KTM SERIES NB / MB THREE-WAY BALL VALVES

2-SEATS (L-PORT) AND 4-SEATS (L AND T-PORT)

A single KTM 3-way ball valve replaces several 2-way valves, saving valuable space and simplifying piping

GENERAL APPLICATION

Diverting or mixing fluids.

TECHNICAL DATA

2 seats (L-port)

Model:	NB Series
Full bore:	DN 40 - 200 (NPS 1½ - 8)
Reduced bore:	DN 125 - 250 (NPS 5 - 10)
Pressure rating:	ASME Class 150, 300 JIS 10K, 20K
Temperature:	-29°C - 270°C (-20°F - 518°F) (Option: up to 500°C/932°F)

4 seats (L and T-port)

Model:	MB Series
Full bore:	DN 15 - 200 (NPS ½ - 8)
Reduced bore:	DN 125 - 200 (NPS 5 - 8)
Pressure rating:	ASME Class 150, 300 JIS 10K, 20K
Temperature:	-29°C to 150°C (-20°F - 302°F)

FEATURES

- Positive alignment of body.
- Blow-out proof stem for safety.
- Sphericity tolerance of the ball is unsurpassed.
- Multiple layers of adjustable PTFE chevron packing rings for standard model enable excellent fugitive emission control.
- Positive position indication.
- Locking device capable.
- Heavy duty body construction.
- Machined ISO 5211 top mounting flange.
- Live load springs keep constant force on stem-seal packing, ensuring seal integrity and extended valve life.
- Dual shaft bearings for high cycle life operation.
- Higher C_v values and less cost for diverting which can be normally done with multiple installation of valves.

2 seats feature

- OM2 compatible, co-polymer E-seat as standard.
- Machined firesafe lip for metal touch to ball in case of fire. It also eliminates possibility of seat deformation.
- Lower operating torque, easing operation and reducing actuator cost.

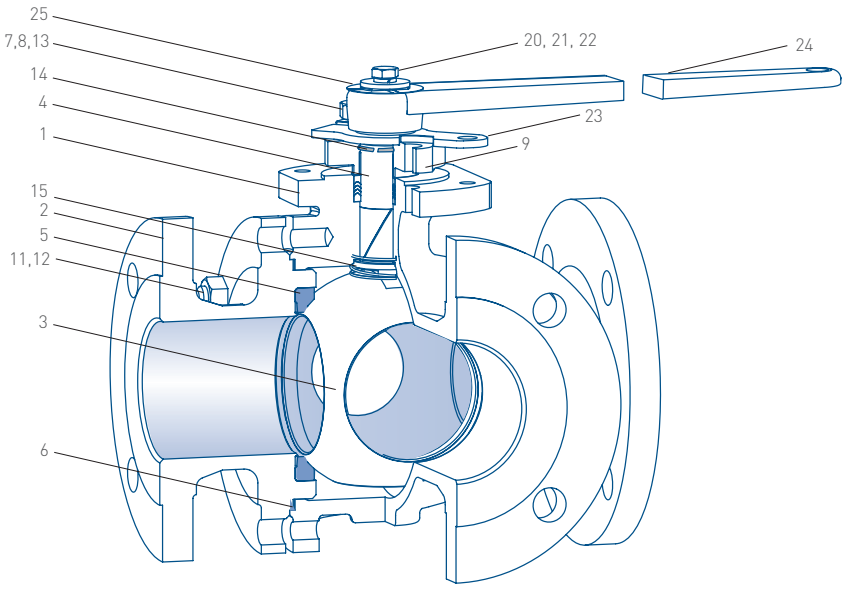
4 seats feature

- Equipped with 4 seats so that each port can be used as an inlet.
- Available with L-port and T-port for variety of applications.
- E-seat as standard for MB11 and MB21.

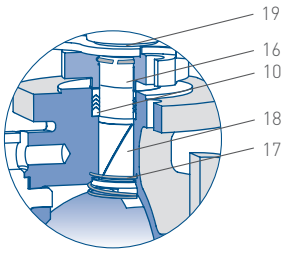
KTM SERIES NB / MB THREE-WAY BALL VALVES

2-SEATS (L-PORT) AND 4-SEATS (L AND T-PORT)

2-SEATS (L-PORT) NB SERIES - FULL BORE / NB SERIES - REDUCED BORE



STEM DETAIL



Note: the illustration shows body construction of 3-way ball valve, Model NB11 in DN 80 (NPS 3)

