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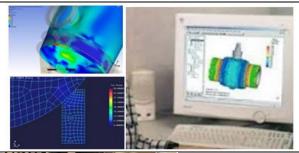




TOUGH BALL VALVES FOR TOUGHEST FLOW

Manufacturer of Quality Valve Products Around the World

At MasterValve®, we are committed to improving our clients' operational and financial performance by supplying the most comprehensive range of valve products in the industry through our family of trusted valve brands.



Engineering Expertise

MasterValve® utilizes the latest state of the art engineering software to provide custom design services for any application. Finite element analysis is just one of many Design Verification Tools MasterValve uses for designing valves to specific customer requirements.



CAD and **NC** capabilities

With MasterValve® fast and efficient workflow, CAD drawings can be released to the network for manufacturing and purchasing. All computer generated machine programs can be quickly changed for weld overlays or other processes. The result is faster deliveries.



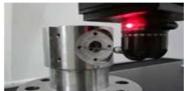
Manufacturing capabilities

MasterValve® has its own forging facility and heat treatment workshop. And we can strictly control forging process, welding process, heat treatment process, testing, painting, and quality control.



Accurate Inventories

Daily cycle counting and other picking using wireless barcode guns and automated part delivery systems results in more accurate inventories and faster product delivery







Quality Control

All MasterValve® manufacture quality products designed and tested to meet the standards of Qualifying Authorities around the world. Advanced engineering and Quality Management System assure that our valve products continue to exceed your expectations for performance.



Customer Service

MasterValve® Customer Service Department is fully staffed with trained customer service representatives ready to help you with your ordering information, technical specifications and logistics.

MasterValve® Repair Kits

Spare parts are available for quick delivery. Orders with valve serial numbers will ensure the correct parts are shipped. Contact your MasterValve salesperson for more information.

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Due to upgrades in industry standards, material innovations, and MasterValve® constant commitment to product advancement, data presented in this brochure is subject to change. Please contact your MasterValve Sales person for updated and/or current drawings and material compliance. This information is available on our website at www.mastervalveusa.com

Applications of O1 & O2 Series Forged Ball Valves

MasterValve® manufactures some of most dependable forged steel ball valves in the industry. MasterValve® offers O Series forged ball valves and is a complete solution for your flow control applications. MasterValve® manufactures a complete range of *API 6D* floating and trunnion mounted ball valves in a size range of 2" to 56" in pressure ratings of up to class 2500. MasterValve manufactures a complete range of *API 6A* trunnion mounted ball valves in a size range of 2" to 30" in pressure ratings of up to API 10000.

O1 & O2 Series valves are designed, manufactured, and tested in accordance with respective API, ASME, And ANSI standards, for instance, API 6D, API 6A, API Q1, API-607, ASME B16.34, ASME B16.5, ASME B16.47, ASME B16.10, ASEM B16.25, MR-01-75, TA-Luft/ISO 15848 et al. In the standard versions, O1 & O2 series ball valves are specified for transmission pipelines, pumping, compression, rejection units, offshore platforms, and chemical processing.



O1 Series Valve

3-Piece side entry forged trunnion mounted ball valve

O2 Series Valve

2-Piece side entry forged trunnion mounted ball valve

O1 Series and O2 Series Design Standards and Design Features

Design Standards

American Petroleum Institute

- API 6D --- Specifications for pipeline valves;
- API 607 --- Fire test for soft-seated ball valves;
- API 6FA --- Fire test for valves;
- API Q1 --- Specifications for quality programs;
- API 6A --- Specifications for Wellhead and Christmas tree equipments;

Manufacturers Standardization Society

- MSS SP-25 --- Standard marking system for valves;
- MSS SP-55 --- Quality Standard for Steel Casting;

American National Standard

- ASME/ANSI B16.10 --- Face-to-face and end-to-end dimensions on ferrous valves;
- ASME/ANSI B16.5 --- Steel pipe flanges and flanged fittings;
- ASME/ANSI B16.47 --- Large Diameter Steel Flanges;
- ASME/ANSI B16.25 --- Buttwelding ends;
- ASME/ANSI B16.34 --- Steel valves-flanged and buttweld end;
- ASME/ANSI B31.1 --- Chemical plant and petroleum refinery piping;

National Association of Corrosion Engineers

• NACE MR-01-75 --- Sulfide stress cracking resistant metallic materials for oilfield equipment;

Standard Features

- Double block and bleed;
- Spring loaded floating seat design;
- Cavity pressure self-relieving;
- Multiple seal for protection against external leakage;
- Stem seperated from the ball and anti-blowout design;
- Triple seal for protection against stem leakage / Meet TA LUFT & ISO 15848;
- Stainless steel trim parts for 4" and smaller / ENP plating for trim parts for 6" and up;
- Antistatic device;
- Emergency stem and seats sealant injection fitting;
- Fire safe to API 607 & API 6FA;
- NACE compliance and fully comply with MR-0175;

Features upon Request

- Metal-seated valve;
- Double piston effect design (DIB-1 type and DIB-2 type);
- Live-loaded stem packing feature;
- Lip seal design;
- Cryogenic service design;
- Extended stem design for buried service;
- Welding overlay technology;

O1 Series and O2 Series Design Standards and Design Features (cont')

Manufacturing range of API 6D O series is shown in the table below. Other sizes and special classes are also available against specific request.

Siz	ze			ASME CLASS			
NPS	DN	150	300	600	900	1500	2500
2	50	01; 02	O1; O2	01; 02	01; 02	01	01
3	80	O1; O2	O1; O2	O1; O2	O1; O2	01	01
4	100	O1; O2	O1; O2	O1; O2	O1; O2	01	01
6	150	O1; O2	O1; O2	O1; O2	01	01	01
8	200	O1; O2	O1; O2	O1; O2	01	01	01
10	250	O1; O2	O1; O2	O1; O2	01	01	01
12	300	O1; O2	O1; O2	O1; O2	01	01	01
14	350	01	01	01	01	01	*
16	400	01	01	01	01	01	*
18	450	01	01	01	01	01	*
20	500	01	01	01	01	01	*
24	600	01	01	01	01	01	*
26	650	01	01	01	01	01	
28	700	01	01	01	01	01	
30	750	01	01	01	01	01	
32	800	01	01	01	01	01	
34	850	01	01	01	01	01	
36	900	01	01	01	01	01	
40	1000	01	01	01	01		
42	1050	01	01	01	01		
46	1150	01	01	01	01		
48	1200	01	01	01	01		
56	1400	01	01	01			

^{* ---} Available upon special request;

Figure 1 and Figure 2 below show standard design features of O1 series and O2 series.

