




Shut-off and control technology



A line of ball valves and ideas

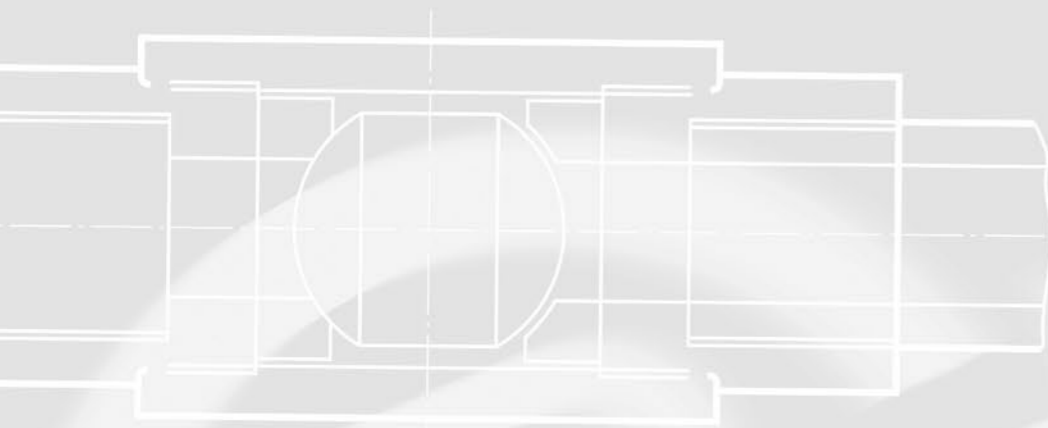


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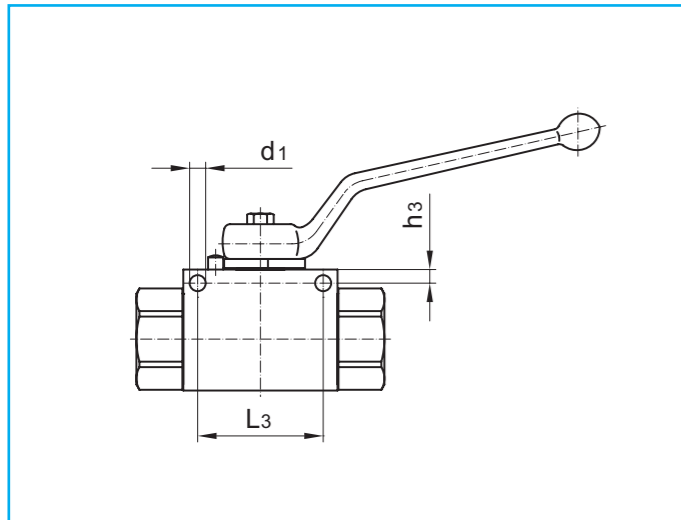


- Mounting holes
- Design principle of ball valves
- Seals of ball valves
- Sealing materials
- Compatibility table
- Ball valve size selection
- Pressure/temperature-diagram
- Δp -characteristics



Technical information

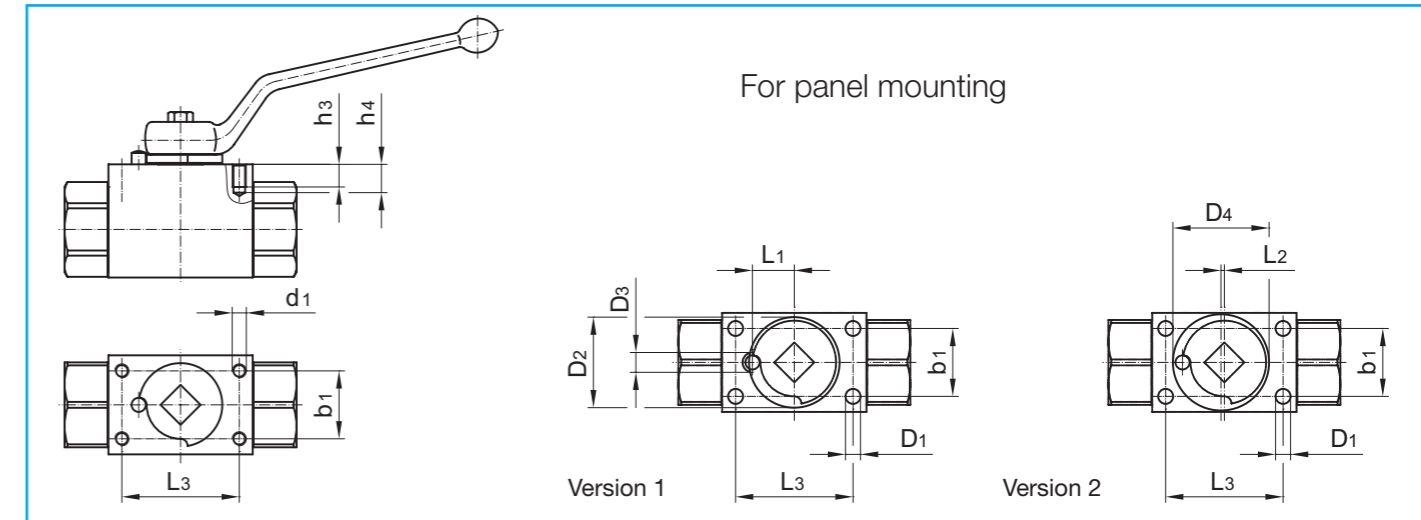
Mounting holes for 2-way and multi-way ball valves with floating ball Steel and stainless steel · DN 4 - DN 25



For wall mounting and stack design

For dimensions and article-numbers for ball valve bodies refer to the respective chapter.
All dimensions subject to change without notice

DN	L3	h3	d1
4	27,5	3,5	4,5
6	27,5	3,5	4,5
8	35,0	4,5	5,3
10	35,0	4,5	5,3
12	41,5	4,5	5,3
16	41,5	4,5	5,3
20	46,5	6,0	5,3
25	46,5	6,0	5,3



For panel mounting

For dimensions and article-numbers for ball valve bodies refer to the respective chapter.
All dimensions subject to change without notice

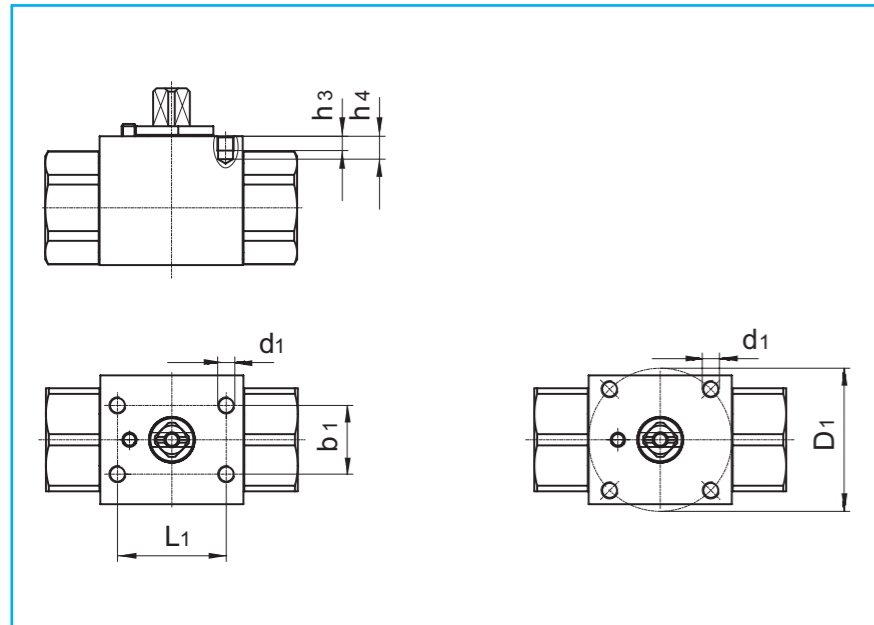
DN	L3	b1	d1	h3	h4	D1	D2	D3	D4	L1	L2
4	27,5	12,0	M4	5	6	4,3	21,5	5,0	22,5	10,0	0,7
6	27,5	12,0	M4	5	6	4,3	21,5	5,0	22,5	10,0	0,7
8	35,0	22,0	M5	6	8	5,3	26,0	6,0	27,0	11,5	0,8
10	35,0	22,0	M5	6	8	5,3	26,0	6,0	27,0	11,5	0,8
12	41,5	24,0	M5	8	10	5,3	32,0	7,0	34,0	14,8	1,2
16*	39,0	28,0	M5	8	10	5,3	32,0	7,0	34,0	14,8	1,2
20	48,0	33,0	M6	9	12	6,4	38,0	8,0	40,0	17,0	1,0
25	54,0	40,0	M6	9	12	6,4	38,0	8,0	40,0	17,0	1,0

* Body stainless steel DN 16 similar to DN 20



Technical information

Mounting holes for 2-way and multi-way ball valves with floating ball Steel and stainless steel · DN 4 - DN 25

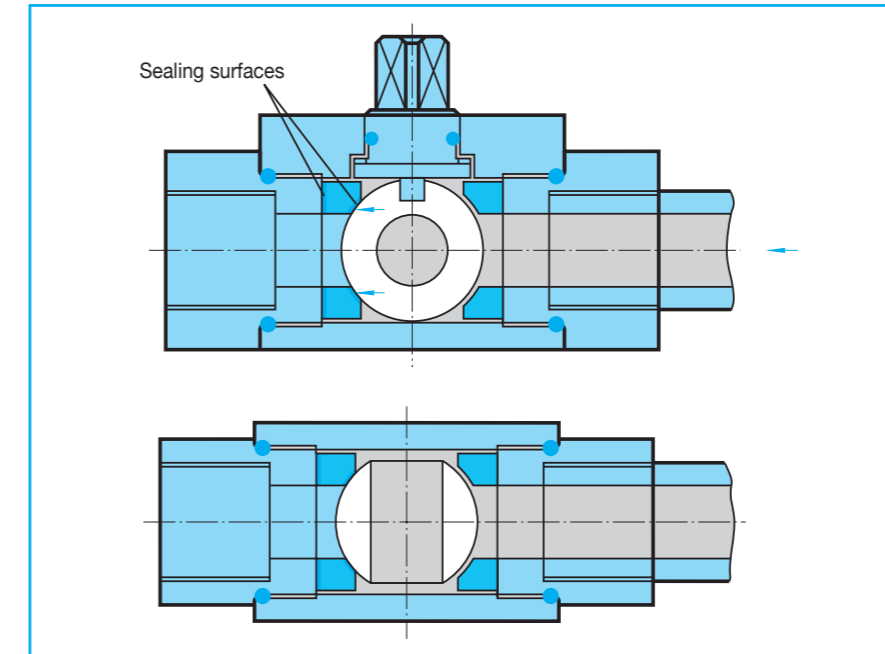


For installation of actuators

For dimensions and article-numbers for ball valve bodies refer to the respective chapter.
All dimensions subject to change without notice

DN	D1	L1	b1	d1	h3	h4
4	-	27,5	11	M4	5	6
6	-	27,5	11	M4	5	6
8	-	27,5	11	M4	5	6
10	-	27,5	11	M4	5	6
12	Ø36	-	-	M5	6	8
16	Ø50	-	-	M6	6	8
20	Ø50	-	-	M6	6	8
25	Ø50	-	-	M6	6	8

