

Metal Seated Ball Valves  
For Power & Industrial Applications

## Severe Service Ball Valves

Series Z1 Unibody Power Valve  
Class 150-3500 & 4500 Sizes 1/2"- 4"

Series Z2 Two-Piece Industrial Valve  
Class 150-2500 Sizes 1/2"- 24"

Series Z3 Three-Piece  
Double Ball, Double Block & Bleed Valve



*Their Options Are Our Standards*

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Severe Service Ball Valve Solutions

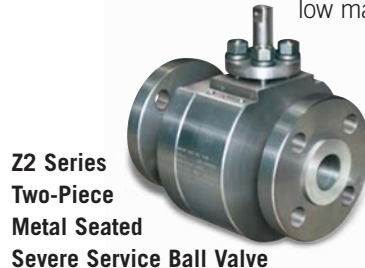
Series Z1, Z2 & Z3 One, Two & Three-Piece Metal Seated Severe Service Ball Valves

introduces their NEW Series of Severe Service Ball Valves engineered for zero-leakage and critical applications.

When it comes to media leakage and critical isolation, now you can strike back with superior quality, long lasting, low maintenance metal seated ball valve solution.



**Z1 Series Unibody High-Pressure Severe Service Ball Valve**



**Z2 Series Two-Piece Metal Seated Severe Service Ball Valve**



**Z3 Series Three-Piece Double Ball, Double Block & Bleed Severe Service Valve**

Severe Service Ball Valves • How To Order

Specifying Metal Seated Severe Service Valve Figure Numbers

**Example: 2.5 x 2 Z125-2240C-99-G418** • This number represents a 2.5" NPS x 2" Bore Series Z1 One-Piece Power Valve in ANSI Class 2500, with F22 Body Material and 410 SS Ball and Seat Material Coated with HVOF Chromium Carbide, SWE Upstream End Connection and a SWE Downstream End Connection, equipped with Gear Operator and 4" Tall Mounting Bracket with an ISO F10 Mounting Pattern and a 36 mm Coupler.

**2.5 x 2      Z1      25 - 22      40      C - 9      9 - G      4      1      8**

NPS x Bore (in.)		Series	ANSI Class	Body Material	Ball & Seat Material	Ball & Seat Coating	Upstream End Conn.	Downstream End Conn.	Operator	Bracket Height	ISO 5211 Mounting Pattern	Coupler Size
Z1*	Z2**											
.75 x .65	3/4	<b>Z1</b>	<b>10</b>	<b>5</b>	<b>36</b>	<b>C</b>	<b>1</b>	<b>1</b>	<b>A</b>	<b>4</b>	<b>0</b>	<b>6</b>
1 x 1	1	1-PC	150 Class	A105	316 SS	HVOF	Raised Face	Raised Face	Actuator	4"	F07	22 mm
1.5 x 1.4	1 1/2	Power Valve	<b>30</b>	<b>22</b>	<b>40</b>	Chromium Carbide	Flange	Flange	<b>B</b>	<b>6</b>	<b>1</b>	<b>7</b>
2 x 1.75	2	<b>Z1-SB</b>	300 Class	F22	410 SS		<b>3</b>	<b>3</b>	Bare Stem	6"	F10	27 mm
2.5 x 2	3	1-PC	<b>60</b>	<b>91</b>	<b>43</b>	<b>T</b>	RTJ	RTJ	(Specify	<b>8</b>	<b>2</b>	<b>8</b>
3 x 2.5	4	Sootblower	600 Class	F91	431 SS	HVOF	<b>5</b>	<b>5</b>	Bracket & Mntg.Pad)	8"	F12	36 mm
4 x 3	6	<b>Z2-FPU</b>	<b>90</b>	<b>36</b>	<b>44</b>	Tungsten Carbide	BWE	BWE	<b>G</b>	<b>12</b>	<b>3</b>	<b>9</b>
6 x 3.5	8	2-PC	900 Class	316 SS	431 SS		(Specify	(Specify	<b>L</b>	12"	F14	46 mm
8 x 4	10	Full Port	<b>15</b>	<b>4</b>	<b>51</b>	<b>S</b>	Pipe Sched.)	Pipe Sched.)	Gear	<b>16</b>	<b>4</b>	<b>K</b>
10 x 6	12	Uni-direction.	1500 Class	304 SS	F51 Duplex	Stellite®	<b>8</b>	<b>8</b>	<b>L</b>	16"	F16	Keyed
12 x 8	14	<b>Z2-FPB</b>	<b>25</b>	<b>51</b>	<b>55</b>	<b>X</b>	NPT	NPT	Lever	<b>X</b>	<b>5</b>	<b>SP</b>
	16	2-PC	2500 Class	F51 Duplex	F55 Duplex	Special	<b>9</b>	<b>9</b>		Special	F25	Special
	18	Full Port	<b>32</b>	<b>55</b>	<b>71</b>		SWE	SWE				
	20	Bi-directional	3200 Class	F55 Duplex	Monel®							
	24	<b>Z2-RPU</b>	<b>35</b>	<b>SP</b>	<b>73</b>							
		2-PC	3500 Class	Special	Hastelloy® C							
		Full Port	<b>45</b>		<b>74</b>							
		Uni-direction.	4500 Class		Inconel® 718							
		<b>Z2-RPB</b>			<b>75</b>							
		2-PC			Inconel® 625							
		Full Port			<b>SP</b>							
		Bi-directional			Special							
		<b>Z3</b>										
		3-PC Double Block & Bleed										

