

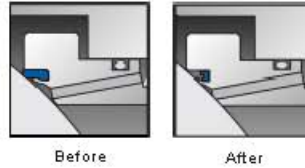
## TOP ENTRY BALL VALVES

This top entry valve with a one-piece trunnion supported ball conforms to API specifications 6A, 6D and ANSI B16.34. All seats are retained in metal holders which are spring-loaded against the ball for low pressure, fire safe sealing.

### GENERAL DESIGN FEATURES

- One-piece flange top-entry trunnion design
- Double block and bleed
- One-piece ball and stem assures precise positioning
- Anti blowout one-piece ball/stem design
- O-rings plus fire safe packing prevents leakage
- Corrosion resistant low friction bearings
- Inconel wave springs provide upstream and downstream sealing
- Stainless Steel Sealant injection fittings for emergency stem of seat sealing
- Inline repairable due to reasonable seat retainer design
- Minimized torque required to open and close valve
- Anti-static grounding between ball, stem and body
- Integral top work direct mounting pad
- ANSI B16.34
- API 6D, API 6A, 607 and 6FA
- NACE MR 0175
- CE Marked (P.E.D. 97/13/EC, Cat. 3)

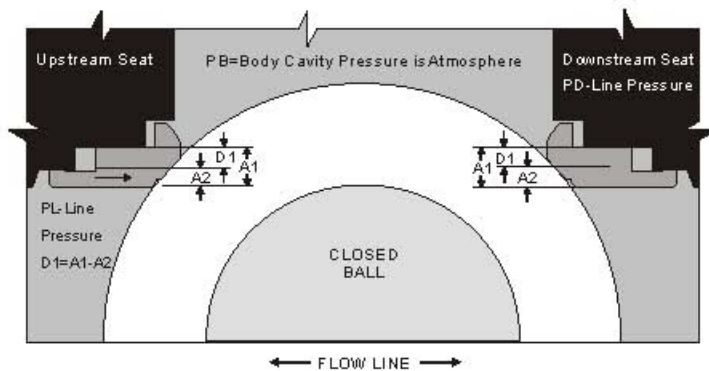
2" thru 16" class 150, 300 and 600,  
2" thru 12" class 900, 1500 and 2500.



### FIRE SAFE FUNCTION

In case of fire and seat construction damage, fire safe requirements are accomplished with automatic metal-to-metal positive sealing.

### TECHNICAL SEATING FEATURES



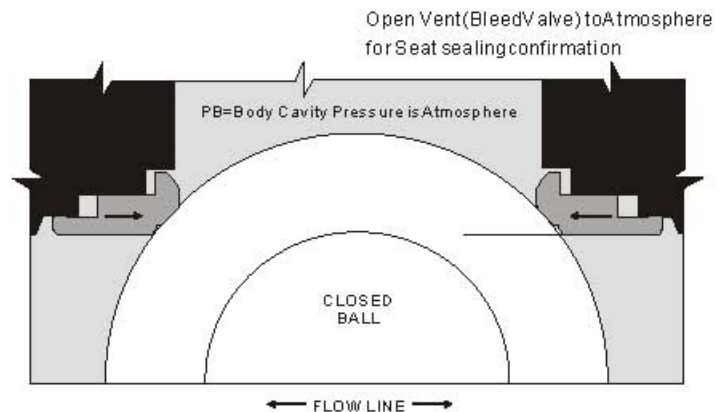
### SELF RELIEVING SEAT DESIGN

**Upstream Seat:** The difference in the area (D1) times the line pressure creates a "piston effect" which forces the seat against the ball surface. Also the springs behind the seat add the force to the seat which keeps the seat in contact with the ball surface by providing the tight seal.

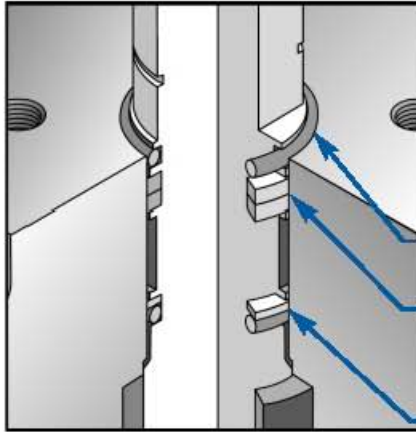
**Downstream Seat:** When the body cavity pressure exceeds the spring pressure, an automatic pressure relief will occur by relieving the body cavity pressure past the downstream seat. This eliminates the need for the body relief valve.

### DOUBLE BLOCK AND BLEED

The double block and bleed condition is available in all seat design configurations. When the ball is in the closed position the body cavity pressure may be drained down to 'zero' by opening the bleed valve and draining the fluid by removing the drain plug. Each seat works independently assuring tight shut off seal against ball on the upstream and downstream side.



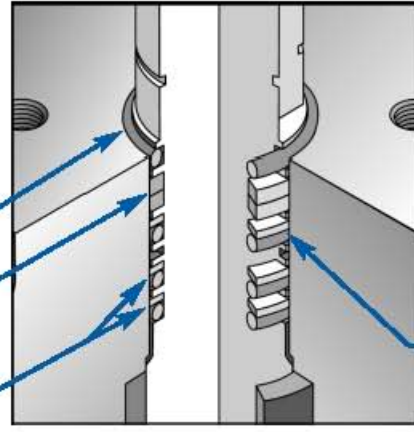
**DESIGN FEATURES**



**FIRESAFE STANDARD SEAL**

2"-6" Class 600-1500  
14"-16" Class 600  
All Sizes Class 2500

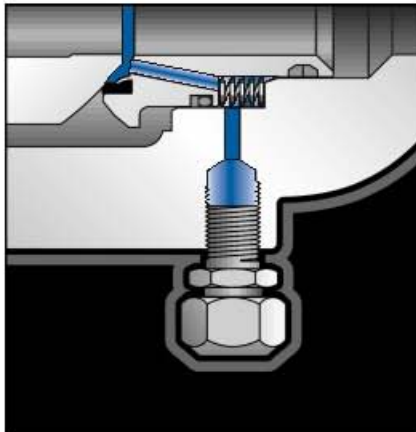
Weather Seal  
Stem Packing  
Braided Carbon Rope  
Primary Stem Seal