Design principle of 2-way ball valves with floating ball



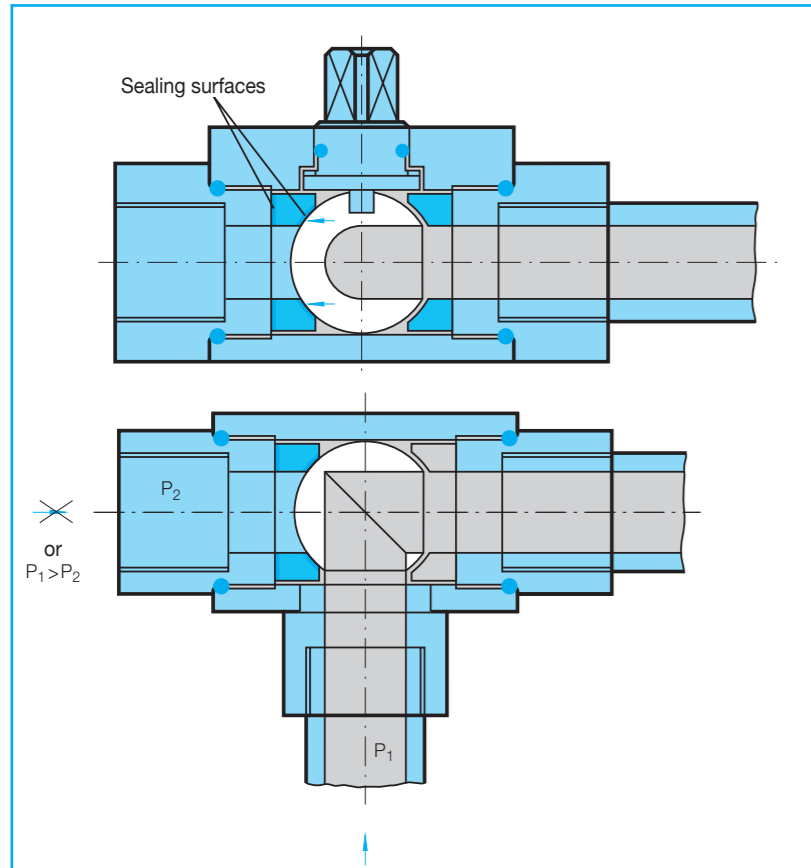
Bearing:
The seats also serve as the bearings for the floating ball.

Sealing:
Medium pressure will force the ball into the seat on the downstream side, forming a tight seal.

Leakage rate:
A - DIN EN 12266-1



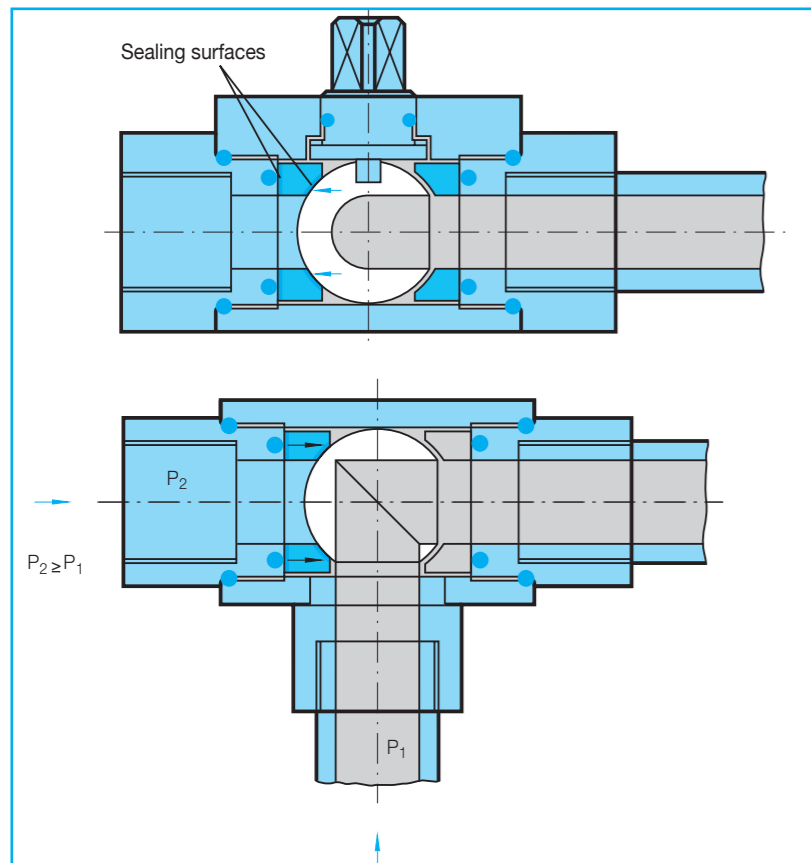
Design principle of multi-way ball valves with floating ball



Bearing:
The seats also serve as the bearings for the floating ball.

Sealing:
Medium pressure will force the ball into the seat on the downstream side, forming a tight seal, provided the pressure in the lines which are joined is greater than the pressure in the line which is closed off. Leakage will be encountered if the pressure in the closed line is equal to or greater than that in the other lines.

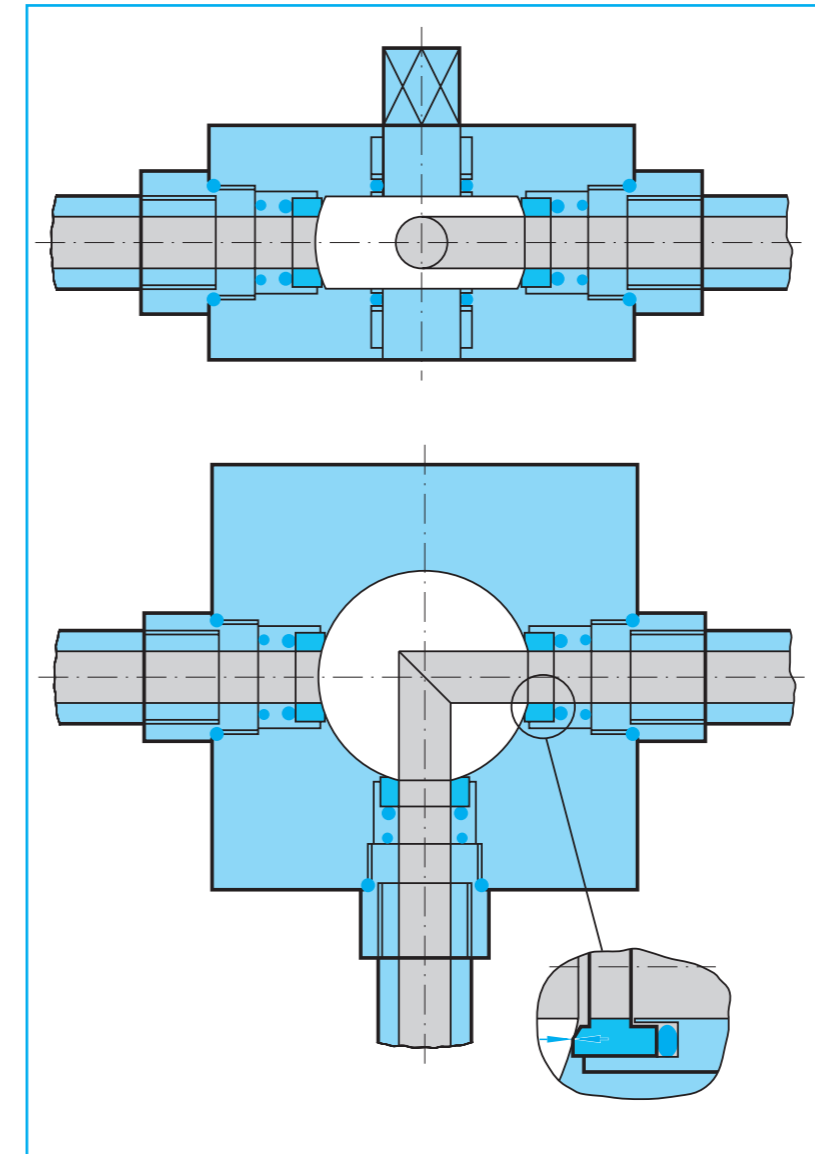
Leakage:
A - DIN EN 12266-1



A.D.-VERSION:
If the pressure from the closed port is higher or equal, the seat at the closed port is pressed against the ball and is sealing tightly.

Leakage:
A - DIN EN 12266-1

Design principle of multi-way ball valves with trunnion ball



Bearing:
The seats also serve as the bearings for the floating ball.

