

FLANGED BALL VALVES ASME CLASS 150 & 300

FULL BORE:

1/2" – 24" (DN 15 – 600) SERIES 9000

The Jamesbury® polymeric-seated flanged ball valves offer a patented flexible-lip seat design that provides positive bi-directional shut-off for a variety of applications in industries ranging from chemical and petrochemical to refining, pulp and paper, and power.

Polymeric-seated flanged ball valves are available in sizes 1/2" – 24" (DN 15 – 600) in both full-bore and standard-bore designs that fully conform to ASME B16.34 requirements.

A choice of body, trim, and seat materials is available to suit an extensive range of applications. As an option, valves can be prepared for special services, such as chlorine, oxygen, high-vacuum, hydrogen peroxide or NACE compliance.

Fire-Tite® Valves

Standard body and trim materials for *Fire-Tite* valves are carbon steel with 316 stainless steel trim and all 316 stainless steel. Seat material options are PTFE (T) and Xtreme® (X) for applications involving chemicals, petrochemicals, acids, caustics, and steam. PFA (B) seats are available to resist the effects of polymerizing monomers such as butadiene and styrene.

Non Fire-Tite Valves

Non *Fire-Tite* valves are available with UHMW (U) polyethylene and PEEK (L) seats.

CE Marked

CE marked and documented valves 9180/9380 which meet the European Pressure Equipment Directive (PED) 97/23/EC are available in ASME Class 150/300. CE marked products also meet the requirements of BS 5351, including static grounding. Operating torques, construction options and valve dimensions are exactly the same as the standard ASME 150/300 offering (see page 18 for ordering instructions).



FEATURES AND BENEFITS

- Xtreme seat provides longer life, expanded performance boundaries, and greater value.
- Polymeric flexible lip-seat design offers tight shut-off in either direction and extended cycle life with minimum maintenance.
- *Fire-Tite* version with non-metallic seats meets API 607, and BS6755-Part 2 requirements.
- Superior control characteristics, coupled with tight shut-off capabilities, make these valves ideal for a variety of on-off and control applications.
- API 608 compliance available to serve refineries and related chemical and petrochemical industries.
- NACE MR0103 compliance available.
- Available to meet over 30 standard and optional industry standards and specifications. (For details see page 19).

NEW FEATURES AND BENEFITS For 1/2" – 1-1/2" (DN 15 – 40) Series 9000

- New patented stem seal system is live loaded and engineered to assure long sealing life.
- ISO 5211 Bonnet for global conformity.
- New stainless steel linkage for VPVL, V, ADC, LCR and LCU actuators has a guided coupling to align top-works during assembly and eliminate side load stress on stem seals for long life, clean environment and reduced maintenance.

Single-Source Responsibility

- Valves, actuators and accessories may be purchased completely mounted from one source.

SPECIFICATIONS

Flow Data

The table at right provides flow coefficients for *Jamesbury* valves covered in this bulletin. C_v values represent the flow of water at +60°F through the valve in U.S. gallons per minute at a pressure drop of 1 psi. The metric equivalent, K_v , is the flow of water at 16°C through the valve in cubic meters per hour at a pressure drop of 1 kg/cm². To convert C_v to K_v , multiply by 0.8569.

Valve Size		C_v
Inches	DN	Full Bore
1/2	15	9
3/4	20	50
1	25	100
1-1/2	40	270
2	50	490
3	80	1160
4	100	2200
6	150	5100
8	200	9300
10	250	15,200
12	300	22,400
14	350	27,000
16	400	37,000
18	450	47,000
20	500	60,000

Valve Body Ratings

These are the maximum working pressure ratings of the valve body only. The seat ratings, shown on the next page, determine the practical temperature and pressure limitations according to actual service conditions. Test pressures are recommended pressures for hydrostatic test with ball half open.

Temp °F	Maximum Working Pressure, psi					
	Class 150				Class 300	
	Carbon steel*	316 Stainless steel*	Alloy 20*	Monel®	Carbon steel*	316 Stainless steel*
-20 to 100	285	275	230	230	740	720
200	260	235	200	200	675	620
300	230	215	190	190	655	560
400	200	195	190	185	635	515
500	170	170	170	170	600	480
Test Pressure	450	425	350	350	1125	1100

Temp °C	Maximum Working Pressure, bar					
	Class 150				Class 300	
	Carbon steel*	316 Stainless steel*	Alloy 20*	Monel	Carbon steel*	316 Stainless steel*
-29 to 38	19.6	19.0	15.9	15.9	51.1	49.6
93	17.7	16.2	13.5	13.5	46.6	42.2
149	15.8	14.8	13.1	13.1	45.1	38.5
204	13.8	13.7	13.1	13.1	43.8	35.7
260	11.7	11.7	11.7	11.7	41.9	33.4
Test Pressure	30	29	24	24	77	75

* In accordance with ASME B16.34

Valve Seat Ratings

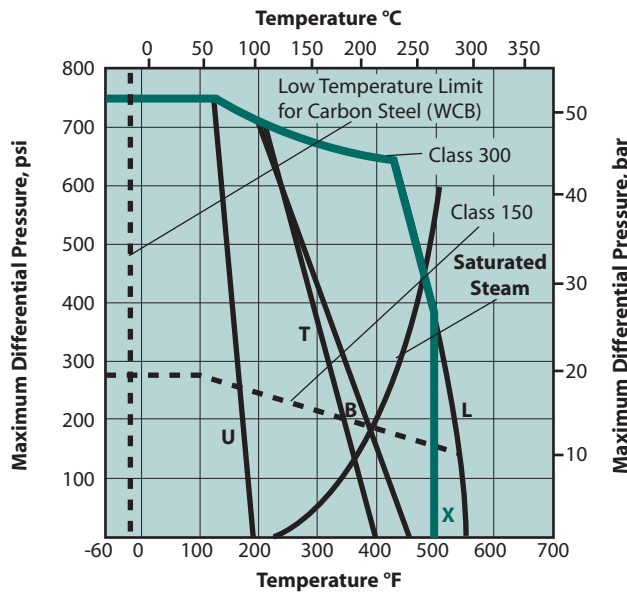
Seat ratings, indicated by solid lines in the charts on the next page, are based on differential pressure with the valve ball in the fully closed position and refer to seats only. The dotted lines indicate maximum working pressures for *WCB carbon steel* valve bodies. (Maximum working pressures of other body materials are shown in the tables above.) The combination of dotted and solid lines indicates the maximum valve rating at specific pressure and temperature conditions. Valves with PTFE, *Xtreme*, PEEK, PFA, and UHMW polyethylene seats can be used in service to -60°F (-51°C) provided that the valve body material is suitable for such a temperature. Carbon steel valves are rated to -20°F (-29°C).

On saturated steam service, stainless steel trim is recommended at all pressures and is required above 200 psi (14 bar). See Bulletin B150-1. PEEK seats require 17-4 PH stainless steel stems. For more application information on seat materials, refer to Bulletin T140-1.

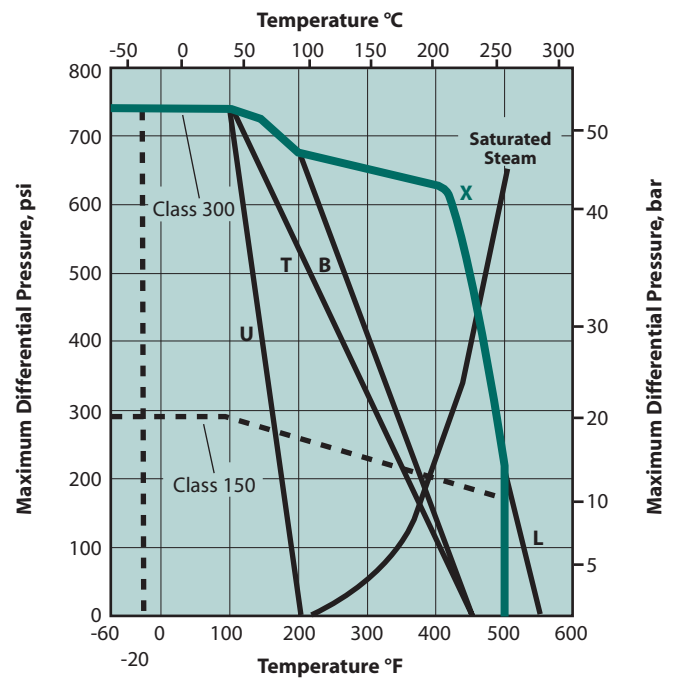
Xtreme Performance and Value

Xtreme seats provide longer life, expanded performance boundaries, and the greatest possible value. *Xtreme* is a unique material that resulted from a technological breakthrough in our polymer research lab. The material is a fluoro-polymer-based blend proprietary to *Jamesbury* that provides superior quarter-turn performance.

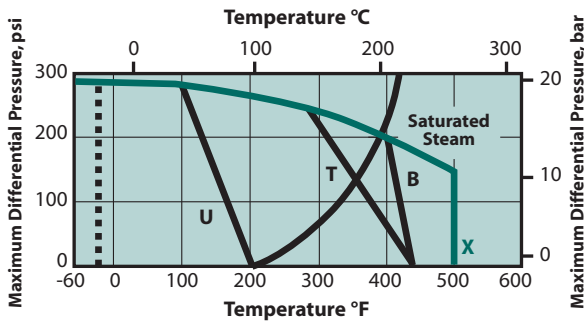
1/2" – 1-1/2" (DN 15 – 40) Full Bore



2" – 4" (DN 50 – 100) Full Bore

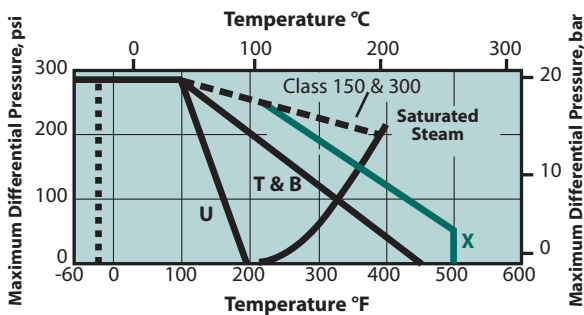


6" (DN 150) Full Bore Non-Trunnion



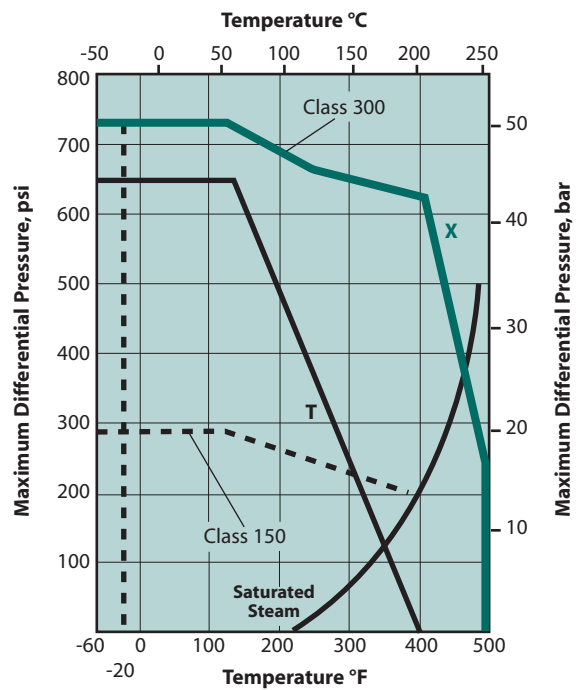
* ASME Class 300 Non-Trunnion is 275 psi (19 bar) max.