**FIRESAFE STANDARD SEAL**

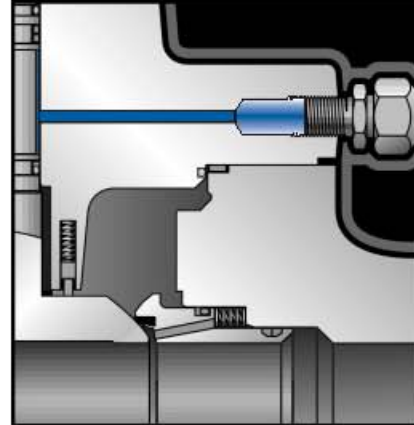
8"-12" Class 600-1500

Secondary Stem Seal



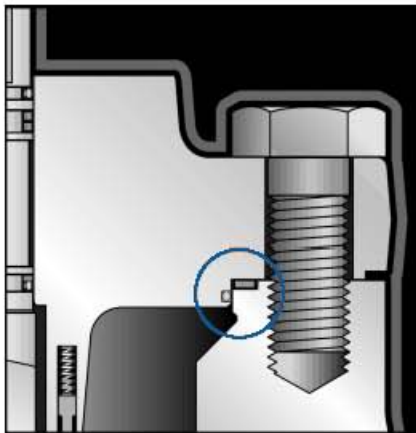
**EMERGENCY SEAT SEAL**

Special sealants may be injected into fittings that are located on the adapter flanges to restore sealing integrity if seat sealing surface is damaged. A second internal check valve provides backup to the fitting.



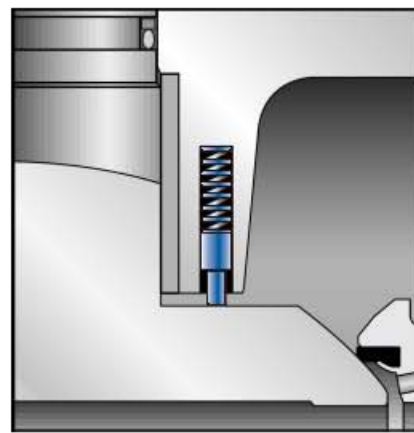
**EMERGENCY SEALANT INJECTION SYSTEM**

The Sealant Injection System located on the bonnet can be utilized in case of emergencies, o-ring damage, or if stem leakage occurs.



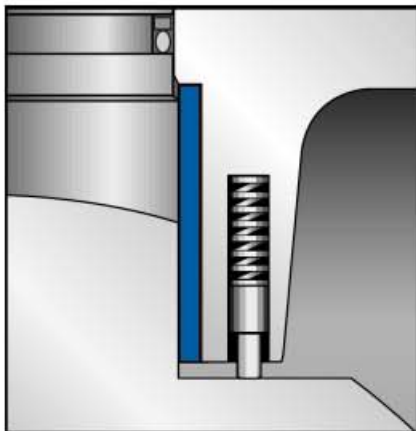
**DOUBLE SEALED ENVELOPE CONNECTIONS**

Double o-rings or a combination of an o-ring and Fire-Safe gasket on body/bonnet connections to ensure positive sealing. This makes these valves suitable for above or below ground service.



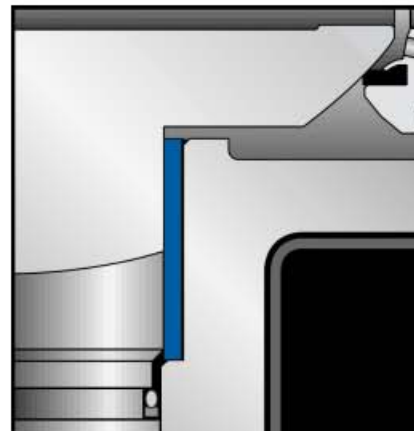
**ANTISTATIC DEVICE**

A spring between the bonnet and the ball permits electrical continuity.



**HEAVY DUTY BEARINGS**

Heavy-duty PTFE lined bearing eliminates the need of lubricating stem and trunnion journals, resulting in smooth and easy operation of valve. Upper stem and lower trunnion bearings balance the pressure load on the ball by reducing friction between ball and seat.



**HEAVY DUTY BEARINGS**

Heavy duty bearing supported in all valve classes

### APPLICABLE STANDARDS

The following list contains the most important applicable standards for ball valves. Vatac valves may be designed,

#### API-American Petroleum Institute

- Spec. 6A Specification for wellhead and Christmas tree equipment.
- Spec. 6D Specification for pipeline valves,
- Spec. RP6F Recommended practice for fire testing of valves,
- Spec. 6FA Specification for fire testing of valves,
- Std. 598 Valve inspection and test.
- Std. 605 Large diameter carbon steel flanges,
- Std. 607 Fire test for soft seated quarter-turn valves.

#### ASME/ANSI-American National Standard

- B 16.5 Steel pipe flanges and flanged fittings.
- B 16.10 Face-to-face and end-to-end dimensions of ferrous valves.
- B 16.25 Butt welding ends.
- B 16.34 Steel valves- Flanged and butt welding ends.
- B 31.3 Chemical plant and petroleum refinery piping
- B 31.4 Liquid petroleum transportation piping systems.
- B 31.8 Gas transmission and distribution piping systems.

#### ASTM-American Society For Testing Materials

##### British Standard

- BS 1503 Specification for steel forgings for pressure purposes.
- BS 1504 Specification for steel castings for pressure purposes.
- BS 1560 Steel pipe flanges and flanged fittings.
- BS 2080 Face-to-face, center-to-face, end-to-end, and center-to-end dimensions of flanged and butt-welding end steel valves for the petroleum, petrochemical and allied industries.

Manufactured and tested in accordance with Other international standards on request.