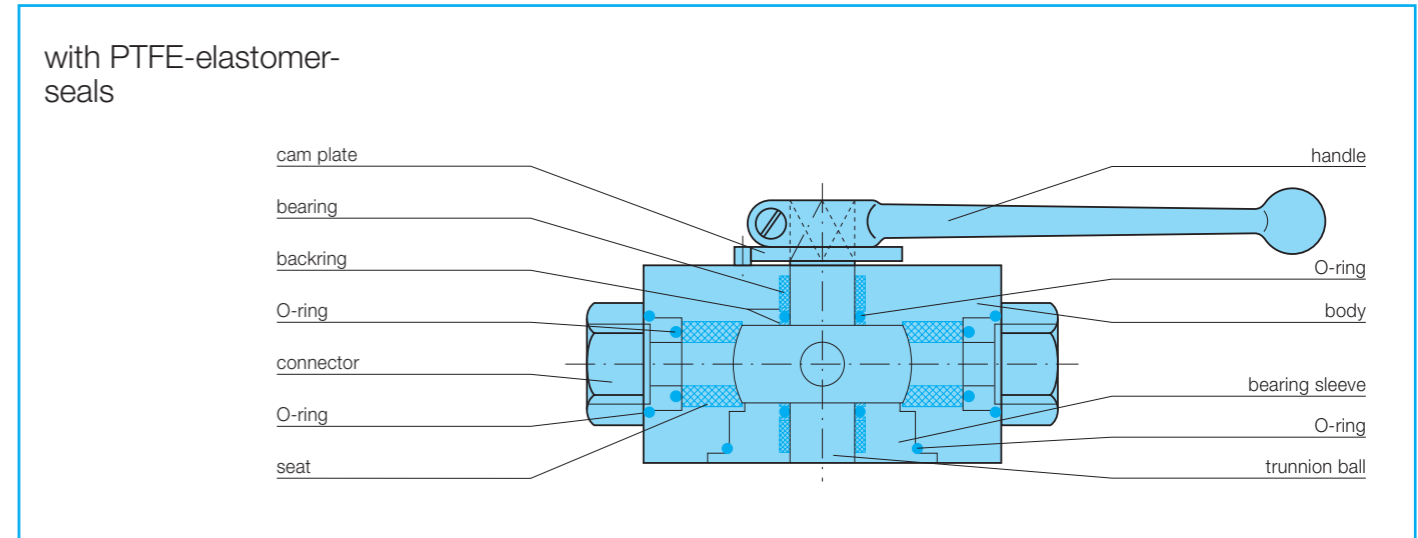
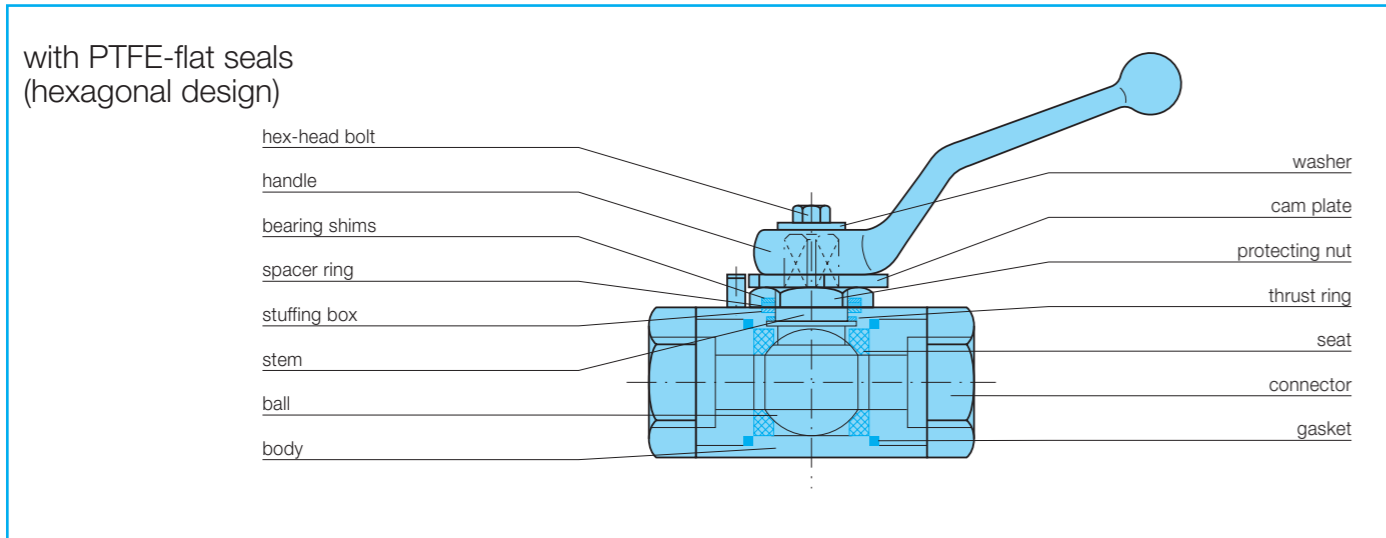
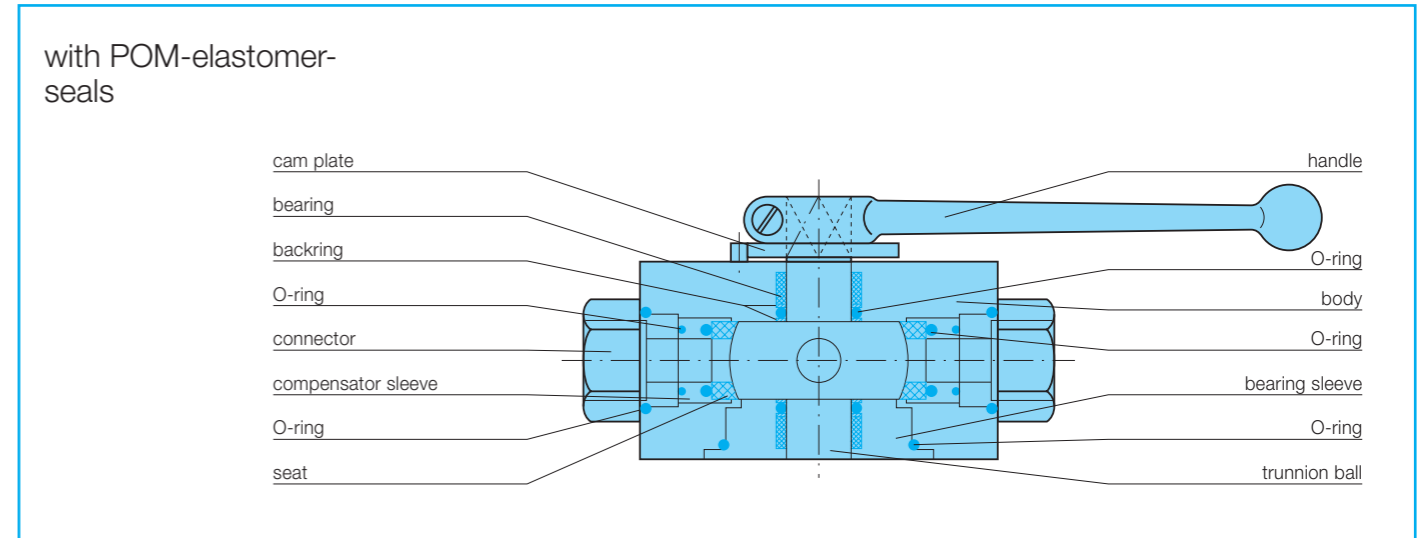
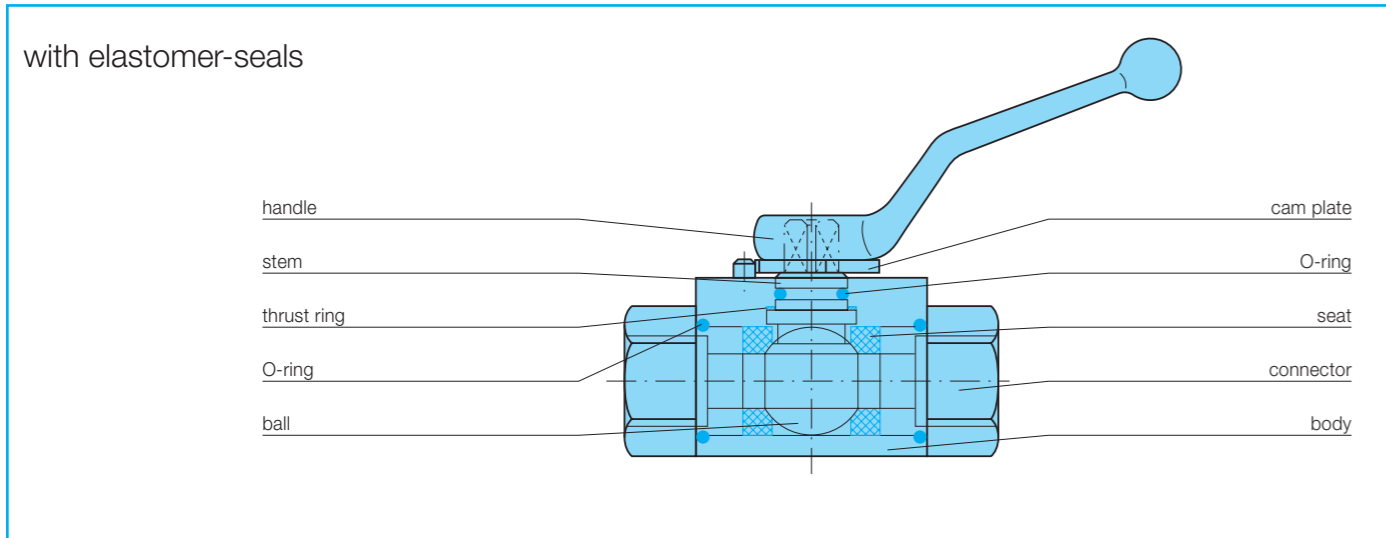
Sealing:
Tight seal at the trunnion ball due to pressure equalized Rötelmann telescopic seal.

Leakage:
A - DIN EN 12266-1



Seals in ball valves with floating ball

Seals in multi-way ball valves with trunnion ball



Sealing materials

Abbreviation (DIN ISO 1629)	Generic designation	Trade name (registered Trademarks)	Plastic properties	Abbreviation (DIN ISO 1629)	Applications	Temperature range (check pressure/ temperature diagram)	Special properties
PTFE	Polytetrafluorethylene	Teflon Hostaflon Fluon	Thermoplastic	PTFE	Ball seal	-200°C to +260°C	High chemical and temperature resistance; good slip properties. Modifying the crosskage can extend the application range to 250°C or 315 bar.
PVDF	Polyvinylidene fluoride	Solef Dyflor	Thermoplastic	PVDF	Ball seal	-40°C to +150°C	Mechanical properties similar to PTFE; greater stiffness than PTFE. Thermal loading capabilities lower than PTFE
PCTFE	Polychlorotrifluorethylene	Kel-F Neoflon Aclar	Thermoplastic	PCTFE	Ball seal	-240°C to +150°C	Mechanical properties similar to PTFE; greater stiffness than PTFE. Thermal loading capabilities lower than PTFE
POM	Polyoxymethylene/Polyacetal	Delrin Hostaform C Ultraform	Thermoplastic	POM	Ball seal	-40°C to +100°C	High strength and stiffness, good creep strength, low humidity absorption, hydrolytic resistance (up to 60°C)
PEEK	Polyether-ether-ketone	Victrex Hostatec	Thermoplastic	PEEK	Ball seal	-60°C to +260°C	Excellent chemical and hydrolytic resistance, good creep strength even at higher temperature, very good resistance to wear under varying operating conditions
PAI	Polyamide	Torlon	Thermoplastic	PAI	Ball seal	-190°C to +260°C	Excellent retention of mechanical stability, stiffness and creep strength at broad temperature range, excellent friction and abrasion performance, excellent UV-resistance
PI	Polyimide	VespeI Kapton	Thermoplastic	PI	Ball seal	-273°C to +255°C	High mechanical strength, stiffness and creep strength even at higher temperature, good abrasion performance
NBR	Nitrile rubber	Perbunan Chemigum Hycar Elaprim Krynac JSR-N	Elastomer	NBR	Body- and stem-seal	-30°C to +100°C*	High density, low deformation under pressure
HNBR	Hydrogenated nitrile rubber	Therban Zetpol	Elastomer	HNBR	Body- and stem-seal	-35°C to +150°C	Excellent physical properties and good abrasion resistance even at higher temperature, low deformation under pressure, good resistance against steam, oxygen and ozone
EPDM	Ethylene propylene diene rubber	Buna AP Vistalon Dutral Keltan	Elastomer	EPDM	Body- and stem-seal	-40°C to +140°C*	Excellent swelling resistance with heating-circuit water and steam, very good ozone-, aging- and atmospheric condition resistance
FKM	Fluor rubber	Viton Tecnoflon Fluorel	Elastomer	FKM	Body- and stem-seal	-15°C to +200°C*	Good chemical stability and high temperature resistance, excellent tightness and low deformation under pressure
FFKM	Perfluor rubber	Kalrez Chemraz Parofluor Isolast Simriz	Elastomer	FFKM	Body- and stem-seal	-15°C to +300°C	Elasticity and sealing properties aligned with chemical inertness and thermal stability, high temperature stress- and chemical resistance
VMQ	Silicone rubber	Silopren Silastic Blensil	Elastomer	VMQ	Body- and stem-seal	-60°C to +180°C	Stable mechanical properties throughout the entire temperature, good resistance against heat, ozone and aging

* Temperature range: DIN 3771-3
More significant compounds on request

Compatibility table

This compatibility table is for information only and without responsibility. The data presented are guidelines and recommendations based on common practice. The resistance of the materials might be affected through specific, on the location prevailing operating conditions as pressure, temperature, static or dynamic strain, but also through modified concentrations of the media exposed to the material. All information referring to room temperature (23°C)