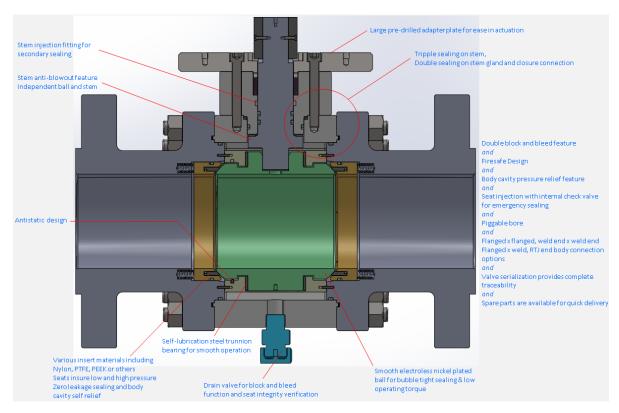


Figure 1 O1 series valve standard design features

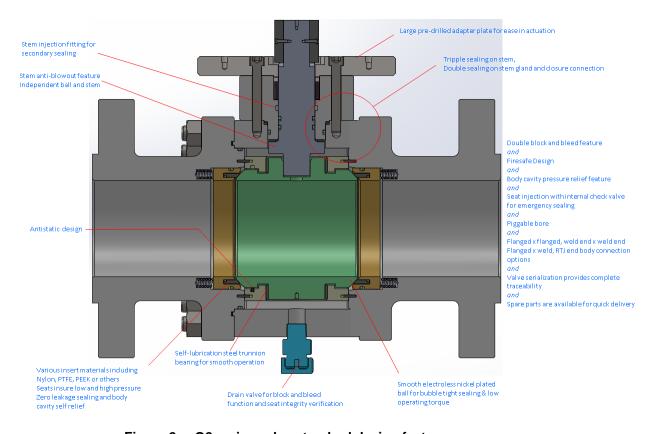


Figure 2 O2 series valve standard design features

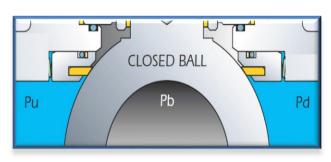
O1 Series and O2 Series Design Standards and Design Features (cont')

Manufacturing range of API 6A • series is shown in the table below. Other sizes and special classes are also available against specific request.

Pressure							Size						
Rating	2 1/16	2 9/16	3 1/8	4 1/16	5 1/8	7 1/16	9	11	13 5/8	16 3/4	21 1/4	26 3/4	30
API	O1 ;	01;	01;	01;	01;	01;	01;	01	01	01	01	01	01
2000	02	02	02	02	02	02	02	01	01	01	01	01	01
Pressure							Size						
Rating	2 1/16	2 9/16	3 1/8	4 1/16	5 1/8	7 1/16	9	11	13 5/8	16 3/4	20 3/4	26 3/4	30
API	01	01	01	01	01	01	01	01	01	01	01	01	01
3000	01	01	01	01	01	01	01	01	01	01	01	01	01
Pressure							Size						
Rating	2 1/16	2 9/16	3 1/8	4 1/16	5 1/8	7 1/16	9	11	13 5/8	16 3/4	18 3/4	21 1/4	
API	01	01	01	01	01	01	01	01	01	01	01	01	
5000	01	O1	01	O1	01	01	01	01	01	01	01	01	
Pressure					Size								
Rating	1 13/16	2 1/16	2 9/16	3 1/16	4 1/16	5 1/8	7 1/16	9	11				
API 10000	01	01	01	01	01	01	01	01	01				

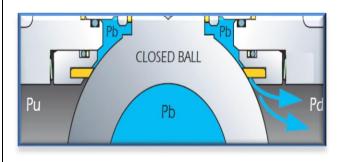
O1 Series and O2 Series Design Standards and Design Features (cont')

Double block and bleed valves



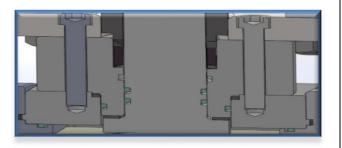
All O1 series and O2 series are designed and manufactured to facilitate double block and bleed applications. In addition, all O1 series and O2 series can be completely flushed with valve under pressure and in the closed position. This is achieved by utilizing the drain valve and vent hole in combination. The illustration shows both the upstream pressure (Pu) and downstream pressure (Pd) being held independently from the body pressure (Pb). Both seats can hold bubble tight sealing simultaneously on both sides of the ball.

Cavity pressure self-relieving design



When a trunnion ball valve in the closed position, media will be trapped in the body cavity. Unless this media is drained, it will be subjected to thermal expansion and contraction. All O1 series and O2 series are designed to self-relieve, allowing the media in the body to escape to the pipeline.

 Multiple seals for against external leakage/stem blow-out proof design

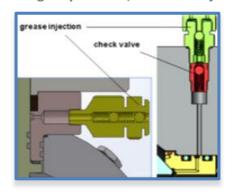


Multiple seal combination of O-ring and spiral wound gasket ensures perfect joint sealing and fire safe.

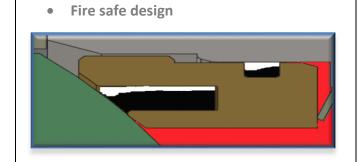
All O1 series and O2 series are designed and manufactured to facilitate **double sealing** on body/closure connection and body/gland, **triple seal** on stem/gland connection.

The blow-out proof stem enables positive stem retention.

• Emergency sealant/lubricant injection



Sealant lubricant fittings are standard on O1 series and O2 series valves. In the event of seat insert or stem seal damage, leakage can occur. Emergency sealant/lubricant injection can save the integrity of the valve by incorporating a seal around the stem or between the seat and the ball until properly serviced. These fittings also act as a lubricant port for regular maintenance.

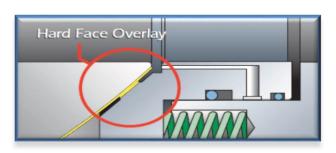


Spring loaded floating seats maintain contact with the ball and provide tight shut off even at low pressure differential and provide body cavity self relief.

In the event of fire, soft insert gets burnt and spring loaded seats ensure metal to metal sealing

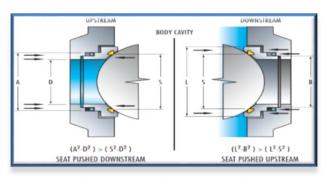
O1 Series and O2 Series Design Features on Request

Metal-to-Metal seat



MasterValve® has extensive experience in the supply of valves for severe application such as high temperature and in corrosive and/or erosive environments. MasterValve achieves the metal-to-metal seating technology through the use of various hard face material on ball and seat face.

Double piston effect design



MasterValve® often times provides a two-way seat design (DIB). This design allows for downstream seat sealing in the case of an upstream seat failing to seal. This design also provides for the function of testing a valve in-line and in full open position with the drain or bleed valve open to the air.

Extended stem design for buried service



MasterValve® often times provides valves installed underground or in remote location. Those valves can be operated with an optional extended stem.

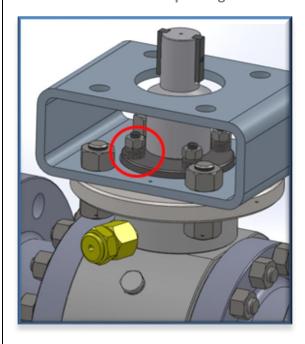
All the drain, vent, and emergency sealant connections can be operated using extended connection pipes firmly attached to the stem protective cover.

Lip seal design/ Cryogenic service design



For service temperatures below -50°F, MasterValve® standard design includes lip seals and/or stem extensions using selected materials for your application. The 12" gas column shown at left is a standard feature to isolate the gear operator and stem seals from the cold media.