8" (DN 200) Full Bore Non-Trunnion



* ASME Class 300 Non-Trunnion is 275 psi (19 bar) max.

**Trunnion Valves
6" – 24" (DN 150 – 600) Full Bore**



LEGEND:

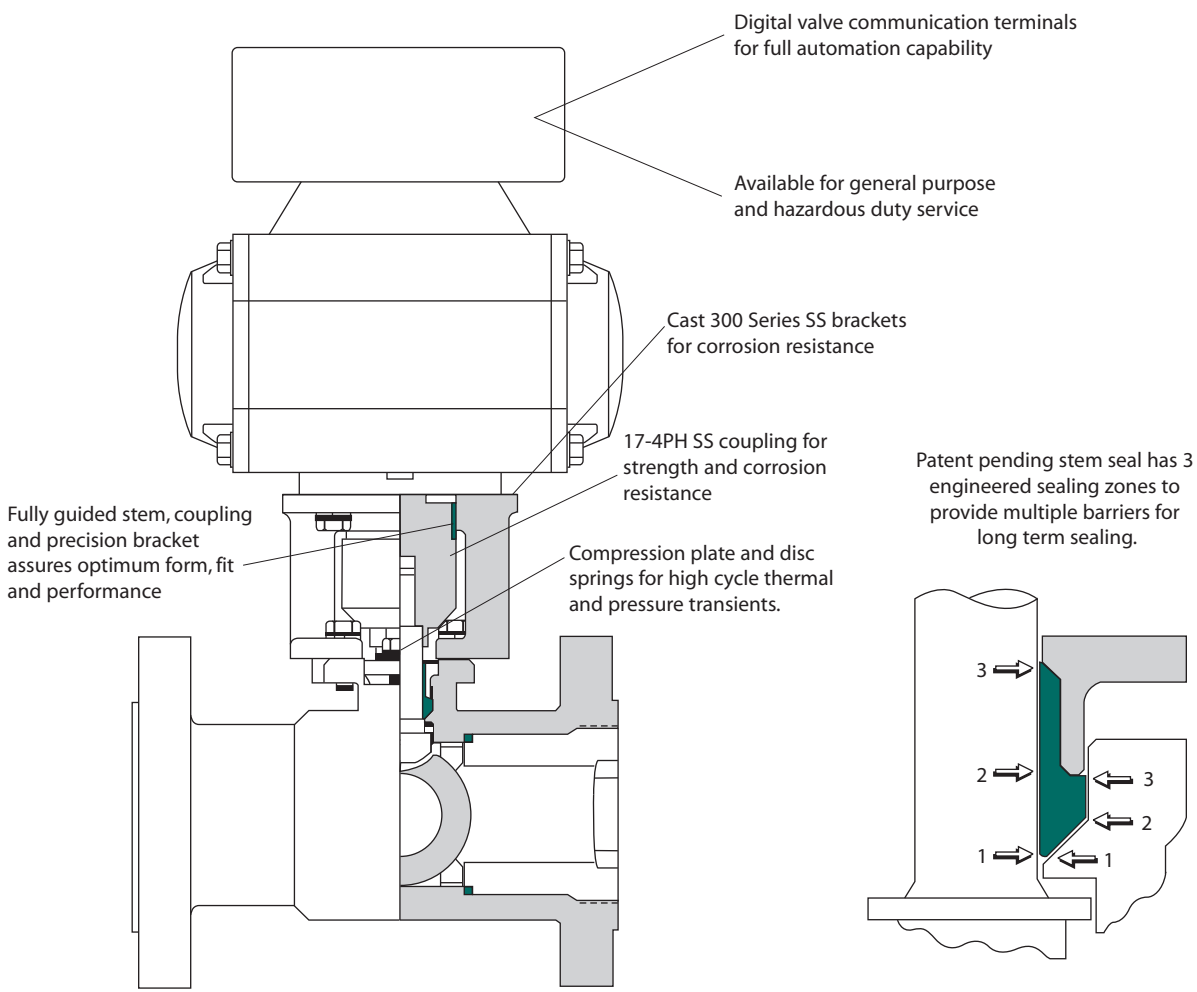
T = PTFE
U = UHMW

U = UHMW

B = PFA
X = Xtreme

Jamesbury 'The Ultimate Process Automation Package' for VPVL Pneumatic Actuators, V-Series, ADC-Series, LC Series, ESR-Series, Q6-Series and QX-Series Electric Actuators

For 1/2" – 1-1/2" (DN 15 – 40) Full Port Series 9000



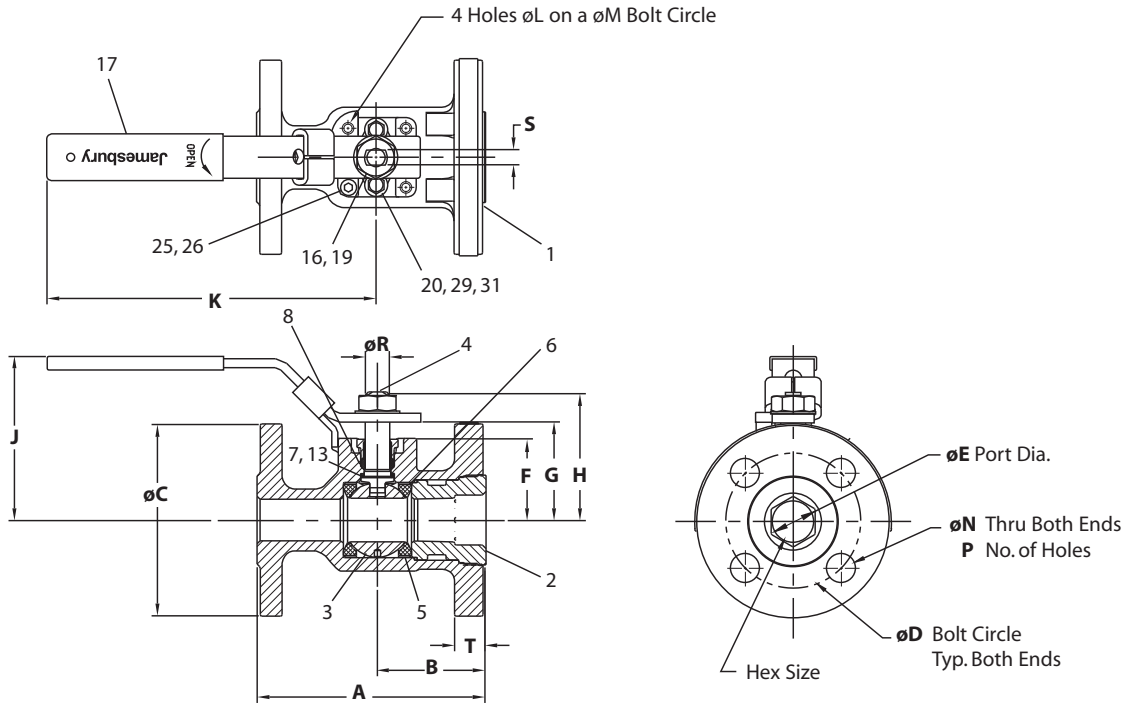
Automation Performance and Value

Valves combined with *Jamesbury* actuators offer a total value and performance package. Available with pneumatic Valv-Powr® VPVL actuators, V-Series, ADC-Series, LC Series, ESR-Series, Q6-Series and QX-Series electric actuators and

with StoneL® Quartz® and Hawkeye® digital monitors or VCTs, the packages have a wide range of applications. Visit our website at: www.metso.com/valves.

DIMENSIONS

1/2" – 1-1/2" (DN 15 – 40) Series 9150 ASME Class 150 and Series 9300 ASME Class 300 Valves



Valve Size inches	Series 9150 ASME Class 150 Approximate Dimensions - inches																Hex Size	ISO Bonnet	Approx Weight lb	
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T			
1/2	4.25	1.94	3.50	2.38	0.50	1.06	1.33	1.63	3.38	5.00	M5	1.42	0.62	4	0.31	0.18	0.50	0.50	F03	3.5
3/4	4.63	2.19	3.88	2.75	0.88	1.65	2.04	2.58	3.69	6.50	M5	1.65	0.62	4	0.50	0.31	0.63	0.88	F04	10
1	5.00	2.19	4.25	3.12	1.00	1.78	2.17	2.71	3.94	6.50	M5	1.65	0.62	4	0.50	0.31	0.63	1.00	F04	13
1-1/2	6.50	2.64	5.00	3.88	1.50	2.26	2.78	3.49	4.46	8.00	M6	1.97	0.62	4	0.62	0.37	0.69	1.50	F05	17

Valve Size DN	Series 9150 ASME Class 150 Approximate Dimensions - mm																Hex Size	ISO Bonnet	Approx Weight kg	
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T			
15	108	49	89	60	13	27	34	41	86	127	M5	36	16	4	8	5	13	13	F03	1.6
20	118	56	99	70	22	42	52	66	94	165	M5	42	16	4	13	8	16	22	F04	4.5
25	127	56	108	79	25	45	55	69	100	165	M5	42	16	4	13	8	16	25	F04	5.9
40	165	67	127	99	38	57	71	89	113	203	M6	50	16	4	16	9	18	38	F05	7.7

Valve Size inches	Series 9300 ASME Class 300 Approximate Dimensions - inches																Hex Size	ISO Bonnet	Approx Weight lb	
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T			
1/2	5.50	1.94	3.75	2.62	0.50	1.06	1.33	1.63	3.38	5.00	M5	1.42	0.62	4	0.31	0.18	0.56	0.50	F03	6
3/4	6.00	2.19	4.63	3.25	0.88	1.65	2.04	2.58	3.69	6.50	M5	1.65	0.75	4	0.50	0.31	0.63	0.88	F04	13
1	6.50	2.19	4.88	3.50	1.00	1.78	2.17	2.71	3.94	6.50	M5	1.65	0.75	4	0.50	0.31	0.69	1.00	F04	17
1-1/2	7.50	2.64	6.13	4.50	1.50	2.26	2.78	3.49	4.46	8.00	M6	1.97	0.88	4	0.62	0.37	0.81	1.50	F05	22

