

Automated Globe Valves

BOA-H Mat E

PN 16/25
DN 20-150

Type Series Booklet



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Type Series Booklet BOA-H Mat E

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Control and Measurement Valves

Automated Globe Valves to DIN/EN

BOA-H Mat E



Main applications

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

Fluids handled

- Hot water
- Saturated steam
- Thermal oil
- Liquids not chemically or mechanically aggressive to the valve materials.

Operating data

Operating properties

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

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

Design details

Design

- Straight-way pattern with horizontal seat
- Throttling plug up to DN 100
- On/off disc for DN 125 and above
- Spring-loaded PTFE V-packing up to 250 °C
- Graphite gland packing up to 350 °C
- Flanges to DIN EN 1092-2 Type 21
- Leakage rate A
- Exterior coating: blue RAL 5002
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.

Actuators (technical data refers to basic configuration):

- 3-point (Open/Stop/Closed) actuators
Supply voltage: 230 V AC / 24 V AC/DC
Actual-position feedback: 2 limit switches

Variants

Globe valve:

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

Actuators:

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

Body materials

Overview of available materials

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

Product benefits

- Internal parts made of high-grade stainless steel for long service life and high chemical resistance.
- Risk of leakage minimised by fully confined bonnet gasket.
- Available with two types of stem seal: maintenance-free PTFE V-rings with spring (< 250 °C) or adjustable graphite gland packing (350 °C).
- Electric actuator with 3-point actuation, available in various sizes up to 14 kN.

Related documents

Other applicable documentation

Document	Reference No.
Flow characteristics	7135.4
Operating manual	7525.81

Pressure/temperature ratings

Test and operating pressures

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

Actuating times

Actuating times in s

Nominal diameter DN	Travel [mm]	EA-C 20 to 80 24 V/230 V	EA-C 140 230 V	EA-C 140 24 V
20	7.5	15.0	-	-
25	7.5	15.0	-	-
32	11	22.0	-	-
40	12	24.0	-	-
50	13.5	27.0	-	-
65	17	34.0	26.2	37.8
80	20.5	41.0	31.5	45.6
100	25.5	51.0	39.2	56.7
125	33	66.0	50.8	73.3
150	38	76.0	58.5	84.4

Maximum permissible closing pressures

 Fluid approaches the plug in closing direction; p₂ = 0 bar
 Values in bar

DN	Travel [mm]	Kvs value [m³/h]	EA-C 20 (2 kN)		EA-C40 (4.5 kN)		EA-C80 (8 kN)		EAC-140 (14 kN)	
			Graphite gland packing	PTFE V-rings with spring	Graphite gland packing	PTFE V-rings with spring	Graphite gland packing	PTFE V-rings with spring	Graphite gland packing	PTFE V-rings with spring
20	7.5	8.3	25.0	25.0						
25	7.5	13	20.6	25.0						
32	11	19.9	12.7	16.3	25.0	25.0				
40	12	27.1	8.1	10.4	24.8	25.0				
50	13.5	42	5.0	6.6	16.1	17.6	25.0	25.0		
65	17	75.1	2.4	3.6	9.2	10.4	18.7	19.8	25.0	25.0
80	20.5	116.7	1.4	2.2	6.0	6.8	12.3	13.1	23.3	24.1
100	25.5	172.3			3.7	4.2	7.9	8.4	15.0	15.5
125	33	270			2.2	2.6	4.9	5.3	9.5	9.9
150	38	393			1.4	1.7	3.3	3.6	6.5	6.8

1) Intermediate temperatures can be derived by linear interpolation.

