

Globe Valve

## BOA-H

PN 16/25  
DN 15-350  
Bellows  
Flanged

## Type Series Booklet



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Type Series Booklet BOA-H

KSB Aktiengesellschaft Pegnitz

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## Globe Valves

### Bellows-type Globe Valves

#### BOA-H



#### Main applications

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

#### Fluids handled

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

#### Operating data

Operating properties

Characteristic	Value	
	JL 1040	JS 1025
Nominal pressure	PN 16	PN 16/25
Nominal size	DN 15-300	DN 15-350 <sup>1)</sup>
Max. permissible pressure	16 bar	25 bar
Max. permissible temperature	300 °C	350 °C

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

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

#### Design details

##### Design

- Straight-way or angle pattern with horizontal seat
- Throttling plug up to DN 100
- On/off disc for DN 125 and above
- All nominal sizes with position indicator, locking device and travel stop
- Compact bonnet
- Maintenance-free bellows-type stem seal with back-up gland packing
- Non-rising handwheel
- Flanges to DIN EN 1092-2 Type 21
- Exterior coating: blue RAL 5002
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.
- Type-tested to the specifications of Germanischer Lloyd

##### Variants

- V-port plug (seat-guided throttling plug for maximum requirements) for DN 15-300
- Valve disc with PTFE ring (max. 200 °C, throttling plug for DN 15-100, on/off disc for DN 125-200)
- Lead-sealable cap (prevents unauthorised actuation) as assembly set
- Pilot plug design from DN 200
- High-temperature resistant paint (grey aluminium)
- Either one or two limit switch(es) as assembly kit for globe valves of DN 15-150 made of JS1025
- Oil and grease-free: lubricated exclusively by mineral oil free lubricants approved by the German Federal Office for Materials Testing (Bundesanstalt für Materialforschung und -prüfung, BAM)
- Other flange designs
- Low-temperature steel bolts for temperatures down to -30 °C (JS 1025 only) up to 0.75 x PN (max.)
- Certification to customer specification
- Globe valve version with gland packing and electric actuator see BOA-H Mat E.

#### Body materials

Overview of materials available for straight-way valve

Material	Material number	Temperature limit
EN-GJL-250	JL 1040	up to 300 °C
EN-GJS-400-18-LT	JS 1025	up to 350 °C

Overview of materials available for angle valve

Material	Material number	Temperature limit
EN-GJL-250	JL 1040	up to 300 °C

### Product benefits

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

### Related documents

Other applicable documentation

Document	Reference No.
Valve characteristics	7150.4
Operating manual	0570.8
Installation instructions "Accessories set for capped valves"	0570.811
Installation instructions "Limit switch set"	0570.812
BOA-H Mat E type series booklet	7135.1

### On all enquiries/orders please specify

1. Type
2. Nominal pressure
3. Nominal size
4. Material
5. Variants
6. Number of type series booklet

### Pressure/temperature ratings

Test and operating pressures

Nominal pressure	Material	Body pressure test	Seat tightness test	Permissible operating pressures in bar at temperatures in °C <sup>2) 3)</sup>							
		with water									
		P10, P11 <sup>4)</sup>	P12 <sup>5)</sup>	-10 to +120	150	180	200	230	250	300	350
PN		[bar]	[bar]								
16	EN-GJL-250	24	17,6	16	14,4	13,4	12,8	11,8	11,2	9,6	-
	EN-GJS-400-18-LT	24	17,6	16	15,5		14,7		13,9	12,8	11,2
25	EN-GJS-400-18-LT	37,5	27,5	25	24,3		23		21,8	20	17,5

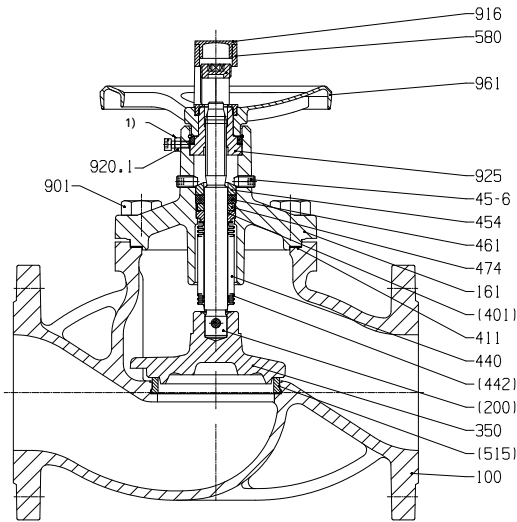
2) Intermediate temperatures can be derived by linear interpolation.

