

UNION TECH



Z-SERIES VALVES | 2021

SEVERE-SERVICE METAL-SEATED BALL VALVES



ABOUT UNION TECH

Since 1982, we have dedicated ourselves to mastering the art of precision machining. From those manufacturing roots, we grew a vertically-integrated enterprise empowered to service the production needs of industries and markets worldwide. Our Valve Products division was launched in 2003 by a team of world-class mechanical engineers, seasoned valve experts, and experienced manufacturing professionals. Since then, Union Tech has engineered, manufactured, and sold over 100,000 MSBV's worldwide as the OEM for a number of different brands.

ENGINEERING AND DESIGN

Z-Series valves are highly engineered products developed by our team of engineers and industry experts. Union Tech utilizes advanced engineering techniques, such as finite element analysis (FEA) and comprehensive flow analysis to ensure every valve is optimized for its intended application. Our engineering team is always available for support with upfront materials selection, piping and instrumentation diagrams (P&ID), and general onsite operations.

MANUFACTURING

Every substantial component is machined internally; all critical processes are performed in-house. This unique approach enables us to maintain and ensure quality and consistency, shorten the supply chain to achieve aggressive delivery horizons, and leverage efficiencies across the entire production process to deliver value to our customers. Examples of insourced manufacturing processes include:

- ♦ Machining
- ♦ Welding
- ♦ Mate Lapping
- ♦ Hardfacing Coatings
- ♦ Assembly
- ♦ Testing per ANSI FCI 70.2 Class VI (or MSS-SP61, API-598, API-607, API-608, API-6D, etc.)

QUALITY AND TESTING

Quality is paramount to our organization, permeates every aspect of our operations, and starts from the very beginning. Raw materials undergo positive material identification (PMI) and hardness testing to ensure procured materials, such as forged barstock and heavy hex nuts, meet engineering specifications. Union Tech employs the Microsoft Dynamics AX ERP system to ensure full transparency and traceability of lot and serial numbered inventory across our organization. Upon manufacturing completion and prior to shipping, each and every Z-Series Valve is tested per ANSI FCI 70.2 Class VI (or MSS-SP61, API-598, API-607, API-608, API-6D, etc.).

SERVICE

Union Tech's technical service team is available 24 hours a day to ensure our valves perform up to the industry's highest standards. From the engineering team that designed the valve to the production cell that assembled and tested it, our professionals stand ready to diagnose and solve any issue that may arise. Our staff can be made available for deployment onsite to provide critical operational support.

CERTIFICATIONS

ISO 9001:2015, 15848-1 // API 6D, 607, 622, 624, and 641 // CRN // PED // GOST-R* // Safety Integrity Level (SIL) 3

* in fieri

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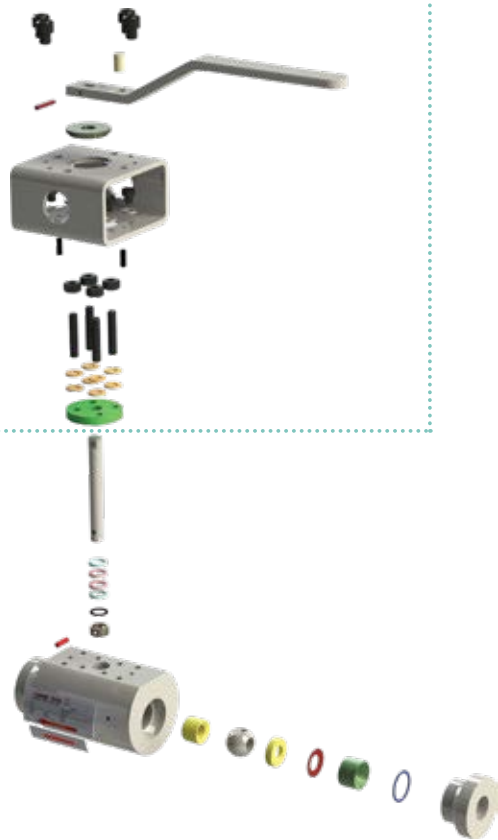
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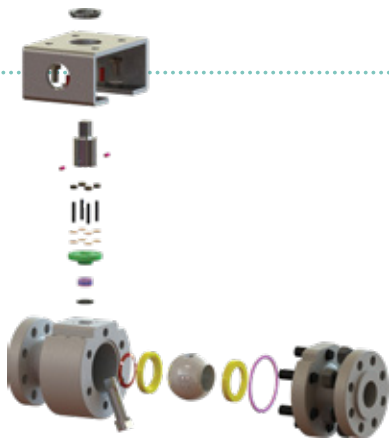


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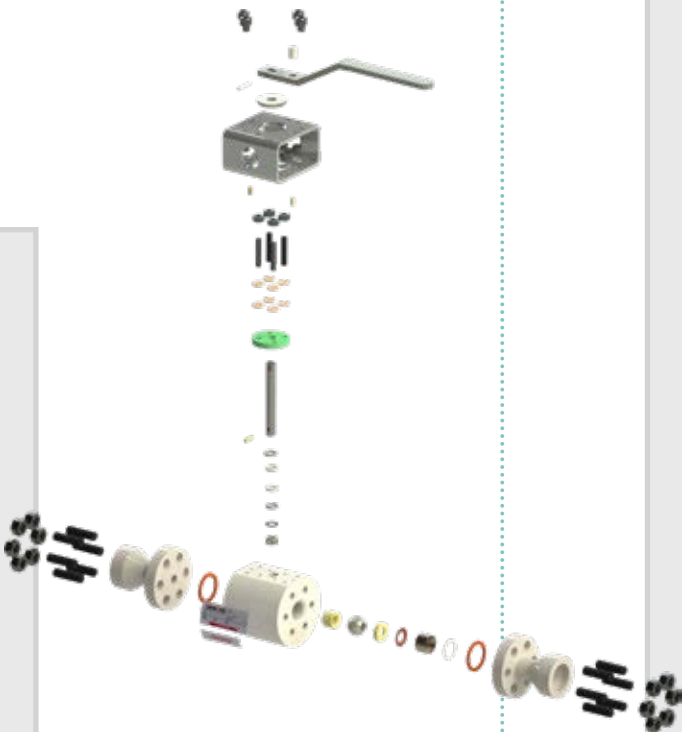


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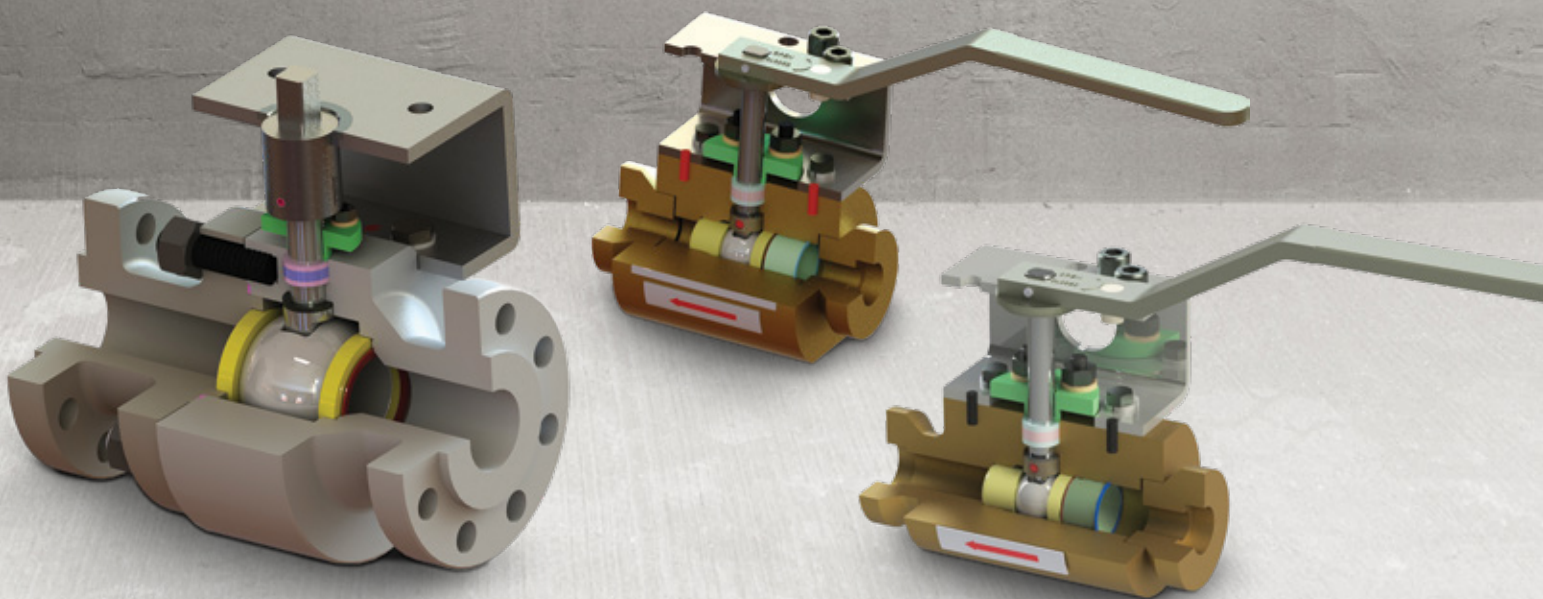
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SEVERE-SERVICE METAL-SEATED BALL VALVES

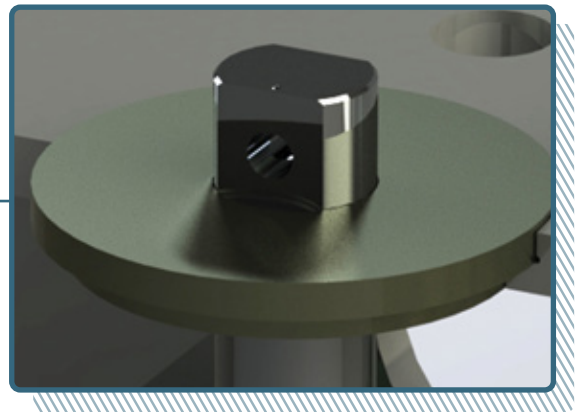
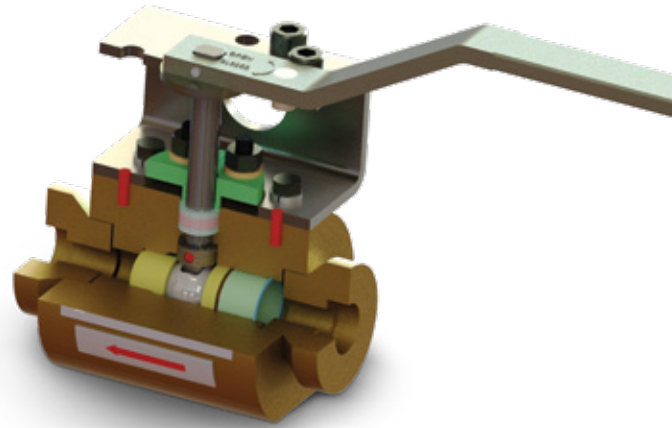


Z1 UNIBODY POWER VALVE

FEATURES

The Z1 Unibody Power Valve is a one-piece, metal-seated ball valve engineered for dependable zero leakage performance in high-pressure, severe-service applications, including power generation and critical on/off applications.

- ◆ 0.65" to 3.00" Bore Sizes
- ◆ 0.75" to 2.50" NPS SWE; 0.75" to 4.00" NPS BWE
- ◆ 150 to 4500# ANSI Classes
- ◆ Design Meets ASME TDP-1 2006 Bore Requirements
- ◆ Materials: A105, F22, F91, and 316SS
- ◆ 4-Year Limited Warranty
- ◆ Scribe Line on Stem to Indicate Mechanical Position
- ◆ Live-Loaded Stem Packing for Reduced Maintenance
- ◆ Two-Piece Die-Formed, Two-Piece Anti-Extrusion Stem Packing
- ◆ Blowout-Proof Stem Design
- ◆ Pressed-In Downstream Seat
- ◆ HVOF or Spray & Fused Chrome Carbide Coated Ball & Seat
- ◆ One-Piece Forged Barstock Design with Customizable End Connections
- ◆ ISO Universal Mounting Bracket
- ◆ Steel Pins – Prevents Side-Loading Bolt Stress
- ◆ In-House CNC Machining
- ◆ Optimized Flow Paths
- ◆ Spring-Loaded Upstream Seat for Constant Seat Loads
- ◆ Mate-Lapped Ball and Seats for Zero Leakage Shutoff
- ◆ Metal-to-Metal Sealing for Class VI Shut-Off
- ◆ Adapter Bushing – Provides Stable Stem Support and Smooth Operation



DIMENSIONAL DATA

End-to-End Lengths, A*

* End-to-end lengths, A, include end connection adapters, if utilized

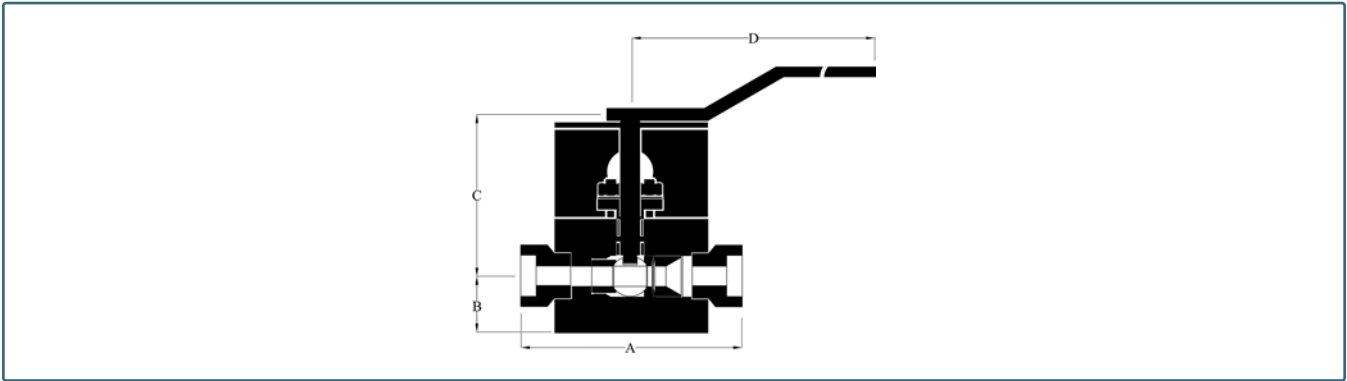
END SIZE	BORE SIZE (IN.)						
	0.65	1.00	1.40	1.75	2.00	2.50	3.00
Socket Weld End							
0.50	7.00	8.00	—	—	—	—	—
0.75	7.00	8.00	—	—	—	—	—
1.00	7.00	8.00	—	—	—	—	—
1.50	5.00	6.00	—	—	—	—	—
2.00	5.00	6.00	8.00	11.00	13.75	—	—
2.50	—	6.00	8.00	11.00	13.75	16.50	—
3.00	—	—	—	—	—	—	—
Butt Weld End							
0.50	9.00	10.00	—	—	—	—	—
0.75	9.00	10.00	—	—	—	—	—
1.00	9.00	10.00	—	—	—	—	—
1.50	9.00	10.00	—	—	—	—	—
2.00	9.00	10.00	12.00	14.50	15.25	—	—
2.50	—	—	12.00	14.50	15.25	18.00	—
3.00	—	—	13.00	14.50	15.25	18.00	18.25

Other Dimensions

Note: Weights are approximated

BORE SIZE (IN.)	B	C	D	WEIGHT (LBS.)
0.65	2.25	5.00	13.25	25.00
1.00	2.75	5.50	19.25	46.00
1.40	3.00	5.75	19.25	66.00
1.75	3.25	6.00	24.00	98.00
2.00	4.25	7.75	—	170.00
2.50	5.50	10.50	—	—
3.00	5.25	11.00	—	—

Note: Tables represent a sample set of data for 3200# ANSI pressure class valve designs. Data for other designs available upon request. Dimensional data provided for reference only – actual data can be furnished upon request.

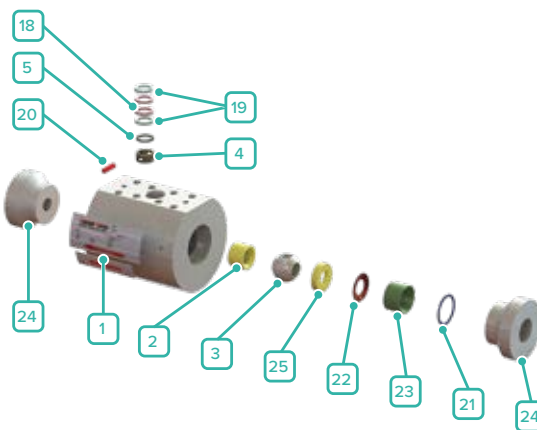
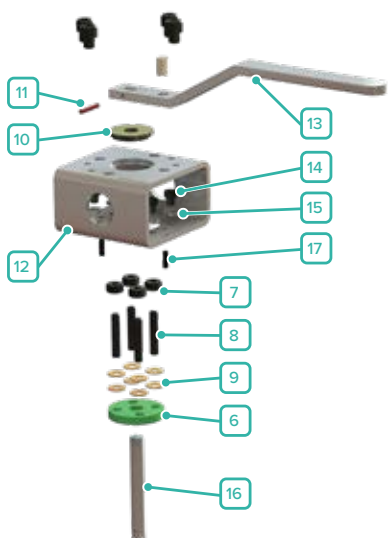


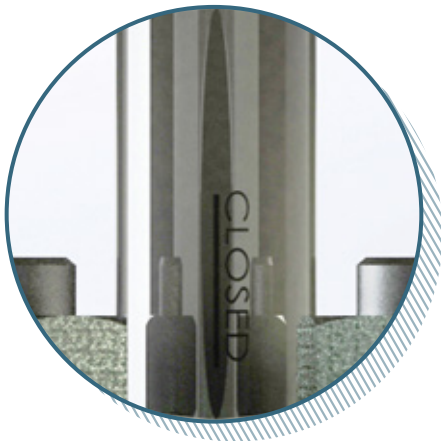
Notes: Depending on the configuration, the actual valve may utilize end connection adapters. Diagrams are illustrative only; actual valve may utilize different components.

