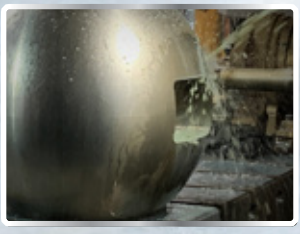
UNION TECH



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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Z1: UNIBODY POWER VALVE

- Features
- Dimensional Data
- Parts and Materials
- Figure Numbers

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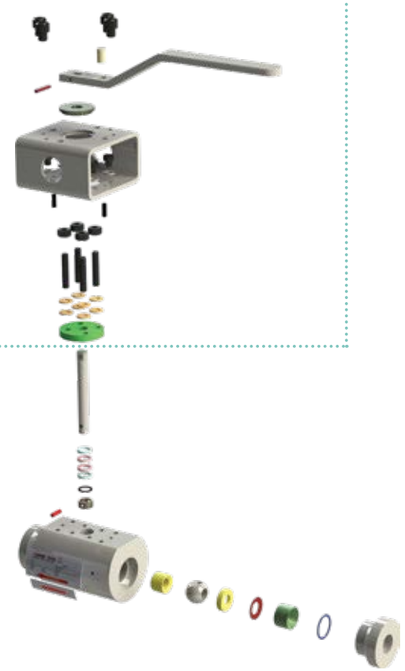
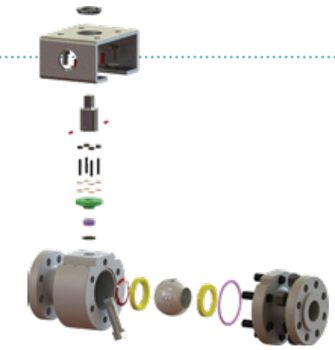
Z1LW: LIGHTWEIGHT UNIBODY POWER VALVE

- Features
- Dimensional Data
- Parts and Materials
- Figure Numbers





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Z2: TWO-PIECE ISOLATION VALVE

- Features
- Dimensional Data
- Parts and Materials
- Figure Numbers

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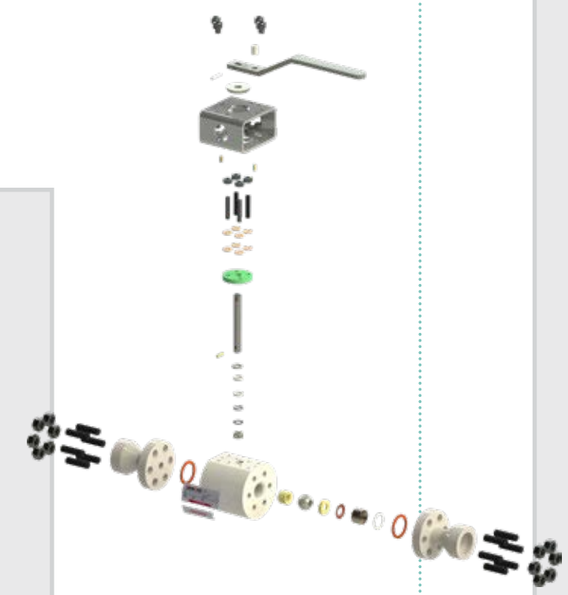
ENGINEERING DATA

- Flow Coefficients (C_v)



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Z3: POWER VALVE SYSTEM

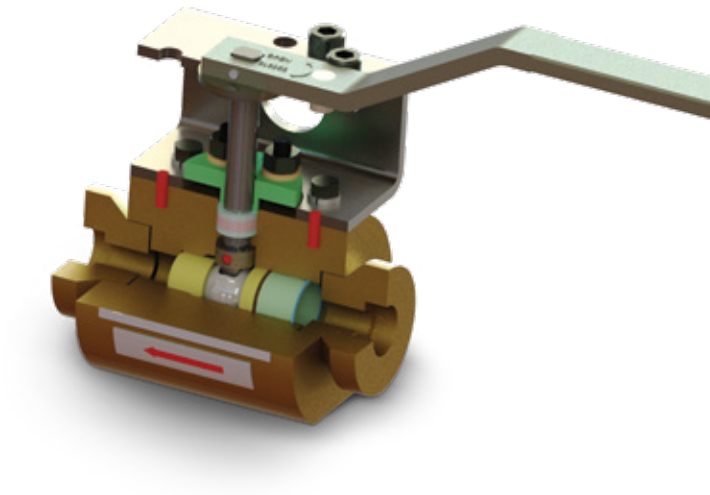
- Features
- Dimensional Data
- Parts and Materials
- Figure Numbers

