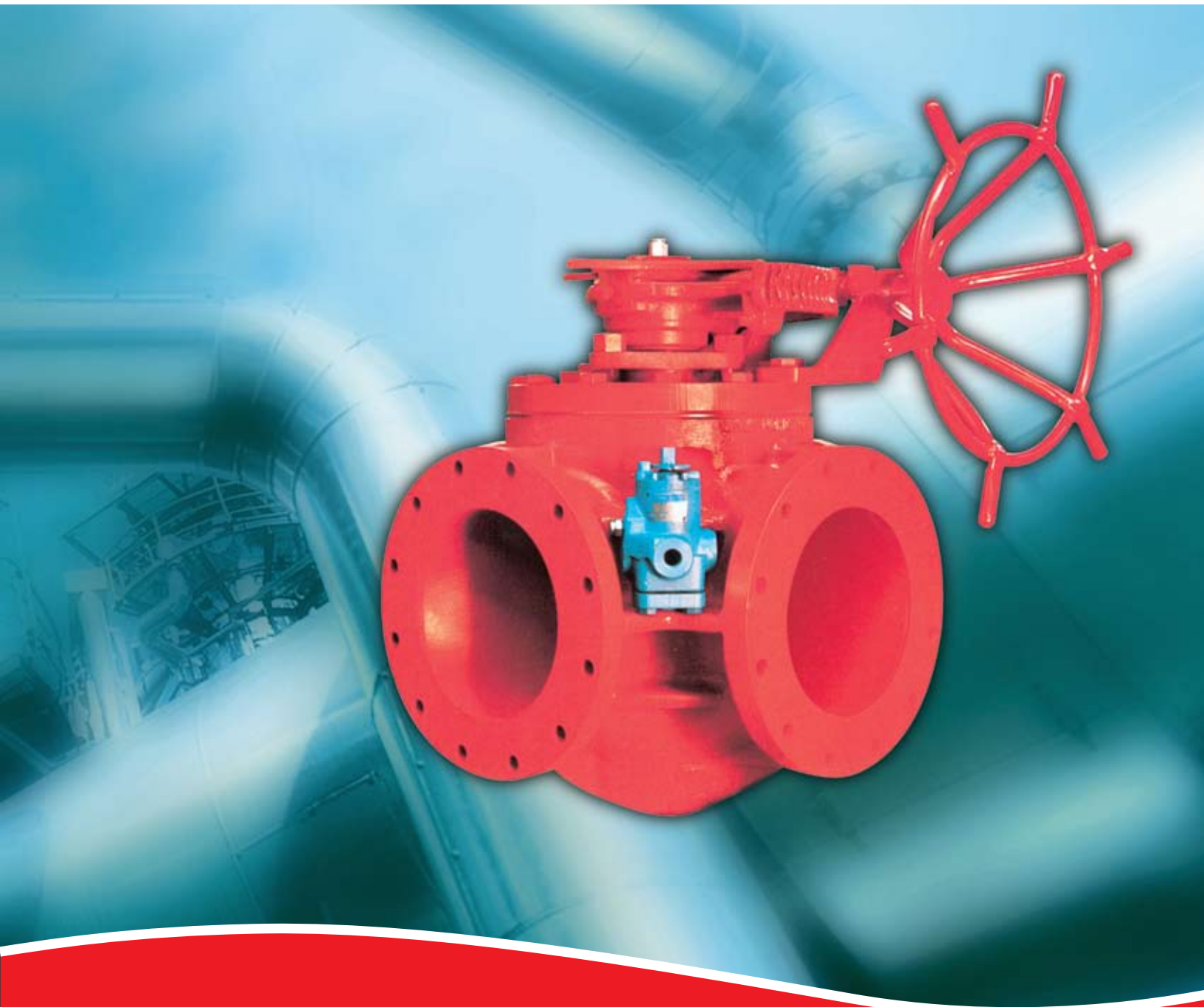
FLOWSERVE

Nordstrom Multiport Plug Valves



Experience In Motion

Contents

Glossary of Terms Used on Valve Dimension Tables

CWP (Cold Working Pressure) is the maximum service pressure permitted in the ambient temperature range -200°F to 1000°F (-290°C to 380°C). CWP is expressed in psig (pounds per square inch gage).

DN (Diameter Nominale) is an indication of nominal diameter.

Test is the Hydrostatic Shell Test Pressure. (See Test and Working Pressures chart.)

Dimension Units

NOTE: In all dimension tables, upper dimensions and weights are in inches and pounds. Lower dimensions and weights are in millimeters and kilograms.

About This Catalog

Every attempt has been made to assure that the data in this catalog is as accurate as possible. Flowserve Nordstrom Valves reserves the right to make product modifications that contradict the contents of this catalog without notification to the holders of this catalog; therefore, Flowserve Nordstrom Valves cannot be held responsible for any data found to be inaccurate or incomplete.

Valve Figure Number Explanation

Valve figure numbers ending in a 2, 3, 4 or 5 indicate wrench-operated valves. Valve figure numbers ending in a 2 or 4 indicate threaded ends. Valve figure numbers ending in a 5 indicate flanged ends. Valve figure numbers ending in a 9 indicate flanged ends with worm gear operator.

Valve Figure Number Index

Nordstrom Iron Valve

Super Nordstrom Steel Valve

Dynamic Balance Valve

Valve Working Pressure Index

Pressure Rating	Type of Operation	Pattern	Nominal Size	Page
Nordstrom Valves – Iron				
200 CWP (13.8 bar)	Wrench	Regular	1–2½ (DN 25–65)	10
	Wrench	Regular	3–6 (DN 80–150)	11
	Worm Gear	Regular	6 & 8 (DN 150–300)	12
400 CWP (27.6 bar)	Wrench	Regular	½–2½ (DN 15–65)	10
Super Nordstrom Valves – Steel				
ANSI Class 150 (PN 20)	Wrench	Regular	1½ & 2 (DN 40 & 50)	13
ANSI Class 300 (PN 50)	Wrench	Regular	½–2 (DN 15–50)	15
Dynamic Balance Valves – Steel				
ANSI Class 150 (PN 20)	Wrench	Regular	3 & 4 (DN 80 & 100)	14
ANSI Class 150 (PN 20)	Worm Gear	Regular	6–10 (DN 150–250)	14
ANSI Class 300 (PN 50)	Wrench	Regular	3 & 4 (DN 80 & 100)	16
ANSI Class 300 (PN 50)	Worm Gear	Regular	6–10 (DN 150–250)	16
ANSI Class 600 (PN 100)	Wrench	Regular	2–4 (DN 50–100)	17
ANSI Class 1500 (PN 250)	Wrench	Regular	1 & 2 (DN 25 & 50)	17

☠ **WARNING:** Numerous products described in this catalog and manufactured before January 1, 1986 were equipped with packings and/or gaskets that contained asbestos. When servicing, disassembling or disposing of these products, avoid breathing the asbestos fibers or dust.

Advantages of Multiport Design

Flowserve Nordstrom multiport valves incorporate the established principles of Nordstrom design and quality and are particularly efficient, compared to non-lubricated multiport valves, because of the provision of sealant grooves to prevent leakage between ports.

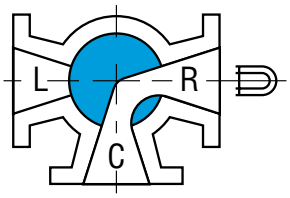
Use of multiport valves is advantageous in many installations, providing simplification of piping and convenience in operation. One 3-way or 4-way Nordstrom multiport valve may be used in place of two, three or four straightway valves, and in most cases will also eliminate other fittings such as tees and elbows.

A further advantage in the use of multiport valves is that, where necessary, ports and stops can be arranged to permit the required operating connections, at the same time making it impossible for the valve to be turned to positions that would produce undesirable results, such as waste, overpressure on equipment, wrong mixtures, etc.

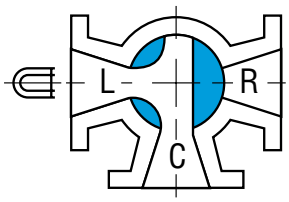
Regular Multiport Valves

Nordstrom 3-way, 2-port; 3-way, 3-port; and 4-way multiport valves have ports arranged so that when the plug is turned from one position to another, the channels previously in connection will be entirely closed before new channels begin to open—thereby preventing mixture of fluids or loss of pressure.