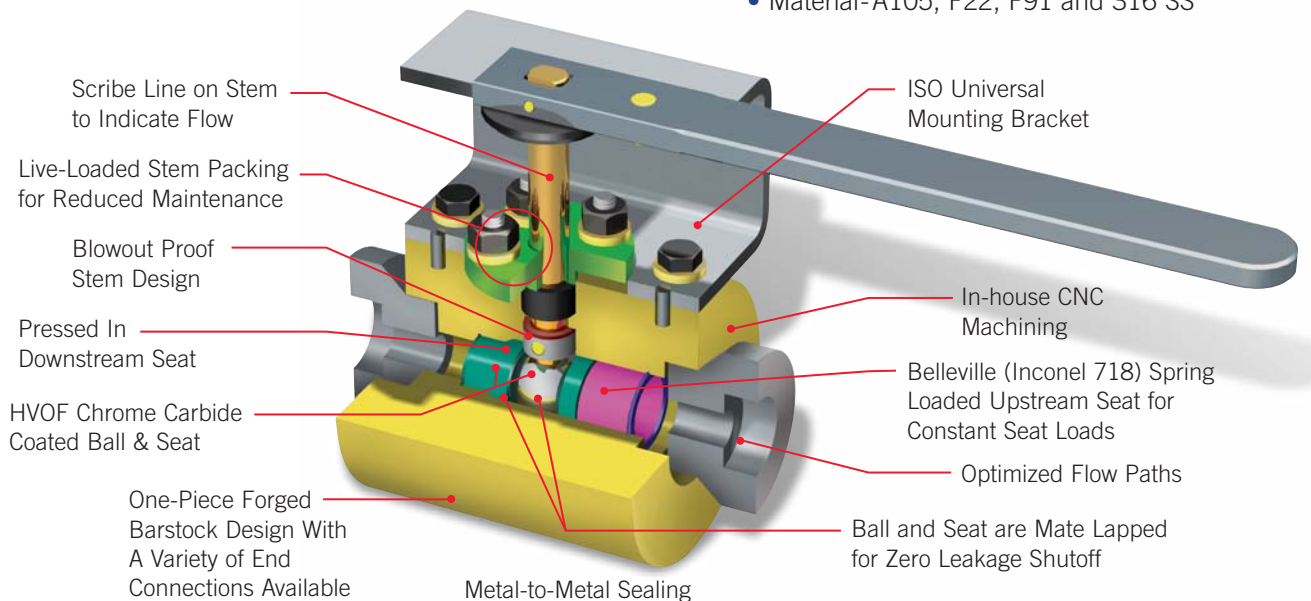
\*When placing orders please include NPS x Bore size before "Series" number. \*\*Z2 Valves are available in FP and RP configurations.

# Z1 Unibody Power Valve • Features, Applications & Dimensional Data

## Z1

One-Piece metal seated ball valves for high-pressure severe service applications including Power Generation and critical on/off applications.

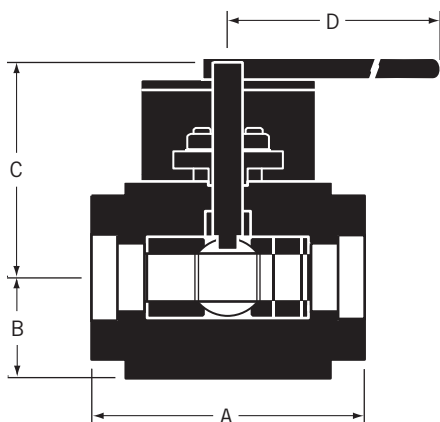
- .65"-3" Bore Size
- 150-4500 ANSI Class
- Design Meets ASME TDP-1 2006 Bore Requirements
- 1/2"-4" Nominal Pipe Size
- 4 Year Warranty
- Material-A105, F22, F91 and 316 SS



## Dependable Performance For All of Your Power Applications

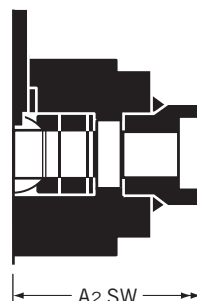
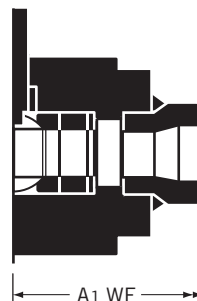
Series Z1 Metal Seated Severe Service Ball Valve is designed for dependable zero leakage performance in high pressure, high temperature, clean critical steam applications.