SEVERE-SERVICE METAL-SEATED BALL VALVES

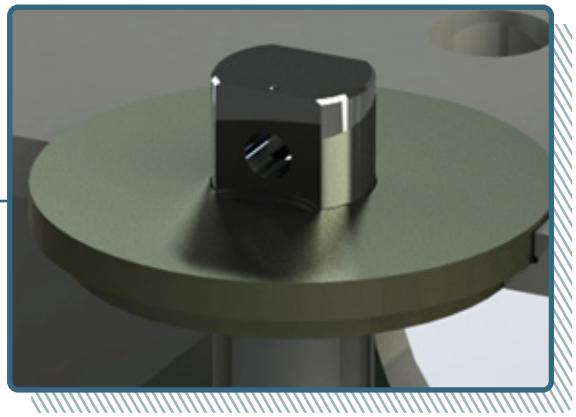
Z1 UNIBODY POWER VALVE

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*

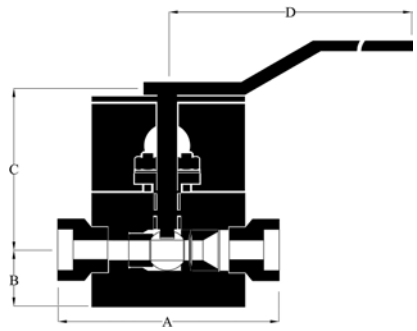
	BORE SIZE (IN.)						
END SIZE	0.65	1.00	1.40	1.75	2.00	2.50	3.00
Socket Weld End							
0.50	7.00	8.00	—	—	—	—	—
0.75	7.00	8.00	—	—	—	—	—
1.00	7.00	8.00	—	—	—	—	—
1.50	5.00	6.00	—	—	—	—	—
2.00	5.00	6.00	8.00	11.00	13.75	—	—
2.50	—	6.00	8.00	11.00	13.75	16.50	—
3.00	—	—	—	—	—	—	—
Butt Weld End							
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.

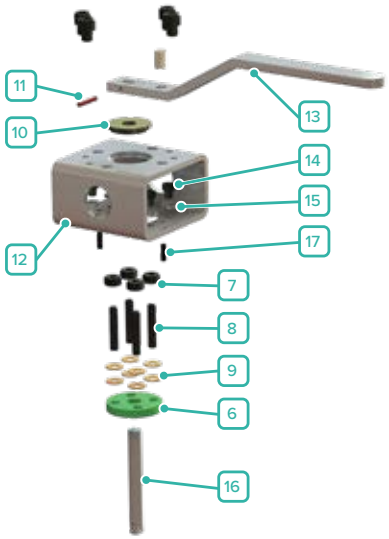


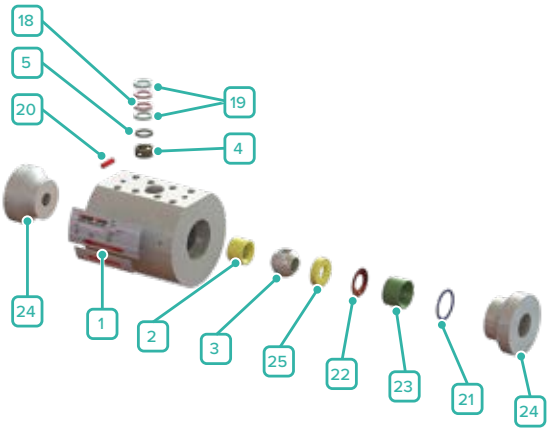
Notes: Depending on the configuration, the actual valve may utilize end connection adaptors. Diagrams are illustrative only; actual valve may utilize different components.

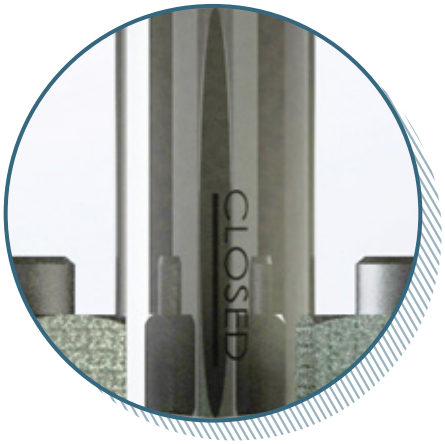
PARTS AND MATERIALS

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

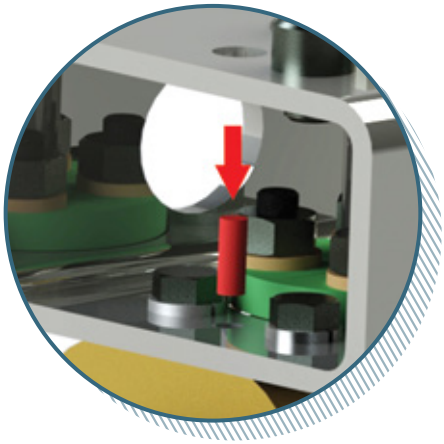
Note: Trim is Inconel® 718 on 4500# ANSI class valves. Materials and specifications are subject to future revisions.



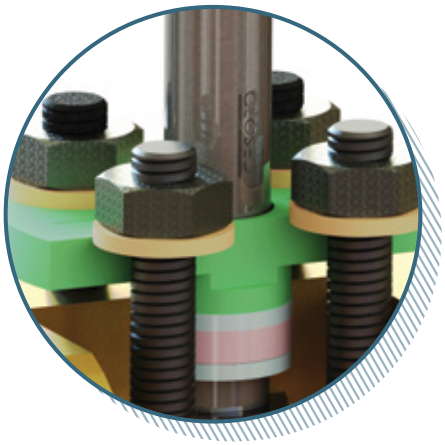




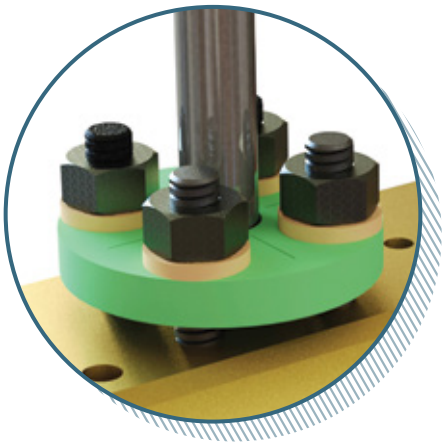
Positive on/off valve position verification is easily obtained via circular visual window