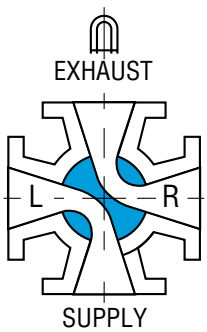
3-Way, 2-Port



3-Way, 3-Port



4-Way



Positive and Negative Shutoff

Multiport valves are built to the same standards of quality and strength as the corresponding straightway valves. However, multiport valves can be expected to provide shutoff against full rated working pressure only in the positive direction (i.e., with the line pressure acting to hold the plug against the body port or ports, which are to be isolated from the higher pressure, as illustrated by Figures 1 and 2). In Figure 1, the flow is from the right-hand to center connection, and the left-hand connection is closed. In Figure 2 the flow is from the left-hand to right-hand connection, or vice versa, and the center connection is closed. In both cases the pressure inside of the valve is trying to get out and tends to force the plug against the port that is to be cut off, which, together with the sealant provided by the Nordstrom sealant system, effects a shutoff at this point.

NOTE: Refer to MSS SP-61 “Pressure Testing of Steel Valves” for allowable leakage rates for multiport valves.

Multiport valves are not expected to shut off high differential pressures when the line pressure is in a negative direction, as illustrated in Figures 3 and 4. In these examples, the pressure is from the left-hand and center connections, respectively, and in both cases, pressure is trying to get into the valve. Under these conditions the pressure can force the plug away from the inlet port, bypass the plug and escape at the connections, which are supposed to be isolated from the higher pressure.

The 4-way valves are intended to be used for directional control only, and cannot be expected to hold high differential pressure without some leakage.

Positive Shutoff

Figure 1

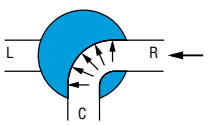
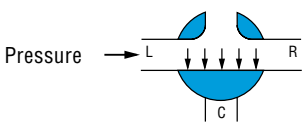


Figure 2



Negative Shutoff

Figure 3

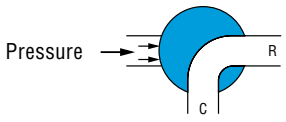
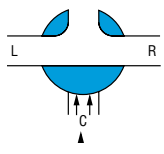


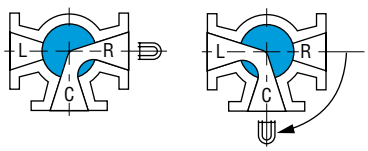
Figure 4



NOTE: When multiport valves are used in vacuum service, the positive and negative effects are reversed.

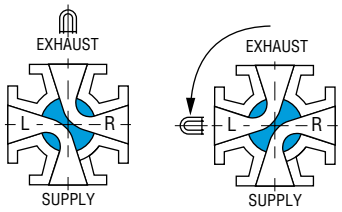
Port and Stop Arrangements

When ordering multiport valves, specify the size, figure number and the port and stop arrangement. (When multiport valves are inverted, the arrangement reverses.)



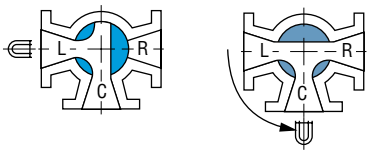
Position 1 Position 2

Arrangement 1: 3-way, 2-port, 90° Turn – Two Positions



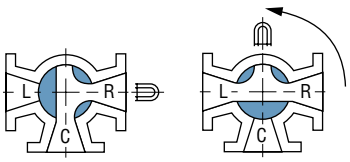
Position 1 Position 2

Arrangement 2: 4-way, 4-port, 90° Turn – Two Positions



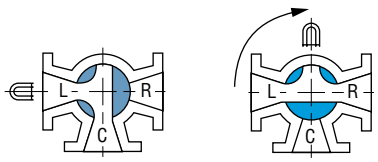
Position 1 Position 2

Arrangement 3: 3-way, 3-port, 90° Turn – Two Positions



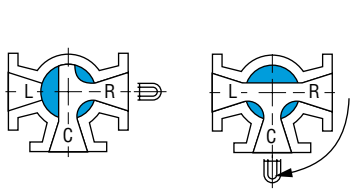
Position 1 Position 2

Arrangement 4: 3-way, 3-port, 90° Turn – Two Positions



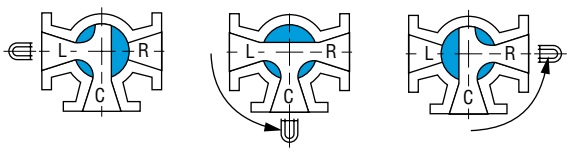
Position 1 Position 2

Arrangement 5: 3-way, 3-port, 90° Turn – Two Positions



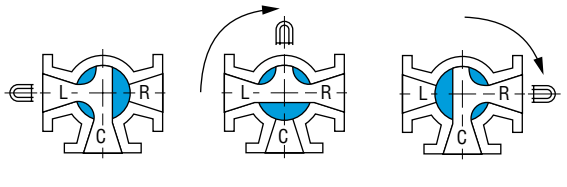
Position 1 Position 2

Arrangement 6: 3-way, 3-port, 90° Turn – Two Positions



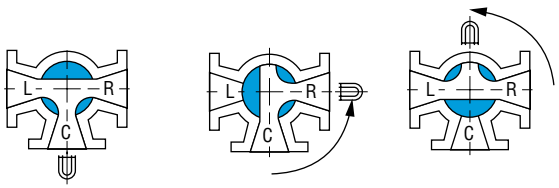
Position 1 Position 2 Position 3

Arrangement 7: 3-way, 3-port, 180° Turn – Three Positions



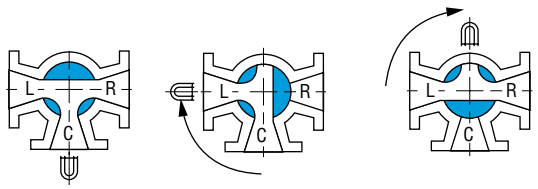
Position 1 Position 2 Position 3

Arrangement 8: 3-way, 3-port, 180° Turn – Three Positions



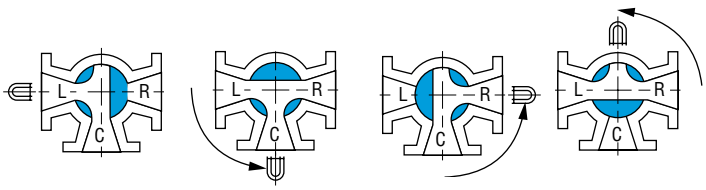
Position 1 Position 2 Position 3

Arrangement 9: 3-way, 3-port, 180° Turn – Three Positions



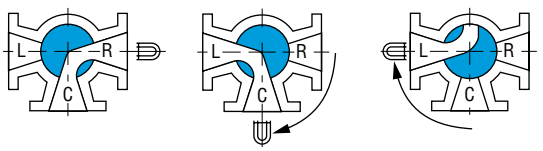
Position 1 Position 2 Position 3

Arrangement 10: 3-way, 3-port, 180° Turn – Three Positions



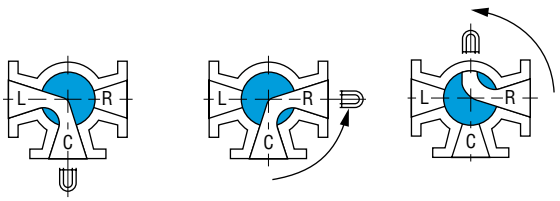
Position 1 Position 2 Position 3 Position 4