PARTS AND MATERIALS

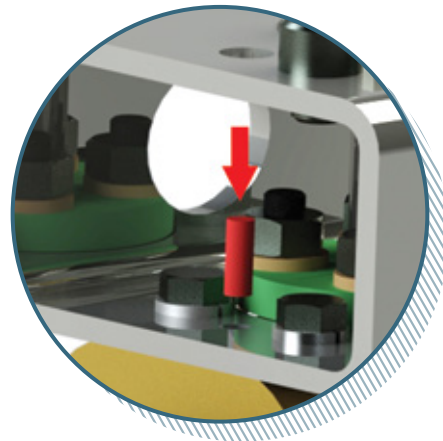
NO	QTY	DESCRIPTION	MATERIAL			
			A105/LF2	A182 F22	A 182 F91	A182 F316
1	1	Body	A105	A182 F22	A 182 F91	A182 F316
2	1	Seal Seat	410SS/CCC	410SS/CCC	410SS/CCC	410SS/CCC
3	1	Ball	410SS/CCC	410SS/CCC	410SS/CCC	410SS/CCC
4	1	Stem Collar	410SS/QPQ	410SS/QPQ	410SS/QPQ	410SS/QPQ
5	1	Stem Bearing	410SS/QPQ	410SS/QPQ	410SS/QPQ	410SS/QPQ
6	1	Gland	410SS	410SS	410SS	410SS
7	4	Gland Nut	A194-GR8	A194-GR8	A194-GR8	A194-GR8
8	4	Gland Stud	A193-B8	A193-B8	A193-B8	A193-B8
9	8	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	2	Stem Packing	Grafoil®	Grafoil®	Grafoil®	Grafoil®
19	2	Stem Packing (Anti-Extrusion)	Grafoil®/Inconel®	Grafoil®/Inconel®	Grafoil®/Inconel®	Grafoil®/Inconel®
20	1	Load Pin	Inconel® 718	Inconel® 718	Inconel® 718	Inconel® 718
21	1	Retaining Ring	ASTM A638 GR660	ASTM A638 GR660	ASTM A638 GR660	ASTM A638 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	Socket Weld Adapter	A105	A182 F22	A182 F91	A182 F316
25	1	Seat Pusher	410SS/QPQ	410SS/QPQ	410SS/QPQ	410SS/QPQ

Note: Trim is Inconel® 718 on 4500# ANSI class valves. Materials and specifications are subject to future revisions.

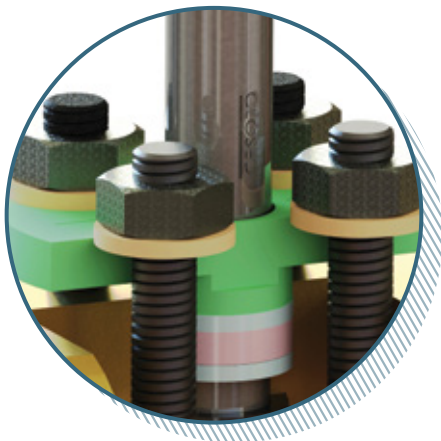




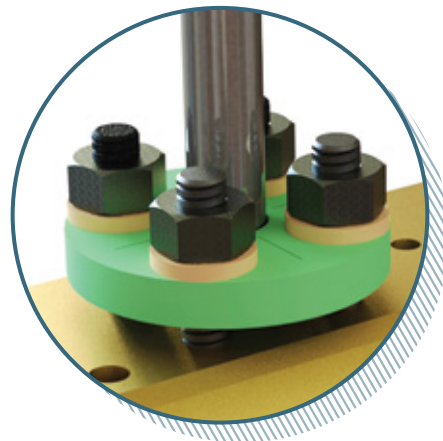
Positive on/off valve position verification is easily obtained via circular visual window



Pinned ISO mounting bracket prevents stem side-loading and bolt stress

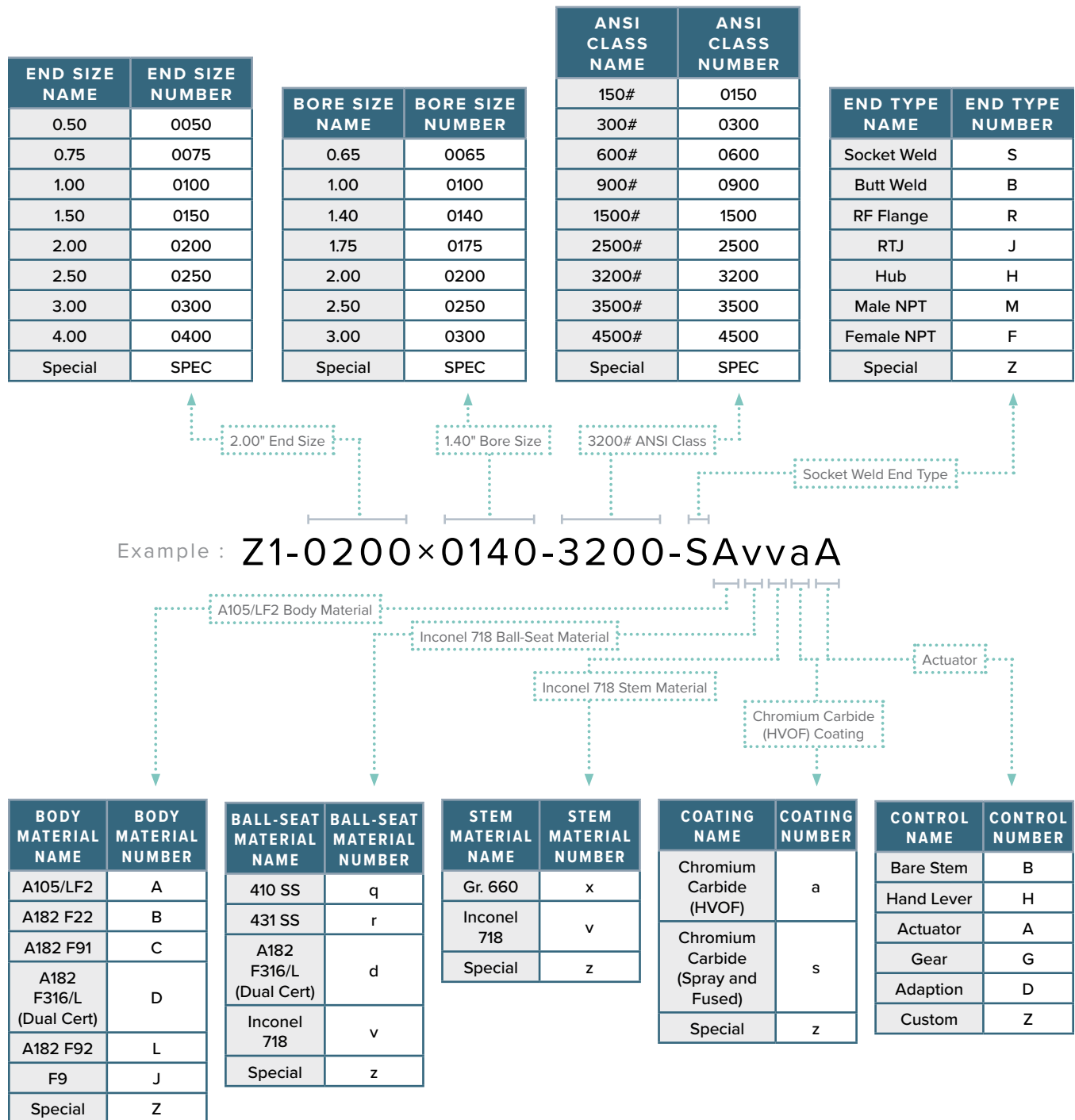


Live-loading Belleville washers provide constant packing pressure to ensure a tight seal; packing consists of two GTP graphite rings compressed between graphite Inconel® anti-extrusion packing rings



4-Bolt packing gland flange is optimally spaced for easy access with commercial tools

FIGURE NUMBERS

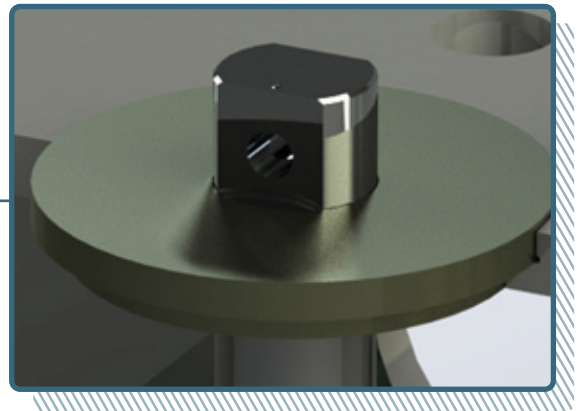
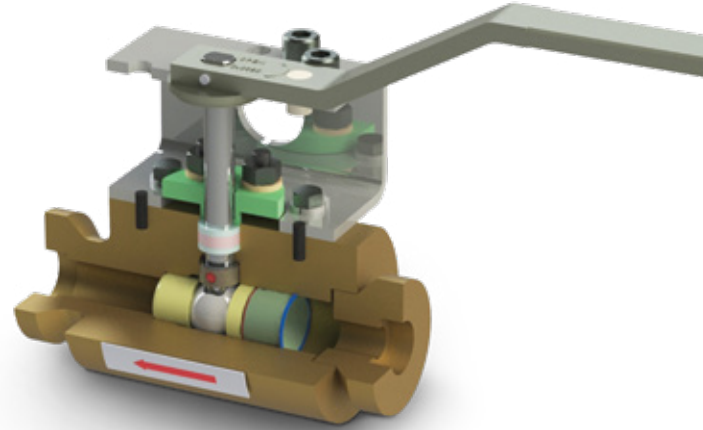


Z1LW LIGHTWEIGHT UNIBODY POWER VALVE

FEATURES

The Z1LW Lightweight Unibody Power Valve is a one-piece, metal-seated ball valve engineered for dependable zero leakage performance in high-pressure, severe-service applications, including power generation and critical on/off applications. With an integrated socket-weld end, the compact design of the Z1LW weighs 50% less than typical flanged valves of the same pressure class.

- ◆ 0.40" to 1.00" Bore Sizes
- ◆ 0.50" to 1.00" NPS SWE
- ◆ 150 to 1500# ANSI Classes
- ◆ Design Meets ASME TDP-1 2006 Bore Requirements
- ◆ Materials: A105, F11, F22, F91, and 316SS
- ◆ 4-Year Limited Warranty
- ◆ Scribe Line on Stem to Indicate Mechanical Position
- ◆ Live-Loaded Stem Packing for Reduced Maintenance
- ◆ Two-Piece Die-Formed, Two-Piece Anti-Extrusion Stem Packing
- ◆ Integrated Socket-Weld End
- ◆ Blowout-Proof Stem Design
- ◆ Pressed-In Downstream Seat
- ◆ HVOF Chrome Carbide Coated Ball & Seat
- ◆ One-Piece Forged Barstock Design with Customizable Connections
- ◆ ISO Universal Mounting Bracket
- ◆ Steel Pins – Prevents Side-Loading Bolt Stress
- ◆ In-House CNC Machining
- ◆ Optimized Flow Paths
- ◆ Spring-Loaded Upstream Seat for Constant Seat Loads
- ◆ Mate-Lapped Ball and Seats for Zero Leakage Shutoff
- ◆ Metal-to-Metal Sealing for Class VI Shut-Off
- ◆ Adapter Bushing – Provides Stable Stem Support and Smooth Operation



DIMENSIONAL DATA

End-to-End Lengths – Socket Weld Ends, A*

END SIZE	BORE SIZE (IN.)**	
	0.65	1.00
0.75	7.00	—
1.00	7.00	8.00

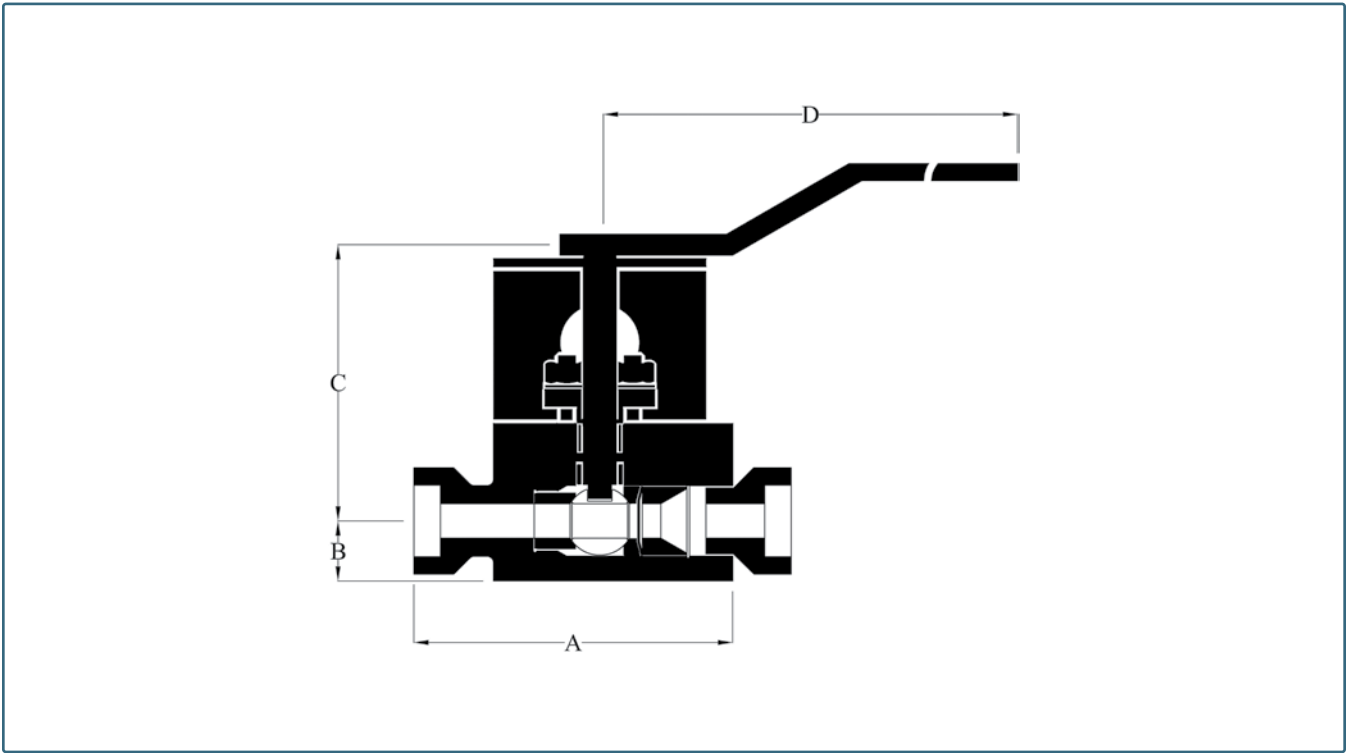
* End-to-end lengths, A, include end connection adapters, if utilized.

Other Dimensions

Note: Weights are approximated

BORE SIZE (IN.)**	B	C	D	WEIGHT (LBS.)
0.65	1.13	5.41	13.25	16
1.00	1.46	5.93	13.25	29

** Data for 0.40" bore sizes available upon request.

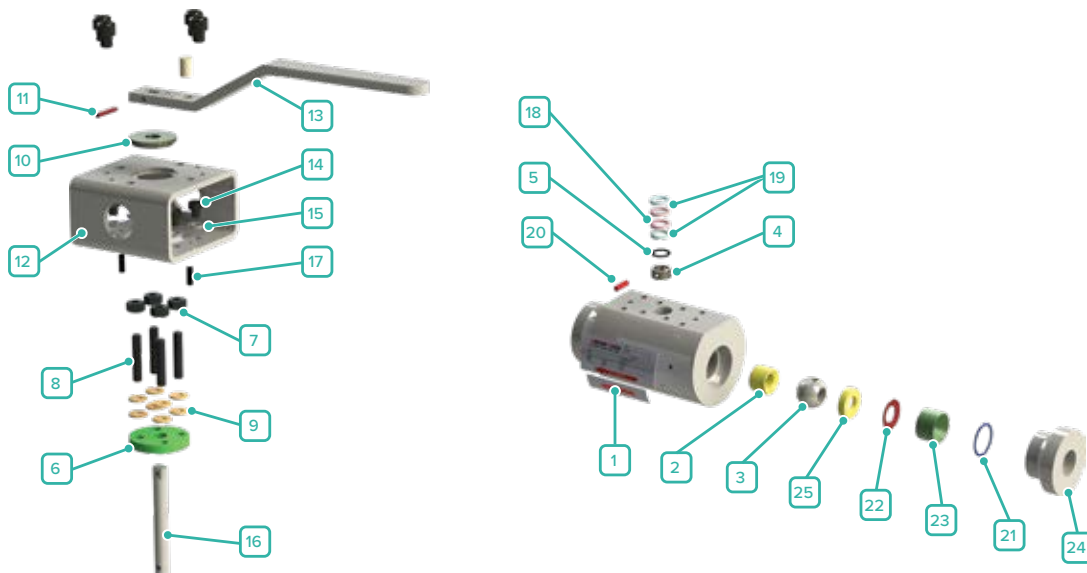


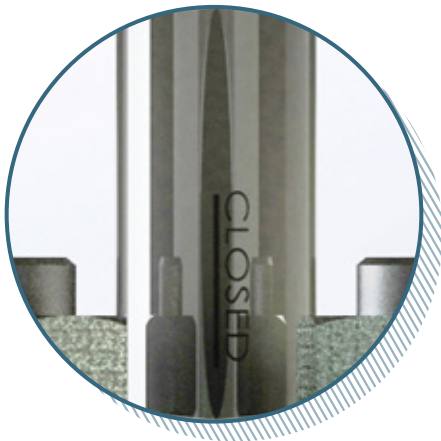
Note: Diagrams are illustrative only; actual valve may utilize different components.

PARTS AND MATERIALS

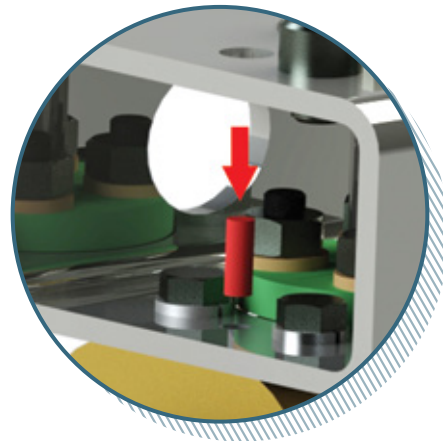
NO	QTY	DESCRIPTION	MATERIAL			
			A105/LF2	A182 F22	A 182 F91	A182 F316
1	1	Body	A105	A182 F22	A 182 F91	A182 F316
2	1	Seal Seat	410SS/CCC	410SS/CCC	410SS/CCC	410SS/CCC
3	1	Ball	410SS/CCC	410SS/CCC	410SS/CCC	410SS/CCC
4	1	Stem Collar	410SS/QPQ	410SS/QPQ	410SS/QPQ	410SS/QPQ
5	1	Stem Bearing	410SS/QPQ	410SS/QPQ	410SS/QPQ	410SS/QPQ
6	1	Gland	410SS	410SS	410SS	410SS
7	4	Gland Nut	A194-GR8	A194-GR8	A194-GR8	A194-GR8
8	4	Gland Stud	A193-B8	A193-B8	A193-B8	A193-B8
9	8	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	2	Stem Packing	Grafoil®	Grafoil®	Grafoil®	Grafoil®
19	2	Stem Packing (Anti-Extrusion)	Grafoil®/Inconel®	Grafoil®/Inconel®	Grafoil®/Inconel®	Grafoil®/Inconel®
20	1	Load Pin	Inconel® 718	Inconel® 718	Inconel® 718	Inconel® 718
21	1	Retaining Ring	ASTM A638 GR660	ASTM A638 GR660	ASTM A638 GR660	ASTM A638 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	Socket Weld Adapter	A105	A182 F22	A182 F91	A182 F316
25	1	Seat Pusher	410SS/QPQ	410SS/QPQ	410SS/QPQ	410SS/QPQ

Note: Materials and specifications are subject to future revisions.

