

TK Trunnion Mounted Ball Valves

Service-engineered ball valves for severe environments and critical operations

TECHNOLOGY



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TK TRUNNION MOUNTED BALL VALVES

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Hammond, La., USA

Cameron is a leading provider of valves, valve automation and measurement systems to the global oil and gas industry. Our products are used primarily to control, direct and measure the flow of oil and gas as it is moved from individual wellheads through flowlines, gathering lines and transmission systems to refineries, petrochemical plants and industrial centers for processing.

Cameron provides a wide range of valves for use in natural gas, LNG, crude oil and refined products transmission lines. The traditional CAMERON® fully welded ball valve product line has been combined with the GROVE®, RING-O®, TOM WHEATLEY®, ENTECH™, TEXSTEAM™ and TK® product lines. This broad offering has strengthened Cameron's ability to serve as a single source provider for a wide scope of customer requirements. Cameron also provides critical service valves for refinery, chemical and petrochemical processing businesses, and for associated storage terminal applications, particularly through its ORBIT® and GENERAL VALVE® product portfolios. These brands are complimented by WKM® and TBV™ valve products and considerably expand the scope of Cameron's product offerings.

The TK brand is the recognized leader in metal-to-metal seating and weld overlay technology for severe service conditions. Customers have available a variety of stainless steel and high-nickel alloys which can be applied to the valve's critical areas, improving valve performance and increasing service life.

TK Trunnion Mounted Ball Valve

Why TK?

With many quarter-turn ball valves on the market meeting standard applications, Cameron's TK ball valves offer end users a longer service life alternative when erosive, corrosive or combinations of extreme service conditions are present. For over 50 years, the TK brand has supplied service engineered solutions in demanding oil and gas environments.

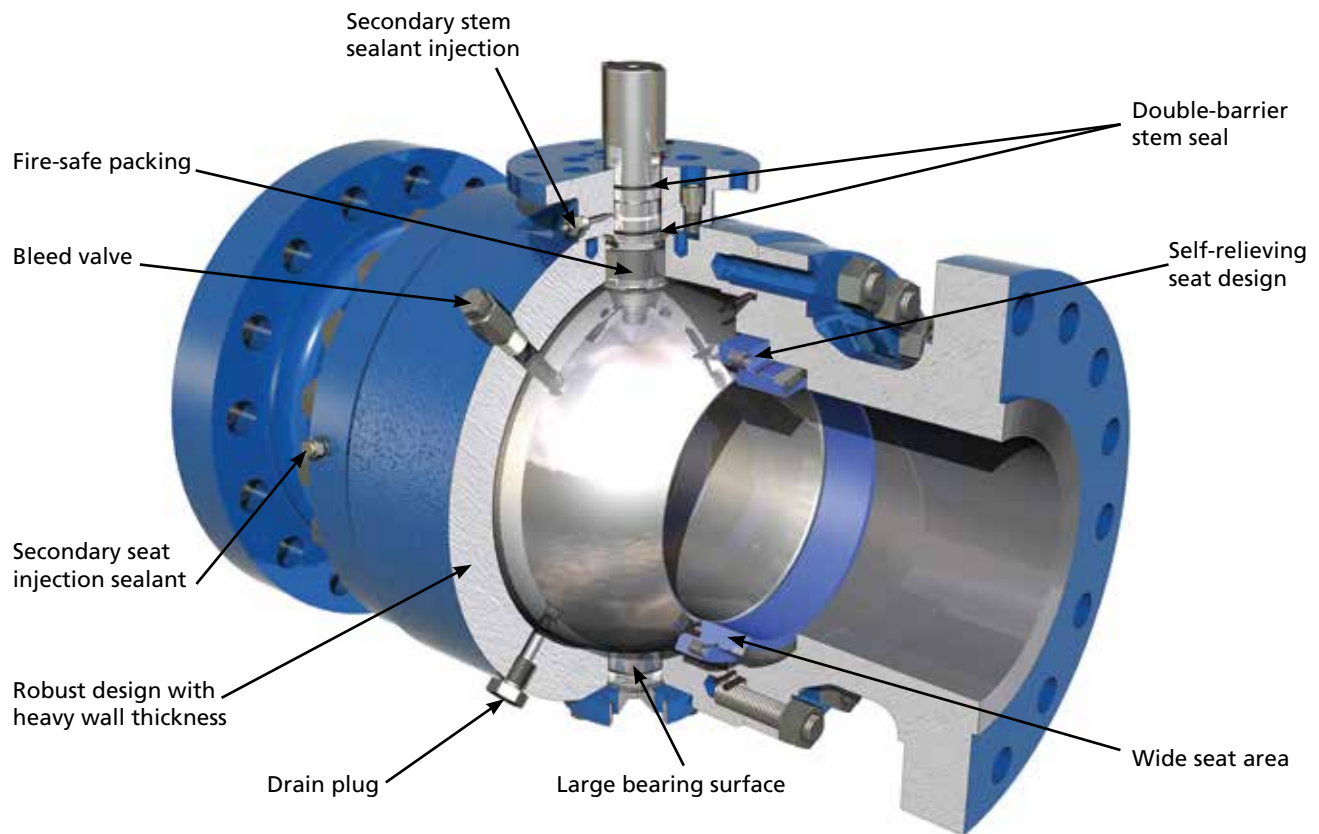
How?

