OIL STATES PIPER VALVE

Series LC Valves

Piper™

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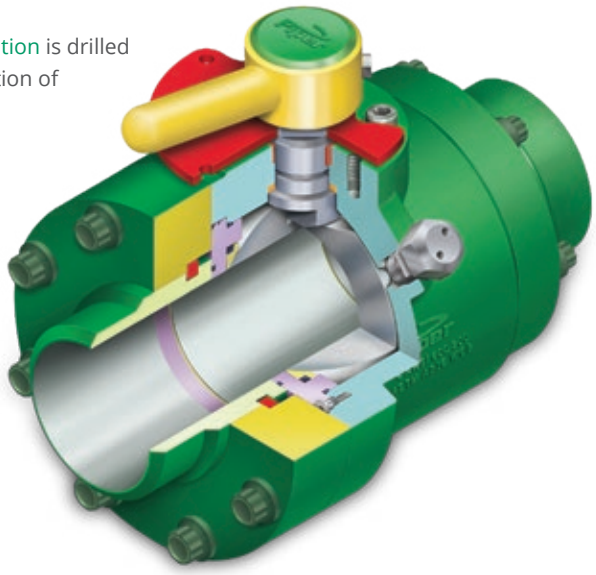
Series LC Ball Valves

SAVING YOU WEIGHT, SPACE AND TIME

High Performance in a Smaller Size

Piper Series LC compact ball valves are designed to provide superior flow characteristics in the most compact valve available, specifically for installations where size and weight are critical. The LC delivers the same superior performance as Piper's Series PB products featuring Piper's Optimum Flow Technology, minimizing system friction pressure loss. The LC compact design also allows for easier handling and installation. Available in 2", 3", 4" and 6" sizes in ANSI Class 600 and 900.

- Integral locking device ear is cast into the body of the valve, allowing the option of locking the valve in the OPEN or CLOSED position when secure line flow is required.
- Blowout-proof square drive stem is heavy duty and internally back-seated to prevent the possibility of blowout. The milled square stem allows the handle to be oriented in any quadrant.
- Top pad designed for automation is drilled and tapped for ready installation of actuators or gear operators.
- Field repairable
  Conventional RTJ flanges require 1" or more of line spread to remove the valve from service. Piper Series LC valves require virtually no line spread allowing easier removal from service for repair.
- Trim options: Stainless, Steel NACE, MR0175 (2003), Firesafe to API 6FA, High Temperature, Seats & Seals



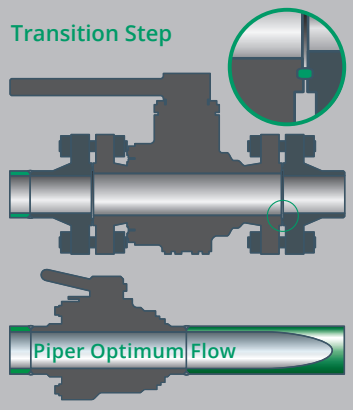
Compact Lightweight Design

Occupies up to 58% less space than conventional flanged end ball valves for skids or manifolds where weight and space are critical.

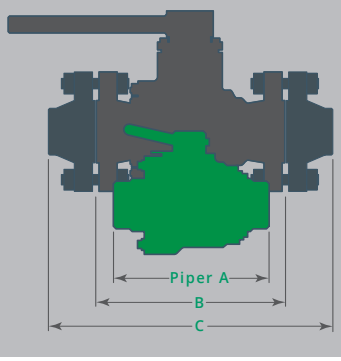
Nominal Size	Dimensions - inches (mm)					Weights - lbs. (kg)				
	Piper A	Traditional Valve				Piper LC	Traditional Valve Only		Traditional Valve & Companion Flanges	
		B		C						
		Class 600	Class 900	Class 600	Class 900		Class 600	Class 900	Class 600	Class 900
2	10.25	11.625	14.625	18.375	23.625	35	41.5	118	70.94	190.96
	(260.4)	(295.3)	(371.5)	(466.7)	(600.1)	(16)	(18.8)	(53.5)	(32.2)	(86.6)
3	13.00	14.125	15.125	21.375	23.875	69	128	157	174	235
	(330)	(358.8)	(384.2)	(542.9)	(606.4)	(31)	(58.1)	(71.2)	(78.9)	(106.6)
4	14.50	17.125	18.125	22.875	27.875	108	205	243	299	375
	(368.3)	(435)	(460.3)	(581)	(708)	(49)	(93)	(110.2)	(135.6)	(170.1)
6	22.00	22.125	24.125	32.125	35.875	319	460	555	646	835
	(558.8)	(562)	(612.8)	(816.0)	(911.2)	(145)	(208.7)	(251.7)	(293)	(378.7)

FLOW-EFFICIENT BORE SIZES

LC Bore sizes correspond to the inside diameter of Schedule 80 Grade B pipe, eliminating transition areas and minimizing system friction pressure loss. It is essential that the valve be sized by bore rather than nominal flange size to assure the most efficient, turbulent-free flow condition.



