

**Maintenance-free
metal-seated
globe valves**

with bellows

Grey cast iron	PN 16	DN 15-300
Nodular cast iron	PN 16	DN 15-350
Nodular cast iron	PN 25	DN 15-150

Application

- Hot-water heating systems DIN 4751
- High temperature hot-water heating systems DIN 4752
- Heat transfer systems DIN 4754
- Pressure vessel equipment to TRB 801 no. 45 ¹⁾
- Steam boiler installations to TRD 108/110 ¹⁾
- Other fluids on request

¹⁾ Please contact KSB for limitations imposed by the applicable technical codes.

Operating data

- Temperature range:
 - 10 up to +300 °C for EN-GJL-250, JL 1040
 - 10 up to +350 °C for EN-GJS-400-18-LT, JS 1025
- Max. operating pressure: up to 16 bar
(up to 25 bar for EN-GJS-400-18-LT, JS 1025)

Materials

Body:

- Straight-way pattern:
 - Lamellar graphite cast iron EN-GJL-250, JL 1040 *)
 - Nodular cast iron EN-GJS-400-18-LT, JS 1025 *)
- Angle pattern:
 - Lamellar graphite cast iron EN-GJL-250, JL 1040 *)
- For further details see table of materials

Design

- Straight-way or angle pattern with straight seat
- Throttling plug up to DN 100 (> DN 100: on/off plug)
- Position indicator, locking device and travel stop for all valve sizes
- Compact bonnet
- Maintenance-free stem sealed by bellows and back-up gland packing
- Non-rising handwheel
- Flanges to DIN EN 1092-2 type 21
- Free from asbestos, PCB and CFC
- Exterior finish: blue RAL 5002

The valves meet the safety requirements of the Pressure Equipment Directive 97/23/EC (PED) of annex I for fluids of the groups 1 and 2.

Standard variants

- Throttling plug for DN > 100
- Plug with PTFE seal ring (max. 200 °C, throttling plugs DN 15-100, on/off plugs DN 125-200)
- Lead-sealable cap against unauthorized closing
- Pilot plug design from DN 200
- Grey aluminium high-temperature resistant paint for applications > 200 °C
- Oil and grease-free design
- Special flange designs
- Bolts having high impact strength at low temperature down to -30 °C (only for JS 1025)
- 3.1 B certification

Additional information

- Valve characteristics 7150.4
- Chemical resistance chart 7150.2
- Operating instructions 0570.8

On all inquiries/orders please specify

Globe valve

1. BOA[®]-H according to type series booklet 7150.1
2. PN 16 or PN 25
3. EN-GJL-250, JL 1040 or EN-GJS-400-18-LT, JS 1025
4. Straight-way or angle pattern (angle pattern only in EN-GJL-250, JL 1040)
5. DN 15-350 (DN 350 only in EN-GJS-400-18-LT, JS 1025)
6. Standard variants

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) according to ATEX 94/9/EC.



Test and operating pressures

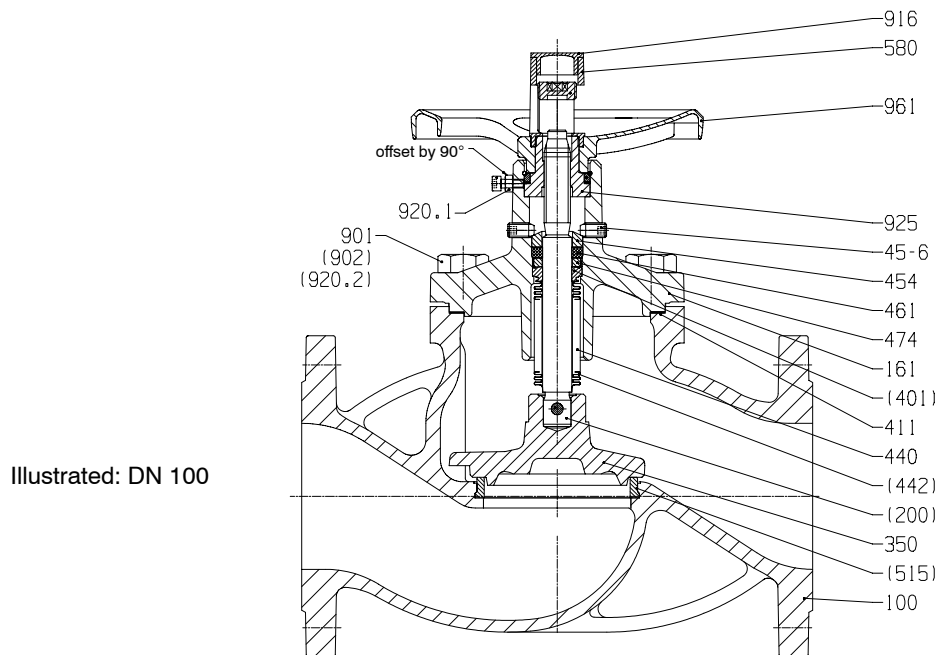
Nominal pressure PN	Material	Body pressure test in bar with water		Pressure / Temperature ratings ³⁾				
		1) bar	2) bar	- 10 up to + 120 °C	200	250	300	350
16	EN-GJL-250	24	16	16	12.8	11.2	9.6	-
	EN-GJS-400-18-LT			16	14.7	13.9	12.8	11.2
25	EN-GJS-400-18-LT	37.5	25	25	23	21.8	20	17.5

¹⁾ DIN EN 12266-1 (P10, P11)

²⁾ DIN EN 12266-1 (P12 leak rate A)

³⁾ Intermediate temperatures can be derived by linear interpolation.

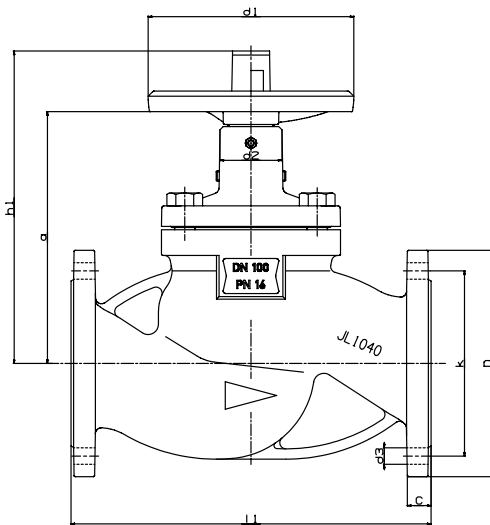
Please note: DIN EN 1092-2, para. 5.3, AD W7, TRD 106 and plant-specific regulations must be observed when selecting connecting elements between the valve flanges and the pipeline flanges.



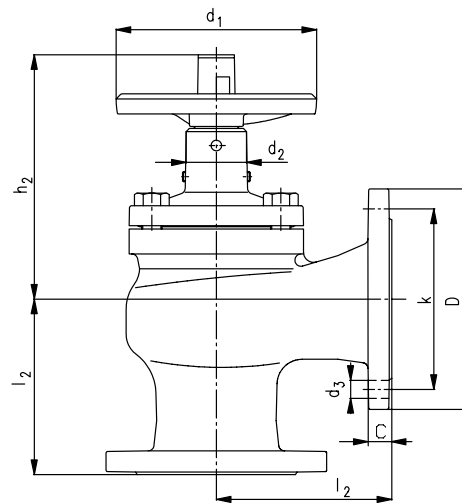
Illustrated: DN 100

Materials

Part No.	Description	DN	Material/Material designation	Material No.
100	Body	15-300	EN-GJL-250	JL1040
		15-350	EN-GJS-400-18-LT	JS1025
161	Bonnet	15-300	EN-GJL-250	JL1040
		15-350	EN-GJS-400-18-LT	JS1025
350	Valve plug	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	Gasket		CRNiSt-graphite	
440	Bellows set comprising:			
200	Stem		Stainless steel (min. 13% Cr)	
401	Welding ring		Stainless steel	
442	Bellows		X 6 CrNiTi 18 10	1.4541
454	Gland ring		Stainless steel	
45-6	Gland bolt		Steel	
461	Gland packing		Pure graphite	
474	Thrust ring		Stainless steel	
515	Seat ring		Stainless steel	
543	Spacer bush	15-65	Glass fibre reinforced plastic	
580	Cap	15-150	Glass-fibre reinforced plastic, impact resistant	
		200-350	Steel	
901	Hex. head bolt		8.8 for EN-GJL-250	
902	Stud		CK 35 V for EN-GJS-400-18-LT	
920	Hex. nut		C35 for EN-GJS-400-18-LT	
916	Plug		Plastic	
925	Stem nut		Steel, coated	
961	Handwheel	15-150	Aluminium die-cast	
		200-350	EN-GJL-250	JL1040

Dimensions PN 16


Straight-way pattern

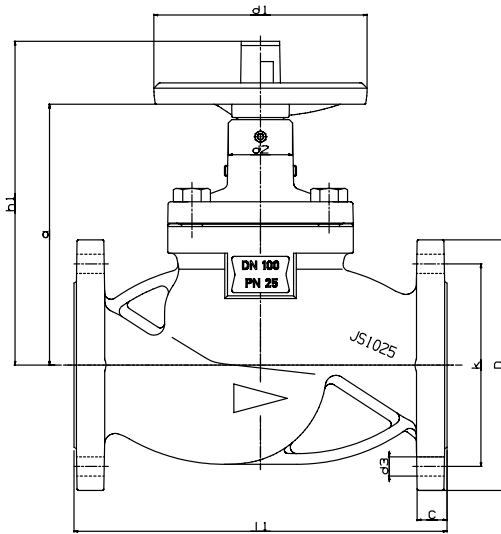


Angle pattern

 a and d₂ insulation dimensions

Dimensions (mm)													Weight approx.	
PN	DN	l ₁	l ₂	h ₁	h ₂	d ₁	d ₂	a	D	k	n x d ₃	C	Straight-way pattern	Angle pattern
													kg	kg
16 JL1040	15	130	90	175	150	125	47	137	95	65	4 x 14	14	3.1	3.2
	20	150	95	178	153	125	47	140	105	75	4 x 14	16	4.0	4.0
	25	160	100	184	151	125	47	146	115	85	4 x 14	16	4.7	4.8
	32	180	105	205	170	125	47	161	140	100	4 x 19	18	7.3	7.5
	40	200	115	210	172	125	47	166	150	110	4 x 19	18	7.7	7.7
	50	230	125	235	198	160	51	190	165	125	4 x 19	20	10.2	9.6
	65	290	145	246	198	160	51	201	185	145	4 x 19	20	17.0	16.3
	80	310	155	282	226	200	60	223	200	160	8 x 19	22	22.0	21.8
	100	350	175	304	244	200	60	245	220	180	8 x 19	24	32.0	30.8
	125	400	200	390	316	250	80	310	250	210	8 x 19	26	54.0	48.3
	150	480	225	408	320	250	80	328	285	240	8 x 23	26	70.5	65.7
	200	600	275	570	468	400	93	440	340	295	12 x 23	30	130.0	114.2
250	730	325	606	480	400	93	476	405	355	12 x 28	32	230.0	180.5	
300	850	375	660	510	400	93	530	460	410	12 x 28	32	328.0	267.5	
16 JS1025	15	130	-	175	-	125	47	137	95	65	4 x 14	14	3.1	-
	20	150	-	178	-	125	47	140	105	75	4 x 14	16	4.1	-
	25	160	-	184	-	125	47	146	115	85	4 x 14	16	4.6	-
	32	180	-	205	-	125	47	161	140	100	4 x 19	18	8.1	-
	40	200	-	210	-	125	47	166	150	110	4 x 19	18	8.5	-
	50	230	-	235	-	160	51	190	165	125	4 x 19	20	11.0	-
	65	290	-	246	-	160	51	201	185	145	4 x 19	20	17.0	-
	80	310	-	282	-	200	60	223	200	160	8 x 19	22	21.0	-
	100	350	-	304	-	200	60	245	220	180	8 x 19	24	31.0	-
	125	400	-	390	-	250	80	310	250	210	8 x 19	26	51.0	-
	150	480	-	408	-	250	80	328	285	240	8 x 23	26	68.5	-
	200	600	-	570	-	400	93	440	340	295	12 x 23	30	139.0	-
250	730	-	606	-	400	93	476	405	355	12 x 28	32	239.0	-	
300	850	-	660	-	400	93	530	460	410	12 x 28	32	343.0	-	
350	980	-	660	-	400	93	530	520	470	16 x 28	36	390.0	-	

Dimensions PN 25



a and d₂ insulation dimensions

Dimensions (mm)											Weight approx.
PN	DN	l1	h1	d1	d2	a	D	k	n x d3	C	Straight-way pattern kg
25 JS1025	15	130	175	125	47	137	95	65	4 x 14	14	3.1
	20	150	178	125	47	140	105	75	4 x 14	16	4.1
	25	160	184	125	47	146	115	85	4 x 14	16	4.6
	32	180	205	125	47	161	140	100	4 x 19	18	8.2
	40	200	210	125	47	166	150	110	4 x 19	18	8.5
	50	230	235	160	51	190	165	125	4 x 19	20	11.0
	65	290	246	160	51	201	185	145	8 x 19	20	17.0
	80	310	282	200	60	223	200	160	8 x 19	22	28.9
	100	350	304	200	60	245	235	190	8 x 23	24	40.0
	125	400	390	250	80	310	270	220	8 x 28	26	65.0
150	480	408	250	80	328	300	250	8 x 28	26	89.0	

Installation instructions

The flow direction in BOA[®]-H shut-off globe valves should correspond to the embossed arrow on the body. An alternating flow direction is permissible for the standard valve plug, but not for the throttling plug. If the following differential pressures are exceeded on valves with standard valve plugs from DN 200 upwards, a pilot plug design is required. The pilot plug only takes effect if there is a pressure build-up on the outlet side. Valves with throttling plugs can only be used up to these differential pressures.

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

Connection dimensions - Standards:

Flanges: DIN EN 1092-2, flange type 21 - JL1040
 flange type 21-21 - JS1025
 Flange facing: DIN EN 1092-2, type B

Face-to-face dimensions

Straight-way pattern: EN 558-1/1 (previously: DIN 3202/F 1)
 ISO 5752/1
 Angle pattern: EN 558-1/8 (previously: DIN 3202/F 32)
 ISO 5752/8

Product features - to our customers' Benefit (1)

Non-rotating stem, protected external thread

Your benefit

- High operating reliability

Bellows welded to the stem

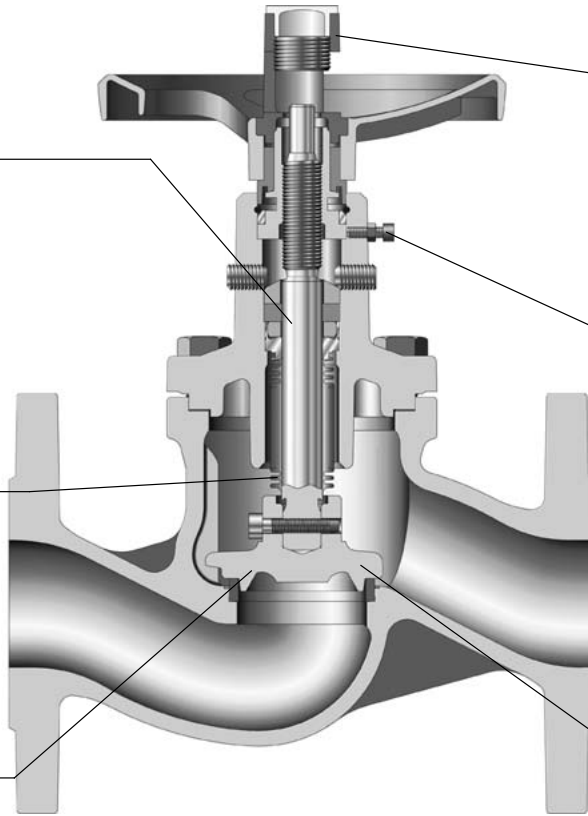
Your benefit

- No vibrations transmitted from plug to bellows

Standard-equipped throttling plug up to DN 100

Your benefit

- Flow regulation at any time and at no extra cost



Standard-equipped position indicator with travel stop located outside the insulation

Your benefit

- Position of valve plug can be identified at any time
- Valve can be exactly set to its original position after closing

Standard-equipped locking device

Your benefit

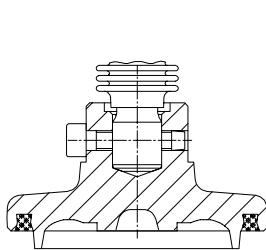
- Protection against accidental valve actuation

Replaceable plug

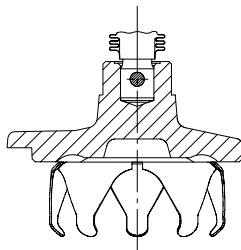
Your benefit

- Reduced maintenance cost as the valve plug can be replaced without having to replace the entire bonnet

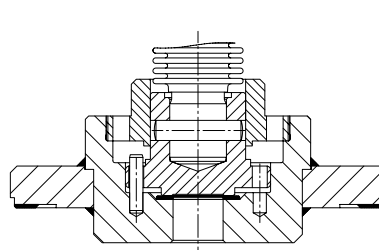
Variants



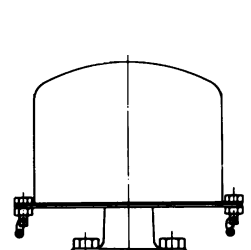
Throttling plug with PTFE seal ring, DN 15-100



Throttling plug from DN 125



Pilot plug design from DN 200



Lead-sealable cap

Product features - to our customers' Benefit (2)

Colour coded position indicator

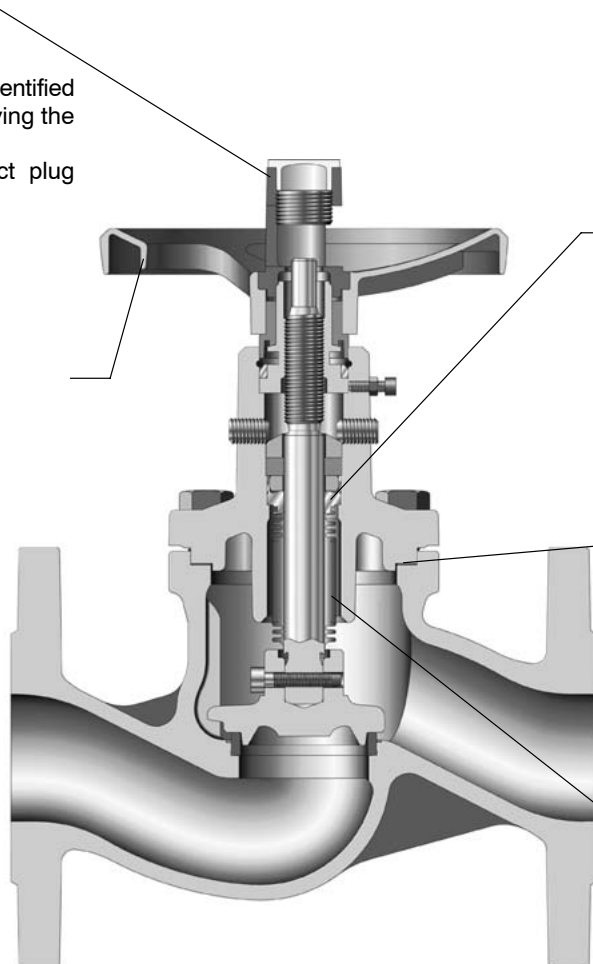
Your benefit

- Valve plug type can be identified externally, without removing the insulation
- Guards against incorrect plug replacement

Non-rising handwheel

Your benefit

- Ideal in confined spaces



Back-up gland packing of pure graphite, e. g. for heat transfer systems to DIN 4754

Your benefit

- Extra safety in the event of a bellows failure

Fully confined bonnet gasket

Your benefit

- Gasket cannot creep out of joint, longer gasket life

Protected bellows when valve is fully open

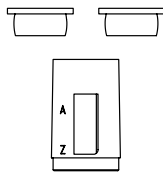
Your benefit

- Bellows protected against pressure surges

Subject to technical modification without prior notice

Colour coding system

Blue plug:
on/off plug

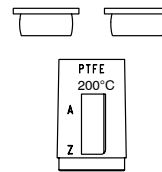


Crimson red
cap:

metal-seated plug

White plug:
throttling plug

Blue plug:
on/off plug



Blood orange
cap:

Design:
plug with PTFE gasket

White plug:
throttling plug

**Maintenance-free
metallic-seat
non-return valves**



flanged

**PN 6, 16
DN 15-350**

Application

- Warm-water heating systems DIN 4751
- Hot-water heating systems DIN 4752
- Heat-transfer installation DIN 4754
- Pressure vessel equipment to TRB 801 nr. 45¹⁾
- Boiler installations to TRD 108/110¹⁾

1) Please contact KSB for limitations imposed by the applicable technical codes.

Operating data

- Temperature range:
 - 10 up to +300 °C for EN-GJL-250 *)
 - 10 up to +350 °C for EN-GJS-400-18-LT **)
 - 30 °C for EN-GJS-400-18-LT **) with bolts for low-temperature service
- Pressure range:
 - Straight way pattern up to $\Delta p = 6$ or 16 bar
 - Angle pattern up to $\Delta p = 16$ bar

Materials

Body:

- Straight-way pattern:
 - Cast iron with flake graphite EN-GJL-250 *)
 - Cast iron with nodular graphite EN-GJS-400-18-LT **)
- Angle pattern:
 - Cast iron with flake graphite EN-GJL-250 *)
- For further details, see table of materials

Design

- Straight-way or angle pattern with horizontal seat
- With spring-loaded check cone
- Free from asbestos, CFC, PCB
- Exterior finish: blue similar to RAL 5002

The valves meet the safety requirements of the Pressure Equipment Directive 97/23/EC (PED) of annex I for fluids of the groups 1 and 2.

Standard variants

- Oil and grease-free design
- Other flange design

Remarks

- Operating instructions: 0570.8

On all enquiries/orders please specify

Non-return valve

1. BOA®-R according to type series booklet 7117.1
2. PN 6 or 16
3. EN-GJL-250 *) or EN-GJS-400-18-LT **)
4. Straight-way and angle pattern (angle pattern only EN-GJL-250 *)
5. DN 15-350 (DN 350 only in EN-GJS-400-18-LT **)
6. Standard variants

*) previously: GG-25

***) previously: GGG-40.3

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) according to ATEX 94/9/EC.



Working pressures

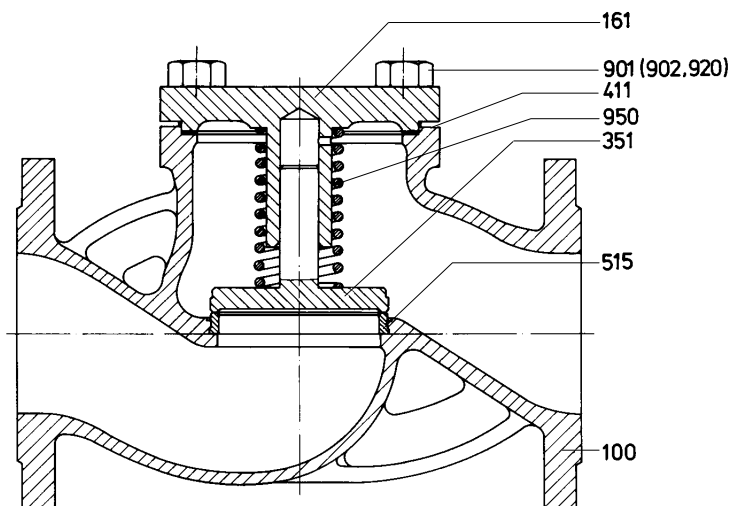
Material	Nominal pressure PN	Body pressure test with water Body ¹⁾	Seat leakage test with water Seat ²⁾	Working pressures in bar at temperatures in °C ³⁾ to V-DIN 2401 (1.66)				
				- 10 up to +120	200	250	300	350
EN-GJL-250	6	9	7,6	6	5	5	5	-
	16	24	17,6	16	12.8	11.2 ⁴⁾	9.6 ⁴⁾	-
EN-GJS-400-18-LT	16	24	17,6	16	14.7	13.9 ⁴⁾	12.8 ⁴⁾	11.2

¹⁾ DIN 3230-BQ (ISO 5208)

²⁾ DIN 3230-BN/leak rate 1 (ISO 5208/rate A)

³⁾ For intermediate temperatures use linear interpolation.

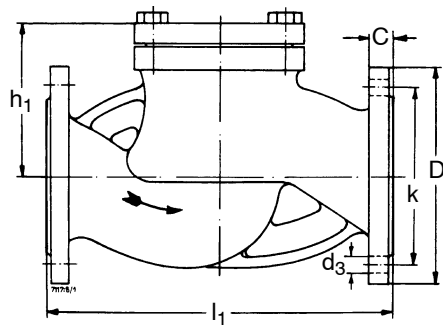
⁴⁾ Note: the connection bolts between valve and pipe flange must also have a guaranteed hot yield strength (e.g. material 5.6 or CK 35 V).



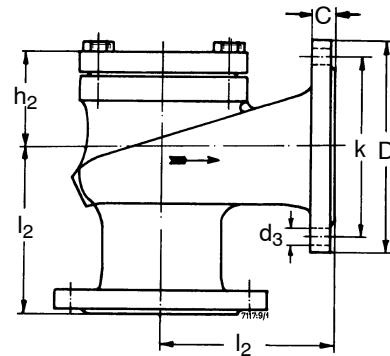
Materials

Part no.	Name of parts	PN	DN	Material	Material no.
100	Body	6/16	15-300	EN-GJL-250	JL 1040
		16	15-350	EN-GJS-400-18-LT	JS 1025
161	Body cover	6/16	15-300	EN-GJL-250	JL 1040
		16	15-350	EN-GJS-400-18-LT	JS 1025
351	Check cone	6	15-175	X 20 Cr 13	1.4021
		16	15-175		
		6	200	St, seat X 15 CrNi 18 8	1.4301
		16	200-350	Guide pin X 20 Cr 13	1.4021
411	Gasket			CrNiSt-graphite	
515	Seat ring			X 20 Cr 13	1.4021
902	Stud		250-300	CK 35 V for EN-GJL-250	
			15-350	CK 35 V for EN-GJS-400-18-LT	
920	Nut		15-350	C 35	
950	Spring			X 12 CrNi 17 7 (1.4310)	1.4310

Dimensions



Straight-way pattern



Angle pattern

Dimensions (mm)										Weight (kg) approx.	
PN	DN	l ₁	l ₂	h ₁	h ₂	D	ø k	n x d ₃	C	Straight-way pattern kg	Angle pattern kg
6 ¹⁾ JL1040	15	130	-	50	-	95	55	4 x 11	14	2.3	-
	20	150	-	60	-	105	65	4 x 11	16	3.5	-
	25	160	-	65	-	115	75	4 x 11	16	4.0	-
	32	180	-	85	-	140	90	4 x 14	18	6.9	-
	40	200	-	90	-	150	100	4 x 14	18	8.0	-
	50	230	-	95	-	165	110	4 x 14	20	10.5	-
	65	290	-	120	-	185	130	4 x 14	20	16.8	-
	80	310	-	130	-	200	150	4 x 19	22	22.0	-
	100	350	-	155	-	220	170	4 x 19	24	32.5	-
	125	400	-	175	-	250	200	8 x 19	26	52.0	-
150	480	-	195	-	285	225	8 x 19	26	72.0	-	
200	600	-	245	-	340	280	8 x 19	30	123.0	-	
16 JL1040 JS1025	15	130	90	50	25	95	65	4 x 14	14	2.3	2.2
	20	150	95	60	35	105	75	4 x 14	16	3.5	3.2
	25	160	100	65	35	115	85	4 x 14	16	4.0	4.1
	32	180	105	85	50	140	100	4 x 19	18	6.9	6.9
	40	200	115	90	50	150	110	4 x 19	18	8.0	8.0
	50	230	125	95	60	165	125	4 x 19	20	10.5	10.2
	65	290	145	120	70	185	145	4 x 19	20	16.8	16.1
	80	310	155	130	75	200	160	8 x 19	22	22.0	19.5
	100	350	175	155	95	220	180	8 x 19	24	32.5	30.3
	125	400	200	175	105	250	210	8 x 19	26	52.0	45
	150	480	225	195	110	285	240	8 x 23	26	72.0	64.5
	200	600	275	245	140	340	295	12 x 23	30	123.0	108
	250	730	325	295	150	400	355	12 x 28	32	200.0	170
	300	850	300	335	185	460	410	12 x 28	32	310.0	262
	350 ²⁾	980	-	335	-	520	470	16 x 28	36	357.0	-

¹⁾ Pattern of drilled holes to PN 6 (dimensions k and nxd); however, flanges dimensioned to PN 16 (dimensions D and b). Please take this into account when selecting the flange connecting bolts.

²⁾ DN 350 only in EN-GJS-400-18-LT (previously: GGG-40.3) in straight-way pattern on request

Installation instructions

Observe direction of flow and integral direction arrow.
For opening, a minimum pressure is required. If this pressure is not attained, the installed closing spring can be removed.
Valves without a closing spring can only be installed upright in horizontal pipelines.

Minimum opening pressures (bar)

DN	15-50	65-150	200-350
With spring	0.250	0.200	0.150
Without spring	0.025	0.016	0.022

Connection dimensions - Standards:

Flanges: DIN EN 1092-2, type of flange 21 - JL1040
type of flange 21-2 - JS1025

Raised faces: DIN EN 1092-2, type B

Face-to-face dimension:

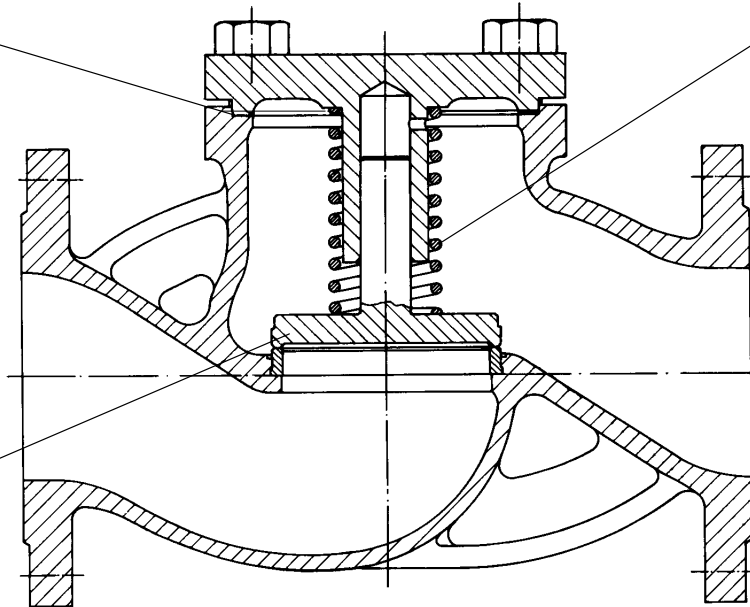
Straight-way pattern: EN 558-1/1 (previously: DIN 3202/F 1)
ISO 5752/1

Angle pattern: EN 558-1/8 (previously: DIN 3202/F 32)
ISO 5752/8

Gasket of
pure graphite,
asbestos-free

Closing spring
of stainless spring
steel

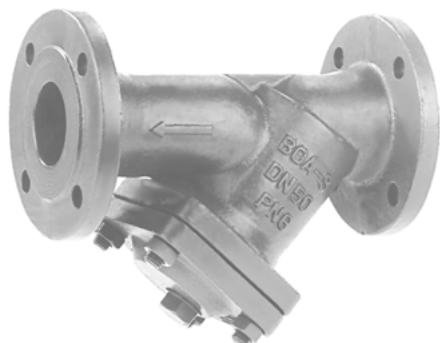
Check cone of
stainless steel
or steel with
stainless guide
pin and alloyed
sealing surface



Subject to technical modification without prior notice

Strainer

with drain plug



Flanged

PN 6, 16, 25
DN 15-300

Fields of Application

- Hot and high-temperature hot water, steam, fluids containing mineral oils and organic heat transfer fluids in systems or system components without special technical codes
- Hot water heating systems DIN 4751
- High-temperature hot water heating systems DIN 4752
- Heat transfer systems DIN 4754
- Steam boiler systems to TRD 108/110
- Pressure vessel systems to TRB 801 No. 45
- Other fluids on request

The limits given in the technical codes must be complied with.