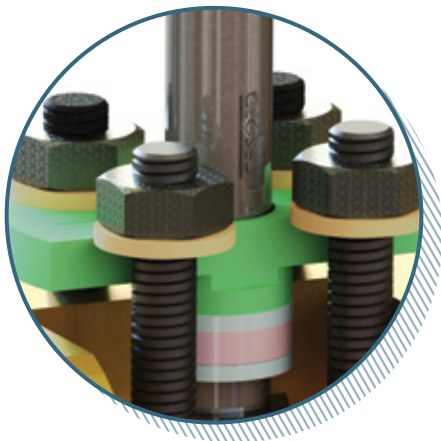




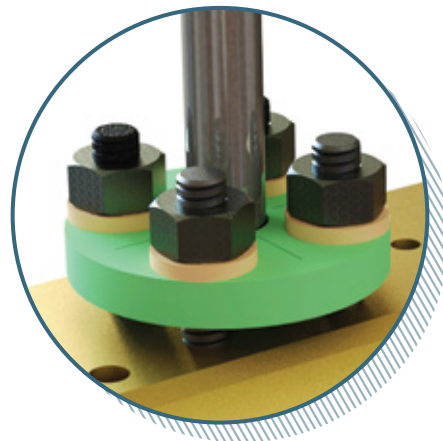
Positive on/off valve position verification is easily obtained via circular visual window



Pinned ISO mounting bracket prevents stem side-loading and bolt stress

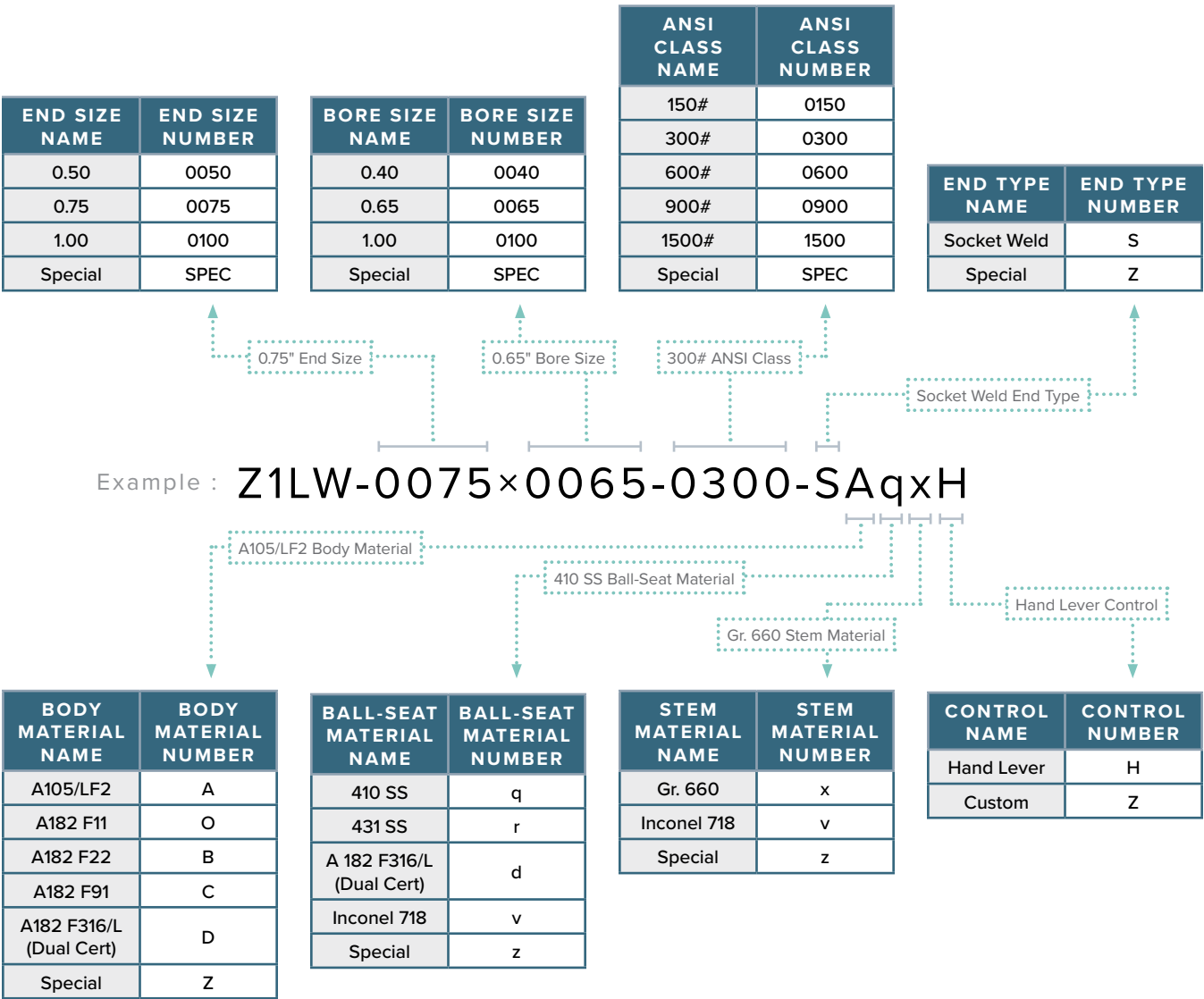


Live-loading Belleville washers provide constant packing pressure to ensure a tight seal; packing consists of two GTP graphite rings compressed between graphite Inconel® anti-extrusion packing rings



4-Bolt packing gland flange is optimally spaced for easy access with commercial tools

FIGURE NUMBERS

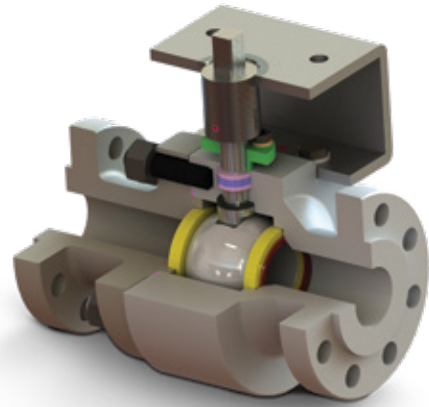


Z2 TWO-PIECE ISOLATION VALVE

FEATURES

The Z2 Two-Piece Isolation Valve is a metal-seated ball valve engineered to be fully-customizable for specific applications in severe-service environments, including chemical / petro-chemical, refining, power, and mining that require dependable zero leakage performance.

- ♦ 0.50" to 24.00" Bore Sizes
- ♦ 150 to 2500# ANSI Classes
- ♦ Full and Reduced Ports
- ♦ Uni- or Bi-Directional
- ♦ Materials: A105, F22, F91, 316SS, and Others upon Request
- ♦ Available in SW, BW, RFF, RTJ, Hub, and NPT Ends
- ♦ Fire-Safe Design Meets API 607 or API 6FA
- ♦ Scribe Line on Stem to Indicate Mechanical Position
- ♦ Live-Loaded Stem Packing for Reduced Maintenance
- ♦ Two-Piece Die-Formed, Two-Piece Anti-Extrusion Stem Packing
- ♦ Blowout-Proof Stem Design
- ♦ Field Replaceable Ball and Seats
- ♦ HVOF Chrome Carbide Coated Ball & Seat (Other Coatings Available)
- ♦ Customizable End Connections
- ♦ ISO Universal Mounting Bracket
- ♦ In-House CNC Machining
- ♦ Spring-Loaded Upstream Seat
- ♦ Mate-Lapped Ball and Seats for Zero Leakage Shutoff
- ♦ Metal-to-Metal Sealing for Class VI Shut-Off



DIMENSIONAL DATA

End-to-End Lengths, A*

* End-to-end lengths, A, include end connection adapters, if utilized

SIZE	ANSI CLASS (#)					
	150	300	600	900	1500	2500
0.50	4.25	5.50	6.50	9.00	9.00	9.00
0.75	4.62	6.00	7.50	9.00	9.00	9.00
1.00	5.00	6.50	8.50	10.00	10.00	10.00
1.50	6.50	7.50	9.50	12.00	12.00	12.00
2.00	7.00	8.50	11.50	14.50	14.50	17.75
3.00	8.00	11.12	14.00	15.00	18.50	22.75
4.00	9.00	12.00	17.00	18.00	21.50	26.50
6.00	15.50	15.88	22.00	24.00	27.75	36.00
8.00	18.00	19.75	26.00	29.00	32.75	40.25
10.00	21.00	22.38	31.00	33.00	39.00	50.00
12.00	24.00	25.50	33.00	38.00	44.45	56.00
14.00	27.00	30.00	35.00	—	—	—
16.00	30.00	33.00	39.00	—	—	—
18.00	34.00	36.00	43.00	—	—	—
20.00	36.00	39.00	47.00	—	—	—
24.00	42.00	45.00	55.00	—	—	—

Other Dimensions

Note: Weights are approximated

SIZE	ANSI CLASS 150#					
	B	C	D	G	K	WEIGHT (LBS.)
0.50	2.00	0.50	3.50	2.75	2.38	15
0.75	2.38	0.75	3.88	3.00	2.50	—
1.00	2.63	1.00	4.25	4.88	3.00	—
1.50	2.88	1.50	5.00	5.25	3.13	—
2.00	3.25	2.00	6.00	6.00	3.38	42
3.00	4.00	3.00	7.50	7.00	4.50	81
4.00	3.75	4.00	9.00	8.25	5.00	128
6.00	7.50	6.00	11.00	11.50	7.75	450
8.00	9.25	8.00	13.50	15.00	9.50	830
10.00	10.75	10.00	16.00	17.75	11.50	1300
12.00	12.00	12.00	19.00	19.00	12.25	—
14.00	13.50	13.25	21.00	21.50	14.50	—
16.00	15.00	15.25	23.50	22.00	15.50	—
18.00	17.00	17.25	25.00	30.00	17.50	—
20.00	18.00	19.25	27.50	34.00	21.00	—
24.00	22.00	23.25	32.00	40.00	25.00	—

SIZE	ANSI CLASS 300#					
	B	C	D	G	K	WEIGHT (LBS.)
0.50	2.25	0.50	3.75	2.75	2.38	—
0.75	2.50	0.75	4.62	3.00	2.50	—
1.00	2.75	1.00	4.88	4.88	3.00	—
1.50	3.00	1.50	6.12	5.25	3.13	—
2.00	3.75	2.00	6.50	6.00	3.38	52
3.00	4.75	3.00	8.25	7.00	4.50	98
4.00	5.38	4.00	10.00	8.25	5.00	185
6.00	7.75	6.00	12.50	11.50	7.75	525
8.00	9.25	8.00	15.00	15.00	9.50	875
10.00	12.00	10.00	17.50	17.75	11.50	1650
12.00	13.00	12.00	20.50	19.00	12.25	—
14.00	16.00	13.25	23.00	21.50	15.25	—
16.00	16.50	15.25	25.50	24.50	15.50	—
18.00	18.00	17.00	28.00	30.00	17.50	—
20.00	20.00	19.00	30.50	37.00	21.00	—
24.00	23.00	23.00	36.00	42.00	25.00	—

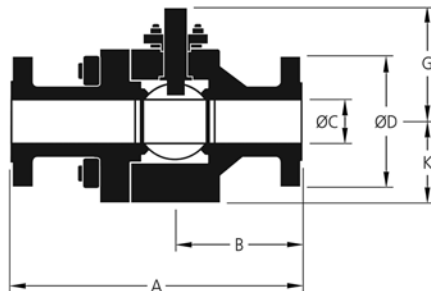
ANSI CLASS 600#						
SIZE	B	C	D	G	K	WEIGHT (LBS.)
0.50	2.75	0.50	3.75	2.75	2.38	—
0.75	3.50	0.75	4.62	3.00	2.50	—
1.00	4.25	1.00	4.88	3.00	3.00	—
1.50	4.75	1.50	6.12	5.25	3.50	—
2.00	5.00	2.00	6.50	6.00	3.75	75
3.00	6.00	3.00	8.25	7.00	4.75	141
4.00	7.75	4.00	10.75	8.25	5.00	304
6.00	9.00	6.00	14.00	11.50	8.00	650
8.00	12.25	7.87	16.50	15.88	10.25	1330
10.00	14.00	9.75	20.00	18.00	11.50	2150
12.00	16.00	11.75	22.00	20.00	12.25	—
14.00	17.50	12.87	23.75	24.00	16.00	—
16.00	20.25	14.75	27.00	26.00	16.00	—
18.00	22.50	16.50	29.25	32.00	18.00	—
20.00	23.75	18.25	32.00	38.00	21.00	—
24.00	28.00	22.00	37.00	44.00	25.00	—

ANSI CLASS 300#						
SIZE	B	C	D	G	K	WEIGHT (LBS.)
0.50	4.50	0.50	4.75	2.75	3.00	—
0.75	4.50	0.69	5.12	3.00	3.00	—
1.00	5.00	0.87	5.88	4.88	3.00	—
1.50	6.00	1.37	7.00	5.25	4.31	—
2.00	6.50	1.87	8.50	6.00	4.50	175
3.00	7.00	2.87	9.50	7.00	5.00	195
4.00	7.50	3.87	11.50	8.25	6.75	375
6.00	9.50	5.75	15.00	11.50	9.00	780
8.00	14.00	7.50	18.50	15.00	11.50	1500
10.00	16.00	9.37	21.50	17.75	13.75	—
12.00	18.00	11.12	24.00	19.00	15.50	—

ANSI CLASS 1500#						
SIZE	B	C	D	G	K	WEIGHT (LBS.)
0.50	4.5	0.50	4.75	4.75	3.00	—
0.75	4.5	0.69	5.12	4.75	3.00	—
1.00	5	0.87	5.88	4.75	3.00	—
1.50	6	1.37	7.00	7.50	3.50	—
2.00	6.5	1.87	8.50	8.25	4.38	175
3.00	8.5	2.75	10.50	9.50	5.50	262
4.00	9.75	3.62	12.25	12.13	7.25	495
6.00	11	5.37	15.50	17.50	10.00	925
8.00	14	7.00	19.00	20.00	12.50	1875
10.00	16	8.75	23.00	21.00	15.50	—
12.00	19	10.37	26.50	24.00	14.00	—

ANSI CLASS 2500#						
SIZE	B	C	D	G	K	WEIGHT (LBS.)
0.50	4.50	0.44	5.25	4.75	3.00	—
0.75	4.50	0.56	5.50	4.75	3.00	—
1.00	5.00	0.75	6.25	4.75	3.00	—
1.50	6.00	1.12	8.00	7.00	4.50	—
2.00	7.25	1.50	9.25	9.00	6.00	—
3.00	10.00	2.25	12.00	11.75	8.50	—
4.00	11.00	2.87	14.00	13.25	7.50	—
6.00	13.00	4.37	19.00	15.00	11.00	—
8.00	14.50	5.75	21.75	24.00	13.00	—
10.00	19.00	7.25	26.50	26.00	13.50	—
12.00	22.00	8.62	30.00	28.00	18.50	—

Notes: Dimensional data provided for reference only; actual data can be furnished upon request. Dimensional data for other sizes / pressure classes available upon request.

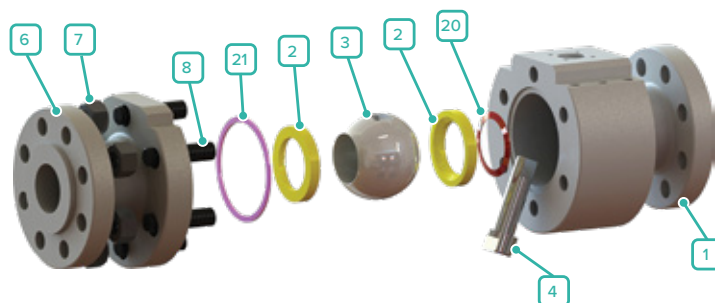
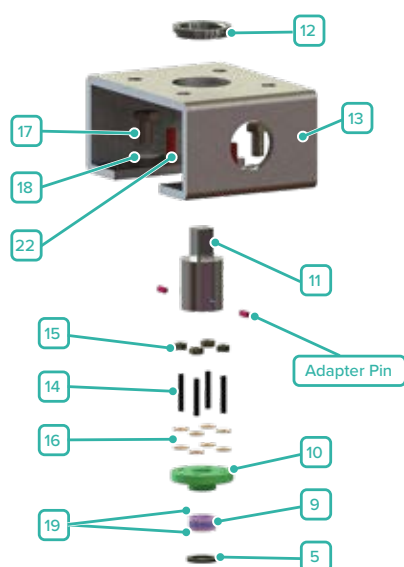


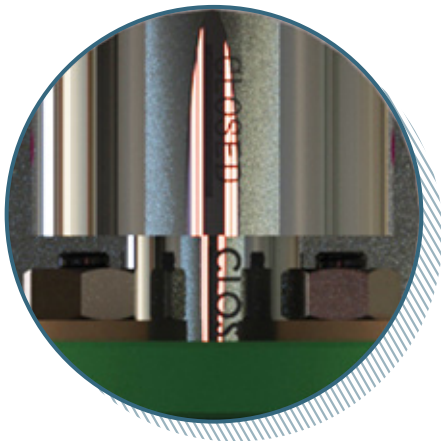
Note: Diagrams are illustrative only; actual valve may utilize different components.