PARTS LIST

No.	Description	Material
1	Body	CF8M, CF8, or WCB
2	Body cap	CF8M, CF8, or WCB
3	Ball	CF8M or CF8
4	Shaft	316 S/S or 304 S/S
5	Seat	E-seat as standard (T or G seat for options)
6	Gasket	R-PTFE
7	Gland bolt	A193 (G) B8
8	Washer	316 S/S
9	Gland flange	CF8
10	Gland packing	PTFE
11	Stud	A193 (G) B8 or A193 (G) B7
12	Nut	A194 (G) 8 or A194 (G) 2H
13	Live loading spring	304 S/S
14	Anti-static spring	316L S/S
15	Anti-static spring	316L S/S
16	Gland bearing	PTFE
17	Thrust bearing	PTFE
18	Shaft bearing	R-PTFE
19	Snap ring	304 SS
20	Spring washer	304 S/S
21	Bolt	304 S/S
22	Washer	304 S/S
23	Stopper	304 S/S
24	Handle	Carbon steel
25	Indicator	304 S/S

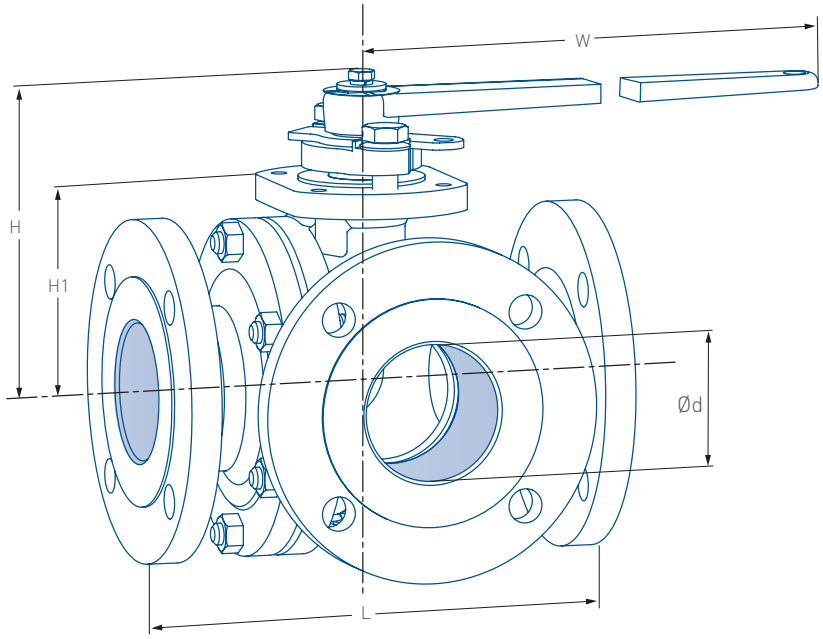
OPTIONS

- NACE MR-01-75
- Gratite seat for high temp. service (NB Series, 2 seats)
- Extension bonnet for low temp. service (NB Series, 2 seats)
- CE Marking PED 97 / 23 / EC
- Special tests
  - X-ray (RT)
  - Liquid penetrant (PT)
  - Positive Material Identification (PMI)

KTM SERIES NB / MB THREE-WAY BALL VALVES

2-SEATS (L-PORT) AND 4-SEATS (L AND T-PORT) - METRIC

2-SEATS (L-PORT) NB SERIES - FULL BORE / NB SERIES - REDUCED BORE



ASME CLASS 150 / JIS 10K DIMENSIONS - NB11 AND NB21

	Full bore - NB11					Reduced bore - NB21					
DN	**Ød**	**L**	**H**	**W**	**H1**	**Ød**	**Ødo**	**L**	**H**	**W**	**H1**
40	38	210	103	230	69	-	-	-	-	-	-
50	51	220	113	230	79	-	-	-	-	-	-
65	64	250	155	400	104	-	-	-	-	-	-
80	76	260	164	400	113	-	-	-	-	-	-
100	102	330	189	715	138	-	-	-	-	-	-
125	127	370	311	1050	168	102	127	370	189	685	138
150	152	430	331	1050	188	127	152	430	311	1050	168
200	203	540	414	1510	248	152	200	540	331	1050	188
250	-	-	-	-	-	203	251	670	414	1410	248

ASME CLASS 300/ JIS 20K DIMENSIONS - NB12 AND NB22

	Full bore - NB12					Reduced bore - NB22					
DN	**Ød**	**L**	**H**	**W**	**H1**	**Ød**	**Ødo**	**L**	**H**	**W**	**H1**
40	38	220	103	230	69	-	-	-	-	-	-
50	51	240	113	230	79	-	-	-	-	-	-
65	64	270	155	400	104	-	-	-	-	-	-
80	76	290	164	400	113	-	-	-	-	-	-
100	102	350	189	715	138	-	-	-	-	-	-
125	127	410	311	1050	168	102	127	410	189	685	138
150	152	460	331	1050	188	127	152	460	311	1050	168
200	203	570	414	1510	248	152	200	570	331	1050	188
250	-	-	-	-	-	203	251	720	414	1410	248