Live-loaded stem packing feature



For frequently cycled valves, high temperature and thermal cycling valves, critical application valves, safety or difficult located valves, and history of packing leak valve, MasterValve® standard valves provide a feature with live loading on the gland follower. Belleville springs are used to maintain load on the gland follower. They are typically arranged in a stack on the stud to increase the elasticity of the system.

Welding overlay technology

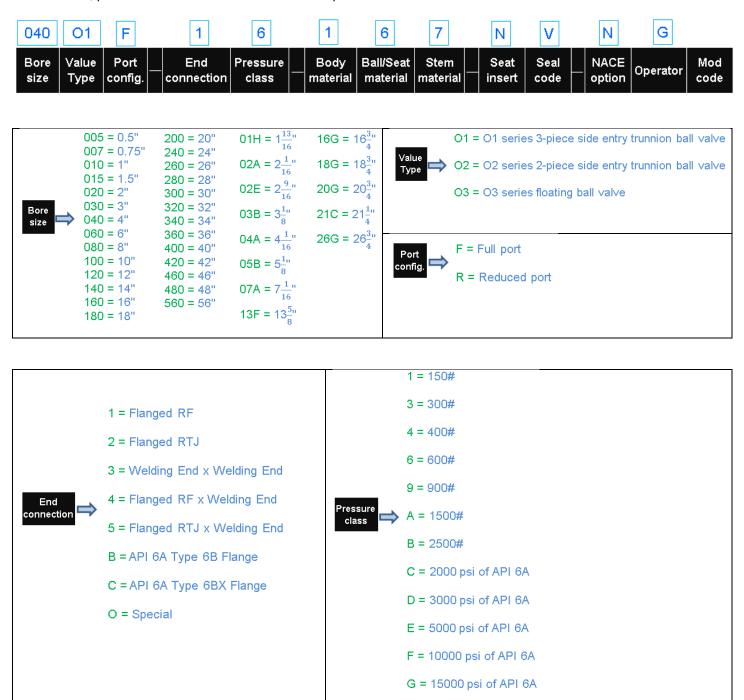


This technology is cost effective for ball valves in highly corrosive or erosive services. The life of a valve can be considerately extended at a fraction of the cost of a solid corrosion resistant alloy valve by the application of a weld overlay to valve internal surfaces. Sealing areas and other critical parts of the valve can be weld overlayed. More frequently used materials are AISI 316L and Alloy 625.

Welding is performed in accordance with ASME BPV Section 9.

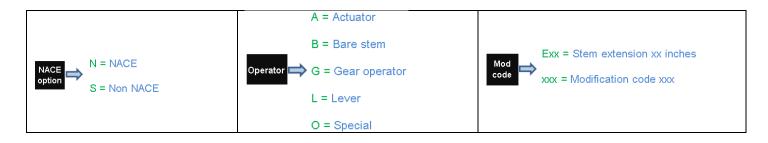
How To Order

Example: 040O1F-16-167-NV-NB. This feature number represents a 4" O1 Series (3-Piece, Side Entry, Trunnion Mounted) Ball Valve, Full Port, Raised Face, ANSI Class 600, A105/A350 LF2 Body, 316SS ball and seat, 174 stem, Nylon seats, Viton A seals, per NACE MR0175 Service and Gear Operator.



O = Special





Example: 06001R-29-167-PV-NG. This feature number represents a 6" O1 Series (3-Piece, Side Entry, Trunnion Mounted) Ball Valve, Reduced Port, Flanged RTJ, ANSI Class 900, A105/A350 LF2 Body, 316SS ball and seat, 17-4PH stem, Peek seats, Viton® A seals, Fire Tested with Emergency Grease Seals, for NACE MR0175 Service and gear operator.

Example: 06002F-16-667-PT-NB. This feature number represents a 6" O2 Series (2-Piece, Side Entry, Trunnion Mounted) Ball Valve, Full Port, Raised Face, ANSI Class 600, 316SS Body, 316SS ball and seat, 17-4P stem, Peek seats, Lip seals, Fire Tested with Emergency Grease Seals, for NACE MR0175 Service and bear stem.

Example: 04003R-13-166-GW-NL. This number represents a 4" O3 Series floating Ball Valve, Reduced Port, Raised Face, ANSI Class 300, A105/A350 LF2 Body, 316SS ball and seat, 316SS stem, Glass filled PTFE seats, Viton® B seals, Fire Tested with Emergency Grease Seals, for NACE MR0175 Service and lever operator.

Example: 20001F-46-UUI-ZT-NA. This feature number represents a 20" O1 Series (3-Piece, Side Entry, Trunnion Mounted) Ball Valve, Full Port, Flange RF x Welding end, ANSI Class 600, Duplex SS Body, Metal-seated Duplex SS ball and seat with tungsten carbide coating, Inconel stem, Lip seals, Fire Tested with Emergency Grease Seals, for NACE MR0175 Service and actuator operated.

Example: 07AO1F-BC-167-NV-SA. This feature number represents a $7\frac{1}{16}$ O1 Series (3-Piece, Side Entry, Trunnion Mounted) Ball Valve, Full Port, API 6A Type 6B Flange, 2000 psi, A105/A350 LF2 Body, 316SS ball and seat, 17-4PH stem, Nylon seats, Viton® A seals, Fire Tested with Emergency Grease Seals, for Non NACE and actuator operator.

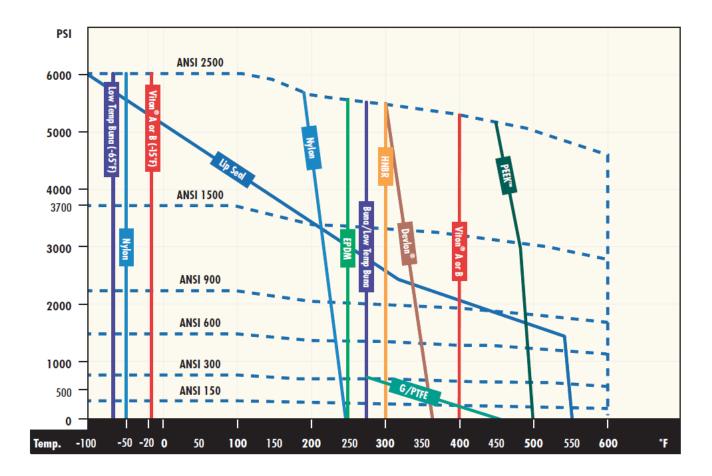
O1 series and O2 series ball valves offer a full range of carbon, alloy and stainless materials. Our commodity valves are A105/A350 LF2 steel, B7H/2HM fasteners, Viton® seals, and are then painted with a durable coating. Material test reports in accordance with EN10204.3 are available on each serialized valve. In addition, all O1 series and O2 series trunnion ball valves, with standard trim, have been proven reliable, and fully comply with NACE MR0175, customers must provide application specific operating conditions. Inclusive to above, valves with bore diameters 4" and smaller are supplied standard with stainless steel ball, seats and stems. Materials type selected may vary depending on design requirements.