#### British Standard-cont

- BS 4504 Flanges and boltings for pipes, valves and fittings.
- BS 5146 Inspection and test of steel valves for the petroleum, petrochemical and allied industries.
- BS 5351 Steel ball valves for the petroleum, petrochemical and allied industries.
- BS 5750 Quality system.
- BS 6755 Testing of valves.

#### EC-EUROPEAN COMMUNITY

CE marked (p.e.d.97/23/ec.cat.3)

ISO-International Organization for Standardization  
ISO 9001:2000 Quality systems-Model for quality assurance in design/development, production, installation and servicing.

#### MSS-Manufacturers Standardization Society

- SP 6 Standard finishes 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 44 Steel pipeline flanges.
- SP 45 By-pass and drain connection standard.
- SP 55 Quality standard for steel castings-visual method.
- SP 61 Hydrostatic testing of steel valves.
- SP 72 Ball valves with flanged or butt-welding ends for general service.

#### NACE-National Association of Corrosion Engineers

- Me0175 Sulfide stress cracking resistant metallic materials for oil field equipment.

### TOP ENTRY BALL VALVE PARTS CONFIGURATION

- |   |   |   |
|---|---|---|
| <p>End Connection —</p> <ul style="list-style-type: none"> <li>● WE x WE</li> <li>● RF x WE</li> <li>● RT J x WE</li> </ul> <p>NACE Conformance —</p> <ul style="list-style-type: none"> <li>● NACE II</li> <li>● Cl. II Boting</li> </ul> <p>Body/Bolting Material —</p> <ul style="list-style-type: none"> <li>● A216 WCB (CS) B7M</li> <li>● SS/B7M</li> <li>● A352 LCC/L7M</li> <li>● SS/660SS</li> </ul> | <p>Trim —</p> <ul style="list-style-type: none"> <li>● 316SS</li> <li>● CS (3 mil ENP)</li> <li>● LCC (3 mil ENP)</li> <li>● 316SS w/Drain</li> <li>● CS (3 mil ENP) w/Drain</li> </ul> <p>Seat Insert/FS —</p> <ul style="list-style-type: none"> <li>● PEEK/FS</li> </ul> | <p>Seal Material —</p> <ul style="list-style-type: none"> <li>● Viton</li> <li>● EPDM</li> <li>● Low Temp Buna N</li> <li>● Handle</li> <li>● Gear Operator</li> </ul> <p>Actuation —</p> <ul style="list-style-type: none"> <li>● Handle w/Locking Device</li> <li>● Gear Operator w/Locking Device</li> <li>● Bare Stem</li> <li>● For Actuation</li> </ul> |
|---|---|---|