Union Tech offers the Z1 Severe Service Ball Valve in a variety of sizes and materials to meet your specific application requirements. Contact your Union Tech Representative today for more information about Severe Service Ball Valves.



## End Configuration Dimensions

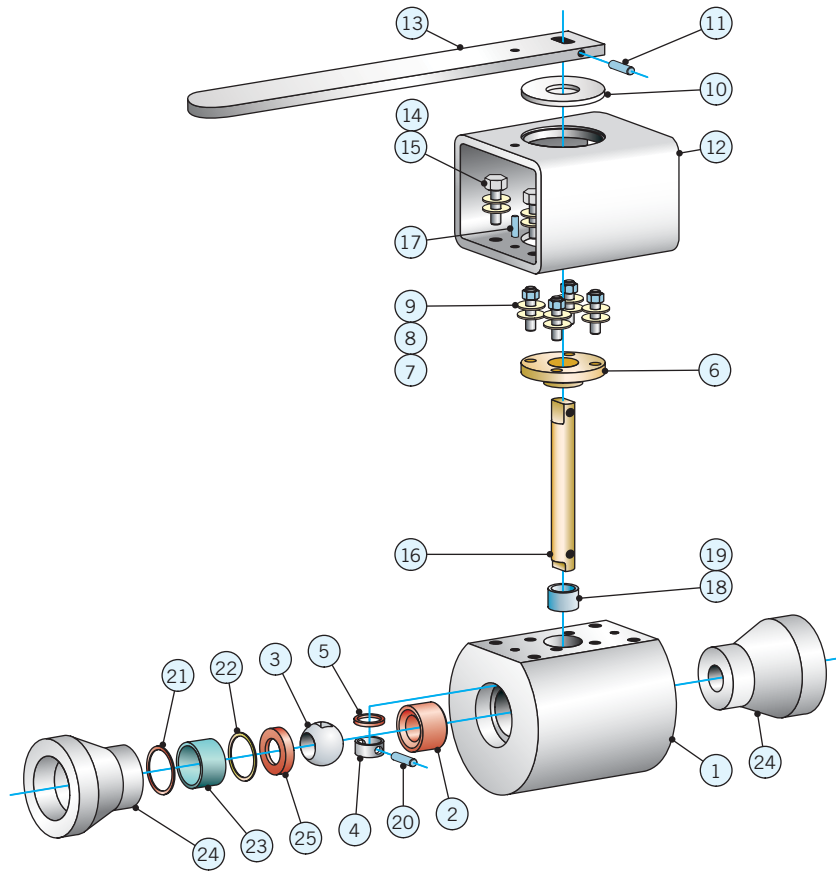
NOTE: From Centerline of Valve.



## Dimensional Data

Bore Size (in.)	A	A1 WE	A2 SW	B	C	D	Weight (Lbs)
.65	5.00	4.50	3.50	2.25	5.00	13.25	25
1.00	6.00	5.00	4.00	2.75	5.50	19.25	46
1.40	8.00	6.00	5.50	3.00	5.75	19.25	66
1.75	9.50	7.25	6.25	3.25	6.00	24.00	98
2.00	12.25	8.13	6.25	4.25	7.75	NA	170
2.50	14.00	*	9.50	5.50	10.50	NA	**
3.00	14.50	*	9.00	5.25	11.00	NA	**

\*Consult factory for dimensions not listed. \*\*Consult factory for weights not listed.