Operating Data

- Maximum permissible pressure 25 bar
- Maximum permissible temperature 350 °C
- Selection as per pressure-temperature ratings (see overleaf)

Materials

Valve body:

- Lamellar graphite cast iron EN-GJL-250, JL 1040
PN 6 and PN 16
- Nodular cast iron EN-GJS-400-18-LT, JS 1025
PN 16 and PN 25
- For further details, see list of materials.

Design

- Strainer in slanted seat design
- Strainer insert made of stainless steel
- Insert accurately guided in cover and body
- Outside confined cover gasket
- Exterior coating: blue similar to RAL 5002
- Drain plug
- For size DN 150 and above: additional strainer basket made of perforated stainless steel sheet
- Free from asbestos, CFC and PCB

The valves meet the safety requirements of the Pressure Equipment Directive 97/23/EC (PED) of annex I for fluids in groups 1 and 2.

Standard Variants

- Fine-mesh strainer insert
- High temperature resistant paint, aluminium grey, for applications > 200 °C (JS 1025 only)
- Other flange designs (JS 1025 only)

Additional information

- For handling **aggressive** fluids in the general and chemical industry, in power station and process engineering we recommend our NORICHEM® stainless steel strainers as described in type series booklet 8113.1
- Operating instructions 0570.8

On all enquiries / orders please specify

Strainer

1. BOA®-S as per type series booklet 7125.1
2. EN-GJL-250, PN 6, DN 15-200
EN-GJL-250, PN 16, DN 15-300
EN-GJS-400-18-LT, PN 16, DN 15-300
EN-GJS-400-18-LT, PN 25, DN 15-200
3. Standard variants



Pressure-Temperature Ratings

Nominal pressure PN	Material	Shell / pressure and leak test in bar with water Body (P10, P11) ¹⁾	Permissible operating pressures in bar at temperatures in °C ²⁾				
			-10 to +120	200	250	300	350
6	EN-GJL-250	9	6	4,8	4,2	3,6	-
16		24	16	12,8	11,2	9,6	-
16	EN-GJS-400-18-LT	24	16	13	13	13	10
25		37,5	25	20	18	16	12

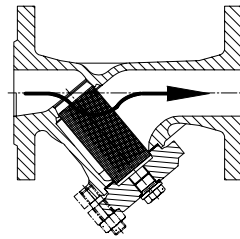
¹⁾ DIN EN 12266-1 (P10, P11) (ISO 5208)

²⁾ Intermediate temperatures can be derived by linear interpolation.

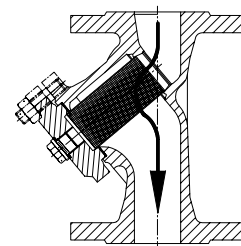
Note: DIN EN 1092-2 para. 5.3 and any plant regulations governing the application in question must be observed when selecting connecting elements between the valve and the piping system.

Installation

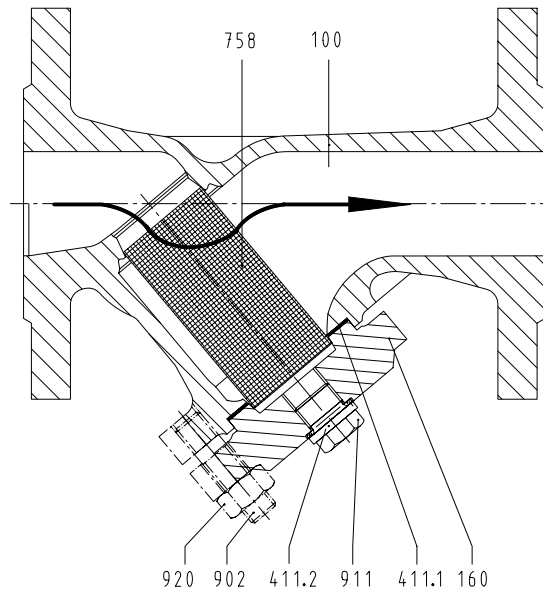
In both horizontal and vertical pipes, we recommend to install the strainer with the strainer insert pointing downwards to facilitate cleaning. Compliance with the directional arrow is important.



Horizontal installation



Vertical installation



Materials

Part No.	Description	PN	Material	Comments
100	Body	6, 16	EN-GJL-250	
		16, 25	EN-GJS-400-18-LT	
160	Cover	6, 16	EN-GJL-250	
		16, 25	EN-GJS-400-18-LT	
411.1	Joint ring	6, 16	CrNi-St-graphite 17	
		16, 25	TESNIT BA-F graphite	
411.2	Joint ring	6, 16, 25	A4	
758	strainer insert	6, 16	X 6 CrNiTi 18 10	1.4541
		16, 25	X 5 CrNi 18 10	1.4301
191	Strainer basket	6, 16	X 6 CrNiTi 18 10	1.4541
		16, 25	X 5 CrNi 18 10	1.4301
902	Stud	6, 16	5.6 or 8.8	gal ZN
		16, 25	Ck 35 V	galvanized, zinc
911	Drain plug	6, 16	A4 or A2	galvanized, zinc
		16, 25	Ck 35 V	galvanized, zinc
920	Hex. nut	6, 16	5-2 or 8	galvanized, zinc
		16, 25	C 35	galvanized zinc

Dimensions of variant EN-GJL-250

Strainer insert made of stainless steel

Your benefit:

- Long service life

Drain plug as standard

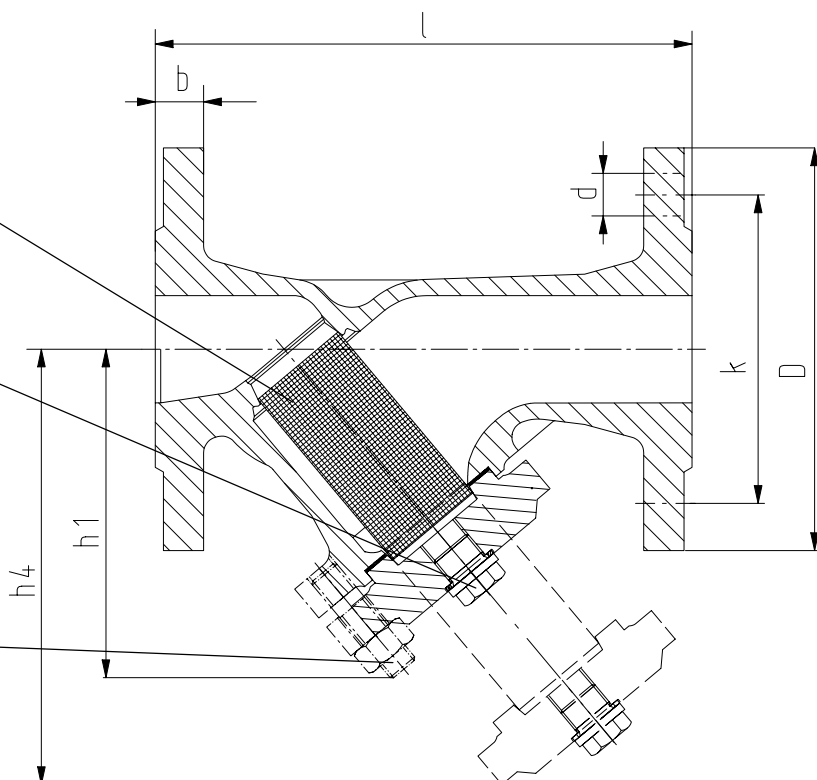
Your benefit:

- Clean draining procedure, especially on large nominal diameters

Studs

Your benefit:

- Time and cost saving replacement of strainer insert, without removing the body insulation



PN	Dimensions (mm)									Weight approx. kg	Performance						
	DN	l	D	k	n x d	b	h ₁	h ₄	Drain plug		Standard mesh		Fine mesh				
											K _V m ³ /h	Zeta value	K _V m ³ /h	Zeta value			
6	15	130	80	55	4x11	12	90	120	G 3/8"	2,5	5,7	2,5	5,3	2,9			
	20	150	90	65	4x11	14	100	139		3,0	10,4	2,4	9,5	2,8			
	25	160	100	75	4x11	14	115	144		4,5	16,4	2,3	15,1	2,7			
	32	180	120	90	4x14	16	125	171		5,5	27,3	2,3	24,7	2,7			
	40	200	130	100	4x14	16	150	180		7,0	42,0	2,3	38,2	2,8			
	50	230	140	110	4x14	16	160	202		9,0	64,7	2,4	57,2	3,0			
	6	65	290	160	130	4x14	16	180	224	G 1/2"	13,0	96,0	3,1	81,1	4,3		
		80	310	190	150	4x18	18	215	255		19,0	149,0	3,0	119,0	4,6		
		100	350	210	170	4x18	18	235	344		26,0	223,0	3,2	181,0	4,9		
		125	400	240	200	8x18	20	275	366		38,0	347,0	3,2	281,0	5,0		
		150	480	265	225	8x18	20	305	426		54,0	480,0	3,5	380,0	5,6		
		200	600	320	280	8x18	22	390	565		110,0	853,0	3,5	672,0	5,7		
		16	15	130	95	65	4x14	14	90		120	G 3/8"	3,0	5,7	2,5	5,3	2,9
			20	150	105	75	4x14	16	100		139		4,0	10,4	2,4	9,5	2,8
25	160		115	85	4x14	16	115	144	5,0	16,4	2,3		15,1	2,7			
32	180		140	100	4x18	18	125	171	7,0	27,3	2,3		24,7	2,7			
40	200		150	110	4x18	18	150	180	9,0	42,0	2,3		38,2	2,8			
50	230		165	125	4x18	20	160	202	12,0	64,7	2,4		57,2	3,0			
16	65		290	185	145	4x18	20	180	224	G 1/2"	16,0	96,0	3,1	81,1	4,3		
	80		310	200	160	8x18	22	215	255		21,0	149,0	3,0	119,0	4,6		
	100		350	220	180	8x18	24	235	344		30,0	223,0	3,2	181,0	4,9		
	125		400	250	210	8x18	26	275	366		43,0	347,0	3,2	281,0	5,0		
	150		480	285	240	8x22	26	305	426		61,0	480,0	3,5	380,0	5,6		
	200		600	340	295	12x22	30	390	565		121,0	853,0	3,5	672,0	5,7		
	250		730	405	355	12x26	32	540	747		154,0	1104,0	5,1	838,0	8,9		
	300		850	460	410	12x26	32	680	931		255,0	1450,0	6,1	1090,0	10,9		

DN	Standard mesh		Fine mesh	
	Mesh width	Wire diameter	Mesh width	Wire diameter
15-50	1,0	0,5	0,25	0,16
65-80	1,25	0,63		
100-300	1,6	1,0		

Dimensions of variant EN-GJS-400-18-LT

Strainer insert made of stainless steel

Your benefit:

- Long service life

Drain plug as standard

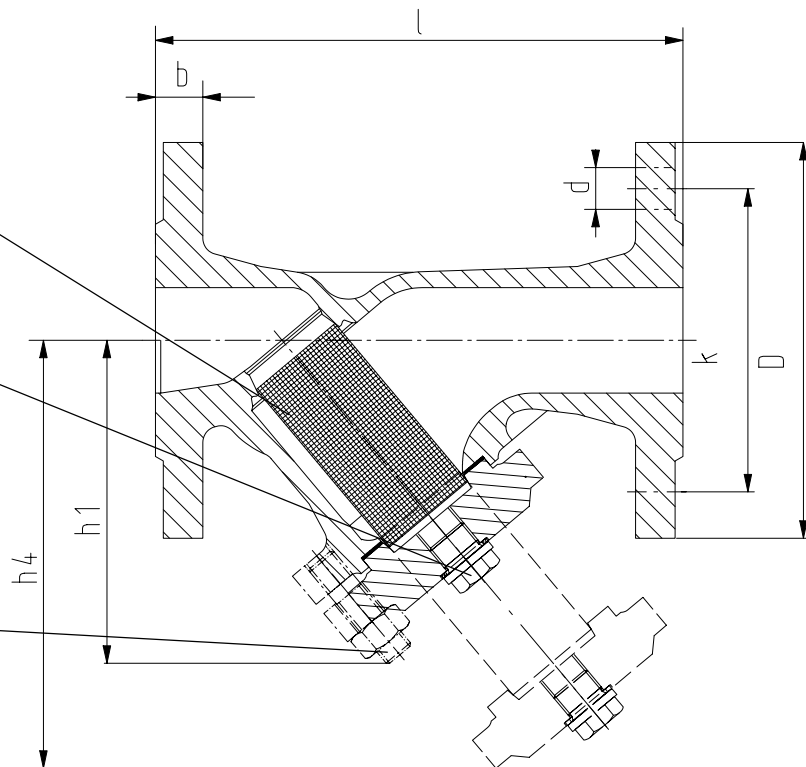
Your benefit:

- Clean draining procedure, especially on large nominal diameters

Studs

Your benefit:

- Time and cost saving replacement of strainer insert, without removing the body insulation



PN	Dimensions (mm)									Drain plug	Weight approx. kg	Weight			
	DN	l	D	k	n x d	b	h ₁	h ₄	Standard mesh			Fine mesh			
									K _v m ³ /h			Zeta value	K _v m ³ /h	Zeta value	
16	15	130	95	65	4x14	16	75	115	G 1/2"	3,5	5,30	2,88	5,00	3,24	
	20	150	105	75	4x14	18	75	115		4,0	9,50	2,84	9,00	3,16	
	25	160	115	85	4x14	18	90	135		5,5	16,50	2,30	14,80	2,85	
	32	180	140	100	4x18	20	90	135	G 1/2"	7,0	20,00	4,19	18,00	5,18	
	40	200	150	110	4x18	20	110	170		9,0	33,00	3,76	30,00	4,55	
	50	230	165	125	4x18	22	120	190		12,0	54,00	3,43	48,00	4,34	
	65	290	185	145	4x18	24	140	220		16,0	95,00	3,16	85,00	3,95	
	80	310	200	160	8x18	26	165	265	G 1"	21,0	140,00	3,34	131,00	3,82	
	100	350	220	180	8x18	28	220	340		28,0	201,00	3,96	189,00	4,48	
	125	400	250	210	8x18	30	260	410		41,0	340,00	3,38	320,00	3,81	
	150	480	285	240	8x22	30	300	475		58,0	526,00	2,93	494,00	3,32	
	200	600	340	295	12x22	34	360	580	G 1"	121,0	870,00	3,38	818,00	3,83	
	250	730	405	355	12x26	36	470	680		154,0	1260,00	3,94	1184,00	4,46	
	300	850	460	410	12x26	36	560	820		255,0	1735,00	4,31	1631,00	4,87	
25	15	130	95	65	4x14	16	75	115		G 1/2"	3,5	5,30	2,88	5,00	3,24
	20	150	105	75	4x14	18	75	115	4,0		9,50	2,84	9,00	3,16	
	25	160	115	85	4x14	18	90	135	5,5		16,50	2,30	14,80	2,85	
	32	180	140	100	4x18	20	90	135	G 1/2"	7,0	20,00	4,19	18,00	5,18	
	40	200	150	110	4x18	20	110	170		9,0	33,00	3,76	30,00	4,55	
	50	230	165	125	4x18	22	120	190		12,0	54,00	3,43	48,00	4,34	
	65	290	185	145	8x18	24	140	220		16,0	95,00	3,16	85,00	3,95	
	80	310	200	160	8x18	26	165	265	G 1"	21,0	140,00	3,34	131,00	3,82	
	100	350	235	190	8x22	28	220	340		32,0	201,00	3,96	189,00	4,48	
	125	400	270	220	8x26	30	260	410		47,0	340,00	3,38	320,00	3,81	
	150	480	300	250	8x26	34	300	475		64,0	526,00	2,93	494,00	3,32	
	200	600	360	310	12x26	34	360	580	G 1"	133,0	870,00	3,38	818,00	3,83	

DN	Standard mesh		Fine mesh	
	Mesh width	Wire diameter	Mesh width	Wire diameter
15-20	0,54	0,31	0,25	0,17
25-65	0,87	0,4		
80-300	1,18	0,7		

Mating Dimensions - Standards

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

ISO 5752/1

Flanges: DIN EN 1092-2, flange type 21 (EN-GJL-250)

DIN EN 1092-2, flange type 21-2

(EN-GJS-400-18-LT)

Flange facing: DIN EN 1092-2, type B



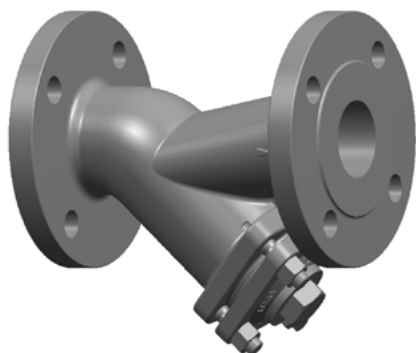
KSB Aktiengesellschaft

Johann-Klein-Strasse 9 • 67227 Frankenthal (Germany)

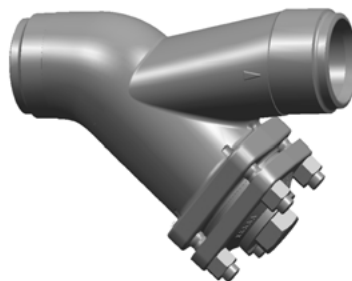
Tel.: +49 6233 86-0 • fax: +49 6233 86-3439 • e-mail: valves@ksb.com • www.ksb.com

Strainer

with drain plug



Type FSL



Type FSS

flanged

or with butt weld ends

PN 25/40
DN 15-300

Fields of Application

- In heat transfer plants, industrial plants, building service and shipbuilding
- For thermal oils, water, steam, gas and other non-aggressive fluids
- Other fluids on request.

Operating Data

- Maximum permissible pressure: 40 bar up to DN 150
25 bar from DN 200
- Maximum permissible temperature 450 °C
- Selection as per pressure-temperature ratings (see overleaf)

Materials

- Flanged valve
DN 15-300 cast steel GP 240 GH+N 1.0619+N
- Valve with butt weld ends
DN 15-300 cast steel GP 240 GH+N 1.0619+N

Variants

- Straight-way Y-valve
- Strainer insert made of stainless steel
- Additional supporting cage from DN 125
- Insert accurately guided in cover and body
- Fully encapsulated cover gasket
- Drain plug
- Materials without nonferrous heavy metals
- External coating: high-temperature coating aluminium grey

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.

Standard Variants

- Fine mesh strainer insert
- Coarse strainer insert, mesh width 2.0 mm (DN 15-100)
- Magnetic inserts
- Other flange designs
- 3.1 B certification

References

- Operating instructions 0570.82

Purchase order data

- | | |
|-------------------------|-------------------------------|
| 1 Type | 6 Fluid |
| 2 PN | 7 Operating temperature |
| 3 DN | 8 Pipe connection |
| 4 Operating pressure | 9 Variants |
| 5 Differential pressure | 10 Type series booklet number |

Pressure-Temperature Ratings

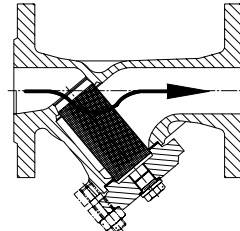
Nominal pressure PN	Material	Permissible operating pressures in bar at temperatures in °C ¹⁾						
		120	200	250	300	350	400	450
25	GP 240 GH+N ²⁾	25	22	20	17	16	13	8
40		40	35	32	28	24	21	13

¹⁾ The valves can be used down to -10 °C

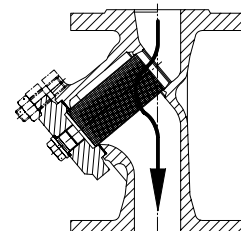
²⁾ previously: GS-C 25 N

Installation

In both horizontal and vertical pipes, we recommend to install the strainer with the strainer insert pointing downwards to facilitate cleaning. Compliance with the directional arrow is important.



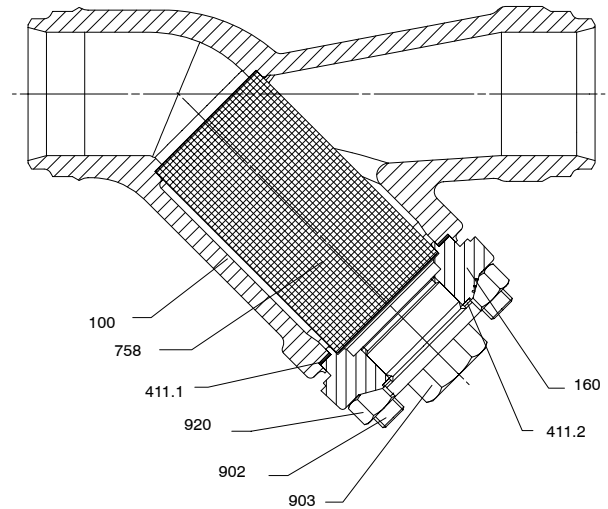
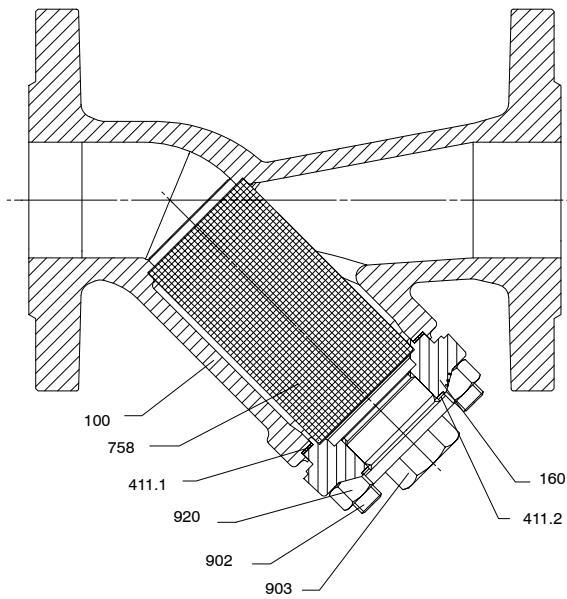
Horizontal installation



Vertical installation

FSL

FSS

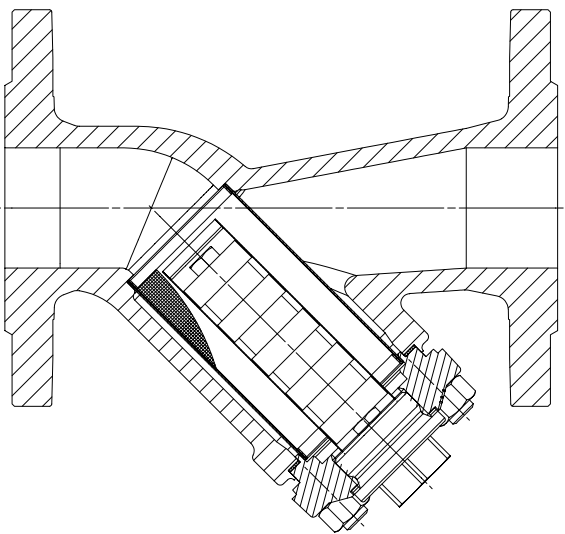


Materials

Part No.	Description	Material		Comments
100	Body	GP 240 GH+N	1.0619+N	
160	Cover	GP 240 GH+N	1.0619+N	
411.1 *)	Joint ring	CrNi steel / graphite		
758 *)	Strainer insert	stainless steel		
191 *)	Strainer basket	stainless steel		DN 125 and above
902	Stud	21 CrMo V 5-7	1.7709	olive-chromated
903 *)	Drain plug	A4		
411.2 *)	Joint ring	A4		
920	Hex. nut	25 CrMo 4	1.7218	olive-chromated

*) Recommended spare parts

Variants



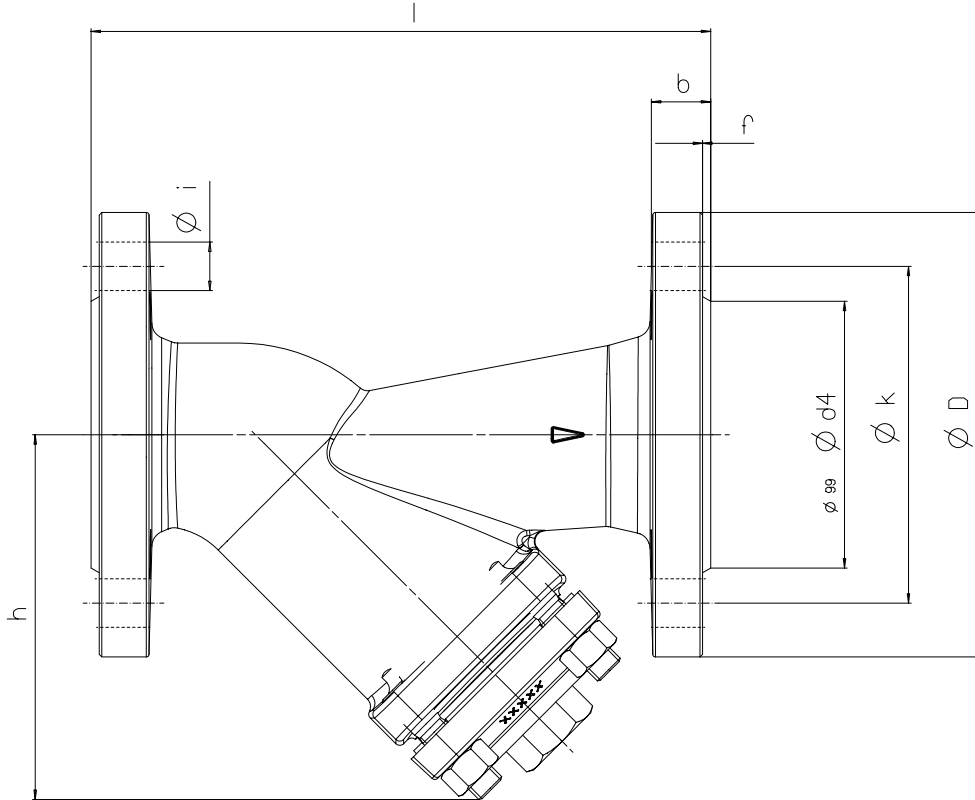
Magnetic inserts

Dimensions, type FSL

- Face-to-face length - to EN 558-1/1 (was: DIN 3202/ F 1) ISO 5752/1
- Flange: - Mating dimensions to DIN 2501 (ISO 2084, BS 4504)
 Raised face type C DIN 2526

Other flange designs:

- e.g. grooved both ends type N, tongue type F DIN 2512, recessed (female face) type R 13, spigot (male face) type V 13 DIN 2513, type D, type E DIN 2526
 Flanges to EN 1092-1
 Other flange designs on request



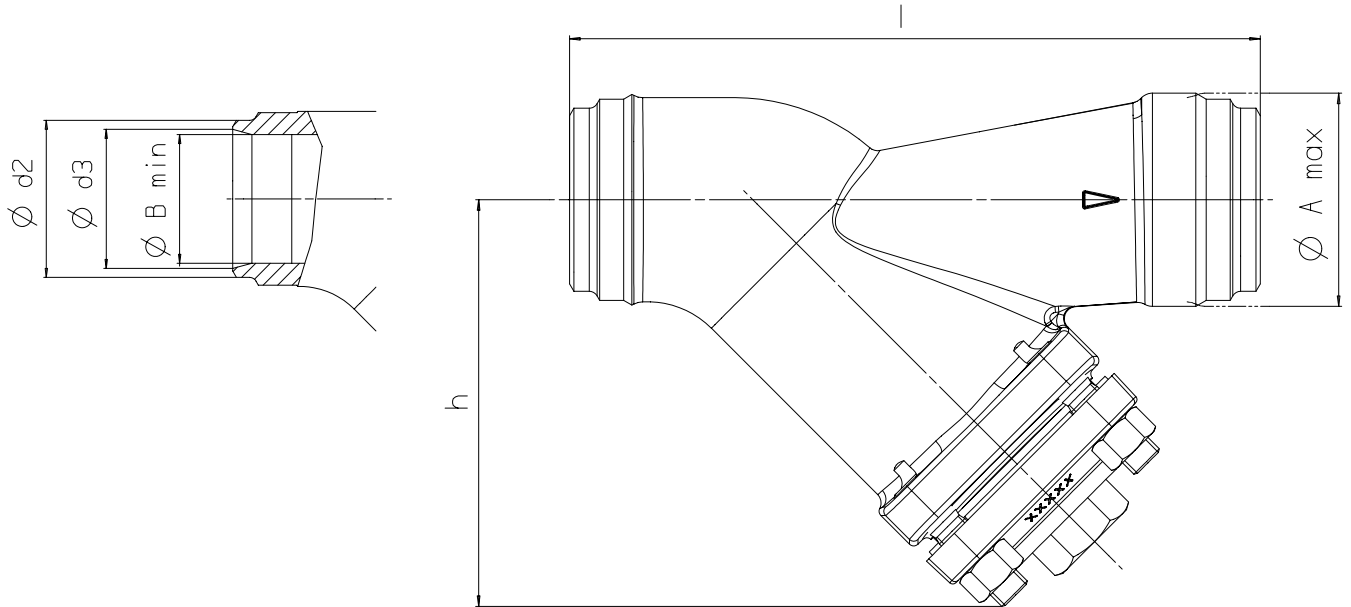
Dimensions in mm

Nominal pressure	Nominal diameter	Overall length	Flange	Bolt circle	Number of bolt holes	Bolt hole	Raised face	Flange thickness	Centre-to-top height	Mesh width		Wire diameter		Weight
										Standard mesh strainer insert	Fine mesh strainer insert	Standard mesh strainer insert	Fine mesh strainer insert	
PN	DN	l	ØD	Øk	z	Øi	Ød4 x f	b	h1	mm	mm	mm	mm	approx. kg
40	15	130	95	65	4	14	46 x 2	16	88	1.25	0.28	0.63	0.22	3.0
	20	150	105	75	4	14	56 x 2	18	87	1.25	0.28	0.63	0.22	3.5
	25	160	115	85	4	14	65 x 2	18	100	1.25	0.28	0.63	0.22	4.4
	32	180	140	100	4	18	76 x 2	20	101	1.25	0.28	0.63	0.22	5.8
	40	200	150	110	4	18	84 x 2	20	134	1.25	0.28	0.63	0.22	8.4
40	50	230	165	125	4	18	99 x 2	22	135	1.25	0.28	0.63	0.22	11.2
	65	290	185	145	8	18	118 x 2	24	191	1.25	0.28	0.63	0.22	19.4
	80	310	200	160	8	18	132 x 2	26	195	1.25	0.28	0.63	0.22	21.6
	100	350	235	190	8	22	156 x 2	28	224	1.25	0.28	0.63	0.22	32.4
	125	400	270	220	8	26	184 x 2	30	268	2.0	0.28	1.0	0.22	48.2
25	150	480	300	250	8	26	211 x 2	34	309	2.0	0.28	1.0	0.22	70.0
	200	600	360	310	12	26	274 x 3	30	380	2.0	0.28	1.0	0.22	120.6
25	250	730	425	370	12	30	330 x 3	32	445	2.0	0.28	1.0	0.22	184.9
	300	850	485	430	16	30	389 x 4	34	511	2.0	0.28	1.0	0.22	269.0

DN	Standard mesh		Fine mesh	
	K _v m³/h	Zeta value	K _v m³/h	Zeta value
15	6.6	1.8	5.4	2.7
20	12.0	1.7	10.3	2.4
25	18.7	1.8	15.0	2.7
32	28.7	2.0	20.0	4.1
40	43.1	2.2	33.4	3.6
50	75.2	1.7	57.3	3.0
65	121.4	1.9	82.3	4.1
80	186.6	1.8	145.4	3.0
100	291.0	1.9	213.4	3.4
125	371.4	2.8	311.1	4.0
150	545.8	2.7	475.2	3.5
200	834.8	3.6	590.3	7.2
250	1304.4	3.6	903.7	7.5
300	1878.3	3.6	1301.3	7.5