CAS number: unique numeral identifier to every chemical substance
 + = resistant - = not resistant o = not specified

Medium	Chem. formula	CAS no.	Steel	1.4571	Has-telloy	Br	Al	POM	PCTFE	PEEK	PTFE	PVDF	HNBR	NBR	EPDM	FKM	FFKM	VMQ
A																		
acetic acid	C ₂ H ₄ O ₂	000064-19-7	-	+	+	-	-	-	+	+	+	+	-	-	-	-	+	-
acetone	C ₃ H ₆ O	000067-64-1	+	+	+	+	+	+	+	+	+	-	-	-	+	-	+	o
acetylene	C ₂ H ₂	000074-86-2	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	o
acrylonitrile	C ₃ H ₃ N	000107-13-1	+	+	+	+	+	-	o	+	+	-	-	-	-	-	+	o
air	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
aluminium chloride	AlCl ₃	007446-70-0	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	o
ammonia	NH ₃	007664-41-7	+	+	+	-	-	+	+	+	+	+	-	-	+	-	+	o
argon	Ar	007440-37-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
B																		
blast furnace gas	-	-	-	+	+	+	-	-	-	+	+	+	-	-	-	+	+	+
boric acid	H ₃ BO ₃	010043-35-3	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+
bromine	Br ₂	007726-95-6	-	-	+	-	-	+	-	+	+	-	-	-	-	-	+	-
butadiene	C ₄ H ₆	000106-99-0	-	+	+	+	-	+	+	+	+	+	-	-	-	-	+	-
butane	C ₄ H ₁₀	000106-97-8	+	+	+	+	-	+	+	+	+	+	-	-	-	+	+	-
butylene	C ₄ H ₈	000106-98-9	+	+	+	+	+	-	o	o	+	+	+	+	-	+	+	-
C																		
calcium chloride	CaCl ₂	010043-52-4	-	+	+	-	-	-	+	+	+	+	+	+	+	+	+	+
calcium hydroxide	CaH ₂ O ₂	001305-62-0	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+
carbon dioxide	CO ₂	000124-38-9	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	-
carbon disulfide	CS ₂	000075-15-0	+	+	+	-	+	+	+	+	+	+	-	-	-	+	+	-
chlorine	Cl ₂	007782-50-5	-	o	o	-	-	-	-	-	+	+	-	-	-	-	+	-
chloroforme	CHCl ₃	000067-66-3	-	+	+	+	-	-	-	+	+	+	-	-	-	+	+	-
citric acid	C ₆ H ₈ O ₇	000077-92-9	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+
copper(II) chloride	CuCl ₂	007447-39-4	-	-	+	-	-	+	+	+	+	+	+	+	+	+	+	+
copper(II) nitrate	CuN ₂ O ₆	003251-23-8	-	+	+	-	-	+	-	+	+	+	-	-	+	+	+	-
copper(II) sulfate	CuSO ₄	007758-98-7	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+
chromic acid	CrO ₃	001333-82-0	-	+	+	-	+	-	+	-	+	+	-	-	-	+	+	-
D																		
diesel fuel	-	068476-36-6	+	+	+	+	+	-	+	+	+	+	+	+	-	+	+	-
E																		
ethane	C ₂ H ₆	000074-84-0	+	+	+	+	+	-	o	+	+	-	+	-	-	+	+	o
ethanol	C ₂ H ₆ O	000064-17-5	+	+	+	+	-	+	o	+	+	+	+	+	-	+	+	o
ethylene	C ₂ H ₄	000074-85-1	+	+	+	+	-	-	o	+	+	+	+	-	-	+	+	-
ethyleneglycol	C ₂ H ₆ O ₂	000107-21-1	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
ethylenetrichloride	C ₂ HCl ₃	000079-01-6	-	+	+	-	-	-	+	+	+	+	-	-	+	+	+	-
F																		
fluorine	F ₂	007782-41-4	-	-	+	-	-	-	+	-	+	-	-	-	-	-	+	-
formaldehyde	CH ₂ O	000050-00-0	-	+	+	-	+	-	-	+	+	+	-	-	+	-	+	o
formic acid	CH ₂ O ₂	000064-18-6	-	+	+	-	+	-	-	+	+	+	-	-	+	-	+	o
fuel	-	008006-61-9	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
fuel oil, light	-	068476-30-2	+	+	+	o	+	-	+	+	+	+	+	+	-	+	+	-
fuel oil, heavy	-	068476-33-5	+	+	+	o	o	-	+	+	+	+	-	-	-	+	+	-
G																		
glucose	C ₆ H ₁₂ O ₆	000050-99-7	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
glycerine	C ₃ H ₈ O ₃	000058-81-5	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
glycol	C ₂ H ₆ O ₂	000107-21-1	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+

Medium	Chem. formula	CAS no.	Steel	1.4571	Has-telloy	Br	Al	POM	PCTFE	PEEK	PTFE	PVDF	HNBR	NBR	EPDM	FKM	FFKM	VMQ
H																		
HEES hydraulic fluid	-	-	o	+	+	o	-	+	+	+	+	+	+	+	-	+	+	o
helium	He	007440-59-7	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+
HEPG hydraulic fluid	-	-	o	+	+	o	-	+	+	+	+	+	+	+	-	+	+	o
HEPR hydraulic fluid	-	-	o	+	+	o	-	+	+	+	+	+	+	+	-	+	+	o
heptane	C ₇ H ₁₆	000142-82-5	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
HETG hydraulic fluid	-	-	o	+	+	o	-	+	+	+	+	+	+	+	-	+	+	o
hexane	C ₆ H ₁₄	000110-54-3	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
HFA hydraulic fluid	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	o
HFB hydraulic fluid	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	o
HFC hydraulic fluid	-	-	o	+	+	o	+	+	+	+	+	+	+	+	+	o	+	o
HFD-R hydraulic fluid	-	-	+	+	+	-	-	o	o	o	+	-	-	-	-	+	+	-
HFD-S hydraulic fluid	-	-	o	+	+	o	-	+	+	+	+	+	-	-	-	+	+	o
HFD-U hydraulic fluid	-	-	+	+	+	o	-	+	o	+	+	+	+	+	-	+	+	-
hydraulic oils	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	o
hydrochloric acid	HCl	007647-01-0	-	-	+	-	-	-	+	-	+	+	-	-	-	+	+	-
hydrogen	H ₂	001333-74-0	o	+	+	+	+	+	o	+	+	+	+	+	+	+	+	-
hydrogen peroxide	H ₂ O ₂	007722-84-1	-	+	+	-	-	-	o	+	+	+	-	-	-	-	-	-
hydrogen sulfide	H ₂ S	007783-06-4	-	+	+	-	-	-	+	+	+	+	-	-	-	-	-	-
I																		
ink	-	-	-	+	+	-	-	+	o	+	+	+	+	+	+	+	+	+
isobutyl alcohol	C ₄ H ₁₀ O	000078-83-1	+	+	+	+	+	+	o	+	+	+	-	-	+	-	+	+
isocyanate	C ₁₅ H ₁₀ N ₂ O ₂	009016-87-9	+	+	+	-	-	-	o	o	+	-	-	-	+	-	+	-
isooctane	C ₈ H ₁₈	026635-64-3	+	+	+	+	+	+	o	+	+	+	+	+	-	+	+	-
isopropylalcohol	C ₃ H ₈ O	000067-63-0	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
iron(II)-chloride	FeCl ₂	007758-94-3	-	+	+	o	-	-	+	o	+	+	+	+	+	+	+	o
iron(II)-sulfate	FeSO ₄	007720-78-7	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+
K																		
kerosene	-	008008-20-6	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
L																		
lacquers	-	-	o	+	+	-	+	+	+	+	+	+	+	+	-	o	+	o
lactose	C ₁₂ H ₂₂ O ₁₁	000063-42-3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
M																		
magn. chloride	MgCl ₂	007786-30-3	-	+	+	-	-	+	o	+	+	+	+	+	+	+	+	+
magn. hydroxide	MgO ₂ H ₂	001309-42-8	+	+	+	-	-	+	o	+	+	+	-	-	+	-	+	-
magn. nitrate	MgN ₂ O ₆	010377-60-3	-	+	+	-	-	+	o	+	+	+	-	-	+	+	+	-
magn. sulphate	MgSO ₄	007487-88-9	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
mercury	Hg	007439-97-6	+	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+
mercury(II) chloride	HgCl ₂	007487-94-7	-	+	+	-	-	+	-	+	+	+	+	+	+	+	+	+
mercury(II) cyanide	C ₂ HgN ₂	000592-04-1	+	+	+	-	-	o	o	o	+	+	-	-	+	+	+	-
mercury(II) nitrate	HgN ₂ O ₆	010045-94-0	+	+	+	-	-	o	o	o	+	+	-	-	+	+	+	-
methane	CH ₄	000074-82-8	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
methanol	CH ₄ O	000067-56-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
methyl acetate	C ₃ H ₆ O ₂	000079-20-9	+	+	+	+	+	+	+	+	+	+	-	-	+	-	+	-
methyl alcohol	CH ₃ O	000067-56-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
methyl chloride	CH ₃ Cl	000074-87-3	-	+	+	+	o	-	o	+	+	+	-	-	+	+	+	-
metoxyethanol	C ₃ H ₈ O ₂	000109-86-4	+	+	+	+	+	-	+	o	+	+	-	-	-	-	+	-
mineral oil	-	008012-95-1	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-

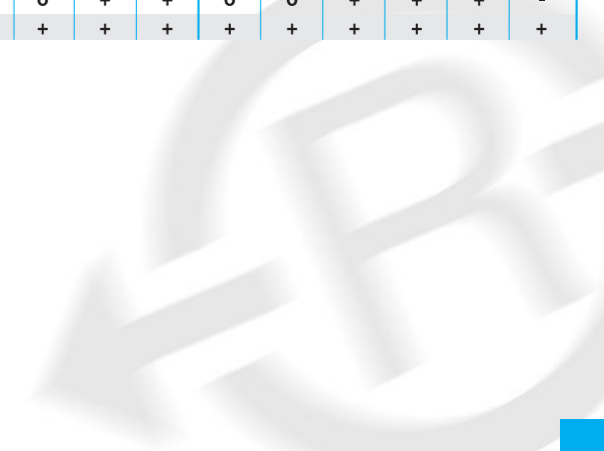
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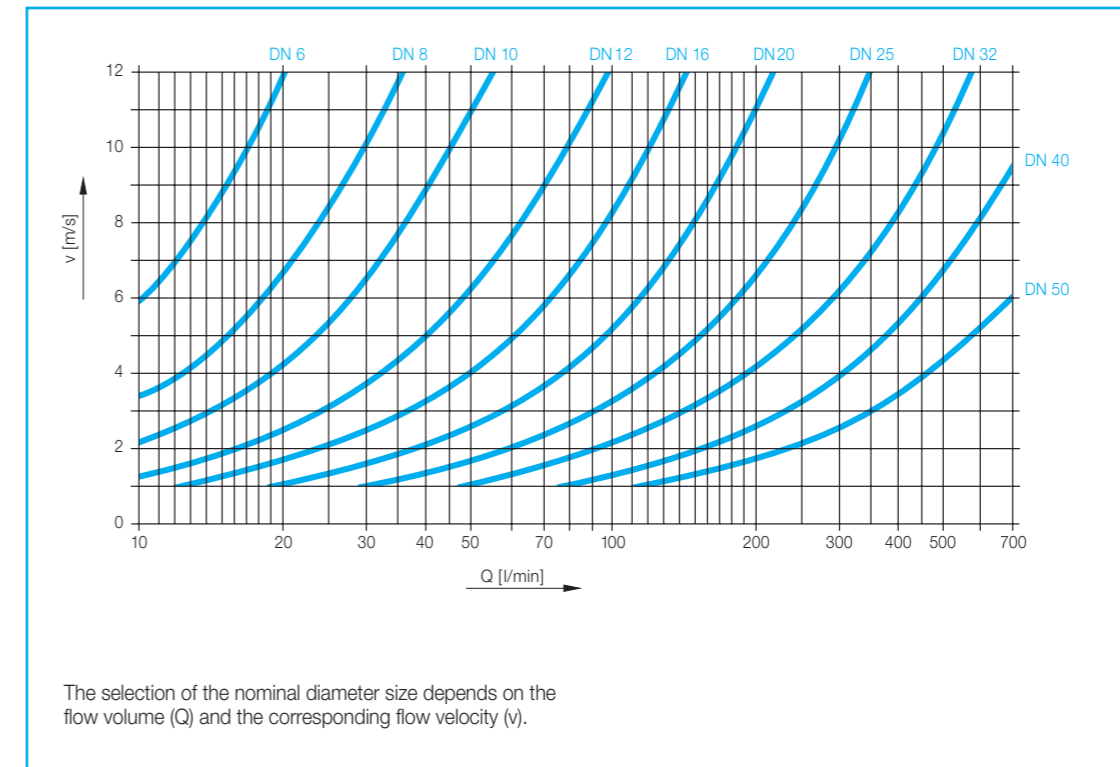
CAS number: unique numeral identifier to every chemical substance
 + = resistant - = not resistant o = not specified