PARTS AND MATERIALS

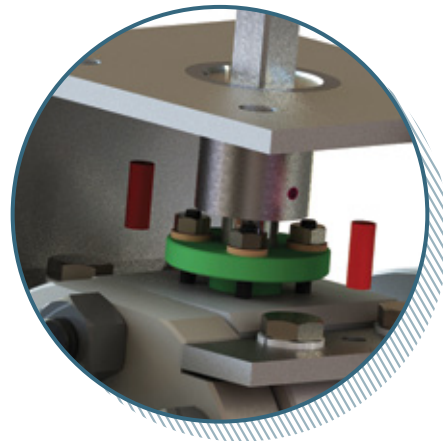
NO	QTY	DESCRIPTION	MATERIAL			
			A105/LF2	A182 F22	A 182 F91	A182 F316
1	1	Body	A105	A182 F22	A 182 F91	A182 F316
2	2	Seal Seat	410SS/CCC	410SS/CCC	410SS/CCC	410SS/CCC
3	1	Ball	410SS/CCC	410SS/CCC	410SS/CCC	410SS/CCC
4	1	Stem	A638 GR660	A638 GR660	A638 GR660	A638 GR660
5	1	Stem Bearing	410SS/QPQ	410SS/QPQ	410SS/QPQ	410SS/QPQ
6	1	End Connection	A105	A182 F22	A 182 F91	A182 F316
7	*	Body Nut	ASTM A194-GR2H	ASTM A194-GR7	ASTM A194-GR7	ASTM A194-GR8
8	*	Body Stud	ASTM A193-B7	ASTM A193-B16	ASTM A193-B16	ASTM A193-B8
9	2	Stem Packing	Grafoil®	Grafoil®	Grafoil®	Grafoil®
10	1	Gland Flange	410SS	410SS	410SS	410SS
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	4	Gland Stud	A193-B8	A193-B8	A193-B8	A193-B8
15	4	Gland Nut	A194-GR8	A194-GR8	A194-GR8	A194-GR8
16	8	Live-Loaded Spring	300SS	300SS	300SS	300SS
17	4	Bracket Bolts	J429 Gr5	J429 Gr5	J429 Gr5	J429 Gr5
18	4	Bracket Lock Washer	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
19	2	Stem Packing (Anti-Extrusion)	Grafoil®/Inconel®	Grafoil®/Inconel®	Grafoil®/Inconel®	Grafoil®/Inconel®
20	1	Spring	Inconel® 718	Inconel® 718	Inconel® 718	Inconel® 718
21	1	Body Gasket	316/Grafoil®Filled	316/Grafoil®Filled	316/Grafoil®Filled	316/Grafoil®Filled
22	2	Mounting Bracket Pin	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel

* Quantity varies according to the size and class

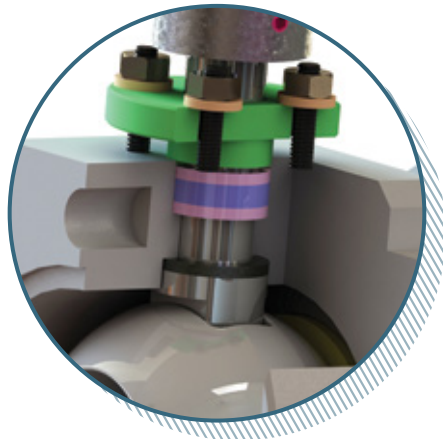




Positive on/off valve position verification is easily obtained via circular visual window

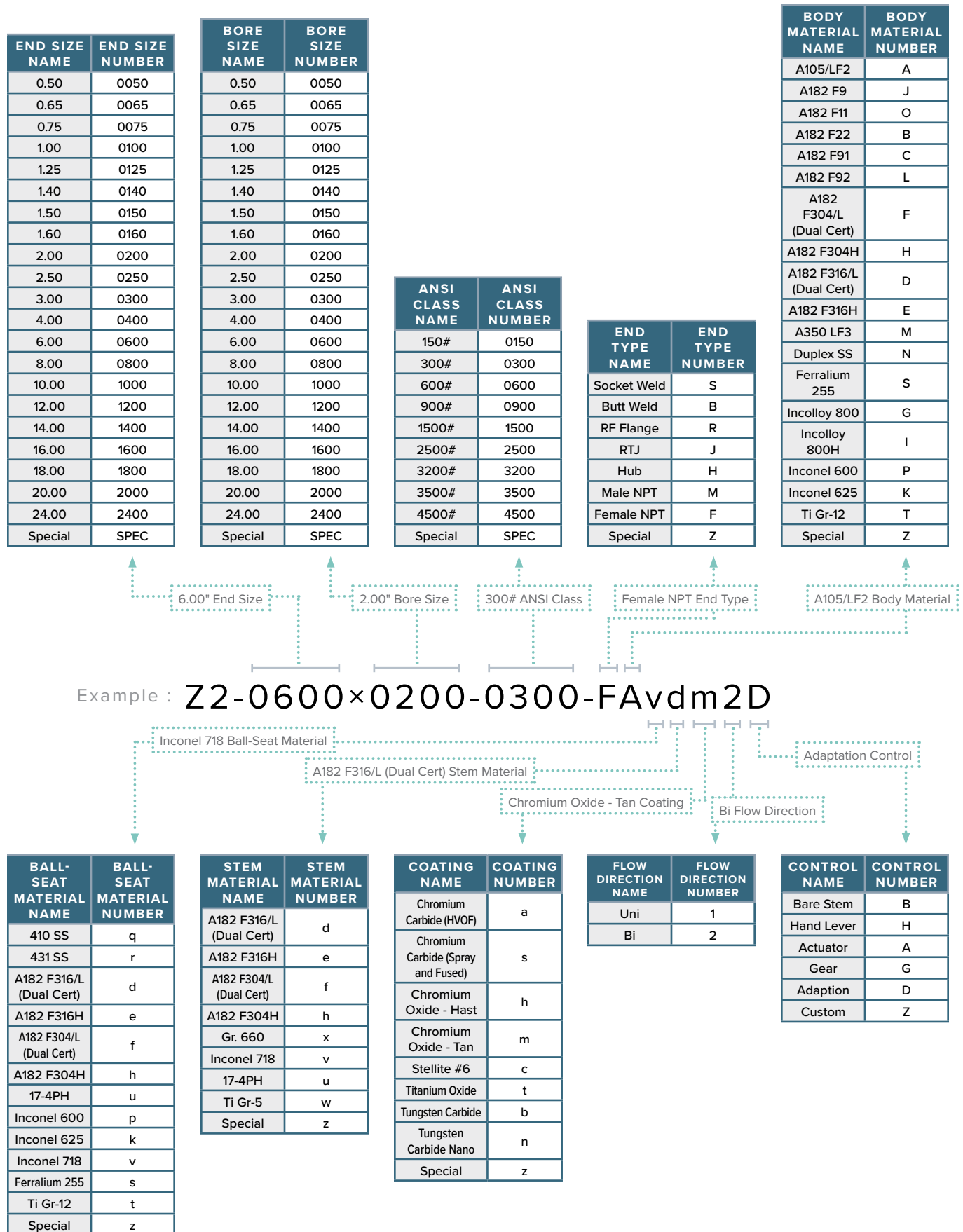


Pinned ISO mounting bracket prevents stem side-loading and bolt stress



Packing consists of two GTP graphite rings compressed between graphite Inconel® anti-extrusion packing rings. Coated stem bearing reduces stem torque.

FIGURE NUMBERS

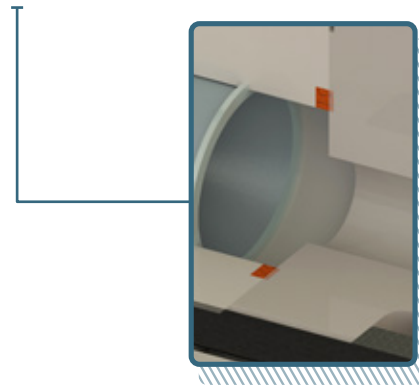
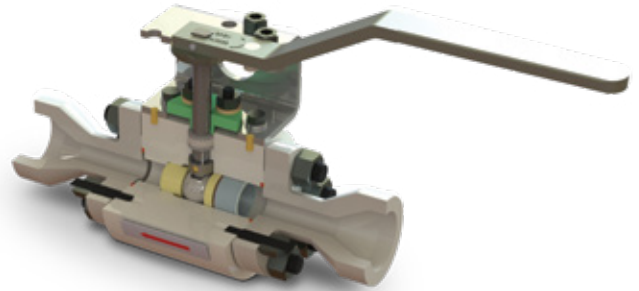


Z3 POWER VALVE SYSTEM

FEATURES

The Z3 Power Valve System is engineered for dependable zero leakage performance in high-pressure, severe-service applications, including power generation and critical on/off applications. Consisting of a modified Z1 valve and a pair of SW or BW end connections, the Z3 enables inline replaceability, eliminating the need to cut-out existing and weld-in replacement valves, while retaining all features of the Z1 Unibody Power Valve.

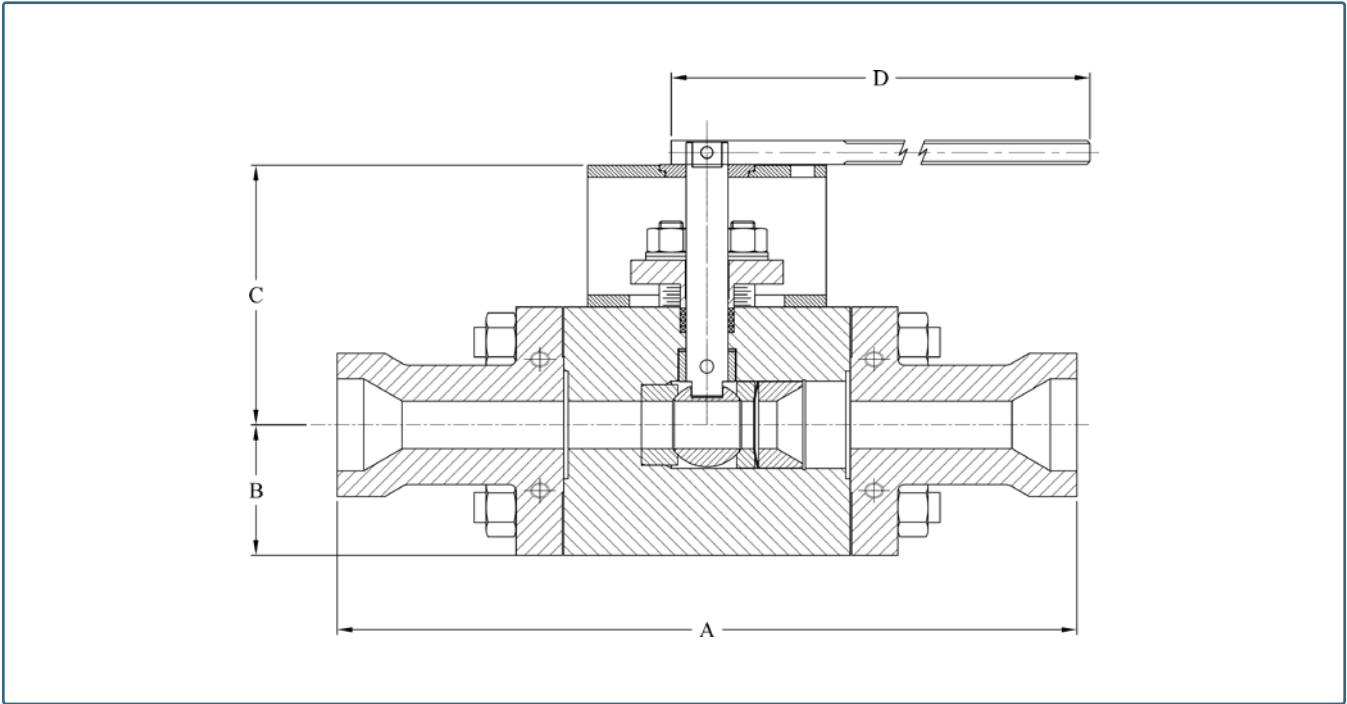
- ◆ Inline Replaceable Valve
- ◆ Eliminates Costs of Cutting-Out Existing and Welding-In (ie, post-weld heat treating) Replacement Valves
- ◆ Replacement Valves Fully Functional and Tested per ANSI FCI 70.2 Class VI as Standalone Valves
- ◆ 0.65" to 2.50" Bore Sizes
- ◆ 0.75" to 2.50" NPS SWE; 0.75" to 4.00" NPS BWE
- ◆ 150 to 4500# ANSI Classes
- ◆ Engineered and Manufactured to ASME B16.34 Requirements
- ◆ Design Meets ASME TDP-1 2006 Bore Requirements
- ◆ Materials: A105, F22, F91, and 316SS
- ◆ 4-Year Limited Warranty
- ◆ Scribe Line on Stem to Indicate Mechanical Position
- ◆ Live-Loaded Stem Packing for Reduced Maintenance
- ◆ Two-Piece Die-Formed, Two-Piece Anti-Extrusion Stem Packing
- ◆ Blowout-Proof Stem Design
- ◆ Pressed-In Downstream Seat
- ◆ HVOF Chrome Carbide Coated Ball & Seat
- ◆ Removeable One-Piece Forged Barstock Valve Design with Customizable End Connections
- ◆ ISO Universal Mounting Bracket
- ◆ Steel Pins – Prevents Side-Loading Bolt Stress
- ◆ All Critical Process Performed In-House
- ◆ Optimized Flow Paths
- ◆ Spring-Loaded Upstream Seat for Constant Seat Loads
- ◆ Mate-Lapped Ball and Seats for Zero Leakage Shutoff
- ◆ Metal-to-Metal Sealing for Class VI Shut-Off
- ◆ Z1 Valve Secured and Sealed to End Connections via Bolting and Gaskets, Enabling Straightforward Replacement



DIMENSIONAL DATA

SIZE	DIMENSION			
	A	B	C	D
3200 Class				
0.65	15.50	2.25	5.00	13.25
1.00	15.50	3.50	7.25	19.50
1.40	21.50	4.50	8.00	19.50
1500 Class				
0.65	15.50	2.25	5.00	13.25
1.00	15.50	2.75	5.50	19.50
1.40	17.50	3.00	6.00	19.50

Note: Tables represent a sample set of data for 3200# ANSI pressure class valve designs. Data for other designs available upon request. Refer to Z1 dimensional data for other dimensions. Dimensional data provided for reference only – actual data can be furnished upon request.



Note: Diagrams are illustrative only; actual valve may utilize different components

PARTS AND MATERIALS

NO	QTY	DESCRIPTION	MATERIAL			
			A105/LF2	A182 F22	A 182 F91	A182 F316
1	1	Body	A105	A182 F22	A 182 F91	A182 F316
2	1	Seal Seat	410SS/CCC	410SS/CCC	410SS/CCC	410SS/CCC
3	1	Ball	410SS/CCC	410SS/CCC	410SS/CCC	410SS/CCC
4	1	Stem Collar	410SS/QPQ	410SS/QPQ	410SS/QPQ	410SS/QPQ
5	1	Stem Bearing	410SS/QPQ	410SS/QPQ	410SS/QPQ	410SS/QPQ
6	1	Gland	410SS	410SS	410SS	410SS
7	4	Gland Nut	A194-GR8	A194-GR8	A194-GR8	A194-GR8
8	4	Gland Stud	A193-B8	A193-B8	A193-B8	A193-B8
9	8	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	2	Stem Packing	Grafoil®	Grafoil®	Grafoil®	Grafoil®
19	2	Stem Packing (Anti-Extrusion)	Grafoil®/Inconel®	Grafoil®/Inconel®	Grafoil®/Inconel®	Grafoil®/Inconel®
20	1	Load Pin	Inconel® 718	Inconel® 718	Inconel® 718	Inconel® 718
21	1	Retaining Ring	ASTM A638 GR660	ASTM A638 GR660	ASTM A638 GR660	ASTM A638 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	Seat Pusher	410SS/QPQ	410SS/QPQ	410SS/QPQ	410SS/QPQ
25	2	End Connection	A105	A182 F22	A 182 F91	A182 F316
26	*	Body Nut	ASTM A194-GR2H	ASTM A194-GR7	ASTM A194-GR7	ASTM A194-GR8
27	*	Body Stud	ASTM A193-B7	ASTM A193-B16	ASTM A193-B16	ASTM A193-B8
28	2	Body Gasket	Spiral Wound/Proprietary*	Spiral Wound/Proprietary*	Spiral Wound/Proprietary*	Spiral Wound/Proprietary*

* Spiral wound gaskets used for 1500# and below; proprietary gaskets used for higher ANSI classes.

Note: Trim is Inconel® 718 on 4500# ANSI class valves. Materials and specifications are subject to future revisions.