Valve Size DN	Series 9300 ASME Class 300 Approximate Dimensions - mm																Hex Size	ISO Bonnet	Approx Weight kg	
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T			
15	140	49	95	67	13	27	34	41	86	127	M5	36	16	4	8	5	14	13	F03	2.7
20	152	56	118	83	22	42	52	66	94	165	M5	42	19	4	13	8	16	22	F04	5.9
25	165	56	124	89	25	45	55	69	100	165	M5	42	19	4	13	8	18	25	F04	7.7
40	190	67	156	114	38	57	71	89	113	203	M6	50	22	4	16	9	21	38	F05	10.0

BILLS OF MATERIALS AND PARTS LIST			
Fire-Tite 1/2" – 1-1/2" (DN 15 – 40) Full Bore Series 9000 Valves			
Part No.	Part Name	Body Material	
		Carbon Steel (22)	316 Stainless Steel (36)
1	Body	Carbon steel ASTM A216 Type WCB	316 Stainless steel ASTM A351 Type CF8M
2	Insert	Carbon steel ASTM A216 Type WCB	316L Stainless steel ASTM A351 Type CF3M
3	Ball	316 Stainless steel ⁺	
4	Stem	316 Stainless steel ⁺	
5	Seat	PTFE, Xtreme, PFA, as specified	
6	Body Seal	TFM	
7	Secondary Stem Seal	Graphite	
8	Primary Stem Seal	PTFE, TFM (Xtreme seated valves), UHMWPE (w/UHMWPE seats)	
13	Stem Bearing	Filled PTFE	
16	Hex Nut	Carbon steel (zinc plated)	300 Series Stainless steel
17	Handle	Carbon steel (zinc plated)	300 Series Stainless steel
19	Lockwasher	Carbon steel (zinc plated)	300 Series Stainless steel
20	Compression Plate ²	316 Stainless steel	
25	Socket Cap Screw	300 Series Stainless steel	
26	Handle Stop Spacer	300 Series Stainless steel	
29	Hex Cap Screw ²	300 Series Stainless steel	
31	Disc Springs	Inconel	
Non Fire-Tite 1/2" – 1-1/2" (DN 15 – 40) Full Bore Series 9000 Valves			
Part No.	Part Name	Body Material	
		Carbon Steel (22)	316 Stainless Steel (36)
1	Body	Carbon steel ASTM A216 Type WCB	316 Stainless steel ASTM A351 Type CF8M
2	Insert	Carbon steel ASTM A216 Type WCB	316L Stainless steel ASTM A351 Type CF3M
3	Ball	316 Stainless steel ⁺	
4	Stem	316 Stainless steel ⁺ or 17-4 PH Stainless steel ¹	
5	Seat	PTFE, PEEK, UHMWPE, as specified	
6	Body Seal	TFM, UHMWPE (w/UHMWPE seats), Graphite (w/PEEK seats)	
8	Primary Stem Seal	TFM (w/Xtreme seats), PTFE (w/PTFE seats), Graphite (w/PEEK seats), UHMWPE (w/UHMWPE seats)	
10	Stem Guide	PEEK (PEEK seated valves)	
16	Hex Nut	316 Stainless steel	
17	Handle	Carbon steel (zinc plated)	300 Series Stainless steel
19	Lockwasher	300 Series Stainless steel	
20	Compression Plate ²	316 Stainless steel	
24	Stem Bearing	Filled PTFE (PEEK when PEEK seated), UHMWPE (w/UHMWPE seats)	
25	Socket Cap Screw	300 Series Stainless steel	
26	Handle Stop Spacer	300 Series Stainless steel	
29	Hex Cap Screw ²	300 Series Stainless steel	
31	Disc Springs	Inconel	
# Requires 17-4 PH stem			

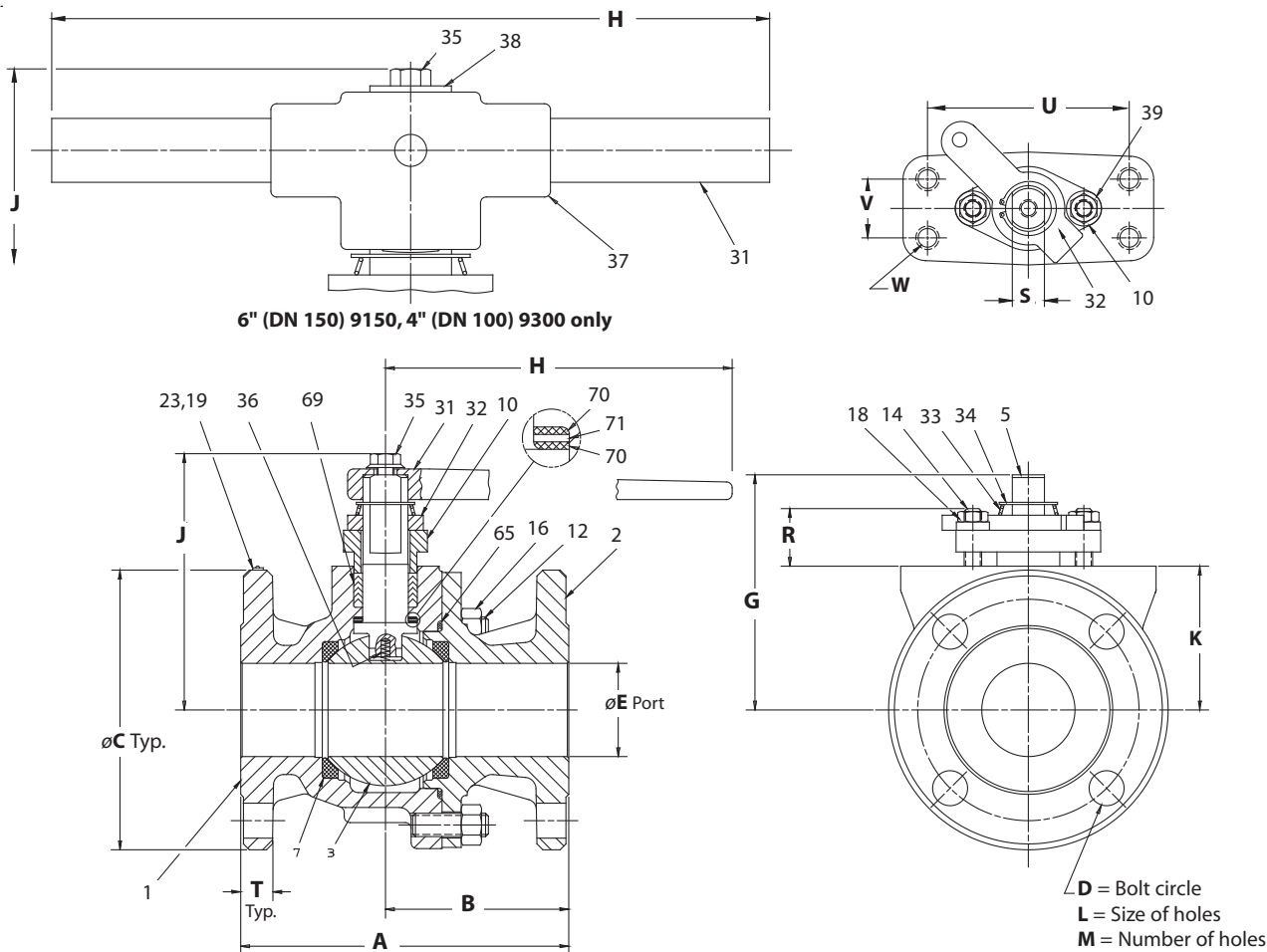
Note 1: 17-4 PH stems required with PEEK seats.

Note 2: When trim is Monel or Hastelloy C, compression plate and hex cap screws are Monel.

+ Furnished with valves for NACE MR0103 service.

DIMENSIONS

2" – 6" (DN 50 – 150) Series 9150, 2" – 4" (DN 50 – 100) Series 9300



Valve Size inches	Series 9150 ASME Class 150 Approximate Dimensions - inches																	Weight lb	
	A	B	C	D	E	G	H	J	K	L	M	N	R	S	T	U	V		W
2	7.00	3.89	6.00	4.75	2.00	5.05	14.00	5.50	3.09	0.75	4	0.97	1.24	0.69	0.69	4.33	1.26	1/2-13	29
3	8.00	4.09	7.50	6.00	3.00	5.87	14.00	6.32	3.90	0.75	4	0.97	1.24	0.69	0.81	4.33	1.26	1/2-13	49
4	9.00	4.48	9.00	7.50	4.00	8.32	19.94	8.78	5.51	0.75	8	1.36	1.78	0.97	1.00	5.10	1.26	1/2-13	89
6	15.50	8.25	11.00	9.50	6.00	10.70	30.00	11.65	7.28	0.88	8	1.75	1.78	1.25	1.06	6.30	1.58	5/8-11	244

Valve Size DN	Series 9150 ASME Class 150 Approximate Dimensions - mm																	Weight kg	
	A	B	C	D	E	G	H	J	K	L	M	N	R	S	T	U	V		W*
50	178	99	152	121	50	128	356	140	78	19	4	25	31	18	18	110	32	1/2-13	13
80	203	104	191	152	76	149	356	161	99	19	4	25	31	18	21	110	32	1/2-13	22
100	229	114	229	191	102	211	506	223	140	19	8	35	45	25	25	130	32	1/2-13	40
150	394	216	279	241	152	272	762	296	185	22	8	44	45	32	27	160	40	5/8-11	110

* Screw-thread dimensions are in inches

Valve Size inches	Series 9300 ASME Class 300 Approximate Dimensions - inches																		Weight lb
	A	B	C	D	E	G	H	J	K	L	M	N	R	S	T	U	V	W	
2	8.50	4.99	6.50	5.00	2.00	5.05	14.00	5.50	3.09	0.75	8	0.97	1.24	0.69	0.94	4.33	1.26	1/2-13	37
3	11.12	6.41	8.25	6.63	3.00	7.50	19.94	7.95	4.69	0.88	8	1.36	1.78	0.97	1.18	5.10	1.26	1/2-13	77
4	12.00	6.59	10.00	7.88	4.00	9.08	30.00	10.03	5.66	0.88	8	1.75	1.78	1.25	1.31	6.30	1.58	5/8-11	136