Dimensions, type FSS

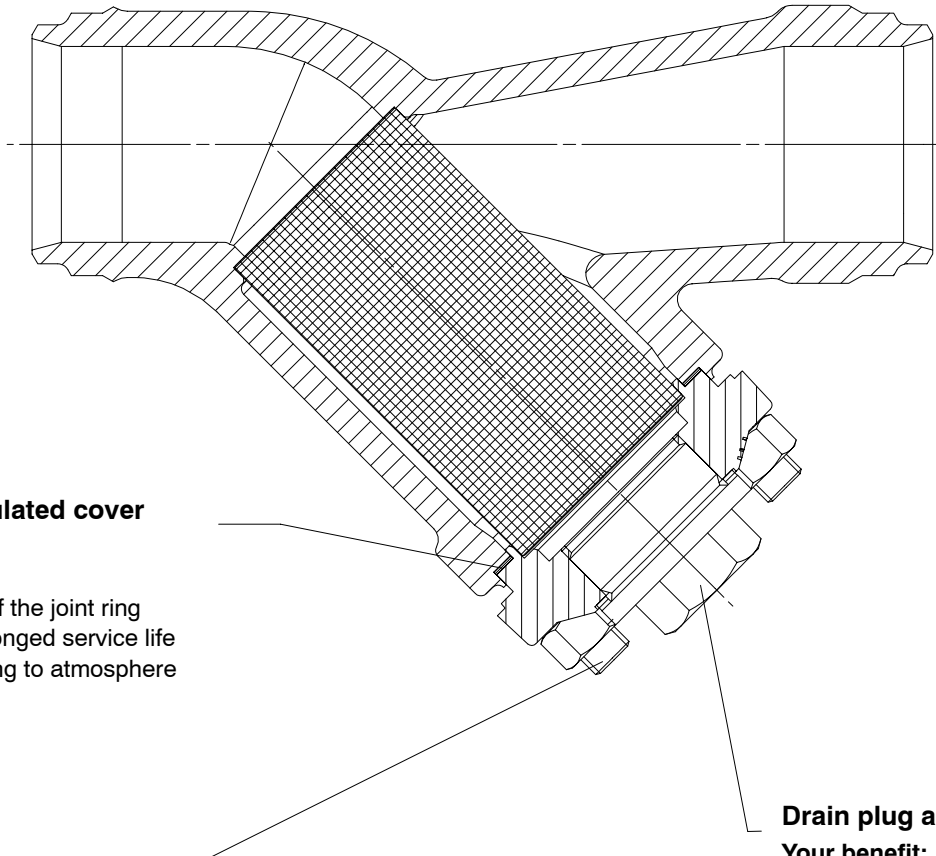
- Face-to-face length - EN 12982/64 (was DIN 3202-S2)
- Butt weld ends - DIN 3239-Type 2
- Groove type - DIN 2559/22



Nominal pressure	Nominal diameter	Face-to-face length	unmachined butt weld ends		Butt weld ends to DIN 3239 T1 Groove from DIN 2559/22			Centre-to-top height	Mesh width		Wire diameter		Weight
			$\varnothing A_{max}$	$\varnothing B_{min}$	$\varnothing d_2$	$\varnothing d_3$ *)	Associated pipe dimensions		Standard mesh strainer insert	Fine mesh strainer insert	Standard mesh strainer insert	Fine mesh strainer insert	
PN	DN	l						h 1	mm	mm	mm	mm	approx. kg
40	15	130	31.0	15.0	22.0	17.0	21.3 x 2.0	88	1.25	0.28	0.63	0.22	1.6
	20	150	38.0	20.0	28.0	22.0	26.9 x 2.3	87	1.25	0.28	0.63	0.22	1.8
	25	160	44.0	25.0	34.0	28.5	33.7 x 2.6	100	1.25	0.28	0.63	0.22	2.2
	32	180	51.0	32.0	43.0	37.0	42.4 x 2.6	101	1.25	0.28	0.63	0.22	2.5
	40	200	61.0	40.0	49.0	43.0	48.3 x 2.6	134	1.25	0.28	0.63	0.22	4.7
	50	230	71.0	50.0	61.0	54.0	60.3 x 3.2	135	1.25	0.28	0.63	0.22	5.6
	65	290	88.0	65.0	77.0	69.0	76.1 x 3.6	191	1.25	0.28	0.63	0.22	12.2
	80	310	104.0	80.0	90.0	82.0	88.9 x 3.2	195	1.25	0.28	0.63	0.22	13.6
	100	350	131.0	100.0	115.0	104.0	114.3 x 5.0	224	1.25	0.28	0.63	0.22	21.8
	125	400	155.0	125.0	142.0	130.5	139.7 x 4.5	268	2.0	0.28	1.0	0.22	33.4
150	480	184.0	150.0	170.0	156.5	168.3 x 5.6	309	2.0	0.28	1.0	0.22	50.4	
25	200	600	249.0	200.0	222.0	204.5	219.1 x 7.1	380	2.0	0.28	1.0	0.22	94.5
	250	730	305.0	250.0	276.0	256.5	273.0 x 8.0	445	2.0	0.28	1.0	0.22	148.9
	300	850	356.0	300.0	325.0	306.5	323.9 x 8.0	511	2.0	0.28	1.0	0.22	221.6

DN	Standard mesh		Fine mesh	
	K_v m ³ /h	Zeta value	K_v m ³ /h	Zeta value
15	6.6	1.8	5.4	2.7
20	12.0	1.7	10.3	2.4
25	18.7	1.8	15.0	2.7
32	28.7	2.0	20.0	4.1
40	43.1	2.2	33.4	3.6
50	75.2	1.7	57.3	3.0
65	121.4	1.9	82.3	4.1
80	186.6	1.8	145.4	3.0
100	291.0	1.9	213.4	3.4
125	371.4	2.8	311.1	4.0
150	545.8	2.7	475.2	3.5
200	834.8	3.6	590.3	7.2
250	1304.4	3.6	903.7	7.5
300	1878.3	3.6	1301.3	7.5

Product features - to our customers' benefit



Fully encapsulated cover gasket

Your benefits:

- No creeping of the joint ring possible, prolonged service life
- Reliable sealing to atmosphere

Studs

Your benefit:

- Time and cost saving replacement of strainer insert, without removing the body insulation

Drain plug as standard

Your benefit:

- Clean draining procedure, especially on large nominal diameters

Subject to technical modification without prior notice

7127.1/3-10 01.06.2005



Shut-off Valves

- BOA-SuperCompact®
- BOA®-Compact
- BOA®-Compact EKB
- BOA®-W
- BOA®-H

Non-return Valves

- BOA®-R
- BOA®-RVK

Strainers

- BOA®-S

1	Declaration of conformity	2
2	General instructions	5
3	Safety	5
3.1	Marking of instructions in the manual	5
3.2	Personnel qualification and training	5
3.3	Non-compliance with safety instructions	5
3.4	Safety awareness	6
3.5	Safety instructions for the operator / user	6
3.6	Safety instructions for maintenance, inspection and installation work	6
3.7	Unauthorized modification and manufacture of spare parts	6
3.8	Unauthorized modes of operation	6
4	Transport and storage	6
4.1	Transport	6
4.2	Storage	6
5	Specification / Relevant documentation	7
5.1	Marking	7
5.2	Drawings / Documentation	8
5.3	List of components	10
5.4	Function	10
6	Installation	11
6.1	General	11
6.2	Fields of application / Operating data / Installation instructions	11
7	Commissioning, start-up / shutdown	14
7.1	Commissioning / start-up	14
7.2	Shutdown	14
8	Servicing / maintenance	14
8.1	Safety instructions	14
8.2	Maintenance	15
8.3	Testing overhauled valves	15
9	Trouble-shooting	15
9.1	General	15
9.2	Faults / malfunctions > Remedy	15
10	Spare parts	15
10.1	Spare parts for the respective products	15

These operating instructions contain fundamental information and precautionary notes. It is imperative that the manual be read prior to installation and commissioning.
The manual shall always be kept close to the valve's location of installation.



1 Declaration of conformity

Hereby we,

**KSB Armaturen GmbH
Johann-Klein-Str. 9
67227 Frankenthal
Germany**

declare that the valves listed below comply with the requirements of the Pressure Equipment Directive 97/23/EC.

Description of the valve types:	Shut-off Valves		
	– BOA-H	PN 16	DN 15-350
	– BOA-H	PN 25	DN 15-150
	Non-return Valves		
	– BOA-R	PN 6	DN 15-200
	– BOA-R	PN 16	DN 15-350
	Strainers		
	– BOA-S (JL 1040)	PN 6	DN 15-200
	– BOA-S (JL 1040)	PN 16	DN 15-300

As per harmonized European standards

Currently not applicable for valves

And other standards / directives:

**DIN 3840 Art. 1.3 and 4.3
Shut-off Valves
Non-return Valves
TRD 110, TRB 801 No. 45**

**DIN 3356
DIN EN 12334**

Suitable for:

Fluid groups 1 and 2

Conformity Assessment Procedure:

Module H

Name and address of the notified body responsible for approval and surveillance

**TÜV Süddeutschland
Bau und Betrieb GmbH
Westendstr. 199
80686 München
Germany**

Identification number of notified body:

0036

Certificate number:

DGR-0036-QS-128-01

Valves DN \leq 25 (PN 16/25) fall under the Pressure Equipment Directive 97/23/EC Art. 3 §3. They must bear neither the CE-marking nor the identification number of the notified body.

Rainer Michalik
Quality Management

(This document has been prepared electronically and is valid without signature)

Hereby we,

**KSB Armaturen GmbH
Johann-Klein-Str. 9
67227 Frankenthal
Germany**

declare that the valves listed below comply with the requirements of the Pressure Equipment Directive 97/23/EC.

Description of the valve types:

Shut-off Valves

– BOA-SuperCompact	PN 6/10/16	DN 20-200
– BOA-Compact	PN 6, 16	DN 15-200
– BOA-Compact EKB	PN 10/16	DN 15-200
– BOA-W	PN 6, 16	DN 15-200

As per harmonized European standards

Currently not applicable for valves

And other standards / directives:

**DIN 3840 Art. 1.3 and 4.3
Shut-off Valves**

DIN 3356

Suitable for:

Fluid groups 2

Conformity Assessment Procedure:

Module H

Name and address of the notified body responsible for approval and surveillance

**TÜV Süddeutschland
Bau und Betrieb GmbH
Westendstr. 199
80686 München
Germany**

Identification number of notified body:

0036

Certificate number:

DGR-0036-QS-128-01

Valves $DN \leq 50$ (PN 16), $DN \leq 100$ (PN 10) and $DN \leq 150$ (PN 6) fall under the Pressure Equipment Directive 97/23/EC Art. 3 §3. They must bear neither the CE-marking nor the identification number of the notified body.

Rainer Michalik
Quality Management

(This document has been prepared electronically and is valid without signature)

Hereby we,

**KSB Armaturen GmbH
Johann-Klein-Str. 9
67227 Frankenthal
Germany**

declare that the valves listed below comply with the requirements of the Pressure Equipment Directive 97/23/EC.

Description of the valve types: **Non-return Valves**
– BOA-RVK PN 6/10/16 DN 15-200

As per harmonized European standards **Currently not applicable for valves**

Suitable for: **Fluid groups 2**

Conformity Assessment Procedure: **Module A**

Name and address of the notified body responsible for approval and surveillance
**TÜV Süddeutschland
Bau und Betrieb GmbH
Westendstr. 199
80686 München
Germany**

Valves DN ≤ 50 (PN 16), DN ≤ 100 (PN 10) and DN ≤ 150 (PN 6) fall under the Pressure Equipment Directive 97/23/EC Art. 3 §3. They must bear neither the CE-marking nor the identification number of the notified body.

Rainer Michalik
Quality Management

(This document has been prepared electronically and is valid without signature)

2 General instructions

These operating instructions apply to KSB valve types BOA-SuperCompact®, BOA-Compact®, BOA-Compact® EKB, BOA®-W, BOA®-H, BOA®-R, BOA®-RVK and BOA®-S.

Address:

KSB Armaturen GmbH
Johann-Klein-Strasse 9
67227 Frankenthal

The design, manufacture and testing of KSB valves are subject to a QM system to DIN EN ISO 9001 and satisfy the safety requirements put forth in Annex I of the Pressure Equipment Directive 97/23/EC (PED). Certification to the Pressure Equipment Directive 97/23/EC has been obtained in accordance with Module H.

Only correct installation, maintenance or repair will ensure smooth operation of the valves.

The manufacturer shall not accept any liability if the instructions set forth in this manual are not complied with.

CAUTION The valves must not be operated outside the permissible operating range. The limits are indicated on the name plate or currently applicable type leaflet. The pressure-temperature ratings, in particular, must not be exceeded. Operation of the valves outside the above-mentioned conditions may result in overloads which may damage the valves.

The type leaflets can be found at www.ksb.com – product catalogue.



Non-observance of this warning may cause personal injury and damage to property, for example:

- injuries resulting from fluid leakage (cold/hot, toxic, under pressure, ...)
- impairment of the valve's function or its destruction.

The descriptions and instructions set forth in this manual refer to the standard models but are also applicable to variants.

Valves with actuator

For actuated valves (electric/pneumatic actuator), the operating manual of the actuator must be adhered to without fail.

These operating instructions do not take into account:

- any eventualities and events which might occur during installation, operation and maintenance.
- local regulations; the operator must ensure that such regulations are strictly observed by all, including the personnel called in for installation.

CAUTION The valve must only be operated by skilled, properly trained personnel.

All personnel involved in the operation, inspection and installation must be fully aware of the interaction between the valve and the system.

The valves are actuated via the handwheel. The closing direction is marked on the handwheel.

Clockwise = Closing the valve

Counter-clockwise = Opening the valve
 (cf. section 7.1 Actuation)

Valve types BOA®-R, BOA®-RVK and BOA®-S are not fitted with handwheels or other external actuating elements.

Incorrect operation of the valve may have a substantial impact on the entire system, for example:

- leakage of the fluid handled
- system / machine brought to a standstill
- impairment / reduction / increase of the system's / machine's function / effect.

For any queries you may have or in the case of damage, please contact KSB Armaturen GmbH.

For any queries and repeat orders, in particular for purchasing spare parts, please specify the type series / variant details or the works / serial number, as well as the year of construction, if possible.

The technical data (operating data) of the valves are specified in the technical literature (type leaflet, valve characteristic, chemical resistance chart) of the respective valve (cf. section 5).

If the valve must be returned, proceed in accordance with section 4, Transport.

3 Safety

These operating instructions contain fundamental information which must be complied with during installation, operation and maintenance. Therefore this operating manual must be read and understood both by the installing personnel and the responsible trained personnel / operators prior to installation and commissioning, and it must always be kept close to the location of operation of the valve for easy access.

Not only must the general safety instructions laid down in this chapter on "Safety" be complied with, but also the safety instructions outlined under specific headings.

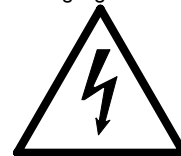
3.1 Marking of instructions in the manual

The safety instructions contained in this manual whose non-observance might cause hazards to persons are specially marked with the general hazard sign, namely



safety sign in accordance with DIN 4844 - W 9.

The electrical danger warning sign is



safety sign in accordance with DIN 4844 – W 8.

The word



is used to introduce safety instructions whose non-observance may lead to damage to the valve or its accessories and its / their functions.

Instructions attached directly to the valve (e. g. nominal pressure) must always be complied with and be kept in a perfectly legible condition at all times.

3.2 Personnel qualification and training

All personnel involved in the operation, maintenance, inspection and installation of the equipment must be fully qualified to carry out the work involved. Personnel responsibilities, competence and supervision must be clearly defined by the operator. If the personnel in question is not already in possession of the requisite know-how, appropriate training and instruction must be provided. If required, the operator may commission the manufacturer / supplier to take care of such training. In addition, the operator is responsible for ensuring that the contents of the operating instructions are fully understood by the responsible personnel.

3.3 Non-compliance with safety instructions

Non-compliance with safety instructions can jeopardize the safety of personnel, the environment, the valve and/or the system. Non-compliance with these safety instructions will also lead to forfeiture of any and all rights to claims for damages.

In particular, non-compliance can, for example, result in:

- failure of important valve / system functions,
- failure of prescribed maintenance and servicing practices,
- hazard to persons by electrical, mechanical and chemical effects,
- hazard to the environment due to leakage of hazardous substances.

3.4 Safety awareness

It is imperative to comply with the safety instructions contained in this manual, the relevant national health and safety regulations and the operator's own internal work, operation and safety regulations.

3.5 Safety instructions for the operator / user

- Any hot or cold valve components (e. g. body components or hand-wheel) that could pose a hazard must be equipped with a guard by the operator.
- Leakages (e.g. at the stem seal) of hazardous fluids (e.g. explosive, toxic, hot) must be contained so as to avoid any danger to persons and the environment. All relevant laws must be heeded.
- Electrical hazards must be eliminated. (For details please refer to VDE regulations and the safety regulations laid down by the local energy supply companies, for instance).

3.6 Safety instructions for maintenance, inspection and installation work

The operator is responsible for ensuring that all maintenance, inspection and installation work be performed by authorized, qualified specialist personnel who are thoroughly familiar with the manual.

As a rule, work on the valve must only be carried out after the valve has cooled down and valve pressure has been released. The fluid temperature must be below the vaporization temperature limit in all areas in contact with the fluid.

For safety reasons, the fitter / qualified personnel must verify whether all measures required for the protection of persons have been taken prior to starting any work.

Valves handling fluids (media) injurious to health must be decontaminated.

Immediately following completion of the work, all safety-relevant and protective devices must be re-installed and / or re-activated. Please observe all instructions set out in section 7 Commissioning / start-up before returning the valve to service.

Work on actuated valves must be carried out only during standstill. The shutdown procedure described in the manual for taking the actuator out of service must be adhered to without fail.

3.7 Unauthorized modification and manufacture of spare parts

The modification or repair of the valve supplied are only permitted after consultation with the manufacturer. Original spare parts supplied by the manufacturer ensure safety. The use of other parts than the original spare parts will lead to forfeiture of the declaration of conformity and will invalidate any liability of the manufacturer for consequential damage.

3.8 Unauthorized modes of operation

The warranty relating to the operating reliability and safety of the valve supplied is only valid if the equipment is used in accordance with its designated use as described in section 2 General of this manual. The limits stated in the technical literature (pressure/temperature diagram to DIN EN1092-2 see section 6.2 and applicable type leaflet) must not be exceeded under any circumstances.

4 Transport and storage

4.1 Transport

The valves are in closed position when supplied and, where required, the line connection ports are capped. The valves are ready for operation upon delivery, the exception being original spare parts which are only ready for operation following assembly / installation and the subsequent shell / pressure / leak tests (cf. section 7.1).

CAUTION For transport and interim storage, the valves must always be kept in the closed position, and the line connection ports must be covered with suitable material (e. g. caps, foil) to avoid damage to the seat / disc contact faces.

CAUTION Valves with plastic coating such as BOA-Compact® EKB (EKB = electrostatic plastic coating), shall be transported in such a way that damage to the plastic coating is prevented.

CAUTION In order to avoid damage or personal injury the valve must never be suspended from the handwheel or actuator, if any, during transport.

Please observe the hoisting instructions on page 16!

For the valve weights refer to the relevant manufacturer documentation (type leaflet → section 5.2 Relevant documentation; order confirmation).

After delivery and prior to installation, check the valve for potential damage acquired in transit. Damaged valves must not be installed.

4.2 Storage

Storage / interim storage of the valves must ensure that even after a prolonged period of storage the valves' function is not impaired and damage to the plastic coating (BOA-Compact® EKB) is prevented. The following requirements must be met:

- Storage is performed with the valve in closed position (to protect the seat / disc contact faces against damage)
- Measures are taken to protect the valves against dirt (dust, sand, mortar and/or building material), frost and corrosion by using foils or caps, for instance.

When storing valves of the BOA-SuperCompact®, BOA-Compact®, BOA-Compact® EKB, BOA®-W series (seat / disc interface and / or stem seal made of elastomers), please observe the guidelines for the storage of elastomers (DIN 7716):

- The storage room shall be dry, free from dust and moderately ventilated. The ambient temperature must not exceed +25°C.
- Stocked valves should be used first to ensure that the periods of storage are as short as possible.
- BOA-SuperCompact®, BOA-Compact®, BOA®-W must not be exposed to solvents, lubricants, fuels and chemicals. The EPDM elastomer at the valve disc and stem seal will be impaired by these substances. (Not applicable to BOA-Compact® EKB, where the elastomer material is NBR).
EPDM = ethylene-propylene-diene rubber
NBR = acrylonitrile butadiene rubber
- The valves must be stored such that the valve disc is not exposed to sun light or UV light from other sources.
- As mentioned above, the valves are required to be stored in closed position. However, the valve discs on soft-seated valves must be closed using little force to prevent premature aging of the elastomer.

5 Specification / Relevant documentation

The sectional drawings below provide examples of the general design / configuration of the valves. For illustrations relating to specific valve series and further information please refer to the respective type leaflets.

5.1 Marking

The valves are marked in accordance with the Pressure Equipment Directive 97/23/EC and the pertinent standards on valve types/design, as well as TRD 110 (German Steam Boiler Regulations) and TRB 801 No. 45 (German Pressure Vessel Regulations).

General marking

Nominal diameter	(DN...)	X
Nominal pressure class	(PN...)	X
Manufacturer	KSB	X
Type series / Model	BOA [®] -....	X
Year of construction (2002, 2003 etc.)	(20..)	X
Material	X
Max. permissible pressure in ¹⁾	PS ...bar	–
Max. permissible temperature in ¹⁾	TS ...°C	–
Flow direction arrow	→	X
Traceability of the material (from category II PED 97/23/EC)	X
CE marking (from category I PED 97/23/EC)		X
Identification number of the notified body: (from category I PED 97/23/EC according to module H)	0036	X

X = Marking applied
– = Marking not applied

¹⁾ Marking is only necessary in the case of a restriction to DIN EN1092-2 with regard to temperature and pressure. Please refer to the respective type leaflet, section: Operating pressures.

Marking attached to the product on customer's request:

System / Unit No.	X
Item No. of order confirmation	X

The valve also receives an internal marking:

- Inspector's stamp mark on one of the flanges following the successful final inspection and testing of the valves.
On BOA-Compact[®] EKB with rub-resistant colour stamp.

The CE marking on the valve means it is in conformity with the European Pressure Equipment Directive 97/23/EC.

In accordance with the Pressure Equipment Directive 97/23/EC, the valves are divided into those

- bearing the CE marking and those
- not bearing the CE marking.

BOA[®]-H, BOA[®]-R and BOA[®]-S for fluids in Groups 1 and 2

PN	DN									
	≤25	32	40	50	65	80	100	125	150	≥200
10										
16										
25										
≥40										

BOA-SuperCompact[®], BOA-Compact[®], BOA Compact[®] EKB, BOA[®]-W and BOA[®]-RVK for fluids in Group 2

PN	DN									
	≤32	40	50	65	80	100	125	150	≥200	
6										
10										
16										
25										
≥40										

Fluid groups

Group 1 comprises fluids defined as

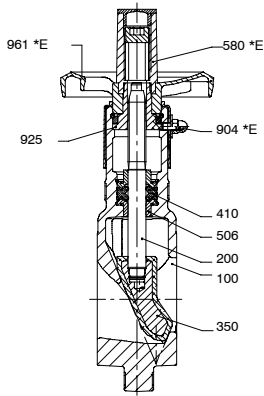
- explosive,
- extremely flammable,
- highly flammable,
- flammable (where the maximum allowable temperature is above flashpoint),
- very toxic,
- toxic,
- oxidizing.

Group 2 comprises all other fluids not referred to in Group 1.

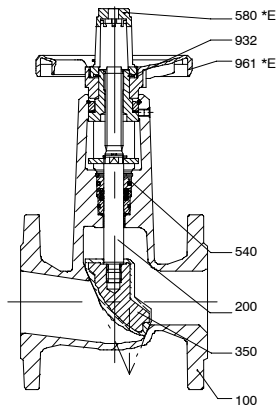
5.2 Drawings / Documentation

Shut-off valves with elastomer stem seal, maintenance-free

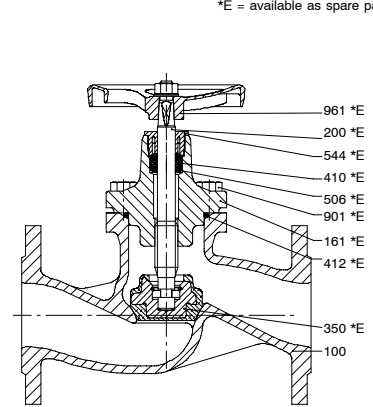
Type	DN	PN	Material	Type leaflet No.
BOA-SuperCompact®	20/25-200	6/10/16	EN-JL 1040	7113.1
BOA-Compact®	15-200	6, 16	EN-JL 1040	7112.1
BOA-Compact® EKB	15-200	10/16	EN-JL 1040	7112.11
BOA®-W	15-200	6, 16	EN-JL 1040	7111.1



BOA-SuperCompact®



BOA-Compact®

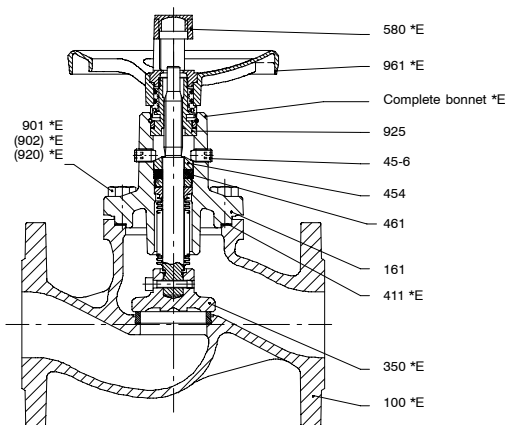


BOA®-W

*E = available as spare part

Bellows-type shut-off valves, maintenance-free

Type	DN	PN	Material	Type leaflet No.
BOA®-H	15-300	16	EN-JL 1040	7150.1
	15-350	16	EN-JS 1025	
	15-150	25	EN-JS 1025	



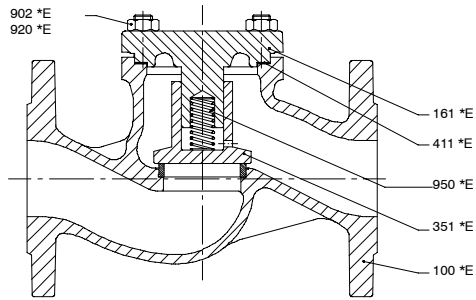
BOA®-H (PN 16/25)

*E = available as spare part

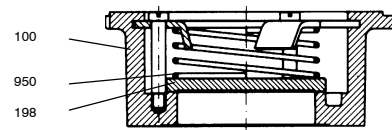
Non-return valves

Type	DN	PN	Material	Type leaflet No.
BOA®-RVK	15-200	6/10/16	CuZn39Pb3	7119.1
			EN-JL 1040	
BOA®-R	15-200	6	EN-JL 1040	7117.1
	15-300	16		
	15-350	16	EN-JS 1025	7117.1

*E = available as spare part



BOA®-R

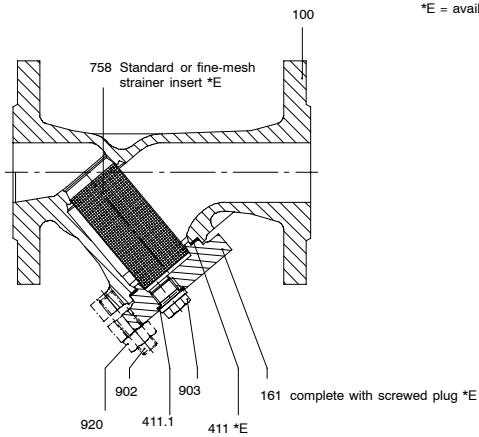


BOA®-RVK

Strainers

Type	DN	PN	Material	Type leaflet No.
BOA®-S	15-200	6	EN-JL 1040	7125.1
	15-300	16		
	15-200	16, 25	EN-JS 1025	7125.1
	15-200	25/40	GS-C25N	7166.1

*E = available as spare part



BOA®-S

5.3 List of components

Part No.	Description
100	Body
161	Body bonnet/cover
198	Disc
200	Stem
350	Valve disc
351	Check valve disc
410	Profile joint
411	Joint ring
411.1	Joint ring
412	O-ring
454	Stuffing box ring
45-6	Stuffing box screw
461	Packing
506	Retaining ring
540	Bush (with 4 O-rings)
580	Cap
758	Strainer insert
901	Hex. head bolt
902	Stud
903	Screwed plug
904	Grub screw
920	Hex. nut
925	Stem nut
932	Circlip
950	Spring
961	Handwheel

5.4 Function

Shut-off valves

BOA-SuperCompact[®], BOA-Compact[®], BOA-Compact[®] EKB

Shut-off valve types BOA-SuperCompact[®], BOA-Compact[®] and BOA-Compact[®] EKB have single-piece bodies (100) without separate bonnets (161). The valves are provided with an elastomer stem seal. The functional unit basically consists of the valve disc (350) and the stem (200); the actuating element is a handwheel (961). The stem (200) passage is sealed by a quadruple O-ring bush (540) or, on BOA-SuperCompact[®] and BOA-Compact[®] DN125-200 valves, by a profile ring (412). The stem seal is maintenance-free and does not require re-tightening.

BOA[®]-H

The valves of the BOA[®]-H series consist of the pressure-retaining parts, i. e. body (100) and bonnet (161), the functional unit, i.e. stem and valve disc, and the actuating element (handwheel). Body (100) and bonnet (161) are connected by means of hex. head bolts (901) and hex. nuts (920) (for EN-JL1040) or by means of studs (902) (for EN-JS1025) and sealed towards the outside by a joint ring (411).

The functional unit of the bellows-type valve with back-up gland packing basically consists of the valve disc (350), the stem (200) and the bellows (442); the actuating element is a handwheel (961). The stem (200) passage is sealed by means of the bellows (442) in accordance with the German clean-air regulations. The back-up gland packing (461) is tightened by means of 2 stuffing box screws (45-6) at the stuffing box ring (454).



When delivered ex factory, the back-up gland packing is not fully tightened. In the event of the bellows' failure, the stuffing box screws (back-up gland packing) must be tightened in order to avoid fluid leakage (cf. section 3 Safety).

The bellows-type stem seal is maintenance-free.

As a standard, the contact faces of body seat and / or valve disc (350) are made of rust-proof materials or plastic rings (variant with PTFE disc).

BOA[®]-W

BOA[®]-W shut-off valves consist of a body (100) and bonnet (161). Body (100) and bonnet (161) are connected by hex. head bolts (901), or by studs (902) with hex. nuts (920) if the valve is supplied with travel stop/position indicator variant kit, and sealed towards the outside by means of an O-ring (412).

The functional unit basically consists of the valve disc (350) and the stem (200); the actuating element is a handwheel (961). The stem (200) passage is sealed by a profile ring (410).

The stem seal is maintenance-free and does not require re-tightening.

Non-return valves

BOA[®]-R

Non-return valves are spring-loaded check valves which close automatically if fluid flow is reversed.

The valves of the BOA[®]-R series consist of the pressure-retaining parts, i. e. body (100) and cover (161) and the functional unit, i.e. disc with spring. In BOA[®]-R valves, the check valve disc (351) is guided in or by the body cover (161). The position of the check valve disc (351) is determined both by the flow conditions and by the spring (950) (standard feature).

BOA[®]-RVK

Non-return valves are spring-loaded check valves which close automatically if fluid flow is reversed.

The valves of the BOA[®]-RVK series consist of a pressure-retaining single-piece body (100) and body cover (161) and the functional unit, i.e. disc with spring. In BOA[®]-RVK valves, the disc (198) is guided in the body (100). The position of the disc (198) is determined both by the flow conditions and by the spring (950) (standard feature).