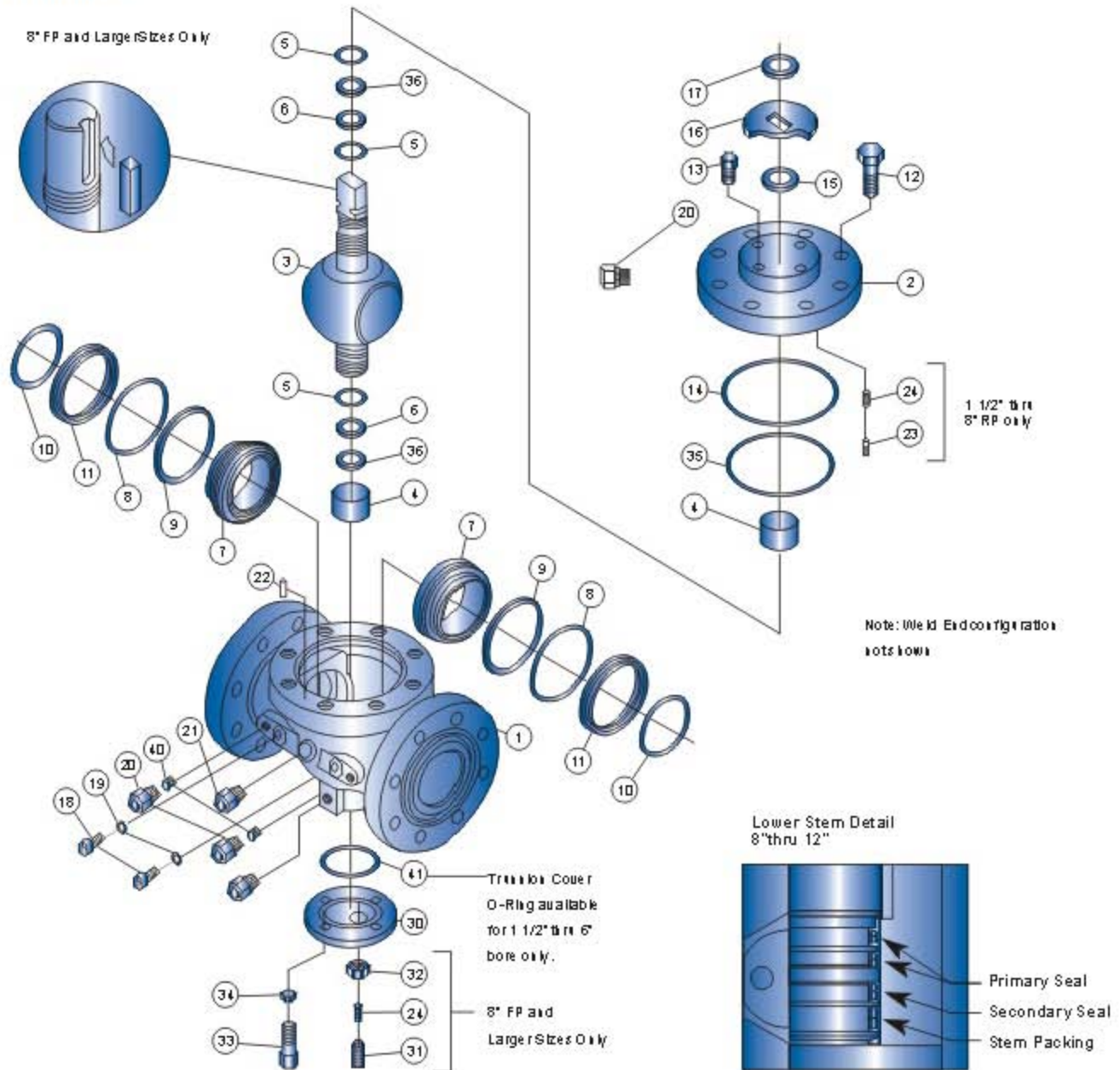
### BUTT WELD ENDSCHEDULE

Pipe Description	Nominal Pipe Size (in.) • Schedule Code								
	2	3	4	6	8	10	12	14	16
Outside Dia. (in.)	2.375	3.500	4.500	6.625	8.625	10.750	12.750	14.000	16.000
(STD) Standard	-	-	.237	.280	.322	.365	.375	.375	.375
Schedule 40	.154	.216	.237	.280	.322	.365	.406	.438	.500
Schedule 60	-	-	-	-	.406	.500	.562	.593	.656
XS	.218	.300	.337	.432	.500	.500	.500	.500	.500
Schedule 80	.218	.300	.337	.432	.500	.593	.687	.750	.843
Schedule 120	-	-	.438	.562	.718	.843	1.000	1.093	1.218
Schedule 160	.343	.438	.531	.718	.906	1.125	1.312	1.406	1.593
XXS	.436	.600	.674	.864	.875	1.000	1.000	-	-

Consult factory for other wall thicknesses.



### Component Parts



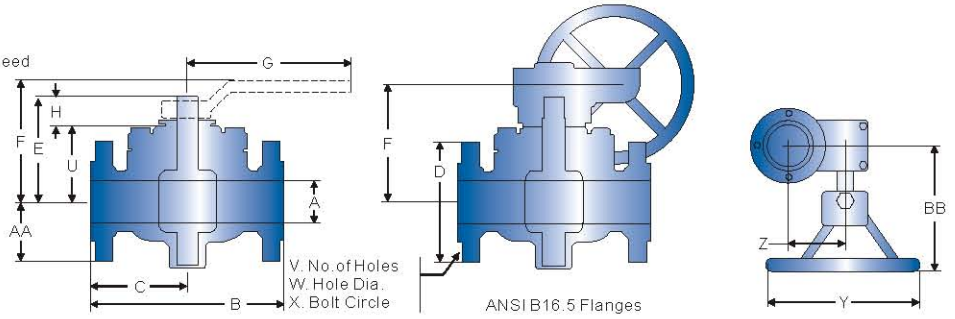
### PARTS LIST

S.N	Description	S.N	Description	S.N	Description	S.N	Description
1	Body	10	Seat Sub Seal/ Braided Carbon Rope	18	Retract. Port Screw	31	Thrust Adjust Screw
2	Bonnet	11	Wave Spring	19	Retract. Port Seal	32	Jam Nut
3	Ball/Stem	12	Bonnet Cap Screw	20	Injection Fitting	33	Thrust Plate Bolt
4	Trunnion Bearing	13	Stop Screw	21	Bleed Valve	34	Lock washer
5	Stem Seal	14	Bonnet Gasket/Seal	22	Bonnet Align. Pin	35	Bonnet Primary Seal
6	Stem Back-up Ring	15	Stem Bearing	23	Grounding Plunger	36	Stem Packing/ Braided Carbon Rope
7	Seat	16	Stop Plate	24	Grounding Spring	40	Internal Ball Check
8	Seat O-Ring	17	Retainer	29	Key	41	Trunnion Cover O-Ring
9	Seat Back-up Ring			30	Thrust Plate		

### TOP ENTRY BALL VALVE

- One Piece Uni-body Top Entry, Double Block and Bleed
- Full Port, Fire Safe, Blow-out Proof Stem
- Anti-static Device, Cavity Relieving Seats
- NACE MR-01-75, Optional Locking Device
- Designed to ASME B16.34, API 6D