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

END SIZE NAME	END SIZE NUMBER
0.50	0050
0.75	0075
1.00	0100
1.50	0150
2.00	0200
2.50	0250
3.00	0300
4.00	0400
Special	SPEC

BORE SIZE NAME	BORE SIZE NUMBER
0.65	0065
1.00	0100
1.40	0140
1.75	0175
2.00	0200
2.50	0250
3.00	0300
Special	SPEC

ANSI CLASS NAME	ANSI CLASS NUMBER
150#	0150
300#	0300
600#	0600
900#	0900
1500#	1500
2500#	2500
3200#	3200
3500#	3500
4500#	4500
Special	SPEC

END TYPE NAME	END TYPE NUMBER
Socket Weld	S
Butt Weld	B
RF Flange	R
RTJ	J
Hub	H
Male NPT	M
Female NPT	F
Special	Z

2.00" End Size

1.40" Bore Size

3200# ANSI Class

Socket Weld End Type

Example : Z1-0200×0140-3200-SAvvaA

A105/LF2 Body Material

Inconel 718 Ball-Seat Material

Inconel 718 Stem Material

Chromium Carbide (HVOF) Coating

Actuator

BODY MATERIAL NAME	BODY MATERIAL NUMBER
A105/LF2	A
A182 F22	B
A182 F91	C
A182 F316/L (Dual Cert)	D
A182 F92	L
F9	J
Special	Z

BALL-SEAT MATERIAL NAME	BALL-SEAT MATERIAL NUMBER
410 SS	q
431 SS	r
A182 F316/L (Dual Cert)	d
Inconel 718	v
Special	z

STEM MATERIAL NAME	STEM MATERIAL NUMBER
Gr. 660	x
Inconel 718	v
Special	z

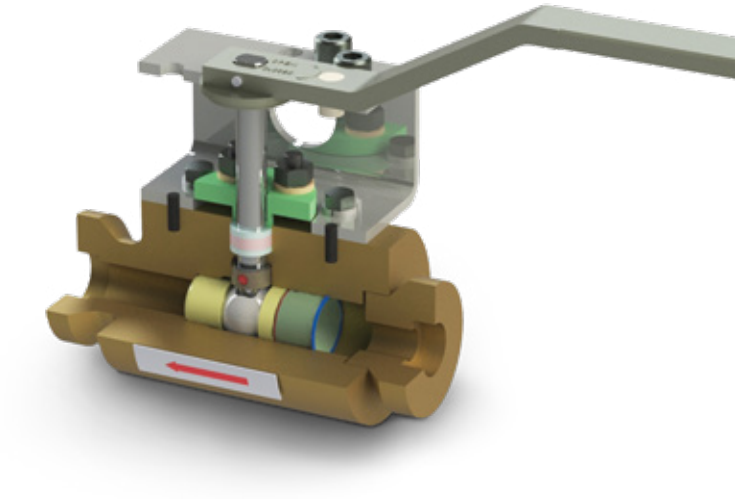
COATING NAME	COATING NUMBER
Chromium Carbide (HVOF)	a
Chromium Carbide (Spray and Fused)	s
Special	z

CONTROL NAME	CONTROL NUMBER
Bare Stem	B
Hand Lever	H
Actuator	A
Gear	G
Adaption	D
Custom	Z

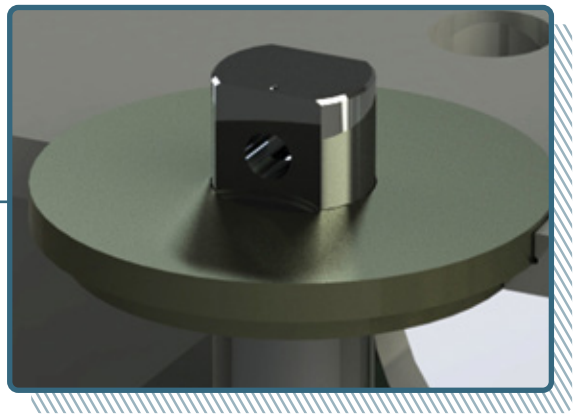
Z1LW LIGHTWEIGHT UNIBODY POWER VALVE

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*

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

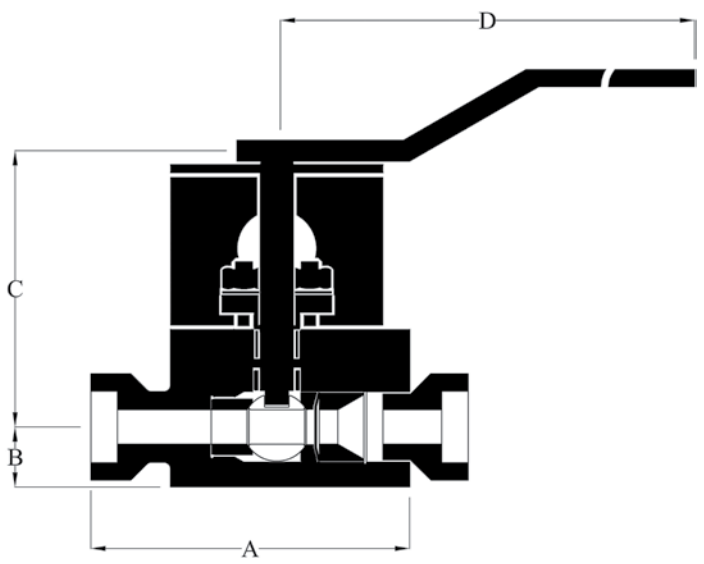
** End-to-end lengths, A, include end connection adapters, if utilized.*