3) Static load

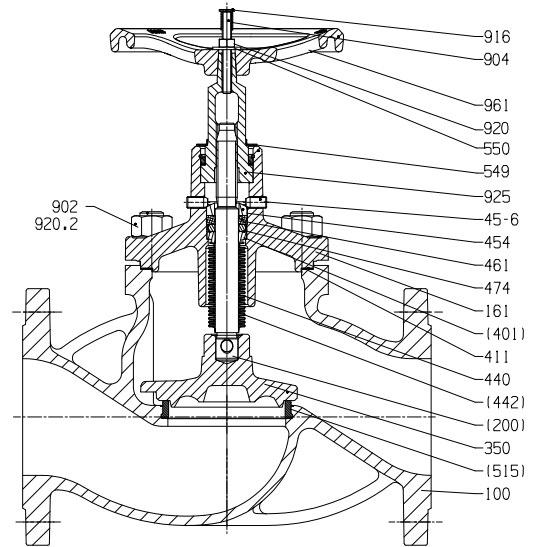
4) DIN EN 12266-1 (P10, P11)

5) DIN EN 12266-1 (P12, leakage rate A)

Materials



EN-GJL-250 (JL 1040)

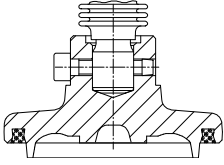


EN-GJS-400-18-LT (JS 1025)

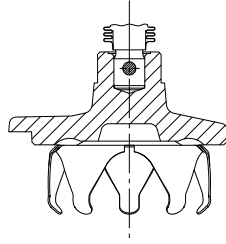
Overview of available materials

Part No.	Description	DN	Material	Material number
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 disc	15-150	X 20 Cr 13	1.4021+QT (1.4021)
		200-350	C 22/X 15 CrNi 18 8	1.0402/1.4370
411	Joint ring		CrNiSt/graphite	
440	Bellows set consisting of:			
	200	Stem	Stainless steel (min. 13 % Cr)	
	401	Weld ring	Stainless steel (min. 13 % Cr)	
	442	Bellows	X 6 CrNiTi 18 10	1.4541
454	Stuffing box ring		Steel	
45-6	Stuffing box screw		Steel	
461	Gland packing		Pure graphite	
474	Thrust ring		Stainless steel	
515	Seat ring		Stainless steel	
543	Spacer bush	15-65	Plastic, glass-fibre reinforced	
549	Collar bush		Stainless steel	
550	Disc		Steel	
580	Cap	15-150	Plastic, glass-fibre reinforced, impact-resistant	
		200-350	Steel	
901	Hexagon head bolt		8.8 on EN-GJL-250 variant	
902	Stud		C 35 E on EN-GJS-400-18-LT variant	
904	Grub screw		Steel	
916	Plug		Plastic	
920	Hexagon nut		C 35 on EN-GJS-400-18-LT variant	
925	Stem nut		Coated steel	
961	Handwheel	15-150	Die-cast aluminium on EN-GJL-250 variant	
		200-300	EN-GJL-200 on EN-GJL-250 variant	JL1030
		15-350	EN-GJL-200 on EN-GJL-400-18-LT variant	JL1030

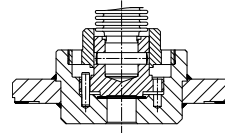
**Variants**



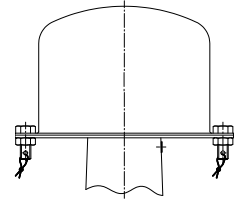
Throttling plug with PTFE ring, DN 15-100



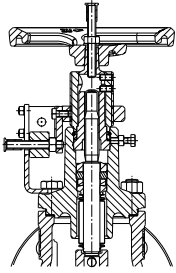
V-port plug



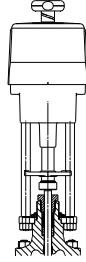
Pilot plug design from DN 200



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

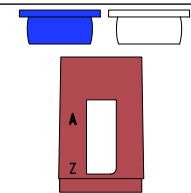
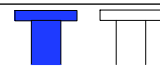
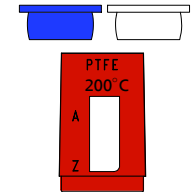
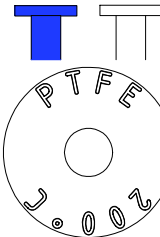
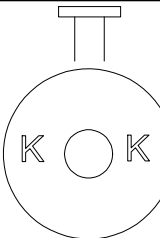


