemical resistance chart for cleaning agents**

Fluids handled	A <sup>7)</sup>	B <sup>8)</sup>
Lye for bottle rinsers (e.g. P3) ≤ 80 °C <sup>9)</sup>	○	○
Lye for metal cleaning ≤ 80 °C <sup>9)</sup>	○	○

**Table 17: Chemical resistance chart for steam**

Fluids handled	A <sup>7)</sup>	B <sup>8)</sup>
Saturated steam	○ <sup>13)</sup>	✓

**Table 18: Chemical resistance chart for other fluids**

Fluids handled	A <sup>7)</sup>	B <sup>8)</sup>
Sodium hydroxide (≤ 50 %, ≤ 50 °C)	○	○
Natural gas	✓	✓
Oil-containing compressed air	✓	✓
Dry chlorine (≤ 30 °C)	○	✓
Ammonia	✓	✓
Butane (liquefied gas)	✓	✓

<sup>6)</sup> General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl<sup>-</sup>) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO<sub>2</sub>), oxygen (O<sub>2</sub>) and dissolved substances. Contact KSB if limits are exceeded!

<sup>7)</sup> EN-GJL-250, Tmax. +300 °C

<sup>8)</sup> EN-GJS-400-18-LT, Tmax. +350 °C

<sup>9)</sup> Without solids

<sup>10)</sup> 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.

<sup>11)</sup> Biologically treated

<sup>12)</sup> Non-corrosive, non-abrasive

<sup>13)</sup> EN-GJS-400-18-LT is recommended for safety reasons (ductility).

Fluids handled	A <sup>7)</sup>	B <sup>8)</sup>
Aqueous glycerine	✓	✓
Carbon dioxide (gas)	✓	✓
Carbon dioxide (aqueous solution)	✗	✗





**KSB SE & Co. KGaA**  
Johann-Klein-Straße 9 • 67227 Frankenthal (Germany)  
Tel. +49 6233 86-0  
[www.ksb.com](http://www.ksb.com)