Face to Face	API 6D
End Flange	ASME B16.5
Buttweld	ASME B16.25
Class	ASME CL600



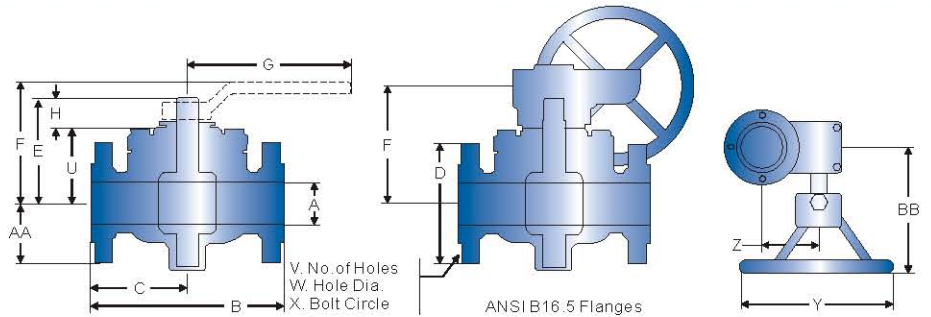
### CLASS 600 DIMENSION

SIZE (in.)	W.T.(lbs.)			A	B		C		D	E	F	G	H	U	V	W	X	Y	Z	AA	BB	Ring Groove RTJ	
	Valve Only	W/ H.O	W/ G.O		RF	RTJ	RF	RTJ			Top of Handle	CL of H/Whl.										Unit: inch	
2X2	71	75	79	2-1/16	11-1/2	11-5/8	5-3/4	5-13/16	6-1/2	6-1/2	7-9/32	6	22	1-3/16	4-7/8	8	3/4	5	8	1-3/4	4-7/8	7-3/16	R-23
3X2	93	97	101	2-1/16	14	14-1/8	7	7-1/16	8-1/4	6-1/2	7-19/32	6	22	1-3/16	4-7/8	8	7/8	6-5/8	8	1-3/4	4-7/8	7-3/16	R-31
3X3	128	136	139	3-1/8	14	14-1/8	7	7-1/16	8-1/4	7-5/8	8-19/32	6-7/8	30	1-11/16	5-1/2	8	7/8	6-5/8	10	2-1/2	5-3/4	7-1/2	R-31
4X3	169	177	180	3-1/8	17	17-1/8	8-1/2	8-9/16	10-3/4	7-5/8	8-19/32	6-7/8	30	1-11/16	5-1/2	8	1	8-1/2	10	2-1/2	5-3/4	7-1/2	R-37
4X4	229	241	250	4-1/16	17	17-1/8	8-1/2	8-9/16	10-3/4	9-1/2	10-19/32	8-15/32	48	1-31/32	7-3/32	8	1	8-1/2	12	2-1/2	6-1/2	9-1/4	R-37
6X4	324	336	345	4-1/16	22	22-1/8	11	11-1/16	14	9-1/2	10-19/32	8-15/32	48	1-31/32	7-3/32	12	1-1/8	11-1/2	12	2-1/2	6-1/2	9-1/4	R-45
6X6	456	470	487	6	22	22-1/8	11	11-1/16	14	11-7/16	12-7/16	10-7/16	48	2-13/32	8-9/16	12	1-1/8	11-1/2	24	3-1/2	8-5/16	11-15/16	R-45
8X6	605	619	636	6	26	26-1/8	13	13-1/16	16-1/2	11-7/16	12-7/16	10-7/16	48	2-13/32	8-9/16	12	1-1/4	13-3/4	24	3-1/2	8-5/16	11-15/16	R-49
8X8	852	-	939	8	26	26-1/8	13	13-1/16	16-1/2	14-3/8	-	13-3/8	-	3-1/8	11-1/4	12	1-1/4	13-3/4	24	4-5/8	10-1/8	14-5/8	R-49
10X8	1024	-	1111	8	31	31-1/8	15-1/2	15-9/16	20	14-3/8	-	13-3/8	-	3-1/8	11-1/4	16	1-3/8	17	24	4-5/8	10-1/8	14-5/8	R-53
10X10	1433	-	1528	10	31	31-1/8	15-1/2	15-9/16	20	16-5/8	-	16-1/16	-	3-11/16	12-15/16	16	1-3/8	17	30	4-5/8	11-7/8	17-3/16	R-53
12X10	1546	-	1636	10	33	33-1/8	16-1/2	16-9/16	22	16-5/8	-	16-1/16	-	3-11/16	12-15/16	20	1-3/8	19-1/4	30	4-5/8	11-7/8	17-3/16	R-57
12X12	1963	-	2123	12	33	33-1/8	16-1/2	16-9/16	22	19-3/8	-	21-1/2	-	4-1/4	15-1/8	20	1-3/8	19-1/4	20	6-1/4	14-1/2	18-3/8	R-57
14X13/4	2610	-	2770	13-1/4	35	35-1/8	17-1/2	17-9/16	23-3/4	19-5/8	-	21-3/4	-	4-1/4	15-3/8	20	1-1/2	20-3/4	36	6-1/4	14	20-5/8	R-61
16X13/4	2792	-	2952	13-1/4	39	39-1/8	19-1/2	19-9/16	27	19-5/8	-	21-3/4	-	4-1/4	15-3/8	20	1-5/8	23-3/4	36	6-1/4	14	20-5/8	R-65
16X15/4	3130	-	3269	15-1/4	39	39-1/8	19-1/2	19-9/16	27	20-3/4	-	22-7/8	-	4-1/4	16-1/2	20	1-5/8	23-3/4	36	6-1/4	15-1/4	20-5/8	R-65

### TOP ENTRY BALL VALVE

- One Piece Uni-body Top Entry, Double Block and Bleed
- Full Port, Fire Safe, Blow-out Proof Stem
- Anti-static Device, Cavity Relieving Seats
- NACE MR-01-75, Optional Locking Device
- Designed to ASME B16.34, API 6D