Valve Size DN	Series 9300 ASME Class 300 Approximate Dimensions - mm																		Weight kg
	A	B	C	D	E	G	H	J	K	L	M	N	R	S	T	U	V	W*	
50	216	127	165	127	51	128	356	140	78	19	8	25	31	18	24	110	32	1/2-13	17
80	282	163	210	168	76	191	506	202	119	22	8	35	44	25	30	130	32	1/2-13	35
100	305	167	254	200	102	231	762	255	144	22	8	44	44	32	33	160	40	5/8-11	62

* Screw-thread dimensions are in inches

BILLS OF MATERIALS AND PARTS LIST			
2" – 6" (DN 50 – 150) Series 9150, 2" – 4" (DN 50 – 100) Series 9300			
Part No.	Part Name	Body Material	
		Carbon Steel	316 Stainless Steel
1	Body	Carbon steel ASTM A216 Type WCB	316 Stainless steel ASTM A351 Type CF8M
2	Body Cap	Carbon steel ASTM A216 Type WCB	316 Stainless steel ASTM A351 Type CF8M
3	Ball	+316 Stainless steel, Monel ¹ , Hastelloy C ¹ - as specified	
5	Stem ³	+316 Stainless steel, Monel ¹ , Hastelloy C ¹ , 17-4 PH Stainless steel - as specified	
7	Seat	<i>Xtreme</i> , PTFE, PFA, PEEK ^{3,4} , UHMW Polyethylene - as specified	
10	Compression Plate ¹	Stainless steel Monel ¹	
12	Body Stud	ASTM A193 Gr. B7; +Gr B7M; <u>B8</u> , <u>B8C</u> , <u>B8T</u> or <u>B8M</u>	
14	Bonnet Stud	ASTM A193 Gr. B7; +Gr B7M; <u>B8</u> , <u>B8C</u> , <u>B8T</u> or <u>B8M</u>	
16	Body Stud Nut	ASTM A194 Gr. 2H; +Gr 2HM; Gr <u>8B</u> , <u>8CB</u> , <u>8MB</u> , <u>8TB</u> , <u>8FB</u>	
18	Bonnet Stud Nut	ASTM A194 Gr. 2H; +Gr 2HM; Gr <u>8B</u> , <u>8CB</u> , <u>8MB</u> , <u>8TB</u> , <u>8FB</u>	
19	Identification Tag	Stainless steel	
23	Rivet	Stainless steel	
31	Handle	Ductile iron ² or carbon steel	
32	Indicator Stop	Carbon steel	
33	Spring	Stainless steel	
34	Retaining Ring	Stainless steel	
35	Handle Screw	Carbon steel	
36	Grounding Spring	Inconel	
37	"T" Handle Adapter ²	Ductile iron	
38	Flat Washer ²	Carbon steel	
39	Stop Bushing ¹	316 Stainless steel	
65	Body Gasket ¹	Spiral wound PTFE/316 Stainless steel ¹	
69	Packing	PTFE, molecularly enhanced PTFE (<i>Xtreme</i> -seated valves)	
70	Stem Bearing	Filled PTFE	
71	Secondary Stem Seal	Graphite	

Note 1: Compression plate, body gasket, and stop bushing are Monel for valves with Monel or Hastelloy C trim.

Note 2: 6" (DN 150) Series 9150, 8" (DN 200) Series 7150, & 4" (DN 100) Series 9300 only.

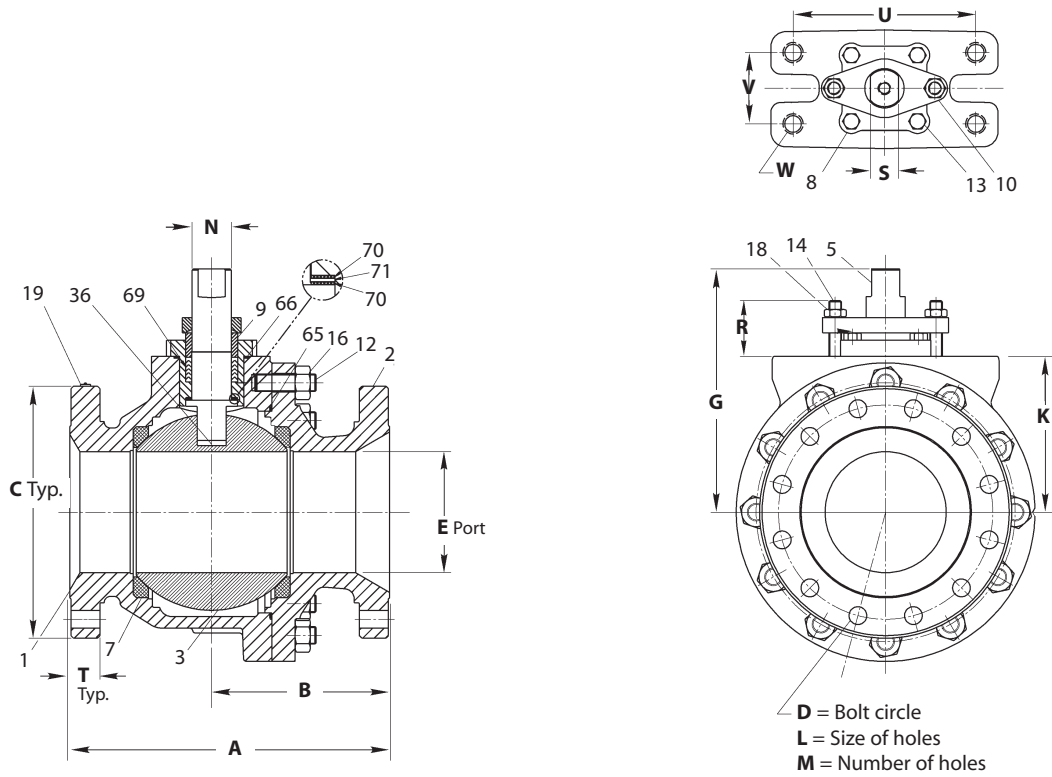
Note 3: 17-4 PH stems are required with PEEK seats.

Note 4: Not available 6" (DN 150) 9150

+ Furnished with valves for NACE MR0103 service.

DIMENSIONS

8" (DN 200) Series 9150, 6" & 8" (DN 150 & 200) Series 9300 (Non-Trunnion)



8" 9300 also available in long version (930L) with 19.750 face-to-face dimension.

Valve Size inches	Series 9150 ASME Class 150 Approximate Dimensions - inches															Weight lb	
	A	B	C	D	E	G	K	L	M	N	R	S	T	U	V		W
8	18.00	8.97	13.50	11.75	8.00	15.60	10.22	0.88	8	2.54	2.88	1.82	1.18	9.06	3.54	1-8	300

Valve Size DN	Series 9150 ASME Class 150 Approximate Dimensions - mm															Weight kg	
	A	B	C	D	E	G	K	L	M	N	R	S	T	U	V		W*
200	457	228	343	298	203	396	260	22	8	65	76	46	30	230	90	1-8	136

Valve Size inches	Series 9300 & 930L ASME Class 300 Approximate Dimensions - inches															Weight lb	
	A	B	C	D	E	G	K	L	M	N*	R	S	T	U	V		W
6	15.88	8.84	12.50	10.63	6.00	12.07	7.74	0.88	12	1.95	2.76	1.39	1.50	9.06	3.54	1-8	327
8	16.50	8.22	15.00	13.00	8.00	15.60	10.22	1.00	12	2.54	2.88	1.82	1.64	9.06	3.54	1-8	560

Valve Size DN	Series 9300 & 930L ASME Class 300 Approximate Dimensions - mm															Weight kg	
	A	B	C	D	E	G	K	L	M	N*	R	S	T	U	V		W*
150	403	225	318	270	152	307	197	22	12	50	70	35	38	230	90	1-8	149
200	419	209	381	336	203	396	260	25	12	65	73	46	42	230	90	1-8	255

* Screw-thread dimensions are in inches

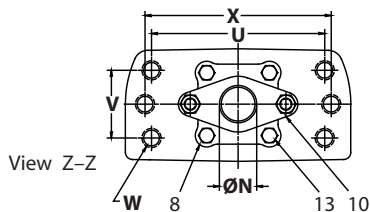
BILLS OF MATERIALS AND PARTS LIST			
8" (DN 200) Series 9150, 6" & 8" (DN 150 & 200) Series 9300 & 930L (Non-Trunnion)			
Part No.	Part Name	Body Material	
		Carbon Steel	316 Stainless Steel
1	Body	Carbon steel ASTM A216 Gr WCB	316 Stainless steel ASTM A351 Gr CF8M
2	Body Cap	Carbon steel ASTM A216 Gr WCB	316 Stainless steel ASTM A351 Gr CF8M
3	Ball	+316 Stainless steel, Alloy 20, Monel ¹ , Hastelloy C ¹ - as specified	
5	Stem	+316 Stainless steel, Monel ¹ , Hastelloy C ¹ , 17-4 PH - as specified	
7	Seat	Xtreme, PTFE	
8	Stem Retainer	Carbon steel	Stainless steel
9	Gland Follower ¹	Carbon steel, Stainless steel, Monel ¹	
10	Compression Plate ¹	Stainless steel, Monel	
12	Body Stud	ASTM A193 Gr B7; +Gr B7M; Gr <u>B8</u> , <u>B8C</u> , <u>B8T</u> or <u>B8M</u>	
13	Stem Retainer Cap Screw	ASTM A193 Gr B7; +Gr B7M; Gr <u>B8</u> , <u>B8C</u> , <u>B8T</u> or <u>B8M</u>	
14	Stud	ASTM A193 Gr B7; +Gr B7M; Gr <u>B8</u> , <u>B8C</u> , <u>B8T</u> or B8M	
16	Nut	ASTM A194 Gr 24; +Gr 2HM; Gr <u>8B</u> , <u>8CB</u> , <u>8MB</u> , <u>8TB</u> , <u>8FB</u>	
18	Nut	ASTM A194 Gr 2H; +Gr 2HM; Gr <u>8B</u> , <u>8CB</u> , <u>8MB</u> , <u>8TB</u> , <u>8FB</u>	
19	Identification Tag	Stainless steel	
36	Grounding Spring	Inconel	
37	Caution Tag	PTFE	
65	Body Gasket ¹	Spiral Wound PTFE / 316 Stainless steel ¹	
66	Stem Retainer ¹	Spiral Wound PTFE / 316 Stainless steel ¹	
69	Packing	PTFE, molecularly enhanced PTFE (Xtreme-seated valves)	
70	Stem Bearing	PTFE	
71	Secondary Stem Seal	Graphite	

Note 1: Compression plate, body gasket, stem retainer, and gland follower are Monel for valves with Monel or Hastelloy C trim.