Arrangement 11: 3-way, 3-port, 270° Turn – Four Positions



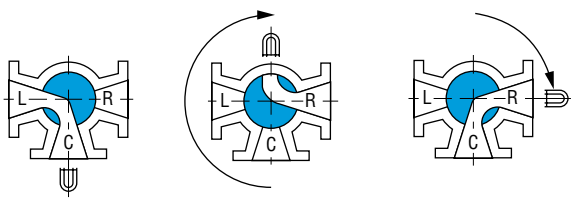
Position 1 Position 2 Position 3

Arrangement 12: 3-way, 2-port, 180° Turn – Three Positions



Position 1 Position 2 Position 3

Arrangement 13: 3-way, 2-port, 180° Turn – Three Positions



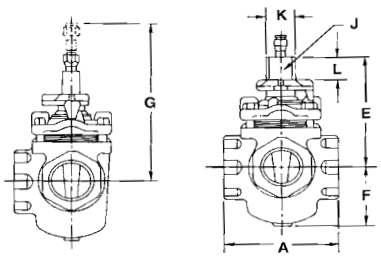
Position 1 Position 2 Position 3

Arrangement 14: 3-way, 2-port, 270° Turn – Three Positions

Nordstrom Iron Screwed Gland-Type Multiport Plug Valves

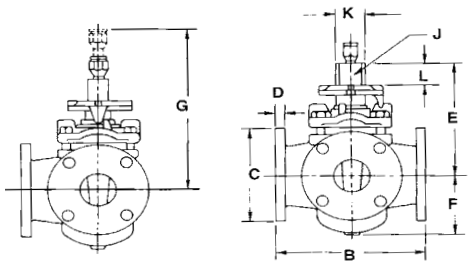
Regular Pattern

400 CWP (27.6 bar)
800 psig (55.2 bar) Test
Figure 3402 – 3-way, 2-port
Figure 3412 – 3-way, 3-port
Figure 3422 – 4-way, 4-port
Threaded, Wrench Operated,
Sizes ½ to 2½



Regular Pattern

200 CWP (13.8 bar)
400 psig (27.6 bar) Test
Figure 3403 – 3-way, 2-port
Figure 3413 – 3-way, 3-port
Figure 3423 – 4-way, 4-port
Flanged, Wrench Operated,
Sizes 1½ to 2½
Figure 3423 ONLY is available in Size 1



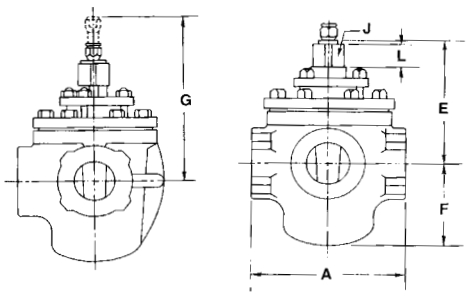
Size	NPS DN	½ 15	¾ 20	1 25	1¼ 32	1½ 40	2 50	2½ 65
End-to-end, threaded	A	3.90 99	3.90 99	4.80 122	5.80 147	5.80 147	7.00 178	8.50 216
Face-to-face, flanged	B			6.50 165		7.50 191	9.00 229	10.00 254
Diameter of flanges	C			4.25 108		5.00 127	6.00 152	7.00 178
Thickness of flanges	D			.50 13		.63 16	.69 18	.75 19
Center to top of stem	E	4.6 117	4.6 117	5.3 135	5.8 147	5.8 147	6.6 168	7.7 196
Center to bottom of body	F	1.8 46	1.8 46	2.1 53	2.7 69	2.7 69	3.2 81	3.7 94
Clearance required to remove sealant fitting	G	7.2 183	7.2 183	7.9 201	8.4 213	8.4 213	9.3 236	10.3 262
Width of stem flats	J	.88 22	.88 22	.94 24	1.13 29	1.13 29	1.25 32	1.38 35
Diameter of stem	K	1.22 31	1.22 31	1.31 33	1.59 40	1.59 40	1.78 45	1.97 50
Height of stem flats	L	1.2 30	1.2 30	1.2 30	1.2 30	1.2 30	1.5 38	1.6 41
Size of sealant stick	—	B	B	B	B	B	B	B
Size of wrench	—	E-9	E-9	H-9	K-9	K-9	L-9	M-9
Length of wrench	—	7.0 178	7.0 178	9.0 229	14.0 356	14.0 356	17.5 445	21.0 533
Weight (approx.), Figure 3402/3412/3422	—	8/8/8 4/4/4	8/8/8 4/4/4	11/11/11 5/5/5	22/21/23 10/10/10	22/21/23 10/10/10	34/32/34 15/15/15	60/50/56 27/23/25
Weight (approx.), Figure 3403/3413/3423	—			18/18/18 8/8/8		28/27/31 13/12/14	45/44/50 20/20/23	68/66/74 31/30/34

Flanges are drilled to ANSI Class 125 Cast Iron Flange Standard Template.
Valves conform to the following standards where applicable: ANSI B2.1; ANSI B16.1; API 5B, ASTM A126 Class B and MSS SP-78.
When ordering multiport valves, specify port and stop arrangement number.
Multiport valves have special lubrication systems and should be lubricated in only 90° plug position.
Center of run to end of side outlet equals half of "A"; to face of side outlet equals half "B."

Nordstrom Iron Bolted Gland-Type Multiport Plug Valves

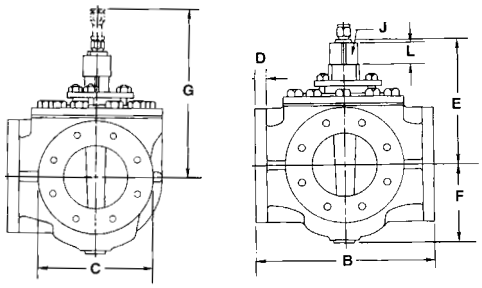
Regular Pattern

200 CWP (13.8 bar)
400 psig (27.6 bar) Test
Figure 3464 – 3-way, 2-port
Figure 3474 – 3-way, 3-port
Figure 3484 – 4-way, 4-port (size 3 only)
Threaded, Wrench Operated,
Sizes 3 to 4



Regular Pattern

200 CWP (13.8 bar)
400 psig (27.6 bar) Test
Figure 3465 – 3-way, 2-port
Figure 3475 – 3-way, 3-port
Figure 3485 – 4-way, 4-port
Flanged, Wrench Operated,
Sizes 3 to 6 (size 5 in 3475 only)



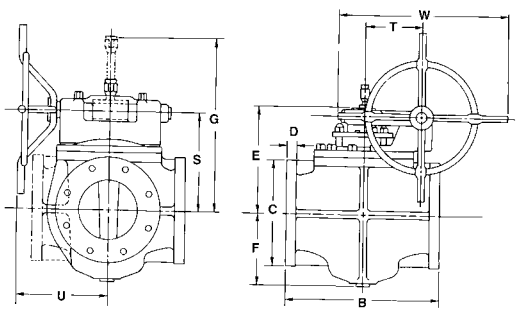
Size	NPS DN	3 80	4 100	5 125	6 150
End-to-end, threaded	A	10.00 254	14.75 375		
Face-to-face, flanged	B	11.50 292	14.00 356	16.25 413	17.00 432
Diameter of flanges	C	7.5 191	9.0 229	10.0 254	11.0 279
Thickness of flanges	D	.81 21	1.00 25	1.00 25	1.10 28
Center to top of stem	E	10.0 254	11.8 300	13.1 333	13.1 333
Center to bottom of body	F	5.4 137	6.3 160	7.8 198	8.3 211
Clearance required to remove sealant fitting	G	13.8 351	16.8 427	18.1 460	18.1 460
Width of stem square	J	1.75 44	2.00 51	2.00 51	2.00 51
Height of stem square	L	1.8 46	2.0 51	2.1 53	2.1 53
Size of wrench	—	P-2	T-2	T-2	T-2
Length of wrench	—	27.0 686	36.0 914	36.0 914	36.0 914
Size of sealant stick	—	D	G	G	G
Weight (approx.), Fig 3464/3474/3484	—	114/112/112 52/51/51	220/216/— 100/98/—		
Weight (approx.), Fig 3465/3475/3485	—	137/136/144 62/62/65	220/216/244 100/98/111	327/326/345 148/148/156	356/354/383 161/161/174

Flanges are drilled to ANSI Class 125 Cast Iron Flange Standard Template.
Valves conform to the following standards where applicable: ANSI B2.1; ANSI B16.1; API 5B, ASTM A126 Class B and MSS SP-78.
When ordering multiport valves, specify port and stop arrangement number.
Multiport valves have special lubrication systems and should be lubricated in only 90° plug position.
Center of run to end of side outlet equals half of "A"; to face of side outlet equals half "B."