Parts & Materials

No.	Qty.	Description	Material			
			A105/LF2	A182 F22	A182 F91	A182 F316
1	1	Body	A105	A182 F22	A182 F91	A182 F316
2	1	Seal Seat	410 SS/CCC	410 SS/CCC	410 SS/CCC	410 SS/CCC
3	1	Ball	410 SS/CCC	410 SS/CCC	410 SS/CCC	410 SS/CCC
4	1	Stem Collar	410 SS/QPQ	410 SS/QPQ	410 SS/QPQ	410 SS/QPQ
5	1	Stem Bearing	410 SS/QPQ	410 SS/QPQ	410 SS/QPQ	410 SS/QPQ
6	1	Gland	410 SS	410 SS	410 SS	410 SS
7	1	Gland Nut	A193-B8M	A193-B8M	A193-B8M	A193-B8M
8	1	Gland Stud	A194-GR8	A194-GR8	A194-GR8	A194-GR8
9	1	Live-Loaded Spring	300SS	300SS	300SS	300SS
10	1	Adapter Bushing	Cast Iron	Cast Iron	Cast Iron	Cast Iron
11	1	Shear Pin	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
12	1	Mounting Bracket	CS ASTM A-500	CS ASTM A-500	CS ASTM A-500	CS ASTM A-500
13	1	Hand Lever	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
14	1	Hex Head Screw	J429 GR5	J429 GR5	J429 GR5	J429 GR5
15	1	Washer	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
16	1	Stem	A638 GR660	A638 GR660	A638 GR660	A638 GR660
17	1	Pin	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
18	1	Stem Packing	Grafoil®	Grafoil®	Grafoil®	Grafoil®
19	1	Stem Packing (Anti-Extrusion)	Grafoil®	Grafoil®	Grafoil®	Grafoil®
20	1	Load Pin	Inconel® 718	Inconel® 718	Inconel® 718	Inconel® 718
21	1	Retaining Ring	ASTM A286 GR660	ASTM A286 GR660	ASTM A286 GR660	ASTM A286 GR660
22	1	Spring	Inconel® 718	Inconel® 718	Inconel® 718	Inconel® 718
23	1	Transition Spacer	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
24	1	Socketweld Adapter	A105	A182 F22	A182 F91	A182 F316
25	1	Seat Pusher	410 SS/QPQ	410 SS/QPQ	410 SS/QPQ	410 SS/QPQ

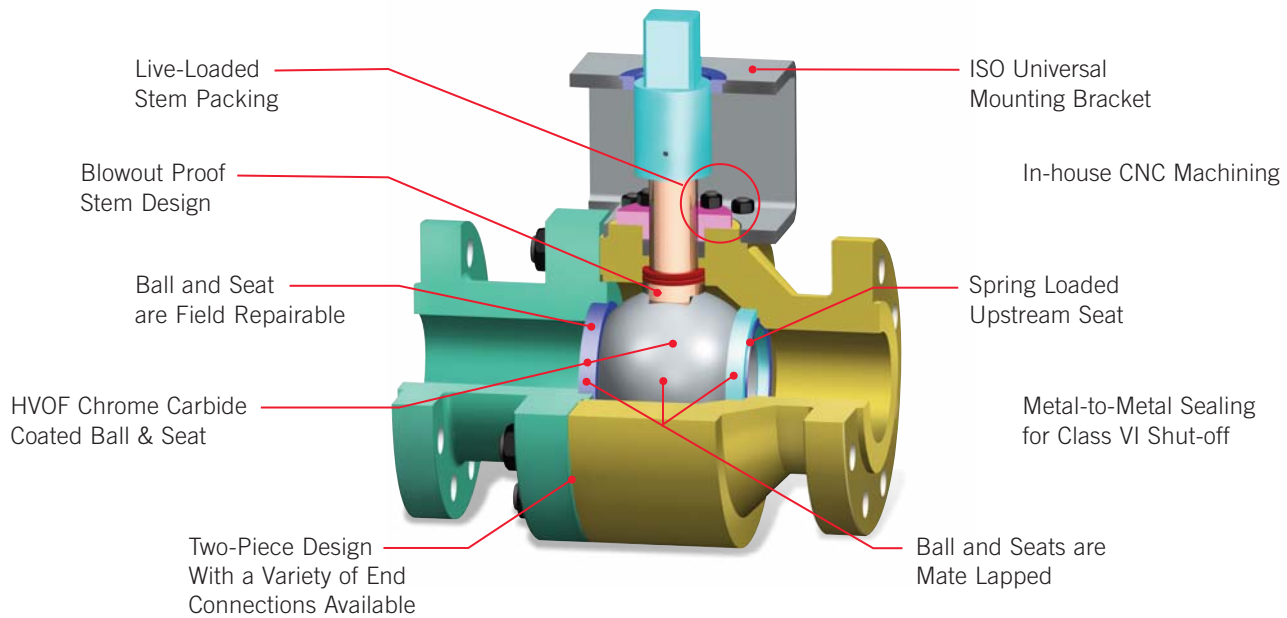
NOTE: Trim is Inconel® 718 on Class 4500 valves.  
We reserve the right to change materials and specifications.

Z2 Two-Piece Industrial Valve • Features, Applications & Dimensional Data (Class 150)

Z2

Two-Piece metal seated ball valves for severe service applications including Chemical, Petro-Chemical, Abrasives, etc.