Part	Material Options
Body & Closure	A105/A350 LF2 / F316 / Duplex SS / Inconel
Ball & Seat	A105/A350 LF2 with ENPC / A351 CF8M / F316 / 17-4PH /
	Duplex SS / Inconel / Monel
Stem	ASTM A29 Grade 4130 with ENP / F316 / A564 Type 630 /
	A479 SS 410 / Duplex SS / Inconel
Seat insert	Nylon / Devlon / Glass filled PTFE / Peek
Gland	ASTM A29 Grade 4130 with ENP / F316 / A564 Type 630 /
	Duplex SS / Inconel
Trunnion Bearing	Carbon steel or Stainless steel + PTFE coated
Seal	Vtion® / Nitril / Buna / HNBR / EPDM / Viton GLT / Kalras /
	Lip Seal
Studs / Cap Screws	A193 B7M / A320 L7M / A193 B8M
Nut	A 194 2HM / A194 7M / A194 8M

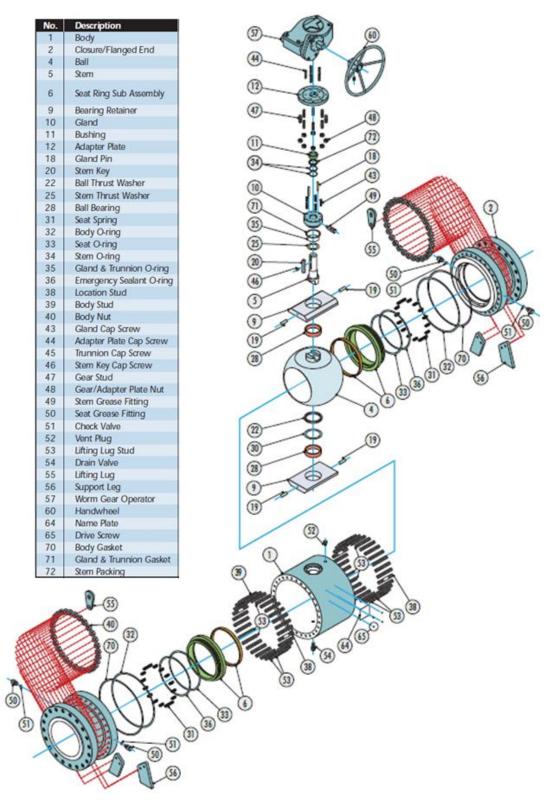
Note: Materials not listed above can be offered on request

O1 Series and O2 Series Pressure Temperature Ratings

The chart below depicts pressure and temperature ratings for plastics and elastomers used in O1 and O2 series ball valves. Other materials are available upon request.



O1 Series standard design general assembly

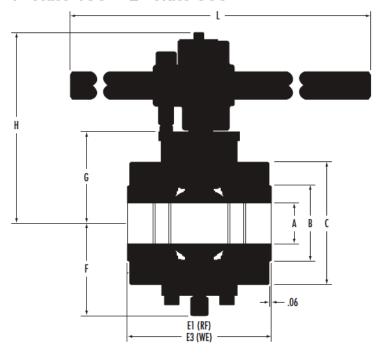


Note: Assemblies are illustrations only. Parts may vary according to design

O1 & O2 Series Ball Valves' Dimensional Data

The charts and tables below depict O1 & O2 Series ball valves' dimensional data. Some dimensional data changes are introduced in 2013. Please contact Master Valve® Salesperson for Top Works data.

2"-4" Class 150 • 2" Class 300



Class 150 2"FP-4"FP (in.)

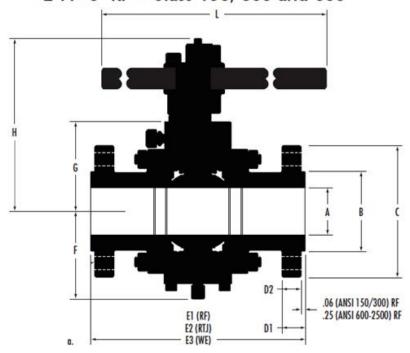
Size	Α	В	С	D1	E1-RF	E3-WE	F	G	Н	L
2 x 2	2.00 x 2.00	3.62	6.00	NA	7.00	8.50	4.89	4.87	9.55	30
3x3	3.00 x 3.00	5.00	7.87	NA	8.00	11.12	5.87	5.94	10.92	30
4 x 4	4.00 x 4.00	6.19	9.49	NA	9.00	12.00	7.30	7.35	12.93	48

Class 300 2"FP (in.)

Size	Α	В	C	D1	E1-RF	E3-WE	F	G	Н	L
2 x 2	2.00 x 2.00	3.62	6.50	NA	8.50	8.50	4.89	4.87	9.55	30

^{*} available per request.

2"FP-6" RP • Class 150, 300 and 600



Class 150 6"RP (in.)

Size	Α	В	C	D1	E1-RF	E2-RTJ	E3-WE	F	G	Н	L
6x4	6.00 x 4.00	8.50	11.00	1.00	15.50	16.00	18.00	7.30	7.35	12.93	48

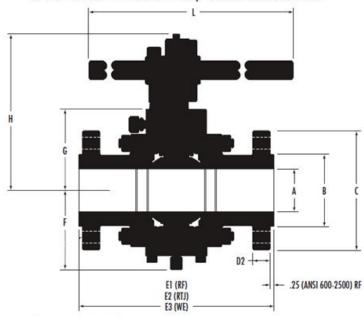
Class 300 3"RP-6"RP (in.)

Size	Α	В	C	D1	E1-RF	E2-RTJ	E3-WE	F	G	Н	L
3x2	3.00 x 2.00	5.00	8.25	1.12	11.12	11.75	11.12	4.89	4.87	9.55	30
3x3	3.00 x 3.00	5.00	8.25	1.12	11.12	11.75	11.12	5.87	5.94	10.92	30
4x3	4.00 x 3.00	6.19	10.00	1.25	12.00	12.62	12.00	5.87	5.94	10.92	30
4 x 4	4.00 x 4.00	6.19	10.00	1.25	12.00	12.62	12.00	7.30	7.35	12.93	48
6x4	6.00 x 4.00	8.50	12.50	1.44	15.88	16.50	18.00	7.30	7.35	12.93	48

Class 600 2"FP-6"RP (in.)

Size	Α	В	C	D2	E1-RF	E2-RTJ	E3-WE	F	G	H	L
2x2	2.00 x 2.00	3.62	6.50	1.00	11.50	11.62	11.50	4.89	4.87	9.55	30
3x2	3.00 x 2.00	5.00	8.25	1.25	14.00	14.12	14.00	4.89	4.87	9.55	30
3x3	3.00 x 3.00	5.00	8.25	1.25	14.00	14.12	14.00	5.87	5.94	10.92	30
4 x 3	4.00 x 3.00	6.19	10.75	1.50	17.00	17.12	17.00	5.87	5.94	10.92	30
4 x 4	4.00 x 4.00	6.19	10.75	1.50	17.00	17.12	17.00	7.30	7.35	12.93	48
6x4	6.00 x 4.00	8.50	14.00	1.88	22.00	22.12	22.00	7.30	7.35	12.93	48

2"FP-6"RP • Class 900, 1500 and 2500



Class 900 2"FP-6"RP (in.)