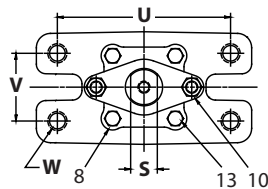
+ Furnished with valves for NACE MR0103 service.

DIMENSIONS

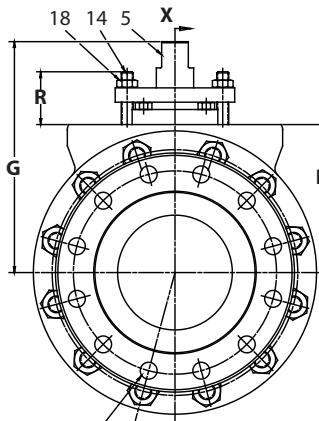
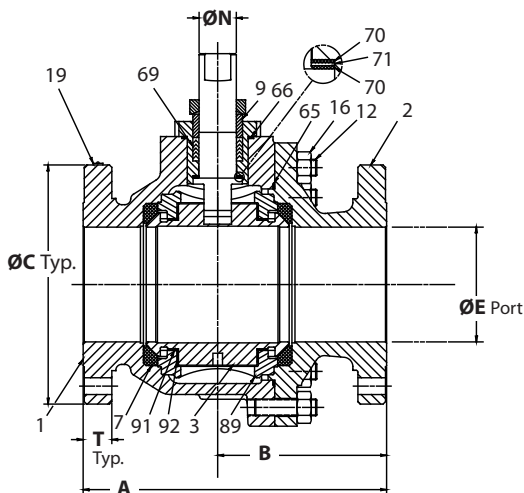
8", 10", & 12" (DN 200, 250, 300) Series 9150, 6", 8", 10" & 12" (DN 150, 200, 250, 300) Series 9300 (Trunnion)



10" & 12" (DN 250 & 300) Class 150 & 300



8" (DN 250) Class 150
6" & 8" (DN 150 & 200) Class 300



D = Bolt circle
L = Size of holes
M = Number of holes

8" 9300 also available in long version (930L) with 19.750 face-to-face dimension.

Valve Size inches	Series 9150 ASME Class 150 Approximate Dimensions - inches																	Weight lb
	A	B	C	D	E	G	K	L	M	N	R	S	T	U	V	W	X	
8	18.00	8.97	13.50	11.75	8.00	15.60	10.22	0.88	8	2.54	2.88	1.82	1.18	9.06	3.54	1-8	N/A	300
10	21.00	10.90	16.00	14.25	10.00	23.39	11.82	1.00	12	2.76	3.38	N/A	1.19	12.10	4.72	1¼-7	12.99	710
12	24.00	11.96	19.00	17.00	12.00	25.11	13.44	1.00	12	3.00	3.63	N/A	1.25	12.10	4.72	1¼-7	12.99	1089

Valve Size DN	Series 9150 ASME Class 150 Approximate Dimensions - mm																	Weight kg
	A	B	C	D	E	G	K	L	M	N	R	S	T	U	V	W*	X	
200	457	228	343	298	203	370	260	22	8	65	76	35	30	230	90	1-8	N/A	136
250	533	276	406	362	254	594	300	25	12	70	86	N/A	30	307	120	1¼-7	330	322
300	610	304	483	432	305	638	341	25	12	76	92	N/A	32	307	120	1¼-7	330	494

Valve Size inches	Series 9300/930L ASME Class 300 Approximate Dimensions - inches																	Weight lb
	A	B	C	D	E	G	K	L	M	N	R	S	T	U	V	W	X	
6	15.88	8.84	12.50	10.63	6.00	12.07	7.74	0.88	12	1.95	2.76	1.39	1.50	9.06	3.54	1-8	N/A	310
8	16.50	8.26	15.00	13.00	8.00	15.60	10.22	1.00	12	2.54	3.00	1.82	1.64	9.06	3.54	1-8	N/A	560
10	22.38	12.19	17.50	15.25	10.00	23.39	11.82	1.13	16	2.75	3.38	2.75	1.88	12.10	4.72	1¼-7	12.99	968
12	25.50	14.02	20.50	17.75	12.00	25.11	13.44	1.25	16	3.00	3.63	3.00	2.00	12.10	4.72	1¼-7	12.99	1496

Valve Size DN	Series 9300/930L ASME Class 300 Approximate Dimensions - mm																	Weight kg
	A	B	C	D	E	G	K	L	M	N	R	S	T	U	V	W*	X	
150	403	225	318	270	152	307	197	22	12	50	70	35	38	230	90	1-8	N/A	141
200	419	210	381	336	203	396	260	25	12	65	76	46	42	230	90	1-8	N/A	255
250	568	310	445	387	254	594	300	29	16	70	86	70	48	307	120	1¼-7	330	439
300	648	356	521	451	305	638	341	32	16	76	92	76	51	307	120	1¼-7	330	679

* Screw-thread dimensions are in inches

BILLS OF MATERIALS AND PARTS LIST			
Series 9150, 6" – 12" (DN 150 – 300) Series 9300 (Trunnion)			
Part No.	Part Name	Body Material	
		Carbon Steel (22) All Series	316 Stainless Steel (36) All Series
1	Body	Carbon steel ASTM A216 Gr WCB	316 Stainless steel ASTM A351 Gr CF8M
2	Body Cap	Carbon steel ASTM A216 Gr WCB	316 Stainless steel ASTM A351 Gr CF8M
3	Ball	+316 Stainless steel, Alloy 20, Monel ¹ , Hastelloy C ¹ - as specified	
5	Stem	+316 Stainless steel, Monel ¹ , Hastelloy C ¹ , 17-4 PH - as specified	
7	Seat	<i>Xtreme</i> , PTFE - as specified	
8	Stem Retainer	Carbon steel ASTM A216 Gr WCB	Stainless steel ASTM A351 Gr CF8M
9	Gland Follower ¹	Carbon Steel, Stainless steel, Monel ¹	
10	Compression Plate ¹	Stainless steel, Monel ¹	
12	Body Stud	ASTM A193 Gr B7; +Gr B7M; Gr <u>B8</u> , <u>B8C</u> , <u>B8T</u> or <u>B8M</u>	
13	Stem Retainer Bolt	ASTM A193 Gr B7; +Gr B7M; Gr <u>B8</u> , <u>B8C</u> , <u>B8T</u> or <u>B8M</u>	
14	Stud	ASTM A193 Gr B7; +Gr B7M; Gr <u>B8</u> , <u>B8C</u> , <u>B8T</u> or <u>B8M</u>	
16	Nut	ASTM A194 Gr 24; +Gr2HM; Gr <u>8B</u> , <u>8CB</u> , <u>8MB</u> , <u>8TB</u> , <u>8FB</u>	
18	Nut	ASTM A194 Gr 2H; +Gr 2HM; Gr <u>8B</u> , <u>8CB</u> , <u>8MB</u> , <u>8TB</u> , <u>8FB</u>	
19	Identification Tag	Stainless steel	
23	Rivet	Stainless steel	
36	Grounding Spring ²	Inconel	
65	Body Gasket ¹	Spiral Wound PTFE / 316 Stainless steel ¹	
66	Stem Retainer Seal ¹	Spiral Wound PTFE / 316 Stainless steel ¹	
69	Packing	PTFE, molecularly enhanced PTFE (<i>Xtreme</i> -seated valves)	
70	Stem Bearing	Filled PTFE	
71	Secondary Stem Seal	Graphite	
89	Trunnion	Carbon Steel	Stainless steel
91	Bearing Spacer	Filled PTFE	
92	Trunnion Bearing	316 Stainless steel	

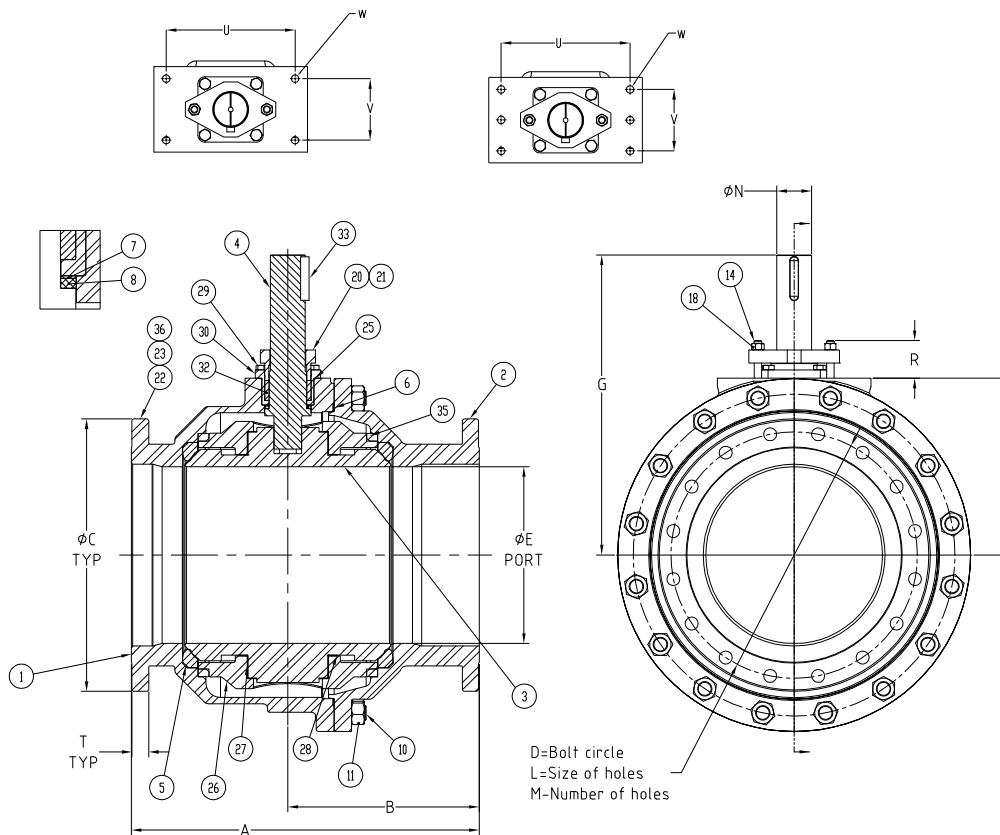
Note 1: Compression plate, body gasket, stem retainer gasket, and gland follower are Monel for valves with Monel or Hastelloy C trim.

Note 2: For grounding valves only.

+ Furnished with valves for NACE MR0103.