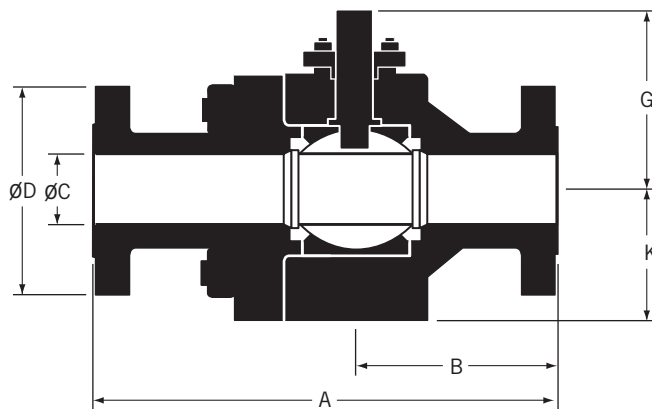
- 1/2"-24" Nominal Pipe Size
- 150-2500 ANSI Class
- Standard and Full Port
- Available in SW, BW, FLF, RTJ, Hub and NPT Ends
- Materials: A-105, F-22, F-91, 316, Others Upon Request
- Uni or Bi-directional



Rugged Design For All of Your Industrial Applications

Series Z2 Metal Seated Severe Service Ball Valve is designed for dependable performance in critical service industrial applications including Oil & Gas Refining, Petroleum & Petro Chemical production and many others.

Union Tech offers the Z2 Severe Service Ball Valve in a variety of sizes and materials to meet your specific application requirements. Contact your Union Tech Representative today for more information about Severe Service Ball Valves.

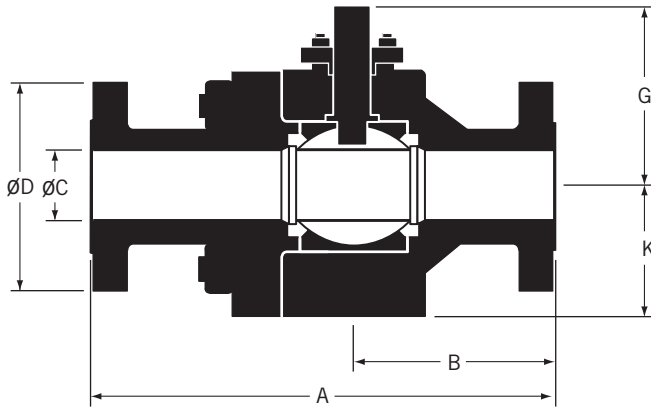


Class 150 Dimensional Data

Size (in.)	A	B	øC	øD	G	K
1/2	4.25	2.00	0.50	3.50	2.75	2.38
3/4	4.62	2.38	0.75	3.88	3.00	2.50
1	5.00	2.63	1.00	4.25	4.88	3.00
1 1/2	6.50	2.88	1.50	5.00	5.25	3.13
2	7.00	3.25	2.00	6.00	6.00	3.38
3	8.00	4.00	3.00	7.50	7.00	4.50
4	9.00	3.75	4.00	9.00	8.25	5.00
6	15.50	7.50	6.00	11.00	11.50	7.75
8	18.00	9.25	8.00	13.50	15.00	9.50
10	21.00	10.75	10.00	16.00	17.75	11.50
12	24.00	12.00	12.00	19.00	19.00	12.25
14	27.00	13.50	13.25	21.00	21.50	14.50
16	30.00	15.00	15.25	23.50	22.00	15.50
18	34.00	17.00	17.25	25.00	30.00	17.50
20	36.00	18.00	19.25	27.50	34.00	21.00
24	42.00	22.00	23.25	32.00	40.00	25.00

NOTE: Z2 Sizes are estimated. Contact factory for verification when ordering.

Z2 Two-Piece Industrial Valve • Dimensional Data (Class 300, 600, 900, 1500 & 2500)



Class 300 Dimensional Data

Size (in.)	A	B	øC	øD	G	K
1/2	5.50	2.25	0.50	3.75	2.75	2.38
3/4	6.00	2.50	0.75	4.62	3.00	2.50
1	6.50	2.75	1.00	4.88	4.88	3.00
1 1/2	7.50	3.00	1.50	6.12	5.25	3.13
2	8.50	3.75	2.00	6.50	6.00	3.38
3	11.12	4.75	3.00	8.25	7.00	4.50
4	12.00	5.38	4.00	10.00	8.25	5.00
6	15.88	7.75	6.00	12.50	11.50	7.75
8	19.75	9.25	8.00	15.00	15.00	9.50
10	22.38	12.00	10.00	17.50	17.75	11.50
12	25.50	13.00	12.00	20.50	19.00	12.25
14	30.00	16.00	13.25	23.00	21.50	15.25
16	33.00	16.50	15.25	25.50	24.50	15.50
18	36.00	18.00	17.00	28.00	30.00	17.50
20	39.00	20.00	19.00	30.50	37.00	21.00
24	45.00	23.00	23.00	36.00	42.00	25.00