Medium	Chem. formula	CAS no.	Steel	1.4571	Has-telloy	Br	Al	POM	PCTFE	PEEK	PTFE	PVDF	HNBR	NBR	EPDM	FKM	FFKM	VMQ
N																		
naphtalene	C ₁₀ H ₈	000091-20-3	+	+	+	+	o	+	+	+	+	+	-	-	-	+	+	-
natural gas	-	008006-14-2	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+
neon	Ne	007440-01-9	+	+	+	+	+	o	+	+	+	+	+	+	+	+	+	+
nickel(II)-chloride	NiCl ₂	007718-54-9	-	+	+	-	-	+	o	+	+	+	+	+	+	+	+	+
nickel(II)-nitrate	NiN ₂ O ₆	013138-45-9	-	+	+	-	-	+	o	+	+	+	+	+	+	+	+	+
nickel(II)-sulfate	NiSO ₄	007786-81-4	-	+	+	-	-	+	o	+	+	+	+	+	+	-	+	+
nitrogen	N ₂	007727-37-9	+	+	+	+	+	-	o	+	+	+	-	+	+	+	+	+
nitric acid	HNO ₃	007697-37-2	-	+	+	-	-	-	+	o	+	+	-	-	-	-	+	-
nitrobenzene	C ₆ H ₅ NO ₂	000098-95-3	+	+	+	+	+	-	+	o	+	+	-	-	-	-	+	-
nitrous oxide	N ₂ O	010024-97-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
O																		
octane	C ₈ H ₁₈	000111-65-9	-	+	+	o	o	o	o	o	+	+	-	-	-	+	+	-
oxalic acid	C ₂ H ₂ O ₄	000144-62-7	-	+	+	-	-	-	+	+	+	+	-	-	+	+	+	-
oxygen	O ₂	007782-44-7	-	+	+	+	+	+	+	+	+	+	o	o	o	o	+	-
ozone	O ₃	010028-15-6	+	+	+	-	-	-	+	o	+	+	-	-	+	+	+	+
P																		
palmitic acid	C ₁₆ H ₃₂ O ₂	000057-10-3	+	+	+	-	+	-	o	o	+	+	+	+	-	+	+	-
paraffin	-	008012-95-1	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
pentane	C ₅ H ₁₂	000109-66-0	o	+	+	o	+	+	o	+	+	+	+	+	-	+	+	-
pentanol, 2-	C ₅ H ₁₂ O	006032-29-7	+	+	+	+	+	+	o	+	+	+	-	-	+	-	+	-
petroleum	-	008002-05-9	+	+	+	o	+	+	+	+	+	+	+	+	-	+	+	-
phenol	C ₆ H ₆ O	000108-95-2	-	+	+	-	+	-	+	o	+	+	-	-	+	+	+	-
phosphonic acid	H ₃ PO ₄	007664-38-2	-	+	+	-	-	-	+	+	+	+	-	-	-	+	+	-
picric acid	C ₆ H ₃ N ₃ O ₇	000088-89-1	+	+	+	+	o	-	o	+	+	+	-	-	-	+	+	-
potassium carbonate	K ₂ CO ₃	000584-08-7	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+
potassium hydroxide	KOH	001310-58-3	-	+	+	-	-	-	+	+	+	+	-	-	+	-	+	-
potassium nitrate	KNO ₃	007757-79-1	+	+	+	+	+	+	o	+	+	+	+	+	+	+	+	+
potassium sulphate	K ₂ SO ₄	007778-80-5	+	+	+	-	+	o	o	+	+	+	+	+	+	+	+	-
propane	C ₃ H ₈	000074-98-6	+	+	+	+	o	+	o	+	+	+	+	+	-	+	+	-
propionic acid	C ₃ H ₆ O ₂	000079-09-4	-	+	+	-	-	-	+	o	+	+	+	+	-	+	+	-
propylene	C ₃ H ₆	000115-07-1	+	+	+	o	+	o	o	o	+	+	-	-	-	+	+	-
propylen glycol, 1,2-	C ₃ H ₈ O ₂	000057-55-6	+	+	+	+	+	+	o	+	+	+	+	+	+	+	+	-

Medium	Chem. formula	CAS no.	Steel	1.4571	Has-telloy	Br	Al	POM	PCTFE	PEEK	PTFE	PVDF	HNBR	NBR	EPDM	FKM	FFKM	VMQ
S																		
salicylic acid	C ₇ H ₆ O ₃	000069-72-7	+	+	+	-	+	-	+	o	+	+	-	-	+	+	+	-
sea water	-	-	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	o
silicone oil	-	063148-62-9	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+
silver nitrate	AgNO ₃	007761-88-8	-	+	+	-	-	-	o	+	+	+	-	-	+	+	+	+
skydrol	-	-	+	+	+	o	+	+	o	+	+	o	-	-	+	+	+	-
sodium silicate	Na ₂ Si ₃ O ₇	001344-09-8	+	+	+	o	+	o	o	o	+	+	+	+	+	+	+	-
solvents	-	-	o	+	+	-	+	o	+	+	+	+	o	+	-	+	+	o
sulfur	S ₈	007704-34-9	+	+	+	o	+	+	+	+	+	+	-	-	+	+	+	-
sulfur dioxide	SO ₂	007446-09-5	-	+	+	-	-	-	+	+	+	+	-	-	+	-	+	-
sulfur trioxide	SO ₃	007446-11-9	-	+	+	-	-	-	o	-	+	-	-	-	-	+	+	-
sulfuric acid	H ₂ SO ₄	007664-93-9	-	+	+	-	-	-	+	-	+	+	-	-	-	+	+	-
T																		
tannic acid	C ₇₆ H ₅₂ O ₄₆	001401-55-4	-	+	+	-	-	-	+	o	+	+	-	-	-	+	+	-
tetrachloro-methane	CCl ₄	000056-23-5	-	+	+	-	-	+	-	+	+	+	-	-	-	+	+	-
thermo oil	-	-	+	+	+	-	-	-	-	+	-	-	-	-	-	+	+	-
tin(II) chloride	SnCl ₂	007772-99-8	-	o	+	-	-	o	+	+	+	+	o	+	+	+	+	-
transformer oil	-	-	+	+	+	+	+	+	o	+	+	+	o	o	-	+	+	o
transmission lubricant	-	-	+	+	+	+	+	+	o	+	+	+	+	+	-	+	+	-
trichloroethylene	C ₂ HCl ₃	000079-01-6	-	+	+	-	-	-	-	+	+	+	-	-	+	+	+	-
triethylene glycol	C ₆ H ₁₄ O ₄	000112-27-6	-	+	+	o	+	+	o	o	+	+	-	-	+	+	+	o
U																		
urea	CH ₄ N ₂ O	000057-13-6	-	+	+	-	-	+	o	+	+	+	+	+	+	+	+	+
V																		
vaseline	-	-	o	+	+	o	+	+	o	+	+	+	+	+	-	+	+	-
vinyl chloride	C ₂ H ₃ Cl	000075-01-4	-	+	+	-	-	-	o	o	+	+	-	-	-	+	+	-
W																		
water	H ₂ O	007732-18-5	o	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
X																		
xenon	Xe	007440-63-3	+	+	+	+	o	o	o	+	+	+	+	+	+	+	+	+
xylene	C ₈ H ₁₀	001330-20-7	+	+	+	+	+	+	-	+	+	+	-	-	-	+	+	-
Z																		
zinc chloride	ZnCl ₂	007646-85-7	-	+	+	-	-	-	o	+	+	+	+	+	+	+	+	+
zinc nitrate	ZnN ₂ O ₆	007779-88-6	o	+	+	o	-	o	o	o	+	+	o	o	+	+	+	-
zinc sulphate	ZnSO ₄	007733-02-0	-	+	+	-	-	o	+	+	+	+	+	+	+	+	+	+