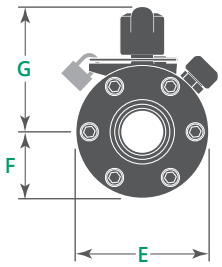
Example: 4" Schedule 80 pipe has an inside diameter of 3.826". A traditional 4" full port valve introduces a transition step in the flow path that can cause inefficient flow and premature failure due to erosion. Piper's Series LC valve is designed around the 3.826" inside diameter, providing a more efficient flow path saving size, weight and horse-power necessary to push fluid.

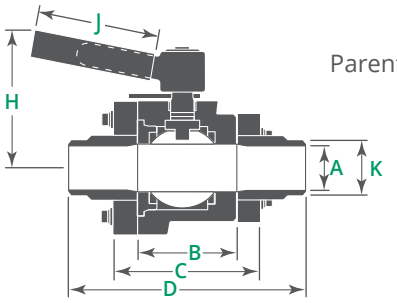


Series LC Ball Valve Dimensional Data & Component Parts

Dimensional Data

Padlock Not Included



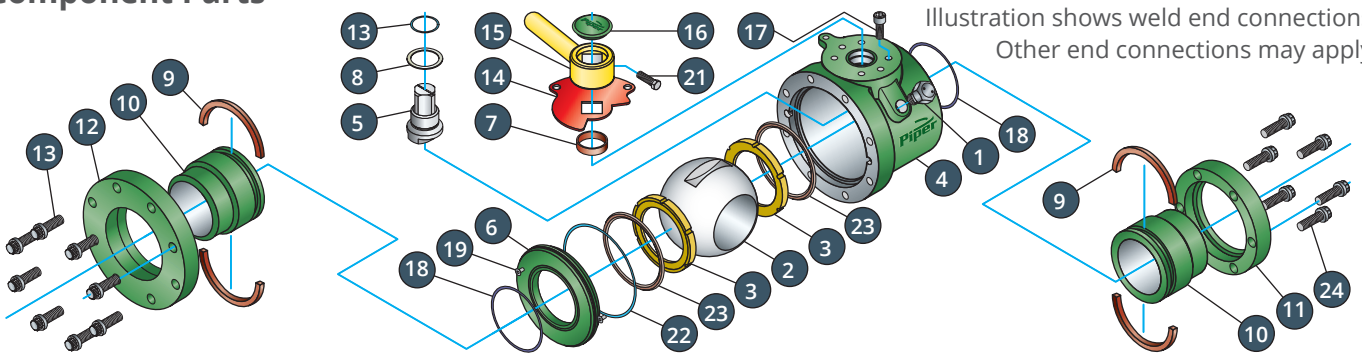


Dimensions are in inches.
Parenthesis indicate millimeters.

Nominal Size	Assembly Base Number	A Ball Port Diameter	B Body Grp Length	C Body & Flange Length	D Overall Length, WE	E Body Width	F Height Below CL	G Height Above CL	H Height of Std. Extens.	J Length of Std. Extens.	K Max Nipple O.D.	Weight lbs. (kg)
2	B02B	1.900	4.250	6.300	10.250	5.750	2.875	5.392	7.54	12	2.775	35
		(48.26)	(107.95)	(160.02)	(260.35)	(146.05)	(73.03)	(136.96)	(190.5)	(305)	(70)	(16)
3	B03B	2.900	5½	8 11/32	13	7	3½	6⅛	10½	24	3.500	69
		(73.66)	(140)	(212)	(330)	(178)	(89)	(156)	(267)	(610)	(89)	(31)
4	B04B	3.826	7½	9 1/32	14½	9	4½	7	13	32	4.500	108
		(97.18)	(191)	(229)	(368)	(229)	(114)	(178)	(330)	(813)	(114)	(49)
6	B06B	5.760	10	14 5/16	22	12⅝	6 1/16	10 1/16	15	48	6.5	319
		(146.30)	(140)	(205)	(559)	(321)	(154)	(256)	(381)	(1219)	(165)	(145)

Component Parts

Illustration shows weld end connections.
Other end connections may apply.