Class 600 Dimensional Data

Size (in.)	A	B	øC	øD	G	K
1/2	6.50	2.75	0.50	3.75	2.75	2.38
3/4	7.50	3.50	0.75	4.62	3.00	2.50
1	8.50	4.25	1.00	4.88	3.00	3.00
1 1/2	9.50	4.75	1.50	6.12	5.25	3.50
2	11.50	5.00	2.00	6.50	6.00	3.75
3	14.00	6.00	3.00	8.25	7.00	4.75
4	17.00	7.75	4.00	10.75	8.25	5.00
6	22.00	9.00	6.00	14.00	11.50	8.00
8	26.00	12.25	7.87	16.50	15.88	10.25
10	31.00	14.00	9.75	20.00	18.00	11.50
12	33.00	16.00	11.75	22.00	20.00	12.25
14	35.00	17.50	12.87	23.75	24.00	16.00
16	39.00	20.25	14.75	27.00	26.00	16.00
18	43.00	22.50	16.50	29.25	32.00	18.00
20	47.00	23.75	18.25	32.00	38.00	21.00
24	55.00	28.00	22.00	37.00	44.00	25.00

Class 900 Dimensional Data

Size (in.)	A	B	øC	øD	G	K
1/2	9.00	4.50	0.50	4.75	2.75	3.00
3/4	9.00	4.50	0.69	5.12	3.00	3.00
1	10.00	5.00	0.87	5.88	4.88	3.00
1 1/2	12.00	6.00	1.37	7.00	5.25	4.31
2	14.50	6.50	1.87	8.50	6.00	4.50
3	15.00	7.00	2.87	9.50	7.00	5.00
4	18.00	7.50	3.87	11.50	8.25	6.75
6	24.00	9.50	5.75	15.00	11.50	9.00
8	29.00	14.00	7.50	18.50	15.00	11.50
10	33.00	16.00	9.37	21.50	17.75	13.75
12	38.00	18.00	11.12	24.00	19.00	15.50

Class 1500 Dimensional Data

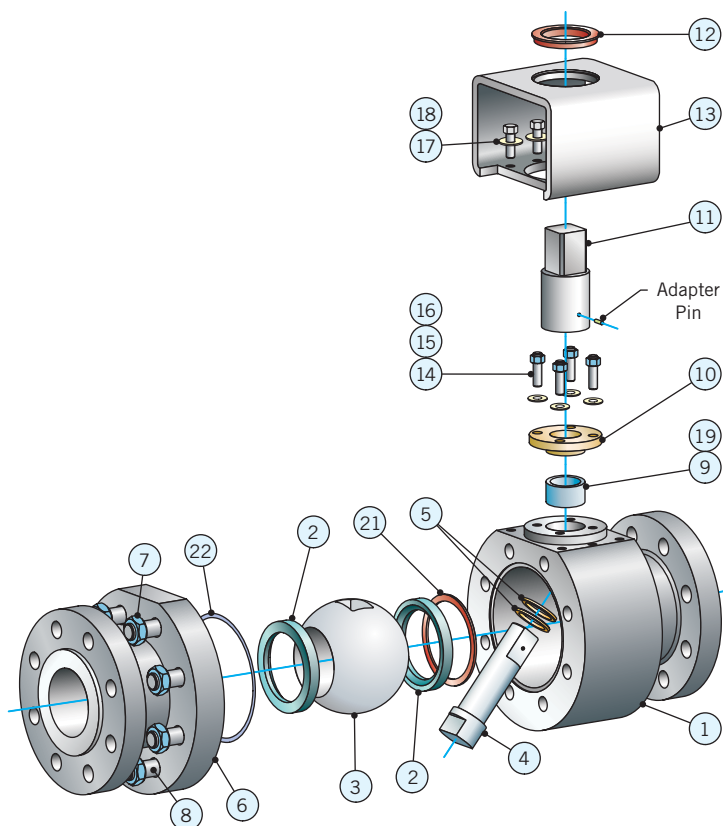
Size (in.)	A	B	øC	øD	G	K
1/2	9.00	4.50	0.50	4.75	4.75	3.00
3/4	9.00	4.50	0.69	5.12	4.75	3.00
1	10.00	5.00	0.87	5.88	4.75	3.00
1 1/2	12.00	6.00	1.37	7.00	7.50	3.50
2	14.50	6.50	1.87	8.50	8.25	4.38
3	18.50	8.50	2.75	10.50	9.50	5.50
4	21.50	9.75	3.62	12.25	12.13	7.25
6	27.75	11.00	5.37	15.50	17.50	10.00
8	32.75	14.00	7.00	19.00	20.00	12.50
10	39.00	16.00	8.75	23.00	21.00	15.50
12	44.50	19.00	10.37	26.50	24.00	14.00

Class 2500 Dimensional Data

Size (in.)	A	B	øC	øD	G	K
1/2	9.00	4.50	0.44	5.25	4.75	3.00
3/4	9.00	4.50	0.56	5.50	4.75	3.00
1	10.00	5.00	0.75	6.25	4.75	3.00
1 1/2	12.00	6.00	1.12	8.00	7.00	4.50
2	17.75	7.25	1.50	9.25	9.00	6.00
3	22.75	10.00	2.25	12.00	11.75	8.50
4	26.50	11.00	2.87	14.00	13.25	7.50
6	36.00	13.00	4.37	19.00	15.00	11.00
8	40.25	14.50	5.75	21.75	24.00	13.00
10	50.00	19.00	7.25	26.50	26.00	13.50
12	56.00	22.00	8.62	30.00	28.00	18.50

NOTE: Z2 Sizes are estimated. Contact factory for verification when ordering. Sizes 14"-24" are available upon request.