2) Static load

Technical data

Technical data - globe valve

BOA-H Mat E

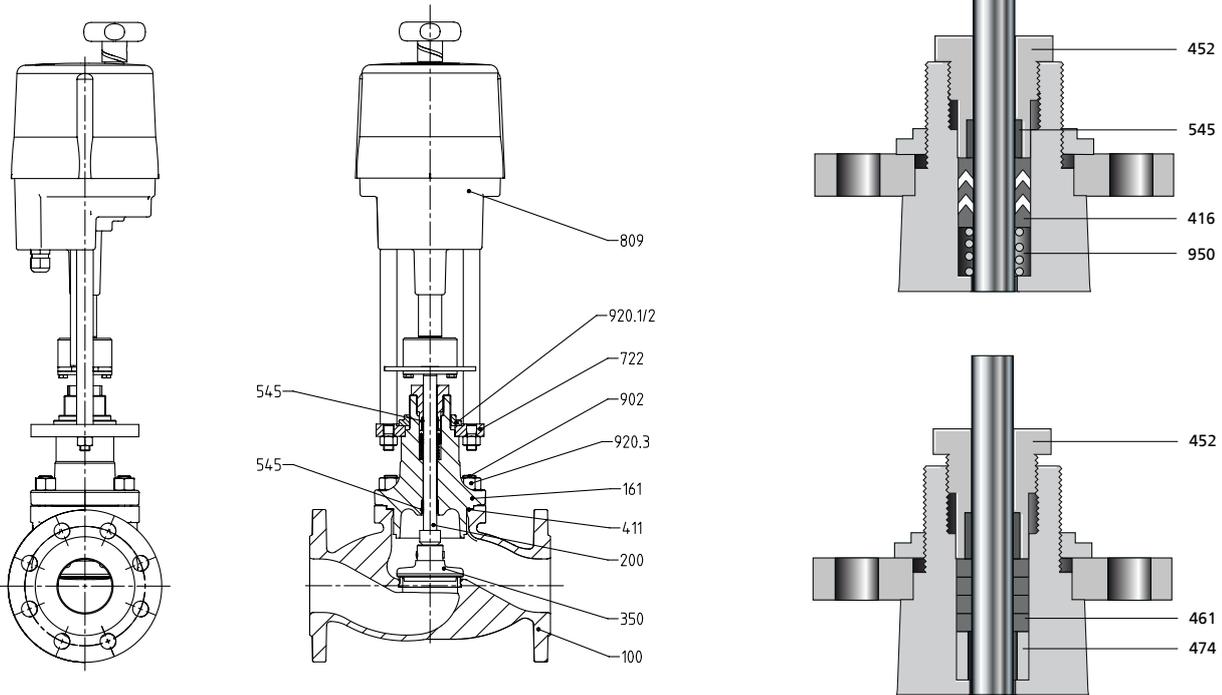
Nominal pressure	PN 16, PN 25
Valve characteristic	On/off
Leakage class	Leakage rate A to DIN EN 12266-1, test P12
Permissible pressure	16 bar, 25 bar
Flanged ends	PN 16 and PN 25 to DIN EN 1092-2
Fluid temperature	-10 to +350 °C

Technical data - actuators

EA-C 20...140 3-point (Open/Stop/Closed) actuators

Power supply	Supply voltage	230 V AC \pm 10 % 24 V AC/DC \pm 10 %
	Max. power input	100 VA
Functional data	Max. actuation force	2000 N/4500 N/8000 N/14000 N
	Actuating speed	EA-C 20...80: 0,5 mm/s EA-C 140: 230 V ~ 0,45 mm/s; 24 V ~ 0,65 mm/s
Signal inputs	Binary input	230 V AC/24 V AC
Enclosure		IP65 to EN 60529
Environment	Operation	
	Temperature	-20 to +60 °C
	Humidity	5 to 95 % rH
	Storage	
	Temperature	-20 to +80 °C
	Humidity	5 to 95 % rH
Standards and directives	Conformity with EC standards: EC electromagnetic compability directive EC directive on low-voltage equipment	
Dimensions	See outline drawings	
Power cable	Direct connection to printed circuit board max. 2.5 mm ²	