Limit switch



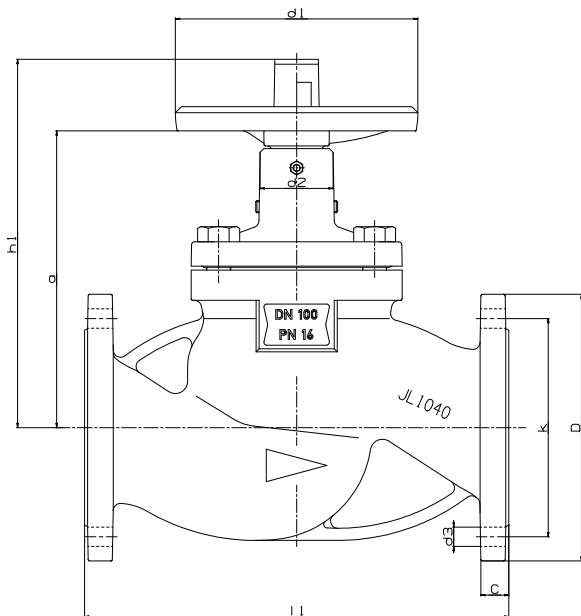
BOA-H Mat E

Colour coding system

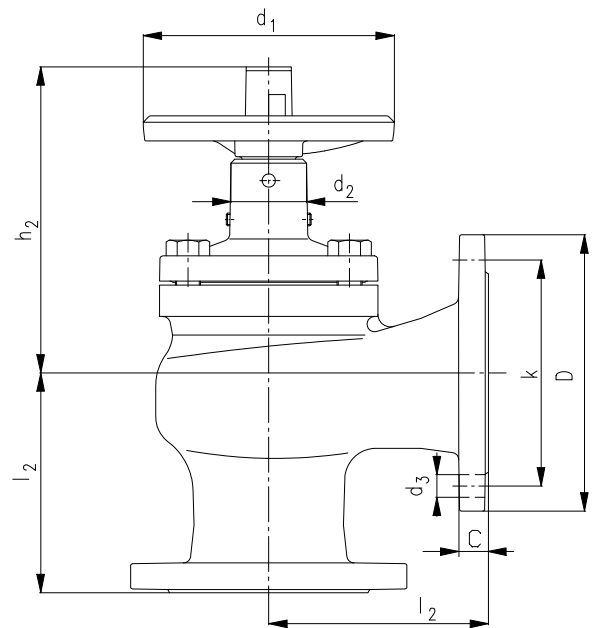
Body made of EN-GJL-250 (JL 1040)			Body made of EN-GJS-400-18-LT (JS1025)		
<b>Metal-seated valve disc</b>			<b>Metal-seated valve disc</b>		
Blue plug Design: on/off disc		White plug Design: throttling plug	Blue plug Design: on/off disc		White plug Design: throttling plug
	Crimson cap				
<b>Valve disc with PTFE ring</b>			<b>Valve disc with PTFE ring</b>		
Blue plug Design: on/off disc		White plug Design: throttling plug	Blue plug Design: on/off disc		White plug Design: throttling plug
	Red orange cap			Sheet metal disc	
<b>V-port plug (DN 15-300)</b>			<b>V-port plug (DN 15-150)</b>		
Tag on handwheel	<input type="checkbox"/> Kronenkegel				White plug
				Sheet metal disc	
			<b>V-port plug (DN 200-350)</b>		
			Tag on handwheel	<input type="checkbox"/> Kronenkegel	

## Dimensions

### Dimensions PN 16, JL 1040



Straight-way valve



Angle valve

### Dimensions in mm

PN	DN	l <sub>1</sub>	l <sub>2</sub>	h <sub>1</sub>	h <sub>2</sub>	d <sub>1</sub>	d <sub>2</sub>	a	D	k	n x d <sub>3</sub>	C	[kg]	
													Straight-way valve	Angle valve
16	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	4
	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	16,3
	80	310	155	282	226	200	60	223	200	160	8 x 19	22	22	21,8
	100	350	175	304	244	200	60	245	220	180	8 x 19	24	32	30,8
	125	400	200	390	316	250	86	310	250	210	8 x 19	26	54	48,3
	150	480	225	408	320	250	86	328	285	240	8 x 23	26	70,5	65,7
	200	600	275	570	468	400	100	440	340	295	12 x 23	30	130	114,2
250	730	325	606	480	400	100	476	405	355	12 x 28	32	230	180,5	
300	850	375	660	510	400	93	530	460	410	12 x 28	32	328	267,5	