Nordstrom Iron Bolted Gland-Type Multiport Plug Valves

Regular Pattern

200 CWP (13.8 bar)
400 psig (27.6 bar) Test
Figure 3469 – 3-way, 2-port
Figure 3479 – 3-way, 3-port
Figure 3489 – 4-way, 4-port
Flanged, Worm Gear Operated, Sizes 6 and 8



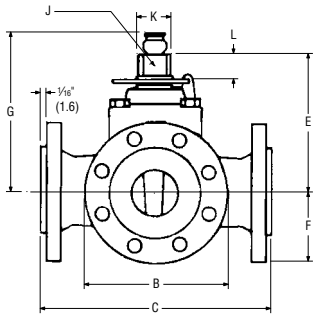
Size	NPS	6	8
	DN	150	200
Face-to-face, flanged	B	17.00	20.00
		432	508
Diameter of flanges	C	11.0	13.5
		279	343
Thickness of flanges	D	1.06	1.18
		27	30
Center to top of stem	E	13.4	15.6
		340	396
Center to bottom of body	F	8.9	10.4
		226	264
Clearance required to remove sealant fitting	G	18.4	20.6
		467	523
Center of port to center of handwheel	S	11.2	13.1
		284	333
Transverse centerline to center of worm shaft	T	6.3	7.5
		160	191
Longitudinal centerline to face of handwheel, 3-way valve	U	11.4	13.6
		290	345
Longitudinal centerline to face of handwheel, 4-way valve	U	15.4	16.9
		391	429
Overall diameter of handwheel, 3-way valve	W	23.0	26.0
		584	660
Overall diameter of handwheel, 4-way valve	W	15.0	18.0
		381	457
Turns of handwheel to turn plug 90°	—	16	191/2
Size of sealant stick	—	G	G
Weight (approx.), Figure 3469	—	440	700
		200	318
Weight (approx.), Figure 3479	—	434	694
		197	315
Weight (approx.), Figure 3489	—	454	743
		206	337

Flanges are drilled to ANSI Class 125 Cast Iron Flange Standard Template.
Valves conform to the following standards where applicable: ANSI B16.1; ASTM A126 Class B and MSS SP-78.
When ordering multiport valves, specify port and stop arrangement number.
Multiport valves have special lubrication systems and should be lubricated in only 90° plug position.
Center of run to end of side outlet equals half of "A"; to face of side outlet equals half "B."

Super Nordstrom Steel Multiport Plug Valves

Regular Pattern

Sizes 1½ and 2
ANSI Class 150 (PN 20)
Figure 3803 – 3-way, 2-port
Figure 3813 – 3-way, 3-port
Figure 3823 – 4-way, 4-port
Flanged, Wrench Operated
Sizes 1½ and 2



Size	NPS DN	1½ 40	2 50
End-to-end, flanged (raised face) (includes 1/16" raised face)	B	9.0 229	9.0 229
Diameter of flange	C	5.0 127	6.0 152
Center to top of stem	E	6.4 163	6.4 163
Center to bottom of body	F	3.8 97	3.8 97
Clearance required to remove sealant fitting	G	8.9 226	8.9 226
Width of stem flats	J	1.25 32	1.25 32
Diameter of stem	K	1.78 45	1.78 45
Height of stem flats	L	1.3 33	1.3 33
Size of sealant stick	—	B	B
Size of wrench	—	L-9	L-9
Length of wrench	—	17.5 445	17.5 445
Weight (approx.), Figure 3803 and 3813	—	55 25	58 26
Weight (approx.), Figure 3823	—	65 29	65 29

When ordering multiport valves, specify port and stop arrangement number.
Multiport valves have special lubrication systems and should be lubricated in only a 90° plug position.
Center of run to face of side outlet equals half "B."

Dynamic Balance Steel Multiport Plug Valves

Regular Pattern

Sizes 3–10
ANSI Class 150 (PN 20)
Figure 5105 – 3-way, 2-port, Sizes 3 and 4
Figure 5115 – 3-way, 3-port, Sizes 3 and 4
Figure 5125 – 4-way, 4-port, Sizes 3 and 4
Flanged, Wrench Operated

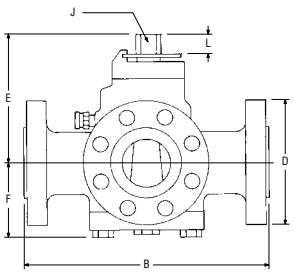
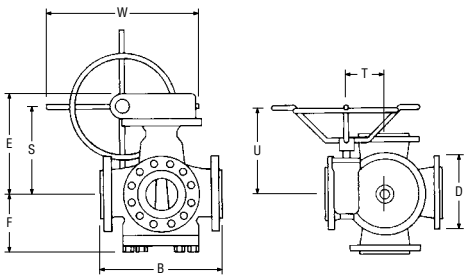


Figure 5109 – 3-way, 2-port, Sizes 6–10
Figure 5119 – 3-way, 3-port, Sizes 6–10
Figure 5129 – 4-way, 4-port, Sizes 6–8
Flanged, Worm Gear Operated



Size	NPS	3	4	6	8	10
	DN	80	100	150	200	250
Face-to-face, flanged, (raised face) (includes 1⁄16" raised face)	B	14.0 356	14.0 356	18.0 457	21.0 533	24.5 622
End-to-end, flanged (ring joint)	—	14.5 368	14.5 368	18.5 470	21.5 546	25.0 635
Diameter of flange	D	7.5 191	9.0 229	11.0 279	13.5 343	16.0 407
Center to top of gearing	E			17.0 432	17.2 437	19.2 488
Center to top of stem	E	10.4 264	10.4 264			
Center to bottom of body	F	6.8 173	6.8 173	8.8 224	10.2 259	10.8 274
Width of stem flats	J	1.25 32	1.25 32			
Height of plug stem	L	1.41 36	1.41 36			
Center of port to center of handwheel	S			12.7 323	12.9 328	14.5 368
Transverse centerline to center of worm shaft	T			4.9 124	4.9 124	6.0 152
Longitudinal centerline to face of handwheel	U			11.9 302	11.9 302	14.3 363
Turns of handwheel to turn plug 90°	—			12.5	12.5	16
Overall diameter of handwheel, 3-way	W			20.0 508	20.0 508	26.0 660
Overall diameter of handwheel, 4-way	W			12 305	12 305	
Size of wrench	—	DB-4	DB-4			
Weight (approx.), Figure 5105/5115	—	185 84	267 121			
Weight (approx.), Figure 5125	—	194 88	280 127			
Weight (approx.), Figure 5109/5119	—			644 292	846 384	1526 692
Weight (approx.), Figure 5129	—			650 295	898 407	

When ordering multiport valves, specify port and stop arrangement number.
Multiport valves have special lubrication systems and should be lubricated in only 90° plug position.
Center of run to face of side outlet equals half "B."