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.*

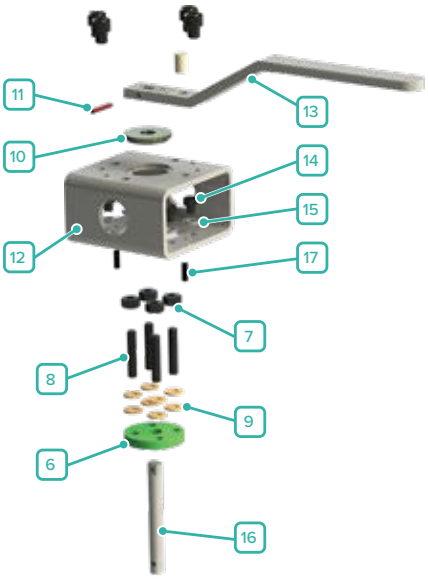


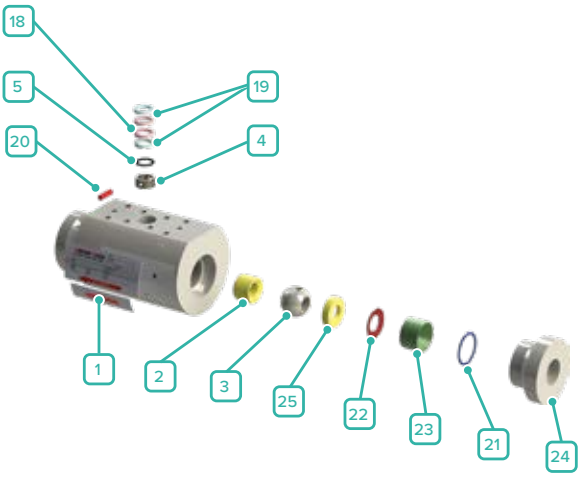
Note: Diagrams are illustrative only; actual valve may utilize different components.

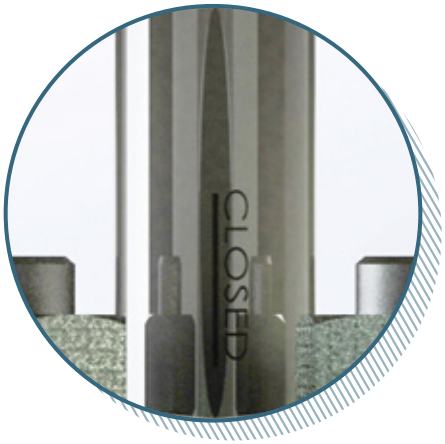
PARTS AND MATERIALS

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

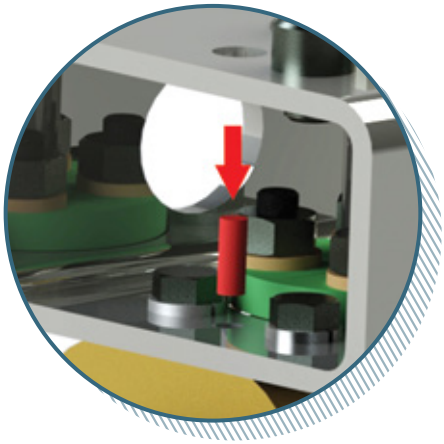
Note: Materials and specifications are subject to future revisions.



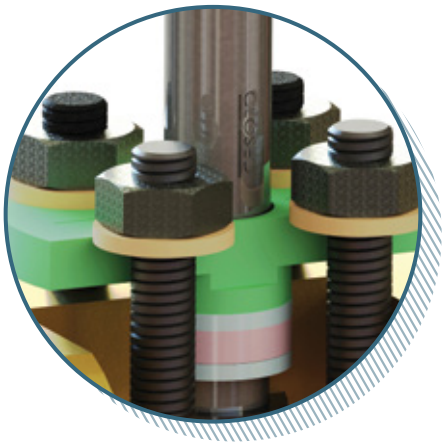




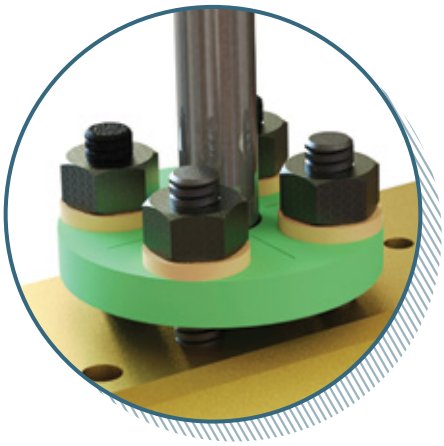
Positive on/off valve position verification is easily obtained via circular visual window



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

END SIZE NAME	END SIZE NUMBER
0.50	0050
0.75	0075
1.00	0100
Special	SPEC

BORE SIZE NAME	BORE SIZE NUMBER
0.40	0040
0.65	0065
1.00	0100
Special	SPEC

ANSI CLASS NAME	ANSI CLASS NUMBER
150#	0150
300#	0300
600#	0600
900#	0900
1500#	1500
Special	SPEC

END TYPE NAME	END TYPE NUMBER
Socket Weld	S
Special	Z

0.75" End Size

0.65" Bore Size

300# ANSI Class

Socket Weld End Type

Example : Z1LW-0075×0065-0300-SAqxH

A105/LF2 Body Material

410 SS Ball-Seat Material

Gr. 660 Stem Material

Hand Lever Control

BODY MATERIAL NAME	BODY MATERIAL NUMBER
A105/LF2	A
A182 F11	O
A182 F22	B
A182 F91	C
A182 F316/L (Dual Cert)	D
Special	Z

BALL-SEAT MATERIAL NAME	BALL-SEAT MATERIAL NUMBER
410 SS	q
431 SS	r
A 182 F316/L (Dual Cert)	d
Inconel 718	v
Special	z