Size	A	В	С	D2	E1-RF	E2-RTJ	E3-WE	F	G	Н	L
2x2	2.00 x 2.00	3.62	8.50	1.50	14.50	14.62	14.50	4.89	4.87	9.55	30
3x2	3.00 x 2.00	5.00	9.50	1.50	15.00	15.12	15.00	4.89	4.87	9.55	30
3x3	3.00 x 3.00	5.00	9.50	1.50	15.00	15.12	15.00	5.87	5.94	10.92	30
4x3	4.00 x 3.00	6.19	11.50	1.75	18.00	18.12	18.00	5.87	5.94	10.92	30
4x4	4.00 x 4.00	6.19	11.50	1.75	18.00	18.12	18.00	7.30	7.35	12.93	48
6x4	6.00 x 4.00	8.50	15.00	2.19	24.00	24.12	24.00	7.30	7.35	12.93	48

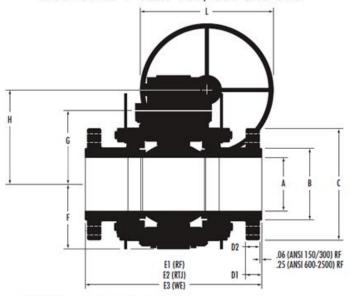
Class 1500 2"FP-6"RP (in.)

Size	A	В	С	D2	E1-RF	E2-RTJ	E3-WE	F	G	н	L
2x2	2.00 x 2.00	3.62	8.50	1.50	14.50	14.62	14.50	5.32	5.47	10.30	30
3x2	3.00 x 2.00	5.00	10.50	1.88	18.50	18.62	18.50	5.32	5.47	10.30	30
3x3	3.00 x 3.00	5.00	10.50	1.88	18.50	18.62	18.50	6.89	6.42	11.60	30
4x3	4.00 x 3.00	6.19	12.25	2.12	21.50	21.62	21.50	6.89	6.42	11.60	30
4x4	4.00 x 4.00	6.19	12.25	2.12	21.50	21.62	21.50	8.14	7.88	13.75	48
6x4	5.75x 4.00	8.50	15.50	3.25	27.75	28.00	27.75	8.14	7.88	13.75	48

Class 2500 2"FP-6"RP (in.)

Size	A	В	C	D2	E1-RF	E2-RTJ	E3-WE	F	G	Н	L
2x2	1.75 x 1.75	3.62	9.25	2.00	17.75	17.87	17.75	6.39	7.25	13.19	30
3x2	2.50 x 1.75	5.00	12.00	2.62	22.75	23.00	22.75	6.39	7.25	13.19	30
3x3	2.50 x 2.50	5.00	12.00	2.62	22.75	23.00	22.75	8.20	8.42	14.68	30
4x3	3.50 x 2.50	6.19	14.00	3.00	26.50	26.88	26.50	8.20	8.42	14.68	30
4x4	3.50 x 3.50	6.19	14.00	3.00	26.50	26.88	26.50	9.43	10.56	16.93	48
6x4	5.25 x 3.50	8.50	19.00	4.25	36.00	36.50	36.00	9.43	10.56	16.93	48

6"FP-14"RP • Class 150, 300 and 600



Class 150 6"FP-14"RP (in.)

Size	A	В	С	D1	E1-RF	E2-RTJ	E3-WE	F	G	Н	L
6x6	6.00x6.00	8.50	11.00	1.00	15.50	16.00	18.00	7.25	8.48	10.63	24
8x6	8.00x6.00	10.62	13.50	1.12	18.00	18.50	20.50	7.25	8.48	10.63	24
8x8	8.00x8.00	10.62	13.50	1.12	18.00	18.50	20.50	8.72	10.13	12.26	24
10x8	10.00x8.00	12.75	16.00	1.19	21.00	21.50	22.00	8.72	10.13	12.26	24
10 x 10	10.00x10.00	12.75	16.00	1.19	21.00	21.50	22.00	10.56	11.96	14.09	24
12 x 10	12.00 x10.00	15.00	19.00	1.25	24.00	24.50	25.00	10.56	11.96	14.09	24
12x12	12.00 x12.00	15.00	19.00	1.25	24.00	24.50	25.00	12.26	13.75	15.88	24
14x12	13.25 x 12.00	16.25	21.00	1.38	27.00	27.50	30.00	12.26	13.75	15.88	24

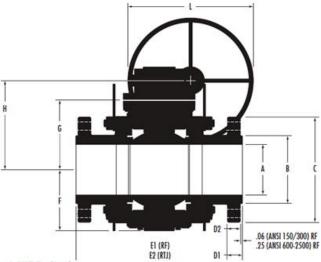
Class 300 6"FP-14"RP (in.)

Size	A	В	C	D1	E1-RF	E2-RTJ	E3-WE	F	G	н	L
6x6	6.00x6.00	8.50	12.50	1.44	15.88	16.50	18.00	7.25	8.48	10.63	24
8x6	8.00x6.00	10.62	15.00	1.62	19.75	20.38	20.50	7.25	8.48	10.63	24
8x8	8.00x8.00	10.62	15.00	1.62	19.75	20.38	20.50	8.72	10.13	12.26	24
10x8	10.00 x 8.00	12.75	17.50	1.88	22.38	23.00	22.00	8.72	10.13	12.26	24
10x10	10.00 x 10.00	12.75	17.50	1.88	22.38	23.00	22.00	10.56	11.96	14.09	24
12x10	12.00 x 10.00	15.00	20.50	2.00	25.50	26.12	25.00	10.56	11.96	14.09	24
12 x 12	12.00 x 12.00	15.00	20.50	2.00	25.50	26.12	25.00	12.26	13.75	15.88	24
14x12	13.25 x 12.00	16.25	23.00	2.12	30.00	30.62	30.00	12.26	13.75	15.88	30

Class 600 6"FP-14"RP (in.)

Size	A	В	С	D2	E1-RF	E2-RTJ	E3-WE	F	G	н	L
6x6	6.00x6.00	8.50	14.00	1.88	22.00	22.12	22.00	7.25	8.48	10.63	24
8x6	8.00x6.00	10.62	16.50	2.19	26.00	26.12	26.00	7.25	8.48	10.63	24
8x8	8.00 x 8.00	10.62	16.50	2.19	26.00	26.12	26.00	10.00	11.57	13.70	24
10x8	10.00 x 8.00	12.75	20.00	2.50	31.00	31.12	31.00	10.00	11.57	13.70	24
10x10	10.00 x 10.00	12.75	20.00	2.50	31.00	31.12	31.00	11.74	13.32	15.45	24
12x10	12.00 x 12.00	15.00	22.00	2.62	33.00	33.12	33.00	11.74	13.32	15.45	24
12x12	12.00 x 12.00	15.00	22.00	2.62	33.00	33.12	33.00	13.86	14.94	21.52	30
14 x 12	13.25 x 12.00	16.25	23.75	2.75	35.00	35.12	35.00	13.86	14.94	21.52	30

6"FP-14"RP • Class 900 and 1500



Class 900 6"FP-14"RP (in.)