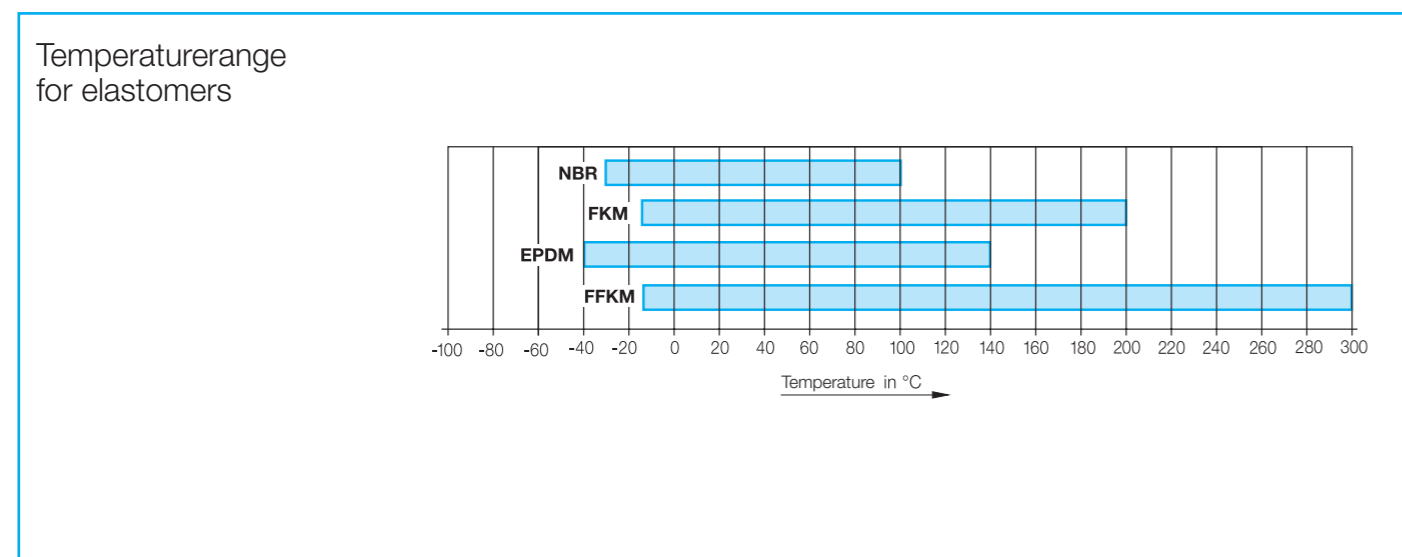
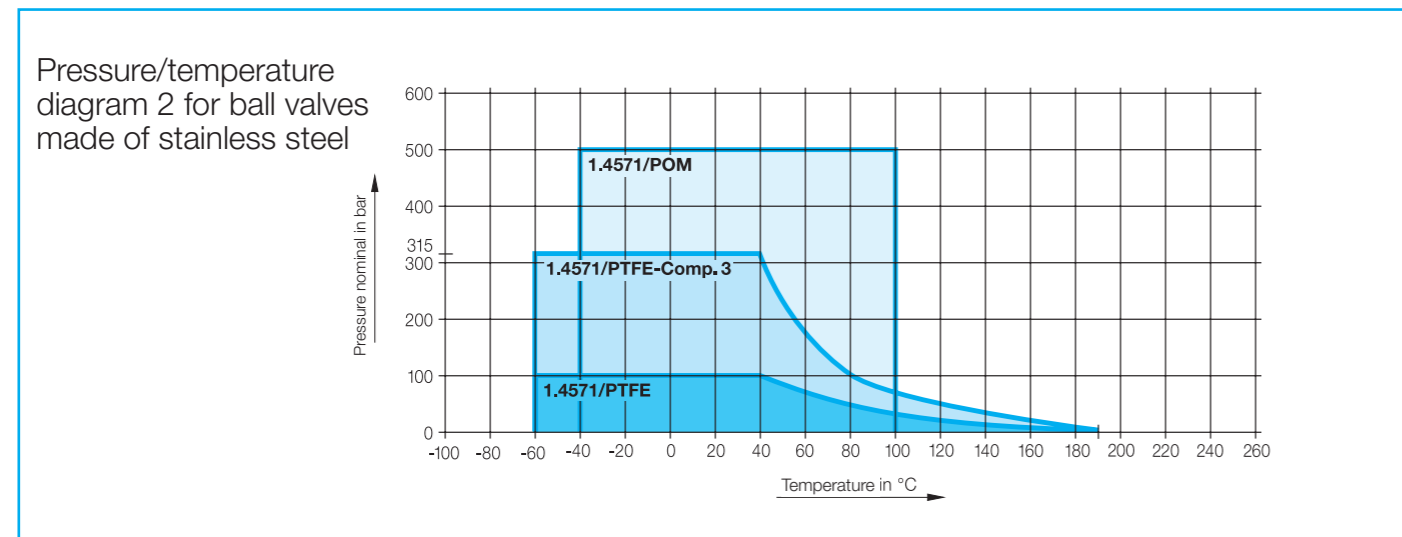
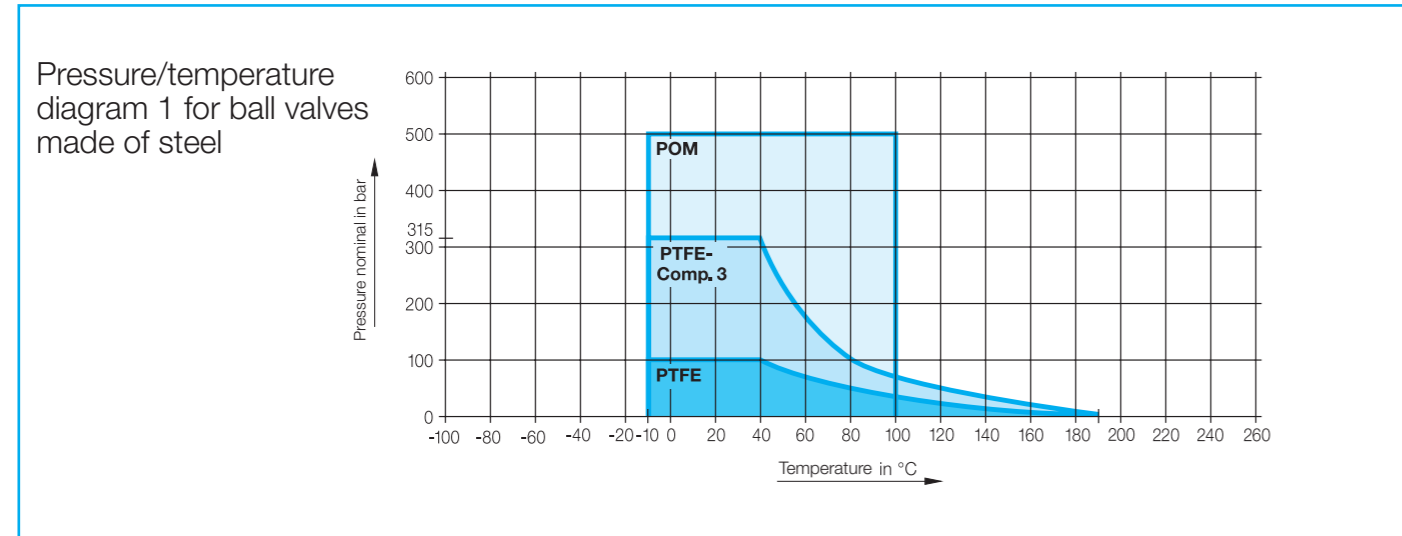


Ball valves size selection

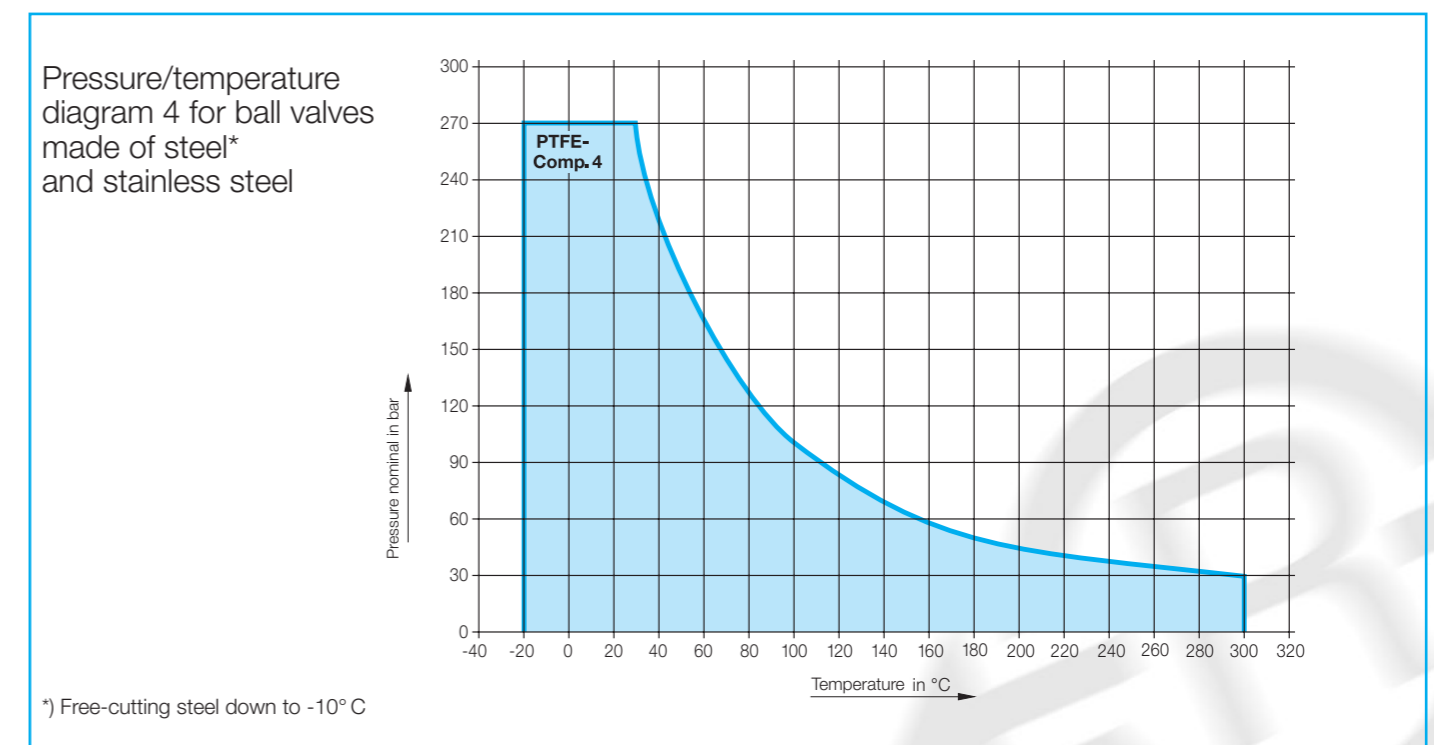
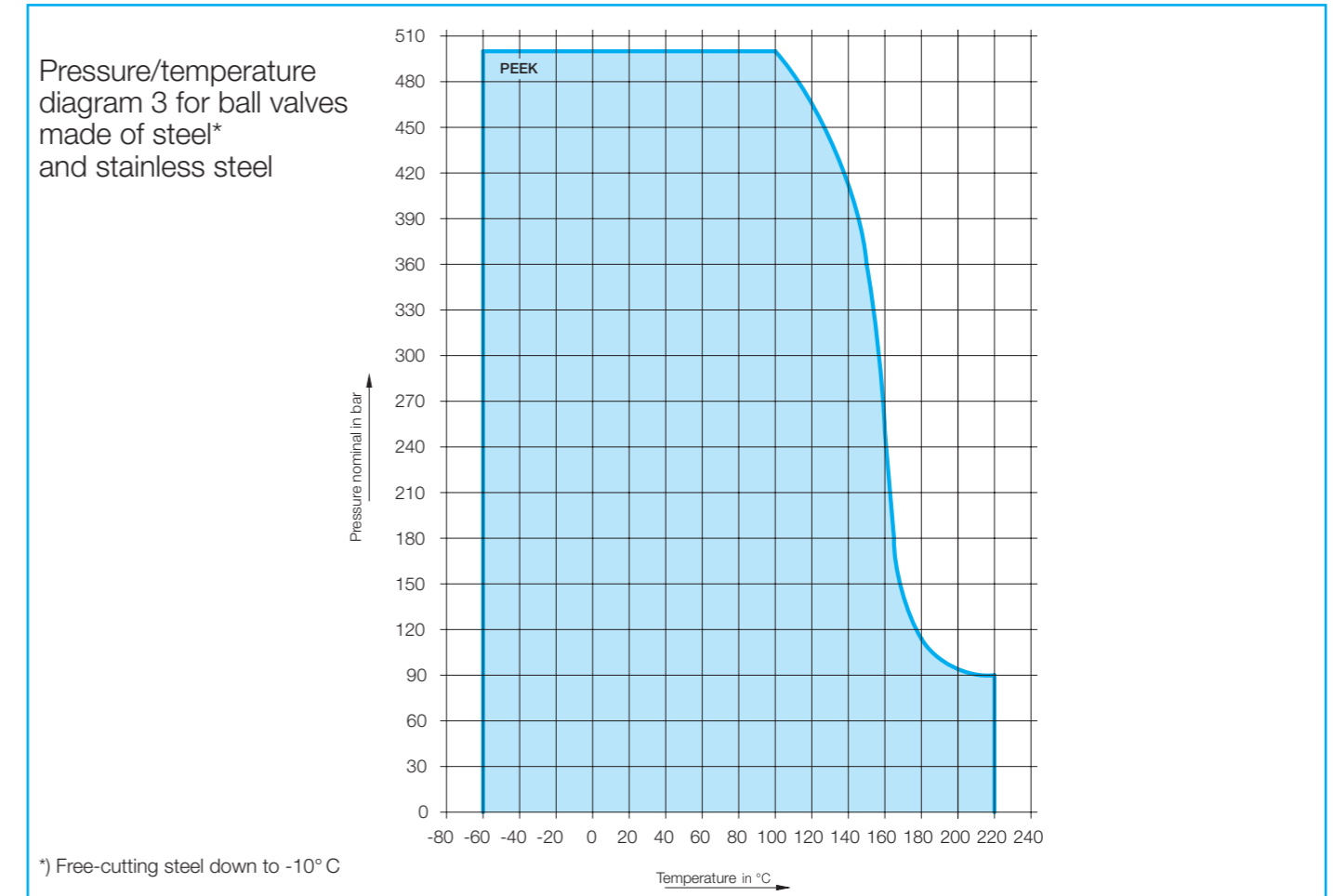