DIMENSIONS

14" – 24" (DN 350 – 600) SERIES 9150, 14 – 24" (DN 350 – 600) SERIES 9300 (Trunnion)



Valve Size	Series 9150 ASME Class 150 Approximate Dimensions – inches															Weight
inches	A	B	C	D	E	G	K	L	M	N	R	T	U	V	W	lb
14	27.00	14.25	21.00	18.75	13.25	24.21	13.88	1.13	12	3.00	3.25	1.31	11.13	3.25	3/4-10	1470
16	30.00	16.50	23.50	21.25	15.25	25.88	15.25	1.13	16	3.00	3.25	1.38	11.13	5.30	3/4-10	1900
18	34.00	18.00	25.00	22.75	17.25	26.82	17.38	1.25	16	3.50	4.00	1.5	13.00	7.00	3/4-10	2800
20	36.00	19.38	27.50	25.00	19.25	29.13	18.25	1.25	20	3.50	4.00	1.62	15.00	7.00	3/4-10	3500
24	42.00	21.06	32.00	29.50	23.25	31	20.00	1.38	20	3.75	4.00	1.81	15.00	7.00	7/8-9	on application

Valve Size	Series 9150 ASME Class 150 Approximate Dimensions – mm															Weight
DN	A	B	C	D	E	G	K	L	M	N	R	T	U	V	W*	kg
350	686	362	533	476	337	615	353	29	12	76	83	33	254	83	3/4-10	667
400	762	419	597	540	387	657	387	29	16	76	83	35	283	135	3/4-10	862
450	864	457	635	578	438	681	441	32	16	89	102	38	330	178	3/4-10	1270
500	914	492	699	635	489	740	464	32	20	89	102	41	330	178	3/4-10	1588
600	1067	535	813	749	590	787	508	35	20	95	102	46	381	178	7/8-9	on application

Valve Size	Series 9300 ASME Class 300 Approximate Dimensions – inches															Weight
inches	A	B	C	D	E	G	K	L	M	N	R	T	U	V	W	lb
14	30.00	17.25	23.00	20.25	13.25	24.94	14.00	1.25	20	3.50	4.00	2.06	13.00	7	3/4-10	2000
16	33.00	17.63	25.50	22.50	15.25	26.12	15.19	1.38	20	3.50	4.00	2.19	13.00	7	3/4-10	2480
18	36.00	19.28	28.00	24.00	17.25	28.78	15.13	1.38	24	3.50	4.50	2.31	15.00	7	7/8-9	3400
20	Contact Factory															
24	45.00	22.50	36.00	32.00	23.25	32	21.06	1.63	24	3.75	4.63	2.69	15.00	7	7/8-9	on application

Valve Size	Series 9300 ASME Class 300 Approximate Dimensions – mm															Weight
DN	A	B	C	D	E	G	K	L	M	N	R	T	U	V	W*	kg
350	762	438	584	514	336	633	356	32	20	89	102	52	330	178	3/4-10	907
400	838	448	648	572	387	663	386	35	20	89	102	56	330	178	3/4-10	1125
450	914	490	711	610	438	731	384	35	24	89	114	59	381	178	7/8-9	1542
500	Contact Factory															
600	1143	572	914	813	590	813	535	41	24	95	118	68	381	178	7/8-9	on application

* Screw-thread dimensions are in inches

BILLS OF MATERIALS AND PARTS LIST			
14" – 24" (DN 350 – 600) Series 9150, 14" – 24" (DN 350 – 600) Series 9300 Full-Bore Valves			
Part No.	Part Name	Body Material	
		Carbon Steel (22) All Series	316 Stainless Steel (36)
1	Body	Carbon steel ASTM A216 Type WCB	316 stainless steel ASTM A351 Type CF8M
2	Body Cap	Carbon steel ASTM A216 Type WCB	316 stainless steel ASTM A351 Type CF8M
3	Ball	Alloy 20, +316 Stainless steel, Monel ¹ , Hastelloy C ¹ - as specified	
4	Stem	Alloy 20, +316 Stainless steel, Monel ¹ , Hastelloy C ¹ -as specified	
5	Seat	PTFE or filled PTFE	
6	Body Seal ¹	Spiral wound PTFE/316 Stainless steel ¹	
7	Secondary Stem Seal	Graphite	
8	Stem Bearing	Filled PTFE	
10	Body Stud	ASTM A193 Gr. B7; +Gr. B7M; or Gr. B8, B8C, B8T or B8M	
11	Nut	ASTM A194 Gr. 2H; Gr. 2HM; or Gr. 8B, 8CB, 8MB, 8TB , or 8FB	
14	Hex Head Cap Screw	ASTM A193 Gr. B7; +Gr. B7M; or Gr. B8, B8C, B8T or B8M	
18	Nut	ASTM A194 Gr. 2H; Gr. 2HM; or Gr. 8B, 8CB, 8MB, 8TB , or 8FB	
20	Compression Plate ¹	Carbon steel	Stainless steel
21	Compression Ring	Stainless steel	
22	Identification Tag	Stainless steel	
23	Drive Screw	Stainless steel	
25	Stem Retainer Seal	Graphite	
26	Trunnion Plate	Carbon steel Type WCB	316 Stainless steel Type CF8M
27	Trunnion Bearing	316 Stainless steel backed glass-filled PTFE	
28	Bearing Spacer	Filled PTFE	
29	Hex.Hd. Cap Screw	ASTM A193 Gr. B7; +Gr. B7M	
30	Stem Retainer	Carbon steel Type WCB	316 Stainless steel Type CF8M
32	Upper Stem Seal	PTFE	
33	Key ²	Carbon steel	
35	Trunnion Ring ³	Carbon steel	Stainless steel
36	Tag:Trunnion Ball	Stainless steel	

Note 1: Compression plate, body seal, and gland follower are Monel for valves with Monel or Hastelloy C trim.

Note 2: Not used in 12" (DN 300) Series 9150 valves.

Note 3: Not used in 14" & 16" (DN 350 & 400) Series 9300 valves. + Furnished with valves for NACE MR0103.

ACTUATORS

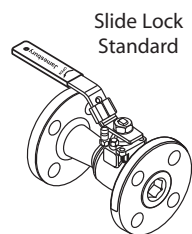
Metso offers a full line of integrally designed actuators for automated systems or for easier control of inaccessible or remote valves. Pneumatic actuators that include double-acting and spring-return piston, vane, and rack and pinion units, spring-diaphragm types, and electric actuators are available for all valves. Electric actuators are available with both watertight and hazardous location enclosures. For further information on actuators for Series 9000 valves, see the following:

Type	Bulletin
Manual Gear Actuators	A100-1
B-Series Piston Actuators	6B20
Quadra-Powr® X Spring Diaphragm	
Rotary Actuators	A110-4
Valv-Powr Series VPVL	A111-5
VPVL Stainless Steel	A111-4
V-Series Electric Actuators	A200-1
ADC Electric Actuators	A201-1
LC Series' Electric Actuators	A202-1 & A203-1
ESR-Series Electric Actuators	A204-1
Q6-Series Electric Actuators	A205-1
QX-Series Electric Actuators	A207-1

ACCESSORIES

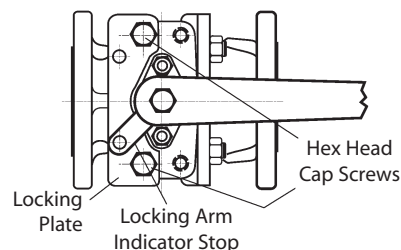
Locking Devices

When safety measures are necessary, a reliable locking plate is available to allow the valve to be padlocked in either the open or closed position. Proper figure numbers are shown in the Accessory Table below.



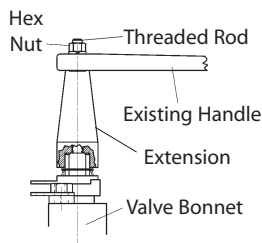
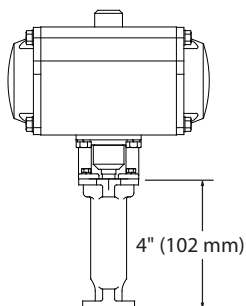
1/2" – 1-1/2" (DN 15 – 40)
Series 9000

2" – 6" (DN 50 – 150) Series 9150
2" – 4" (DN 50 – 100) Series 9300
LD56, 57 & 58



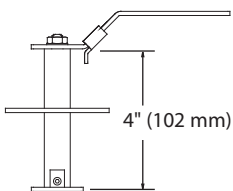
Bonnet/Stem Extensions

4" (102 mm) bonnet/stem extensions are available for applications that require insulated pipe, particularly useful for automated products, extensions can also be used to prevent interference between actuators and companion pipelines and equipment. They are ideal as extension that require locking lever or locking oval handle capability. Stainless steel construction is also available.



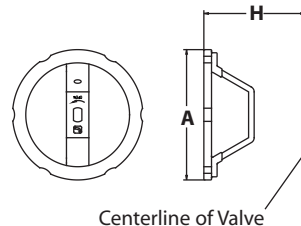
Stem Extensions

A standard 4" (102 mm) stem extension is offered for Series 9000 valves (1/2 – 1-1/2" (DN15 – 40)) for improved accessibility, particularly when used in insulated pipelines. Stem extension kits can be ordered factory-mounted or shipped separately for field mounting



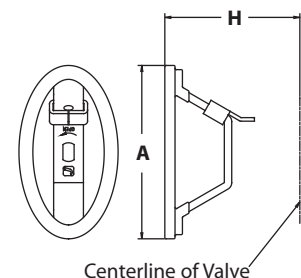
Round Handles

Series 9000 ball valves have optional round handles available. To order handles separately, specify the part number shown in the accessories table below.



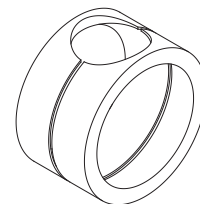
Oval handles with slide-lock

Optional oval handle saves space and may be padlocked to retain the valve in the open or closed position.



Cavity Fillers

Cavity fillers are available in 9000 series full bore valves. The fillers are PTFE and used for sanitary applications and in processes where cross contamination is a concern. Food processing, pharmaceuticals, cosmetics, paints, solvents, finishes and dyes are typical applications where fillers are employed.



Accessory Table – inches (DN)									
Valve Size Full Bore	Locking Device	Stem Ext.	Bonnet/ Stem Ext.	Locking Oval	Round	Round/Oval Handle		Allowable Max. Torque FT•LBS (N•m)	
						Dimension A	Dimension H	Round	Oval
1/2" (15)	Standard Equipment	SE-093	SE-096	112-0108-30	112-0105-30	4.00 (101.6)	2.96 (75.2)	9 (12)	9 (12)
3/4" (20)		SE-094	SE-097	112-0109-30	112-0106-30	4.50 (114.3)	3.70 (94.0)	18 (24)	18 (24)
1" (25)		SE-094	SE-097	112-0109-30	112-0106-30	4.50 (114.3)	3.83 (97.3)	18 (24)	18 (24)
1-1/4" (30)		SE-095	SE-098	112-0110-30	112-0107-30	5.75 (146.0)	4.75 (120.7)	25 (34)	25 (34)
1-1/2" (40)		SE-095	SE-098	112-0110-30	112-0107-30	5.75 (146.0)	4.94 (125.5)	25 (34)	25 (34)
2" (50)	LD56	SE-60							
3" (80) 9150	LD56	SE-60							
3" (80) 9300	LD57	SE-61							
4" (100) 9150	LD57	SE-61							
4" (100) 9300	LD58	SE-62							
6" (150) 9150	LD58	SE-62							
						NA			

* For valves with PEEK(L) seats that require stem extensions use bonnet/stem extension SE-096, 097 or 098.