Size	A	В	C	D2	E1-RF	E2-RTJ	E3-WE	F	G	H	N	M	P	L
6x6	6.00x6.00	8.50	15.00	2.19	24.00	24.12	24.00	8.62	10.01	12.14	12	1.25	12.50	24
8x6	8.00x6.00	10.62	18.50	2.50	29.00	29.12	29.00	8.62	10.01	12.14	12	1.50	15.50	24
8x8	8.00x8.00	10.62	18.50	2.50	29.00	29.12	29.00	10.00	11.57	13.70	12	1.50	15.50	24
10x8	10.00x8.00	12.75	21.50	2.75	33.00	33.12	33.00	10.00	11.57	13.70	16	1.50	18.50	24
10x10	10.00 x 10.00	12.75	21.50	2.75	33.00	33.12	33.00	11.74	13.32	19.90	16	1.50	18.50	30
12x10	12.00 x 12.00	15.00	24.00	3.12	38.00	38.12	38.00	11.74	13.32	19.90	20	1.50	21.00	30
12 x 12	12.00 x 12.00	15.00	24.00	3.12	38.00	38.12	38.00	13.86	14.94	21.52	20	1.50	21.00	30
14x12	12.75 x 12.00	16.25	25.25	3.38	40.50	40.88	40.50	13.86	14.94	21.52	20	1.62	22.00	30

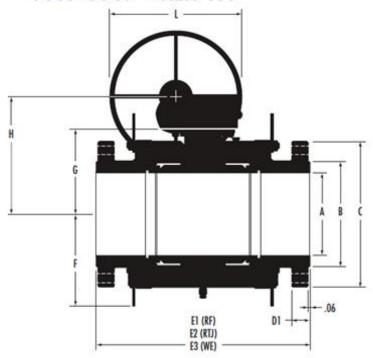
Class 1500 6"FP-14"RP (in.)

Size	A	В	C	D2	E1-RF	E2-RTJ	E3-WE	F	G	H	N	M	P	L
6x6	5.75 x 5.75	8.50	15.50	3.25	27.75	28.00	27.75	9.72	10.67	12.80	12	1.50	12.50	24
8x6	7.63x5.75	10.62	19.00	3.62	32.75	33.13	32.75	9.72	10.67	12.80	12	1.75	15.50	24
8x8	7.63x7.63	10.62	19.00	3.62	32.75	33.13	32.75	12.16	12.88	19.46	12	1.75	15.50	30
10 x8	9.50 x 7.63	12.75	23.00	4.25	39.00	39.38	39.00	12.16	12.88	19.46	12	2.00	19.00	30
10 x 10	9.50 x 9.50	12.75	23.00	4.25	39.00	39.38	39.00	14.40	15.48	22.06	12	2.00	19.00	30
12 x 10	11.38 x 9.50	15.00	26.50	4.88	44.50	45.12	44.50	14.40	15.48	22.06	16	2.12	22.50	30
12 x 12	11.38 x 11.38	15.00	26.50	4.88	44.50	45.12	44.50	16.98	17.83	24.41	16	2.12	22.50	30
14 x 12	12.50 x 11.38	16.25	29.50	5.25	49.50	50.25	49.50	16.98	17.83	24.41	16	2.38	25.00	30

Class 2500 6"FP-12"RP (in.)

Size	A	В	C	D2	E1-RF	E2-RTJ	E3-WE	F	G	н	N	M	P	L
6x6	5.25 x 5.25	8.50	19.00	4.25	36.00	36.50	36.00	12.74	12.70	19.28	8	2.12	14.50	30
8x6	7.14 x 5.25	10.62	21.75	5.00	40.25	40.87	40.25	12.74	12.70	19.28	12	2.12	17.25	30
8x8	7.14 x 7.14	10.62	21.75	5.00	40.25	40.87	40.25	15.22	16.63	18.76	12	2.12	17.25	30
10x8	8.88x7.14	12.75	26.50	6.50	50.00	50.88	50.00	15.22	16.63	18.76	12	2.62	21.25	30
10 x 10	8.88 x 8.88	12.75	26.50	6.50	50.00	50.88	50.00	19.73	18.25	24.83	12	2.62	21.25	30
12 x 10	10.50 x 8.88	15.00	30.00	7.25	56.00	56.88	56.00	19.73	18.25	24.83	12	2.88	24.38	30
12 x 12	10.50 x 10.50	15.00	30.00	7.25	56.00	56.88	56.00	22.06	20.79	27.69	12	2.88	24.38	30

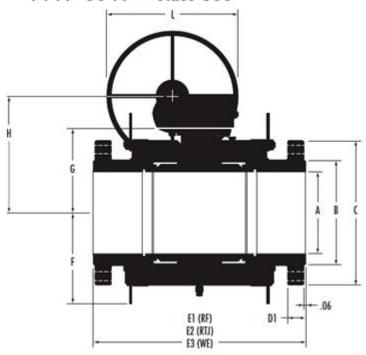
14"FP-56"FP • Class 150



Class 150 14"FP-56"FP (in.)

Size	A	В	C	D1	E1-RF	E2-RTJ	E3-WE	F	G	н	L
14x14	13.25 x 13.25	16.25	21.00	1.38	27.00	27.50	30.00	14.92	15.18**	20.89	30
16 x 14	15.25x13.25	18.50	23.50	1.44	30.00	30.50	33.00	16.60	15.18**	20.89	30
16x16	15.25 x 15.25	18.50	23.50	1.44	30.00	30.50	33.00	16.60	15.89	22.47	30
18x16	17.25 x 15.25	21.00	25.00	1.56	34.00	34.50	36.00	21.05	15.89	22.47	30
18x 18	17.25 x 17.25	21.00	25.00	1.56	34.00	34.50	36.00	21.05	19.76	26.34	30
20x18	19.25 x 17.25	23.00	27.50	1.69	36.00	36.50	39.00	19.67	19.76	26.34	30
20x20	19.25x19.25	23.00	27.50	1.69	36.00	36.50	39.00	19.67	20.20	26.78	30
24 x 20	23.25 x 19.25	27.25	32.00	1.88	42.00	42.50	45.00	22.75	20.20	26.78	30
24x24	23.25 x 23.25	27.25	32.00	1.88	42.00	42.50	45.00	22.75	23.34	30.24	30
30 x 30	29.00 x 29.00	33.75	38.75	2.88	51.00		55.00	31.25	32.08	38.98	30
36x36	34.50 x 34.50	40.25	46.00	3.50	60.00		68.00	34.39	35.83	42.73	30
40x40	38.50 x 38.50	44.25	50.75	3.50	72.83		70.08	36.54	37.13		
44×44	42.32x42.32	49.00	55.25	3.94	76.77		74.80	39.76	40.39		
48 x 48	45.98 x 45.98	53.50	59.50	4.19	85.83		82.68	41.77	43.19		
56x56	53.62 x 53.62	62.00	68.75	4.82	90.55	6.5	88.58	48.50	49.92		

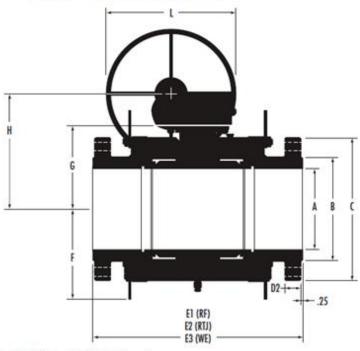
14"FP-56"FP • Class 300



Class 300 14"FP-56"FP (in.)