Strainers

BOA®-S

The valves of the BOA®-S series consist of the pressure-retaining parts, i. e. body (100) and body cover (161) and strainer insert (758). Actuating elements are not required on this valve type and therefore not supplied.

The body (100) and cover (161) are connected by studs (902) and nuts (920), and the joint is sealed off by the joint ring (411). The strainer insert (standard or fine-mesh) (758) is clamped in the body neck and catches dirt particles depending on the mesh size (see type leaflet).



The strainer requires regular maintenance (cleaning the strainer insert).

6 Installation

6.1 General

As a rule, the engineering contractor, construction company or operator / user are responsible for the positioning and installation of the valves. Planning and installation errors may impair the reliable function of the valves and pose a substantial safety hazard. Compliance with the following requirements is of particular importance:

CAUTION

The piping must be laid such that detrimental thrust and torsional forces are kept away from the valve body (100) during installation and operation to avoid both leakage and damage to the body.

CAUTION

The caps on the connection ports, if any, shall be removed immediately prior to installation. The flange faces must be clean and undamaged.



The gaskets on the flange faces must be positioned exactly in the centre.

Only fasteners (for ex. to DIN EN 1515-1) and flange gaskets (for ex. to DIN EN 1514) made of materials suitable for the respective valve size may be used. For the flange connection between valve and pipe use all flange bolt holes provided.

For information on the size and the number of connecting elements between piping and valve, refer to the respective type leaflet and/or the KSB "flange calculator" (Ref. No. 0570.3/02).

If **BOA-SuperCompact®**, **BOA-Compact®**, **BOA-Compact® EKB** and **BOA®-H** valves are installed outdoors with the stem pointing upwards, water ingress at the stem head must be prevented by ensuring suitable weather protection.

When painting pipes or equipment, do not apply paint to the bolts (902, 920, 901), stems (200) and plastic components (cap 580, handwheel 961) (valve function will be impaired).

If construction work is still in progress, the valves must be protected against dust, sand and building material (cover with suitable material).

Neither the valves' handwheels nor any other valve actuators fitted must be used as footholds.

CAUTION

Valves with bodies (100) made of cast iron EN-JL1040 (body is marked JL1040 – or GG-25 on older bodies) must not be subjected to any sudden impacts (using tools, for example) on either body and bonnet/cover as they could be destroyed.

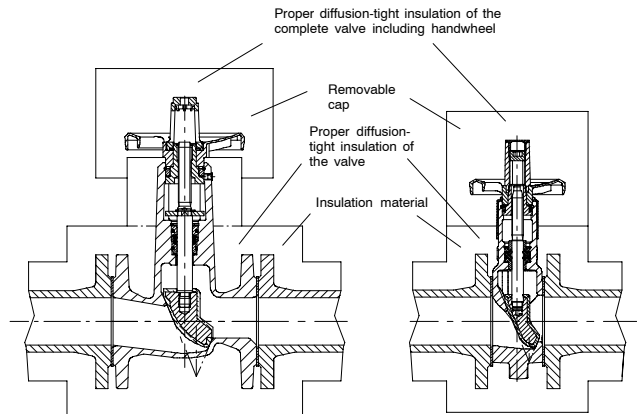


For safety reasons, valves and piping systems operated at high (> 50°C) or low (< 0°C) temperatures, must be insulated, or a warning sign must point out the risk of personal injury involved when touching the hot or cold components.

CAUTION

If there is a risk of condensation water or ice formation, for example in air-conditioning, cooling and refrigerating systems, it is important to ensure that the complete valve including handwheel, if required, is provided with a proper diffusion-tight insulation. The formation of ice introduces the risk of valve actuator blocking. See sketch.

Proper diffusion-tight insulation (schematic)



6.2 Fields of application / Operating data / Installation instructions

The valves are installed such that the flow direction of the fluid (medium handled) corresponds to the direction shown by the arrow cast on the valve body. General information on the individual valve series, fields of application, permissible operating data, installation instructions and piping connections are given below.

The following maximum values for operating pressures must not be exceeded; refer to section 3.8 as well as to the identical information in the respective type leaflets.

Max. permissible operating pressures in bar

Valve types BOA-SuperCompact®, BOA-Compact®, BOA-Compact® EKB, BOA®-W, BOA®-H, BOA®-R, BOA®-S

in material **EN-GJL-250**, data as per DIN EN 1092-2

PN	-10 to 120 °C	150 °C	180 °C	200 °C	230 °C	250 °C	300 °C
6	6.0	5.4	5.0	4.8	4.4	4.2	3.6
10	10.0	9.0	8.4	8.0	7.4	7.0	6.0
16	16.0	14.4	13.4	12.8	11.8	11.2	9.6

Valve types BOA®-H, BOA®-R, BOA®-S

in material **EN-GJS-400-18-LT**, data as per DIN EN 1092-2

PN	-10 to 120 °C	150 °C	200 °C	250 °C	300 °C	350 °C
16	16.0	15.5	14.7	13.9	12.8	11.2
25	25.0	24.3	23.0	21.8	20.0	17.5

Valve type BOA®-S

in material **GP240-GH+N**, data as per V-DIN 2401

PN	-10 to 120 °C	200 °C	250 °C	300 °C	350 °C	400 °C	450 °C
25	25.0	22.0	20.0	17.0	16.0	13.0	8.0
40	40.0	35.0	32.0	28.0	24.0	21.0	13.0

Valve type BOA®-RVK

in material **CuZn39Pb3** or **EN-GJL-250** product-specific data

PN	50 °C	80 °C	100 °C	120 °C	250 °C
6	6.0	4.0	2.0	–	–
6/10/16	16.0	16.0	16.0	16.0	13.0

The below data is an excerpt of the type leaflets:

BOA-SuperCompact®

Fields of application

Hot-water heating systems up to 120 °C to DIN 4751
Air-conditioning systems

Not suitable for fluids containing mineral oils, steam or fluids liable to attack EPDM and cast iron (EN-JL1040).

Operating data

Temperature range: -10 to +120 °C (continuous)
Pressure range: up to $\Delta p = 6, 10$ and 16 bar

Installation instructions

Flow through BOA-SuperCompact® shut-off valves should be in the direction of the embossed arrow on the valve body.
An alternating direction of flow is permissible, however.

Dimensions – Standards

Face-to-face lengths: DN length Nom. diameter = Face-to-face length (DN20/25 to DN150)
DN 200 Face-to-face length as per EN 558-1/14 suitable for installation between flanges to DIN EN 1092-2
DN 200 Flanges to DIN EN 1092-2
Flange type 21
Flange facing: DIN EN 1092-2, type B

BOA-Compact®

Fields of application

Hot-water heating systems up to 120 °C to DIN 4751
Air-conditioning systems

Not suitable for fluids containing mineral oils, steam or fluids liable to attack EPDM and cast iron (EN-JL1040).

Operating data

Temperature range: -10 to +120 °C (continuous)
Pressure range: up to $\Delta p = 6$ and 16 bar

Installation instructions

Flow through BOA-Compact® shut-off valves should be in the direction of the embossed arrow on the valve body.
An alternating direction of flow is permissible, however.

Dimensions – Standards

Face-to-face lengths: EN 558-1/14 (was: DIN 3202/F 4) ISO 5752/14
Flanges: DIN EN 1092-2, flange type 21
Flange facing: DIN EN 1092-2, type B

BOA-Compact® EKB

Fields of application

Water supply systems, drinking water
Air-conditioning systems
Cooling circuits

Fluids containing mineral oils
For installation in copper pipelines the installation instructions given below must be complied with.

Not suitable for steam or fluids liable to attack NBR and the electrostatic plastic coating (EKB).

Operating data

Temperature range: -10 to +70 °C, for short periods +90 °C
Pressure range: up to $\Delta p = 10$ bar (DVGW version, German Association of the Gas and Water Sector)
up to $\Delta p = 16$ bar

Installation instructions

Flow through BOA-Compact® EKB shut-off valves should be in the direction of the embossed arrow on the valve body.
An alternating direction of flow is permissible, however.



When the valve is installed in copper pipes, fabric-reinforced rubber gaskets (sealing elements to DIN EN 1514) must be fitted between the valves flanges and the pipe flanges, and insulating bushes with centering collar made of polyamide (e.g. Korrex insulating bushes, available from fastener suppliers) must be fitted between the bolts and bolt holes (to avoid metal-to-metal contact between the valve and the pipe if the coating should be damaged). Sealing elements and insulating bushes must be ordered from specialist suppliers.



Please contact a KSB sales office before installing BOA-Compact® EKB valves in copper pipes of industrial hot water systems from 30 °C to 70 °C.

Dimensions – Standards

Face-to-face lengths: EN 558-1/14 (was: DIN 3202/F 4) ISO 5752/14
Flanges: DIN EN 1092-2, flange type 21
Flange facing: DIN EN 1092-2, type B

BOA®-W

Fields of application

Hot-water heating systems up to 120 °C to DIN 4751.
Air-conditioning systems

Not suitable for fluids containing mineral oils, steam or fluids liable to attack EPDM and cast iron (EN-JL1040).

Operating data

Temperature range: -10 to +120 °C.
Pressure range: up to $\Delta p = 6$ and 16 bar

Installation instructions

Flow through BOA®-W shut-off valves should be in the direction of the embossed arrow on the valve body. An alternating direction of flow is permissible. For DN 200 valves, however, alternating flow is only permitted up to a differential pressure of 12 bar. For higher differential pressures BOA®-H shut-off valves with pilot plug (see type leaflet 7150.1) shall be used.

Dimensions – Standards

Face-to-face lengths: EN 558-1/1 (was: DIN 3202/F 1) ISO 5752/1
Flanges: DIN EN 1092-2, flange type 21
Flange facing: DIN EN 1092-2, type B

BOA®-H

Fields of application

Hot water heating systems DIN 4751
High-temperature hot water heating systems DIN 4752
Heat transfer systems DIN 4754
Pressure vessel equipment to TRB 801 No. 45 1)
Steam boiler systems to TRD 108/110 1)

1) The limits given in the technical codes shall be complied with.

Operating data

Temperature range: -10 to + 300 °C for EN-GJL-250
-10 to + 350 °C for EN-GJS-400-18-LT
Pressure range: up to $\Delta p = 16$ bar EN-GJL250 (DN15-300) and EN-GJS-400-18-LT (DN15-350)
up to $\Delta p = 25$ bar EN-GJS-400-18-LT (DN 15-150)

Installation instructions

Flow through BOA®-H shut-off 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 disc, but not for valves fitted with throttling discs. If the following differential pressures are exceeded on valves with standard discs from DN 200 upwards, a pilot plug design is required. The pilot plug only takes effect if there is a pressure build-up on the outlet side (flow in the opposite direction of the arrow on the valve body).

	DN	150	200	250	300/350
PN 16	Δp bar	–	12	9	6
PN 25		21			



The valves should not be installed with the stem (200) pointing downwards to prevent dirt deposits between the folds of the bellows (442) which might cause valve failure. Shut-off valves must be installed in the line so as to ensure that the fluid enters the valve beneath the disc (350) and flows out above the disc. However, they can also be installed in lines with alternating flow. If the valves are to be used for throttling applications, a throttling valve disc (standard variant) must be used. In valves with throttling discs, the flow direction must correspond to the direction indicated by the arrow on the valve. If in doubt please contact a KSB sales office. Valves with pilot plug are always installed so that the pressure to be sealed off lies above the plug.

Dimensions – Standards

Flanges: DIN EN 1092-2, flange type 21
Flange facing: DIN EN 1092-2, type B
Face-to-face lengths:
Straight-way pattern: EN 558-1/1 (was: DIN 3202/F 1) ISO 5752/1
Angle pattern: EN 558-1/8 (was: DIN 3202/F 32) ISO 5752/8

BOA®-R

Fields of application

Hot water heating systems DIN 4751
 High-temperature hot water heating systems DIN 4752
 Heat transfer systems DIN 4754
 Pressure vessel equipment to TRB 801 No. 45 ¹⁾
 Steam boiler systems to TRD 108/110 ¹⁾

¹⁾ The limits given in the technical codes shall be complied with.

Operating data

Temperature range: –10 to +300 °C for EN-GJL-250
 –10 to +350 °C for EN-GJS-400-18-LT
 Pressure range: Straight-way pattern: up to $\Delta p = 6$ or 16 bar
 Angle pattern: up to $\Delta p = 16$ bar

Installation instructions

The flow direction must correspond to the arrow indicated on the valve body. A minimum pressure is required for opening. If this minimum pressure is not reached, the spring can be dismantled. Without spring, the valve shall only be installed in upright position in horizontal pipes.

Minimum opening pressures (mbar)

DN	15-50	65-150	200-350
with spring	250	200	150
without spring	25	16	22



To ensure proper operation, non-return valves must always be installed in such a way that the fluid enters the valve beneath the check valve disc (351). When equipped with a spring (950), they can be used in both pipes with upward flow and pipes with downward flow. Non-return valves without spring (950) shall only be installed in horizontal position with the cover (161) pointing upwards in horizontal pipes (cf. notes in section 6.2 BOA®-R).

Dimensions – Standards

Flanges: DIN EN 1092-2, flange type 21
 Flange facing: DIN EN 1092-2, type B
 Face-to-face lengths:
 Straight-way pattern EN 558-1/1 (was: DIN 3202/F 4) ISO 5752/1
 Angle pattern: EN 558 1/8 (was: DIN 3202/F 32) ISO 5752/8

BOA®-RVK

Fields of application

Industrial and heating systems
 Liquids, gases and steams
 Hot water heating systems DIN 4751
 High-temperature hot water heating systems DIN 4752
 Heat transfer systems DIN 4754 (PN 6/10/16 only)
 Any limits given in the technical codes shall be complied with.
 Not suitable for fluids liable to attack the valve materials.

Operating data

Temperature range: PN 6: –30 ^{*}) to 100 °C
 PN 6/10/16: –30 ^{*}) to 250 °C
^{*}) for DN 125-200 (EN-GJL-250) down to –10 °C
 Pressure range: up to $\Delta p = 6$ or 16 bar

Opening pressures (p₀)

depending on flow direction

DN	p ₀ in mbar			
	↔	↓	↑	↑ without spring
15	20	16	24	4
20	20	16	24	4
25	20	16	24	4
32	20	16	24	4
40	20	15,5	24,5	4,5
50	20	15	25	5
65	20	14,5	25,5	5,5
80	20	13,5	26,5	6,5
100	20	13,5	26,5	6,5
125	20		34	14
150	20		33	13
200	20		32	12

Installation instructions

The flow direction must correspond to the arrow cast on the valve body. A minimum pressure is required for opening. If this minimum pressure is not reached, the spring can be dismantled. Valves without spring shall only be installed in vertical pipes with upward flow.



Valves of the BOA®-RVK series are clamped between the two mating flanges of the pipeline and centered by the flange bolting. A minimum pressure is required for opening BOA®-RVK valves. If this minimum pressure is not reached, the spring (950) can be dismantled. Valves without spring shall only be installed in vertical pipes with upward flow.

Dimensions – Standards

Face-to-face lengths: EN 558-1/49 (was: DIN 3202/K 4)
 Can be installed between
 flanges: DIN 2501 PN 6-16, ANSI B 16.1 25/125,
 BS 4504 PN 6-16

BOA®-S

Fields of application

Hot and high-temperature hot water, steam, fluids containing mineral oils and organic heat transfer media in systems or system components without special technical codes
 Hot water heating systems DIN 4751
 High-temperature hot water heating systems DIN 4752
 Heat transfer systems DIN 4754
 Steam boiler systems to TRD 108/110 ¹⁾
 Pressure vessel systems to TRB 801 No. 45 ¹⁾
¹⁾ The limits given in the technical codes shall be complied with.

Operating data

Temperature range: –10 to +300 °C for EN-GJL-250
 –10 to +350 °C for EN-GJS-400-18-LT
 Pressure range: up to $\Delta p = 6, 16$ or 25 bar

Installation instructions

Compliance with the flow direction arrow is of paramount importance. If the strainer is installed incorrectly – with fluid flow opposite to the directional arrow – its function is impaired. In both horizontal and vertical pipes, we recommend to install the strainer with the strainer insert hanging downwards to facilitate cleaning. Compliance with the directional arrow is important.



Strainers shall always be installed in such a way that the fluid flows through the strainer insert from the inside towards the outside (cage effect of the strainer insert). In horizontal pipes, the strainer insert is normally located below the pipe axis.

Dimensions – Standards

Face-to-face lengths: EN 558-1/1 (was: DIN 3202/F 1) ISO 5752/1
 Flanges: DIN EN 1092-2, flange type 21
 Flange facing: DIN EN 1092-2, type B

7 Commissioning, start-up / shutdown

(Please also refer to section 6 Installation)

7.1 Commissioning / start-up

General

Prior to commissioning / start-up compare the material, pressure and temperature data on the valves with the operating conditions of the piping to check the material's chemical resistance and stability under load.



Surge pressure (waterhammer), which might occur, must not exceed the max. permissible pressure (see the pressure / temperature table in Section 6.2). Safety measures are required to be taken. Venting the valve by undoing the bonnet/cover bolting or removing the gland packing is dangerous and therefore not permitted.

It is generally not allowed to use lamellar graphite cast iron (EN-JL1040) in systems where surge pressures might develop, since this material does not withstand pressure surges and, therefore, the valves can be damaged or destroyed. In such cases valves made of nodular cast iron (EN-JS1025) or steel shall be used.

In new systems and particularly after repair, the complete piping must be thoroughly flushed with the valves fully opened so that particles and / or welding beads that might damage the seat / disc interface are removed.

Valve actuation

Viewed from above, the valve is closed with a clock-wise turn of the handwheel, and opened with a counter clock-wise turn. Direction symbols are found on the top of the handwheel.

CAUTION As the valve can be damaged by applying excessive forces, it is not allowed to use additional levers when moving the handwheel. This is of particular importance for soft-seated valves types (BOA-SuperCompact[®], BOA-Compact[®], BOA-Compact[®] EKB, BOA[®]-W) but also applies to metal-seated valves (BOA[®]-H with standard disc).

Shut-off valves are normally used in such a way that they are either fully open or fully closed.

For control functions, variants with throttling disc should be fitted, unless throttling discs are installed as a standard feature (e.g. BOA-SuperCompact[®], BOA-Compact[®], BOA-Compact[®] EKB).

CAUTION Performing throttling operations without a throttling disc may result in an excessive noise level, excessive wear or even destruction of the valve by cavitation.

Functional test

The following functions must be checked:

Check the shut-off function of the installed valve prior to commissioning / start-up by opening and closing it several times.

The bonnet/cover bolting (902/920 or 901) on BOA[®]-H, BOA[®]-R, BOA[®]-W and BOA[®]-S with the joint ring (411) or O-ring (412) shall be checked for tightness after the first loading or heating up of the valves (also applies to maintenance-free valves!). If required, the bonnet bolting (902/920 or 901) must be gradually re-tightened, cross-wise and evenly in a clock-wise direction.

CAUTION Before tightening the bonnet bolting open the valve by approximately two full turns of the handwheel to avoid stress or distortion.

Re-tightening the bonnet/cover bolting is particularly important for valves installed in heat transfer systems to DIN 4754.

Valves with actuator

For valves with actuators (electric/pneumatic) please refer to the separate operating manual supplied.

7.2 Shutdown

In the event of prolonged shutdowns, fluids (media) which change their physical condition due to changes in concentration, polymerization, crystallization, solidification, etc. must be drained from the piping. If required, flush the piping with the valves fully opened.

8 Servicing / maintenance

8.1 Safety instructions

Repair and maintenance work must only be performed by skilled, properly trained personnel.

It is imperative that the safety instructions given below and the general information on safety as per section 3 be observed for all servicing and maintenance work to be performed.

CAUTION Always use suitable original spare parts (see section 10) and tools - even if sudden emergencies arise - to ensure proper functioning of the valve.

Valve dismantling

Before removing the complete valve from the pipeline or before repair or maintenance work to the valve itself, i.e.

- prior to undoing the flange bolting between valve and pipe
- prior to undoing the bonnet bolting (902/920 or 901)
- prior to undoing the stuffing box screw (45-6) at the stuffing box ring (454)
- if the bellows is defective or there is fluid leakage in this area
- prior to removing any drain, opening or vent plugs



valve pressure must be released and the valve must be allowed to cool down such that the temperature is below the fluid's vaporization temperature in all areas in contact with the fluid in order to effectively prevent any risk of scalding.



Never open a valve under pressure (danger to life)!

If toxic or easily inflammable fluids were handled, or fluids whose residues may cause corrosion in conjunction with air humidity, drain the valve and flush or vent it.

If required, wear safety clothing and a protective mask!

Depending on the installation position, fluid residues may be left in the valve; these must be collected and properly disposed of.

Prior to any transport, flush and drain the valve thoroughly.

For any queries please contact the nearest KSB sales branch.

Removing actuators

If actuators powered by an external source of energy (electric, pneumatic, hydraulic) need to be removed from the valves or dismantled, the energy supply must be shut down prior to starting any work and the instructions in sections 3, 8.1 and the operating manual of the actuator must be observed.

Actuators with integrated spring mechanism cannot be dismantled.

CAUTION Pre-loaded springs!

For any queries please contact the nearest KSB sales branch.

8.2 Maintenance

All valve components have been designed to be largely maintenance-free. The materials of the moving parts have been selected for minimum wear. To ensure operating reliability and to reduce repair costs, all valves should however be checked regularly, i. e. they should be actuated at least once or twice per year (opened/closed), in particular those valves which are rarely used or difficult to access.

The operator/user is responsible for fixing appropriate inspection and servicing intervals as required by the service conditions of the valves.

The service life of valves, no matter whether they require maintenance or not, can be prolonged by:

- Lubricating the moving parts such as stem (200) and stem nut (925) using standardized lubricants to DIN 51825.
- Replacing the bonnet/cover joint ring (411) by a new one in due time.

The safety instructions in sections 3, 8.1 and the notes in section 9 shall be observed.

8.3 Testing overhauled valves

After re-assembly (using original spare parts) and prior to commissioning / start-up, the overhauled valves must be subjected to shell / pressure and leak tests to DIN 3230, Part 3 (not applicable to BOA[®]-S).

9 Trouble-shooting

9.1 General

KSB valves are robust in design. Nevertheless, malfunctions e.g. caused by maloperation, lack of maintenance or improper use cannot be ruled out completely.

All repair and maintenance work shall be performed by skilled, properly trained personnel using suitable tools and original spare parts. We recommend to have this work performed by our service personnel.

The safety instructions in sections 3 and 8 must be complied with.

9.2 Faults / malfunctions > Remedy

• Leakage at the seat / disc interface

Valve types BOA-SuperCompact[®], BOA-Compact[®], BOA-Compact[®] EKB:

> Rework not possible, replace valve.

Valve types BOA[®]-H, BOA[®]-R:

> The seat / disc contact faces on the body and valve disc can be reworked using a suitable reseating tool after the bonnet bolting (902/920/901) has been undone. Re-grind the seat / disc contact faces until they are consistently smooth and even (continuous ground surface).

Valve types BOA[®]-H (Variant: PTFE disc), BOA[®]-W:

> Replace the seal ring at the disc (350) (BOA[®]-H) or the complete disc (BOA[®]-W) after having removed the bonnet bolting (902/920 bzw. 901).

• Leakage at bonnet / body joint

Valve types BOA[®]-H, BOA[®]-R, BOA[®]-S and BOA[®]-W:

> Re-tighten the bonnet/cover bolting (902/920 or 901)

> Fit new joint ring (411) or O-ring (412) after having removed the bonnet/cover bolting (902/920 or 901). Clean the sealing surfaces carefully before inserting a new joint ring or O-ring.

CAUTION

Do not use additional sealing agents for non-asbestos joint rings. With anti-adhesive coatings, only use agents explicitly recommended by the seal element manufacturer.

For any queries please contact the nearest KSB sales branch.

10 Spare parts

10.1 Spare parts for the respective products



Only use original spare parts for valve repair (also refer to section 3.7 Unauthorized modification and manufacture of spare parts).

The spare parts for each valve series are listed below:

BOA-SuperCompact[®]

580	Cap with position indicator and travel stop
961	Handwheel
904	Locking device

BOA-Compact[®], BOA-Compact[®] EKB

580	Cap (indicate variant for correct marking: standard or EKB)
	Complete cap for capped valve variant
961	Handwheel
	Variant kit (cap with position indicator and travel stop)

BOA[®]-W

410	O-ring
412	Profile ring
506	Retaining ring
544	Threaded bush
961	Handwheel
	Complete cap for capped valve variant
	Complete bonnet (incl. O-ring)
	Stem/disc, complete

BOA[®]-H

100	Body (including bolts and nuts)
350	Disc (Specify disc type: standard disc, throttling disc, PTFE disc, throttling disc with PTFE)
	Joint ring
580	Cap (Specify disc type: standard disc, throttling disc, PTFE disc, throttling disc with PTFE)
902	Stud
920	Hex. nut
961	Handwheel
	Complete bonnet (incl. joint ring)

BOA[®]-R

100	Body (including bolts and nuts)
161	Body cover
350	Check valve disc
411	Joint ring
901	Stud
920	Hex. nut
950	Spring

BOA[®]-S

161	Body cover, complete (with screwed plug and joint ring)
411	Joint ring
758	Strainer insert (standard or fine-mesh, please specify)

Hoisting the valve for installation into horizontal pipeline (Examples)

Fig. 1, 2

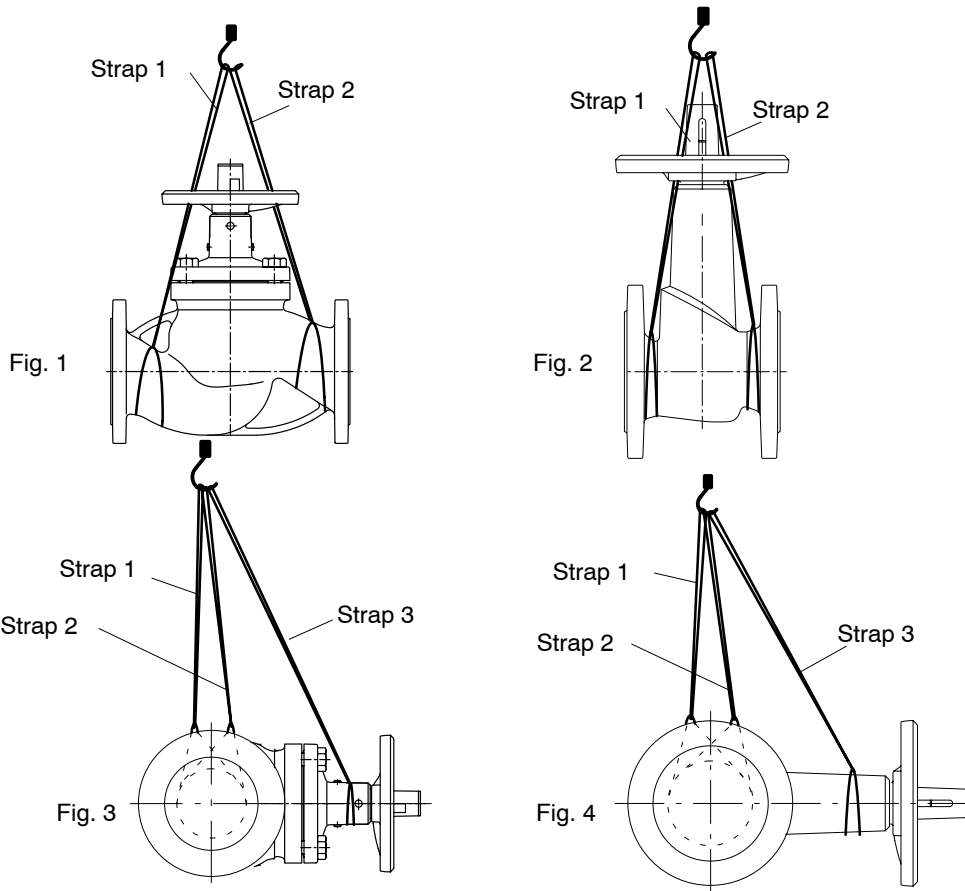
Straps 1 and 2 must be tied around the valve body. To hold the valve in the position shown below and to avoid tilting, both straps should be routed to the lifting hook between the handwheel arms.

Fig. 3, 4

Straps 1 and 2 must be tied around the valve body. The third strap serves to keep the valve in horizontal position.



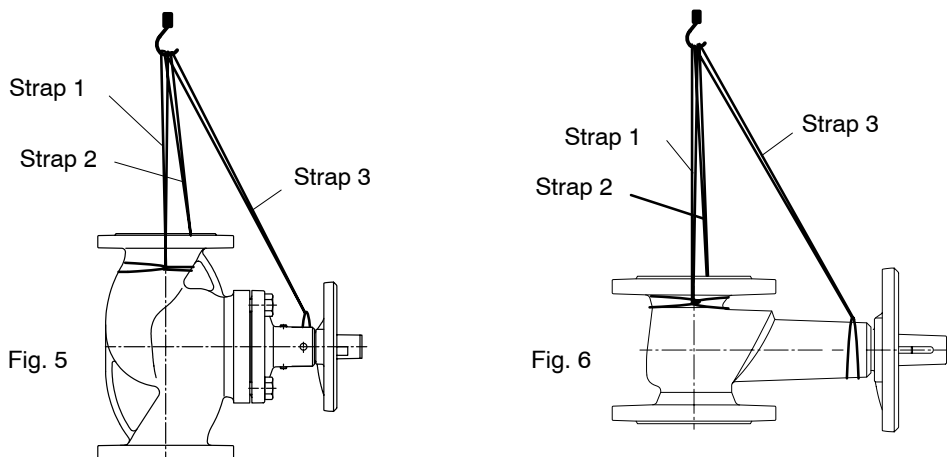
Valves must not be lifted using the handwheel.



Hoisting the valve for installation into vertical pipeline (Examples)

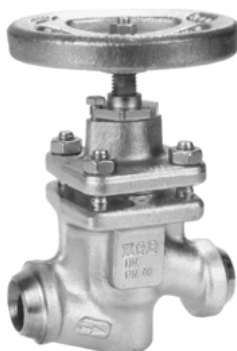
Fig. 5, 6

Straps 1 and 2 must be tied around the valve body. The third strap serves to keep the valve in horizontal position.





BOA-H



BOA-HE

Maintenance-free shut-off globe valves

with bellows

flanged
or with butt or socket-
weld ends

PN 25/40
DN 10-200

DN 250-350 BOA-HV/HEV

Our bellows globe valves meet the stringent requirements of the German Clean Air Act

Application

- In industrial plants, building services industries, power stations and marine engineering.
- For water, steam, gas and other non-aggressive media.
- Other applications on request.

Operating data

- Maximum allowable pressure 40 bar
- Maximum allowable temperature 450 °C
- Pressure-temperature ratings see next side

Materials

- Flange design
DN 10-40 forged steel P 250 GH ¹⁾ - 1.0460
DN 50-350 cast steel GP 240 GH ²⁾ - 1.0619
- Weld end design
DN 10-50 forged steel P 250 GH ¹⁾ - 1.0460
DN 65-350 cast steel GP 240 GH ²⁾ - 1.0619

Design

- Straight-way pattern with vertical bonnet
- Shut-off cone
- Seats of wear-resistant and corrosion-proof Cr-steel or CrNi-steel
- External stem thread
- Back seat
- Stem sealed by double-walled bellows and safety gland
- EC type tested (Module H), component mark TÜ.A./AR-291
- Exterior finish: blue RAL 5002

¹⁾ previously: C 22.8

²⁾ previously: GS-C 25 N

The valves meet the safety requirements of the Pressure Equipment Directive 97/23/EC (PED) of annex I for fluids of the groups 1 and 2.