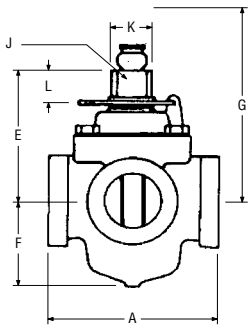
Super Nordstrom Steel Multiport Plug Valves

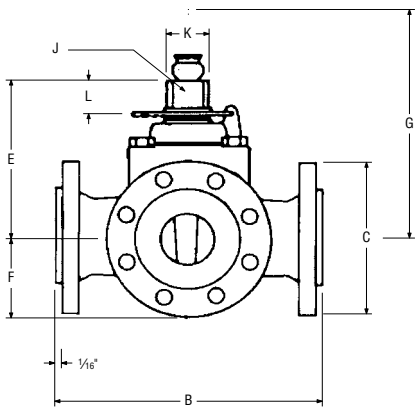
Regular Pattern

Sizes ½–2
ANSI Class 300 (PN 50)

Figure 4802 – 3-way, 2-port
Figure 4812 – 3-way, 3-port
Figure 4822 – 4-way, 4-port
Threaded, Wrench Operated

Figure 4803 – 3-way, 2-port
Figure 4813 – 3-way, 3-port
Figure 4823 – 4-way, 4-port
Flanged, Wrench Operated





Size	NPS	½	¾	1	1½	2
	DN	15	20	25	40	50
End-to-end, threaded	A	4.8 122	4.8 122	4.8 122	6.9 175	6.9 175
Face-to-face, flanged (raised face) (includes 1/16" raised face)	B				9.5 241	9.4 239
Diameter of flange	C				6.1 155	6.5 165
Center to top of stem	E	4.5 114	4.5 114	4.5 114	6.4 163	6.4 163
Center to bottom of body	F	2.1 53	2.1 53	2.1 53	3.8 97	3.8 97
Clearance required to remove sealant fitting	G	7.0 178	7.0 178	7.0 178	8.9 226	8.9 226
Width of stem flats	J	.81 21	.81 21	.81 21	1.25 32	1.25 32
Diameter of stem	K	1.09 28	1.09 28	1.09 28	1.78 45	1.78 45
Height of stem flats	L	.9 23	.9 23	.9 23	1.3 33	1.3 33
Wrench size	—	SN-1	SN-1	SN-1	L-9	L-9
Size of sealant stick	—	B	B	B	B	B
Weight (approx.), Figure 4802/4812	—	14 6	14 6	14 6	52 24	52 24
Weight (approx.), Figure 4822	—	15 7	15 7	15 7	54 25	54 25
Weight (approx.), Figure 4803/4813	—				57 26	59 27
Weight (approx.), Figure 4823	—				65 30	68 31

When ordering multiport valves, specify port and stop arrangement number.
Multiport valves have special lubrication systems and should be lubricated in only a 90° plug position.
Center of run to face of side outlet equals half "B."

Dynamic Balance Steel Multiport Plug Valves

Regular Pattern

Sizes 3–10
ANSI Class 300 (PN 50)
Figure 5205 – 3-way, 2-port, Sizes 3 and 4
Figure 5215 – 3-way, 3-port, Sizes 3 and 4
Figure 5225 – 4-way, 4-port, Sizes 3 and 4
Flanged, Wrench Operated

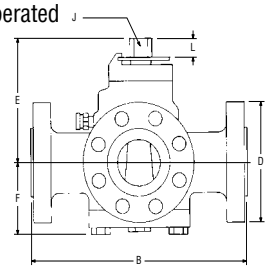
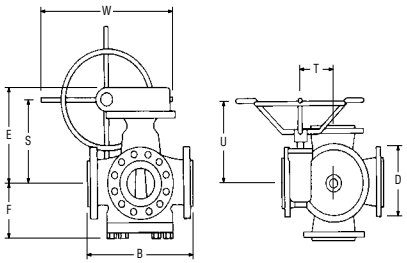


Figure 5209 – 3-way, 2-port, Sizes 6–10
Figure 5219 – 3-way, 3-port, Sizes 6–10
Figure 5229 – 4-way, 4-port, Sizes 6–10
Flanged, Worm Gear Operated



Size	NPS	3	4	6	8	10
	DN	80	100	150	200	250
Face-to-face, flanged, (raised face) (includes 1/16" raised face)	B	14.0 356	16.3 414	19.5 495	23.0 584	24.5 622
End-to-end, flanged (ring joint)	—	14.6 371	16.9 429	20.1 511	23.6 599	25.0 635
Diameter of flange	D	8.25 210	10.00 254	12.50 318	15.00 381	17.50 445
Center to top of gearing	E			17.0 432	17.2 437	19.2 488
Center to top of stem	E	10.4 264	10.4 264			
Center to bottom of body	F	6.8 173	6.8 173	8.8 224	10.2 259	10.8 274
Width of stem flats	J	1.25 32	1.25 32			
Height of plug stem	L	1.41 36	1.41 36			
Center of port to center of handwheel	S			12.7 323	12.9 328	14.5 368
Transverse centerline to center of worm shaft	T			4.9 124	4.9 124	6.0 152
Longitudinal centerline to face of handwheel	U			11.9 302	11.9 302	14.3 363
Turns of handwheel to turn plug 90°	—			12.5	12.5	16
Overall diameter of handwheel, 3-way	W			20.0 508	20.0 508	26.0 660
Overall diameter of handwheel, 4-way	W			12 305	12 305	
Size of wrench	—	DB-4	DB-4			
Weight (approx.), Figure 5205/5215	—	204 93	297 135			
Weight (approx.), Figure 5225	—	220 100	320 145			
Weight (approx.), Figure 5209/5219	—			704 319	930 422	1640 744
Weight (approx.), Figure 5229	—			730 331	1010 458	

When ordering multiport valves, specify port and stop arrangement number.
Multiport valves have special lubrication systems and should be lubricated in only 90° plug position.
Center of run to face of side outlet equals half "B."

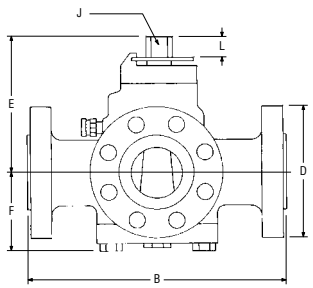
Dynamic Balance Steel Multiport Plug Valves

Regular Pattern

Sizes 1–4
ANSI Classes 600 (PN 100)
and 1500 (PN 250)

ANSI Class 600 (PN 100)
Figure 6405 – 3-way, 2-port, Sizes 2–4
Figure 6415 – 3-way, 3-port, Sizes 2–4
Flanged, Wrench Operated

ANSI Class 1500 (PN 250)
Figure 6804 – 3-way, 2-port, Sizes 1 and 2
Figure 6814 – 3-way, 3-port, Sizes 1 and 2
Figure 6824 – 4-way, 4-port, Sizes 1 and 2
Flanged, Wrench Operated (not shown)



Size	NPS	Class 600 (PN 100)			Class 1500 (PN 250)	
		2	3	4	1	2
	DN	50	80	100	25	50
End-to-end, threaded	A				5.1 130	8.9 226
Face-to-face, flanged (raised face) (includes ¼" raised face)	B	12.0 305	15.5 394	18.0 457		
End-to-end, flanged (ring joint)	—	12.1 307	15.6 396	18.0 457		
Diameter of flange	C	6.50 165	8.25 210	10.75 273		
Center to top of stem	E	7.4 188	10.4 264	10.4 264	5.9 150	7.4 188
Center to bottom of body, Figure 6804/6814/6824	F				3.1 79	5.4 137
Center to bottom of body, Figure 6405/6415	F	5.4 137	6.8 173	6.8 173		
Width of stem flats	J	1.00 25	1.25 32	1.25 32	.62 16	1.00 25
Height of stem flats	L	1.4 36	1.4 36	1.4 36	.9 23	1.4 36
Size of wrench	—	DB-3	DB-4	DB-4	DB-1	DB-3
Weight (approx.), Figure 6405/6415	—	104 47	230 104	326 148		
Weight (approx.), Figure 6804/6814	—				22 10	105 48
Weight (approx.), Figure 6824	—				26 12	100 45

When ordering multiport valves, specify port and stop arrangement number.
Multiport valves have special lubrication systems and should be lubricated in only 90° plug position.
Center of run to face of side outlet equals half "B."

Conformance to Standard Specifications

Wherever applicable, iron and steel plug valves by Flowserve Nordstrom Valves conform to the latest edition of the standard specifications shown below as to pressure ratings, dimensions and construction. Consult your Nordstrom Customer Service Representative for additional information.