Z2 Two-Piece Industrial Valve • Parts & Materials



Parts & Materials

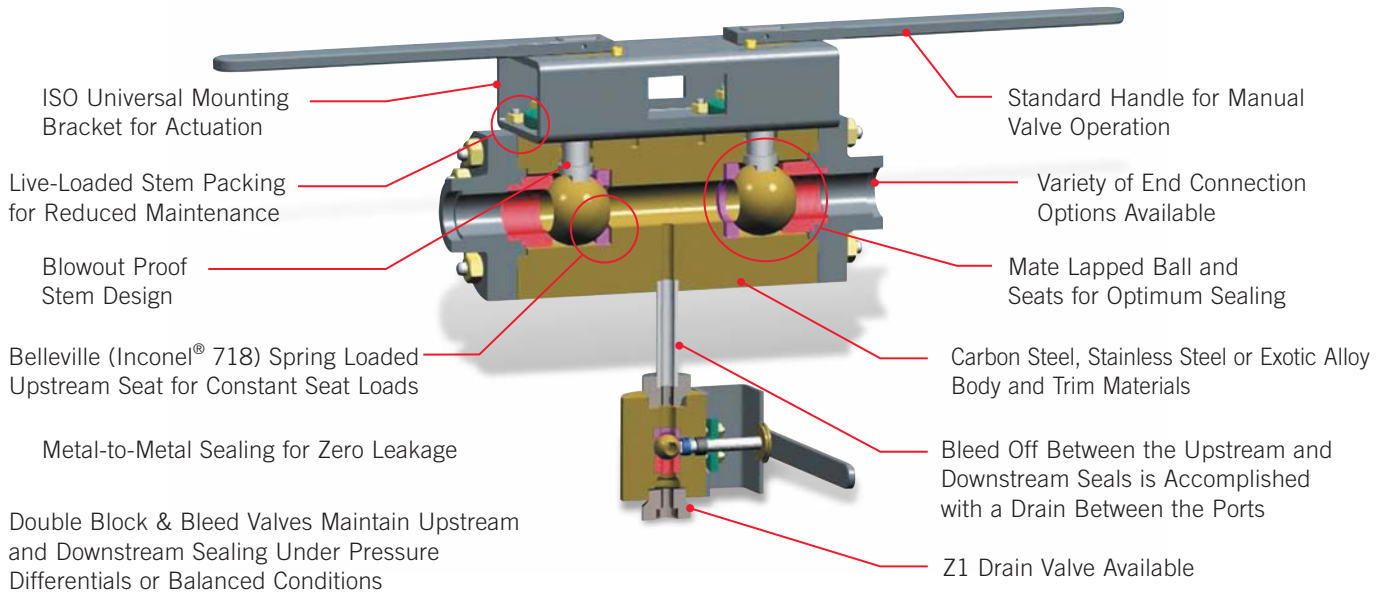
No.	Qty.	Description	Material			
			A105/LF2	A182 F22	A182 F91	A182 F316
1	1	Body	A105	A182 F22	A182 F91	A182 F316
2	2	Seal Seat	410 SS/CCC	410 SS/CCC	410 SS/CCC	410 SS/CCC
3	1	Ball	410 SS/CCC	410 SS/CCC	410 SS/CCC	410 SS/CCC
4	1	Stem	A638 GR660	A638 GR660	A638 GR660	A638 GR660
5	1	Stem Bearing	410 SS/QPQ	410 SS/QPQ	410 SS/QPQ	410 SS/QPQ
6	1	End Connection	A105	A105	A105	A105
7	1	Body Nut	ASTM A194-GR2H	ASTM A194-GR4H	ASTM A194-GR4H	ASTM A194-GR8
8	1	Body Stud	ASTM A193-B7	ASTM A193-B16	ASTM A193-B16	ASTM A193-B8
9	1	Stem Packing	Grafoil®	Grafoil®	Grafoil®	Grafoil®
10	1	Gland Flange	410 SS	410 SS	410 SS	410 SS
11	1	Stem Adapter	4140HT	4140HT	4140HT	4140HT
12	1	Adapter Bushing	Cast Iron	Cast Iron	Cast Iron	Cast Iron
13	1	Mounting Bracket	CS ASTM A-500	CS ASTM A-500	CS ASTM A-500	CS ASTM A-500
14	1	Gland Stud	A193-B8M	A193-B8M	A193-B8M	A193-B8M
15	1	Gland Nut	A194-GR8	A194-GR8	A194-GR8	A194-GR8
16	1	Gland Lock Washer	300SS	300SS	300SS	300SS
17	1	Bracket Bolts	A574 GR5	A574 GR5	A574 GR5	A574 GR5
18	1	Bracket Lock Washer	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
19	1	Stem Packing (Anti-Extrusion)	Grafoil®	Grafoil®	Grafoil®	Grafoil®
21	1	Spring	Inconel® 718	Inconel® 718	Inconel® 718	Inconel® 718
22	1	Body Gasket	316/Grafoil® Filled	316/Grafoil® Filled	316/Grafoil® Filled	316/Grafoil® Filled