Standard variants

- Throttle cone
- Pressure relief cone DN 250-350 (for DN 125-200 NORI[®] 40)
- Position indicator (standard equipment for DN 250-350)
- Nuts and bolts (tough at subzero temperature)
- Cap
- Free from oil and grease (parts in contact with flow medium)
- Other flange and butt-weld end designs
- Acceptance tests to technical codes such as TRD/TRB/AD2000 or customer specification

Remarks

- For actuators at DN 10-200 we recommend our maintenance-free globe valves NORI[®] 40, type ZXLBV/ZXLB; ZXSBV/ZXSB, according to type series booklet 7165.1
- Operating instructions: 0570.82

On all enquiries / orders please specify

- | | |
|-------------------------|-------------------------------|
| 1 Type | 6 Medium |
| 2 PN | 7 Operating temperature |
| 3 DN | 8 Pipe connection |
| 4 Working pressure | 9 Standard variants |
| 5 Differential pressure | 10 Type series booklet number |

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) according to ATEX 94/9/EC.



Pressure-Temperature ratings

Nom. pressure PN	Material	Working pressures at temperatures in °C ¹⁾						
		-10 to +120	200	250	300	350	400	450
25	P 250 GH ²⁾	25	22	20	17	16	13	8
40	GP 240 GH ³⁾	40	35	32	28	24	21	13
DN 250-350		27	22	21	19	18	17	13

¹⁾ The valves can be used down to -10° C

²⁾ previously: C 22.8

³⁾ previously: GS-C 25 N

Operating pressures to EN 1092/1 are also permissible

Installation

Globe valves are installed in the line so that the medium enters the valve underneath the cone and flows out above it. They can also be installed in lines with alternating flow.

If differential pressures as taken from the table for DN 125 to 350 are exceeded, a pressure relief cone is required. In this case, the valve must be installed so that the medium to be sealed off acts above the cone.

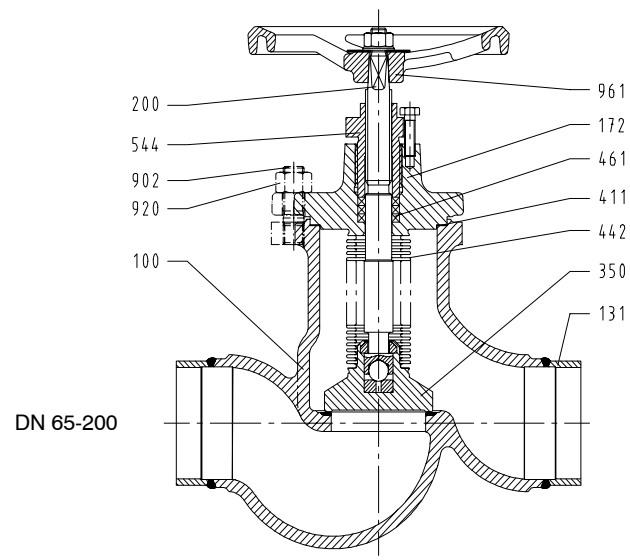
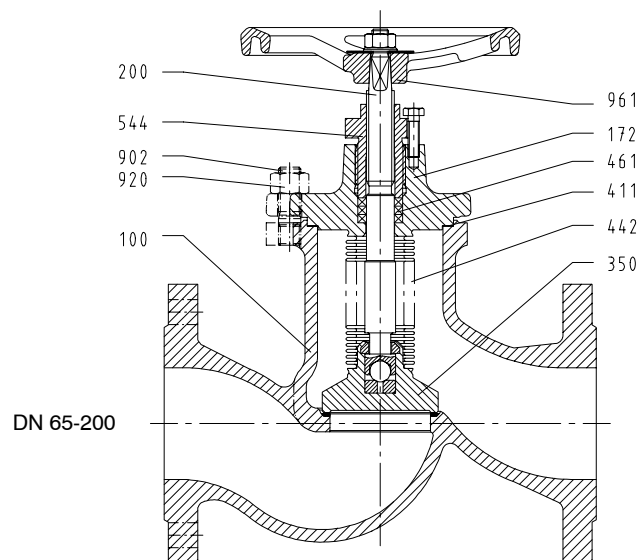
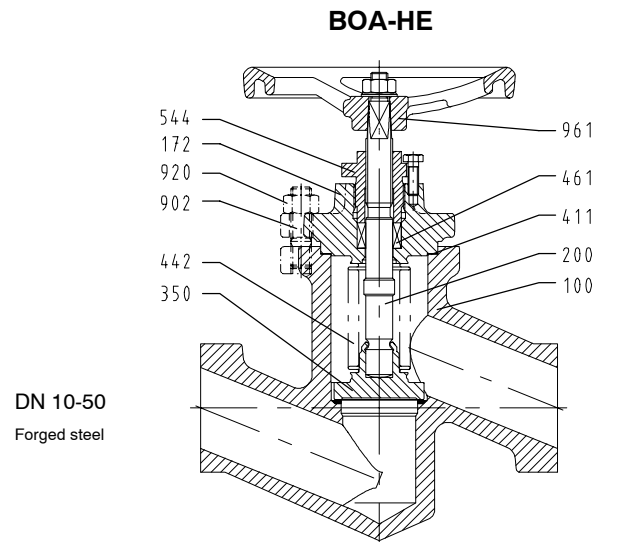
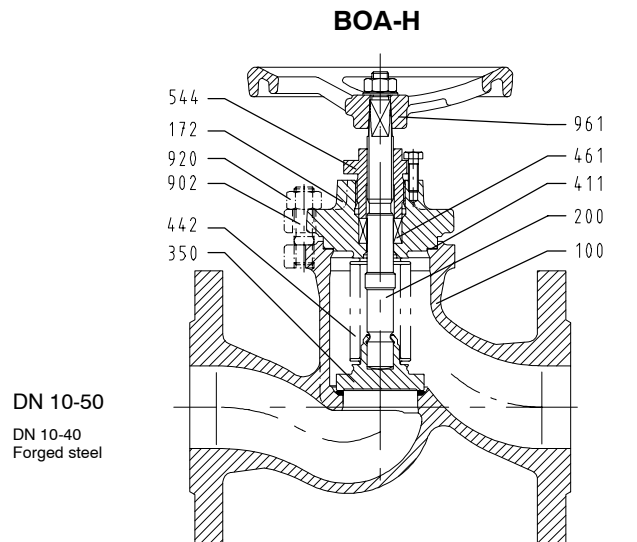
The pressure relief cone acts as a bypass and can only fulfill its function if a back pressure builds up after the valve has been opened, so that the differential pressures specified in the table are not exceeded.

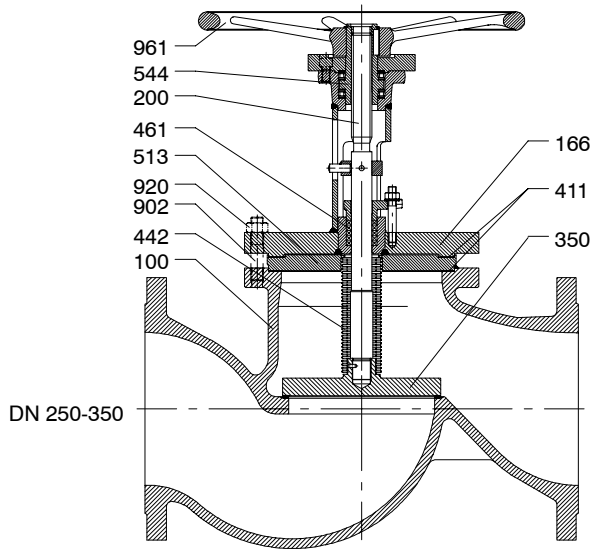
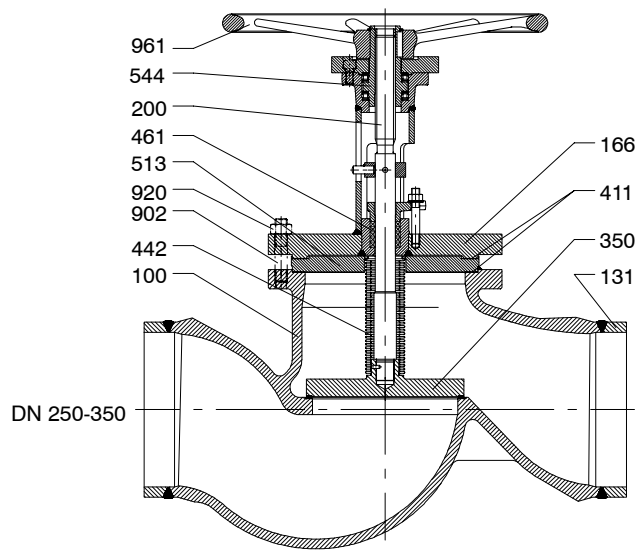
If a relief cone is required for DN 125-200, type series NORI[®] 40, type ZXLBV/ZXLB, ZXSBV/ZXSB must be used.

Max permissible differential pressure for shut-off (shut-off cone)

DN	125	150	200	250	300	350
Δp bar	33	21	14	9	6	4.5

For the optimum selection of valves with throttle cone, detailed information about the operating mode should be provided.

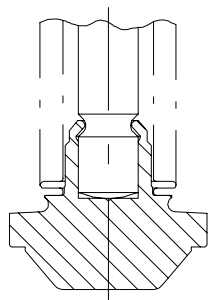


BOA-HV

BOA-HEV


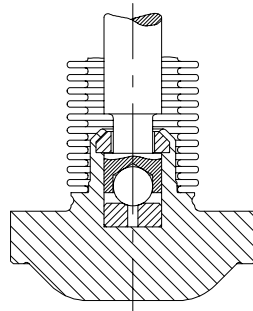
Materials

Part no.	Name of parts	Material	Remarks
100	Body	P 250 GH 1.0460	Stainless steel hard faced (1.4370)
		GP 240 GH 1.0619	
131	Connection branch	P 235 GH 1.0305	≥ DN 65
166	Yoke	P 250 GH 1.0460	DN 250
		P265GH 1.0425	≥ DN 300
172	Bonnet	P 250 GH 1.0460	
200*)	Stem	X 20 Cr 13 1.4021	Nitrided (DN 10-100)
350*)	Cone	X 20 Cr 13 1.4021	
		P 250 GH 1.0460	≥ DN 125
442*)	Bellows	X 6 CrNiMoTi 17 12 2 1.4571	Hard faced (1.4115)
544*)	Threaded bush	11 SMn 30+C 1.0715	Nitrided
		X 35 CrMo 17 1.4122	Nitrided ≥ DN 250
411*)	Gasket	CrNi - steel/graphite	
461*)	Packing	Graphite	
513	Insert ring	P 250 GH 1.0460	≥ DN 250
902	Stud	21 CrMoV 5-7 1.7709	
		Ck 35 V 1.1181	≥ DN 125
920	Hex. nut	25 CrMo 4 1.7258	
		C 35 E 1.1181	≥ DN 125
961	Handwheel	JL 1030 0.6020	

*) Recommended spare parts

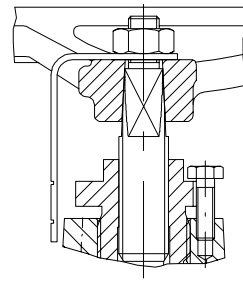
Variants BOA-H/HE


DN 10-50



DN 65-200

Throttle cone

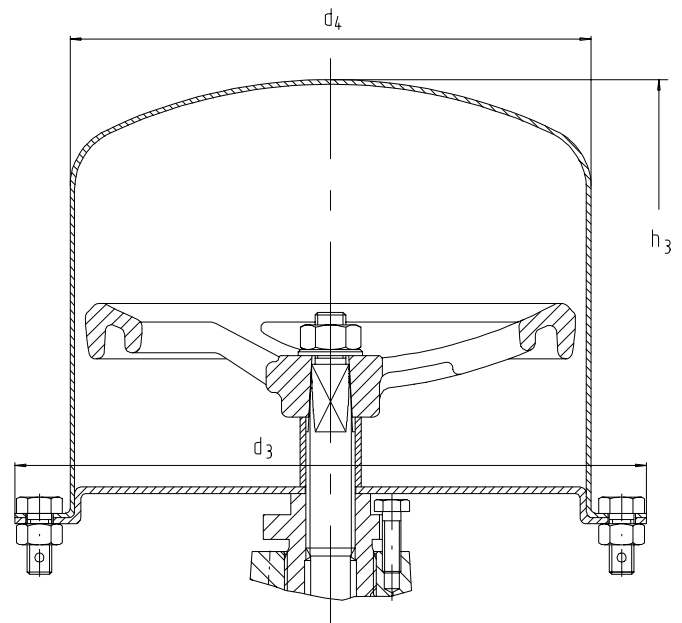


DN 10-200

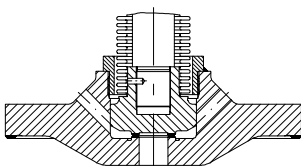
Position indicator

Dimensions

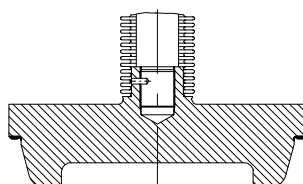
Nom. bore DN	d ₃	d ₄	BOA-H	BOA-HE h ₃	Weight (cap) approx. kg
10	165	130	185	205	0.8
15	165	130	185	205	0.8
20	165	130	205	205	0.8
25	165	130	205	205	0.8
32	205	170	265	275	1.6
40	205	170	275	275	1.6
50	205	170	295	295	1.6
65	256	220	385	385	2.5
80	256	220	415	415	2.5
100	390	340	455	455	6.5
125	390	340	495	495	6.5
150	390	340	520	520	6.5
200	470	420	550	550	9.0



Cap

Variants BOA-HV/HEV


Pressure relief cone



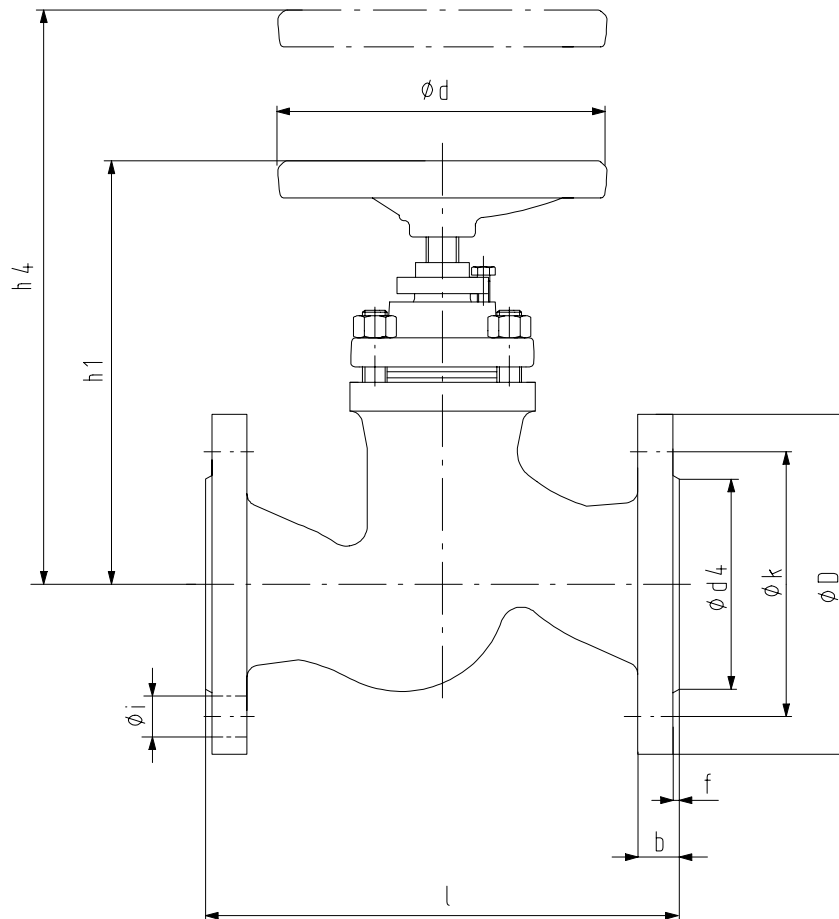
Throttling cone

Dimensions, connection dimensions, standards type BOA-H

Face-to-face dimension – EN 558-1/1
(previously: DIN 3202/F1)
ISO 5752/1

Flanges – connecting dimensions to
DIN 2501, ISO 2084, BS 4504
– raised face type C DIN 2526

Other flange designs:
e.g. grooved both ends type N, tongue type F DIN 2512,
recessed (female face) type R13, spigot (male face)
type V13 DIN 2513, type D, type E DIN 2526
Flanges to EN 1092/1
Other flange designs on request.



Dimensions in mm

Nom. pressure PN	Nom. bore DN	Face-to-face dimension l	Flange diam. ø D	Bolt circle ø k	Number of bolt holes z	Bolt hole diameter ø i	Raised face diameter ø d ₄ x f	Flange thickness b	Centre-to-top height open h 1	Vertical clearance for removal h 4	Stroke mm	Handwheel ø d	Weight approx. 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	3.7
	20	150	105	75	4	14	58 x 2	18	165	260	6.5	125	4.6
	25	160	115	85	4	14	68 x 2	18	165	260	6.5	125	5.2
	32	180	140	100	4	18	78 x 2	18	190	290	8.0	160	9.4
	40	200	150	110	4	18	88 x 3	18	200	300	10.0	160	10.6
	50	230	165	125	4	18	102 x 3	20	220	330	12.5	160	13.6
	65	290	185	145	8	18	122 x 3	22	270	420	16.5	200	22.0
	80	310	200	160	8	18	138 x 3	24	305	480	20.0	200	33.0
	100	350	235	190	8	22	162 x 3	24	345	550	25.0	250	46.0
125	400	270	220	8	26	188 x 3	26	395	580	31.5	315	67.0	
150	480	300	250	8	26	218 x 3	28	430	620	37.5	315	98.0	
25	200	600	360	310	12	26	278 x 3	30	500	760	47.5	400	169.0
40	200	600	375	320	12	30	285 x 3	34	500	760	47.5	400	175.0

Dimensions, connection dimensions, standards type BOA-HE

Face-to-face dimension - EN 12982/64

(previously: DIN 3202-S2)

Butt-weld ends

- Butt-weld ends to DIN 3239-Form 1

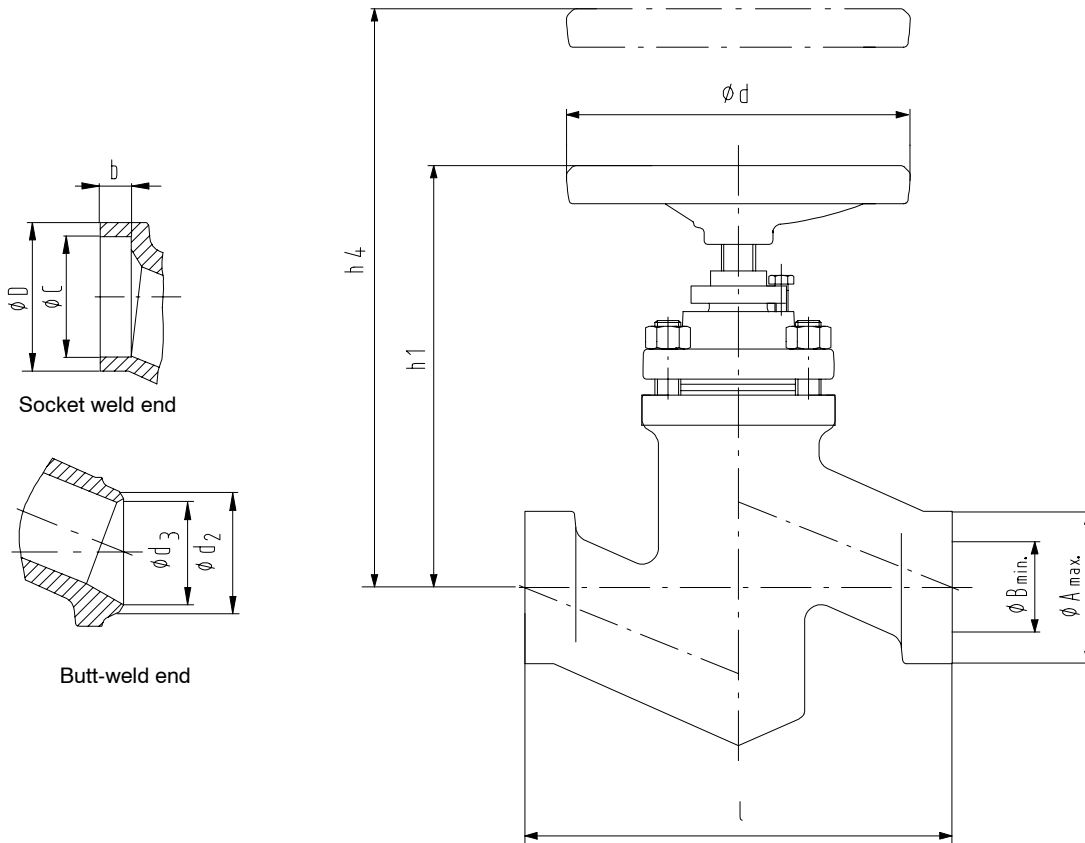
Groove form to DIN 2559-21

socket-weld ends

- ASME B16.11 / DIN 3239/2

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

Butt weld ends to EN 12627 or socket weld ends to EN 12760 possible.



Dimensions in mm

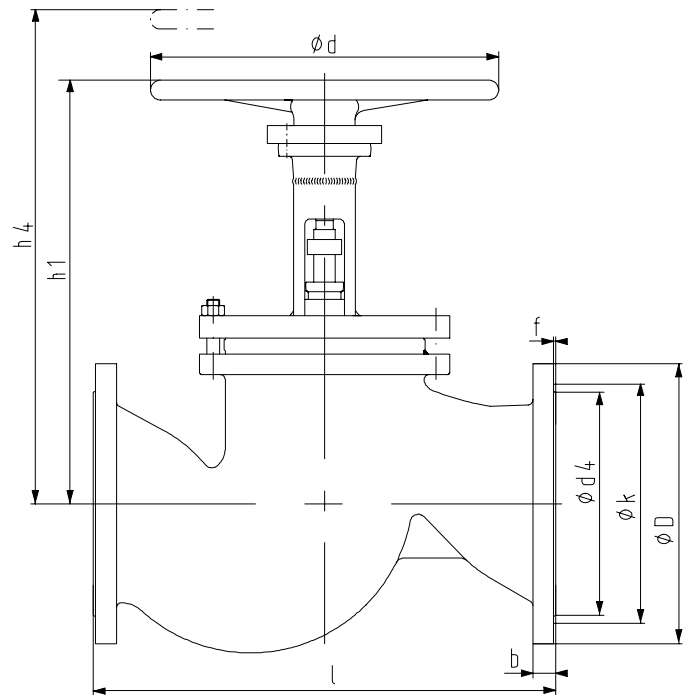
Nom. pressure	Nom. bore	Face-to-face dimension	Butt-weld ends not machined		Butt weld ends to DIN 3239-Form 1 Groove forms to DIN 2559-21			Socket weld-ends to ASME B 16.11 DIN or 3239 T2			Centre-to-top height open	Disassembly height	Stroke	Handwheel	Weight
			$\phi A_{max.}$	$\phi B_{min.}$	ϕd_2	$\phi d_3^*)$	Associated pipe dimensions	$\phi D_{-0.5}$	$\phi C^{+0.2}$	$b_{min.}$					
PN	DN	l									h 1	h 4	mm	ϕd	approx. kg
25/40	10	130	37	10	18	13	17.2 x 2.0	25	17.6	9.5	165	260	4.0	125	3.0
	15	130	37	15	22	17	21.3 x 2.0	30.5	21.7	9.5	165	260	4.0	125	3.0
	20	130	37	20	28	22	26.9 x 2.3	36.5	27.1	12.7	165	260	6.5	125	3.5
	25	130	37	24	34	28.5	33.7 x 2.6	44.5	33.8	12.7	165	260	6.5	125	4.5
	32	160	60	30	43	37	42.4 x 2.6	53.5	42.5	12.7	200	290	8.0	160	6.0
	40	180	60	38	49	43	48.3 x 2.6	60.5	48.7	12.7	200	300	10.0	160	8.0
	50	210	73	47	61	54	60.3 x 3.2	73.5	61.1	15.9	220	330	12.5	160	11.3
	65	290	76.1	64.9	76.1	69	76.1 x 3.6				270	420	16.5	200	17.0
	80	310	88.9	79.9	88.9	81	88.9 x 4.0				305	480	20.0	200	30.0
	100	350	114.3	100.1	114.3	104	114.3 x 5.0				345	550	25.0	250	40.0
	125	400	139.7	125.5	139.7	130.5	139.7 x 4.5				395	580	31.5	315	60.0
	150	480	168.3	148.3	168.3	156.5	168.3 x 5.6				430	620	37.5	315	80.0
	200	600	219.1	199.1	219.1	204.5	219.1 x 7.1				500	760	47.5	400	130.0

 *) $d_3 = d_p$ to DIN 3239

Dimensions, connection dimensions, standards type BOA-HV

- Face-to-face dimension - EN 558-1/1
(previously: DIN 3202/F 1)
ISO 5752/1
- Flanges - connection dimensions to
DIN 2501, ISO 2084, BS 4504
- raised face type C DIN 2526

Other flange designs:
e.g. grooved both ends type N, tongue type F (DIN 2512),
recessed (female face) type R13, spigot (male face)
type V13 (DIN 2513), type D, type E (DIN 2526)
Flanges to EN 1092/1
Other flange designs on request.



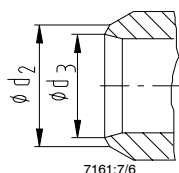
Dimensions in mm

Nominal pressure PN	Nominal bore DN	Face-to-face dimension l	Flange diam. ø D	Bolt circle ø k	Number of bolt holes z	Bolt hole diameter ø i	Raised face diameter ø d ₄ x f	Flange thickness b	Centre-to-top height open h 1	Vertical clearance for removal h 4	Handwheel ø d	Weight approx. 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

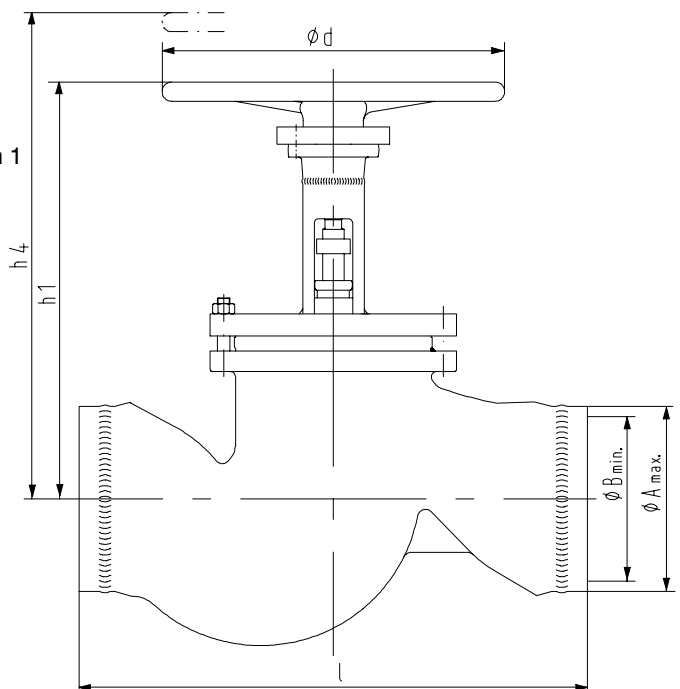
Dimensions, connection dimensions, standards type BOA-HEV

- Face-to-face dimension - EN 12982/64 (for DN 250)
- as per table (for DN 300,350)
- Weld ends - Butt weld ends to DIN 3239-Form 1
Groove form to DIN 2559-21

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



Butt weld end



Dimensions in mm

Nominal pressure PN	Nominal bore DN	Face-to-face dimension l	Butt-weld ends unmachined		Butt-weld ends to DIN 3239-Form 1 Groove forms to DIN 2559/21			Centre-to-top height open h 1	Vertical clearance for removal h 4	Handwheel ø d	Weight approx. kg
			ø A _{max.}	ø B _{min.}	ø d ₂	ø d ₃	Corresponding pipe dimensions				
25/40	250	730	273	251	273	256.5	273.0 x 8.0	705	1035	500	273
	300	950	345	305	323.9	306.5	323.9 x 8.0	785	1145	630	290
	350	1100	385	335	355.6	336.5	355.6 x 8.8	950	1400	800	600

 ø d₃ = ø d_p to DIN 3239

Product Features - to our Customers' Benefit

External stem thread

Your benefit

- Easy to service
- Free from non-ferrous metals

Stem with burnished shank

Your benefit

- Long gland life

Back seat

Your benefit

- Additional stem seal for emergency operation
- Blow-out protection to guard staff and plant
- Stroke limitation protects bellows against overloading

Olive-chromated studs and nuts

Your benefit

- Corrosion-resistant
- Easy to repair

Cone guided in the body (from DN 125 onwards)

Your benefit

- Prevents torsional forces from acting on bellows

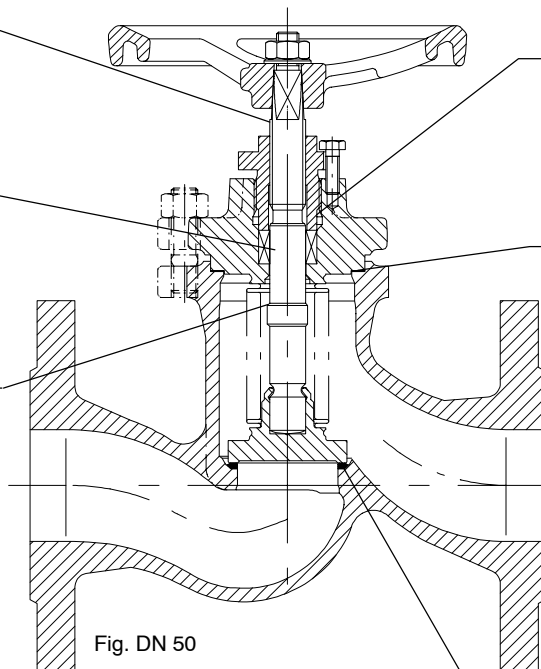


Fig. DN 50

Easily accessible safety gland

Your benefit

- Easy to readjust

Bonnet gasket inside and outside confined

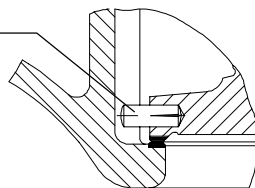
Your benefit

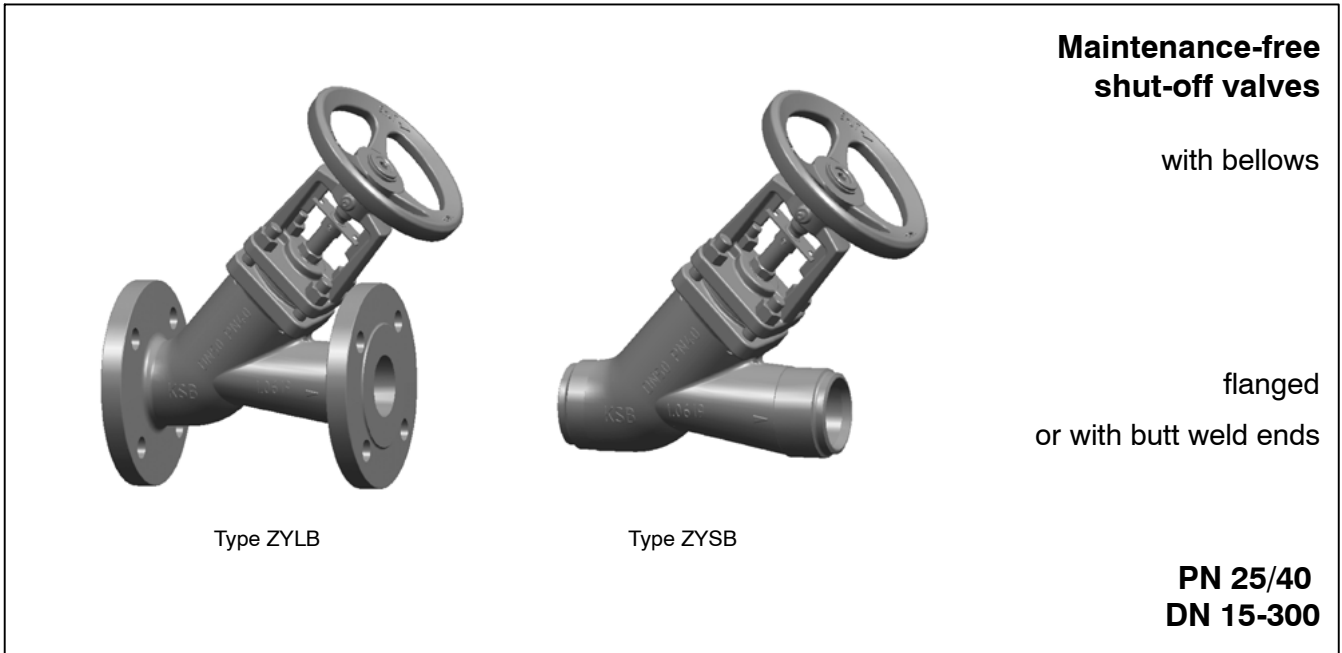
- Reliable sealing towards the atmosphere

Valve seat made of wear and corrosion-resistant materials

Your benefit

- High reliability
- Long life





Fields of Application

- In heat transfer plants, industrial plants, building services and shipbuilding
- For thermal oils, water, steam, gas and other non-aggressive fluids
- Other fluids on request.