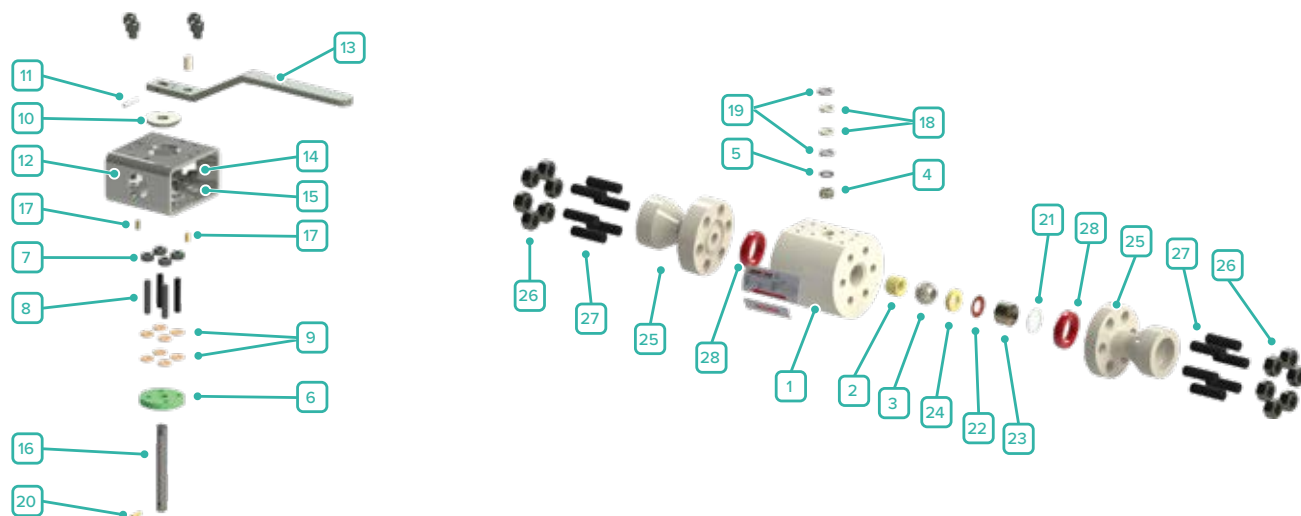
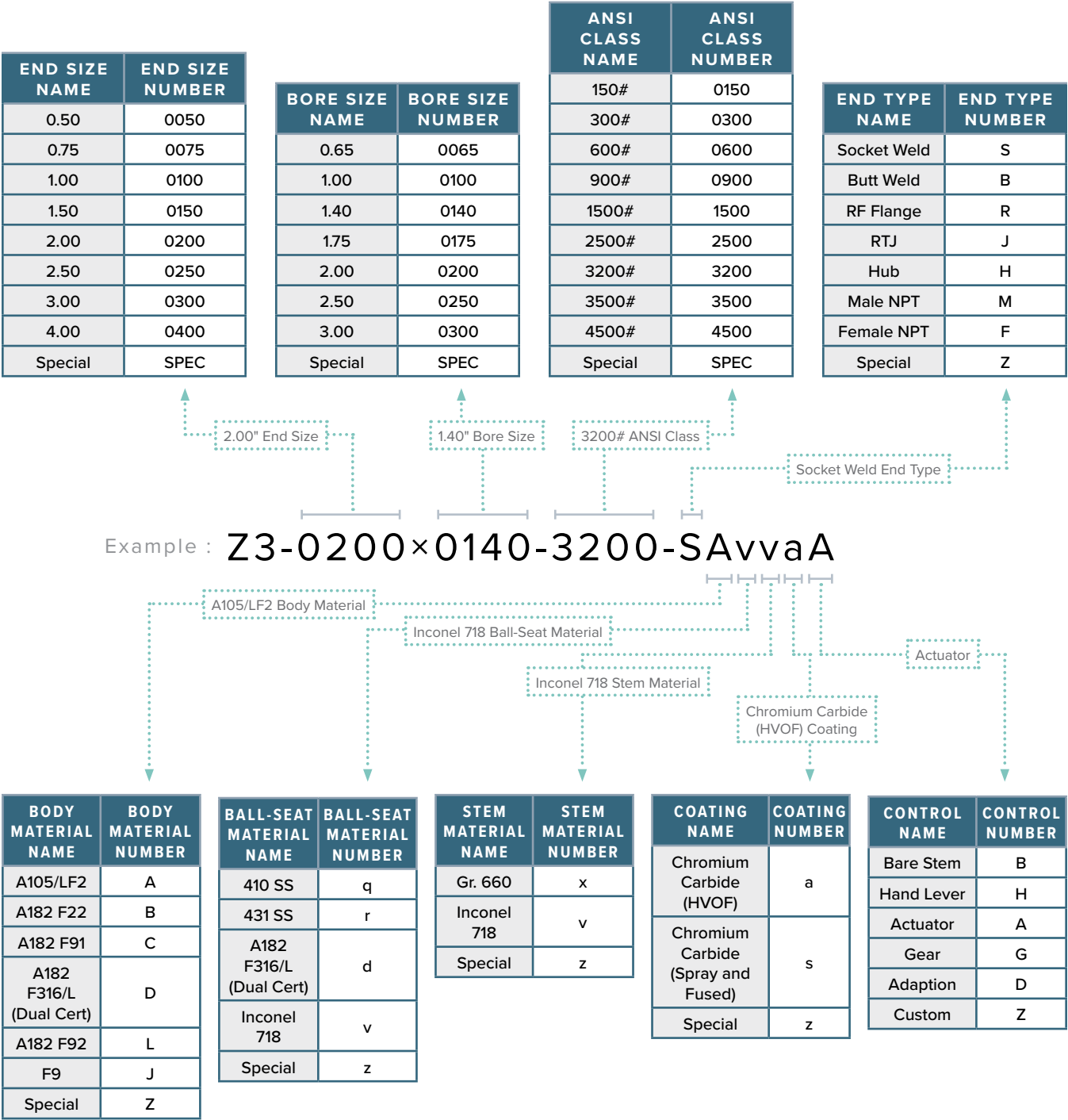


FIGURE NUMBERS



ENGINEERING DATA

The C_v indicates the flow capacity of the valve. By definition, C_v 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.

FLOW COEFFICIENTS (C_v) – Z1 UNIBODY POWER VALVE

NPS	BORE SIZE (IN.)													
	0.65		1.00		1.40		1.75		2.00		2.50		3.00	
	80	160	80	160	80	160	80	160	80	160	80	160	80	160
0.50	22	22	—	—	—	—	—	—	—	—	—	—	—	—
0.75	32	40	—	—	—	—	—	—	—	—	—	—	—	—
1.00	31	26	103	74	—	—	—	—	—	—	—	—	—	—
1.50	15	16	48	56	155	212	—	—	—	—	—	—	—	—
2.00	14	15	40	46	105	135	264	375	466	347	—	—	—	—
2.50	—	—	36	37	86	94	170	208	304	400	—	—	—	—
3.00	—	—	28	29	75	80	135	150	202	234	481	655	—	—
4.00	—	—	—	—	56	58	115	120	160	172	296	342	588	785

Note: Other pipe sizes available upon request.

FLOW COEFFICIENTS (C_v)* – Z2 TWO-PIECE ISOLATION VALVE

NPS	BORE SIZE	ANSI CLASS (#)					
		150	300	600	900	1500	2500
0.50	0.50	26	26	26	26	26	20
0.75	0.75	62	62	62	52	52	33
1.00	1.00	114	114	114	84	84	61
1.00	1.50	8	8	8	9	9	10
1.50	1.00	40	40	40	45	45	70
1.50	1.50	270	270	270	223	223	145
2.00	1.50	105	105	105	120	120	270
2.00	2.00	500	500	500	432	432	270
3.00	2.00	159	159	159	168	177	286
3.00	3.00	1,175	1,175	1,175	1,070	978	640
4.00	3.00	427	427	427	454	528	640
4.00	4.00	2,160	2,160	2,160	2,013	1,748	1,070
6.00	4.00	787	787	787	830	916	1,515
6.00	6.00	5,076	5,076	5,076	4,641	4,018	2,602
8.00	6.00	1,724	1,724	2,161	2,376	2,815	—
8.00	8.00	9,300	9,300	8,985	8,120	7,022	4,641
10.00	8.00	4,250	4,250	4,502	4,992	6,246	6,622
10.00	10.00	14,865	14,865	14,095	12,966	11,228	7,560
12.00	10.00	7,348	7,348	7,776	9,268	12,411	—
12.00	12.00	21,799	21,799	20,857	18,578	16,044	10,880
14.00	12.00	13,793	13,793	15,502	19,581	—	—
16.00	14.00	19,916	19,916	23,040	30,125	—	—
18.00	16.00	23,588	25,508	30,887	39,857	—	—
20.00	18.00	36,010	38,269	47,203	—	—	—
24.00	20.00	32,665	33,972	39,620	48,573	—	—

*Flow coefficient data also applies to Z1LW and Z3 valves.

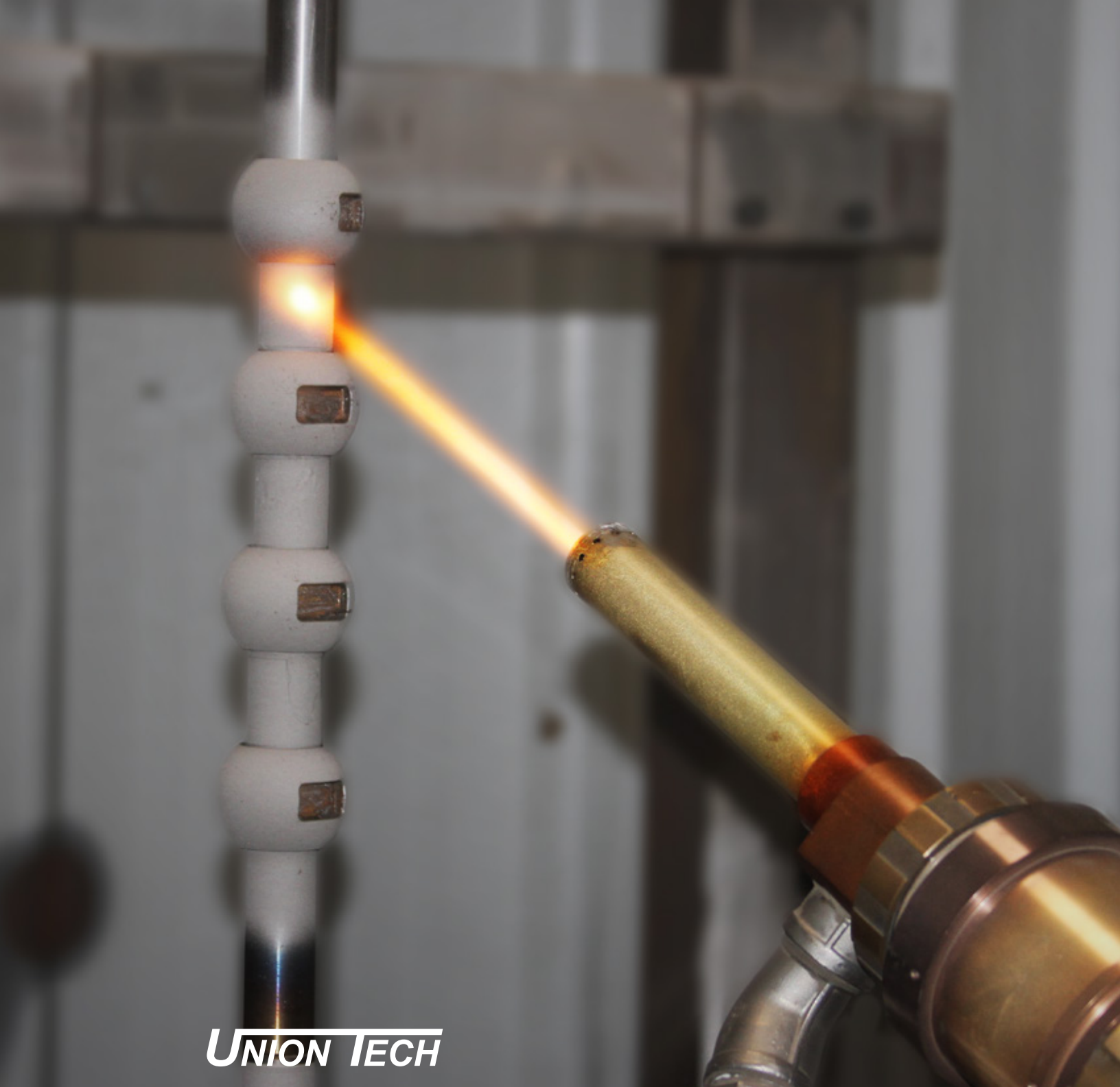
Note: ID based on ASME B16.34 Annex A. Other pipe sizes available upon request.

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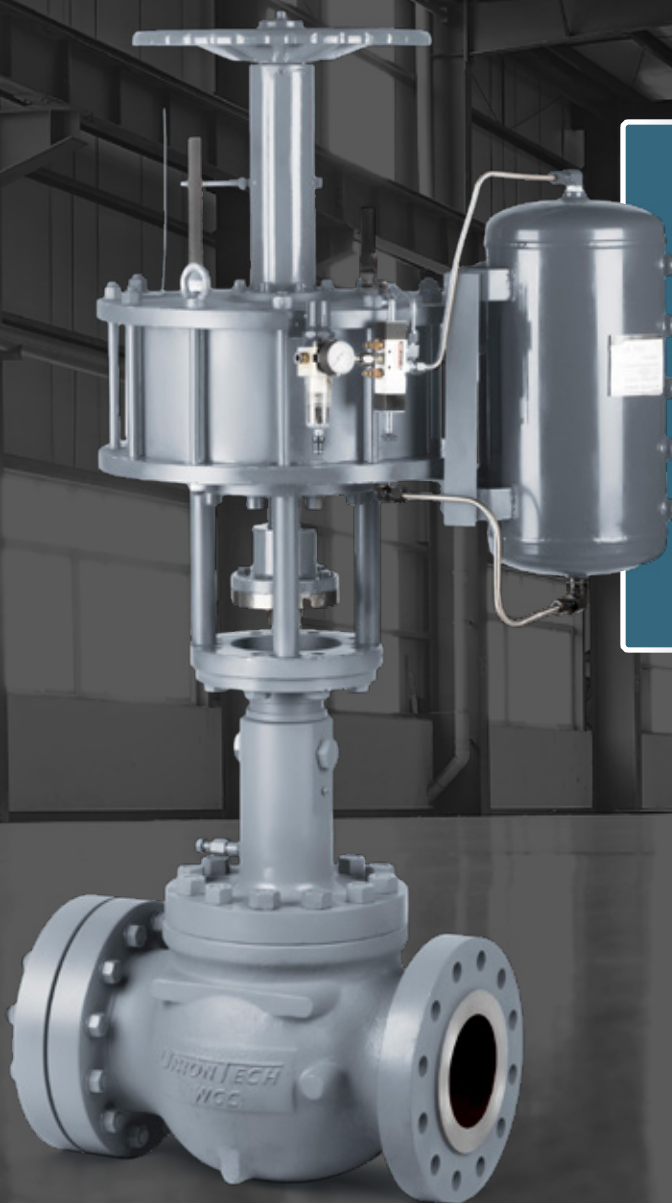
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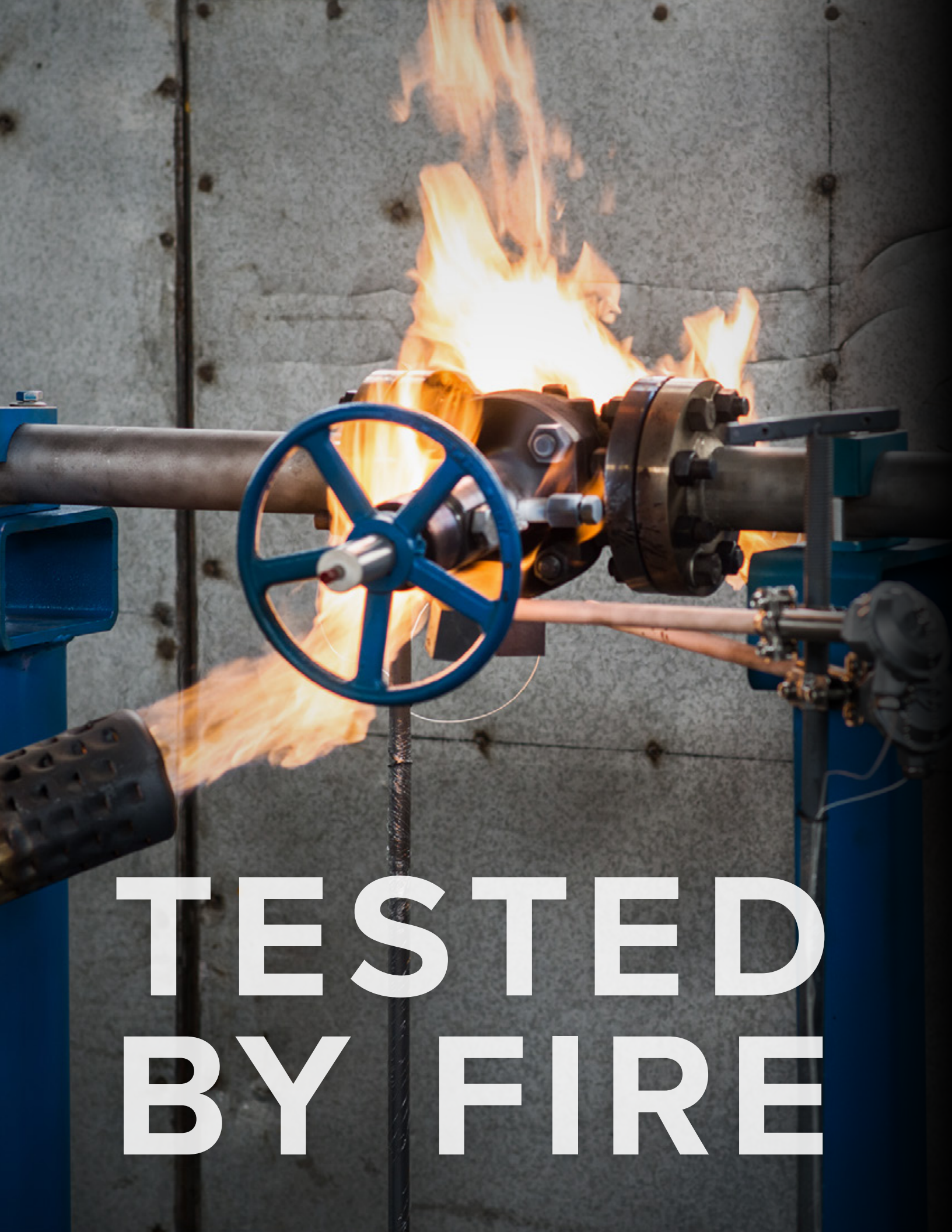
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UNION TECH

Z-SERIES VALVES | 2021

**RISING STEM
BALL VALVES
PNEUMATIC
ACTUATORS**





TESTED BY FIRE

ABOUT UNION TECH

Since 1982, we have dedicated ourselves to mastering the art of precision machining. From those manufacturing roots, we grew a vertically-integrated enterprise empowered to service the production needs of industries and markets worldwide. Our Valve Products division was launched in 2003 by a team of world-class mechanical engineers, seasoned valve experts, and experienced manufacturing professionals. Since then, Union Tech has engineered, manufactured, and sold over 100,000 MSBV's worldwide as the OEM for a number of different brands.

ENGINEERING AND DESIGN

Z-Series valves are highly engineered products developed by our team of engineers and industry experts. Union Tech utilizes advanced engineering techniques, such as finite element analysis (FEA) and comprehensive flow analysis to ensure every valve is optimized for its intended application. Our engineering team is always available for support with upfront materials selection, piping and instrumentation diagrams (P&ID), and general onsite operations.

MANUFACTURING

Every substantial component is machined internally; all critical processes are performed in-house. This unique approach enables us to maintain and ensure quality and consistency, shorten the supply chain to achieve aggressive delivery horizons, and leverage efficiencies across the entire production process to deliver value to our customers. Examples of insourced manufacturing processes include:

- ♦ Machining
- ♦ Welding
- ♦ Mate Lapping
- ♦ Hardfacing Coatings
- ♦ Assembly
- ♦ Testing per ANSI FCI 70.2 Class VI (or MSS-SP61, API-598, API-607, API-608, API-6D, etc.)

QUALITY AND TESTING

Quality is paramount to our organization, permeates every aspect of our operations, and starts from the very beginning. Raw materials undergo positive material identification (PMI) and hardness testing to ensure procured materials, such as forged barstock and heavy hex nuts, meet engineering specifications. Union Tech employs the Microsoft Dynamics AX ERP system to ensure full transparency and traceability of lot and serial numbered inventory across our organization. Upon manufacturing completion and prior to shipping, each and every Z-Series Valve is tested per ANSI FCI 70.2 Class VI (or MSS-SP61, API-598, API-607, API-608, API-6D, etc.).

SERVICE

Union Tech's technical service team is available 24 hours a day to ensure our valves perform up to the industry's highest standards. From the engineering team that designed the valve to the production cell that assembled and tested it, our professionals stand ready to diagnose and solve any issue that may arise. Our staff can be made available for deployment onsite to provide critical operational support.