ANSI – American National Standards Institute

B1.20.1 Pipe Threads, General Purpose (Inch)
B16.1 Cast Iron Pipe Flanges and Flanged Fittings (except valves having slightly thicker flanges)
B16.5 Pipe Flanges and Flanged Fittings
B16.11 Forged Steel Fittings, Socket-Welding and Threaded Ends
B16.25 Butt-Welding Ends
B16.34 Valves – Flanged, Threaded and Welding Ends
B18.2.1 Square and Hex Bolts and Screws
B18.2.2 Square and Hex Nuts

API – American Petroleum Institute

5B Threading, Gaging and Thread Inspection of Casing, Tubing and Line Pipe Threads

DOT – United States Department of Transportation

49 CFR part 192 Pipeline Safety Regulations

ISO 9001 Certified

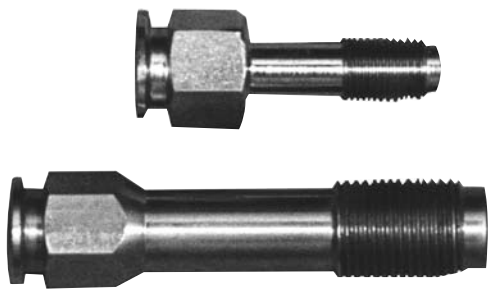
MSS – Manufacturers Standardization Society of the Valve and Fittings Industry

SP-6 Standard Finish for Contact Faces of Pipe Flanges and Connecting-End Flanges of Valves and Fittings
SP-25 Standard Marking System for Valves, Fittings, Flanges and Unions
SP-55 Quality Standard for Steel Castings for Valves, Flanges and Fittings and Other Piping Components
SP-78 Cast Iron Plug Valves, Flanged and Threaded Ends
SP-84 Steel Valves – Socket Welding and Threaded Ends
MR0175 Standard Material Requirements Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment (Valves for NACE Service)

Sealant Fittings

Combination Fitting

The Nordstrom Sealant Fitting is standard equipment on all Nordstrom valves. The fitting is equipped with a cylindrical, spring-loaded check valve that is superior to run-of-the-mill ball check fittings, which may trap dirt that is subsequently pumped into the valve. Nordstrom Sealant Fittings also allow both manual and automatic sealant injection without need for other special fittings. They are available separately, in several sizes, as replacements for damaged fittings or the lube screw on older design Nordstrom valves still in service.



Sealant Stick Size	Parallel Thread Size	Carbon Steel Fitting Part Number
B	¼"	3000711
C	⅜"	37416
D	½"	37417
G	¾"	37418

Button Head Fitting

The Dynamic Balance Valve button head fittings are adaptable for mechanical injection of valve sealant. Part No. 480766.

Gearing

Simple Worm Gearing for Valves with Side-Mounted Handwheel

Simple worm gearing enclosed in a weatherproof housing is used on Flowserve Nordstrom valves. An indicator on top readily shows the valve operating position. This gearing is adaptable for mounting electric actuators. Worm gear operating mechanisms are built to withstand abuse under all types of conditions. Wear tests have proven them reliable for thousands of cycles at full rated output of the unit.

Worm Gearing for Buried Service

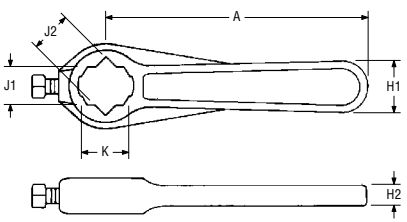
Standard iron valves for typical buried services (such as those found in waterworks) can be factory modified to provide watertight worm gearing that includes a 2" operating nut and a bent sealant pipe. This modification protects the valve plug stem and brings sealant injection to ground level. With this buried worm gearing, the valve is operated with a tee-handle socket wrench.

Actuators

Flowserve Nordstrom Valves can supply hydraulic, pneumatic or electric power actuators for mechanical operation of Dynamic Balance, Nordstrom and Super Nordstrom valves. To obtain equipment in close conformance with customer requirements, the following information should be provided at the time of the inquiry:

1. Valve size and pressure class
   - A. If the power actuator is being ordered for field conversion, describe the actuator currently installed on the valve.
2. Type of actuator desired
   - A. Hydraulic
   - B. Pneumatic
   - C. Electric
3. Maximum differential pressure across valve during operation
4. Minimum differential pressure across valve during operation
5. Line fluid
6. Type of Flowserve Nordstrom sealant used in valve
7. Speed of operation required in minutes or seconds
   - A. To open
   - B. To close
8. Frequency of operation
9. For an electric operator, specify
   - A. AC or DC voltage
   - B. Single or 3-phase
   - C. Type of motor
     1. Explosion proof
     2. Weatherproof
     3. Other
   - D. Frequency
10. If pneumatic or hydraulic actuator is desired, specify
    - A. Minimum and maximum pressure available
    - B. Operating medium
      1. Gas
      2. Air
      3. Fluid (specify type)
    - C. Accessory equipment desired
      1. Filter
      2. Pump
      3. Control valving
         a. electrically operated
         b. manually operated
         c. pilot operated
11. Position indicator (visual indicator on valves is standard)
    - A. Remote reading
      1. Selsyn
      2. Potentiometer
12. Full instrumentation to be furnished by
    - A. Flowserve Nordstrom Valves
    - B. Others

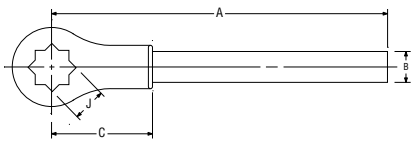
Wrenches



Nordstrom and Super Nordstrom Valves with Square or Obround Stems

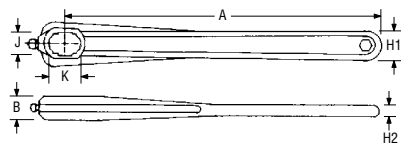
Size	Part #	Weight	A	H1	H2	J1	J2	K
SN-1	3001198	.9	7.0	1.1	.4	.81	.88	1.10
		.4	178	28	10	21	22	28

Nordstrom Valves with Square Heads (Size 6 and Larger)



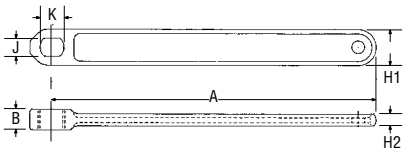
Size	Part #	Weight	A	B (Dia.)	C	J
P-2	8889	6	27.0	1.7	5.5	1.84
		3	686	43	140	47
T-2	8148	11	36.0	1.9	6.7	2.09
		5	914	48	170	53

Nordstrom Valves with Obround Stems



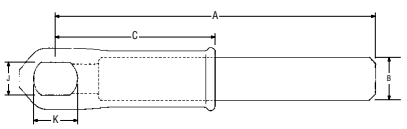
Size	Part #	Weight	A	B	H1	H2	J	K
E-9	15105	1.0	7.0	.8	1.3	.5	.88	1.23
		.5	178	20	33	13	22	31
H-9	15106	1.3	9.0	.9	1.4	.5	.94	1.32
		.6	229	23	36	13	24	34
E-9	15108	2.5	14.0	1.1	1.6	.6	1.13	1.60
		1.1	356	28	41	15	29	41
L-9	15109	3.8	17.5	1.2	1.8	.6	1.25	1.79
		1.7	445	30	46	15	32	45
M-9	15110	5.5	21.0	1.3	1.9	.6	1.38	1.98
		2.5	533	33	48	15	35	50

Cast Wrench for Dynamic Balance Valves



Size	Part #	Weight	A	B	H1	H2	J	K
DB-1	482014	2.0	18.0	.9	1.4	.4	.655	.875
		.9	457	23	35	11	17	22

Cast Heads Fitted with Pipe Handle for Dynamic Balance Valves



Size	Part #	Weight	A	B (Dia.)	C	J	K
DB-3	482137	6.8	36	1.3	4.7	1.03	1.44
		3	914	33	119	26	37
DB-4	482138	12.9	48	1.9	5.5	1.28	1.82
		6	1219	49	140	33	46

Square Adapters

For Wrench-Operated Valves

All adapters have 2" (51 mm) square wrench flat, so that all valves fitted with adapters may be operated with a single lever or socket wrench having 2" (51 mm) square opening.

2" Square Adapters for Valves with Square Wrench Heads

Distance Across Flats of Square Stem Head on Valve (See Dimension "J")*	Adapter Part #
1.75 44	1277
2.00 25	None Required

** For dimension "J" refer to valve dimension tables.*

2" Square Adapters for Valves with Obround Wrench Heads

Distance Across Flats of Obround Wrench Head on Valve (See Dimension "J")*	Adapter Part #
.62 .16	61291
.81 21	12180
.88 22	12181
.94 24	12182
1.00 25	12183
1.12 29	12184
1.25 32	12185
1.38 35	12186

** For dimension "J" refer to valve dimension tables.*

Locking Devices

For Nordstrom Bolted Gland-Type Multiport Valves

Locking devices can be used to lock or seal valves in any of the operating positions. The device encloses the wrench flats and gland of the valve, thus preventing removal of or tampering with these parts.