Face to Face	API 6D
End Flange	ASME B16.5
Buttweld	ASME B16.25
Class	ASME CL900



### CLASS 900 DIMENSION

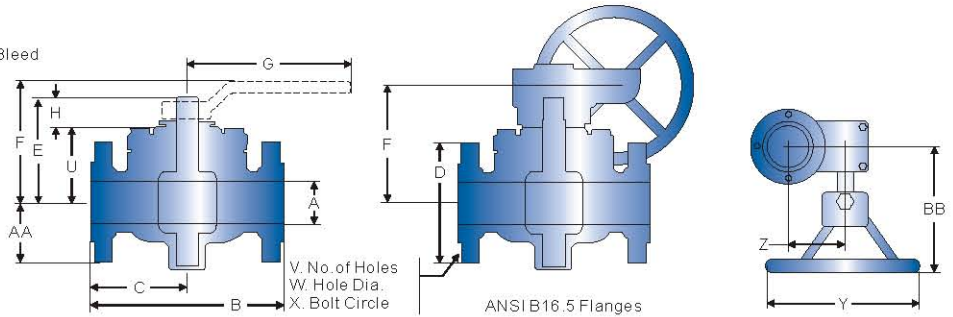
SIZE (in.)	W.T.(lbs.)			A	B		C		D	E	F	G	H	U	V	W	X	Y	Z	AA	BB	Ring Groove RTJ	
	Valve Only	W/ H.O	W/ G.O		RF	RTJ	RF	RTJ			Top of Handle	CL of H/Whl.										Unit: inch	
2X2	116	120	124	2-1/16	14-1/2	14-5/8	7-1/4	7-5/16	8-1/2	6-1/2	7-19/32	6	22	1-3/16	4-7/8	8	1	6-1/2	8	1-3/4	5	7-3/16	R-24
3X2	129	133	137	2-1/16	15	15-1/8	7-1/2	7-9/16	9-1/2	6-1/2	7-19/32	6	22	1-3/16	4-7/8	8	1	7-1/2	8	1-3/4	5	7-3/16	R-31
3X3	160	168	171	3-1/8	15	15-1/8	7-1/2	7-9/16	9-1/2	7-5/8	8-25/32	7-1/16	30	1-1/2	5-11/16	8	1	7-1/2	10	2-1/2	5-13/16	7-1/2	R-31
4X3	216	224	227	3-1/8	18	18-1/8	9	9-1/16	11-1/2	7-5/8	8-25/32	7-1/16	30	1-1/2	5-11/16	8	1-1/4	9-1/4	10	2-1/2	5-13/16	7-1/2	R-37
4X4	272	284	293	4-1/16	18	18-1/8	9	9-1/16	11-1/2	9-1/2	10-19/32	8-15/32	48	1-31/32	7-3/32	8	1-1/4	9-1/4	12	2-1/2	6-3/4	9-1/4	R-37
6X4	360	372	381	4-1/16	24	24-1/8	12	12-1/16	15	9-1/2	10-19/32	8-15/32	48	1/31-32	7-3/32	12	1-1/4	12-1/2	12	2-1/2	6-3/4	9-1/4	R-45
6X6	540	564	571	6	24	24-1/8	12	12-1/16	15	11-7/16	12-11/16	10-7/16	48	2-5/32	8-13/16	12	1-1/4	12-1/2	24	3-1/2	8-5/8	11-15/16	R-45
8X6	675	689	706	6	29	29-1/8	14-1/2	14-9/16	18-1/2	11-7/16	12-11/16	10-7/16	48	2-5/32	8-13/16	12	1-1/2	15-1/2	24	3-1/2	8-5/8	11-15/16	R-49
8X8	833	-	925	8	29	29-1/8	14-1/2	14-9/16	18-1/2	14-3/8	-	13-3/8	-	3-1/8	11-1/4	12	1-1/2	15-1/2	30	4-5/8	10-3/32	15-7/8	R-49
10X8	1105	-	1197	8	33	33-1/8	16-1/2	16-9/16	21-1/2	14-3/8	-	13-3/8	-	3-1/8	11-1/4	16	1-1/2	18-1/2	30	4-5/8	10-3/32	15-7/8	R-53
10X10	1387	-	1522	10	33	33-1/8	16-1/2	16-9/16	21-1/2	16-5/8	-	20-1/16	-	3-11/16	12-15/16	16	1-1/2	18-1/2	30	6-1/4	11-7/8	18-3/8	R-53
12X10	1801	-	1936	10	38	38-1/8	19	19-1/16	24	16-5/8	-	20-1/16	-	3-11/16	12-15/16	20	1-1/2	21	30	6-1/4	11-7/8	18-3/8	R-57
12X12	2493	-	2632	12	38	38-1/8	19	19-1/16	24	19-3/8	-	21-1/2	-	4-1/4	15-1/8	20	1-1/2	21	36	6-1/4	14-1/2	20-5/8	R-57



### TOP ENTRY BALL VALVE

- One Piece Uni-body Top Entry, Double Block and Bleed
- Full Port, Fire Safe, Blow-out Proof Stem
- Anti-static Device, Cavity Relieving Seats
- NACE MR-01-75, Optional Locking Device
- Designed to ASME B16.34, API 6D

Face to Face	API 6D
End Flange	ASME B16.5
Buttweld	ASME B16.25
Class	ASME CL1500



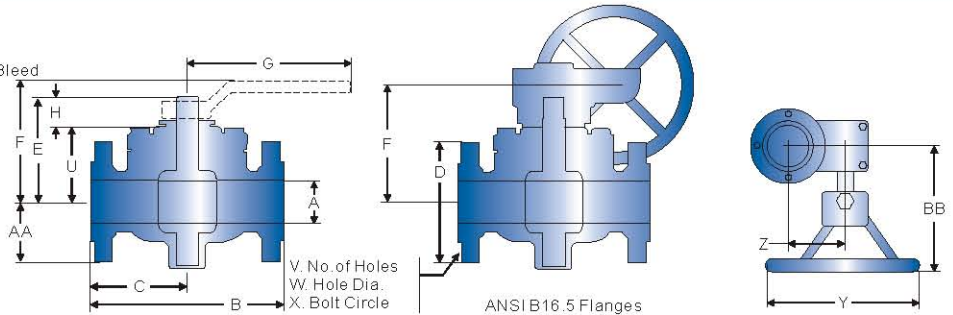
### CLASS 1500 DIMENSION

SIZE (in.)	W.T.(lbs.)			A	B		C		D	E	F		G	H	U	V	W	X	Y	Z	AA	BB	Ring Groove RTJ
	Valve	W/	W/		RF	RTJ	RF	RTJ			Top of Handle	CL of H/Whl.											Unit: inch
	Only	H.O.G.O																					
2X2	118	122	124	2-1/16	14-1/2	14-5/8	7-1/4	7-5/16	8-1/2	6-1/2	7-19/32	6	22	1-3/16	4-7/8	8	1	6-1/2	8	1-3/4	5-1/8	7-3/16	R-24
3X2	164	168	172	2-1/16	18-1/2	18-5/8	9-1/4	9-5/16	10-1/2	6-1/2	7-19/32	6	22	1-3/16	4-7/8	8	1-1/4	8	8	1-3/4	5-1/8	7-3/16	R-35
3X3	202	210	213	3-1/8	18-1/2	18-5/8	9-1/4	9-5/19	10-1/2	8-15/16	9-31/32	8-1/4	30	1-5/8	6-7/8	8	1-1/4	8	10	2-1/2	6-1/8	7-1/2	R-35
4X3	299	307	310	3-1/8	21-1/2	21-5/8	10-3/4	10-13/16	12-1/4	8-15/16	9-31/32	8-1/4	30	1-5/8	6-7/8	8	1-3/8	9-1/2	10	2-1/2	6-1/8	7-1/2	R-39
4X4	385	397	398	4-1/16	21-1/2	21-5/8	10-3/4	10-13/16	12-1/4	10-13/32	11-1/2	9-5/16	48	1-31/32	7-15/16	8	1-3/8	9-1/2	12	2-1/2	7	9-1/4	R-39
6X4	475	487	486	4-1/16	27-3/4	28	13-7/8	14	15-1/2	10-13/32	11-1/2	9-5/16	48	1-31/32	7-15/16	12	1-1/2	12-1/2	12	2-1/2	7	9-1/4	R-46
6X6	540	-	605	6	27-3/4	28	13-7/8	14	15-1/2	14-15/16	-	13-5/16	-	3-5/8	11-5/16	12	1-1/2	12-1/2	18	4-5/8	8-3/8	17-5/8	R-46
8X6	675	-	740	6	32-3/4	33-1/8	16-3/8	16-9/16	19	14-15/16	-	13-5/16	-	3-5/8	11-5/16	12	1-3/4	15-1/2	18	4-5/8	8-3/8	17-5/8	R-50
8X8	1488	-	1586	7-5/8	32-3/4	33-1/8	16-3/8	16-9/16	19	14-5/8	-	13-3/8	-	3-3/8	11-1/4	12	1-3/4	15-1/2	18	4-5/8	11-9/16	17-3/4	R-50
10X8	2050	-	2148	7-5/8	39	39-3/8	19-1/2	19-11/16	23	14-5/8	-	13-3/8	-	3-3/8	11-1/4	12	2	19	18	4-5/8	11-9/16	17-3/4	R-54
10X10	2650	-	2775	9-1/2	39	39-3/8	19-1/2	19-11/16	23	20-5/8	-	23-5/16	-	3-11/16	16-15/16	12	2	19	30	6-1/4	12-5/8	20-5/8	R-54
12X10	3242	-	3367	9-1/2	44-1/2	45-1/8	22-1/4	22-9/16	23-1/2	20-5/8	-	23-5/16	-	3-11/16	16-15/16	16	2-1/8	22-1/2	30	6-1/4	12-5/8	20-5/8	R-58
12X12	3613	-	3748	11-3/8	44-1/2	45-1/8	22-1/4	22-9/16	26-1/2	24-1/8	-	21-1/2	-	4-1/4	19-7/8	16	2-1/8	22-1/2	36	6-1/4	14-1/2	20-5/8	R-58