NOTE: We reserve the right to change materials and specifications.

Z3

Three-Piece metal seated double block and bleed ball valves for severe service applications.

- .65"-3" Bore Size
- 1/2"-4" Nominal Pipe Size
- 150-1500 ANSI Class
- Available in SW, BW, FLG and NPT Ends
- Materials: A-105, F-22, F-91, 316 and others upon request



Rugged Design For All of Your Industrial Applications

Series Z3 Double Block & Bleed Metal Seated Severe Service Ball Valve is designed for dependable performance including Clean Critical Service, Oil & Gas Refining, Petroleum & Petro Chemical Production and many others. With two isolation points for zero leakage, the Z3 is designed to maintain upstream and downstream sealing under pressure differentials or balanced conditions.

Union Tech offers the Z3 Double Block & Bleed Metal Seated Severe Service Ball Valve in a variety of sizes and materials to meet your specific application requirements. Contact your Union Tech Representative today for more information about Series Z3 Ball Valves.

Z1 Unibody Power Valve & Z2 Two-Piece Industrial Valve • Engineering Data

The  $C_v$  for valves indicates the flow capacity of the valve.  $C_v$  by definition is the volume of water in gallons per minute at 60°F that will flow through a given element with a pressure drop of 1 psig.

Series Z1 • Flow Coefficients ( $C_v$ )

Valve Size	Bore Size (in.)/Pipe Schedule													
	.65		1.00		1.40		1.75		2.00		2.50		3.05	
	80	160	80	160	80	160	80	160	80	160	80	160	80	160
1/2	22	22	—	—	—	—	—	—	—	—	—	—	—	—
3/4	32	40	—	—	—	—	—	—	—	—	—	—	—	—
1	31	26	103	74	—	—	—	—	—	—	—	—	—	—
1 1/2	15	16	48	56	155	212	—	—	—	—	—	—	—	—
2	14	15	40	46	105	135	264	375	466	347	—	—	—	—
2 1/2	—	—	36	37	86	94	170	208	304	400	—	—	—	—
3	—	—	28	29	75	80	135	150	202	234	481	655	—	—
4	—	—	—	—	56	58	115	120	160	172	296	342	588	785

NOTE: For other pipe sizes not in the chart, contact factory.

Series Z2 • Flow Coefficients ( $C_v$ )

Valve Size (in.)	Flow Coefficients ( $C_v$ ) Rating					
	Cl. 150	Cl. 300	Cl. 600	Cl. 900	Cl. 1500	Cl. 2500
1/2	26	26	26	26	26	20
3/4	62	62	62	52	52	33
1 x 1 1/2	8	8	8	9	9	10
1	114	114	114	84	84	61
1 1/2 x 1	40	40	40	45	45	70
1 1/2	270	270	270	223	223	145
2 x 1 1/2	105	105	105	120	120	270
2	500	500	500	432	432	270
3 x 2	159	159	159	168	177	286
3	1175	1175	1175	1070	978	640
4 x 3	427	427	427	454	528	640
4	2160	2160	2160	2013	1748	1070
6 x 4	787	787	787	830	916	1515
6	5076	5076	5076	4641	4018	2602
8 x 6	1724	1724	2161	2376	2815	—
8	9300	9300	8985	8120	7022	4641
10 x 8	4250	4250	4502	4992	6246	6622
10	14,865	14,865	14,095	12,966	11,228	7560
12 x 10	7348	7348	7776	9268	12,411	—
12	21,799	21,799	20,857	18,578	16,044	10,880
14 x 12	13,793	13,793	15,502	19,581	—	—
16 x 14	19,916	19,916	23,040	30,125	—	—
18 x 16	23,588	25,508	30,887	39,857	—	—
20 x 18	36,010	38,269	47,203	—	—	—
24 x 20	32,665	33,972	39,620	48,573	—	—

NOTE: I.D. of valve size is based on ASME B16.34 Annex A. Please contact factory for additional valve sizes.