CERTIFICATIONS

ISO 9001:2015, 15848-1 // API 6D, 607, 622, 624, and 641 // CRN // PED // GOST-R* // Safety Integrity Level (SIL) 3

* in fieri

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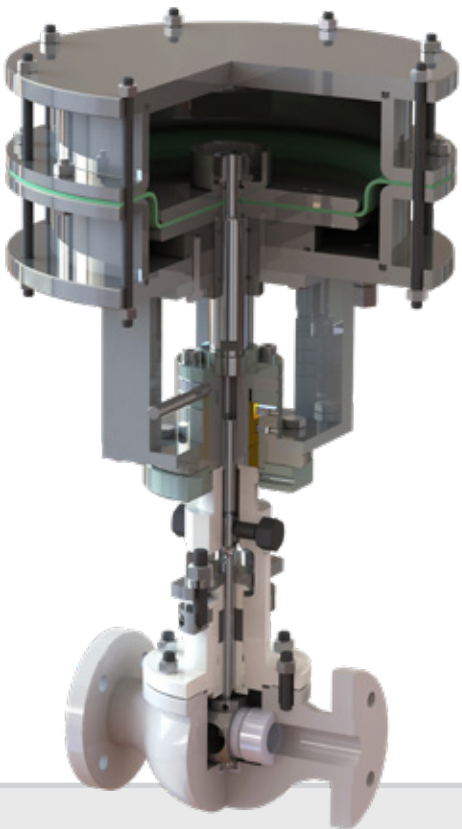
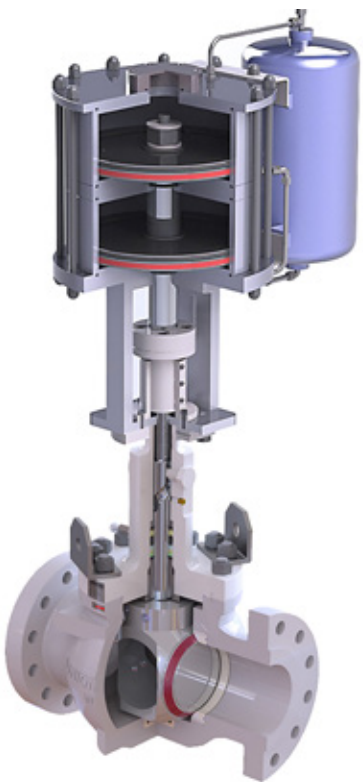
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- Piston Actuator Figure Numbers



RISING STEM BALL VALVES



Z4 RISING STEM BALL VALVE

FEATURES

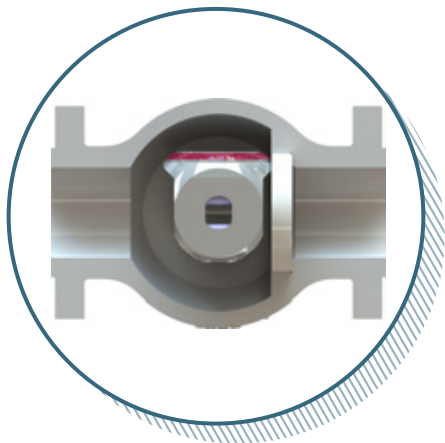
The design and performance advantages of the Z4 Rising Stem Ball Valve enable it to replace traditional ball, gate, and plug valves in applications, such as gas processing plants using molecular sieve systems for switching service, pipelines, gas transmission, and other high performance applications requiring frequent cycling with positive shutoff operation.

- ♦ Designed per ASME B16.34 and API Spec 6D
- ♦ 0.75" to 24.00" Bore Sizes
- ♦ 150 to 2500# ANSI Classes
- ♦ Full or Reduced Ports
- ♦ Enclosed or OS&Y Bonnet Designs
- ♦ Materials: WCC, WCB, LCC, LCB, and CF8M; Forgings and Other Materials Available
- ♦ Available in SW, BW, RFF, and NPT Ends
- ♦ Flanges Drilled per ANSI/ASME B 16.5
- ♦ Testing Standards:
 - ♦ Seat – ISO 5208 A
 - ♦ Fugitive Emissions – ISO 15848-1A
 - ♦ Fire – API 607, 7th Edition
- ♦ Operation: Manual, Electric, or Pneumatic
- ♦ Temperature Range: -155°F TO 800°F
- ♦ Low Torque Operation – Elimination of seal rubbing enables handwheel operation for most sizes; gearbox operators required for larger valves
- ♦ Dual Hardened Stem Slots & Guide Pins – Controls lift and turn of the stem
- ♦ Injectable Stem Packing Material – Enables in-service maintenance and controls fugitive emissions for enclosed bonnet models
- ♦ Top Entry Design – Provides simplified maintenance by allowing inline inspection and repair of depressurized systems
- ♦ Friction-Free Sealing – Tilt-and-turn cam mechanics eliminates abrasion resulting in reduced ball and seat wear, longer operating life, and increased return on investment
- ♦ Mechanical Cam Closure – Enables forced sealing
- ♦ Self-Cleaning – Product flow around 360° of the ball face flushes foreign material away from the seat, cleaning the valve and diminishing localized high velocity erosion damage
- ♦ Stem Guide Locking Mechanism – Superior sealing performance at stem guide with anti-loosening locking design
- ♦ Variable Seat Design Options – Soft, metal, and block & bleed seats can be specified according to specific application. Seats can be further customized to optimize performance.
- ♦ Pressed-In Seat – Enables inline replacement using extraction tool. Available in Teflon®, Nylon, or PEEK™
- ♦ Floating Seat – Leverages Z2 severe-service floating ball valve technology to streamline seat replacement
- ♦ Surface Hardened Metal Seats – Leverages commercially proven Z-Series HVOF coating technology. Metal seats are HVOF coated and mate-lapped to the ball resulting in > 60 HRC for true severe service durability. Coatings may be customized per application.

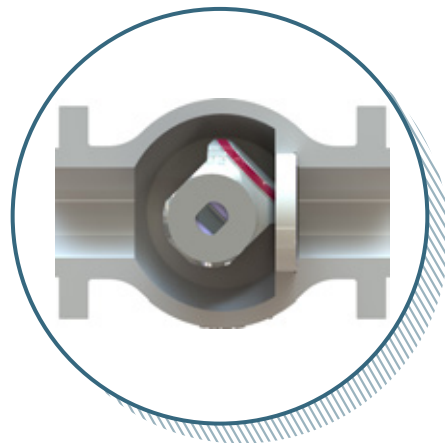


- ♦ API Standard 607, 7th Ed., June 2016
- ♦ ISO 15848-1: 2015

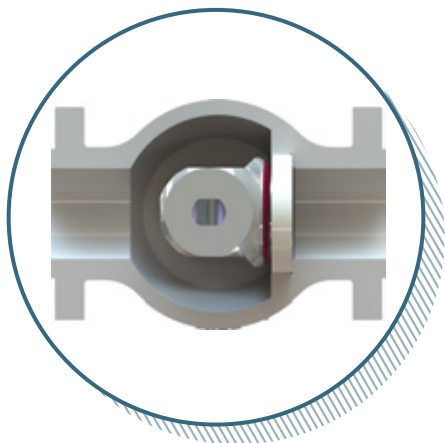
VALVE OPERATION



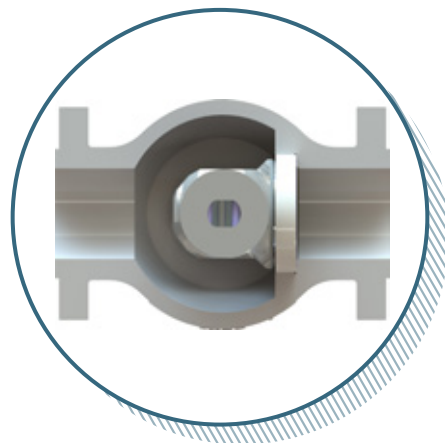
Close valve by turning the hand wheel clockwise. Stem moves downward along the double-helix stem guide channels.



As the handwheel continues to turn, the fixed guide pins move along the double-helix channels. As a result, the ball begins to rotate.



As the handwheel continues to turn, the double-helix channels rotate the ball so that it faces the seat.



The final turns of the handwheel engages the mechanical cam, which sets the ball into the seated position, resulting in a bubble tight seal. At no point prior to this step, has the ball contacted the seat.

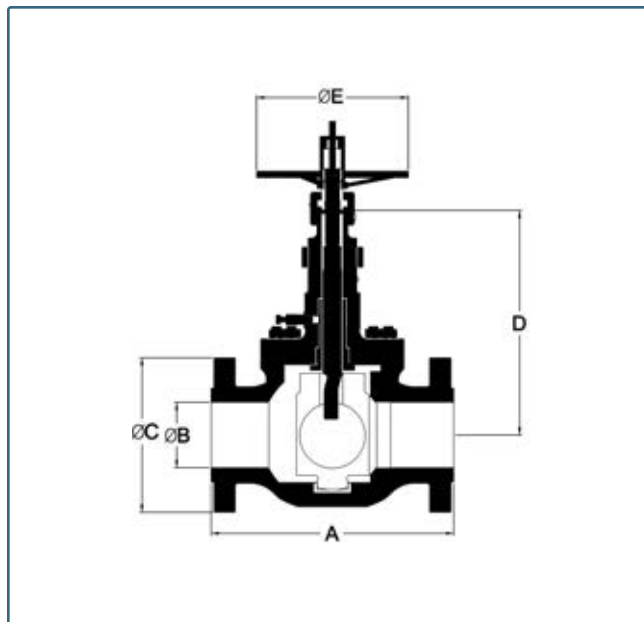
DIMENSIONAL DATA

End-to-End Lengths, Flanged Ends A*

SIZE	CLASS					
	150 RF	300 RF	600 RF	900 RTJ**	1500 RTJ**	2500 RTJ**
0.75	6.00*	6.00	7.50	—	—	—
1.00	8.50*	8.50*	8.50	10.00	10.00	—
1.50	9.50*	9.50*	9.50	12.00	12.00	—
2.00	7.00	8.50	11.50	14.63	14.63	17.88
3.00	8.00	11.13	14.00	15.13	18.63	23.00
4.00	12.00*	12.00	17.00	18.13	21.63	26.88
6.00	15.88*	15.88	22.00	24.13	28.00	36.50
8.00	18.00	19.75	26.00	29.13	33.13	40.88
10.00	26.50*	26.50*	31.00	33.13	39.38	—
12.00	30.00*	30.00*	33.00	38.13	45.13	—
14.00	—	32.50*	35.00	—	—	—
16.00	35.50*	35.50*	39.00	44.88	—	—
18.00	43.00*	—	—	—	—	—
20.00	—	47.00*	47.00	—	—	—
24.00	—	—	—	—	—	—

* Manufacturer's standard end-to-end dimension.

** For raised face flanged dimensions, contact Union Tech for details.
Dimensional data for other sizes/pressure classes available upon request.



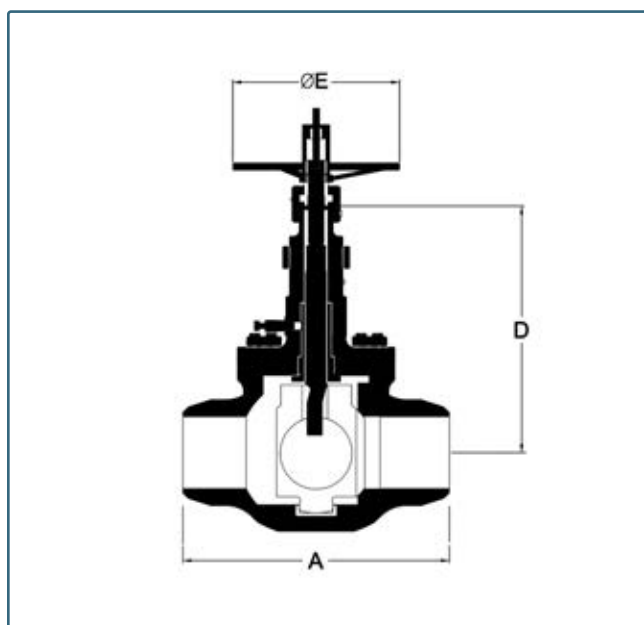
Note: Diagrams are illustrative only; actual valve may utilize different components.

End-to-End Lengths, Butt Weld Ends A*

SIZE	CLASS					
	150	300	600	900	1500	2500
0.75	—	—	—	—	—	—
1.00	—	—	—	—	—	—
1.50	—	—	—	—	—	—
2.00	8.50	8.50	8.50*	10.63*	10.63*	—
3.00	11.63*	11.63*	11.63*	13.25*	13.25*	—
4.00	14.50*	14.50*	14.50*	14.50*	21.50	—
6.00	20.00*	20.00*	18.62*	23.00*	27.75	—
8.00	23.38*	23.38*	26.00	29.00	—	—
10.00	26.50*	26.50*	31.00	33.00	—	—
12.00	30.00*	30.00*	33.00	38.00	—	—
14.00	32.50*	32.50*	35.00	—	—	—
16.00	39.00*	39.00*	39.00	—	—	—
18.00	—	—	—	—	—	—
20.00	—	—	—	—	—	—
24.00	—	—	—	—	—	—

* Manufacturer's standard end-to-end dimension.

Dimensional data for other sizes/pressure classes available upon request.



Note: Diagrams are illustrative only; actual valve may utilize different components.

Other Dimensions

ANSI CLASS 150#					
SIZE	B MINIMUM	C	D	E	WEIGHT (LBS.)
0.75	0.75	3.88	8.21	7.09	—
1.00	1.00	4.25	8.21	7.09	—
1.50	1.50	5.00	10.05	8.66	—
2.00	1.94	6.00	9.73	8.66	—
3.00	2.94	7.50	13.00	11.81	—
4.00	3.94	9.00	15.50	13.78	—
6.00	5.94	11.00	20.40	17.72	—
8.00	7.94	13.50	23.50	23.62	—
10.00	9.94	16.00	28.20	19.88	—
12.00	11.94	19.00	32.28	—	—
14.00	13.19	21.00	—	—	—
16.00	15.19	23.50	—	—	—
18.00	17.19	25.00	43.73	—	—
20.00	19.19	27.50	—	—	—
24.00	23.19	32.00	—	—	—

ANSI CLASS 300#					
SIZE	B MINIMUM	C	D	E	WEIGHT (LBS.)
0.75	3.75	8.21	7.09	—	—
1.00	4.88	8.21	7.09	—	—
1.50	6.12	10.05	8.66	—	—
1.94	6.50	9.73	8.66	—	—
2.94	8.25	13.00	11.81	—	—
3.94	10.00	15.50	13.78	—	—
5.94	12.50	20.40	17.72	—	—
7.94	15.00	23.50	23.62	—	—
9.94	17.50	28.20	19.88	—	—
11.94	20.50	32.28	—	—	—
13.19	23.00	—	—	—	—
15.19	25.50	—	—	—	—
17.19	28.00	43.73	—	—	—
19.19	30.50	—	—	—	—
23.19	36.00	—	—	—	—

ANSI CLASS 600#					
SIZE	B MINIMUM	C	D	E	WEIGHT (LBS.)
0.75	3.75	8.21	7.09	—	—
1.00	4.88	8.21	7.09	—	—
1.50	6.12	10.05	8.66	—	—
1.94	6.50	9.73	8.66	—	—
2.94	8.25	13.00	11.81	—	—
3.94	10.75	15.50	13.78	—	—
5.94	14.00	20.40	17.72	—	—
7.94	16.50	23.50	23.62	—	—
9.94	20.00	28.20	19.88	—	—
11.94	22.00	32.28	—	—	—
13.19	23.75	—	—	—	—
15.19	27.00	—	—	—	—
17.19	29.25	43.73	—	—	—
19.19	32.00	—	—	—	—
23.19	37.00	—	—	—	—

ANSI CLASS 900#					
SIZE	B MINIMUM	C	D	E	WEIGHT (LBS.)
0.75	—	—	—	—	—
1.00	1.00	5.88	—	7.09	—
1.50	1.50	7.00	—	7.09	—
2.00	1.94	8.50	—	8.66	—
3.00	2.94	9.50	—	13.78	—
4.00	3.94	11.50	—	17.72	—
6.00	5.94	15.00	—	23.62	—
8.00	7.94	18.50	—	23.62	—
10.00	9.94	21.50	—	—	—
12.00	11.94	24.00	—	—	—
14.00	12.69	25.25	—	—	—
16.00	14.69	27.75	—	—	—
18.00	16.69	31.00	—	—	—
20.00	18.56	33.75	—	—	—
24.00	22.44	41.00	—	—	—

ANSI CLASS 1500#					
SIZE	B MINIMUM	C	D	E	WEIGHT (LBS.)
—	—	—	—	—	—
1.00	5.88	—	7.09	—	—
1.50	7.00	—	7.09	—	—
1.94	8.50	—	8.66	—	—
2.94	10.50	—	17.72	—	—
3.94	12.25	—	17.72	—	—
5.69	15.50	—	23.62	—	—
7.56	19.00	—	23.62	—	—
9.44	23.00	—	—	—	—
11.31	26.50	—	—	—	—
12.44	29.50	—	—	—	—
14.19	32.50	—	—	—	—
16.00	36.00	—	—	—	—
17.88	38.75	—	—	—	—
21.50	46.00	—	—	—	—

ANSI CLASS 2500#					
SIZE	B MINIMUM	C	D	E	WEIGHT (LBS.)
—	—	—	—	—	—
1.00	—	—	—	—	—
1.50	—	—	—	—	—
1.69	9.25	—	8.66	—	—
2.44	12.00	—	11.81	—	—
3.44	14.00	—	13.78	—	—
5.19	19.00	—	23.62	—	—
7.06	21.75	—	—	—	—
8.81	26.50	—	—	—	—
10.44	30.00	—	—	—	—
11.50	—	—	—	—	—
13.13	—	—	—	—	—
14.75	—	—	—	—	—
16.50	—	—	—	—	—
—	—	—	—	—	—

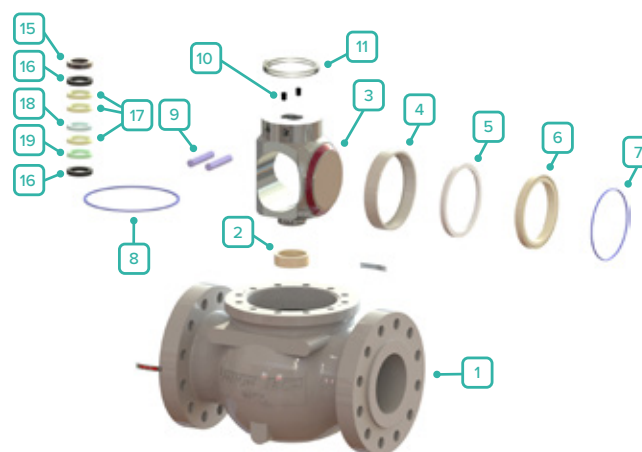
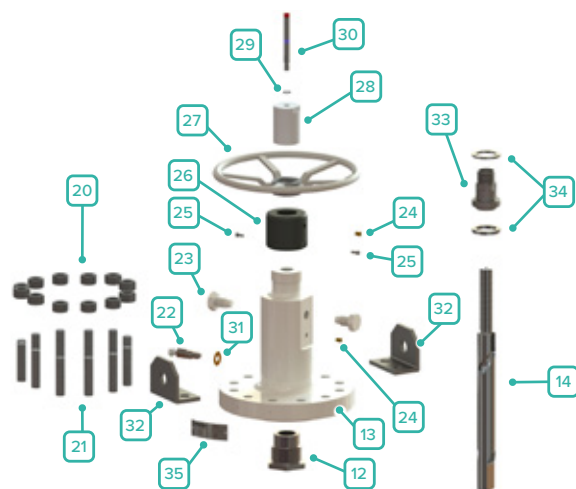
PARTS AND MATERIALS – ENCLOSED BONNET DESIGNS

NO	QTY	DESCRIPTION	MATERIAL			
			STANDARD K3	STANDARD K7	LOW TEMP K3	LOW TEMP K7
1	1	Body	A216 WCC, A105/ LF2(A350) NACE	A216 WCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE
2	1	Trunnion Bushing	Cast Iron	Cast Iron	Cast Iron	Cast Iron
3	1	Ball	A216 WCC, A105/ LF2(A350) NACE	A216 WCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE
4	1	Seat Outer Ring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
5	1	Seat Insert	Teflon	Teflon	Teflon	Teflon
6	1	Seat Inner Ring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
7	1	O-Ring	Teflon	Teflon	Teflon	Teflon
8	1	Body Gasket	316/Grafoil® Filled	316/Grafoil® Filled	316/Grafoil® Filled	316/Grafoil® Filled
9	2	Ball Pin	Alloy Steel	Stainless Steel	Alloy Steel	Stainless Steel
10	2	Key	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
11	1	Wave Spring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
12	1	Bonnet Bushing	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
13	1	Bonnet	A216 WCC, A105/ LF2(A350) NACE	A216 WCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE
14	1	Stem	Alloy Steel	Stainless Steel	Alloy Steel	Stainless Steel
15	1	Anti Extrusion Ring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
16	2	Grafoil Fire Ring	Grafoil®	Grafoil®	Grafoil®	Grafoil®
17	3	PTFE V Ring	Teflon	Teflon	Teflon	Teflon
18	1	PTFE Backup V Ring	Teflon	Teflon	Teflon	Teflon
19	1	PTFE Bottom V Ring	Teflon	Teflon	Teflon	Teflon
20	*	Body Nut	ASTM A194 Gr.2H	ASTM A194 Gr.2HM	ASTM A194 Gr.7	ASTM A194 Gr.7M
21	*	Body Stud	ASTM A193 Gr.B7	ASTM A193 Gr.B7M	ASTM A320 Gr.L7	ASTM A320 Gr.L7M
22	1	Packing Fitting	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
23	2	Stem Guide	Alloy Steel	Stainless Steel	Alloy Steel	Stainless Steel
24	*	Grease Fitting	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
25	2	Socket Head Cap Screw	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
26	1	Bonnet Nut	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
27	1	Hand Wheel	Cast Iron	Cast Iron	Cast Iron	Cast Iron
28	1	Stem Protector	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy
29	1	O-Ring	Viton	Viton	Viton	Viton
30	1	Indicator Lever	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
31	*	Warning Label	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
32	2	Lifting Eye	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
33	1	Stem Nut	Cast Iron	Cast Iron	Cast Iron	Cast Iron
34	2	Bearing	Bearing Steel	Bearing Steel	Bearing Steel	Bearing Steel
35	1	Tag	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
36	1	Injectable Packing**	Variable	Variable	Variable	Variable

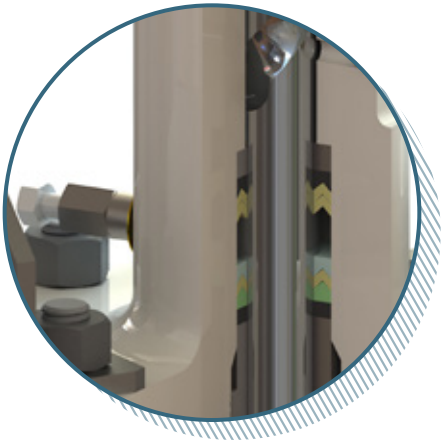
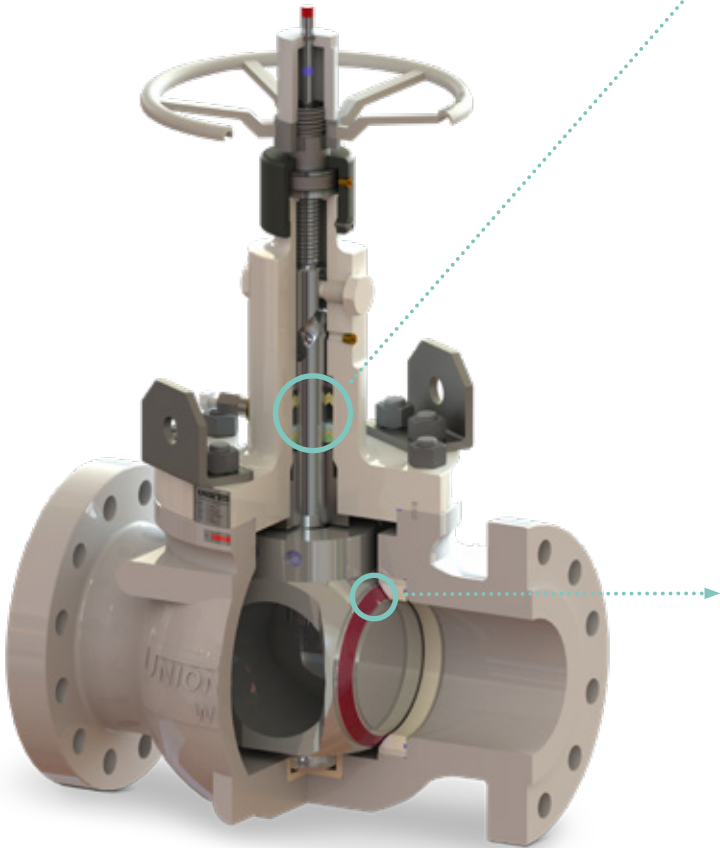
* Quantity varies according to the size and class

** Injectable packing material depends on service conditions

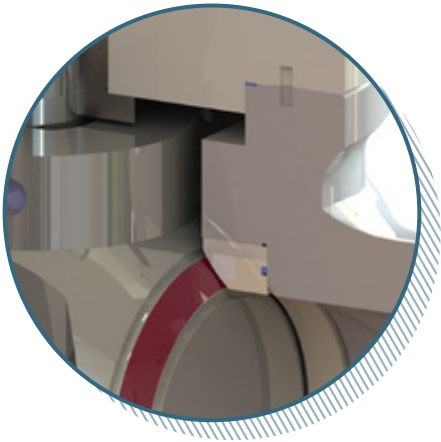
This is a partial list of material options. Many alternatives can be provided to match the actual service requirements. Consult Union Tech for detailed materials list.



ENCLOSED BONNET DESIGNS



Stem Packing Detail



Seat Seal Detail

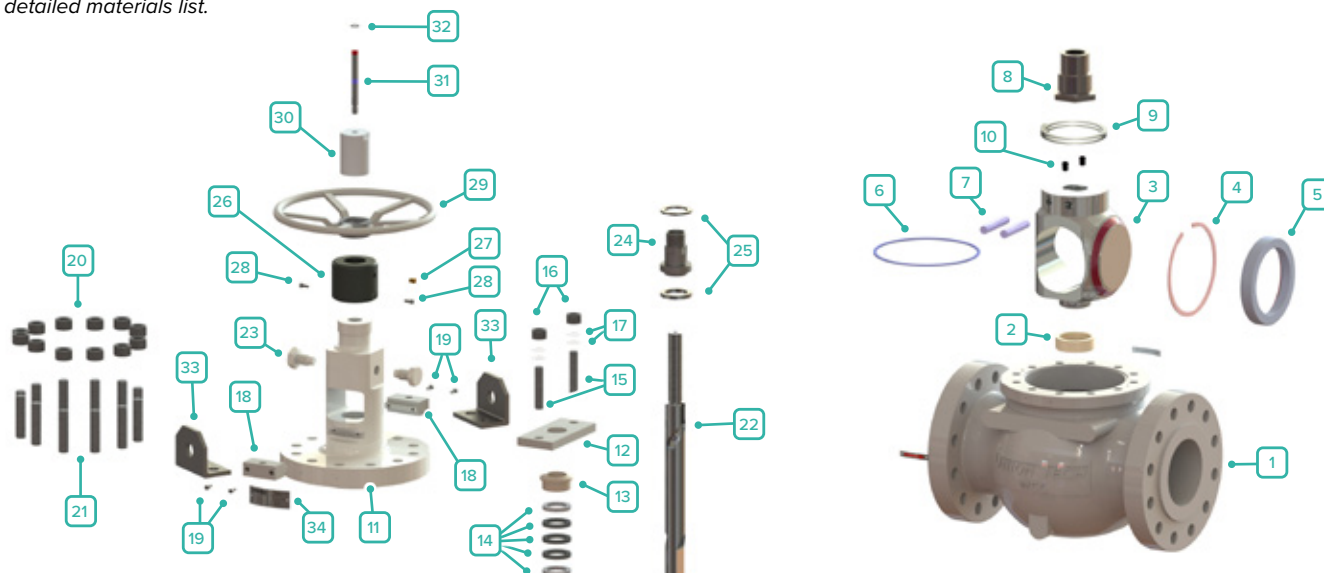
PARTS AND MATERIALS – OS&Y BONNET DESIGNS

NO	QTY	DESCRIPTION	MATERIAL			
			STANDARD K3	STANDARD K7	LOW TEMP K3	LOW TEMP K7
1	1	Body	A216 WCC, A105/ LF2(A350) NACE	A216 WCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE
2	1	Trunnion Bushing	Cast Iron	Cast Iron	Cast Iron	Cast Iron
3	1	Ball	A216 WCC, A105/ LF2(A350) NACE	A216 WCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE
4	1	Retaining Ring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
5	1	Seal Seat	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
6	1	Body Gasket	316/Grafoil® Filled	316/Grafoil® Filled	316/Grafoil® Filled	316/Grafoil® Filled
7	2	Ball Pin	Alloy Steel	Stainless Steel	Alloy Steel	Stainless Steel
8	1	Bonnet Bushing	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
9	1	Key	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
10	2	Wave Spring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
11	1	Bonnet	A216 WCC, A105/ LF2(A350) NACE	A216 WCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE	A352 LCC, A105/ LF2(A350) NACE
12	1	Gland	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
13	1	Gland Bushing	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
14	1	Stem Packing Assembly	Grafoil®	Grafoil®	Grafoil®	Grafoil®
15	2	Gland Stud	ASTM A193-B8	ASTM A193-B8	ASTM A193-B8	ASTM A193-B8
16	2	Gland Nut	ASTM A194-Gr8	ASTM A194-Gr8	ASTM A194-Gr8	ASTM A194-Gr8
17	4	Live Load Spring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
18	1	Gland Ear	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
19	4	Socket Head Cap Screw	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
20	*	Body Nut	ASTM A194 Gr.2H	ASTM A194 Gr.2HM	ASTM A194 Gr.7	ASTM A194 Gr.7M
21	*	Body Stud	ASTM A193 Gr.B7	ASTM A193 Gr.B7M	ASTM A320 Gr.L7	ASTM A320 Gr.L7M
22	1	Stem	Alloy Steel	Stainless Steel	Alloy Steel	Stainless Steel
23	2	Stem Guide	Alloy Steel	Stainless Steel	Alloy Steel	Stainless Steel
24	1	Stem Nut	Cast Iron	Cast Iron	Cast Iron	Cast Iron
25	2	Bearing	Bearing Steel	Bearing Steel	Bearing Steel	Bearing Steel
26	1	Bonnet Nut	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
27	*	Grease Fitting	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
28	2	Socket Head Cap Screw	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
29	1	Hand Wheel	Cast Iron	Cast Iron	Cast Iron	Cast Iron
30	1	Stem Protector	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy
31	1	Indicator Lever	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
32	1	O-Ring	Viton	Viton	Viton	Viton
33	2	Lifting Eye	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
34	1	Tag	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel

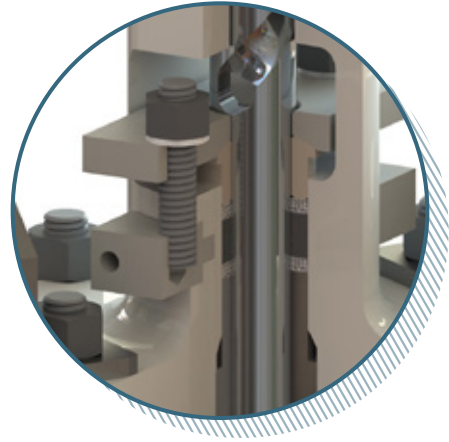
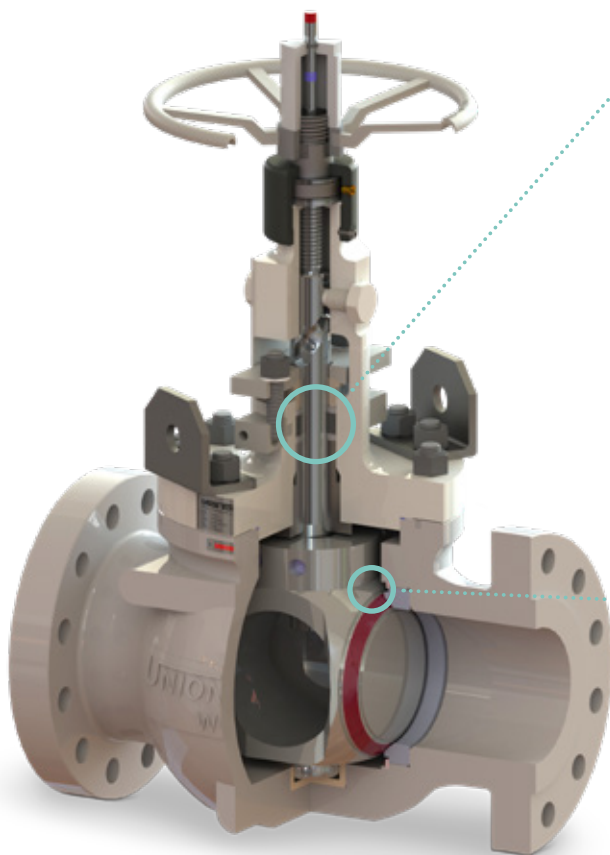
* Quantity varies according to the size and class

** Injectable packing material depends on service conditions

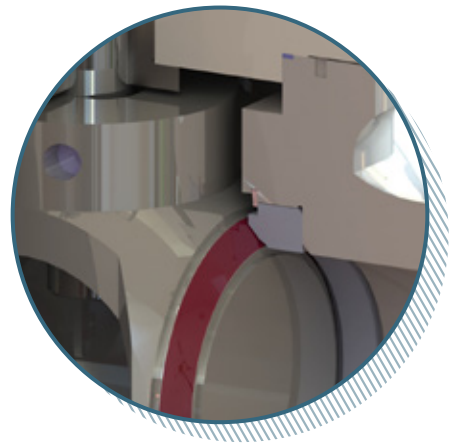
This is a partial list of material options. Many alternatives can be provided to match the actual service requirements. Consult Union Tech for detailed materials list.



OS&Y BONNET DESIGNS

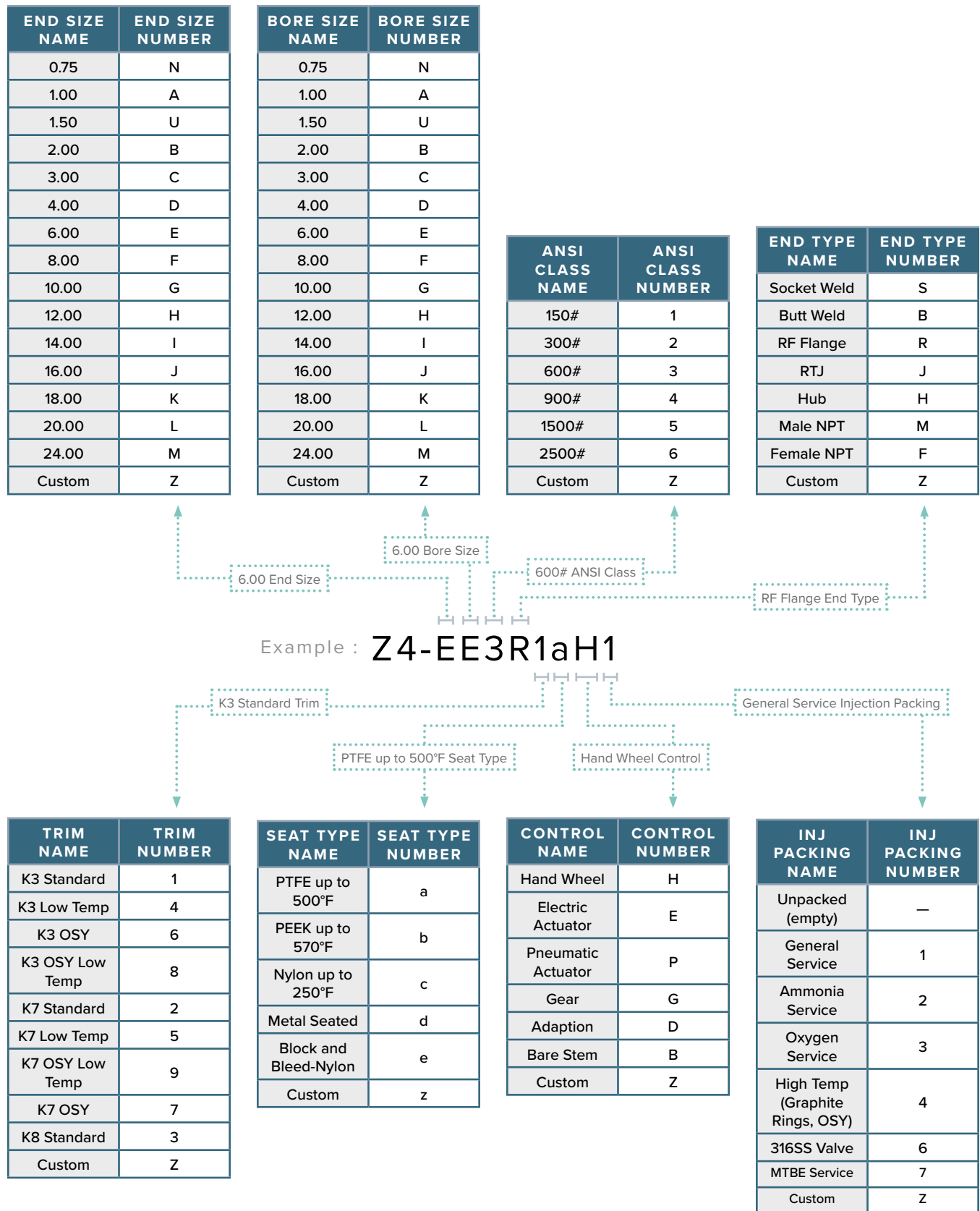


Stem Packing Detail



Seat Seal Detail

FIGURE NUMBERS



TRIM NOTES

STANDARD K3: -20°F to 500°F	
BODY	A216 WCC/WCB, A105/LF2(A350) NACE
BONNET	A216 WCC/WCB, A105/LF2(A350) NACE
STEM	Alloy Steel
BALL	Carbon steel
SEAT	Stainless Steel
BALL FACE*	Alloy Steel /Stainless Steel