### TOP ENTRY BALL VALVE

- One Piece Uni-body Top Entry, Double Block and Bleed
- Full Port, Fire Safe, Blow-out Proof Stem
- Anti-static Device, Cavity Relieving Seats
- NACE MR-01-75, Optional Locking Device
- Designed to ASME B16.34, API 6D

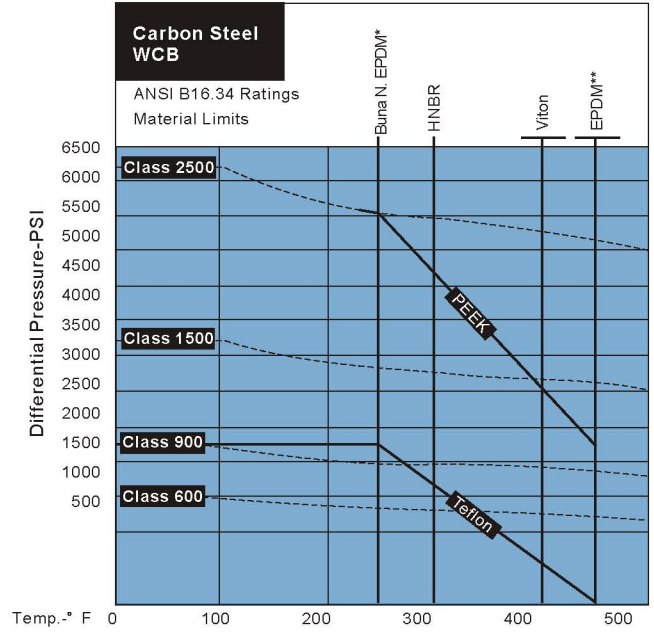
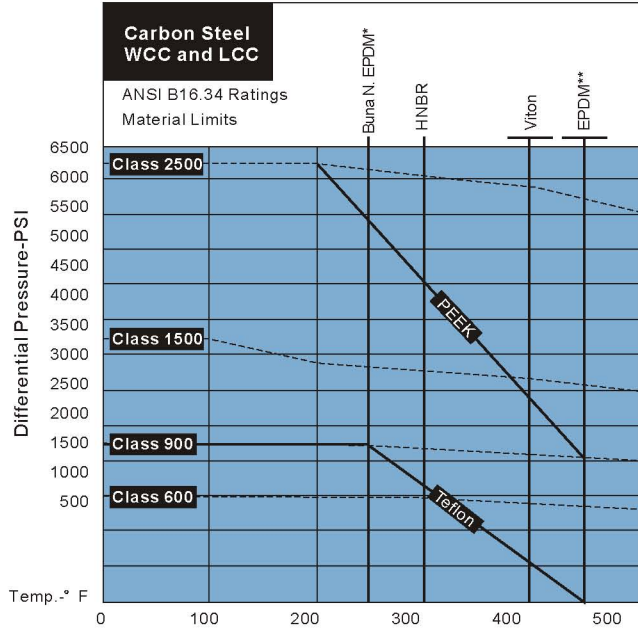
Face to Face	API 6D
End Flange	ASME B16.5
Buttweld	ASME B16.25
Class	ASME CL2500