Operating Data

- Maximum permissible pressure: 40 bar up to DN 150
25 bar from DN 200
- Maximum permissible temperature 450 °C
- Selection as per pressure-temperature ratings (see overleaf)

Materials

- Flanged valve
DN 15-300 cast steel GP 240 GH+N 1.0619+N
- Valve with butt weld ends
DN 15-300 cast steel GP 240 GH+N 1.0619+N

Design

- Straight-way Y-valve
- Throttling valve plug up to DN 100, replaceable shut-off valve plug from DN 125
- Non-rotating stem with non-rising handwheel
- Stem sealing with double walled bellows and back-up gland packing
- Fully encapsulated bonnet gasket
- Position indicator
- Locking device and travel stop
- Materials without nonferrous heavy metals
- External coating: high-temperature coating aluminium grey

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.

Standard Variants

- Throttling plug from DN 125
- Pilot plug from DN 125
- Other flange designs
- Position switch
- 3.1 B certification

References

- NORI® 40 strainer type FSL/FSS, see type series booklet 7127.1
- Flow characteristics 7160.4
- Operating instructions 0570.82

Purchase order data

- | | | | |
|---|-----------------------|----|----------------------------|
| 1 | Type | 6 | Fluid |
| 2 | PN | 7 | Operating temperature |
| 3 | DN | 8 | Pipe connection |
| 4 | Operating pressure | 9 | Variants |
| 5 | Differential pressure | 10 | Type series booklet number |



Pressure-Temperature Ratings

Nominal pressure PN	Material	Permissible operating pressures in bar at temperatures in °C ¹⁾						
		120	200	250	300	350	400	450
25	GP 240 GH+N ²⁾	25	22	20	17	16	13	8
40		40	35	32	28	24	21	13

¹⁾ The valves can be used down to -10 °C

²⁾ previously: GS-C 25 N

Operating pressures to EN 1092/1 are also permissible

Installation

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

As soon as the max. permissible differential pressures for shut-off indicated for DN 125 to 300 are exceeded, pilot plugs are required. In this case, the installation must ensure that the pressure to be sealed off is applied above the plug.

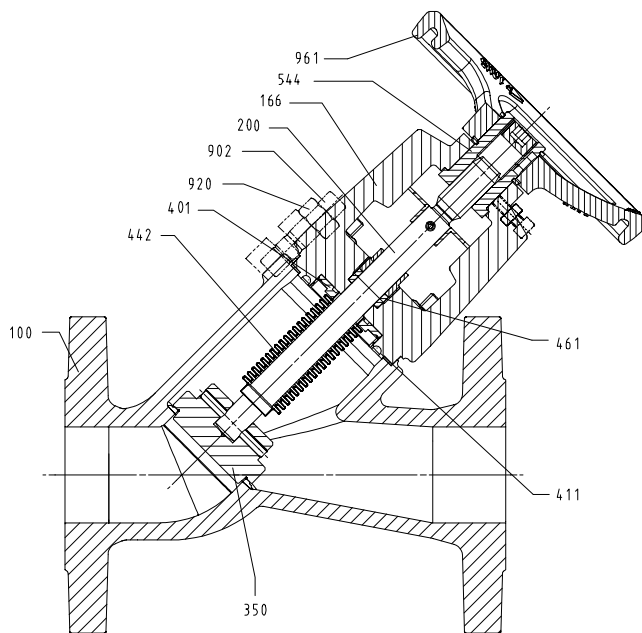
The pilot plug serves as a bypass and only fulfills its purpose if a back pressure forms after it is opened, to prevent the max. permissible differential pressures for shut-off (see rating) from being exceeded.

Max. permissible differential pressure for shut-off (standard plug)

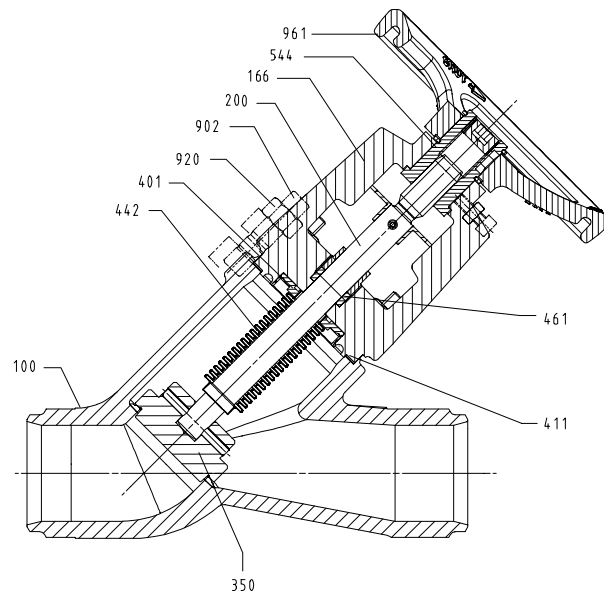
DN	125	150	200	250	300
Δp bar	33	21	14	9	6

For valves with throttling plugs detailed information on the operating mode is required for optimum selection.

ZYLB



ZYSB

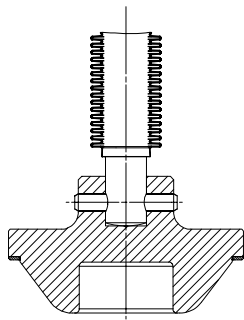


Materials

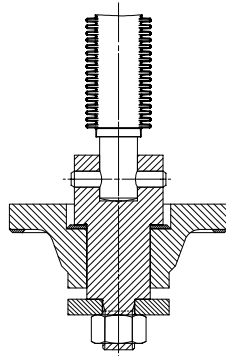
Part No.	Description	Material		Comments
100	Body	GP 240 GH+N	1.0619+N	with stainless steel hard faced plating (1.4370)
166	Yoke	GP 240 GH+N	1.0619+N	
440 *)	Bellows set	consisting of:		
166	Yoke	GP 240 GH+N	1.0619+N	
200	Stem	X 20 Cr 13	1.4021	
442	Bellows	X 6 CrNiMoTi 17 12-2	1.4571	
401	Weld ring	X 20 Cr 13	1.0421	
350 *)	Valve plug	X 20 Cr 13	1.4021	DN 15-150
		C22	1.0402	DN 200-300, with stainless steel hard faced plating (1.4370)
411 *)	Joint ring	CrNi steel / graphite		
461 *)	Gland packing	Pure graphite		
544 *)	Threaded bush	Coated steel		
902	Stud	21 CrMoV 5-7	1.7709	olive-chromated
920	Hex. nut	25 CrMo 4	1.7218	olive-chromated
961	Handwheel	GJS-400-15	JS1030	

*) Recommended spare parts

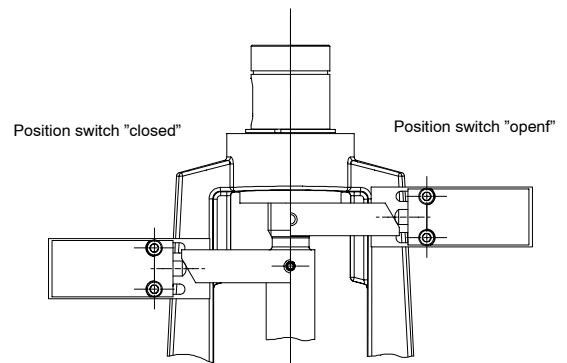
Variants



Throttle cone
from DN 125 onwards



Pressure relief cone
from DN 125 onwards



Position switch

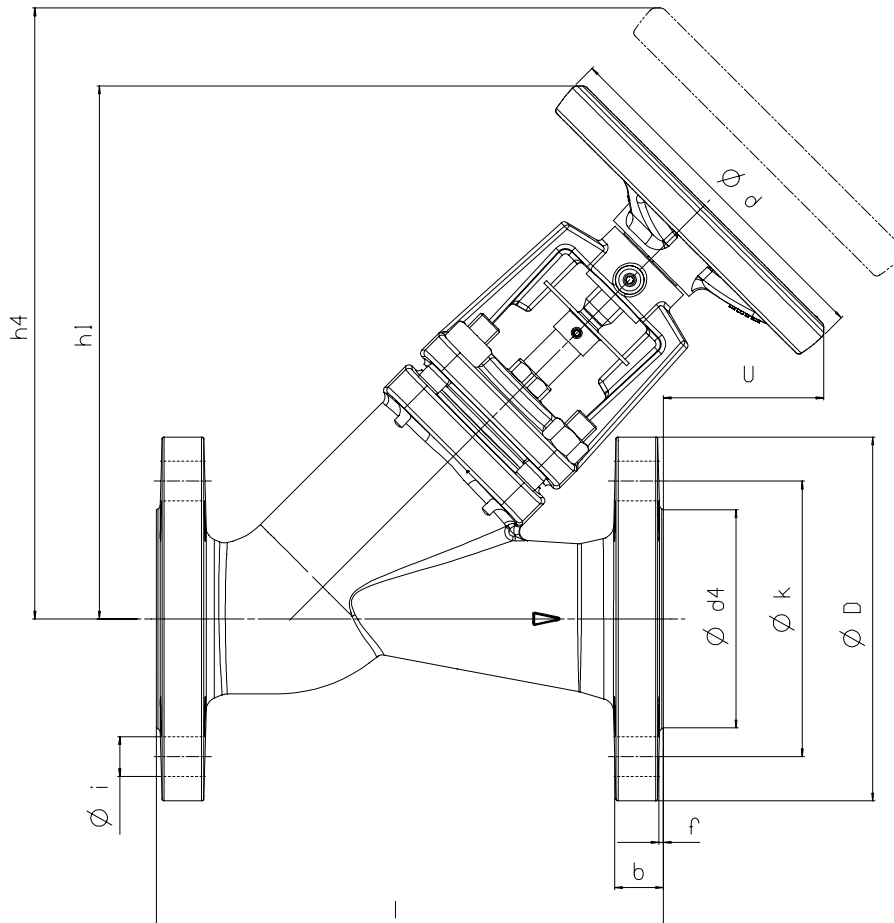
Dimensions, type ZYLB

Face-to-face length - to EN 558-1/1 (was: DIN 3202/ F 1)
 - ISO 5752/1

Flange: - Mating dimensions to DIN 2501,
 ISO 2084, BS 4504
 Raised face type C DIN 2526

Other flange designs:

e.g. grooved both ends type N, tongue type F DIN 2512,
 recessed (female face) type R 13, spigot (male face) type V 13
 DIN 2513, raised face types D or E DIN 2526
 Flanges to EN 1092-1
 Other flange designs on request

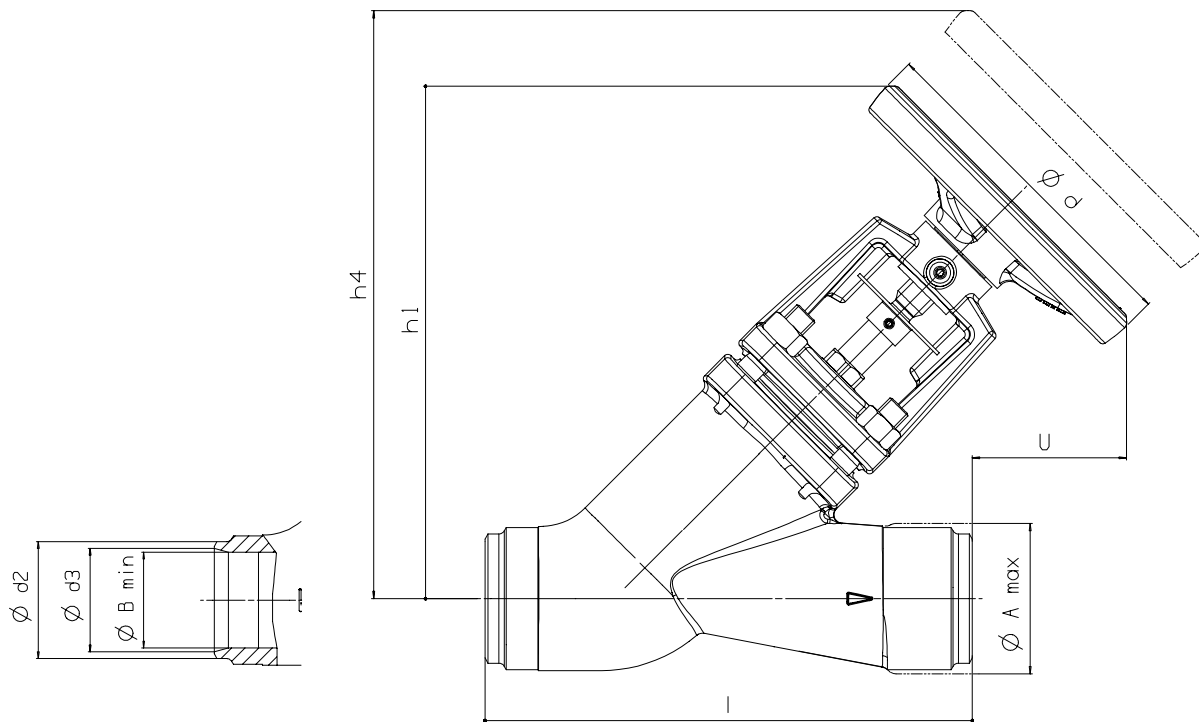


Dimensions in mm

Nominal pressure	Nominal diameter	Face-to-face length	Flange	Bolt circle	Number of bolt holes	Bolt hole	Raised face	Flange thickness	Centre-to-top height open	Vertical clearance for removal	Overhang	Handwheel	Weight
PN	DN	l	øD	øk	z	øi	ød ₄ x f	b	h 1	h 4	U	ø d	approx. kg
40	15	130	95	65	4	14	46 x 2	16	187	229	69	125	4.9
	20	150	105	75	4	14	56 x 2	18	181	220	59	125	5.4
	25	160	115	85	4	14	65 x 2	18	195	244	70	125	6.4
	32	180	140	100	4	18	76 x 2	20	195	244	55	125	8.1
	40	200	150	110	4	18	84 x 2	20	240	313	83	160	11.8
	50	230	165	125	4	18	99 x 2	22	242	316	73	160	14.6
	65	290	185	145	8	18	118 x 2	24	314	420	104	200	25.8
	80	310	200	160	8	18	132 x 2	26	317	425	92	200	28.5
	100	350	235	190	8	22	156 x 2	28	363	488	103	250	43.0
	125	400	270	220	8	26	184 x 2	30	420	569	100	315	63.2
	150	480	300	250	8	26	211 x 2	34	446	622	66	315	85.9
25	200	600	360	310	12	26	274 x 3	30	553	765	93	400	147.1
	250	730	425	370	12	30	330 x 3	32	639	907	94	500	221.1
	300	850	485	430	16	30	389 x 4	34	692	1003	77	500	320.0

Dimensions, type ZYSB

- Face-to-face length - EN 12982/64 (was DIN 3202-S2)
- Butt weld ends - DIN 3239-Type 2
- Groove type - DIN 2559/22

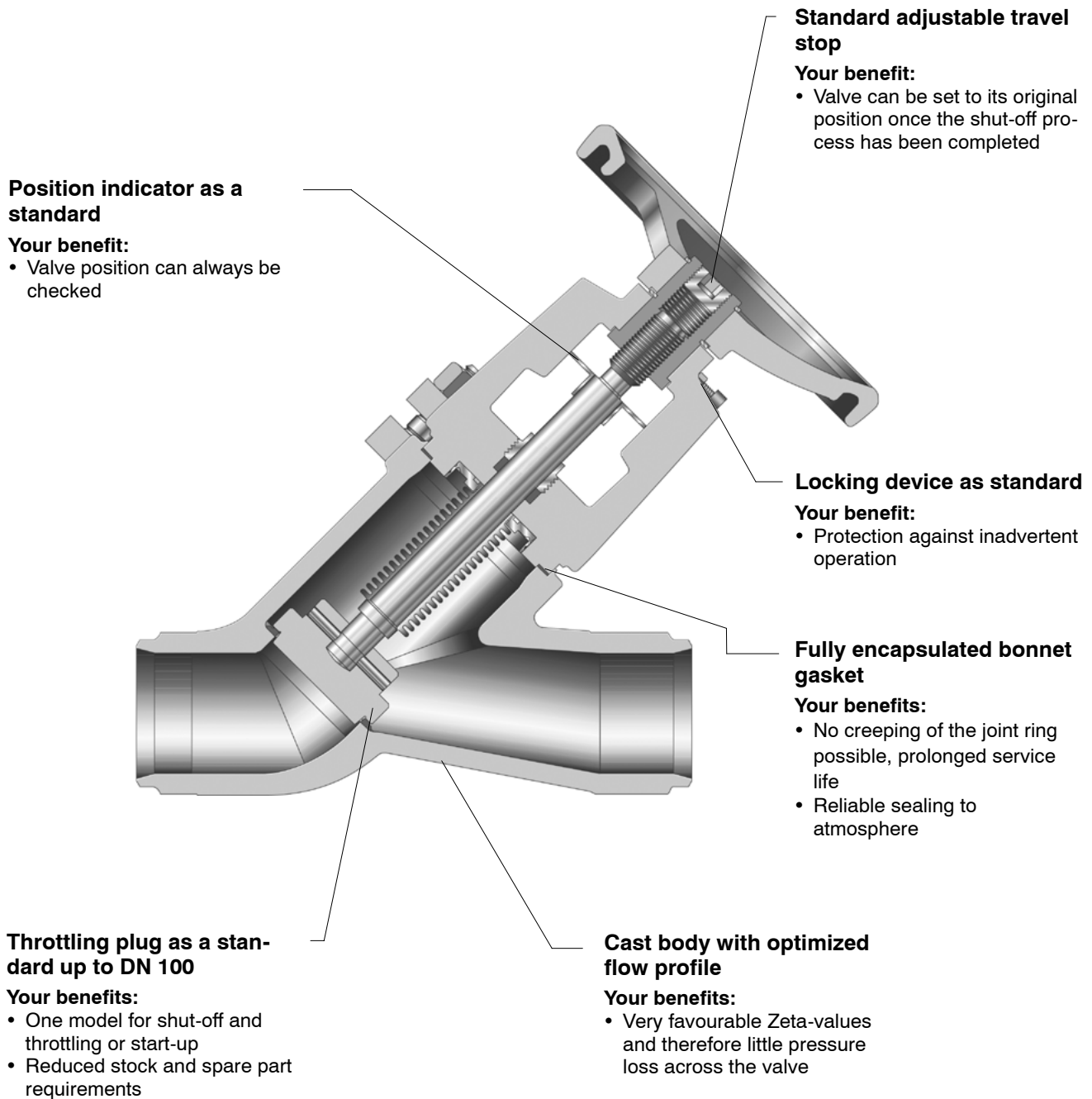


Dimensions in mm

Nominal pressure	Nominal diameter	Overall length	unmachined butt weld ends		Butt weld ends to DIN 3239 T1 Groove type DIN 2559/22			Centre-to-top height open	Vertical clearance for removal	Overhang	Handwheel	Weight
			$\varnothing A_{max}$	$\varnothing B_{min}$	$\varnothing d_2$	$\varnothing d_3^*)$	Associated pipe dimensions					
40	15	130	31.0	15.0	22.0	17.0	21.3 x 2.0	187	229	69	125	3.4
	20	150	38.0	20.0	28.0	22.0	26.9 x 2.3	181	220	59	125	3.6
	25	160	44.0	25.0	34.0	28.5	33.7 x 2.6	195	244	70	125	4.0
	32	180	51.0	32.0	43.0	37.0	42.4 x 2.6	195	244	55	125	4.3
	40	200	61.0	40.0	49.0	43.0	48.3 x 2.6	240	313	83	160	6.8
	50	230	71.0	50.0	61.0	54.0	60.3 x 3.2	242	316	73	160	8.5
	65	290	88.0	65.0	77.0	69.0	76.1 x 3.6	314	420	104	200	18.3
	80	310	104.0	80.0	90.0	82.0	88.9 x 3.2	317	425	92	200	19.4
	100	350	131.0	100.0	115.0	104.0	114.3 x 5.0	363	488	103	250	31.4
	125	400	155.0	125.0	142.0	130.5	139.7 x 4.5	420	569	100	315	46.7
	150	480	184.0	150.0	170.0	156.5	168.3 x 5.6	446	622	66	315	65.3
25	200	600	249.0	200.0	222.0	204.5	219.1 x 7.1	553	765	93	400	121.7
	250	730	305.0	250.0	276.0	256.5	273.0 x 8.0	639	907	94	500	185.7
	300	850	356.0	300.0	325.0	306.5	323.9 x 8.0	692	1003	77	500	271.4

 *) $\varnothing d_3 = d_p$ as per DIN 3239

Product features - to our customers' benefit (1)



Position indicator as a standard
Your benefit:
 • Valve position can always be checked

Standard adjustable travel stop
Your benefit:
 • Valve can be set to its original position once the shut-off process has been completed

Locking device as standard
Your benefit:
 • Protection against inadvertent operation

Fully encapsulated bonnet gasket
Your benefits:
 • No creeping of the joint ring possible, prolonged service life
 • Reliable sealing to atmosphere

Throttling plug as a standard up to DN 100
Your benefits:
 • One model for shut-off and throttling or start-up
 • Reduced stock and spare part requirements

Cast body with optimized flow profile
Your benefits:
 • Very favourable Zeta-values and therefore little pressure loss across the valve

Product features - to our customers' benefit (2)

Stem with burnished shank

Your benefit:

- Long service life of gland packing

Olive-chromated screws and nuts

Your benefits:

- Corrosion resistant
- service-friendly

Valve seat made of wear and corrosion resistant materials

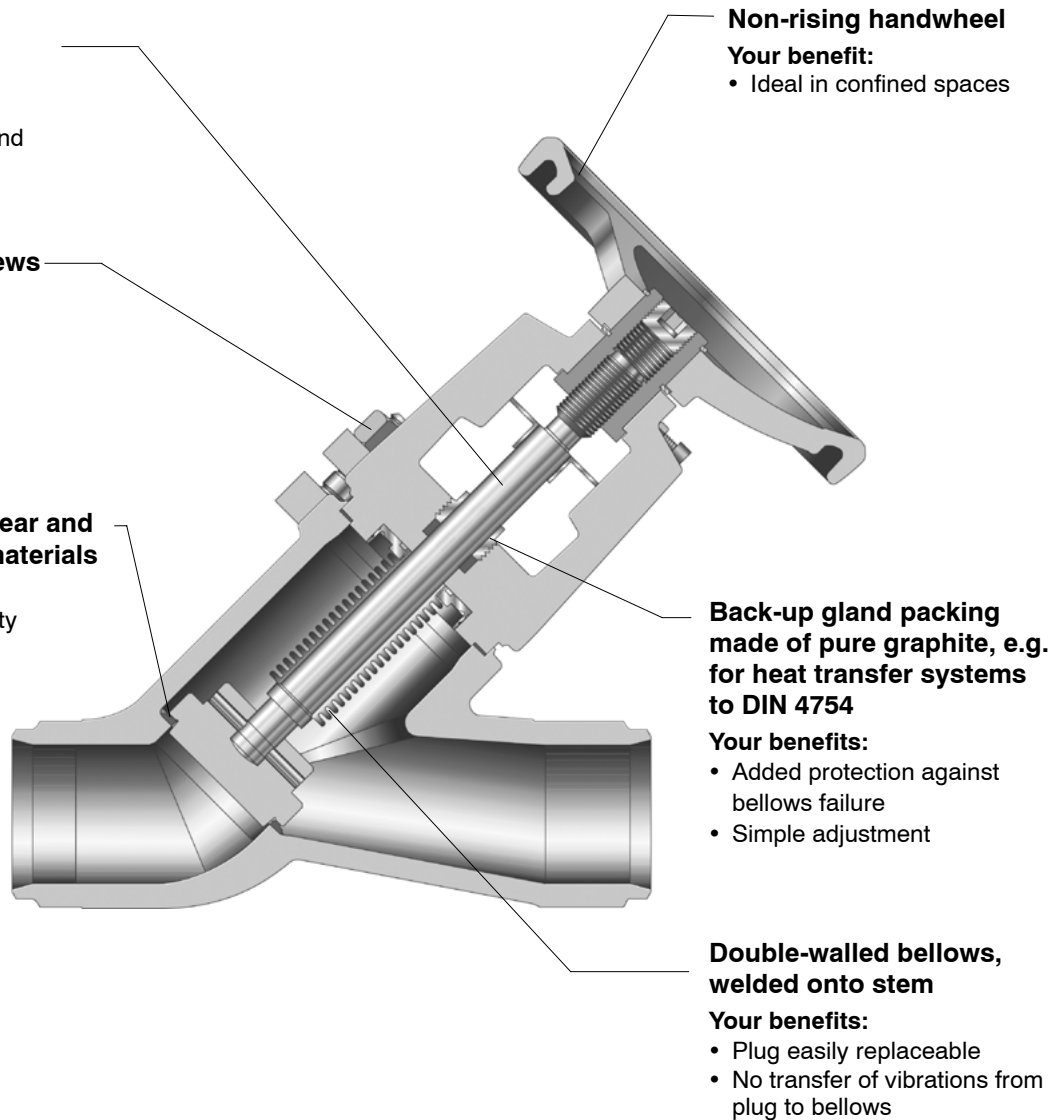
Your benefits:

- High functional reliability
- Long service life

Non-rising handwheel

Your benefit:

- Ideal in confined spaces



Back-up gland packing made of pure graphite, e.g. for heat transfer systems to DIN 4754

Your benefits:

- Added protection against bellows failure
- Simple adjustment

Double-walled bellows, welded onto stem

Your benefits:

- Plug easily replaceable
- No transfer of vibrations from plug to bellows





Maintenance-free STAINLESS STEEL globe valves

with bellows

flanged

PN 10-40
DN 15-100

Our bellows seal valves meet the requirements of the TA-Luft (German clean air regulation)

Application

- Process engineering, industry, building services industry, power stations, food, beverages and tobacco industry, chemical engineering, for aggressive media.

Operating data

- Maximum allowable pressure 40 bar
- Maximum allowable temperature 400 °C
- Pressure-temperature ratings see next side

Materials

- Cast steel G X 5 CrNiMo 19-11-2 1.4408

Design

- Straight-way pattern with vertical bonnet
- Shut-off cone
- Seats of corrosion-proof CrNiMo steel
- External stem thread
- Back seat
- Stem sealed by double-walled bellows and safety gland
- All parts which are in contact with the flow medium are made of CrNiMo steel

Standard variants

- Throttle cone
- Position indicator
- Locking device and travel stop
- Other flange designs
- Acceptance tests to technical codes such as TRD/TRB/AD2000 or customer specification

Remarks

- For special applications, for example tapered cone, actuators we recommend our maintenance-free globe valves NO-RICHEM® type ZXAB/ZYAB to type series booklet 8135.1
- Operating instructions: 0570.82

On all enquiries / orders please specify

- | | |
|-------------------------|-------------------------------|
| 1 Type | 6 Medium |
| 2 PN | 7 Operating temperature |
| 3 DN | 8 Pipe connection |
| 4 Working pressure | 9 Variants |
| 5 Differential pressure | 10 Type series booklet number |

The valves meet the safety requirements of the Pressure Equipment Directive 97/23/EC (PED) of annex I for fluids of the groups 1 and 2.



Pressure-Temperature ratings

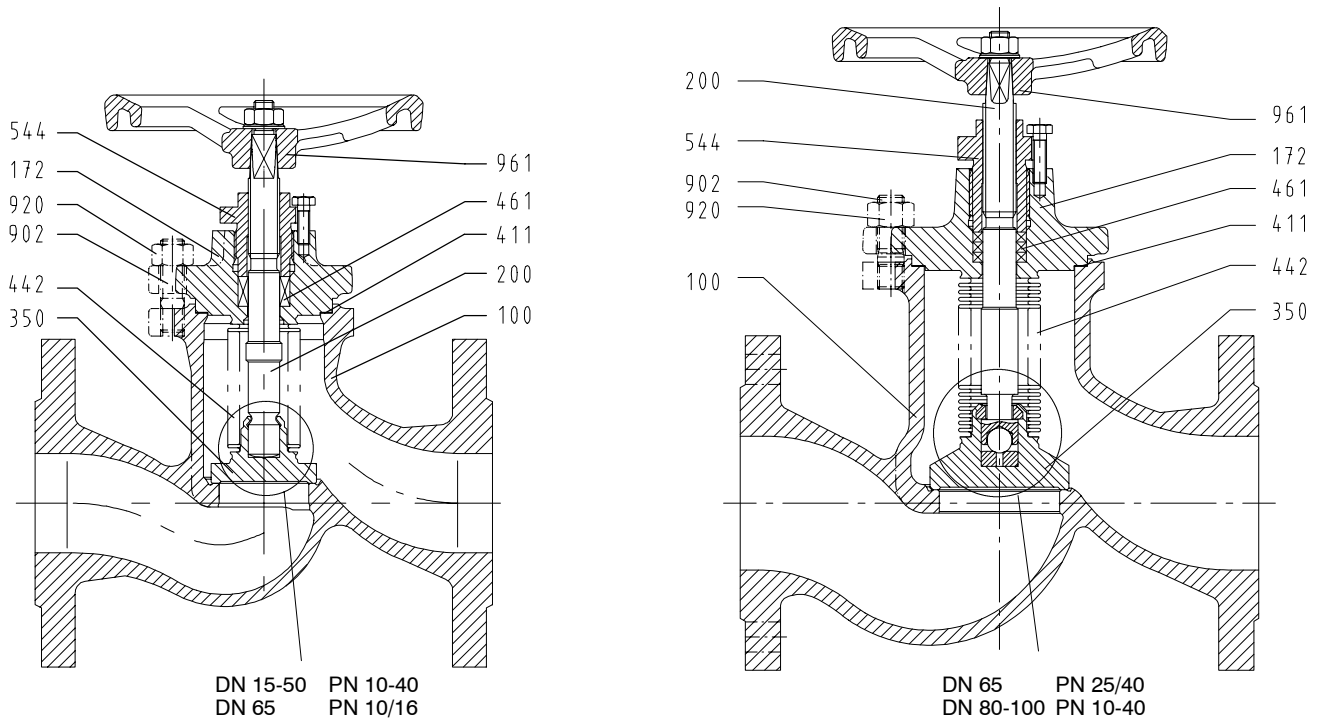
Nom. pressure PN	Material	Working pressures at temperatures in °C ¹⁾							
		-10 to 20	100	150	200	250	300	350	400
10	1.4408	10	9	8	7	6	5,5	5	5
16		16	14	12,5	11	10	9	8,5	8
25		25	22	19,5	17	15	13,5	13	12
40		40	35,5	31	27	24,5	22	20,5	19,5

¹⁾ The valves can be used down to temperatures of -10 °C
Operating pressures to EN 1092/1 are also permissible

Installation

Globe valves are installed in the line so that the medium enters the valve underneath the cone and flows out above it. They can also be installed in lines with alternating flow.