Figure Numbers 3465, 3475 and 3485; Sizes 5 and 6

Part Description	Part #
Hood	57629
Locking Clip	57613
Dart and Chain	57734
Complete Assembly	58092

Figure Numbers 3464, 3465, 3474, 3475, 3484 and 3485; Sizes 3 and 4

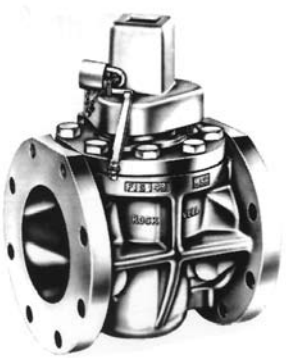
Part Description	Part #
Hood	57630
Locking Clip	45926
Dart and Chain	57734
Complete Assembly	58093

For Dynamic Balance and Super Nordstrom Multiport Valves

Locking devices can be used to lock wrench-operated valves for port arrangements 1 through 6 only. Ask your Customer Service Representative for details.

For Wrench-Operated Valves

When ordering a locking device, specify the size and figure number of the valve.



Dynamic Balance Standard Design Categories

In the interest of clarity, Flowserve Nordstrom Valves has designated the following standard design categories for Dynamic Balance multiport valves. When ordering, please indicate the letter suffix that best defines your requirements, along with complete service details.

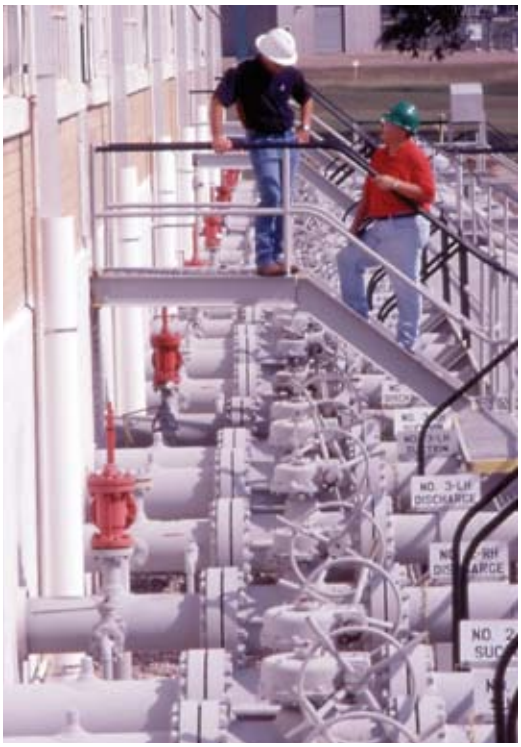
Contact your Customer Service Representative for assistance.

A The standard carbon steel B16.34 valve suitable for general service at temperatures from -20°F to 450°F (-29°C to 232°C).

B Low-temperature valves (LCC material) suitable for general service from -50°F to 450°F (-46°C to 232°C).

C Sour gas valves conforming to NACE MR0175 and B16.34, suitable for -20°F to 450°F (-29°C to 232°C) in accordance with the appropriate standard.

D Sour gas valves conforming to NACE MR0175 and B16.34, constructed of material suitable for low-temperature service -50°F (-46°C) to either 250°F (121°C) or 450°F (232°C) in accordance with the appropriate standard.



NACE Construction Valves for Sour Gas Applications

NACE, the Natural Association of Corrosion Engineers, has published a report outlining acceptable materials for valves for sour gas service. The current outline is Publication MR0175, and is a guide to the manufacturers and users of valves based on the latest metallurgical knowledge. Most of our customers involved in this area of production also have their own specifications, which may or may not be more stringent than those in the NACE publication. The reason for this is, of course, that the product varies from field to field and many different types of inhibitors are used.

The basic problem is that whenever even a small amount of hydrogen sulfide (H_2S) is encountered in natural gas or under oil pressure, a corrosion phenomenon, known as hydrogen sulfide embrittlement or sulfide stress cracking, may occur. Actually, the steel part is absorbing hydrogen. This causes ductility, and when other stresses are added, may result in failure of the part. Currently, we know that some steels with yield strengths above 90,000 psi (621 MPa) and/or hardness greater than Rockwell 22 (235 Brinell) are subject to sulfide stress cracking. Failure below these limits is unlikely.

Because of a long history of reliability in numerous sour gas installations, Dynamic Balance valves can be supplied in conformance to standards enumerated in the NACE governing document on sour gas application.

In some cases, a more sophisticated construction may be required because of other corrosive elements in the flow stream. All major components are heat treated to a controlled hardness of 22 or lower on the Rockwell C scale. In this construction, the plug is coated with electroless nickel to prevent galling.

Complete engineering details are available upon request.

Dynamic Balance Multiport Plug Valve Metals

Carbon Steel

Cast carbon steel used in Dynamic Balance valve bodies is a medium carbon steel, conforming to ASTM Specification A216, Grade WCC.

Each heat is rigidly controlled and recorded. The castings are marked to identify the heat used in each finished valve.

Steel plugs for carbon steel valves are made of a low alloy steel, heat treated to produce the proper balance between non-galling properties and the toughness required to resist the mechanical loads imposed in operating the valve.

Ferritic Steel

Grade LCC Ferritic Steel, conforming to ASTM Specification A352, is basically a "killed" mild carbon steel which has good impact qualities at low temperatures.

This material is used generally for subzero temperatures to -50°F (-46°C) and must have a minimum average Charpy "V" notch impact strength of 15 foot pounds at that temperature.

Test and Working Pressures (psig minimum)

	150 CWP	200 CWP	400 CWP	ANSI Class			
				150	300	600	1500
Maximum Cold Working Pressure	150	200	400	285	740	1480	3705
Hydrostatic Body (Shell) Test	300	400	800	450	1125	2225	5575
Hydrostatic Seat Test	225	300	600	325	825	1650	4100

Test Times

Valve Type	Valve Sizes	Test Time (min.)			
		150, 200 and 400 CWP Valves		ANSI Class Valves	
		Hydrostatic Body	Hydrostatic Seat	Hydrostatic Body	Hydrostatic Seat
Screwed Gland	**1–4**	½	1	2	2
Bolted Gland	**4–8**	1	1	5	5
Dynamic Balance and Super Nordstrom Valves	**1–4**	—	—	2	2
	6–10	—	—	5	5

Operating Temperatures

Steel Plug Valves Maximum Operating Temperatures

Dynamic Balance Plug Valves
Standard construction Dynamic Balance valves (Category A) are suitable for operation at the pressures and temperatures listed in the above table up to a maximum temperature of 450°F (232°C).

Super Nordstrom Steel Plug Valves
Super Nordstrom and Nordstrom ANSI rated valves are suitable for operation at the pressures and temperatures in the above table up to a maximum of 350°F (177°C).