### CLASS 2500 DIMENSION

SIZE (in.)	W.T.(lbs.)			A	B		C		D	E	F		G	H	U	V	W	X	Y	Z	AA	BB	Ring Groove RTJ
	Valve	W/	W/		RF	RTJ	RF	RTJ			Top of Handle	CL of H/Whl.											Unit: inch
	Only	H.O.G.O																					
2X2	199	205	207	1-3/4	17-3/4	17-7/8	8-7/8	8-15/16	9-1/4	7-1/2	8-19/32	7	30	1-3/16	5-7/8	8	1-1/8	6-3/4	10	1-3/4	4-1/2	7-1/2	R-26
3X3	341	352	355	2-1/2	22-3/4	23	11-3/8	11-1/2	12	9-13/16	10-37/32	10	48	1-5/8	7-3/4	8	1-3/8	9	12	2-1/2	5-9/16	7-7/8	R-32
4X3	505	516	519	2-1/2	26-1/2	26-7/8	13-1/4	13-7/16	14	9-13/16	10-27/32	10	48	1-5/8	7-3/4	8	1-5/8	10-3/4	12	2-1/2	5-9/19	7-7/8	R-38
4X4	650	-	681	3-1/2	26-1/2	26-7/8	13-1/4	13-7/16	14	11-11/32	-	9-29/32	-	2-11/32	8-27/32	8	1-5/8	10-3/4	24	3-1/2	6-11/16	13-3/8	R-38
6X4	803	-	834	3-1/2	36	36-1/2	18	18-1/4	19	11-11/32	-	9-29/32	-	2-11/32	8-27/32	8	2-1/8	14-1/2	24	3-1/2	6-11/16	13-3/8	R-47
6X6	913	-	994	5-1/4	36	36-1/2	18	18-1/4	19	16-1/32	-	18-9/16	-	3-21/32	12-3/8	8	2-1/8	14-1/2	18	4-5/8	8-7/16	17-5/8	R-47
8X6	1141	-	1222	5-1/4	40-1/4	40-7/8	20-1/8	20-7/16	21-3/4	16-1/32	-	18-9/16	-	3-21/32	12-3/8	12	2-1/8	17-1/4	18	4-5/8	8-7/16	17-5/8	R-51
8X8	2515	-	2640	7-1/8	40-1/4	40-7/8	20-1/8	20-7/16	21-3/4	19-15/16	-	22-5/8	-	3-11/16	16-1/4	12	2-1/8	17-1/4	30	6-1/4	11-1/8	20-5/8	R-51
10X8	3465	-	3590	7-1/8	50	50-7/8	25	25-7/16	26-1/2	19-15/16	-	22-5/8	-	3-11/16	16-1/4	12	2-5/8	21-1/4	30	6-1/4	11-1/8	20-5/8	R-55
10X10	5565	-	5700	8-7/8	50	50-7/8	25	25-7/16	26-1/2	24-13/16	-	26-3/8	-	4-1/4	20-9/16	12	2-5/8	21-1/4	30	6-1/4	13-5/8	20-5/8	R-55
12X10	6808	-	6943	8-7/8	56	56-7/8	28	28-7/16	30	24-13/16	-	26-3/8	-	4-1/4	20-9/16	12	2-7/8	24-3/8	30	6-1/4	13-5/8	20-5/8	R-60
12X12	7587	-	7722	10-1/2	56	56-7/8	28	28-7/16	30	27-1/2	-	19-15/32	-	4-5/16	23-3/16	12	2-7/8	24-1/8	30	6-1/4	14-5/8	20-5/8	R-60

**TOP ENTRY BALL VALVE PRESSURE TEMPERATURE AND FLOW DATA**



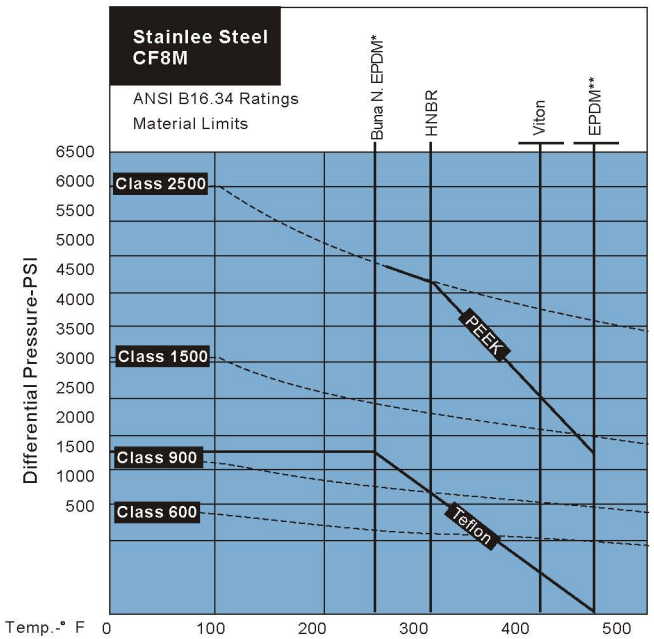
Pressure Temperature Chart Notes: Consult factory for service above 325° F  
 \*For chemical service. \*\* For water and steam service only.

**LOW TEMPERATURE LIMITS**

Body Material	° F	° C	Seat Material	° F	° C
WCC	-20°	-28.9	Teflon	-50°	-45.6
LCC	-50°	-45.6	PEEK	-50°	-45.6
WCB	-20°	-28.9			
CF8M	-50°	-45.6			

Seal Material	° F	° C	Seal Material	° F	° C
Buna N	-30°	-34.4	Viton	+10°	-12.2
Low Temp Buna N	-50°	-45.6	NBR	-40°	-40
Viton	-20°	-28.9	EPDM	-50°	-45.6



**FLOW COEFFICIENT (CV), API 6D & ANSI B16.34**

Class	Size(in.)						
	3 RP	4 RP	6 RP	8 RP	10 RP	12 RP	16 RP
600	185	570	890	2235	4605	7525	14,750
900	190	560	800	2150	4500	8000	-
1500	185	570	890	2235	4000	7000	-
2500	170	520	750	2050	3970	6850	-

**METHOD OF CALCULATING FLOW**

The Flow Coefficient "Cv" of a valve is the flow rate of water (gallons/minute @ 60° F) through a fully opened valve, with a pressure drop of 1 psi across the valve. To find the flow of a liquid or gas through a valve from the Cv, use the following formulas:

**Liquid Flow**

QL = flow rate of liquid (gal./min.)  
 ΔP = differential pressure across the valve (psi)  
 G = Specific gravity of liquid (for water, G=1)

$$Q_L = C_v \sqrt{\frac{\Delta P}{G}}$$

**Gas Flow**

Qg = flow rate of gas (CFH at STP)  
 P<sub>2</sub> = outlet pressure (psi)  
 g = Specific gravity of gas (for air, g=1.000)

$$Q_g = 61 C_v \sqrt{\frac{P_2 \Delta P}{G}} \quad \left\{ \frac{\Delta P}{P_2} < 1.0 \right\}$$

For non-critical flow