For the optimum selection of valves with throttle cone, detailed information about the operating mode should be provided.

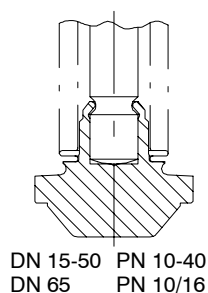


Materials

Part no.	Name of parts	Material		Remarks
100	Body	G X 5 CrNiMo 19-11-2	1.4408	DN 20, 1.4404
172	Bonnet	X 2 CrNiMo 17 12 2	1.4404	
200*)	Stem	X 20 Cr 13	1.4021	Nitrided
350*)	Cone	X 6 CrNiMoTi 17 12 2	1.4571	
442*)	Bellows	X 6 CrNiMoTi 17 12 2	1.4571	
544*)	Threaded bush	115 Mn 30+C	1.0715	Nitrided
411*)	Gasket	CrNi - steel/graphite		Olive-chromated
461*)	Packing	Graphite		
902	Stud	21 CrMoV 5-7	1.7709	
920	Hex. nut	25 CrMo 4	1.7218	
961	Handwheel	JL 1030	0.6020	

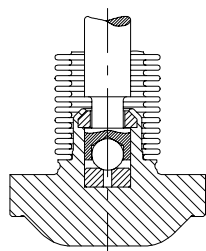
*) Recommended spare parts

Variants

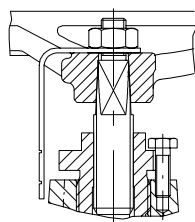


DN 15-50 PN 10-40
DN 65 PN 10/16

Throttle cone

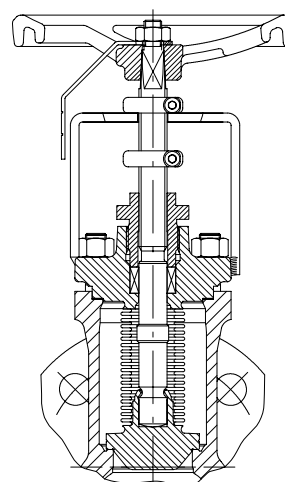


DN 65 PN 25/40
DN 80-100 PN 10-40



DN 15-100

Position indicator



Throttle cone, position indicator, locking device and travel stop

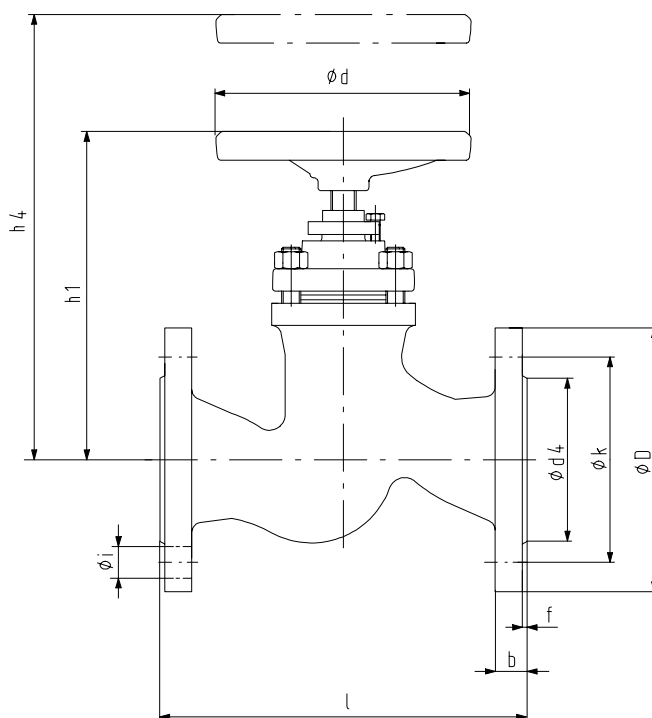
Dimensions

Face-to-face dimension – EN 558-1/1
(previously: DIN 3202/F1)
ISO 5752/1

Flanges – connecting dimensions to
DIN 2501, ISO 2084, BS 4504
– raised-face type C DIN 2526

Other flange designs:
e.g. grooved both ends type N, tongue type F DIN 2512,
recessed (female face) type R13, spigot (male face)
type V13 DIN 2513, type D, type E DIN 2526; Flanges in
acc. with EN 1092/1

Other flange designs on request.



Dimensions in mm

Nom. pressure PN	Nom. bore DN	Face-to-face dimension l	Flange diam. Ø D	Bolt circle Ø k	Number of bolt holes z	Bolt hole diameter Ø i	Raised face diameter Ø d ₄ x f	Flange thickness b	Centre-to-top height open h 1	h 1 *	Vertical clearance for removal h 4	h 4*	Stroke mm	Hand-wheel Ø d	Weight approx. kg
10-40	15	130	95	65	4	14	45 x 2	16	140	190	210	245	4.0	125	3.7
	20	150	105	75	4	14	58 x 2	18	165	215	260	275	6.5	125	4.6
	25	160	115	85	4	14	68 x 2	18	165	215	260	275	6.5	125	5.2
	32	180	140	100	4	18	78 x 2	18	190	235	290	305	8.0	160	9.4
	40	200	150	110	4	18	88 x 3	18	200	240	300	320	10.0	160	10.6
10/16	50	230	165	125	4	18	102 x 3	20	220	275	330	360	12.5	160	13.6
	65	290	185	145	4	18	122 x 3	18	270	315	420	420	16.5	200	21.0
	80	310	200	160	8	18	138 x 3	20	300	360	450	485	20.0	200	28.0
25/40	100	350	220	180	8	18	158 x 3	20	350	400	530	545	25.0	250	39.0
	65	290	185	145	8	18	122 x 3	22	305	365	480	505	16.5	200	22.0
	80	310	200	160	8	18	138 x 3	24	305	365	480	505	20.0	200	33.0
100	80	310	200	160	8	18	138 x 3	24	305	365	480	505	20.0	200	33.0
	100	350	235	190	8	22	162 x 3	24	350	400	550	550	25.0	250	46.0

* Height of valve with locking device and travel stop

Product Features - to our Customers' Benefit

External stem thread

Your benefit

- Easy to service
- Free from non-ferrous metals

External stem thread

Your benefit

- Easy to service
- Free from non-ferrous metals

Back seat

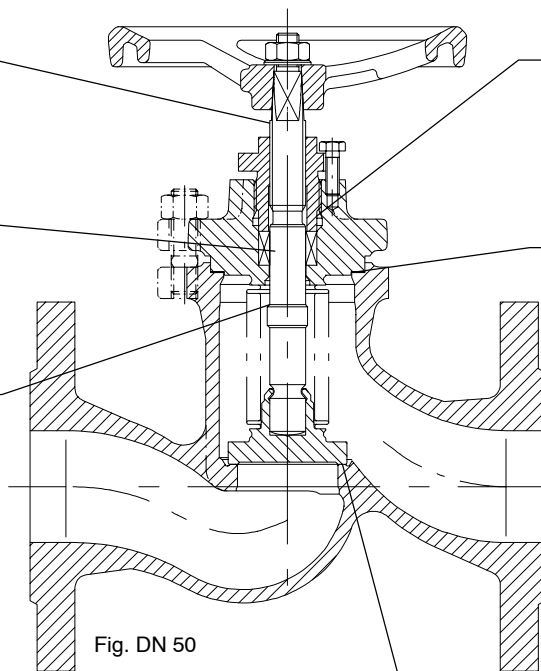
Your benefit

- Additional stem seal for emergency operation
- Blow-out protection to guard staff and plant
- Stroke limitation protects bellows against overloading

Olive-chromated studs and nuts

Your benefit

- Corrosion-resistant
- Easy to repair



Easily accessible safety gland

Your benefit

- Easy to readjust

Bonnet gasket inside and outside confined

Your benefit

- Reliable sealing towards the atmosphere

Valve seat made of corrosion-resistant materials

Your benefit

- High reliability
- Long life



Application

- In industrial plants, building services industry, power stations and marine engineering.
- For water, steam, gas and other non-aggressive media.
- Other applications on request.

Operating data

- Maximum allowable pressure 40 bar
- Maximum allowable temperature 450 °C
- Pressure-temperature ratings see next side

Materials

- Flanged design
DN 10-40 forged steel P 250 GH ¹⁾ - 1.0460
DN 50-400 cast steel GP 240 GH ²⁾ - 1.0619
- Weld-end design
DN 10-50 forged steel P 250 GH ¹⁾ - 1.0460
DN 65-350 cast steel GP 240 GH ²⁾ - 1.0619
- For further details see table of materials

Design

- Straight-way pattern with vertical bonnet
- Shut-off cone
- Rotating stem
- Seats made of wear-resistant and corrosion-proof Cr-steel or CrNi-steel
- Back seat
- Stem sealed by gland
- Inside and outside confined bonnet gasket (DN 10-100)
- EC type tested (Module H), component mark TÜ.A./AR-290
- Exterior finish: blue RAL 5002

¹⁾ previously: C 22.8

²⁾ previously: GS-C 25 N

The valves meet the safety requirements of the Pressure Equipment Directive 97/23/EC (PED) of annex I for fluids of the groups 1 and 2.

Standard variants

- Throttle cone
- Position indicator
- Pressure relief cone
- Locking device
- Screw-down non-return valve
- Studs/hex. nuts in A4-70 (low temp.)
- PTFE-packing (max. 250 °C)
- Free from oil and grease (parts in contact with flow medium)
- Free from oil and grease for handling oxygen
- Other flange and butt-weld end designs
- Acceptance tests to technical codes such as TRD/TRB/AD2000 or customer specification

Remarks

- NORI® 40 globe valves with gland, with non-rotating stem, type ZXLF/ZXS F according to type series booklet: 7622.1
- NORI® 40 non-return valves, type RXL/RXS according to type series booklet: 7673.1
- NORI® 40 globe valves with bellows, with two-piece stem, type ZXLBV/ZXLB, ZXSBV/ZXSB according to type series booklet: 7165.1
- Operating instructions: 0570.82

On all enquiries / orders please specify

- | | |
|-------------------------|-------------------------------|
| 1 Type | 6 Medium |
| 2 PN | 7 Operating temperature |
| 3 DN | 8 Pipe connection |
| 4 Working pressure | 9 Standard variants |
| 5 Differential pressure | 10 Type series booklet number |

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) according to ATEX 94/9/EC.



Pressure-Temperature ratings

Nom. pressure PN	Material	Working pressures at temperatures in °C ¹⁾						
		-10 to +120	200	250	300	350	400	450
25	P 250 GH 1.0460 ²⁾	25	22	20	17	16	13	8
40	GP 240 GH 1.0619+N ³⁾	40	35	32	28	24	21	13

¹⁾ The valves can be used down to -10 °C

²⁾ previously: C 22.8

³⁾ previously: GS-C 25 N

Operating pressures to EN 1092/1 are also permissible

Installation

Globe valves are installed in the line so that the medium enters the valve underneath the cone and flows out above it. They can also be installed in lines with alternating flow.

If differential pressures specified for DN 125 to 400 in the table are exceeded, a pressure relief cone is required. In this case, the valve must be installed so that the medium to be sealed off lies acts the cone.

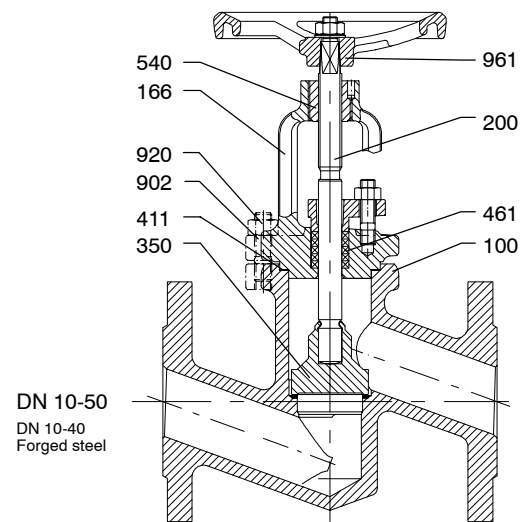
The pressure relief cone acts as a bypass and can only fulfill its function if a back pressure builds up after the valve has been opened, so that the max. differential pressures specified in the table are not exceeded.

Max permissible differential pressure for shut-off (shut-off cone)

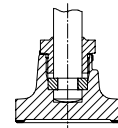
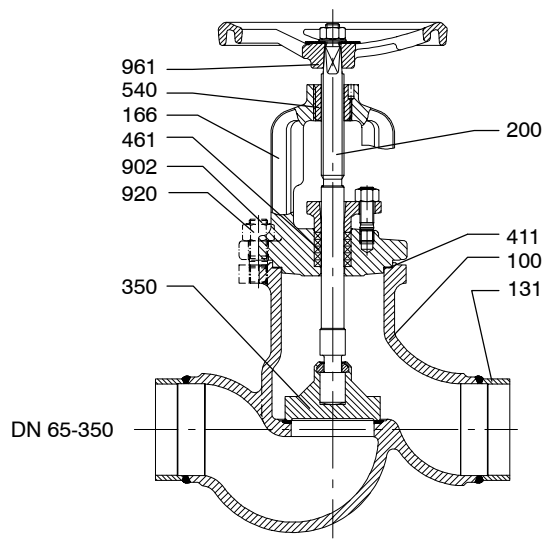
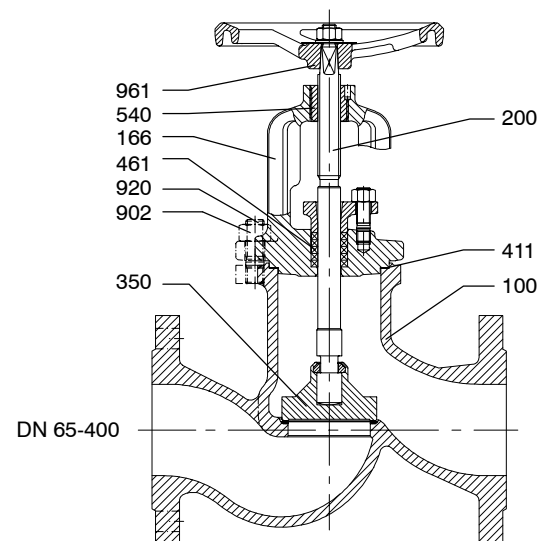
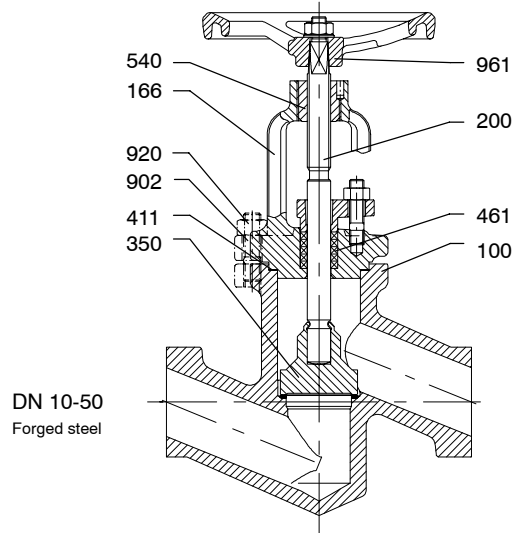
DN	125	150	200	250	300	350	400
Δp bar	33	21	14	9	6	4.5	3.5

For the optimum selection of valves with throttle cone, detailed information about the operating mode should be provided.

ZXL



ZXS

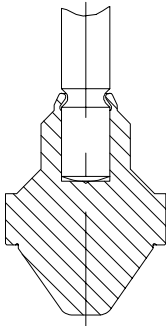


From DN 125 onwards
Screw-type cone stem connection

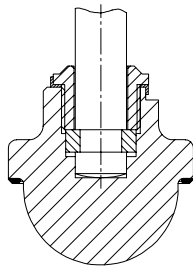
Materials

Part no.	Name of parts	Material	Remarks
100	Body	P 250 GH 1.0460	DN 10-40 Type ZXL DN 10-50 Type ZXS
		GP 240 GH 1.0619	DN 50-400 Type ZXL DN 65-350 Type ZXS
131	Connection branch	P 235 GH 1.0305	From DN 65 upwards
166	Yoke	P 250 GH 1.0460	From DN 250 upwards
		GP 240 GH 1.0619	
200*)	Stem	X 20 Cr 13 1.4021	From DN 125 upwards
350*)	Cone	P 250 GH 1.0460	
411*)	Gasket	CrNi-steel/graphite	With hard facing (1.4115)
461*)	Packing	Graphite	
540*)	Bush	11 SMn30+C 1.0715	Nitrided
902	Stud	21 CrMoV 5-7 1.7709	From DN 125 upwards
		C 35 E 1.1181	
920	Hex. nut	25 CrMo 4 1.7218	From DN 125 upwards
		C 35 E 1.1181	
961	Handwheel	JL 1030 0.6020	

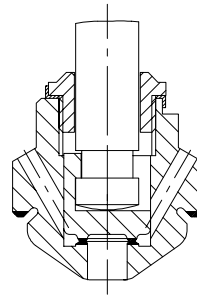
*) Recommended spare parts

Variants


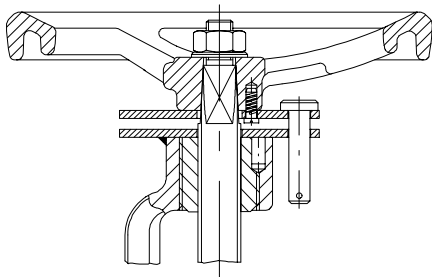
Throttle cone
DN 10-100



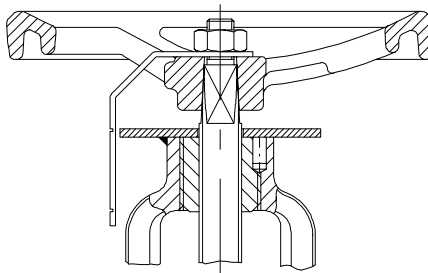
Throttle cone
DN 125-400



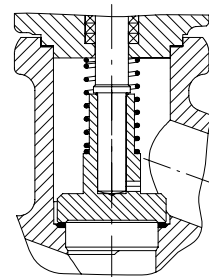
Pressure relief cone
from DN 125 onwards



Locking device



Position indicator



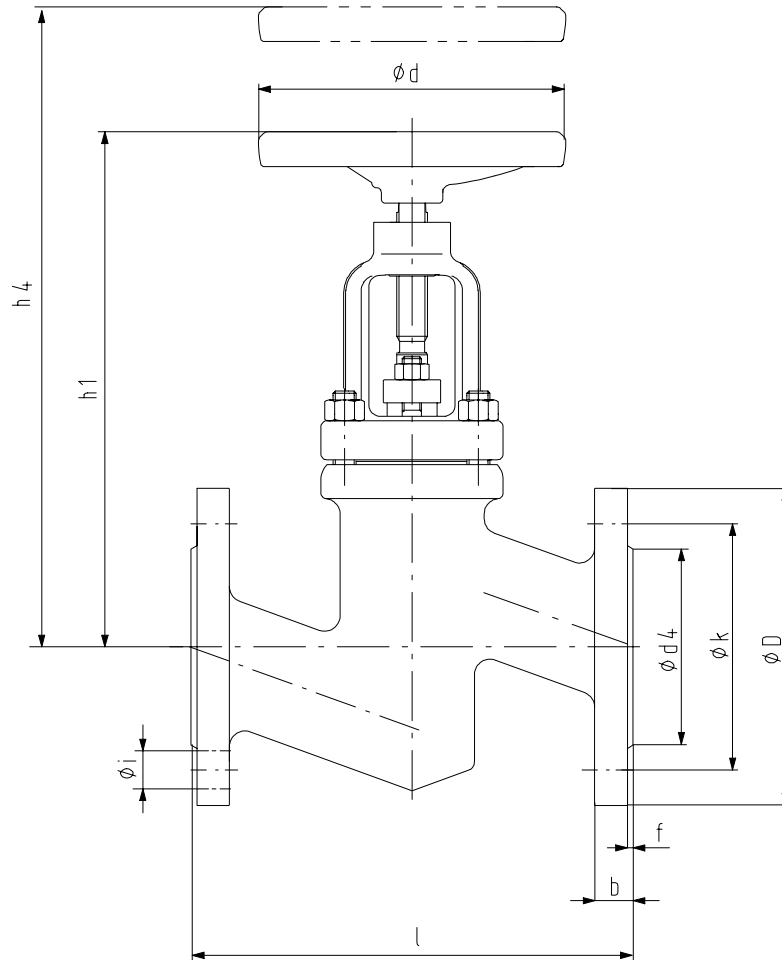
Screw-down non-return valve

Dimensions type ZXL

Face-to-face dimension: - EN 558-1/1
(previously: DIN 3202/F1),
ISO 5752/T1

Flange: - connection dimensions to
DIN 2501, ISO 2084, BS 4504
- raised face type C DIN 2526

Other flange designs:
e. g. grooved both ends type N, tongue type F DIN 2512, re-
cessed (female face) type R13, spigot (male face) type V13
DIN 2513, type D, type E DIN 2526
Flanges to EN 1092/1
Other flange designs on request.



Dimensions in mm

Nom. pressure PN	Nom. bore DN	Face-to-face dimension l	Flange diam. ϕD	Bolt circle ϕk	Number of bolt holes z	Bolt hole diameter ϕi	Raised face diameter $\phi d_4 \times f$	Flange thickness b	Centre-to-top height open h 1	Vertical clearance for removal h 4	Stroke	Handwheel ϕd	Weight approx. kg
25/40	10	130	90	60	4	14	40 x 2	16	220	290	8	125	4.1
	15	130	95	65	4	14	45 x 2	16	220	290	8	125	4.3
	20	150	105	75	4	14	58 x 2	18	230	310	15	125	5.5
	25	160	115	85	4	14	68 x 2	18	230	310	15	125	6.2
	32	180	140	100	4	18	78 x 2	18	280	370	19	160	9.6
	40	200	150	110	4	18	88 x 3	18	285	380	24	160	10.5
	50	230	165	125	4	18	102 x 3	20	300	400	30	160	13.5
	65	290	185	145	8	18	122 x 3	22	348	490	40	200	21.3
	80	310	200	160	8	18	138 x 3	24	405	575	48	200	33.3
	100	350	235	190	8	22	162 x 3	24	457	665	60	250	46.0
125	400	270	220	8	26	188 x 3	26	515	650	50	315	68.0	
150	480	300	250	8	26	218 x 3	28	540	685	60	315	95.0	
25	200	600	360	310	12	26	278 x 3	30	680	855	90	400	159.0
	250	730	425	370	12	30	335 x 3	32	810	1005	105	500	240.0
	300	850	485	430	16	30	395 x 4	34	965	1165	119	630	390.0
	350	980	555	490	16	33	450 x 4	38	1075	1330	148	630	530.0
	400	1100	620	550	16	36	505 x 4	40	1360	1640	135	630	680.0
40	200	600	375	320	12	30	285 x 3	34	680	855	90	400	175.0
	250	730	450	385	12	33	345 x 3	38	810	1005	105	500	280.0
	300	850	515	450	16	33	410 x 4	42	965	1165	119	630	425.0
	350	980	580	510	16	36	465 x 4	46	1075	1330	148	630	600.0

Dimensions type ZX5

Face-to-face dimension: – EN 12982 (previously:
DIN 3202/S2)

Butt weld ends

– DIN 3239-Form1

Groove form

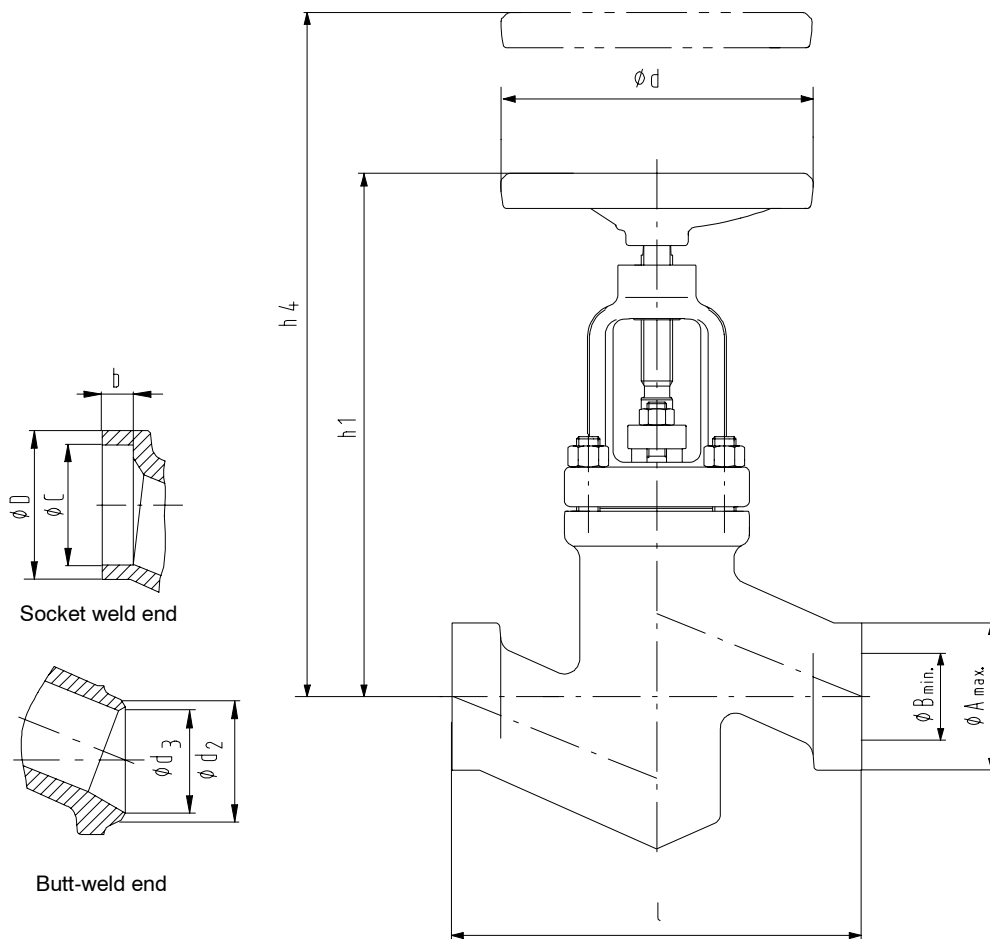
– DIN 259/21

Socket weld ends

– ASME B16.11 / DIN 3239/2

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

Butt weld ends to EN 12627 or socket weld ends to EN 12760 possible.

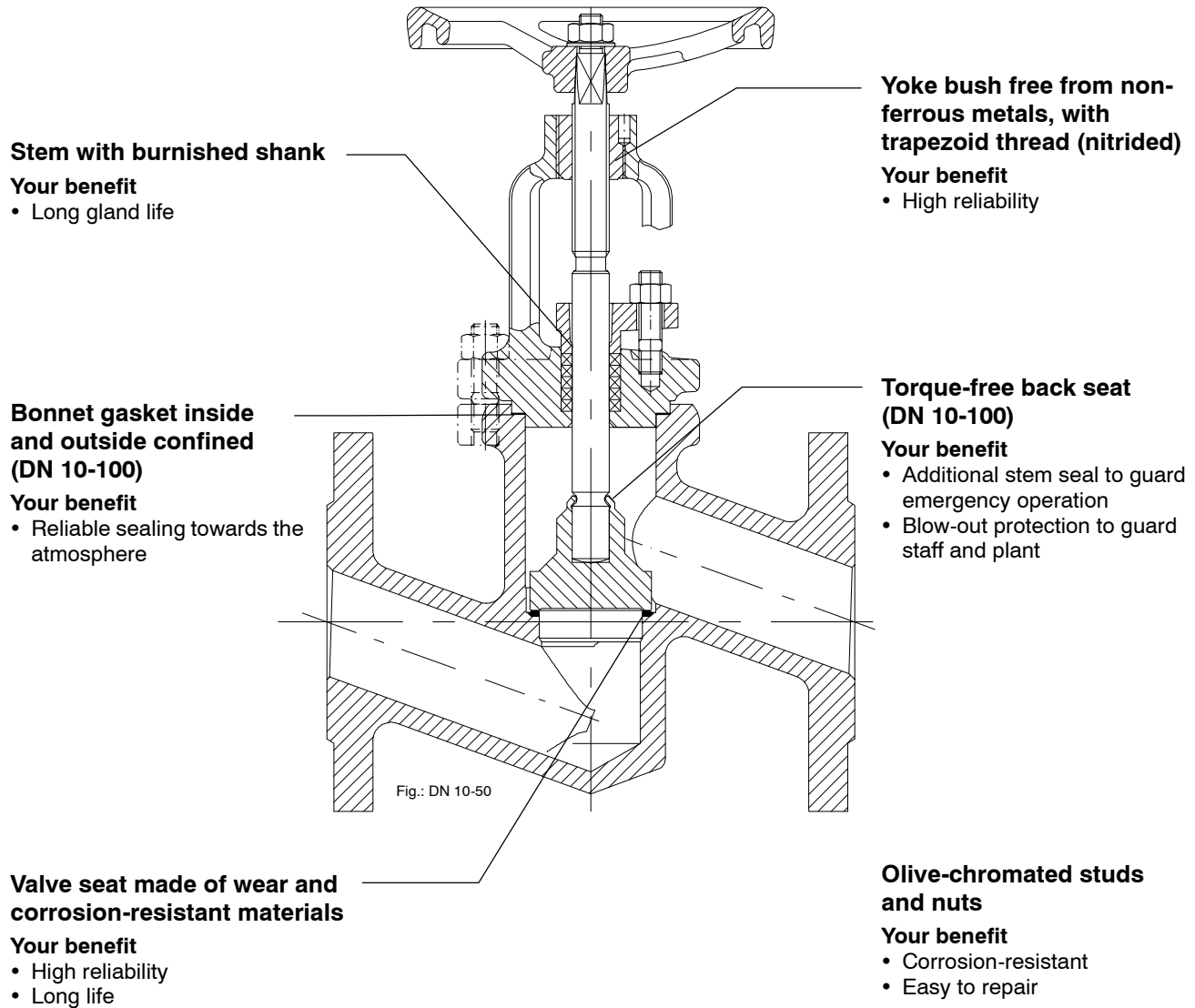


Dimensions in mm

Nom. pressure PN	Nom. bore DN	Face-to-face dimension l	Butt-weld ends unmachined		Butt-weld ends to DIN 3239-Form 1 Groove forms to DIN 2559-21			Socket weld ends to ASME B 16.11 or DIN 3239 T2			Centre-to-top height open h 1	Vertical clearance for removal h 4	Stroke	Handwheel ø d	Weight approx. kg
			øA _{max.}	øB _{min.}	ød ₂	ød ₃ *)	Associated pipe dimensions	øD _{-0.5}	øC ^{+0.2}	b _{min.}					
25/40	10	130	44	10	18	13	17.2 x 2.0	25	17.6	9.5	230	310	15	125	3.8
	15	130	44	15	22	17	21.3 x 2.0	30.5	21.7	9.5	230	310	15	125	3.8
	20	130	44	20	28	22	26.9 x 2.3	36.5	27.1	12.7	230	310	15	125	3.8
	25	130	44	24	34	28.5	33.7 x 2.6	44.5	33.8	12.7	230	310	15	125	3.8
	32	160	60	33	43	37	42.4 x 2.6	53.5	42.5	12.7	285	380	24	160	8.0
	40	180	60	38	49	43	48.3 x 2.6	60.5	48.7	12.7	285	380	24	160	8.0
	50	210	73	48	61	54	60.3 x 3.2	73.5	61.1	15.9	300	400	30	160	11.5
	65	290	76.1	64.9	76.1	69	76.1 x 3.6				348	490	40	200	14.8
	80	310	88.9	79.9	88.9	81	88.9 x 4.0				405	575	48	200	25.0
	100	350	114.3	100.1	114.3	104	114.3 x 5.0				457	665	60	250	34.0
	125	400	139.7	125.5	139.7	130.5	139.7 x 4.5				515	650	50	315	60.0
	150	480	168.3	148.3	168.3	156.5	168.3 x 5.6				540	685	60	315	80.0
	200	600	219.1	199.1	219.1	204.5	219.1 x 7.1				680	855	90	400	130.0
	250	730	273	251	273	256.5	273.0 x 8.0				810	1005	105	500	200.0
	300	950	345	305	323.9	306.5	323.9 x 8.0				965	1165	119	630	285.0
350	1100	385	335	355.6	336.5	355.6 x 8.8				1075	1330	148	630	380.0	

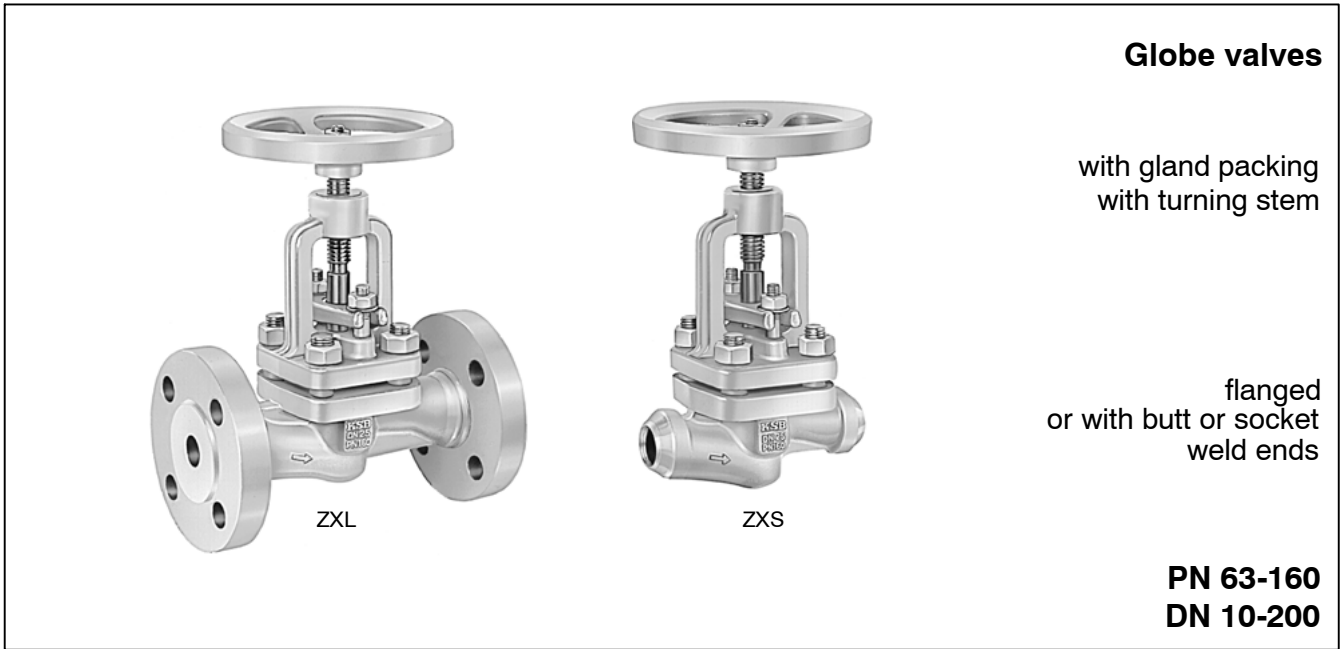
*) ød₃ = d_p to DIN 3239

Product Features - to our Customers' Benefit



Subject to technical modification without prior notice

7621/1/8-10 01.02.2006



Application

- In industrial plants, power stations, process and marine engineering.
- For water, steam, gas, oil and other non-aggressive media.
- Other applications on request.