Materials

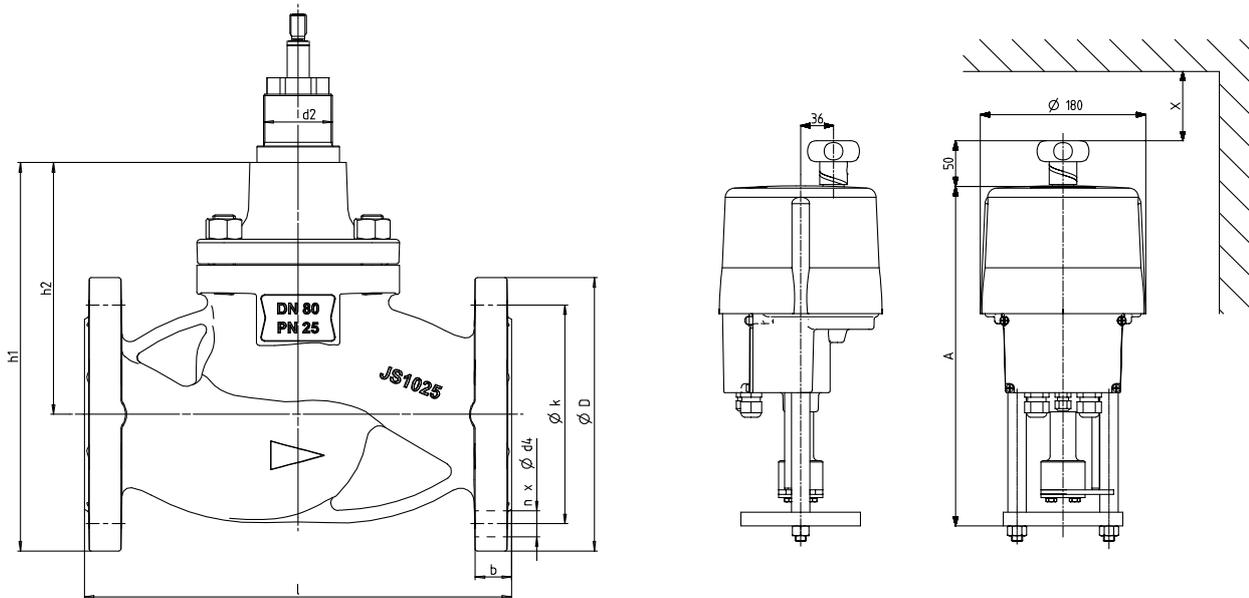


DN 20-150 with actuator type: EA-C...

Overview of available materials

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

Dimensions



Dimensions of BOA-H Mat E globe valve

Dimensions in mm

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

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

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

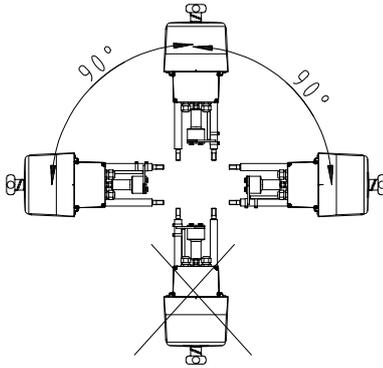
Mating dimensions - Standards

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

Installation instructions

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

Installation positions:



i DIN EN 1092-2 para. 5.3, AD W7, TRD 106 and any plant regulations governing the application in question must be observed when selecting connecting elements between the valve flanges and the piping flanges.

Further installation instructions

Electrical connection must be effected in accordance with the applicable local regulations for electrical installations and the equipment wiring and/or terminal plans. (⇒ Page 9)

The safety instructions and requirements for the protection of persons and equipment must always be complied with.

The permissible temperatures must be complied with (⇒ Page 5).

Service work on the actuator:

Switch off the pump and disconnect the power supply. Close the pipeline's shut-off valve, release the pressure in the piping and let the system cool down. Disconnect the electrical connections from the terminals.

Overview of actuator models

- Switching via limit switches in closing and opening direction.
- Delivered configured to match required operating data.
- Initial adaptation to the valve.
- After a power failure, operation is continued in accordance with the operating data (24 V actuator).
- Actuator and valve coupled via stem coupling.
- Stroke indication on adhesive scale sticker
- All actuators connected directly to printed circuit board.
- Manual adjustment via handwheel.
- CE conformity marking

Control signal	24 V AC/230 V AC	
Actual-position feedback	24 V AC	Options: 0-10 V, 2-10 V
	230 V AC	4-20 mA
Power supply	24 V AC/230 V AC	
Actuating time	Fixed	
Accessories	Actuator heating, power back-up unit (24 V actuator)	

Wiring diagrams

Terminal configuration EA-C 20 to 140

3-point 24 V AC with terminal box

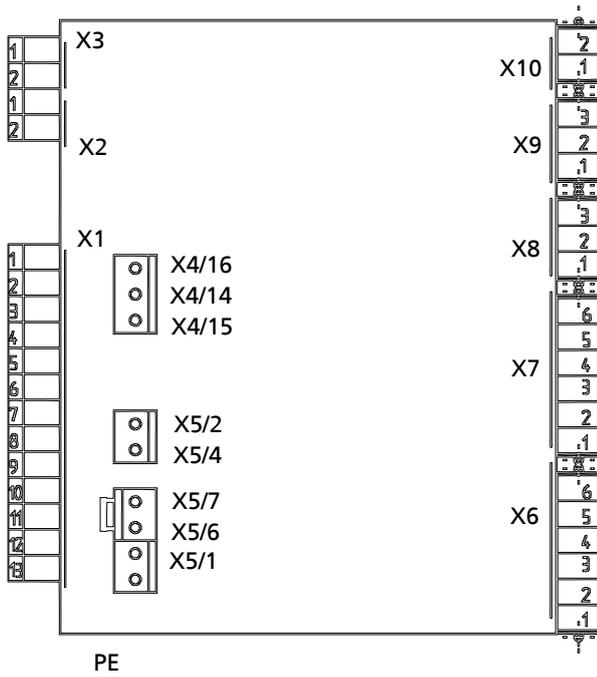
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		RJ-45 TTL	Push- button		
↑	↑	↑	↓	↓	↓	↑↓	↑↓	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑↓	↑↓	↑↓	↑↓	↑	↑	PE	(Optional)			
+0(2) - 10 V	+0(4) - 20 mA	GND	+0(2) - 10 V	+0(4) - 20 mA	GND		Max. load 100 mA at 24 VDC	L OPEN 24 V AC/DC □ 115 V AC □ 230 V AC □	N	L CLOSE	L (24 V AC/DC)	N (24 V AC/DC)	24-40 V DC / 100 mA	+0(2) - 10 V	+0(4) - 20 mA	GND	(Optional)	(Optional)	(Optional)	(Optional)	L (see name plate)	N (see name plate)		(Optional)			
(A)			(B)			(C)		(D)		(E)		(F)	(G)				(H)	(I)		(J)	(K)	(L)	(M)				
(N)							(O)					(P)															