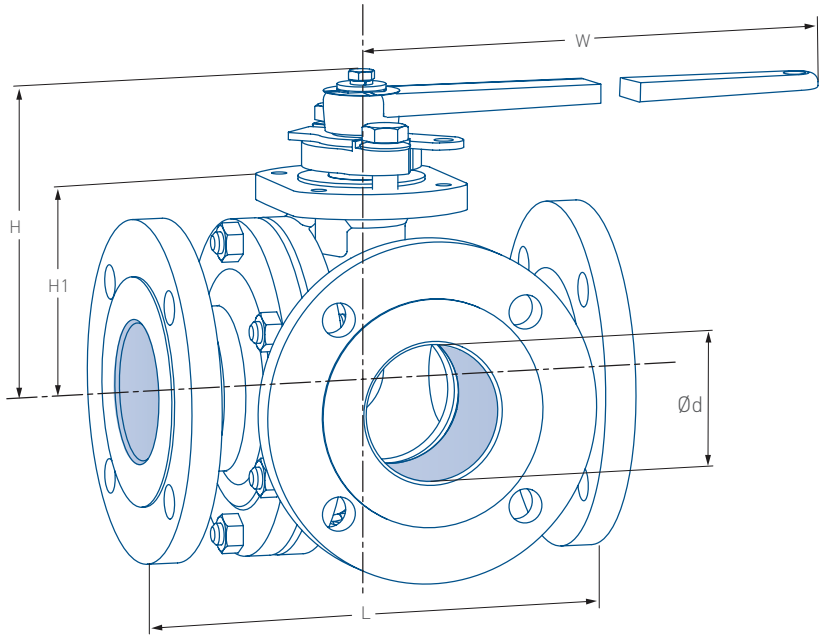
NOTE

Ødo = bore opening diameter on reduced bore valves

KTM SERIES NB / MB THREE-WAY BALL VALVES

2-SEATS (L-PORT) AND 4-SEATS (L AND T-PORT) - IMPERIAL

2-SEATS (L-PORT) NB SERIES - FULL BORE / NB SERIES - REDUCED BORE



ASME CLASS 150 / JIS 10K DIMENSIONS - NB11 AND NB21

	Full bore - NB11					Reduced bore - NB21					
NPS	**Ød**	**L**	**H**	**W**	**H1**	**Ød**	**Ødo**	**L**	**H**	**W**	**H1**
1½	1.50	8.27	4.04	9.06	2.72	-	-	-	-	-	-
2	2.00	8.66	4.43	9.06	3.11	-	-	-	-	-	-
2½	2.52	9.84	6.08	15.75	4.09	-	-	-	-	-	-
3	3.00	10.24	6.44	15.75	4.45	-	-	-	-	-	-
4	4.02	12.99	7.44	26.97	5.43	-	-	-	-	-	-
5	5.00	14.57	12.22	41.34	6.61	4.02	5.00	14.57	7.44	26.97	5.43
6	5.98	16.93	13.00	41.34	7.40	5.00	5.98	16.93	12.22	41.34	6.61
8	8.00	21.26	16.30	55.51	9.76	5.98	7.87	21.26	13.00	41.34	7.40
10	-	-	-	-	-	8.00	9.88	26.38	16.30	55.51	9.76

ASME CLASS 300/ JIS 20K DIMENSIONS - NB12 AND NB22

	Full bore - NB12					Reduced bore - NB22					
NPS	**Ød**	**L**	**H**	**W**	**H1**	**Ød**	**Ødo**	**L**	**H**	**W**	**H1**
1½	1.50	8.66	4.04	9.06	2.72	-	-	-	-	-	-
2	2.00	9.45	4.43	9.06	3.11	-	-	-	-	-	-
2½	2.52	10.63	6.08	15.75	4.09	-	-	-	-	-	-
3	3.00	11.42	6.44	15.75	4.45	-	-	-	-	-	-
4	4.02	13.78	7.44	26.97	5.43	-	-	-	-	-	-
5	5.00	16.14	12.22	41.34	6.61	4.02	5.00	16.14	7.44	26.97	5.43
6	5.98	18.11	13.00	41.34	7.40	5.00	5.98	18.11	12.22	41.34	6.61
8	8.00	22.44	16.30	55.51	9.76	5.98	7.87	22.44	13.00	41.34	7.40
10	-	-	-	-	-	8.00	9.88	28.35	16.30	55.51	9.76

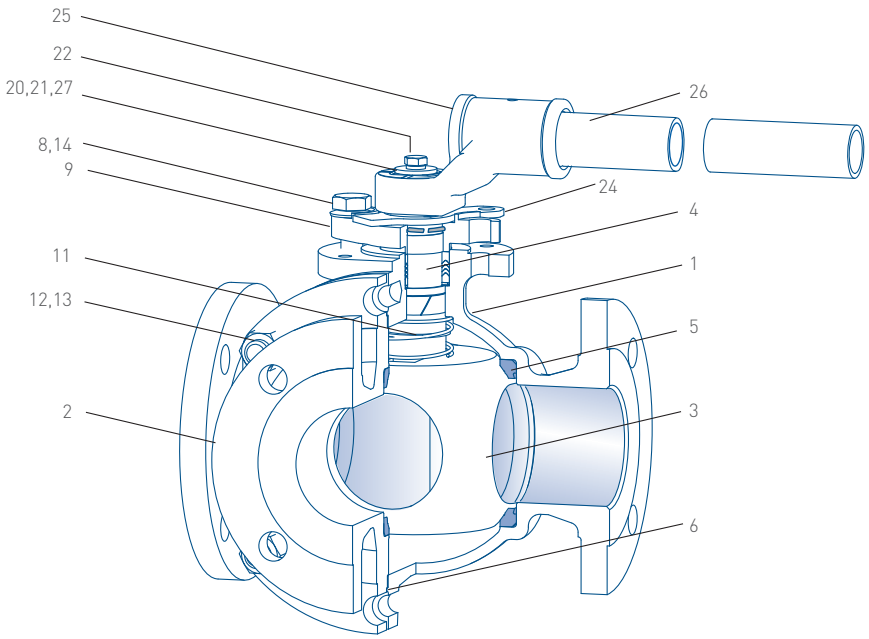
NOTE

Ødo = bore opening diameter on reduced bore valves

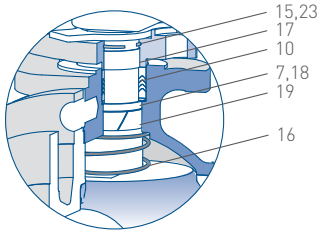
KTM SERIES NB / MB THREE-WAY BALL VALVES

2-SEATS (L-PORT) AND 4-SEATS (L AND T-PORT)

4-SEATS (L AND T-PORT) MB SERIES - FULL BORE / MB SERIES - REDUCED BORE



STEM DETAIL



Note: the illustration shows body construction of 3-way ball valve, Model MB11 in DN 80 (NPS 3)

PARTS LIST

No.	Description	Material
1	Body	CF8M, CF8, or WCB
2	Body cap	CF8M, CF8, or WCB
3	Ball	CF8M or CF8
4	Stem	316 S/S or 304 S/S
5	Seat	E-seat as standard (G-seat an option)
6	Gasket	PTFE
7	Thrust washer	316 S/S
8	Gland bolt	A193 (G) B8
9	Gland flange	CF8
10	Gland packing	PTFE
11	Snap ring	304 S/S
12	Stud	A193 (G) B8 or A193 (G) B7
13	Nut	A194 (G) 8 or A194 (G) 2H
14	Live loading spring	304 S/S
15	Anti-static spring	316L S/S
16	Anti-static spring	316L S/S
17	Gland bearing	PTFE
18	Thrust bearing	PTFE
19	Shaft bearing	R-PTFE
20	Washer	304 S/S
21	Spring washer	304 S/S
22	Bolt	304 S/S
23	Snap ring	304 S/S
24	Stopper	304 S/S
25	Handle head	Carbon steel
26	Handle/pipe	Carbon steel
27	Indicator	304 S/S

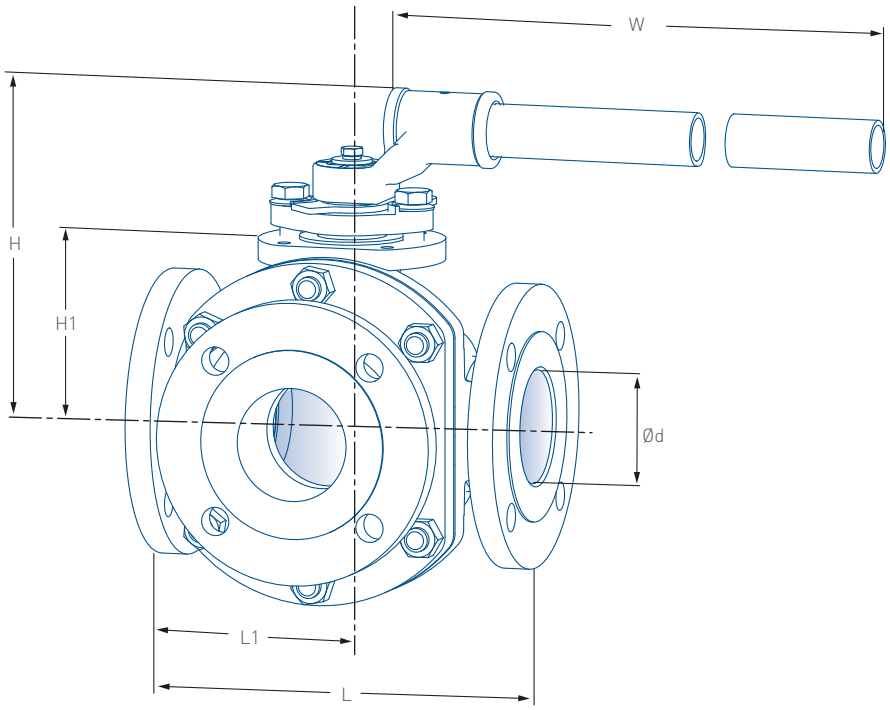
OPTIONS

- NACE MR-01-75
- CE Marking PED 97 / 23 / EC
- Special tests
  - X-ray (RT)
  - Liquid penetrant (PT)
  - Positive Material Identification (PMI)

NOTE

Please consult us for 4 seats ASME Class 300 valves (MB12 and MB22)

4 - SEATS (L AND T - PORT) MB SERIES - FULL BORE / MB SERIES - REDUCED BORE



ASME CLASS 150 / JIS 10K DIMENSIONS - MB11 AND MB21

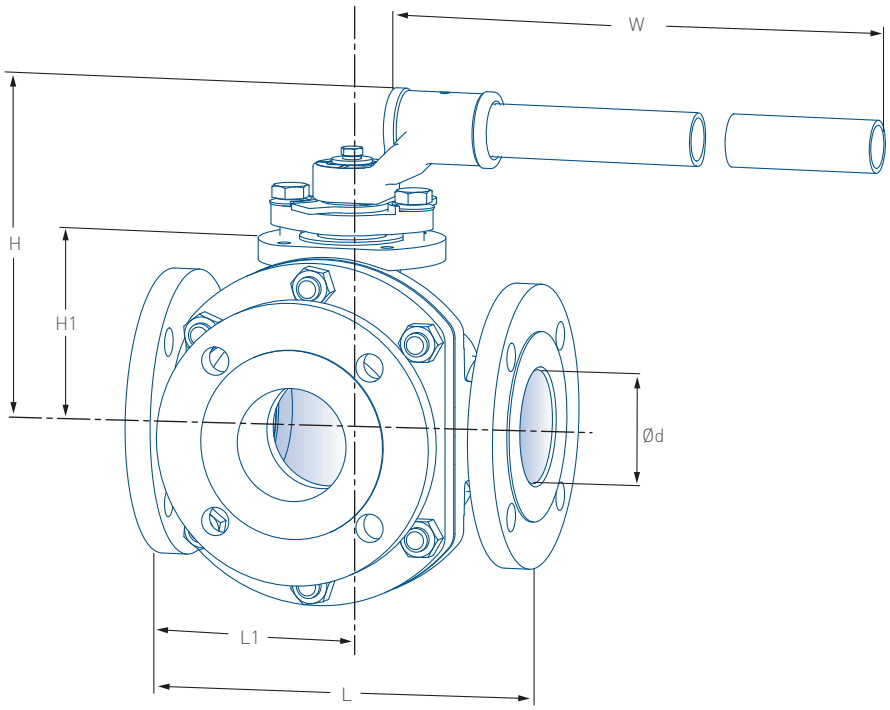
	Full bore - MB11						Reduced bore - MB21						
DN	**Ød**	**L**	**L1**	**H**	**W**	**H1**	**Ød**	**Ødo**	**L**	**L1**	**H**	**W**	**H1**
15	13	140	25	94	160	46	-	-	-	-	-	-	-
20	19	150	30	108	230	52	-	-	-	-	-	-	-
25	25	160	34	110	230	55	-	-	-	-	-	-	-
40	38	210	51	158	400	97	-	-	-	-	-	-	-
50	51	220	63	164	400	103	-	-	-	-	-	-	-
65	64	250	74	215	715	113	-	-	-	-	-	-	-
80	76	260	87	224	715	122	-	-	-	-	-	-	-
100	102	330	106	304	1050	161	-	-	-	-	-	-	-
125	127	430	151	327	1050	184	102	127	370	108	304	1050	161
150	152	510	167	314	-	223	127	152	430	151	327	1050	184
200	203	580	211	400	-	282	152	203	500	167	-	-	223

NOTE

Ødo = bore opening diameter on reduced bore valves

Please consult us for 4 seats ASME Class 300 valves (MB12 and MB22)

4 - SEATS (L AND T - PORT) MB11 FULL BORE / MB21 REDUCED BORE



ASME CLASS 150 / JIS 10K DIMENSIONS - MB11 AND MB21

	Full bore - MB11						Reduced bore - MB21						
NPS	**Ød**	**L**	**L1**	**H**	**W**	**H1**	**Ød**	**Ødo**	**L**	**L1**	**H**	**W**	**H1**
½	0.51	5.51	0.98	3.70	6.30	1.81	-	-	-	-	-	-	-
¾	0.75	5.91	1.18	4.23	9.06	2.05	-	-	-	-	-	-	-
1	0.98	6.30	1.34	4.33	9.06	2.15	-	-	-	-	-	-	-
1½	1.50	8.27	2.01	6.20	15.75	3.82	-	-	-	-	-	-	-
2	2.01	8.66	2.46	6.44	15.75	4.06	-	-	-	-	-	-	-
2½	2.52	9.84	2.91	8.46	26.97	4.45	-	-	-	-	-	-	-
3	3.00	10.24	3.43	8.82	26.97	4.78	-	-	-	-	-	-	-
4	4.02	13.00	4.17	11.97	41.34	6.34	-	-	-	-	-	-	-
5	5.00	16.93	5.94	12.85	41.34	7.24	4.02	5.00	14.57	4.25	11.97	41.34	6.34
6	5.98	20.08	6.57	12.36	-	8.78	5.00	5.98	16.93	5.94	12.87	41.34	7.24
8	8.00	22.83	8.31	15.75	-	11.08	5.98	8.00	19.69	6.57	-	-	8.78

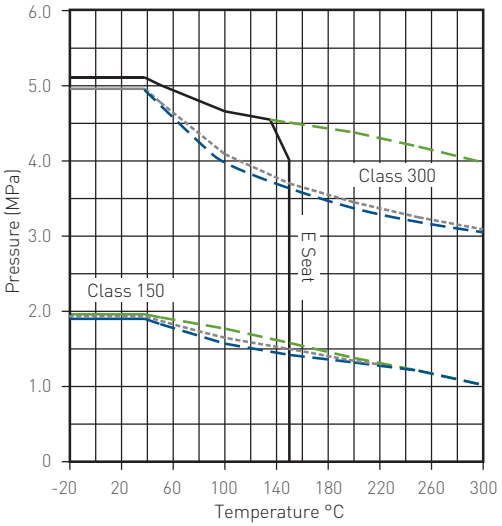
NOTE

Ødo = bore opening diameter on reduced bore valves

Please consult us for 4 seats ASME Class 300 valves (MB12 and MB22)

PRESSURE-TEMPERATURE RATINGS

DN 15, 20 FOR FULL BORE



LEGEND:

Dashed lines indicate body ratings.

- WCB
- CF8M
- CF8
- 4-seats - Upper limit 150°C (302°F)

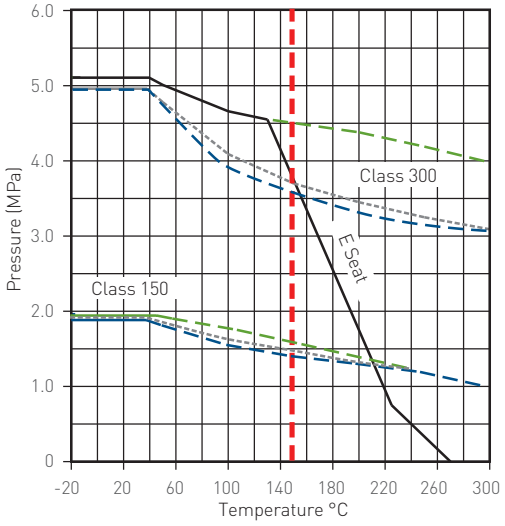
NOTE

E seat is PTFE/PFA copolymer seat

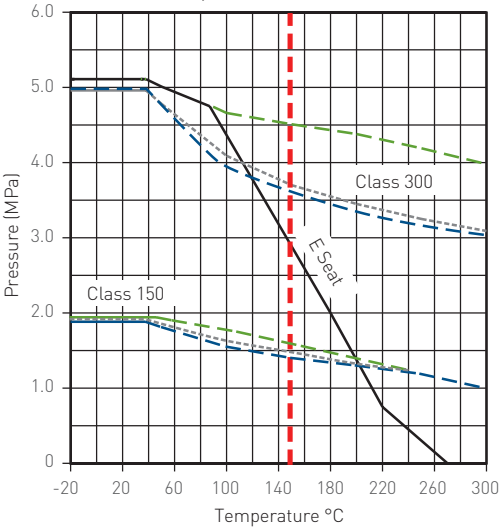
Seat ratings for Gratite seated valves are identical to ASME body ratings

Please consult us for 4 seats ASME Class 300 valves (MB12 and MB22)

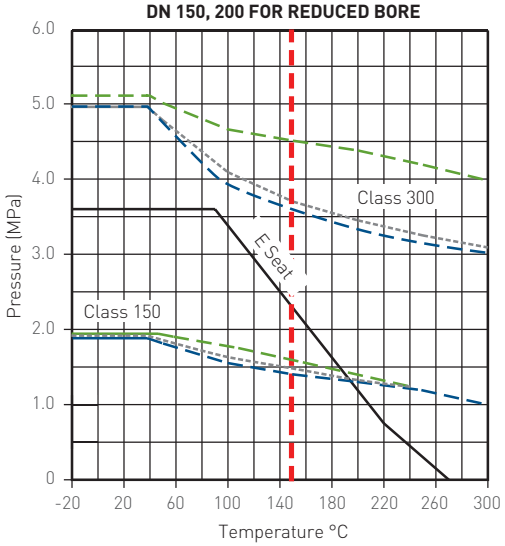
DN 25 - 60 FOR FULL BORE
DN 80 FOR REDUCED BORE



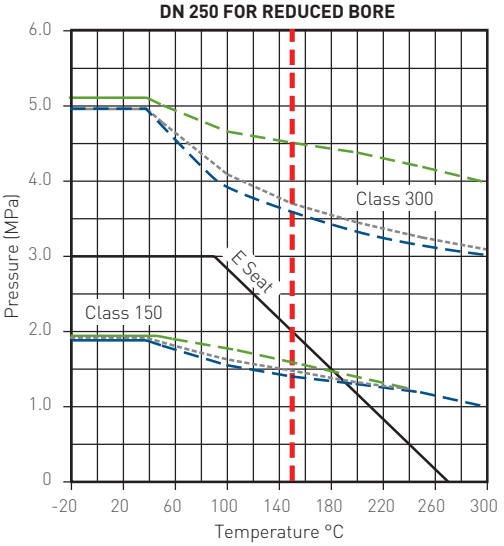
DN 80, 100 FOR FULL BORE
DN 100,125 FOR REDUCED BORE



DN 125, 150 FOR FULL BORE
DN 150, 200 FOR REDUCED BORE

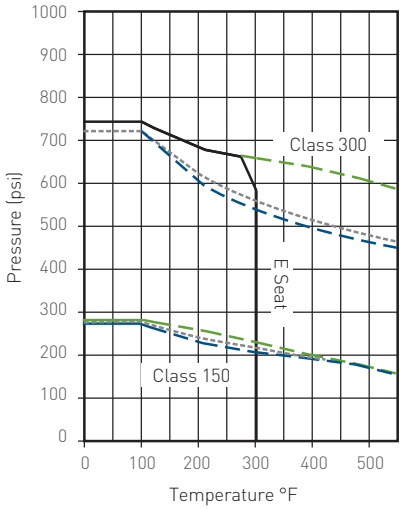


DN 200 FOR FULL BORE
DN 250 FOR REDUCED BORE



PRESSURE-TEMPERATURE RATINGS

NPS ½, ¾



LEGEND:

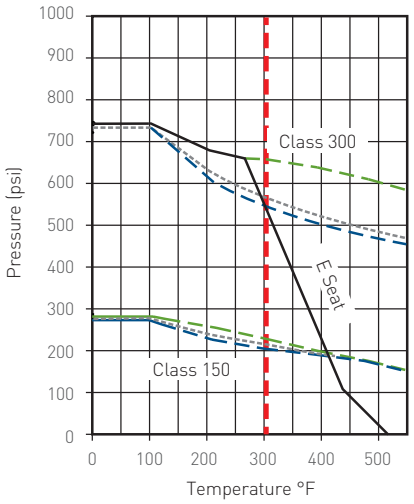
Dashed lines indicate body ratings.

- WCB
- CF8M
- CF8
- 4-seats - Upper limit 302°F

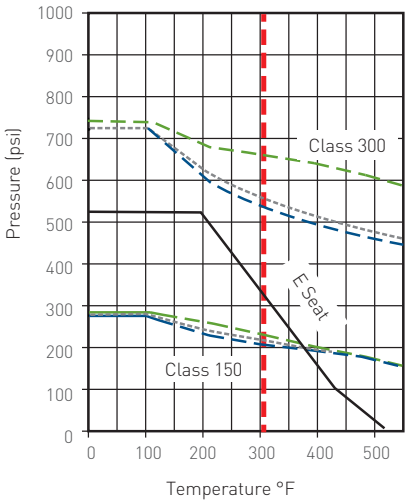
NOTE

E seat is PTFE/PFA copolymer seat
Seat ratings for Gratite seated valves are identical to ASME body ratings
Please consult us for 4 seats ASME Class 300 valves (MB12 and MB22)

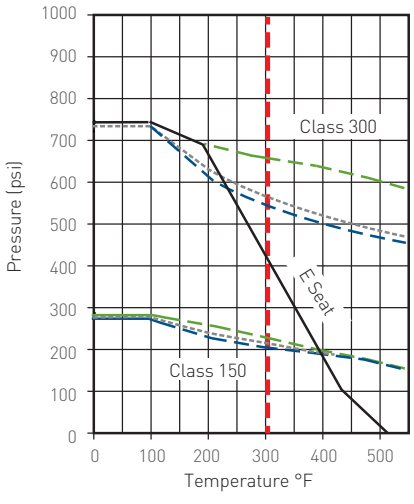
NPS 1 - 2½FOR FULL BORE
NPS 3 FOR REDUCED BORE



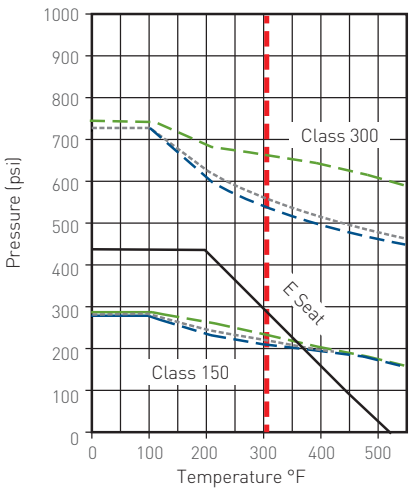
NPS 3, 4 FOR FULL BORE
NPS 4, 5 FOR REDUCED BORE



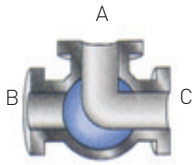
NPS 5, 6 FOR FULL BORE
NPS 6, 8 FOR REDUCED BORE



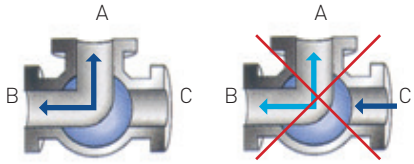
NPS 8 FOR FULL BORE
NPS 10 FOR REDUCED BORE



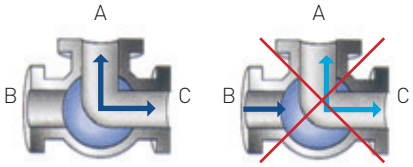
OPERATION FORM L-PORT (NB11, NB12, NB21, NB22 AND MB11, MB21)



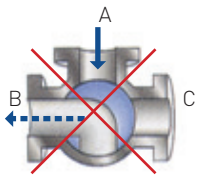
- A, B, C indicate the three supply ports.
- Quarter turn and L-port construction allow for the following two flow patterns. (Pattern 1 and Pattern 2)



PATTERN 1



PATTERN 2



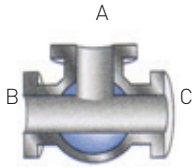
PATTERN 3

- Pattern 1 and Pattern 2 are standard flow directions for L-port valve.
- Arrows → indicate pressure higher than 0 MPa. For vacuum use please inquire separately.
- Straight flow from B to C and C to B is not possible. (The operation rotates 90°.)
- Crossed out ✕ forms cannot be used.
- Leakage occurs on the flow channel side if the pressure of arrow → is higher than the flow channel → side.

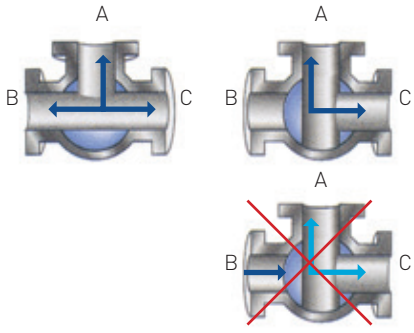
NOTES

1. As for 2-seats (NB), Shut-off function is not available at the center port (A) because the seat is not installed there. Please pay attention to the direction of the flow channel when using it. In Pattern 3, the fluid pass through both flow channel A to B and B to A.
2. Please consult us for 4-seats ASME Class 300 and JIS 20K valves (MB12/MB22)

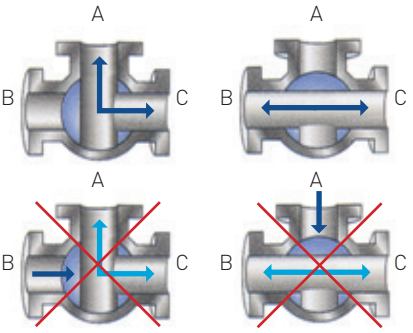
OPERATION FORM T-PORT (MB11, MB21)



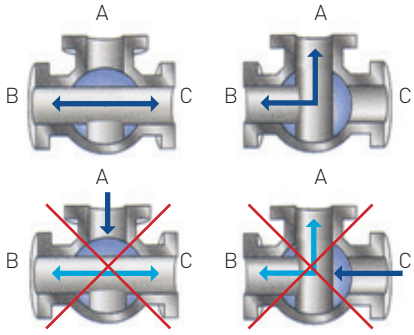
- A, B, C indicate the three supply ports.
- T-port available for below four patterns.



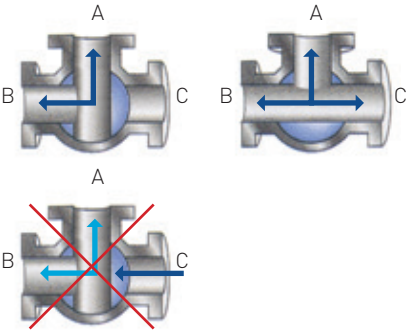
PATTERN 1



PATTERN 2



PATTERN 3



PATTERN 4

- Pattern 1 and Pattern 2 are standard flow directions for a 4-seat (T-port) valve.
- Arrows → indicate pressure higher than 0 MPa. For vacuum use please inquire separately.
- Crossed out ✕ forms cannot be used.
- Leakage occurs on the flow channel side if the pressure of arrow → is higher than the flow channel → side.

NOTE

Please consult us for 4-seats ASME Class 300 and JIS 20K valves (MB12/MB22)