Size	A	В	C	D1	E1-RF	E2-RTJ	E3-WE	F	G	н	L
14x14	13.25 x 13.25	16.25	23.00	2.12	30.00	30.62	30.00	14.92	14.31	20.89	30
16x14	15.25 x 13.25	18.50	25.50	2.25	33.00	33.62	33.00	16.60	14.31	20.89	30
16x16	15.25 x 15.25	18.50	25.50	2.25	33.00	33.62	33.00	16.60	15.89	22.47	30
18x16	17.25 x 15.25	21.00	28.00	2.38	36.00	36.62	36.00	21.05	15.89	22.47	30
18x18	17.25 x 17.25	21.00	28.00	2.38	36.00	36.62	36.00	21.05	19.76	26.34	30
20x18	19.25 x 17.25	23.00	30.50	2.50	39.00	39.75	39.00	19.67	19.76	26.34	30
20x20	19.25x 19.25	23.00	30.50	2.50	39.00	39.75	39.00	19.67	20.20	26.78	30
24x20	23.25 x 19.25	27.25	36.00	2.75	45.00	45.88	45.00	22.75	20.20	26.78	30
24x24	23.25 x 23.25	27.25	36.00	2.75	45.00	45.88	45.00	22.75	23.34	30.24	30
30 x 30	29.00 x 29.00	33.75	43.00	3.62	55.00	56.00	55.00	31.25	32.08	38.98	30
36x36	34.50x34.50	40.25	50.00	4.12	68.00	69.12	68.00	34.39	35.83	42.73	30
40x40	38.50 x 38.50	42.75	48.75	4.44	72.83		70.08	36.54	37.13		
44×44	42.32 x 42.32	47.00	53.25	4.82	76.77		74.80	39.76	40.39	-1.6	
48 x 48	45.98 x 45.98	51.25	57.75	5.19	85.83		82.68	41.77	43.19		
56x56	53.62 x 53.62	59.75	67.25	6.00	90.55	*	88.58	48.50	49.92		*

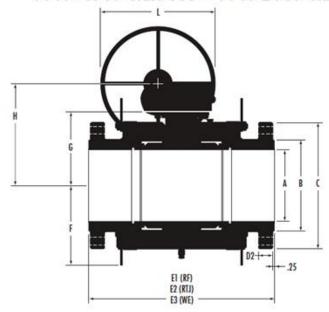
14"FP-56"FP • Class 600



Class 600 14"FP-56"FP (in.)

Size	A	В	C	D2	E1-RF	E2-RTJ	E3-WE	F	G	н	L
14x14	13.25 x 13.25	16.25	23.75	2.75	35.00	35.12	35.00	14.92	14.31	20.89	30
16x14	15.25 x 13.25	18.50	27.00	3.00	39.00	39.12	39.00	16.33	14.31	20.89	30
16x16	15.25 x 15.25	18.50	27.00	3.00	39.00	39.12	39.00	16.33	15.89	22.47	30
18x16	17.25 x 15.25	21.00	29.25	3.25	43.00	43.12	43.00	21.05	15.89	22.47	30
18x 18	17.25x17.25	21.00	29.25	3.25	43.00	43.12	43.00	21.05	19.76	26.34	30
20x18	19.25x17.25	23.00	32.00	3.50	47.00	47.25	47.00	19.67	19.76	26.34	30
20x20	19.25 x 19.25	23.00	32.00	3.50	47.00	47.25	47.00	19.67	20.09	26.99	30
24x20	23.25 x 19.25	27.25	37.00	4.00	55.00	55.38	55.00	23.13	20.09	26.99	30
24×24	23.25 x 23.25	27.25	37.00	4.00	55.00	55.38	55.00	23.13	25.35(1)	31.25	30
30 x 30	29.00 x 29.00	33.75	44.50	4.50	65.00	65.50	65.00	31.25	32.08	38.98	30
36x36	34.50 x 34.50	40.25	51.75	4.88	82.00	82.64	82.01	34.39	35.83	42.73	30
40x40	38.50 x 38.50	43.75	52.00	6.25	78.74		74.80	37.13	37.60		
44×44	42.32x42.32	48.25	57.25	6.81	86.61		80.71	40.55	41.73		
48 x 48	45.98 x 45.98	52.50	62.75	7.44	94.49		85.83	43.50	44.69		
56x56	53.62 x 53.62	60.75	73.00	8.56			93.90	49.37	50.79		

14"FP-48"FP Class 900 • 14"FP-24"FP Class 1500



Class 900 14"FP-24"FP (in.)

Size	Α	В	C	D2	E1-RF	E2-RTJ	E3-WE	F	G	Н	L
14 x 14	12.75 x 12.75	16.25	25.25	3.38	40.50	40.88	40.50	18.61	16.76	23.34	30
16 x 14	14.75 x 12.75	18.50	27.75	3.50	44.50	44.88	44.50	20.63	16.76	23.34	30
16x16	14.75 x 14.75	18.50	27.75	3.50	44.50	44.88	44.50	20.63	18.87	25.77	30
18x16	16.75 x 14.75	21.00	31.00	4.00	48.00	48.50	48.00	23.39	18.87	25.77	30
18x18	16.75 x 16.75	21.00	31.00	4.00	48.00	48.50	48.00	23.39	24.91	31.81	30
20x18	18.63 x 16.75	23.00	33.75	4.25	52.00	52.50	52.00	24.30	24.91	31.81	30
20 x 20	18.63 x 18.63	23.00	33.75	4.25	52.00	52.50	52.00	24.30	26.18	33.08	30
24 x 20	22.50 x 18.63	27.25	41.00	5.50	61.00	61.75	61.00	21.70	24.20	28.90	30
24×24	22.50 x 22.50	27.25	41.00	5.50	61.00	61.75	61.00	23.80	29.80	30.90	30
30x30	28.11 x 28.11	33.75	48.50	5.88	69.29	70.16	65.35	30.94	31.42		
36x36	33.74 x 33.74	40.25	57.50	6.75	80.71	81.89	74.80	36.38	36.14		
40x40	37.56 x 37.56	45.75	59.50	7.75	85.83		82.68	39.88	39.65		
44×44	41.26 x 41.26	50.00	64.88	8.44	93.70		88.58	41.26	45.28		
48x48	45.00 x 45.00	54.50	70.25	9.19	96.46		93.70	47.64	47.72		

Class 1500 14"FP-24"FP (in.)

Size	A	В	C	D2	E1-RF	E2-RTJ	E3-WE	F	G	н	L
14x14	12.50 x 12.50	16.25	29.50	5.25	49.50	50.25	49.50	20.60	18.83	25.73	30
16x14	14.25 x 12.50	18.50	32.50	5.75	54.50	55.38	54.50	22.27	18.83	25.73	30
16x16	14.25 x 14.25	18.50	32.50	5.75	54.50	55.38	54.50	22.27	20.50	27.40	30
18x16	16.75 x 14.25	21.00	36.00	6.38	60.50	61.38	60.50	23.39	20.50	27.40	30
18x18	16.75 x 16.75	21.00	36.00	6.38	60.50	61.38	60.50	23.39	24.91	31.81	30
20x18	18.63 x 16.75	23.00	38.75	7.00	65.50	66.38	65.50	23.39	24.96	31.81	30
20x20	18.63 x 18.63	23.00	38.75	7.00	65.50	66.38	65.50	21.70	27.50	28.90	30
24 x 20	22.50 x 18.63	27.25	46.00	8.00	80.50	81.63	80.50	21.70	27.50	28.90	30
24x24	22.50 x 22.50	27.25	46.00	8.00	80.50	81.63	80.50	23.80	33.70	30.90	30