VALVE TORQUE DATA

Use these torque charts as a guide for actuator selection. Additional requirements may be imposed by media characteristics, trim, and frequency of valve operation. For clean lubricating fluid service, required torque for PTFE (T), Xtreme (X) and filled PTFE (M) seated valves only may be reduced 20% when the valve is equipped with corrosion resistant trim. For difficult services such as slurries and semi-solids, and for oxygen, increase values by 50%. If in doubt, err on the side of safety by using a larger actuator than would normally be selected.

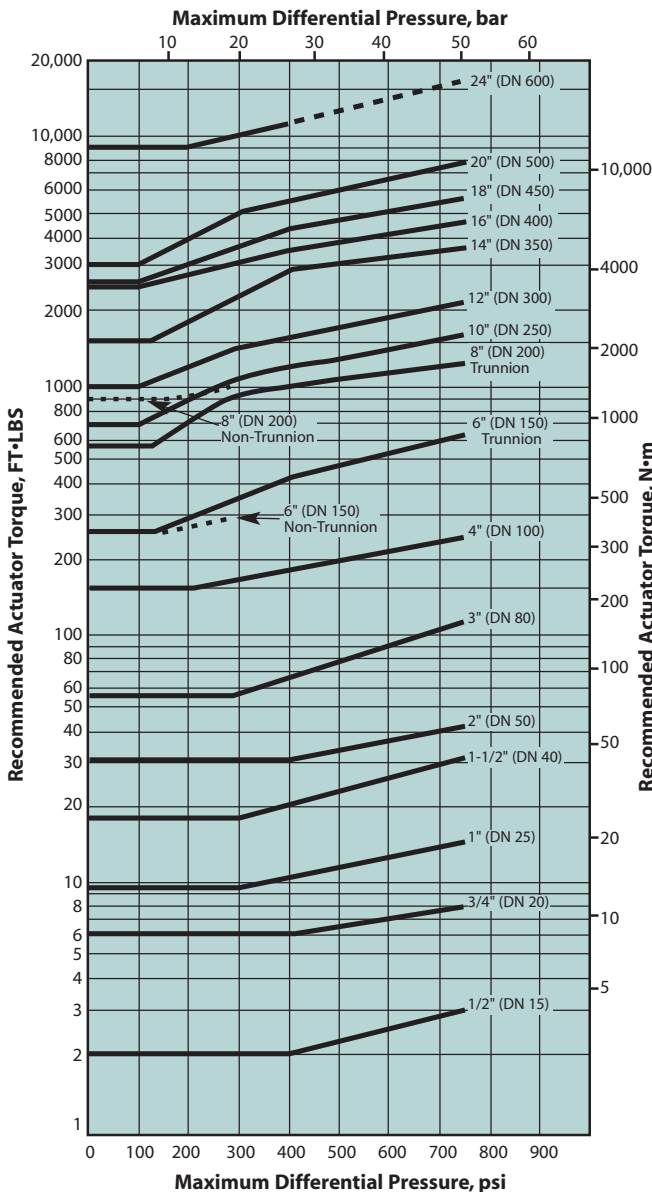
Valves with Emission-Pak® require an increase in operating torque. Refer to Bulletin B115-4 for additional information.

Torque output values and actuator selection tables for the different types of *Jamesbury* actuators are contained in the bulletins listed below.

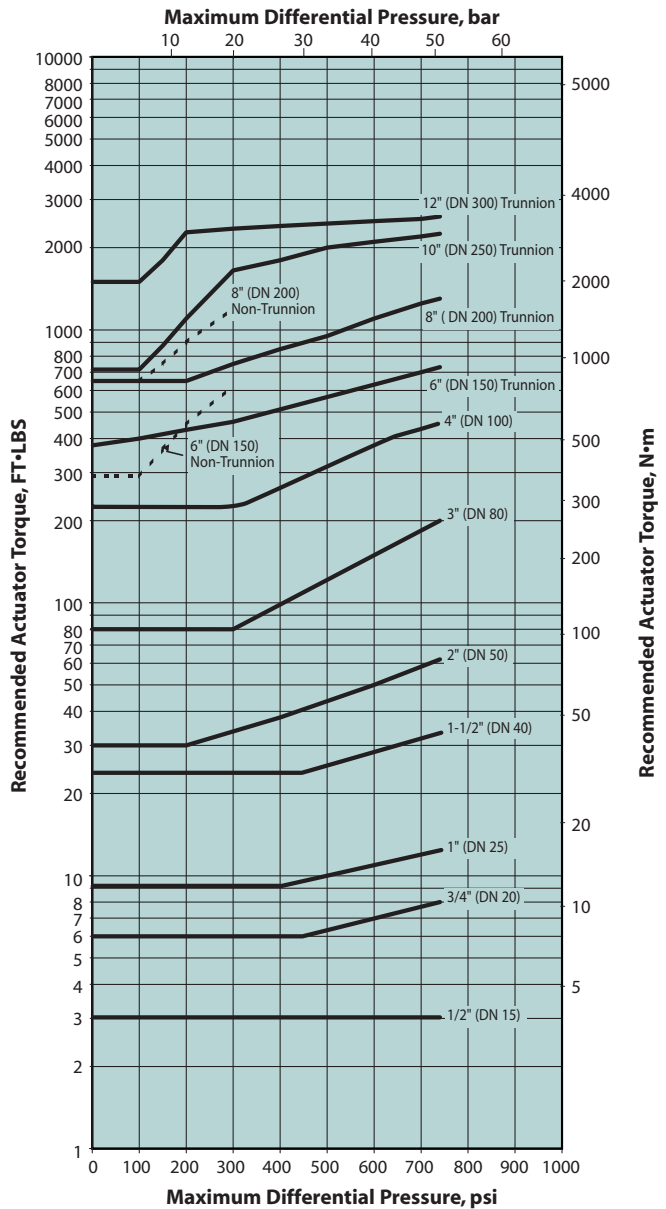
Manual Gear Actuators	A100-1
B-Series Piston Actuators	6B20
Quadra-Powr® X Spring Diaphragm Rotary Actuators	A110-4
Valv-Powr Series VPVL	A111-5
VPVL Stainless Steel	A111-4
V-Series Electric Actuators	A200-1
ADC Electric Actuators	A201-1
LC Series' Electric Actuators	A202-1 & A203-1
ESR-Series Electric Actuators	A204-1
Q6-Series Electric Actuators	A205-1
QX-Series Electric Actuators	A207-1

ASME Class 150 and 300 Valve Torque Data

PTFE (T) Seated Valves



Xtreme (X) Seated Valves 1/2" – 12" (DN 15 – 300)

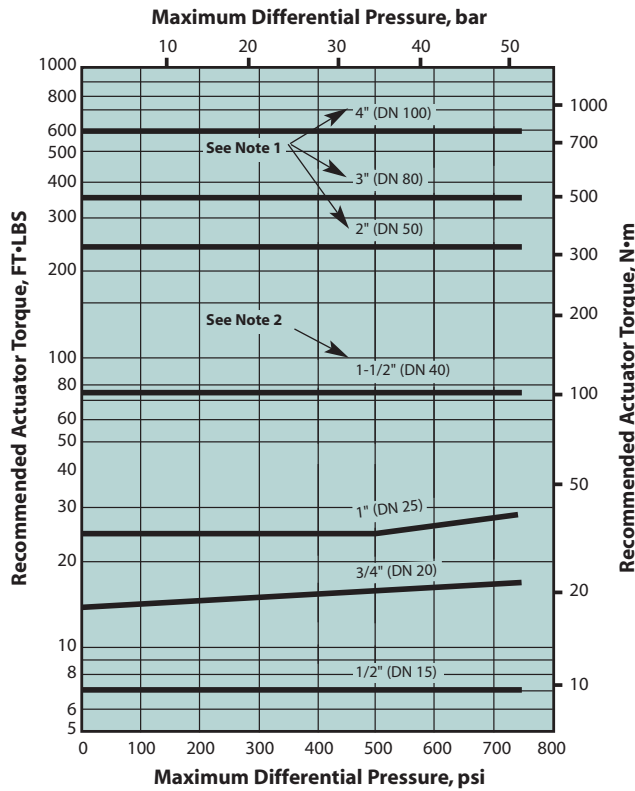


Note: See note on page 17.