Operating data

- Maximum allowable pressure 160 bar
- Maximum allowable temperature 550 °C
- Pressure-temperature ratings see next side

Materials

- Flanged variant

DN 10-25	P 250 GH ¹⁾	1.0460	up to 450 °C
	13 CrMo 4-5	1.7335	up to 550 °C
DN 32-200	GP 240 GH ²⁾	1.0619	up to 450 °C
	G-17 CrMo 5-5	1.7357	up to 550 °C
- Variant with weld ends

DN 10-50	16 Mo 3	1.5415	up to 530 °C
	13 CrMo 4-5	1.7335	up to 550 °C
DN 65-200	GP 240 GH ²⁾	1.0619	up to 450 °C
	G-17 CrMo 5-5	1.7357	up to 550 °C

Design

- Straight-way pattern with vertical bonnet
- Shut-off cone DN 10-100, pressure relief cone DN 125-200
- Rotating stem
- Seats made of wear-resistant and corrosion-proof Cr-steel or stellite
- Stem sealed by a gland
- Inside and outside confined bonnet gasket
- Studs and nuts olive-chromated
- Component-tested to TRD 110, TRB 801 Nr. 45 TÜ.A. 237-95

¹⁾ previously: C 22.8

²⁾ previously: GS-C 25 N

The valves meet the safety requirements of the Pressure Equipment Directive 97/23/EC (PED) of annex I for fluids of the groups 1 and 2.

Standard variants

- Throttle cone
- Pressure relief cone (standard with DN 125-200)
- Position indicator
- Stellite seats (standard with 1.7335/1.7357)
- Locking device
- PTFE packing (up to max. 250 °C)
- Free from oil and grease
- Back seat (standard with DN 10-50)
- Attachments for retrofitting electric actuators (DN 10-50)
- Connection branch made of 16 Mo 3 (ZXS ≥ DN 65)
- Other flange and butt-weld end designs
- Acceptance tests to technical codes such as TRD/TRB/AD2000 or customer specification

Remarks

- NORI® 160 globe valves with non-rotating stem, type ZXLF/ZXS according to type series booklet: 7633.1
- NORI® 160 non-return valves, type RXL/RXS according to type series booklet 7681.1
- Operating instructions: 0570.82

On all enquiries / orders please specify

- | | |
|----------------------------|-------------------------------|
| 1 Type | 7 Material |
| 2 PN | 8 Medium |
| 3 DN | 9 Flow rate *) |
| 4 Working pressure | 10 Pipe connection |
| 5 Differential pressure *) | 11 Standard variants |
| 6 Operating temperature | 12 Type series booklet number |

When ordering spares, indicate original factory number and year of manufacture.

*) Indispensable for variant with throttle cone

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) according to ATEX 94/9/EC.



Pressure-Temperature ratings

Nom. pressure PN	Material	Material no.	Working pressures at temperatures in °C ¹⁾														
			120	200	250	300	350	400	425	450	475	500	510	520	530	540	550
63	P 250 GH ²⁾ GP 240 GH ³⁾	1.0460 1.0619	63	50	45	40	36	32	28	22							
	13 CrMo 4-5 GS-17 CrMo 5-5	1.7335 1.7357				63	61	58	57	56	53	47	40	32	25	18	14
100	P 250 GH ²⁾ GP 240 GH ³⁾	1.0460 1.0619	100	80	70	60	56	50	45	34							
	13 CrMo 4-5 G-17 CrMo 5-5	1.7335 1.7357				100	95	91	89	87	82	74	62	49	38	28	21
160	P 250 GH ²⁾ GP 240 GH ³⁾	1.0460 1.0619	160	130	112	96	90	80	72	51							
	16 Mo 3	1.5415	160	160	160	139	125	118	115	112	110	87	70	57	45		
	13 CrMo 4-5 G-17 CrMo 5-5	1.7335 1.7357				160	153	146	142	139	132	118	100	79	62	46	35

1) The valves can be used down to -10 °C

2) previously: C 22.8

3) previously: GS-C 25 N

Operating pressures to EN 1092/1 are also permissible

Installation

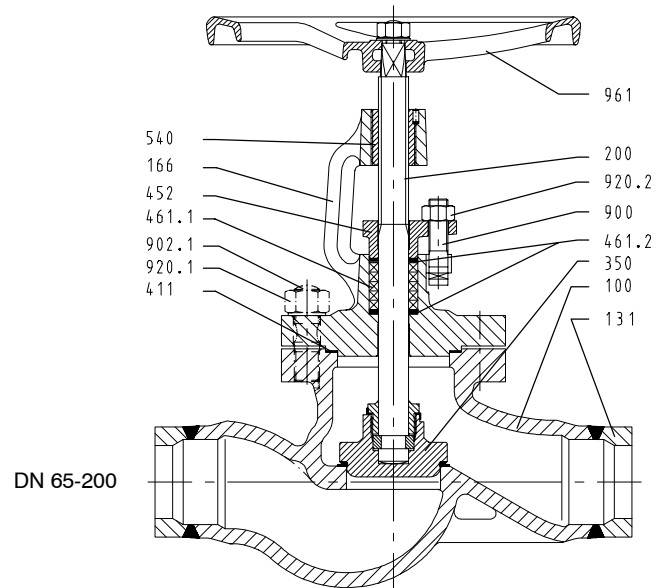
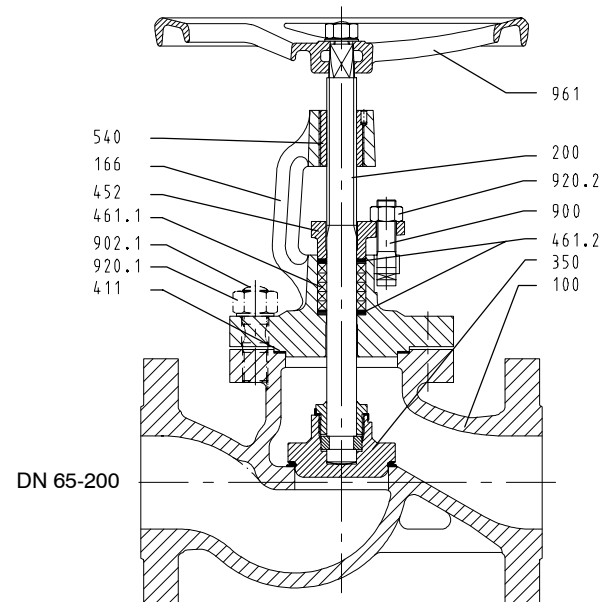
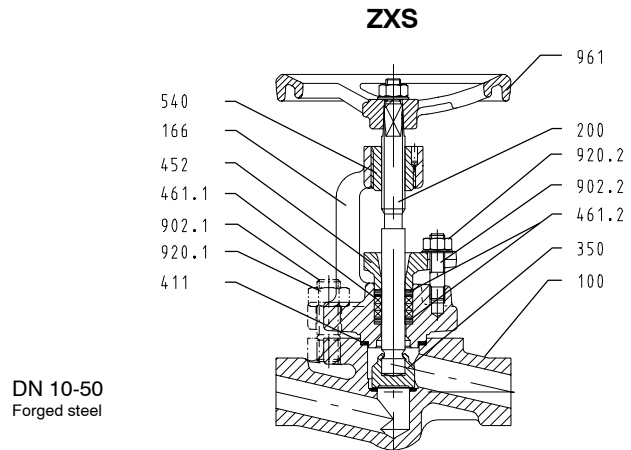
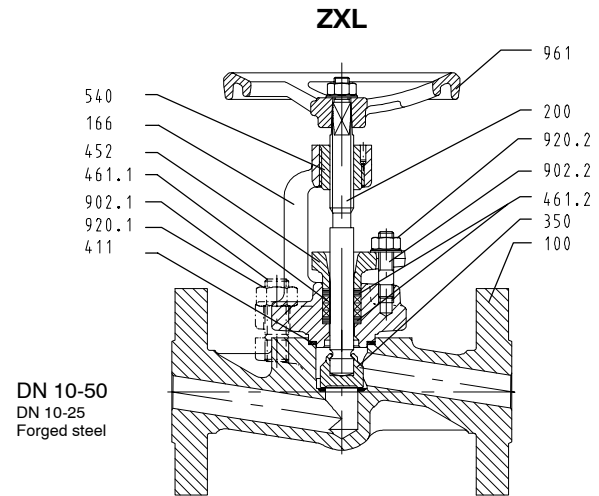
Globe valves are installed in the line so that the medium enters the valve underneath the cone and flows out above it. They can also be installed in lines with alternating flow. If differential pressures as specified for DN 65 to 200 above are exceeded, a pressure relief cone is required. In this case, the valve must be installed so that the medium to be sealed off above the cone.

The pressure relief cone acts as a bypass and can only serve its purpose if a back pressure builds up after opening so that the max. pressures specified in the table are not exceeded. For the optimum selection of valves with throttle cone, detailed information about the operating conditions should be provided.

Max permissible differential pressure for shut-off (shut-off cone)

DN	65	80	100	125	150	200
Δp bar	110	70	44	33	21	14

Pressure relief cone as standard in sizes from DN 125 onwards.

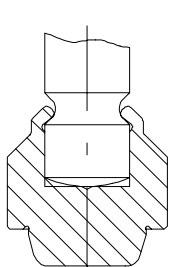


Materials

Part no.	Name of parts	Material	Temperature °C	Remarks	
100	Body	P 250 GH 1.0460	Up to 450	ZXL ≤ DN 25	
		GP 240 GH previously: GS-C 25 N 1.0619		ZXL ≥ DN 32, ZXS ≥ DN 65	
		16 Mo 3 1.5415	Up to 530	ZXS ≤ DN 50	
		13 CrMo 4-5 1.7335	Up to 550	ZXL ≤ DN 25, ZXS ≤ DN 50	
		G-17 CrMo 5-5 1.7357		ZXL ≥ DN 32, ZXS ≥ DN 65	
131	Connection branch	P 250 GH 1.0460	Up to 450	≥ DN 65	
		13 CrMo 4-5 1.7335	Up to 550		
166	Yoke	GP 240 GH 1.0619	Up to 450	≥ DN 65	
		16 Mo 3 1.5415	Up to 530	≤ DN 50	
		13 CrMo 4-5 1.7335	Up to 550	≥ DN 65	
		GS-17 CrMo 55 1.7357			
200 *)	Stem	X 20 Cr 13 1.4021	Up to 450		
		X 39 CrMo 17-1 1.4122	Up to 550		
350 *)	Cone	X 39 CrMo 17-1 1.4122	Up to 550	≤ DN 50	
		P 250 GH 1.0460	Up to 450	≥ DN 65	
		13 CrMo 4-5 1.7335	Up to 550		
411 *)	Gasket	CrNi-steel / graphite	Up to 550	Serrated	
452	Gland	P 250 GH 1.0460			
461.1 *)	Packing	Graphite			
461.2 *)				Confined	
540 *)	Yoke bush	9 SMn 28 K 1.0715		Nitrided	
900	T-head bolt	C 35 E 1.1181		≥ DN 65	Olive chromated
902.1/2	Stud	21 CrMo V 5-7 1.7709			
920.1/2	Hexagon nut	25 CrMo 4 1.7218			
920.2	Hexagon nut	C35E 1.1181		≥ DN 65	
961	Handwheel	GG-20/GG-25 0.6020/0.6025			

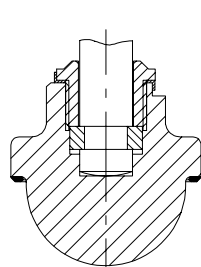
*) Recommended spare parts

Variants



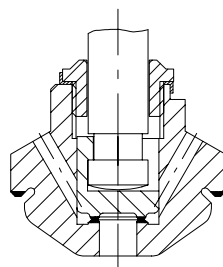
DN 10-50

Throttle cone



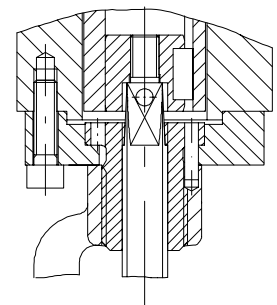
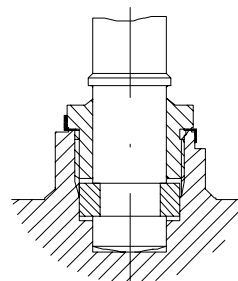
DN 65-200

Pressure relief cone

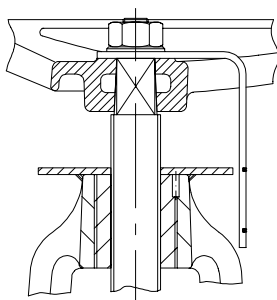


DN 65-200

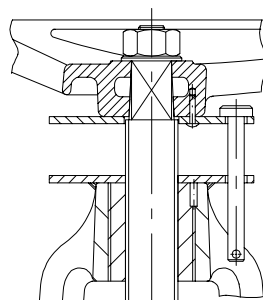
Back seat



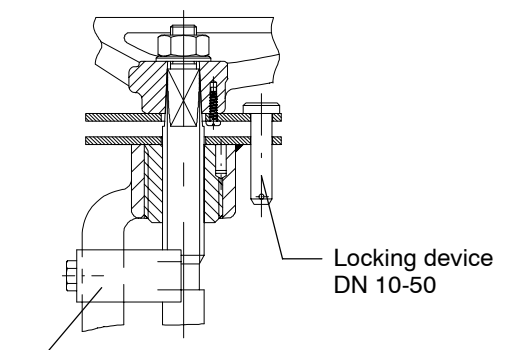
Attachments for retrofitting electric actuators DN 10-50



Position indicator DN 65-200



Locking device DN 65-200



Position indicator DN 10-50

Locking device DN 10-50

Dimensions type ZXL

Face-to-face dimension - EN 558-1/2

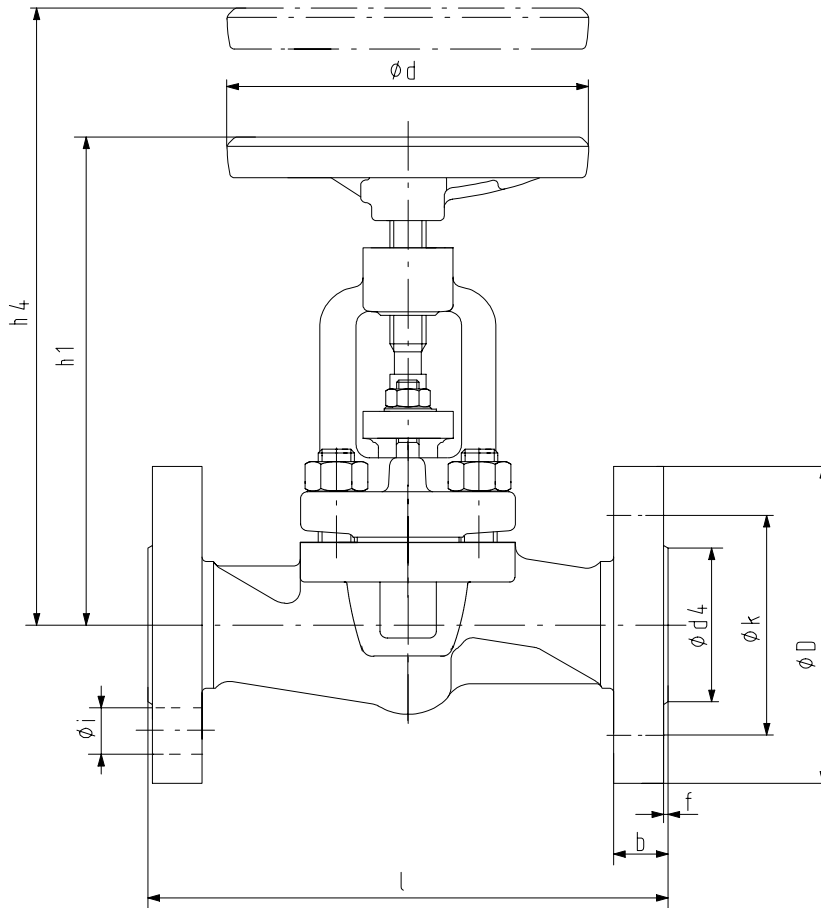
(previously: DIN 3202/1-F2)

Flanges

- Connection dimensions to DIN 2501, (ISO 2084, BS 4504)
- raised face type E DIN 2526

Other flange designs:

- e.g. grooved both ends type N DIN 2512,
- recessed (female face) type R13 DIN 2513
- lens joint type L DIN 2696
- flanges to EN 1092-1 (PN 63-100)
- Other flange designs on request



Dimensions in mm

Nom. pressure PN	Nom. bore DN	Face-to-face dimension l	Flange øD	Bolt circle øk	Number of bolt holes z	Hole øi	Raised face ød ₄ x f	Flange thickness b	Centre-to-top height open h 1	Vertical clearance for removal h 4	Stroke	Hand-wheel ø d	Weight appr. kg
63-160	10	210	100	70	4	14	40 x 2	20	230	270	11	160	8.0
	15	210	105	75	4	14	45 x 2	20	230	270	11	160	9.5
	20	230	130	90	4	18	58 x 2	24	230	270	11	160	11.0
	25	230	140	100	4	18	68 x 2	24	230	270	11	160	12.5
	32	260	155	110	4	22	78 x 2	26	310	360	17	200	16.5
	40	260	170	125	4	22	88 x 3	28	310	360	17	200	20.5
63	50	300	180	135	4	22	102 x 3	26	315	370	22	200	25.0
100/160	50	300	195	145	4	26	102 x 3	30	315	370	22	200	26.0
63	65	340	205	160	8	22	122 x 3	26	415	540	36	315	40.0
	80	380	215	170	8	22	138 x 3	28	500	650	51	315	55.0
	100	430	250	200	8	26	162 x 3	30	550	710	51	400	85.0
	125	500	295	240	8	30	188 x 3	34	620	810	66	500	125.0
	150	550	345	280	8	33	218 x 3	36	625	840	75	500	150.0
	200	650	415	345	12	36	285 x 3	42	855	1120	118	500	260.0
100	65	340	220	170	8	26	122 x 3	34	415	540	36	315	45.0
	80	380	230	180	8	26	138 x 3	36	500	650	51	315	58.0
	100	430	265	210	8	30	162 x 3	40	550	710	51	400	88.0
	125	500	315	250	8	33	188 x 3	40	620	810	66	500	135.0
	150	550	355	290	12	33	218 x 3	44	625	840	75	500	170.0
	200	650	430	360	12	36	285 x 3	52	855	1120	118	500	285.0
160	65	340	220	170	8	26	122 x 3	34	415	540	36	315	45.0
	80	380	230	180	8	26	138 x 3	36	500	650	51	315	60.0
	100	430	265	210	8	30	162 x 3	40	550	710	51	400	90.0
	125	500	315	250	8	33	188 x 3	44	620	810	66	500	135.0
	150	550	355	290	12	33	218 x 3	50	625	840	75	500	175.0
	200	650	430	360	12	36	285 x 3	60	855	1120	118	500	320.0

Dimensions type ZXS

Face-to-face dimension – EN 12982/65 (previously: DIN 3202/2-S3) (DN 10-50) or per table (DN 65–200)

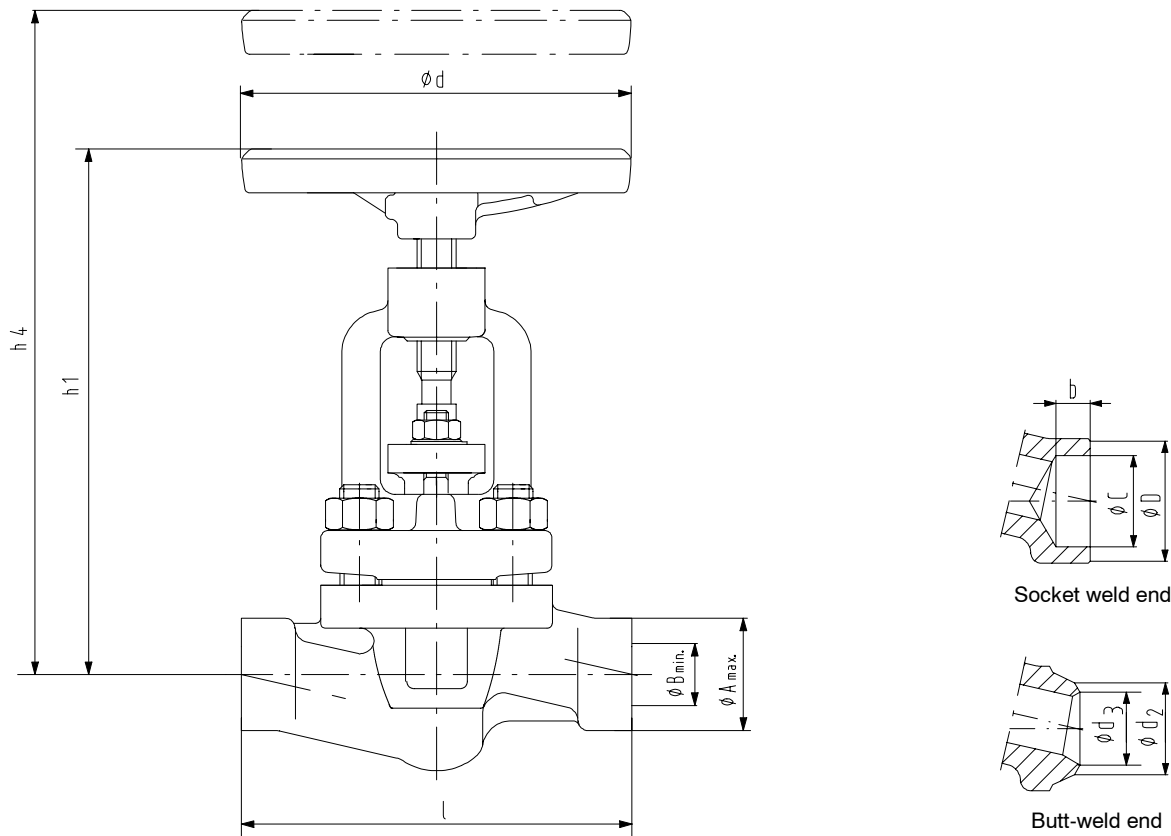
Butt weld ends – DIN 3239-Form 1

Groove form – DIN 2559/21

socket weld ends – ASME B16.11, DIN 3239/2

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

Butt weld ends to EN 12627 or socket weld ends to EN 12760 possible.



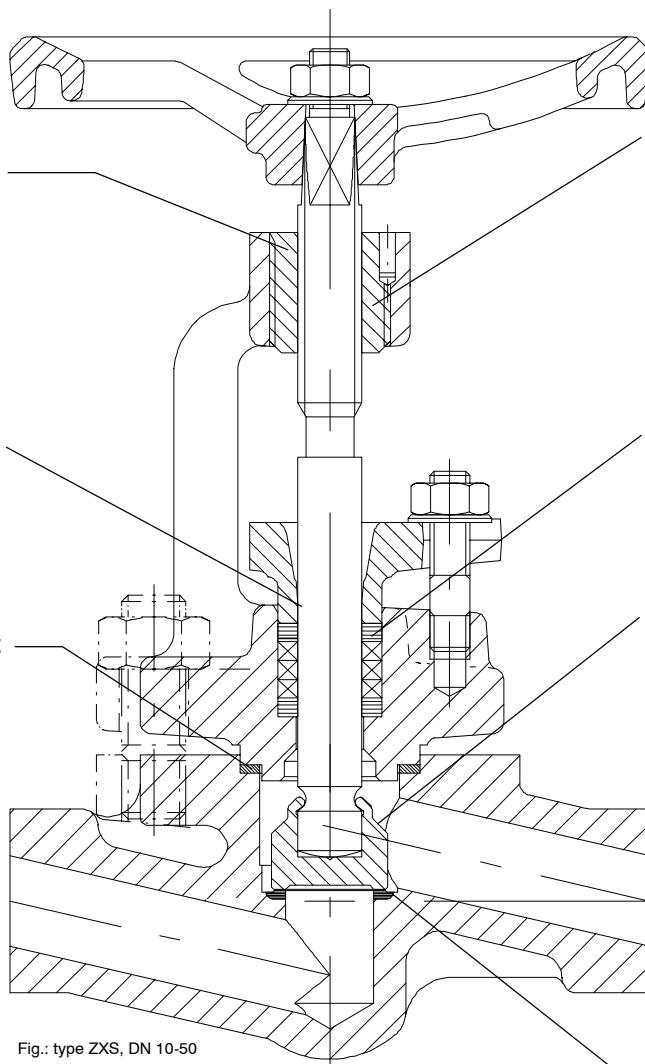
Dimensions in mm

Nom. pressure PN	Nom. bore DN	Face-to-face dimension l	Butt-weld ends not machined		Butt-weld ends to DIN 3239-type 1 Groove forms to DIN 2559-21 Ød3 *)			Socket-weld ends to ASME B 16.11 resp. DIN 3239 T 2			Centre-to-top height open h ₁	Vertical clearance for removal h ₄	Stroke Ød	Hand-wheel Ød	Weight appr. kg	
			ØA _{max.}	ØB _{min.}	Ød ₂	PN 63	PN 100	PN 160	ØD _{-0.5}	ØC ^{+0.2}						b _{min.}
63-160	10	150	46	9	18	13.0	13.0	13.0	25.0	17.6	9.5	230	270	11	160	6.0
	15	150	46	14	22	17.0	17.0	17.0	30.5	21.7	9.5	230	270	11	160	6.5
	20	150	46	19	28	22.0	22.0	22.0	36.5	27.1	12.7	230	270	11	160	7.5
	25	160	46	22	34	28.5	28.5	27.0	44.5	33.8	12.7	230	270	11	160	8.5
	32	180	63	28	43	37.0	37.0	35.0	53.5	42.5	12.7	305	355	17	200	11.0
	40	210	63	35	49	43.0	43.0	41.0	60.5	48.7	12.7	305	355	17	200	13.5
	50	250	80	42	61	54.0	54.0	52.5	73.5	61.1	15.9	310	365	22	200	17.0
	65	420	83	52	77	69.0	69.0	65.0				415	540	36	315	30.0
	80	460	108	62	90	81.0	81.0	76.5				500	650	51	315	45.0
	100	510	118	78	115	104.0	104.0	98.5				550	710	51	400	72.0
	125	600	153	109	141	130.5	127.0	120.5				620	810	66	500	110.0
	150	650	173	125	170	156.5	154.0	144.5				625	840	75	500	165.0
	200	750	229	176	222	204.5	199.5	189.0				855	1120	118	500	215.0

*) d₃ = d_p acc. to DIN 3239

Nom. bore DN	Corresponding pipe dimensions		
	PN 63	PN 100	PN 160
10	17.2x2.0	17.2x2.0	17.2x2.0
15	21.3x2.0	21.3x2.0	21.3x2.0
20	26.9x2.3	26.9x2.3	26.9x2.3
25	33.7x2.6	33.7x2.6	33.7x3.2
32	42.4x2.6	42.4x2.6	42.4x3.6
40	48.3x2.6	48.3x2.6	48.3x3.6
50	60.3x3.2	60.3x3.2	60.3x4.0
65	76.1x3.6	76.1x3.6	76.1x5.6
80	88.9x4.0	88.9x4.0	88.9x6.3
100	114.3x5.0	114.3x5.0	114.3x8.0
125	139.7x4.5	139.7x6.3	139.7x10.0
150	168.3x5.6	168.3x7.1	168.3x12.5
200	219.1x7.1	219.1x10.0	219.1x16.0

Product Features - to our Customers' Benefit



Replaceable yoke bush

Your benefit

- Retrofitting of actuators possible without dismantling pressure-retaining parts

Stem with burnished shank

Your benefit

- Long gland life

Serrated bonnet gasket inside and outside confined

Your benefit

- Reliable sealing towards the atmosphere

Olive-chromated studs

Your benefit

- Corrosion-resistant
- Easy to repair

Yoke bush free from non-ferrous metals, with trapezoid thread (nitrided)

Your benefit

- High reliability

Confined graphite gland

Your benefit

- High tightness
- Easy to service

Torque-free back seat (DN 10-50 standard)

Your benefit

- Additional stem seal for emergency operation
- Blow-out protection for staff and plant

Valve seat made of wear and corrosion-resistant materials

Your benefit

- High reliability
- Long life

Fig.: type ZXS, DN 10-50

Subject to technical modification without prior notice

7681.1/112-10 01.02.2006