MasterValve® General Terms and Conditions of Sale

By acceptance of the goods described herein, the Purchaser expressly acknowledges and agrees as follows:

- 1. Warranty: The warranty described below applies only to new or unused goods or goods reconditioned by MasterValve® (Seller). The Seller specifically disclaims any warranty for used goods or goods sold as is. For a period of one (1) year after date of purchase of any of the goods described herein, Seller warrants such goods shall remain free from failure due to defects in workmanship and materials incorporated therein by or for Seller provided such failure shall not have been caused or contributed to by improper usage, service or application, improper installation or maintenance, repairs, alterations, or modifications effected by or for the user, misuse, negligence or accident. In the event of failure for which Seller has assumed warranty obligations hereunder, and provided written notification of such failure shall be immediately given to Seller, it agrees to repair, or at its option, to replace the goods sold at its sold expense. Apart from the warranty and undertaking above set forth, or unless otherwise specifically consented to in writing by Seller, Seller assumes no obligation or liability for losses, expense or damages, direct or consequential, suffered or incurred as a result of any failure of, or defect in, the goods described herein, including but not limited to, such costs, expenses or damages as may result from the necessity to remove, replace, restore or transport the goods from any location or service in which they may be used, regardless of the cause of such failure or defect. This warranty extends only to the original Purchaser of the goods and is the only warranty made by Seller in connection therewith. There are no other warranties, express or implied, of any kind given with Seller any form of warranty other than that above set forth. The goods described herein are not sold or distributed by Seller for personal, family or household purposes, nor are they normally suited for use as such.
- 2. Prices: Prices and other terms of sale where set forth in current price sheets are subject to change without notice. Stenographic or clerical errors are subject to correction.
- 3. Acceptance of Orders and Special Orders: All orders are subject to acceptance by Seller at its home office, Stafford, Texas, only. No assignment of the Purchaser's rights may be made without the written consent of the Seller. Orders for special materials are subject to cancellation only upon agreement to make payment for the work performed, material used, and a reasonable profit.
- 4. Terms, Payment and Partial Shipment: All accounts are payable net 30 days of invoice date. One percent (1%) per month interest charged on accounts after 30 days, or twelve percent (12%) annually. All accounts are payable in United States dollars, free of exchange, collection, or any other charges. If in the sole discretion of Seller, the financial condition of the Purchaser at any time so requires, Seller retains the right to require full or partial payment in advance, to set spending limits for credit accounts or to require other adequate assurances of financial responsibility. Seller reserves the right to make partial shipments from time to time and render invoices therefore, which shall be due and payable as provided in said invoices.
- 5. Freight Charges: Unless otherwise specifically noted, standard shipping charges (calculated by product weight, not including packaging) shall be added or be in addition to the price quoted and Purchaser agrees to pay the same to Seller.
- **6. Taxes:** Unless otherwise specifically noted, the amount of any sales, use, occupancy, excise tax, or other tax, of any nature, federal, state, or local, for which Seller is legally liable, either initially or through failure of payment by Purchaser, shall be added or be in addition to the price quoted and Purchaser agrees to pay the same to Seller.
- 7. Unavoidable Conditions: Seller shall not be liable for failure to deliver or delays in delivery occasioned by causes beyond its control, including, without limitation, strikes, lockouts, fires, embargoes, war or other outbreaks of hostilities, acts of God, inability to obtain shipping space, machinery, breakdowns, delays of carriers or suppliers, and governmental acts or regulations.
- 8. Returns and Cancellations: No product may be returned without Seller's prior written consent. All goods returned are subject to a handling charge plus freight in both directions, restocking fees and charges for any required reconditioning, unless otherwise specified in writing by Seller. Overages, shortages and incorrect material claims must be made in writing within ten (10) days of receipt of goods. Cancellation of orders once placed with and accepted by Seller may be made only with its written consent.
- **9. No Waiver:** Seller's failure to insist upon any of the terms, covenants, or conditions listed herein or to exercise any right hereunder shall not be construed as a waiver or relinquishment of the future performances of any such term, covenant or condition, or the future exercise of such right or a waiver or relinquishment or waiver of any other term, covenant or condition or the exercise of any other rights hereunder.
- 10. Drawings, Data and Confidential Information: The weights, dimensions, capacities, prices, performance ratings and other data included in catalogues, prospectuses, circulars, advertisements, illustrated matter and price lists constitute a guide. These data shall not be binding except to the extent that they are by reference expressly included in the purchase order. Any drawings or technical documents intended for use in the manufacture of machinery, equipment, plants, parts, or other material and any ancillary services associated therewith (Material), or a part thereof, and submitted to the Purchaser prior or subsequent to the formation of the purchase order, remain the exclusive property of the Seller. They shall not, without the Seller's consent, be utilized by the Purchaser or copied, reproduced, transmitted or communicated to an unauthorized third party, provided, however, that the said plans and documents shall be the property of the Purchaser if it is expressly so agreed in writing. Any drawings or technical documents intended for use in the construction of the Material or of part thereof and submitted to the Seller by the Purchaser prior or subsequent to the formation of the purchase order remain the exclusive property of the Purchaser. They shall not, without Purchaser's consent in writing, be utilized by the Seller or copied, reproduced, transmitted or communicated to an unauthorized third party.
- 11. Governing Law: This contract shall be governed by, construed and enforced in accordance with the laws of the State of Texas.
- 12. Totality of Agreement, Special Provisions, Modifications: This instrument constitutes the entire agreement of the parties with respect to all matters and things herein mentioned. Purchaser warrants, represents and agrees that it has inspected the goods and otherwise made inquiry and review, upon its own behalf, concerning the nature, characteristics and quality of the materials and workmanship incorporated therein at or prior to delivery, that it is fully contented and satisfied therewith and has independently determined that the goods are in all respects fit and usable for all purposes for which they are intended to be employed by Purchaser. It is expressly acknowledged and agreed by and between the parties that neither party has, nor is now, relying upon any collateral, prior or contemporaneous agreement, written or oral, assurance or assurances, representation or warranty, of any kind or nature as to or respecting the condition or capabilities of the goods and the other matters and things, rights and responsibilities herein fixed and described. No modification, waiver or discharge of any term or provision of this instrument shall be implied by law, nor shall any alteration, modification or acquittance of any such term or provision be effective for any purpose unless in writing signed by or upon behalf of the party charged therewith.
- (1) Returns are accepted within 180 days of shipment. Restocking charges for returned standard materials is 15%. Cancellation of orders for standard materials prior to shipment may incur a 10% minimum cancellation charge. Cancellation of non-standard material may incur up to 100% cancellation charge depending on stage of work in progress. All material returned to MasterValve® must be accompanied by a prior written Returned Goods Authorization (RGA) form and freight must be prepaid. All material is subject to inspection and final disposition by MasterValve® quality department. A clean up and or re-certification charge may apply to any returned materials. Special items, buyouts, and modified products are non-returnable. (2) All products are subject to prior sales. (3) All sales are subject to MasterValve® standard Terms & Conditions.
- 13. Export Regulations: MasterValve® products can only be exported in accordance with U.S. Export Administration Regulations and other U.S. legal requirements. Diversion contrary to U.S. law is prohibited.

Represented By:

