

Piston Valve

Description

Forbes Marshall Piston Valves, PSVAL, provide perfect tightness and durable stability on different media such as steam, superheated steam, heat transfer fluid, water and compressed air.

Sizes and Pipe Connection

- DN 15 / 20 / 25 / 32 / 40
Screwed BSPT / NPT, socket weld ends, flanged to class 150 / 300 / 600 available on special request
- DN 50 / 65 / 80 / 100 / 125 / 150 / 200 / 250
Flanged to class 150 / 300
- DN 50 / 65 / 80 / 100 / 125 / 150 / 200 / 250
Flanged to PN16 / PN25 / PN40

For higher sizes DN 250 and 300 contact Forbes Marshall

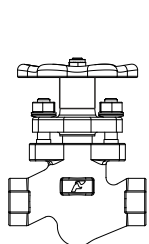
Limiting Conditions

For DN 15 / 20 / 25 / 32 / 40 Socket weld ends	
Maximum operating pressure	78 bar g
Maximum operating temperature	425 deg c
Maximum hydraulic test pressure	156 bar g (IBR requirement)

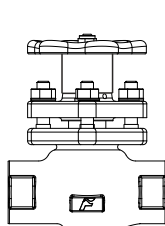
For DN 15 / 20 / 25 Screwed ends	
Maximum operating pressure	78 bar g
Maximum operating temperature	425 deg c
Maximum hydraulic test pressure	156 bar g (IBR requirement)

For DN 32 / 40 Screwed ends	
Maximum operating pressure	41.5 bar g
Maximum operating temperature	425 deg c
Maximum hydraulic test pressure	83 bar g (IBR requirement)

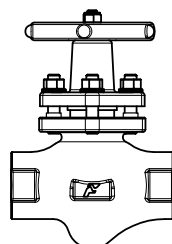
Body design conditions : DN 15/20/25/32/40 Class 600 Flanged ends	
Maximum allowable pressure	102 bar g @ 38 °C
Maximum operating pressure	78 bar g @ 295 °C
Maximum operating temperature	425 °C @ 57.5 bar g
Maximum hydraulic test pressure	156 bar g



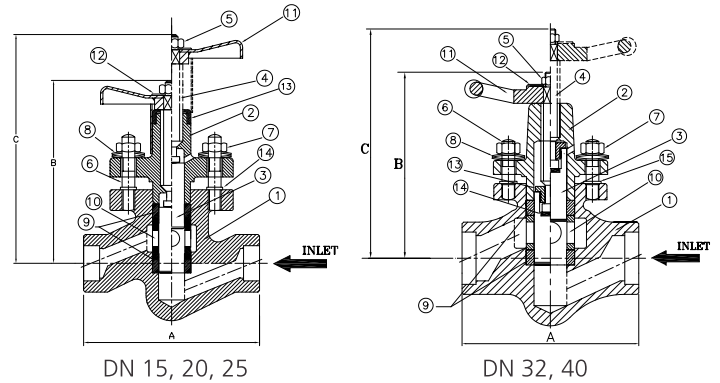
DN 15 / 20



DN 25



DN 32 / 40



Material: DN 15-40

Sr.No.	Description	Material	
1	Body	Forged Carbon Steel	ASTM A105N
2	Bonnet	Forged Carbon Steel	ASTM A105N
3	Piston	Stainless Steel	ASTM A 276 TYPE 304
4	Spindle	Stainless Steel	ASTM A 276 TYPE 410
5	Nyloc Nut	Carbon Steel	
6	Stud	Carbon Steel	ASTM A193 Gr. B7
7	Nut	Carbon Steel	ASTM A 194 Gr.2H
8	Belleville Washer	Spring Steel	50CrV4
9	Sealing stack	S.S. Reinforced Graphite	
10	Spacer	Stainless Steel	ASTM A 276 TYPE 410
11	*Handwheel	Sheet Metal / SG Iron	
12	Gap rings	Stainless Steel 410	

*Note : For DN 15-25 Handwheel - Sheet Metal
For DN32-40 Hand wheel-S.G. Iron

Additional material: DN 40

Sr.No.	Description	Material	
13	Split Nut	Brass	DIN En12164
14	Thrust Plate	Stainless Steel	ASTM A 275 TYPE 420

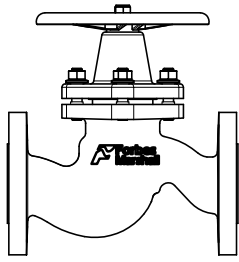
Dimensions (approx. in mm)

Size (DN)	A	B	C
15	110	118	146
20	110	118	146
25	126	133	165
32	165	175	215
40	165	175	215

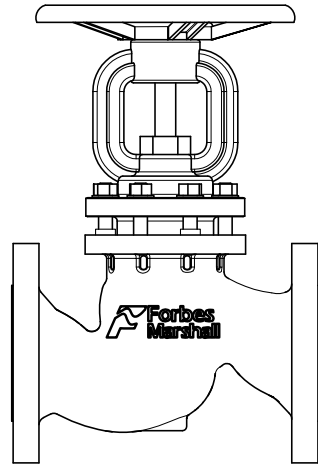
Flange Class

Size (DN)	A*			B	C
	Class 150	Class 300	Class 600		
15	252	265	265	118	146
20	252	265	265	118	146
25	260	278	278	133	165
32	305	317	320	175	215
40	305	317	320	175	215

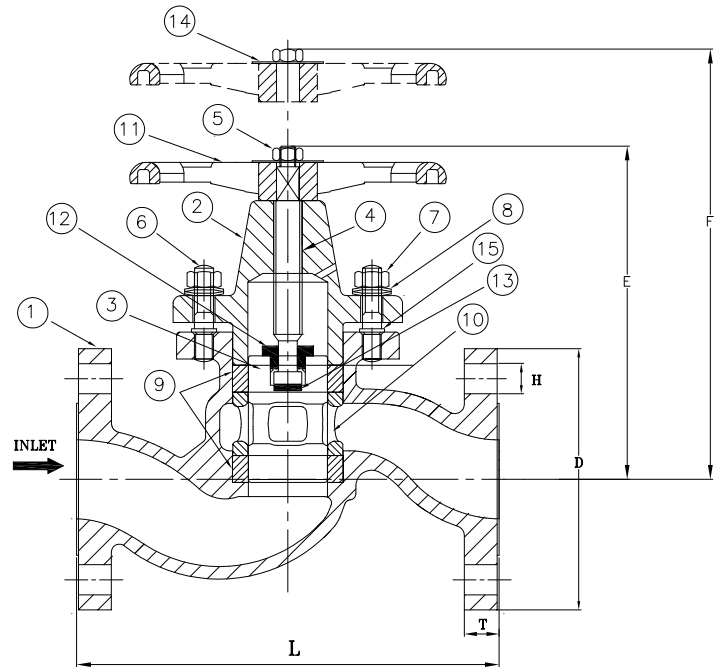
*Tol ±1mm



DN 50



DN 65 to 250



DN 50 Piston valve : always open /close valve fully
do not use valve key

Body design conditions : DN 50-200 PN 16 Flanged End	
Maximum allowable pressure	16 bar g at 38 deg C
Maximum operating pressure	16 bar g at 204 deg C
Maximum operating temperature	425 deg C at 9.1 bar g
Cold hydraulic test pressure	24 bar g

Body design conditions : DN 50-150 PN 25 Flanged End	
Maximum allowable pressure	25 bar g at 38 deg C
Maximum operating pressure	25 bar g at 226 deg C
Maximum operating temperature	425 deg C at 14 bar g
Cold hydraulic test pressure	38 bar g

Body design conditions : DN 50-200 PN 40 Flanged End	
Maximum allowable pressure	40 bar g at 38 deg C
Maximum operating pressure	39 bar g at 250 deg C
Maximum operating temperature	425 deg C at 22.8 bar g
Cold hydraulic test pressure	60 bar g

Body design conditions : DN 50/65/80/100/150/200/250 Class 150 Flanged ends	
Maximum allowable pressure	19.6 bar g at 38 deg C
Maximum operating pressure	14 bar g at 197 deg C
Maximum operating temperature	425 deg C at 5.5 bar g
Cold hydraulic test pressure	28 bar g (IBR requirement)

Body design conditions : Class 300 Flanged End	
Maximum allowable pressure	51 bar g at 38 deg C
Maximum operating pressure	41.5 bar g at 253 deg C
Maximum operating temperature	425 deg C at 28.8 bar g
Cold hydraulic test pressure	83 bar g (IBR requirement)

Material: DN 50

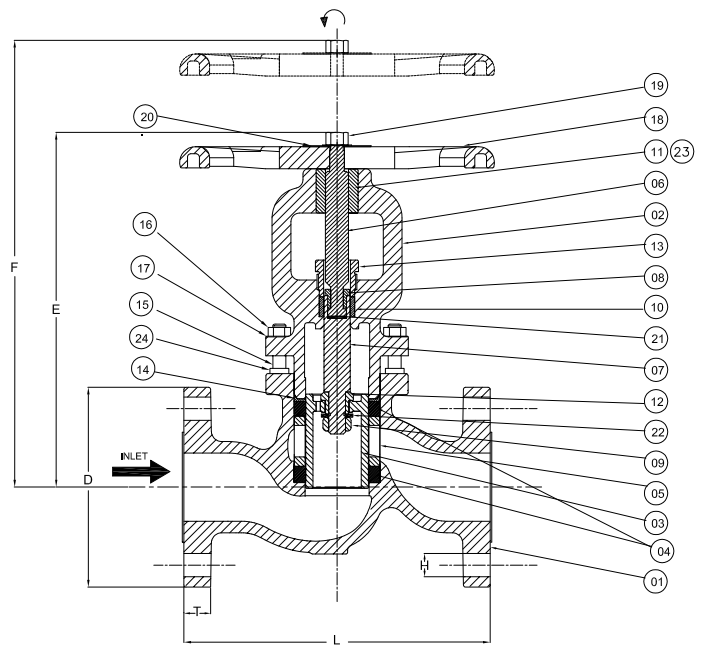
Sr.No.	Description	Material	
1	Body	Cast Steel	ASTM A 216 Gr.WCB
2	Bonnet	Cast Steel	ASTM A 216 Gr.WCB
3	Piston	Stainless Steel	ASTM A 276 TYPE 304
4	Spindle	Stainless Steel	ASTM A 276 TYPE 410
5	Nyloc Nut	Carbon Steel	
6	Stud	Carbon Steel	ASTM A193 Gr. B7
7	Nut	Carbon Steel	ASTM A 194 Gr.2H
8	Belleville Washer	Spring Steel	50CrV4
9	Sealing stack	S/S Reinforced Graphite	
10	Spacer	Stainless Steel	ASTM A 743 Gr.CA15
11	Handwheel	SG Iron	
12	Thrust Plate	Stainless Steel	ASTM A 276 TYPE 420
13	Name Plate	Stainless Steel	ASTM A 240 TYPE 304
14	Split Nut	Brass	DIN EN 12164
15	Gap Rings	Stainless Steel	SS 420

Dimensions (approx. in mm) : Size DN 50

ANSI Class	L	D	PCD	H	No. of Holes	T	E	F	Approx Wt
150	203	152	121	19	4	19	210	262	14.5 kg
200	267	165	127	19	8	22	210	262	17.5 kg
PN 16	230	165	125	18	4	18	210	262	14.5 kg
PN 40	230	165	125	18	4	20	210	262	17.5 kg

Material: DN 65-250

Sr.No.	Description	Material	
1	Body	Cast Steel	ASTM A 216 Gr.WCB
2	Bonnet	Cast Steel	ASTM A 216 Gr.WCB
3	Piston	Stainless Steel	ASTM A 351 CF8
4	Body sealing stack	S/S Reinforced Graphite	
5	Spacer	Stainless Steel	ASTM A 743 CA 15
6	Spindle	Stainless Steel	ASTM A 276 Type 410
7	Stem	Stainless Steel	ASTM A 276 Type 304
8	Split Nut	Brass	DIN EN 12164
9	LH Nut	Stainless Steel	ASTM A 276 Type 304
10	Gland Sealing Stack	S/S Reinforced Graphite	
11	Threaded Bush	Ph. Bronze	
12	Back Seat	Stainless Steel	ASTM A 276 Type 410
13	Gland Nut	Stainless Steel	ASTM A 194 Gr.2H
14	Bonnet Sealing Ring	Graphite	
15	Stud	Carbon Steel	ASTM A 193 Gr.B7
16	Nut	Carbon Steel	ASTM A 194 Gr.2H
17	Beleville Washer	Spring Steel	50CrV4
18	Handwheel	S.G. Iron	
19	Nyloc Nut	Carbon Steel	



DN 65-250 : always open / close valve fully
Do not use 'F' Key

20	Washer	Stainless Steel	ASTM A 240 TYPE 304
21	Name Plate	Stainless Steel	ASTM A 240 TYPE 304
22	Thrust Plate	Stainless Steel	ASTM A 276 TYPE 420
23	Gap Rings	Stainless Steel	SS420

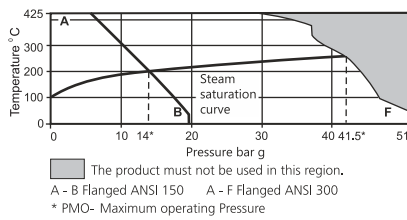
Dimensions (approx. in mm) : Size DN 65 to 250

Sizes (DN)	Pressure Class	L	D	PCD	H	NO. OF HOLES	T	E	F	Approx. Weight (Kg)
65	CLASS 300	292	191	149	22	8	25	335	400	31
65	CLASS 150	216	178	140	19	4	22	335	400	27
65	PN 16 / 25	290	185	145	18	8	18	335	400	27
65	PN40	290	185	145	18	8	22	335	400	31
80	CLASS 300	318	210	168	22	8	28	320	384	37
80	CLASS 150	241	191	152	19	4	24	320	384	31
80	PN 16 / 25	310	200	160	18	8	24	320	384	31
80	PN 40	310	200	168	18	8	20	320	479	37
100	CLASS 300	356	254	200	22	8	32	395	479	58
100	CLASS 150	292	229	191	19	8	24	395	479	47
100	PN 16 / 25	350	220	180	20	8	18	395	479	47
100	PN 40	350	235	190	24	8	22	395	479	58
125	CLASS 300	400	280	235	22	8	35	446	540	87
125	CLASS 150	356	254	216	22	8	24	446	540	70
125	PN 16 / 25	400	250	210	18	8	22	446	540	70
125	PN 40	400	270	220	26	8	26	446	540	87
150	CLASS 300	445	318	270	22	12	37	486	598	117
150	CLASS 150	406	279	241	22	8	26	486	598	90
150	PN 16 / 25	480	285	240	22	8	22	486	598	90
150	PN 40	480	300	250	26	8	28	486	598	117
200	CLASS 300	559	381	330	25	12	41	591	728	210
200	CLASS 150	495	343	298	22	8	28	591	728	164
200	PN 16 / 25	600	340	295	22	12	24	591	728	164
200	PN 40	600	375	320	30	12	34	591	728	210
250	CLASS 300	622	455	381	26	16	48	653	813	340
250	CLASS 150	622	405	362	25	12	31	653	813	300
*250	PN 16 / 25	730	405	355	26	12	26	653	813	340
*250	PN 40	730	450	385	33	12	38	653	813	370

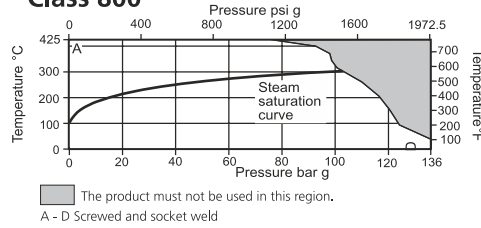
*For DN250 Class PN16 / 25 and PN40, please contact Forbes Marshall

Operating Range

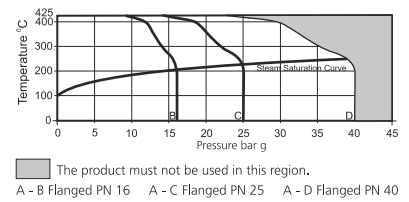
50-250 NB



Class 800



DIN PSVAL



How to Order

Example: DN 15 Piston Valve with socket weld ends.

Installation

The valve is designed for installation in a vertical or horizontal line with inlet as per the arrow direction. To open the valve turn hand wheel till it stops at the top and to close, turn hand wheel till it touches the bonnet. Do not use "F" key. If any leakage is observed during operation at the outlet, close valve fully and tighten opposite nuts equally half or one turn until leakage stops.

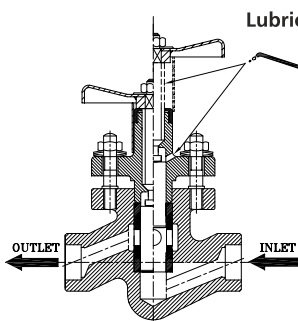
Safety Information

Pressure : Before attempting any maintenance of the valve, ensure that pressure is isolated and safely vented to atmosphere. Do not assume that the system is depressurized even when a pressure gauge indicates zero.

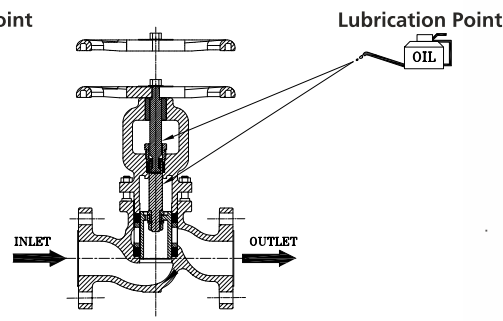
Maintenance

Use Molykote M30 oil for lubrication. For DN 15-50 sizes lubricate spindle regularly through bonnet hole and spindle threads. For DN 65-250 lubricate frequently through spindle threads, split nut and stem.

Operate the valve once or twice after lubrication.



Lubrication Details
DN 15-50



Lubrication Details
DN 65 - 250

Available Spares

DN 15-50	Sealing stacks
DN 65-250	Body sealing stack set, bonnet sealing ring and gland sealing stack

How to Order Spares

Order spares as per the code no. specified in the user manual.

Kv Values

Size (DN)	15	20	25	32	40	50	65	80	100	125	150	200	250
Kv	2.5	2.5	5.8	13	13	41	51	77	131	194	221	438	675

Recommended Tightening Torques

For Bonnet Nut

Sr. No.	Size (DN)	Torque (Nm)
1	15	3 - 5
2	20	
3	25	5 - 7
4	32	18 - 20
5	40	
6	50	20 - 25
7	65	50 - 60
8	80	
9	100	70 - 80
10	125	
11	150	80 - 90
12	200	
13	250	

For Gland Nut

Sr. No.	Size (DN)	Torque (Nm)
1	65	35 - 45
2	80	35 - 45
3	100	75 - 85
4	125	75 - 85
5	150	85 - 95
6	200	95 - 110
7	250	95 - 110