Iron Plug Valve Maximum Operating Temperatures

Bolted Gland Design	350°F	177°C
Screwed Gland Design	350°F	177°C

Temperature Ratings

Recommended Pressure/Temperature Ratings for Nordstrom Iron Plug Valves

Temperature (°F)	Working Pressure (psig)		
	150	200	400
-20 to 150	150	200	400
200	135	190	370
225	130	180	355
250	125	175	340
275	120	170	325
300	110	165	310
325	105	155	295
353	100	150	280

Temperature (°C)	Working Pressure (bar)		
	10.3	13.8	28.0
-29 to 65	10.3	13.8	28.0
80	9.8	13.3	26.0
100	9.2	12.7	25.0
120	8.6	12.1	24.0
135	8.3	11.7	22.0
140	8.0	11.5	22.0
149	7.2	10.7	20.0
178	6.9	10.3	19.3

Carbon Steel Valve Pressure/Temperature Ratings

Pressure/Temperature Ratings (Carbon Steel – ASTM A105, ASTM 216 Grade WCB and ASTM A216 Grade WCC)

Service Temperature (°F)	Working Pressure by Classes (psig)			
	150	300	600	1500
-20 to 100	285	740	1480	3705
200	260	675	1350	3375
250	245	665	1333	3328
300	230	655	1315	3280
400	200	635	1270	3170
450	185	618	1235	3083

Pressure/Temperature Ratings (Carbon Steel – ASTM A105, ASTM 216 Grade WCB and ASTM A216 Grade WCC)

Service Temperature (°C)	Working Pressure by Rating Number (bar)			
	150	300	600	1500
-29 to 38	19.6	51.5	102.1	255.3
50	19.2	50..1	100.2	250.4
100	17.7	46.4	92.8	231.9
120	16.9	45.9	91.9	229.5
150	15.8	45.3	90.5	226.1
200	14.0	43.5	87.6	219.1
232	12.8	42.6	85.2	212.6

CAN/CSA Z245-15 Ratings

Service Temperature (°C)	Working Pressure by Rating Number (kPa)			
	PN 20	PN 50	PN 100	PN 250
-29 to 120	19.00	49.60	99.30	248.20

Typical Materials of Construction

Nordstrom Screwed Gland-Type Valves

Part Name	Standard Construction
Body	Gray Iron
Cover	Malleable Iron
Plug & Stem	Gray Iron
Gland	Carbon Steel
Cover Bolting	A449-SAE Grade 5
Gland/Stem Seals	Buna N[1]
Seal Holder	Carbon Steel
Gasket	Asbestos-Free Sheet Gasket Material
Diaphragm	Stainless Steel
Check Valve	Carbon Steel
Sealant Fitting	Carbon Steel
Washer	Carbon Steel
Weatherseal	Polyethylene

Nordstrom Bolted Gland-Type Valves

Part Name	Standard Construction
Body	Gray Iron
Cover	Hi Elon Iron[2]
Plug & Stem	Gray Iron
Gland	Hi Elon Iron
Cover Bolting	A449-SAE Grade 5
Gland Bolting/Nuts	A193 Grade B7/A307 Grade B
Gaskets	Asbestos-Free Sheet Gasket Material
Diaphragm	Stainless Steel
Gland/Stem Seals	Buna N[1]
Check Valve	Carbon Steel
Sealant Fitting	Carbon Steel

Notes:

[1] 4-way, 4-port multiport valves have silicone seals as standard construction.

[2] 200 CWP gear-operated valve covers are integral with the gear housing and are gray iron material. Some wrench-operated valve covers may be made from carbon steel material.

Super Nordstrom Valves

Part Name	Standard Construction
Body	A216 Grade WCB or A216 Grade WCC
Body End Flanges	A105 Forged
Cover	Carbon Steel
Plug and Stem	Carbon Steel
Gland	Carbon Steel
Cover Bolting	A193 Grade B7
Packing	Compound of Graphite and TFE
Controlled Dimension Washers	Stainless Steel
Spring	Stainless Steel
Gasket	Stainless Steel and Graphite
Stop Collar	Wrought Carbon Steel
Retainer Ring	Carbon Steel
Sealant Fitting	Carbon Steel
Check Valve	Carbon Steel
Weatherseal	Buna N

Dynamic Balance Valve Typical Materials of Construction

Size 4 and Smaller Multiport Valves

Part Name	Category A	Category B	Category C	Category D
Adjusting Screw	Alloy Steel			
Adjusting Screw Cap	Carbon Steel			
Ball	Stainless Steel		K-500 Monel	
Body[1]	A216 Grade WCC	A352 Grade LCC	A216 Grade WCC	A352 Grade LCC
Body End Flanges	A105 Forged	A350 Grade LF2	A105 Forged	A350 Grade LF2
Bolting – Cover	A193 Grade B7	A320 Grade L7	A193 Grade B7M	A320 Grade L7M
Bolting – Gland	A193 Grade B7	A320 Grade L7	A193 Grade B7M	A320 Grade L7M
Bolting – Gear Flange	A193 Grade B7	A320 Grade L7	A193 Grade B7M	A320 Grade L7M
Check Valve	Carbon Steel		Stainless Steel	
Cover[1]	Carbon Steel			
Diaphragm – Thick	Carbon Steel			
Diaphragm – Thin	Stainless Steel			
Equalizer	Alloy Steel		Alloy Steel .003" ENP	
Gasket	Graphite and Stainless Steel			
Gear Flange	Wrought Carbon Steel			
Gland	Ductile Iron			
Nameplate	Stainless Steel			
Packing	Graphite and Fluoropolymer Compound			
Plug	A48 Grade 45B/50B or Alloy Steel		Alloy Steel HRC 22 Maximum .003" ENP	
Retaining Ring	Carbon Steel			
Sealant Fitting	Carbon Steel			
Spring	Stainless Steel		Inconel X-750	
Stem[1] (Wrench Operated)	Stainless Steel		Stainless Steel HTC 33 Maximum	
Stem[1] (Gear Operated)	Wrought Carbon or Low Alloy Steel		Alloy Steel HRC 35 Maximum	
Stem Ring	Carbon Steel		Wrought Carbon Steel	
Stop Collar	Wrought Carbon Steel			
Thrust Button	Nickel Steel		Wrought Carbon Steel	
Weatherseal – Cover	Neoprene			
Weatherseal – Stem	Buna N			
Zinc Washer	Zinc			

[1] Category B and D valves are impact tested to 20/15 ft-lb values.

Size 6 and Larger Multiport Valves

Part Name	Category A	Category B	Category C	Category D
Adjusting Screw	Carbon Steel			
Adjusting Screw Cap	Carbon Steel			
Ball – Balance	Stainless Steel		K-500 Monel	
Ball – Thrust	Stainless Steel		K-500 Monel	
Ball Retaining Washer	Stainless Steel			
Ball Seat – Thrust	Alloy Steel		Stainless Steel – Stellite Hardfaced	
Bearing (Thrust Washer)	Glass/PTFE Fiber Carbon Steel Backed		Glass/PTFE Fiber Stainless Steel Backed	
Body[1]	A216 Grade WCC	A352 Grade LCC	A216 Grade WCC	A352 Grade LCC
Bolting – Cover	A193 Grade B7	A320 Grade L7	A193 Grade B7M	A320 Grade L7M
Bolting – Gland Retainer	A193 Grade B7	A320 Grade L7	A193 Grade B7M	A320 Grade L7M
Bolting – Adj. Screw Cover	SAE Gr 5			
Check Valve	Carbon Steel		Stainless Steel	
Cover[1]	Carbon Steel			
Diaphragm – Thick	Carbon Steel			
Diaphragm – Thin	Stainless Steel			
Equalizer	Alloy Steel		Alloy Steel .003" ENP	
Gasket – Cover	Carbon Steel			
Gasket – Adj. Screw Cover	ACCOPAC N 820			
Gland – Gear Operated	Gray Iron			
Gland Retainer	Carbon Steel			
Key	Carbon Steel			
Nameplate	Stainless Steel			
Packing	Graphite and Fluoropolymer Compound			
Plug	Alloy Steel		Alloy Steel HRC 22 Maximum .003" ENP	
Sealant Fitting	Carbon Steel			
Spring	Stainless Steel		Inconel X-750	
Stem[1] (Gear Operated)	Alloy Steel		Alloy Steel HRC 22 Maximum .003" ENP	
Stem Ring	Carbon Steel			
Thrust Button	Wrought Carbon Steel			
Weatherseal – Cover	Neoprene			
Zinc Washer	Zinc			

[1] Category B&D valves are impact tested to 20/15 ft-lb values.

[2] 100% hardness tested

United States
Nordstrom Valves
Flowserve Flow Control
1511 Jefferson Street
Sulphur Springs, TX 75482
Telephone: 903 885 3151
Fax: 903 439 3411

Latin America
Nordstrom Valves
Flowserve Flow Control
Telephone: 903 439 3407
Fax: 903 439 3411

Other Countries
Nordstrom Valves
Flowserve Flow Control
Telephone: 903 885 4692
Fax: 903 439 3404

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To find your local Flowserve representative:

For more information about Flowserve Corporation, visit www.flowserve.com or call USA 1 800 225 6989