Index	Quantity	Description	Standard Materials
1	1	Grease Fitting	ENP Carbon Steel
2	1	Ball	ENP Carbon Steel
3	2	Seat	Celcon®
4	1	Body	ASTM A216 WCB Carbon Steel
5	1	Stem	1040 Carbon Steel (Chrome Plated)
6	1	Retainer	1040 Carbon Steel (Xylan® Coated)
7	1	Stem Bearing	Stainless Steel/Teflon®
8	1	Thrust Washer	Delrin®
9	2	Half Ring (set)	Carbon Steel (Xylan® Coated)
10	2	Weld Nipple	ASTM A106 Gr. B or Equivalent
11	1	Non Retainer Swivel Flange	1040 Carbon Steel
12	1	Retainer Swivel Flange	1040 Carbon Steel
13	1	Stem Seal	Peroxide Cured Nitrile
14	1	Lock Plate	Carbon Steel (Xylan® Coated)
15	1	Handle	Carbon Steel
16	1	Cap, Handle	Plastic
17	1	Stop Screw	18-8 Stainless Steel
18	2	Flange Face Seal	Peroxide Cured Nitrile
19	2	Retainer Screw	18-8 Stainless Steel
20	1	Stem Seal	Peroxide Cured Nitrile
21	1	Hex Bolt	Grade 8 Zinc Plated
22	1	Retainer Seal	Peroxide Cured Nitrile
23	2	L-Seal	Peroxide Cured Nitrile
24	varies	12-Point Ferry Cap Screw	ASTM A193 Gr. B7 (Xylan® Coated)

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Series LC Valves

Series LC Ball Valve Construction

Specifying Series LC Model Numbers

Body/Retainer Material

1 • CS/CS
2 • 316 SS/316 SS
3 • Duplex SS/Duplex SS
4 • 316 SS/Duplex SS
5 • LTCS/LTCS
6 • LTCS/316 SS

Stem/Ball Material

1 • CS/CS w/1-mil ENP
2 • 316 SS/316 SS Chrome Plate
3 • Duplex SS/Duplex SS

Seat Material

1 • Celcon®
2 • PEEK™

Seal Material

1 • Peroxide Cured Nitrile
2 • Viton®
3 • Low Temp Nitrile

Actuation

0 • Bare Stem
1 • Handle
2 • Gear Operator

End Configuration

W • Weld Ends
F • Female Threaded
M • Male Threaded
9 • Body Group Only

Pipe Schedule or Thread Type

A • Schedule 40 or NPT Threaded
B • Schedule 60 or 8 Round
C • Schedule 80
D • Schedule 100
E • Schedule 120
F • Schedule 140
G • Schedule 160
H • Schedule XXH
9 • Body Group Only

Nipple Material

1 • A106 Equivalent
2 • Duplex SS
3 • 316L
4 • A350 LF2

Assembly Base Number

2″ • B02B
3″ • B03B
4″ • B04B
6″ • B06B

B0XB - X X X X X - X X X

PIPER OPTIMUM-FLOW TECHNOLOGY

Quality Commitment

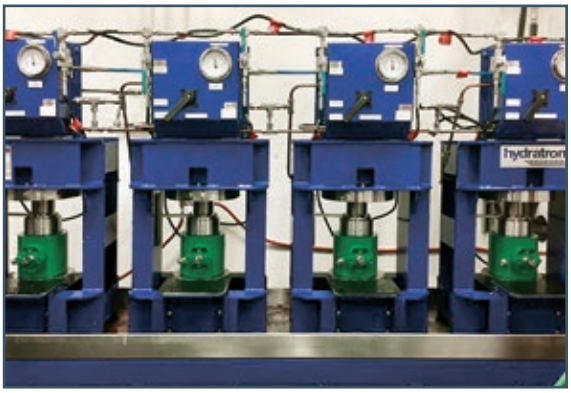
Product Verification & Testing

Oil States Piper Valve continually strives to improve its products and increase their performance. A direct result of this commitment is product verification that is obtained through stringent testing guidelines of API 6A, API 6D, API 598, API 17D, and others. Piper valves are also subjected to the following performance testing.

- API 6FA/6FD
  Specification for Fire Test for Ball Valves and Check Valves.
- API 6A Appendix F PR2
  Performance Verification Testing combining both the effects of pressure and temperature.
- Erosive Flow Testing
  Consisting of 1,000 Open/Close cycles against a 0.1%, by volume, sand-laden slurry flowing at a velocity of 3 m/s.
- Hyperbaric Testing (Subsea Applications)
  100% of Piper's subsea valves are subjected to external pressure equal to 10,000 feet of submerged service and held to prove the valves external pressure integrity.
- API 6A PSL 3 & 3G, PSL 4
  Additional material testing, extended hydrostatic and gas testing.

Piper Certification

- OSI Piper Valve has maintained ISO 9001 certification since August 2002.
- OSI Piper Valve has also maintained API Q1 certification with API 6A and 6D monogramming licenses since March 2012.



PIPER OPTIMUM-FLOW TECHNOLOGY

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