STEM MATERIAL NAME	STEM MATERIAL NUMBER
Gr. 660	x
Inconel 718	v
Special	z

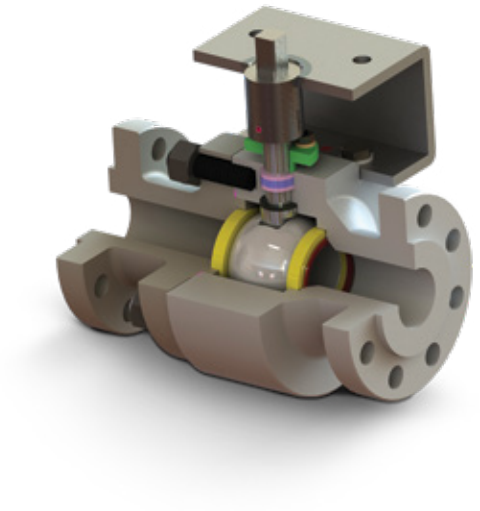
CONTROL NAME	CONTROL NUMBER
Hand Lever	H
Custom	Z

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



CERTIFIED
SIL 3 CAPABLE
IEC 61508

DIMENSIONAL DATA

End-to-End Lengths, A*

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

	ANSI CLASS (#)					
SIZE	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

	ANSI CLASS 150#					
SIZE	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	—

	ANSI CLASS 300#					
SIZE	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	—

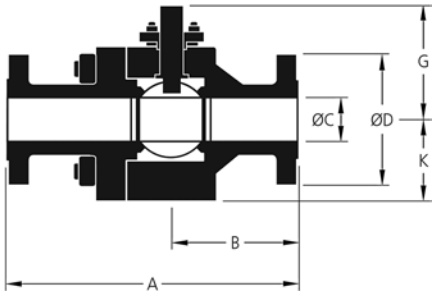
	ANSI CLASS 600#					
SIZE	B	C	D	G	K	WEIGHT (LBS.)
0.50	2.75	0.50	3.75	2.75	2.38	—
0.75	3.50	0.75	4.62	3.00	2.50	—
1.00	4.25	1.00	4.88	3.00	3.00	—
1.50	4.75	1.50	6.12	5.25	3.50	—
2.00	5.00	2.00	6.50	6.00	3.75	75
3.00	6.00	3.00	8.25	7.00	4.75	141
4.00	7.75	4.00	10.75	8.25	5.00	304
6.00	9.00	6.00	14.00	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.

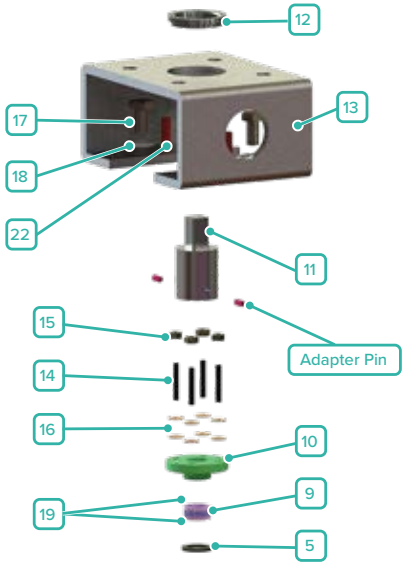


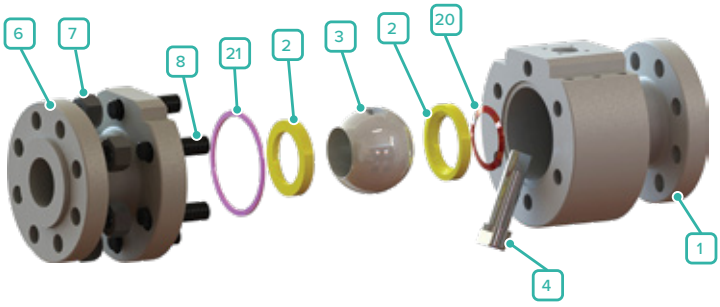
Note: Diagrams are illustrative only; actual valve may utilize different components.

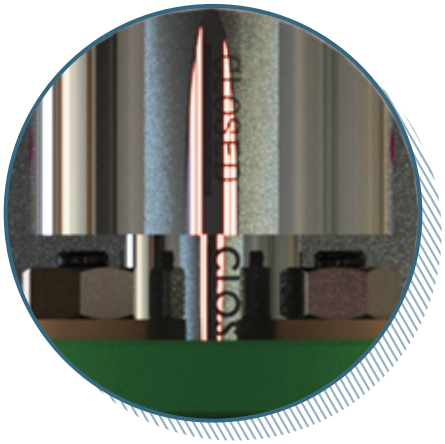
PARTS AND MATERIALS

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

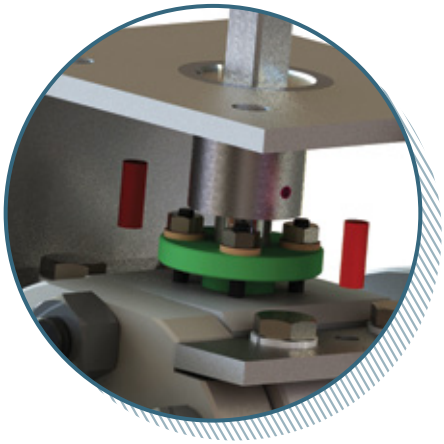
** Quantity varies according to the size and class*