Pressure/temperature diagrams

Please observe max. pressure of ball valves!

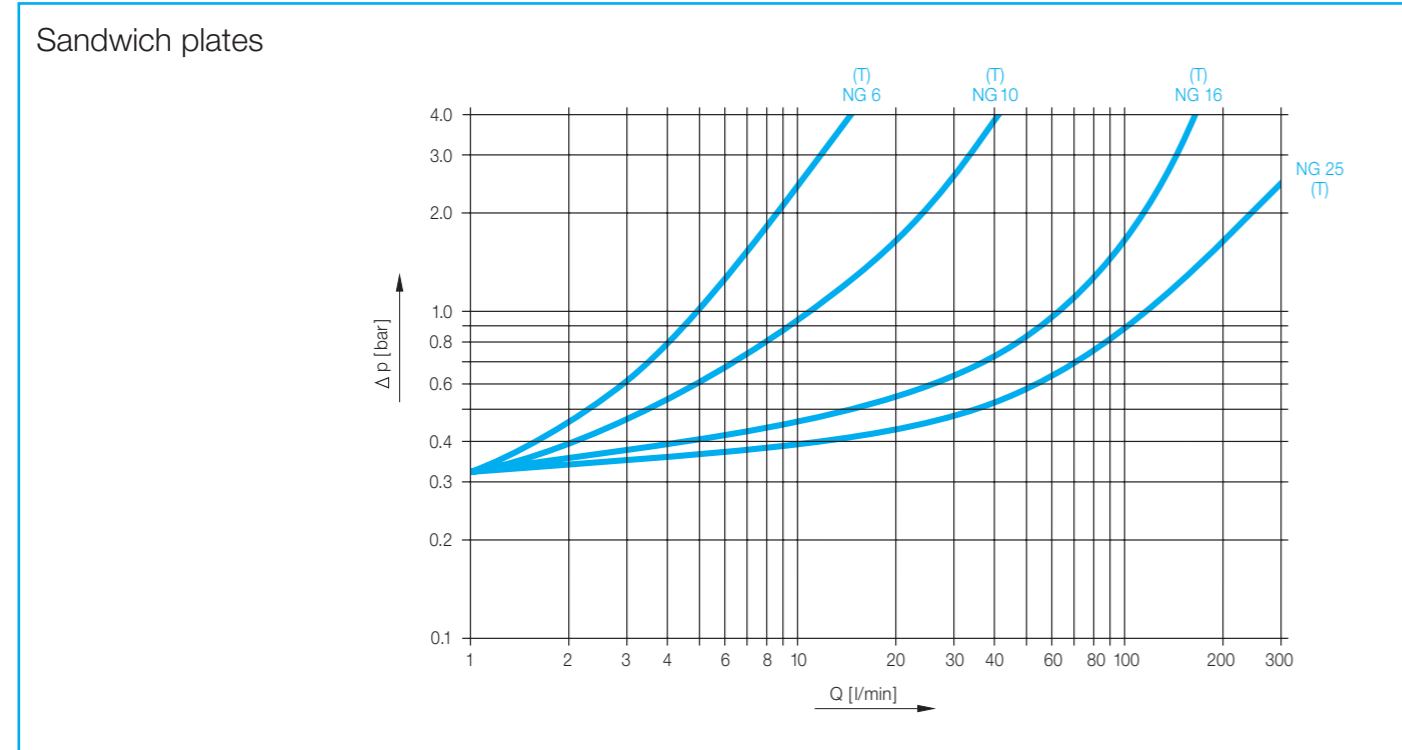


Please observe max. pressure of ball valves!

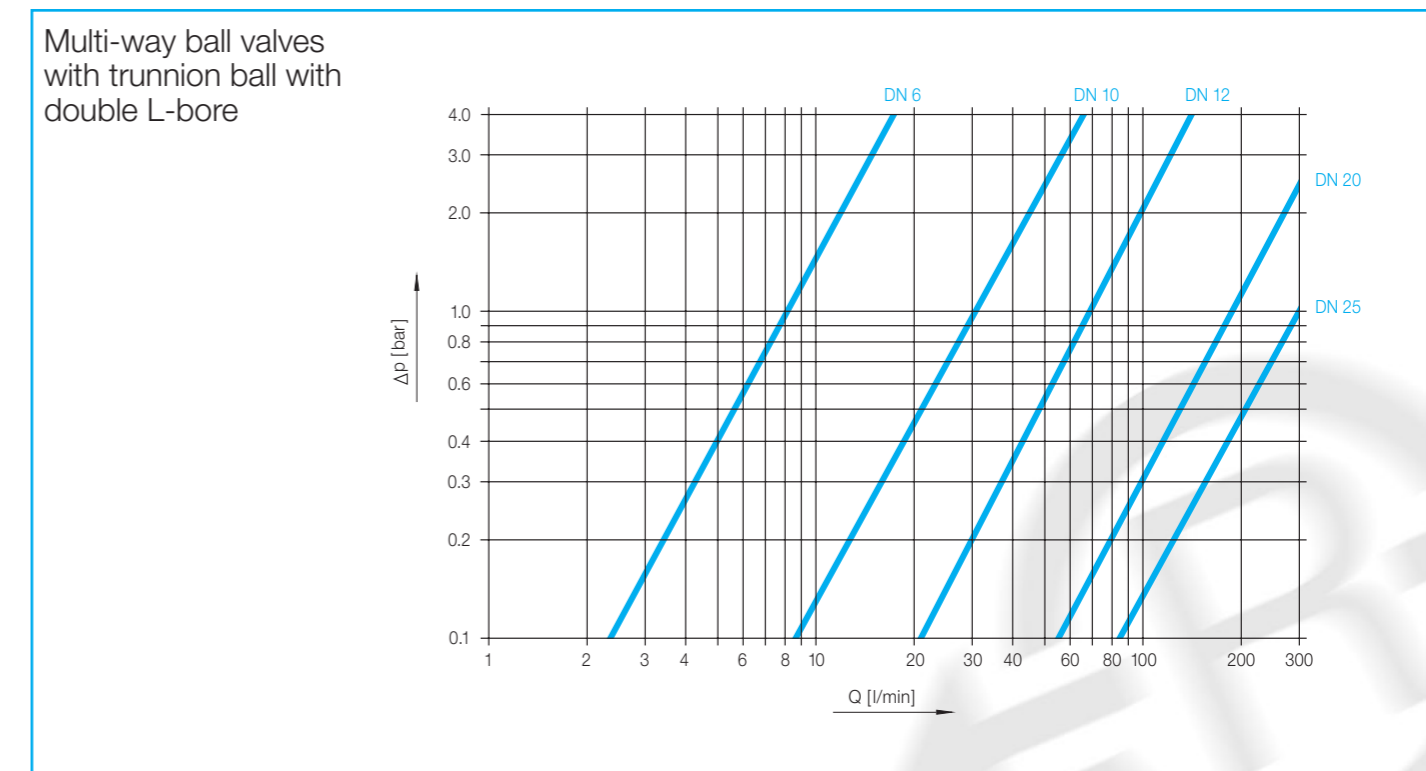
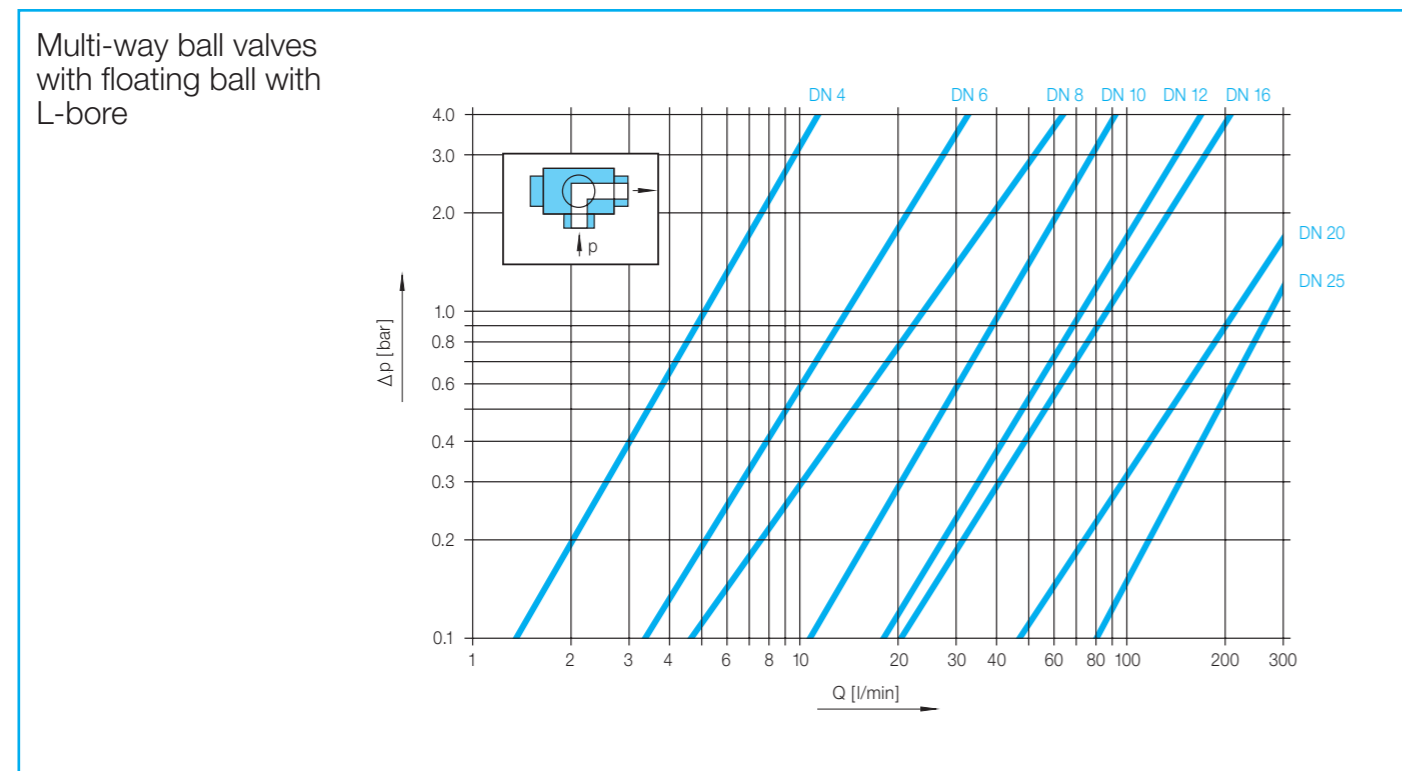
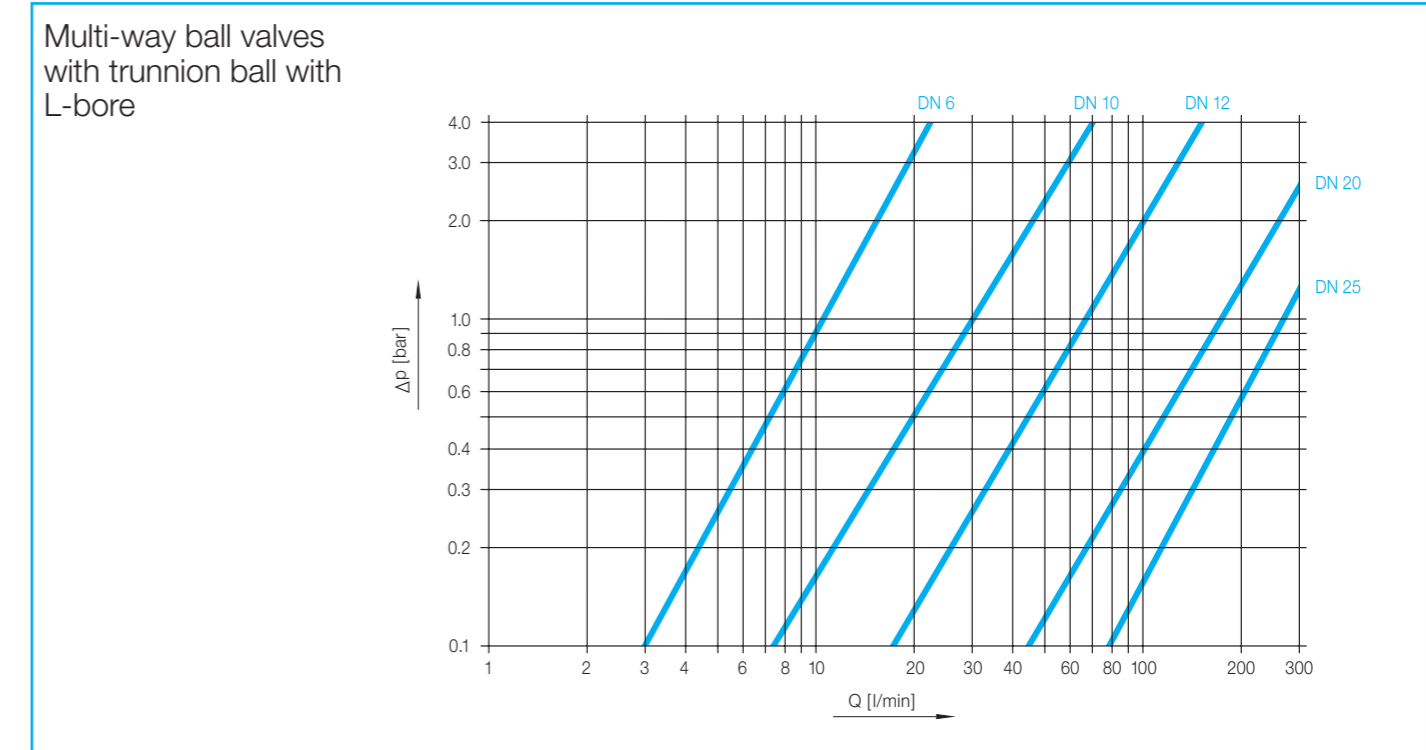