### Mating dimensions - Standards

Face-to-face Straight-way valve: DIN EN 558 FTF-1, ISO 5752

lengths: Angle valve: DIN EN 558 CTF-8, ISO 5752

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

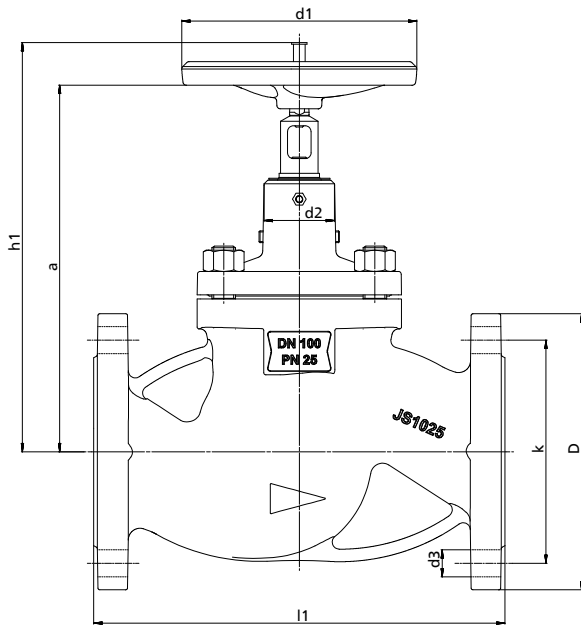
Flange facing: DIN EN 1092-2, type B

### Other flange designs

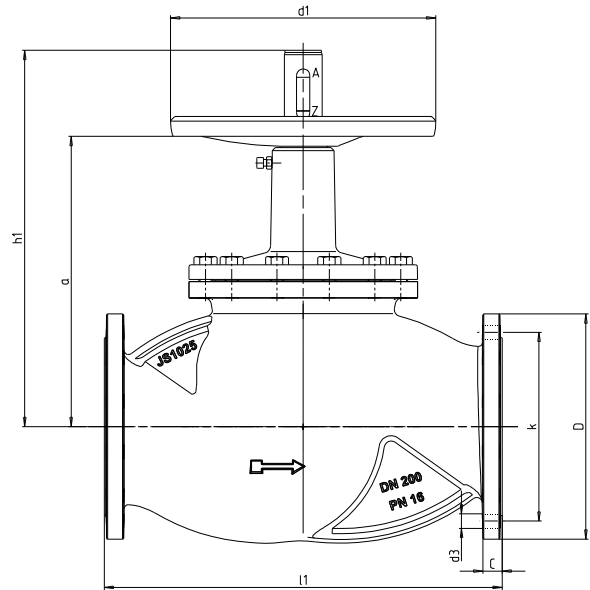
- Undrilled, DN 200-300 drilled to PN 10, drilled to PN 6 (DIN EN 1092-2), drilled to ANSI Class 150, tongue (type C), groove (type D), spigot (type E), recess (type F) at both ends (to DIN EN 1092-1)
- Other flange designs on request



Dimensions PN 16 and PN 25, JS 1025



PN 16/25 up to DN 150



PN 16 DN 200-350

Dimensions in mm

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

Mating dimensions - Standards

Face-to-face lengths: Straight-way valve: DIN EN 558 FTF-1, ISO 5752  
Angle valve: DIN EN 558 CTF-8, ISO 5752  
Flanges: DIN EN 1092-2, flange type 21 for JL1040  
DIN EN 1092-2, flange type 21-2 for JS1025  
Flange facing: DIN EN 1092-2, type B

Other flange designs

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

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

### Installation instructions


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


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

Differential pressures in bar

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

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

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

 EN 1515-4 "Selection of bolting for equipment subject to the Pressure Equipment Directive 97/23/EC" and any plant regulations governing the application in question must be observed when selecting connecting elements between the valve flange and the pipe flange.

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<sup>6)</sup> No pilot plug available.