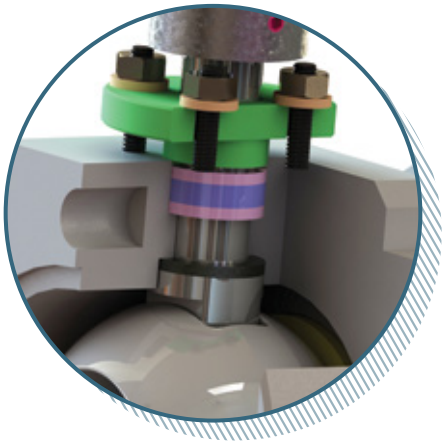




Positive on/off valve position verification is easily obtained via circular visual window



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

END SIZE NAME	END SIZE NUMBER
0.50	0050
0.65	0065
0.75	0075
1.00	0100
1.25	0125
1.40	0140
1.50	0150
1.60	0160
2.00	0200
2.50	0250
3.00	0300
4.00	0400
6.00	0600
8.00	0800
10.00	1000
12.00	1200
14.00	1400
16.00	1600
18.00	1800
20.00	2000
24.00	2400
Special	SPEC

BORE SIZE NAME	BORE SIZE NUMBER
0.50	0050
0.65	0065
0.75	0075
1.00	0100
1.25	0125
1.40	0140
1.50	0150
1.60	0160
2.00	0200
2.50	0250
3.00	0300
4.00	0400
6.00	0600
8.00	0800
10.00	1000
12.00	1200
14.00	1400
16.00	1600
18.00	1800
20.00	2000
24.00	2400
Special	SPEC

ANSI CLASS NAME	ANSI CLASS NUMBER
150#	0150
300#	0300
600#	0600
900#	0900
1500#	1500
2500#	2500
3200#	3200
3500#	3500
4500#	4500
Special	SPEC

END TYPE NAME	END TYPE NUMBER
Socket Weld	S
Butt Weld	B
RF Flange	R
RTJ	J
Hub	H
Male NPT	M
Female NPT	F
Special	Z

BODY MATERIAL NAME	BODY MATERIAL NUMBER
A105/LF2	A
A182 F9	J
A182 F11	O
A182 F22	B
A182 F91	C
A182 F92	L
A182 F304/L (Dual Cert)	F
A182 F304H	H
A182 F316/L (Dual Cert)	D
A182 F316H	E
A350 LF3	M
Duplex SS	N
Ferralium 255	S
Incolloy 800	G
Incolloy 800H	I
Inconel 600	P
Inconel 625	K
Ti Gr-12	T
Special	Z

6.00" End Size

2.00" Bore Size

300# ANSI Class

Female NPT End Type

A105/LF2 Body Material

Example : Z2-0600×0200-0300-FAvdm2D

Inconel 718 Ball-Seat Material

A182 F316/L (Dual Cert) Stem Material

Chromium Oxide - Tan Coating

Bi Flow Direction

Adaptation Control

BALL-SEAT MATERIAL NAME	BALL-SEAT MATERIAL NUMBER
410 SS	q
431 SS	r
A182 F316/L (Dual Cert)	d
A182 F316H	e
A182 F304/L (Dual Cert)	f
A182 F304H	h
17-4PH	u
Inconel 600	p
Inconel 625	k
Inconel 718	v
Ferralium 255	s
Ti Gr-12	t
Special	z

STEM MATERIAL NAME	STEM MATERIAL NUMBER
A182 F316/L (Dual Cert)	d
A182 F316H	e
A182 F304/L (Dual Cert)	f
A182 F304H	h
Gr. 660	x
Inconel 718	v
17-4PH	u
Ti Gr-5	w
Special	z

COATING NAME	COATING NUMBER
Chromium Carbide (HVOF)	a
Chromium Carbide (Spray and Fused)	s
Chromium Oxide - Hast	h
Chromium Oxide - Tan	m
Stellite #6	c
Titanium Oxide	t
Tungsten Carbide	b
Tungsten Carbide Nano	n
Special	z

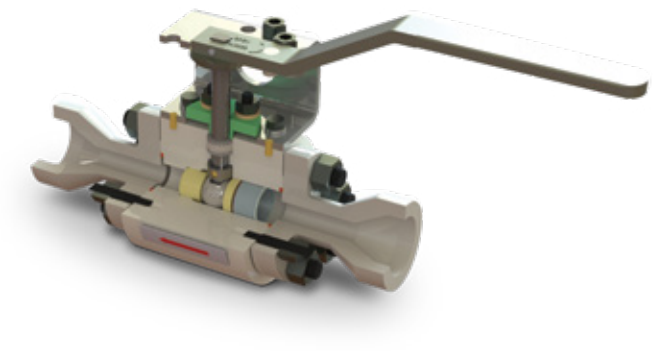
FLOW DIRECTION NAME	FLOW DIRECTION NUMBER
Uni	1
Bi	2

CONTROL NAME	CONTROL NUMBER
Bare Stem	B
Hand Lever	H
Actuator	A
Gear	G
Adaption	D
Custom	Z

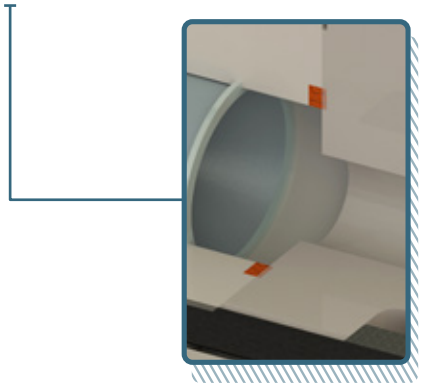
Z3 POWER VALVE SYSTEM

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.



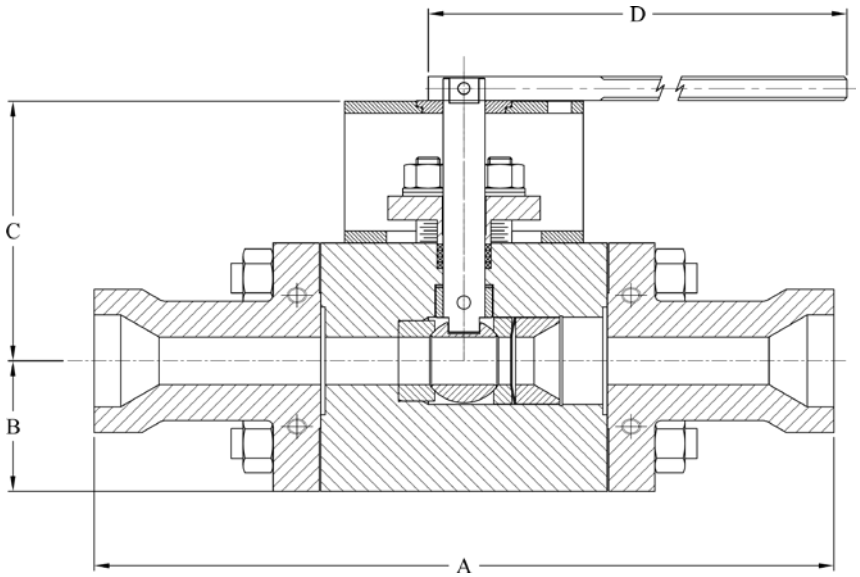
- Inline Replaceable Valve
- Eliminates Costs of Cutting-Out Existing and Welding-In (ie, post-weld heat treating) Replacement Valves
- Replacement Valves Fully Functional and Tested per ANSI FCI 70.2 Class VI as Standalone Valves
- 0.65" to 2.50" Bore Sizes
- 0.75" to 2.50" NPS SWE; 0.75" to 4.00" NPS 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

	DIMENSION			
SIZE	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.

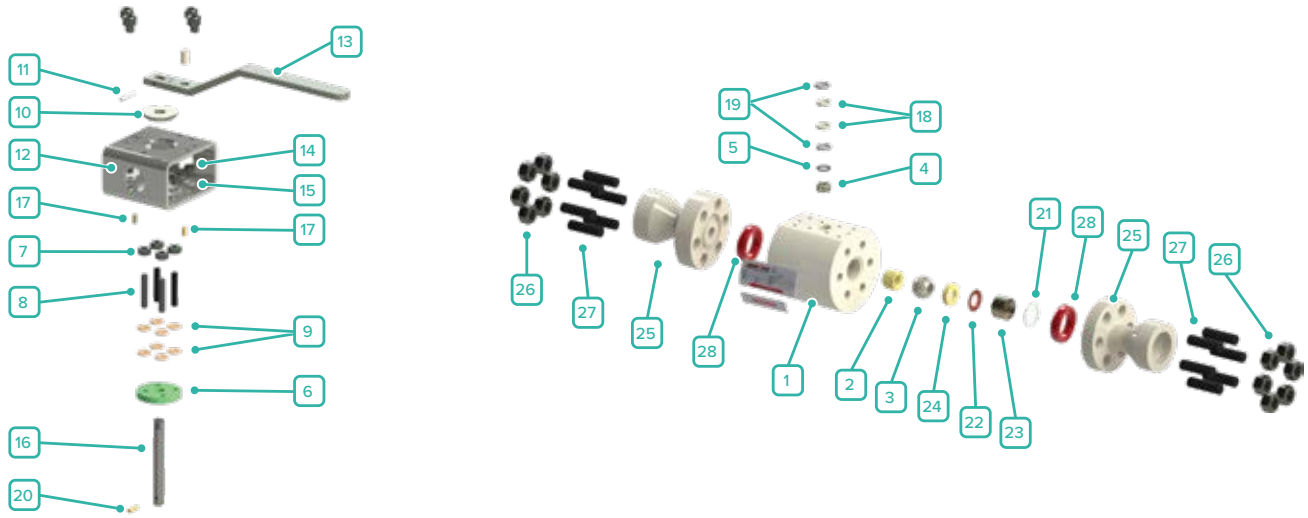


FIGURE NUMBERS

END SIZE NAME	END SIZE NUMBER
0.50	0050
0.75	0075
1.00	0100
1.50	0150
2.00	0200
2.50	0250
3.00	0300
4.00	0400
Special	SPEC

BORE SIZE NAME	BORE SIZE NUMBER
0.65	0065
1.00	0100
1.40	0140
1.75	0175
2.00	0200
2.50	0250
3.00	0300
Special	SPEC

ANSI CLASS NAME	ANSI CLASS NUMBER
150#	0150
300#	0300
600#	0600
900#	0900
1500#	1500
2500#	2500
3200#	3200
3500#	3500
4500#	4500
Special	SPEC

END TYPE NAME	END TYPE NUMBER
Socket Weld	S
Butt Weld	B
RF Flange	R
RTJ	J
Hub	H
Male NPT	M
Female NPT	F
Special	Z

2.00" End Size

1.40" Bore Size

3200# ANSI Class

Socket Weld End Type

Example : Z3-0200×0140-3200-SAvvaA

A105/LF2 Body Material

Inconel 718 Ball-Seat Material

Inconel 718 Stem Material

Chromium Carbide (HVOF) Coating

Actuator

BODY MATERIAL NAME	BODY MATERIAL NUMBER
A105/LF2	A
A182 F22	B
A182 F91	C
A182 F316/L (Dual Cert)	D
A182 F92	L
F9	J
Special	Z

BALL-SEAT MATERIAL NAME	BALL-SEAT MATERIAL NUMBER
410 SS	q
431 SS	r
A182 F316/L (Dual Cert)	d
Inconel 718	v
Special	z

STEM MATERIAL NAME	STEM MATERIAL NUMBER
Gr. 660	x
Inconel 718	v
Special	z

COATING NAME	COATING NUMBER
Chromium Carbide (HVOF)	a
Chromium Carbide (Spray and Fused)	s
Special	z

CONTROL NAME	CONTROL NUMBER
Bare Stem	B
Hand Lever	H
Actuator	A
Gear	G
Adaption	D
Custom	Z

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

	BORE SIZE (IN.)													
	0.65		1.00		1.40		1.75		2.00		2.50		3.00	
NPS	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.

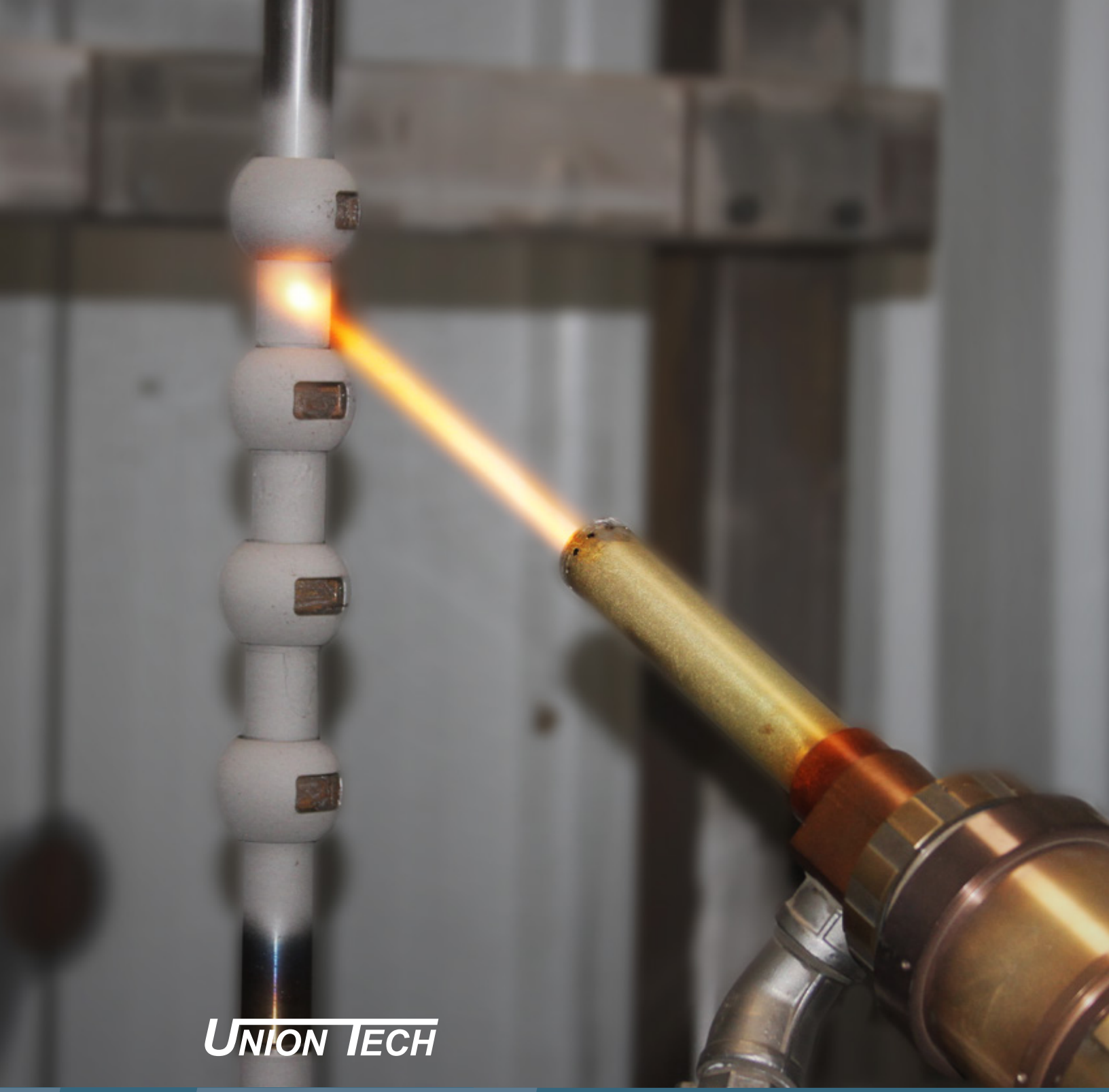
FLOW COEFFICIENTS (C_V)* – Z2 TWO-PIECE ISOLATION VALVE

		ANSI CLASS (#)					
NPS	BORE SIZE	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.

QUALITY. SPEED. SCALE.



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