Δp -characteristics

Test medium : hydraulic oil
 Viscosity : 33 mm²/s (cSt)



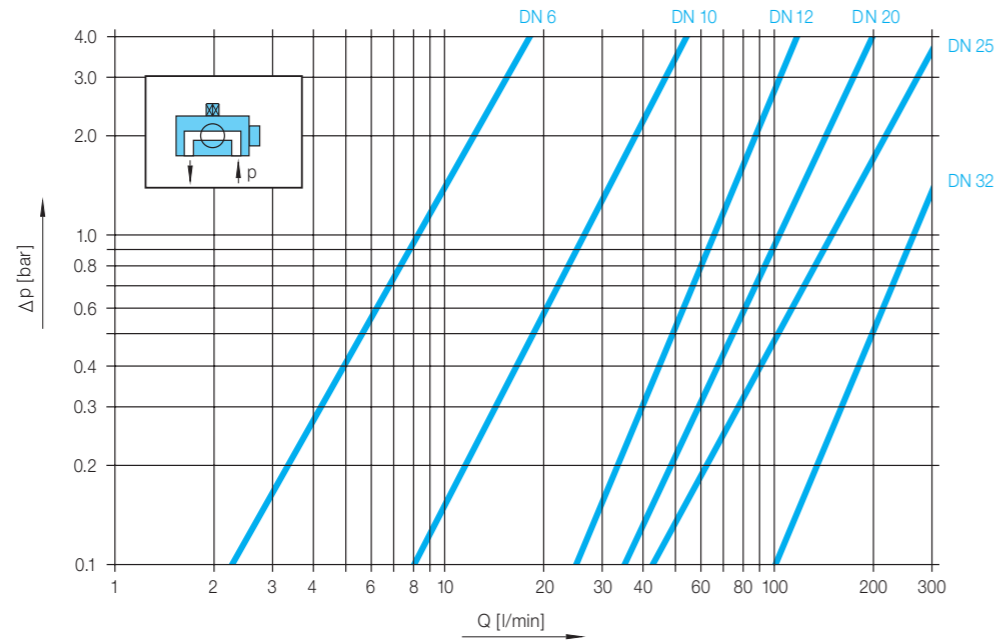
Test medium : hydraulic oil
 Viscosity : 33 mm²/s (cSt)



Δp-characteristics

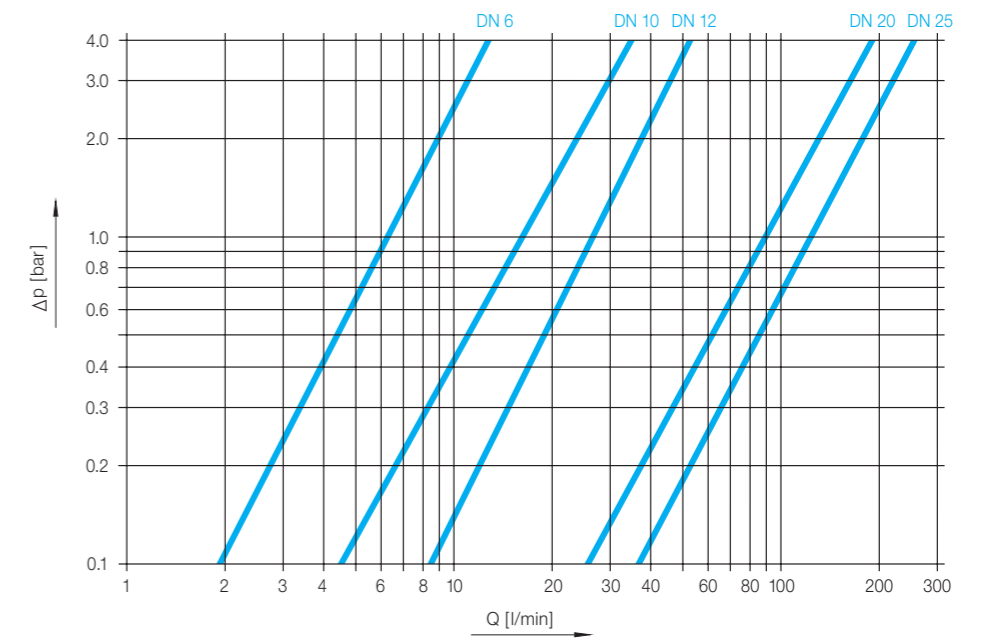
Test medium : hydraulic oil
 Viscosity : 33 mm²/s (cSt)

2-way ball valves for manifold mounting

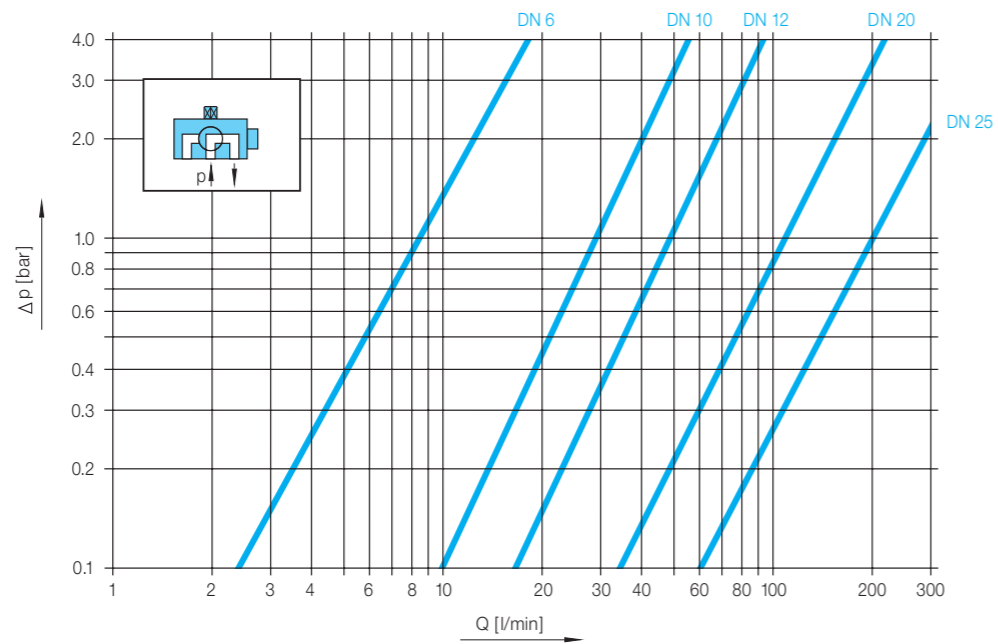


Test medium : hydraulic oil
 Viscosity : 33 mm²/s (cSt)

Multi-way ball valves with trunnion ball for manifold mounting with L-bore



Multi-way ball valves with floating ball for manifold mounting with L-bore



Multi-way ball valves with trunnion ball for manifold mounting with double L-bore