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

Key

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

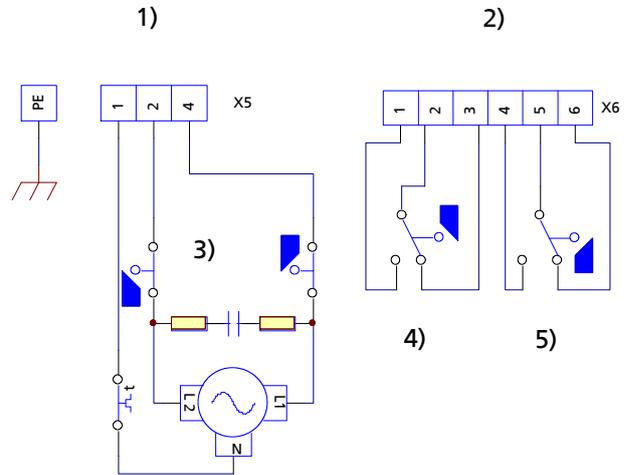
3-point 230 V AC



Key

X1	Internal wiring
X2	Internal wiring
X3	Internal wiring

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



1)	1~ AC	4)	Closed
2)	Additional limit switches	5)	Open
3)	Stroke		

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

Fluids handled	Max. content	Max. temp.	
Brackish water ³⁾⁴⁾			✗
Service water ³⁾⁴⁾			✓
Fire-fighting water ³⁾			✓
Chlorinated water ³⁾	0,6 mg/kg		✓
Deionised water (demineralised water)			✗
Distilled water			✗
Boiler feed water ⁵⁾			✓
Hot water ³⁾			✓
High-temperature hot water ⁵⁾		T = f (p)	✓
Condensate ⁵⁾			✓
Oil-free cooling water ³⁾			✓
Oil-containing cooling water ³⁾			✓
Ozonised water ³⁾	0,5 mg/kg		✓
Pure water ³⁾			✓
Seawater			✗
Scale-forming water ³⁾⁴⁾			○
Raw water ³⁾⁴⁾			✓
Partly desalinated water			✗
Fully desalinated water			✗
Municipal waste water ⁴⁾⁶⁾			✓
Industrial waste water ⁴⁾⁷⁾			✓

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

Fluids handled	Max. content	Max. temp.	
Vegetable oils			✓
Mineral oils			✓
Synthetic oils			✓
Crude oil			✓
Petroleum			✓
Light fuel oil			✓
Linseed oil			✓
Oil-water emulsion ⁴⁾			✓
Jet fuel			✓
Petrol			✓
Kerosene			✓

Chemical resistance chart for refrigerants

Fluids handled	Max. content	Max. temp.	
Ammonium hydroxide	30 %	25 °C	✓
Glycol (ethylene glycol)			✓
Propylene glycol			✓
Water-glycol mixture			✓
Inorganic cooling brine, ph 7,5 inhibited			✓

Chemical resistance chart for thermal oils

Fluids handled	Max. content	Max. temp.	
Synthetic thermal oils			✓
Mineral-based thermal oils			✓

Chemical resistance chart for acids

Fluids handled	Max. content	Max. temp.	
Hydrochloric acid			✗
Sulphuric acid (pure, techn., concentr.)			✗
Sulphurous acid			✗
Fatty acid			✗
Nitric acid			✗

Chemical resistance chart for cleaning agents

Fluids handled	Max. content	Max. temp.	
Lye for bottle rinsers (e.g. P3) ⁴⁾		≤ 80 °C	○
Lye for metal cleaning ⁴⁾		≤ 80 °C	○

Chemical resistance chart for steam

Fluids handled	Max. content	Max. temp.	
Saturated steam			✓

Chemical resistance chart for other fluids

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

³⁾ 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 (Cl₂) < 0.6 mg/kg.

⁴⁾ Without solids

⁵⁾ Water treatment must be in compliance with the guidelines for feed water (e.g. VdTÜV 1466, TRD 611, etc.): pH value ≥ 9,0; O₂ content ≤ 0,02 mg/l

⁶⁾ Biologically treated

⁷⁾ Non-corrosive, non-abrasive

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.

Symbol	Description
○	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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