**Chemical resistance chart**

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

**Chemical resistance chart for water**

Fluid handled	Max. content	Max. temp.	A <sup>7)</sup>	B <sup>8)</sup>
Brackish water <sup>9)</sup> 10)			✗	✗
Service water <sup>9)</sup> 10)			✓	✓
Fire-fighting water <sup>9)</sup>			✓	✓
Chlorinated water <sup>9)</sup>	0,6 mg/kg		✓	✓
Deionised water (demineralised water)			✗	✗
Distilled water			✗	✗
Boiler feed water <sup>11)</sup>			✓	✓
Hot water <sup>9)</sup>			✓	✓
High-temperature hot water <sup>11)</sup>		T = f (p)	✓	✓
Condensate <sup>11)</sup>			✓	✓
Oil-free cooling water <sup>9)</sup>			✓	✓
Oil-containing cooling water <sup>9)</sup>			✓	✓
Ozonised water <sup>9)</sup>	0,5 mg/kg		✓	✓
Pure water <sup>9)</sup>			✓	✓
Seawater			✗	✗
Scale-forming water <sup>9)</sup> 10)			○	○
Raw water <sup>9)</sup> 10)			✓	✓
Partly desalinated water			✗	✗
Fully desalinated water			✗	✗
Municipal waste water <sup>10)</sup> 12)			✓	✓
Industrial waste water <sup>10)</sup> 13)			✓	✓

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

Fluid handled	Max. content	Max. temp.	A <sup>7)</sup>	B <sup>8)</sup>
Vegetable oils			✓	✓
Mineral oils			✓	✓
Synthetic oils			✓	✓
Crude oil			✓	✓
Petroleum			✓	✓
Light fuel oil			✓	✓
Heavy fuel oil			✓	✓
Linseed oil			✓	✓
Oil-water emulsion <sup>10)</sup>			✓	✓

7) EN-GJL-250 (JL 1040), Tmax. +300 °C

8) EN-GJS-400-18-LT (JS 1025), Tmax. +350 °C

9) General limits for water to be handled by valves made of non-alloyed materials: pH value 6,5 - 12; chloride ions (Cl) < 150 mg/kg; chlorine (Cl<sub>2</sub>) < 0,6 mg/kg.

10) Without solids

11) Water treatment must be in compliance with the guidelines for feed water (e.g. VdTÜV 1466, TRO 611, etc.): pH value ≥ 9,0; O<sub>2</sub> content ≤ 0,02 mg/l

12) Biologically treated

13) Non-corrosive, non-abrasive

14) For safety reasons (ductility) we recommend to use EN-GJS-400-18-LT.

Fluid handled	Max. content	Max. temp.	A <sup>7)</sup>	B <sup>8)</sup>
Jet fuel			○ <sup>14)</sup>	✓
Petrol			○ <sup>14)</sup>	✓
Kerosene			○ <sup>14)</sup>	✓

**Chemical resistance chart for refrigerants**

Fluid handled	Max. content	Max. temp.	A <sup>7)</sup>	B <sup>8)</sup>
Ammonium hydroxide	30 %	25 °C	✓	✓
Glycol (ethylene glycol)			✓	✓
Propylene glycol			✓	✓
Water-glycol mixture	50 %	40 °C	✓	✓
Inorganic cooling brine, pH 7,5 inhibited			✓	✓

**Chemical resistance chart for thermal oils**

Fluid handled	Max. content	Max. temp.	A <sup>7)</sup>	B <sup>8)</sup>
Synthetic thermal oils			✓	✓
Mineral-based thermal oils			✓	✓

**Chemical resistance chart for acids**

Fluid handled	Max. content	Max. temp.	A <sup>7)</sup>	B <sup>8)</sup>
Hydrochloric acid			✗	✗
Sulphuric acid (pure, techn., concentr.)			✗	✗
Sulphurous acid			✗	✗
Fatty acid			✗	✗
Nitric acid			✗	✗

**Chemical resistance chart for cleaning agents**

Fluid handled	Max. content	Max. temp.	A <sup>7)</sup>	B <sup>8)</sup>
Lye for bottle rinsers (e.g. P3) <sup>10)</sup>		≤ 80 °C	○	○
Lye for metal cleaning <sup>10)</sup>		≤ 80 °C	○	○

**Chemical resistance chart for steam**

Fluid handled	Max. content	Max. temp.	A <sup>7)</sup>	B <sup>8)</sup>
Saturated steam			○ <sup>14)</sup>	✓

**Chemical resistance chart for other fluids**

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

Fluid handled	Max. content	Max. temp.	A <sup>7)</sup>	B <sup>8)</sup>
Aqueous glycerine			✓	✓
Carbon dioxide (gas)			✓	✓
Carbon dioxide (aqueous solution)			✗	✗

Key to the symbols

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





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