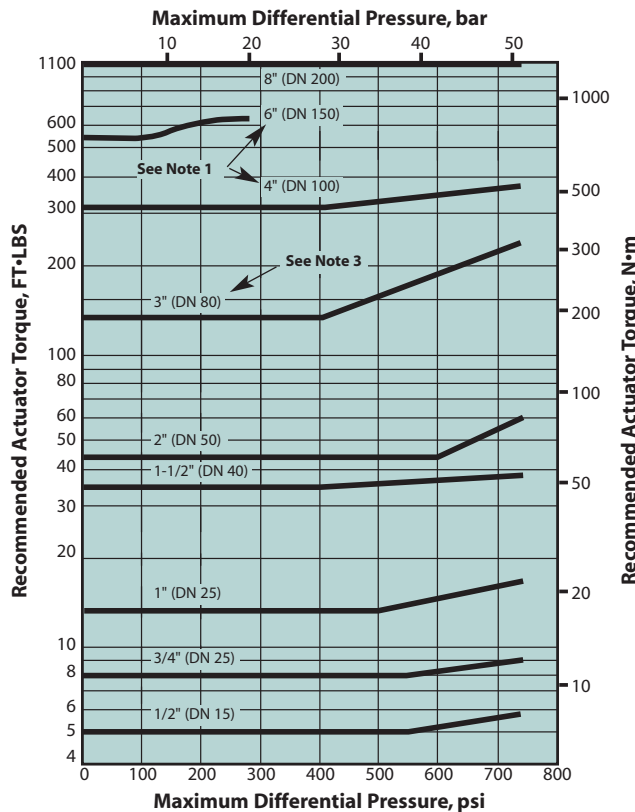
VALVE TORQUE DATA

ASME Class 150 and 300 Valves

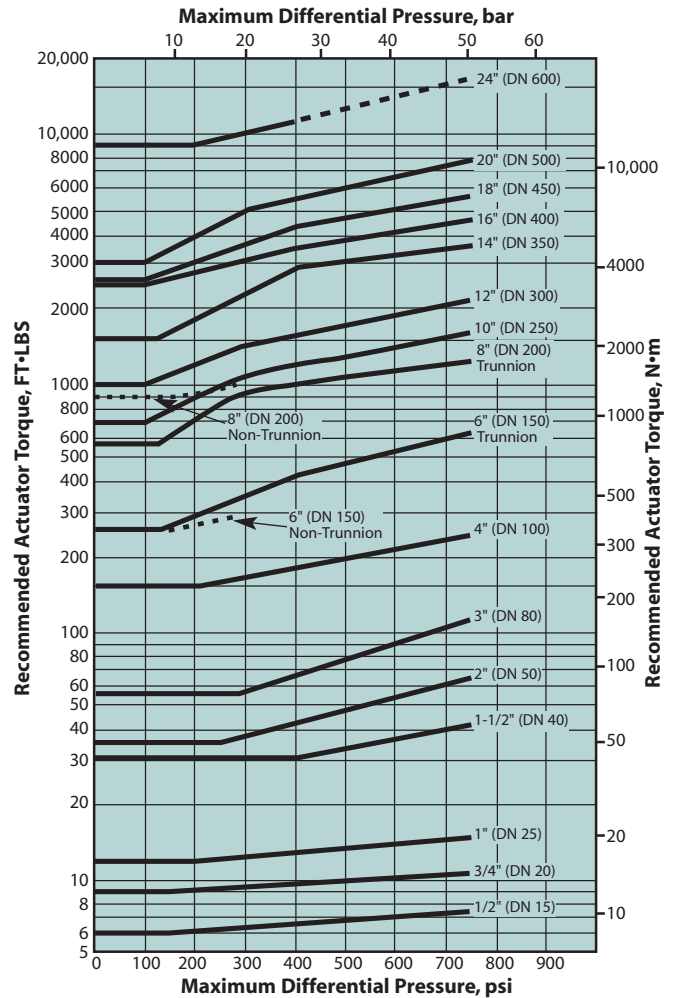
PEEK (L) Seated Valves 1/2" – 6" (DN 15 – 150)



PFA (B) Seated Valves 1/2" – 8" (DN 15 – 200)



UHMW Polyethylene (U) Seated Valves



- Note 1:** Actuator is required;
- Note 2:** Actuator is required for difficult service;
- Note 3:** Actuator is required for difficult service and pressure greater than 500 psi.
- Note 4:** Dashed line indicates Non-Trunnion and is rated to Class 150 only for seats.

HOW TO ORDER

EXAMPLE: A 2" ASME Class 300 short design valve (9150) in *Fire-Tite* design (3) with raised-face flanges (31), carbon steel body (22), and 316 stainless steel trim (36), with *Xtreme* seats (XTZ) and molecularly enhanced PTFE stem seals is written: 2" 9150-31-2236XTZ1.

1	2	3	4	5	6	7	8
2"	9150	-	31	22	36	XTZ	1

1	Size		
1/2" to 24"	1/2" (DN 15)	4" (DN 100)	14" (DN 350)
	3/4" (DN 20)	6" (DN 150)	16" (DN 400)
	1" (DN 25)	8" (DN 200)	18" (DN 450)
	1-1/2" (DN 40)	10" (DN 250)	20" (DN 500)
	2" (DN 50)	12" (DN 300)	24" (DN 600)
	3" (DN 80)		

2	Valve Series & Style	Size Range
9150	Full Bore Class 150	1/2" – 24" (DN 15 – 600)
9180	Full Bore Class 150*	1/2" – 24" (DN 15 – 600)
9300	Full Bore Class 300	1/2" – 24" (DN 15 – 600)
930L	Full Bore Class 300 B16.10 long F-F	8" (DN 200)
9380	Full Bore Class 300*	1/2" – 24" (DN 15 – 600)
938L	Full Bore Class 300 B16.10 long F-F	8" (DN 200)

* Metric units on nameplate. Valves larger than 1" (DN 25) are CE marked. Includes static grounding.

3	Special Construction
—	Standard (no entry)
C	Chlorine
N	NACE MR0103
O	Oxygen
DT	125 RMS Flange Finish
Q	PTFE Cavity Filler
STG	Grounded 9000 Series
V	High Vacuum
VC	High Vacuum Certified
DBB	Double Block and Bleed (See Bulletin B151-1)

4	End Connection Construction	Size Range
11	Raised Face Non- <i>Fire-Tite</i> Non-Trunnion	1/2 – 8" (DN 15 – 200) Full Bore
31	Raised Face <i>Fire-Tite</i> Non-Trunnion	1/2 – 8" (DN 15 – 200) Full Bore
71	Raised Face <i>Fire-Tite</i> Trunnion	8 – 24" (DN 200 – 600) Class 150 Full Bore 6 – 24" (DN 150 – 600) Class 300 Full Bore

5	Body Material*	Size Range
22	Carbon Steel (WCB)	All
35	Alloy 20 (CN7M)	Optional in all sizes
36	Stainless Steel (CF8M)	All
71	Monel	Optional in all sizes

* Other materials available on application

6	Ball & Stem Materials*	Size Range
35	Alloy 20	3/4 – 8" (DN 20 – 200) Full Bore
36	316 Stainless Steel	All
71	Monel	Optional
73	Hastelloy	Optional in all sizes
HB	316 SS, 17-4 PH	Required for seat & seal code LGG
00	Same as body	All (Carbon steel not available)

* Other materials available on application

7	Seat / Body Seal / Stem Seal Material	Size Range
XTZ	<i>Xtreme</i> /PTFE ² /TFM	All
TTT	PTFE/PTFE ² /PTFE ²	All
BT	PFA/PTFE ² /PTFE ²	1/2 – 6" (DN 20 – 150) Full Bore
LGG ^{†3}	PEEK/Graphite/Graphite	1/2 – 4" (DN 20 – 100) Full Bore
UUU ¹	UHMW/UHMW/UHMW	1/2 – 8" (DN 15 – 200) Full Bore
MBT ¹	Barrier-filled PTFE	3 – 8" (DN 80 – 200) Full Bore
ZTT	TFM/PTFE ² /PTFE ²	1/2" – 10" (DN 15 – 250) Full Bore

† Requires 17-4PH Stem

- 1 Non-*Fire-Tite* only
- 2 TFM on sizes 1-1/2" (DN 40) and smaller
- 3 Not a self relieving seat design

8	Bolts	Nuts	Application
1*	ASTM A193 Gr B7	ASTM A194 Gr 2H	Carbon Steel Monel
2	ASTM A193 Gr B8, B8C, B8M or B8T (Class 2)	ASTM A194 Gr 8B, 8CB, 8MB, 8TB, or 8FB	316 St. Stl. Alloy 20
5**4	ASTM A193 Gr B7M	ASTM A194 Gr 2HM	NACE
4**	Monel		Monel NACE All Cl ₂

Bolts and nuts for 1-1/2" (DN40) and smaller valves apply to bonnet hardware only. For 2" (DN50) and larger bolts and nuts pertain to bonnet hardware and body and cap fasteners.

- * Stainless bolting standard for 1-1/2" and smaller
- ** Required for compliance to NACE MR0103 2" and larger.
- 4 1-1/2" (DN 40) and smaller use Monel bonnet hardware for NACE MR0103 compatibility.

STANDARDS AND SPECIFICATIONS

The Company

ISO 9001 – 2008 ANSI/150/ASQ Q9001 – 2008

Pressure Equipment Directive 97/23/EC

Available Standards

API 598	American Petroleum Institute - Valve Inspection and testing
API 607	American Petroleum Institute - Fire Test for Soft Seated Valves (Division of refining)
API 608	Metal Ball Valves Used in On-Off Service that have Buttwelded or Flanged Ends
ANSI/ASME B16.10	American National Standard - Face-to-Face and End-to-End Dimensions of Ferrous Valves
ANSI/ASME B16.5	American National Standard - Steel Pipe Flanges and Flanged Fittings
ANSI/ASME B16.34	American National Standard - Steel Valves - Flanged and Buttwelded End
ANSI/ASME B31.1	American National Standard - Power Piping
ANSI/ASME B31.3	American National Standard - Chemical Plant and Petroleum Refinery Piping
ANSI/FCI 70-2	American National Standard - For Control Valve Seat Leakage
ISO 15848-1	Industrial Valves - Fugitive Emissions - Measurement, Test & Qualification Procedures
ISO 17292	Metal Ball Valves for Petroleum, Petrochemical and Allied Industries
ISO 5752	International Standard for Organization Metal Valves for use in Flanged Piping Systems
ISA 75.02	Valve Sizing Coefficient Cv, Piping Geometry Factor Fp and Pressure Drop Limitation XT
ISA 575.19	Hydrostatic Testing of Control Valves
ISO 5211	Dimensions for Attachment of Actuators/Gear Boxes to Valves (ISO Mounting)
MSS SP-25	Manufacturers Standardization Society - Standard Marking System for Valves
MSS-SP-55	Manufacturers Standardization Society - Quality Standards for Steel Castings
MSS-SP-6	Standard Finishes for Contact Faces of Pipe Flanges and Connecting-End Flanges of Valves and Fittings
MSS-SP-44	Steel Pipe Line Flanges
MSS-SP-61	Pressure Testing of Steel Valves
MSS SP-72	Flanged or Butt and Weld End Ball Valves Having Full or Reduced Bores for General Liquid and Gas Service
MSS SP-96	Terminology for Valves and Fittings
97 / 23 / EC	European Pressure Equipment Directive
MSS SP-53-1995	Quality Standard For Steel Castings and Forgings for Valves, Flanges and Fittings and Other Piping Components-Magnetic Particle Examination Method
MSS SP-93-1987	Quality Standard For Steel Castings and Forgings for Valves, Flanges and Fittings and Other Piping Components-Liquid Penetrant Method
NACE Standard MR0103	National Association of Corrosion Engineers-Engineers - Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments
Factory Mutual (FM)	Figure 1052 Gas and Oil Shutoff Valves.
CSA	Figure 1051 Supervisory Cock Valves, Electric Interlocking Fuel Gas and Fuel Oil Cocks.
CSA	Figure 1057/1056 Gas Shut-Off and Vent Valves.
CSA	Figure 1075 Emergency Shut-Off and Fire-Safe Valves.
CSA	CGA 3.16.
EN 161/264	
Underwriter Laboratory (UL) Categories MHKZ, YQAR, YRBX, YRPV, YSDT.	
ULC	YSDC & MSVVC

Subject to change without prior notice.

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