STANDARD K7: -20°F to 500°F	
BODY	A216 WCC/WCB, A105/LF2(A350) NACE
BONNET	A216 WCC/WCB, A105/LF2(A350) NACE
STEM	Stainless Steel
BALL	Carbon steel
SEAT	Stainless Steel
BALL FACE*	Alloy Steel /Stainless Steel

K8 CORROSIVE (316SS): -155°F to 800°F	
BODY	A351 CF8M/316SS/316L
BONNET	A351 CF8M/316SS/316L
STEM	Stainless Steel
BALL	Stainless Steel
SEAT	Stainless Steel
BALL FACE*	Alloy Steel /Stainless Steel

K3 LOW TEMP: -50°F TO 500°F	
BODY	A352 LCC, A105/LF2(A350) NACE
BONNET	A352 LCC, A105/LF2(A350) NACE
STEM	Alloy Steel
BALL	Carbon steel
SEAT	Stainless Steel
BALL FACE*	Alloy Steel /Stainless Steel

K7 LOW TEMP: -50°F TO 500°F	
BODY	A352 LCC, A105/LF2(A350) NACE
BONNET	A352 LCC, A105/LF2(A350) NACE
STEM	Stainless Steel
BALL	Carbon steel
SEAT	Stainless Steel
BALL FACE*	Alloy Steel /Stainless Steel

K3 OSY: -20°F TO 800°F	
BODY	A216 WCC/WCB, A105/LF2(A350) NACE
BONNET	A216 WCC/WCB, A105/LF2(A350) NACE
STEM	Alloy Steel
BALL	Carbon steel
SEAT	Stainless Steel
BALL FACE*	Alloy Steel /Stainless Steel

K7 OSY: -20°F TO 650°F	
BODY	A216 WCC/WCB, A105/LF2(A350) NACE
BONNET	A216 WCC/WCB, A105/LF2(A350) NACE
STEM	Stainless Steel
BALL	Carbon steel
SEAT	Stainless Steel
BALL FACE*	Alloy Steel /Stainless Steel

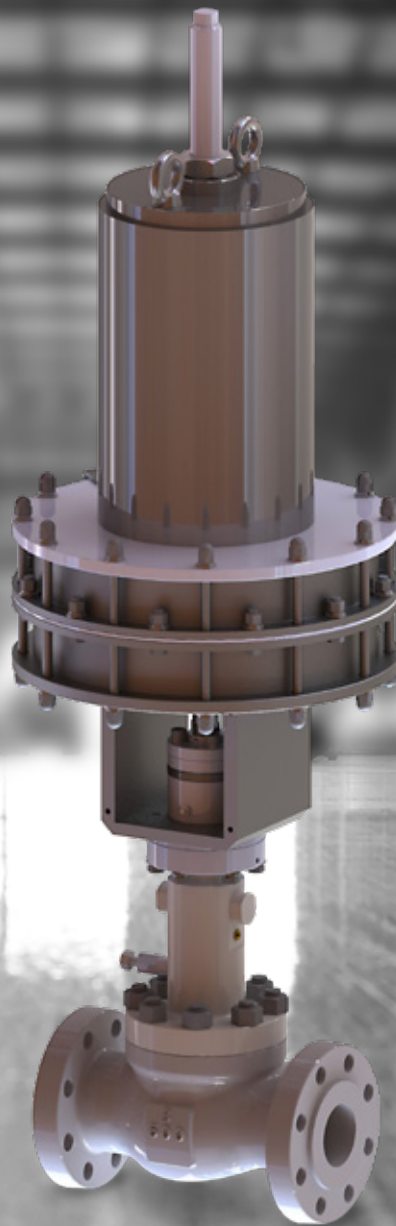
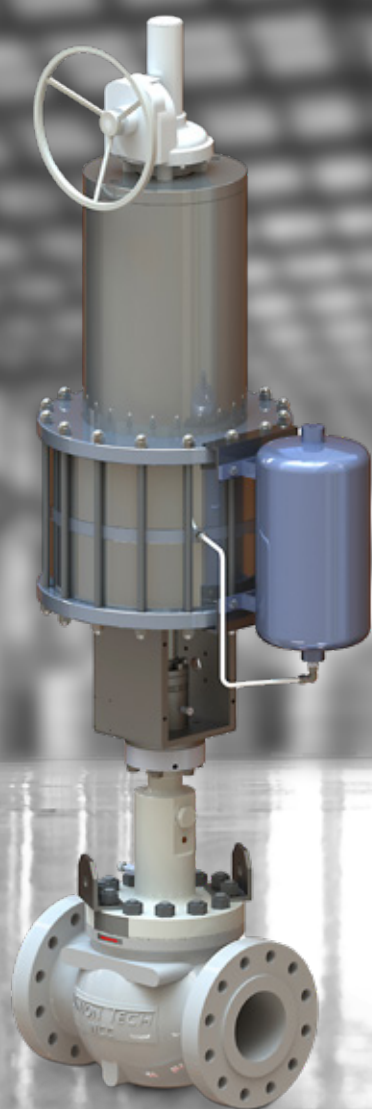
K3 OSY LOW TEMP: -50°F TO 800°F	
BODY	A352 LCC, A105/LF2(A350) NACE
BONNET	A352 LCC, A105/LF2(A350) NACE
STEM	Alloy Steel
BALL	Carbon steel
SEAT	Stainless Steel
BALL FACE*	Alloy Steel /Stainless Steel

K7 OSY LOW TEMP: -50°F TO 650°F	
BODY	A352 LCC, A105/LF2(A350) NACE
BONNET	A352 LCC, A105/LF2(A350) NACE
STEM	Stainless Steel
BALL	Carbon steel
SEAT	Stainless Steel
BALL FACE*	Alloy Steel /Stainless Steel

* Optional component for superceded models

This is an illustrative list of trim component materials. Alternatives may be provided to match actual service requirements. Consult Union Tech for detailed material list.

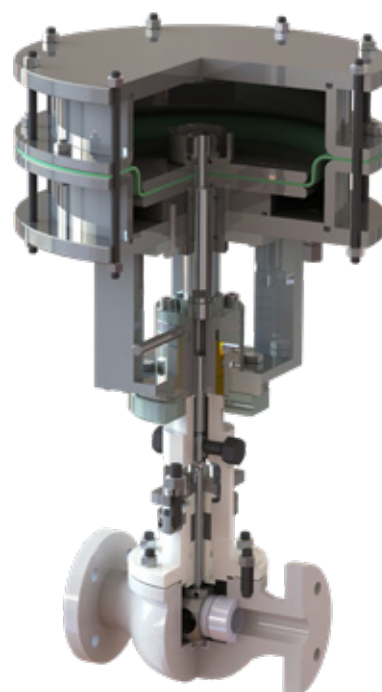
PNEUMATIC ACTUATORS



Z4 PNEUMATIC ACTUATOR

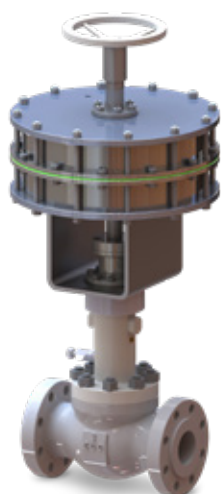
D-SERIES DIAPHRAGM ACTUATOR FEATURES

- ♦ Union Tech Z4 Pneumatic Diaphragm Actuators are designed specifically for smaller-sized Union Tech Z4 Rising-Stem Ball Valves; mechanical operation of the actuator is matched and tuned precisely to that of the Z4.
- ♦ Recommended for Z4 Valves sized 4" or smaller
- ♦ Maximum air pressure = 65 psi
- ♦ Carbon steel housing with phosphate coating applied to external surfaces for corrosion resistance
- ♦ Tri-layer design maintains structural stability and enhances durability
- ♦ Diaphragm consists of ruggedized nitrile elastomer – which was engineered and tested to surpass 100,000 cycles under 0.25 Mpa



PNEUMATIC DIAPHRAGM ACTUATOR STYLES

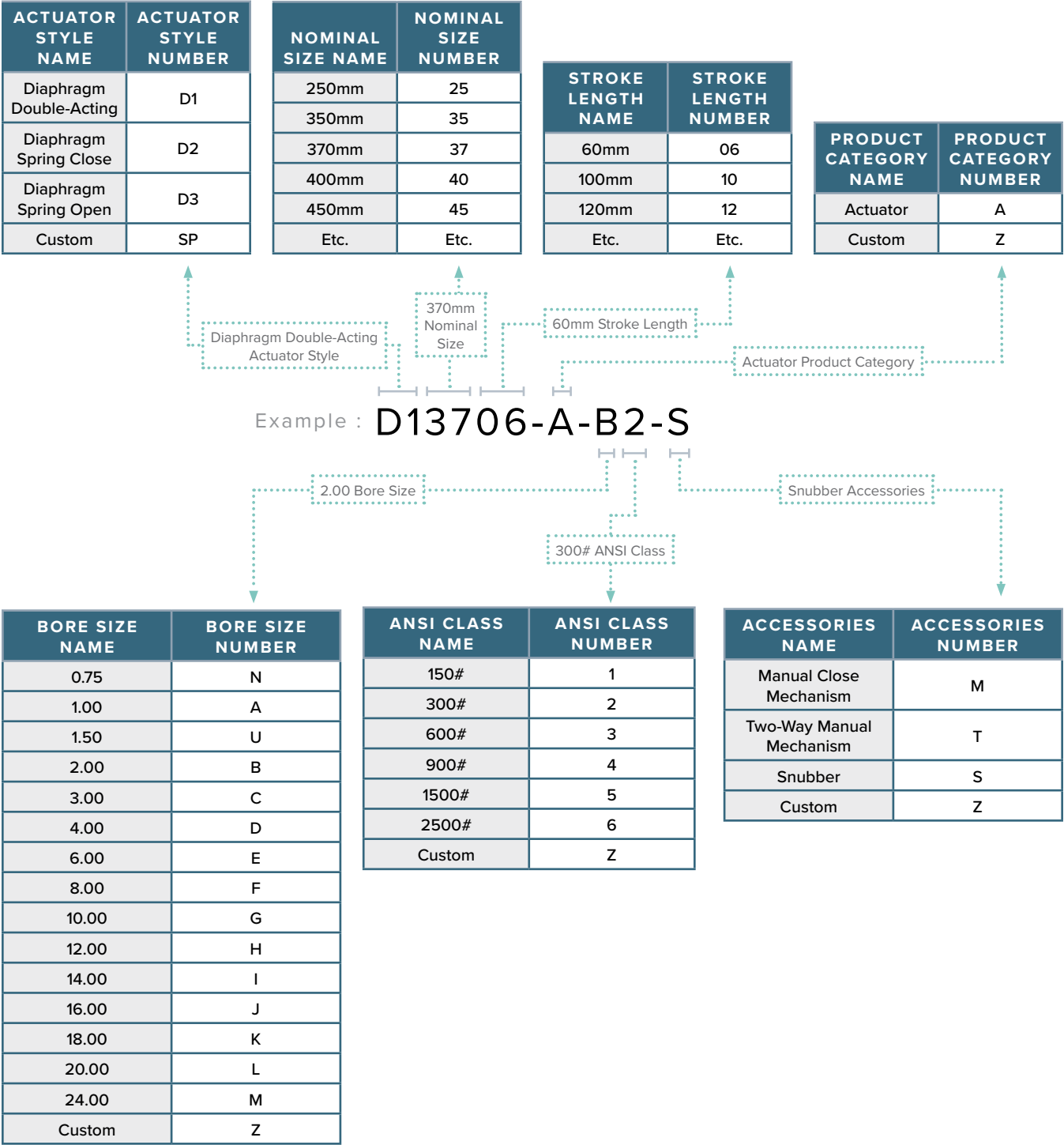
Double Acting



Spring Close

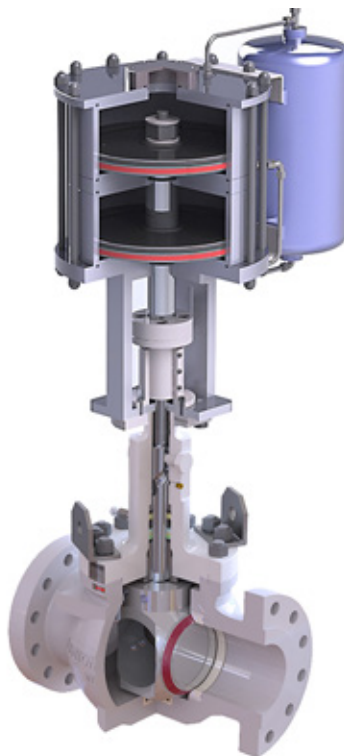


FIGURE NUMBERS



P-SERIES PISTON ACTUATOR FEATURES

- ♦ Union Tech Z4 Pneumatic Piston Actuators are designed specifically for larger-sized Union Tech Z4 Rising-Stem Ball Valves
- ♦ Recommended for Z4 valves sized above 4"
- ♦ Driven by compressed air pressure, the piston actuator generates sufficient linear thrust to operate larger-sized Z4 Rising-Stem Ball Valves
- ♦ Carbon steel housing with chrome-plated inner surfaces for corrosion resistance and extended service life
- ♦ Upgradable design allows for up to 3 cylinders for increased thrust output
- ♦ Nylon belt and double nitrile O-ring design effectively seals and reduces friction for piston subassembly
- ♦ Equipped with damping oil tank for shock absorption



PNEUMATIC PISTON ACTUATOR STYLES

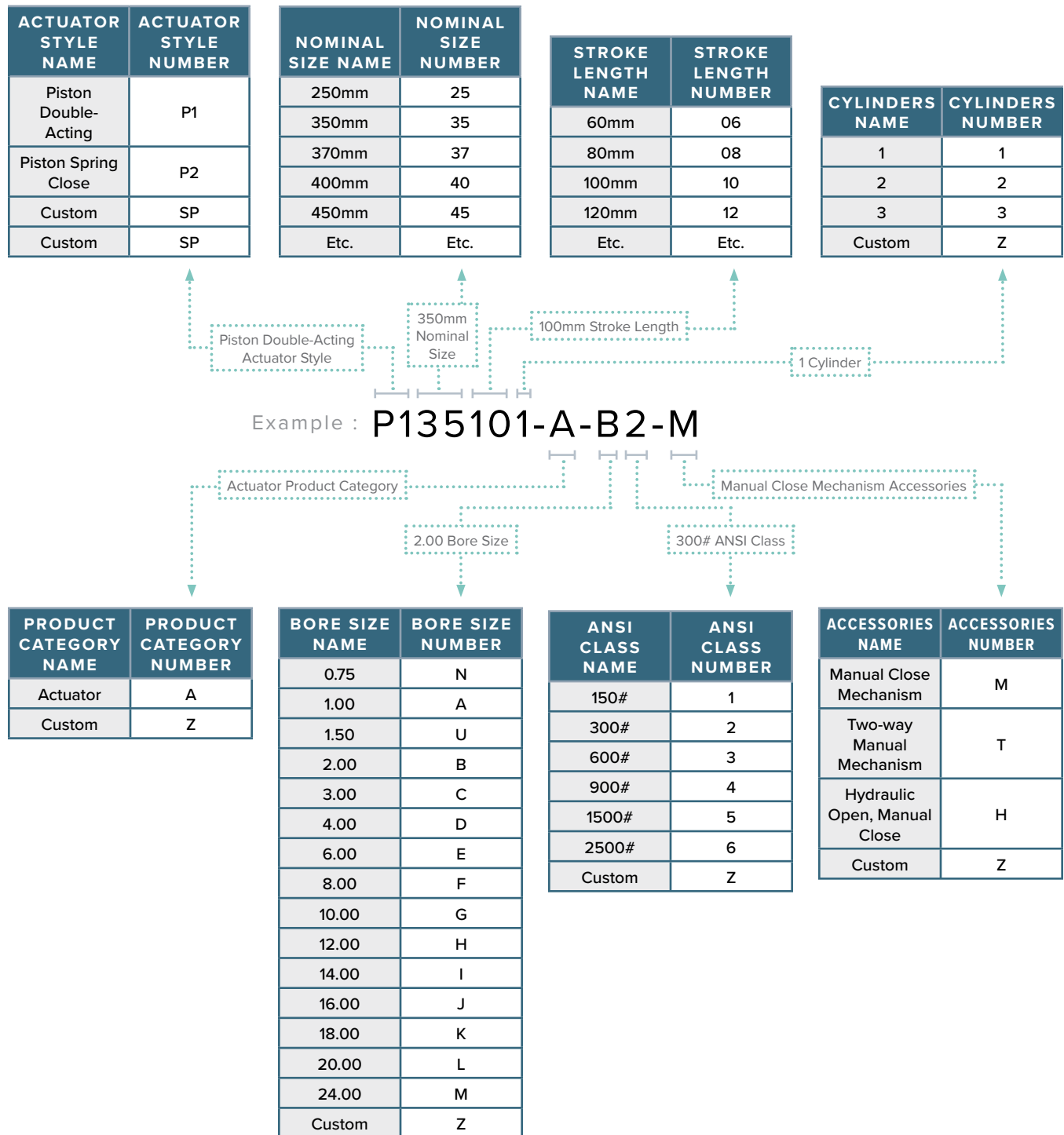
Double Acting



Spring Close



FIGURE NUMBERS



TOSHIBA MACHINE

MPO
ED

QUALITY.
SPEED.
SCALE.





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