Cameron's TK valves utilize robust components designed around wide seat sealing surfaces and optional non-corrosive plated or weld overlay on internal wetted surfaces.

When end users evaluate safety and total cost of ownership, TK ball valves provide great value.

DOUBLE BLOCK-AND-BLEED DESIGN

The TK OF valve is an end-entry, trunnion mounted ball valve.



STANDARD FEATURES

- TK OF design – original fire-safe with soft-seat inserts
- Bolted forged body
- Trunnion mounted (some soft-seat designs are non-trunnion seat-supported designs – see product design matrix)
- Wide seat-sealing contact area
- Fire-safe
- Piston-action SR (self-relieving) seats
- Spring-energized seats for sealing at low line pressure
- O-ring stem seals – double barrier
- Secondary stem sealant injection (2" and above)
- Secondary soft-seat sealant injection (6" and above)
- Double block-and-bleed
- NACE MR0175

OPTIONAL FEATURES

Twin Valve

The TK Twin Valve utilizes the proven TK design in a twin ball body satisfying double-isolation requirements as specified in most process safety management systems. By combining two valves into one body, the Twin Valve reduces weight, envelope dimensions and potential leak paths.

Metal Seated

The TK MF design offers metal-to-metal seat sealing ideally suited for the following applications:

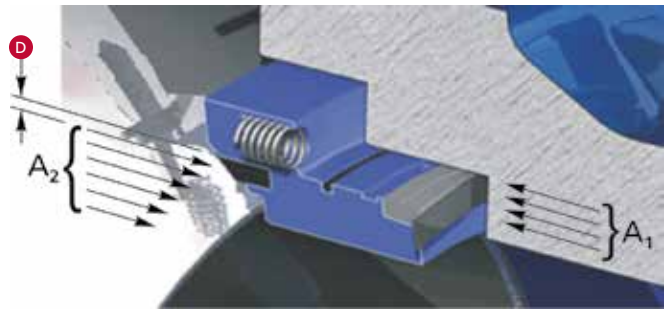
- High-temperature and abrasive services
- Severe corrosive mediums
- Coal gasification
- Throttling and control services

The TK metal-seated design has a temperature range of -50° F to 550° F (-45° C to 287° C) and meets acceptance criteria per API 6D.

Sealing surface is critical to metal-seated valve performance. These valves utilize a proprietary grade tungsten carbide coating applied to both the ball and seats.

PISTON-ACTION SEATS

As line pressure increases, the seat reacts to the force of the pressure to form an effective seal. Line pressure against seat area A_1 (see illustration) is not equalized by pressure against seat area A_2 . The difference in areas D times the line pressure creates a piston-action, which forces the seat unit against the ball surface. The net result of this piston-action is the formation of a tight, effective seal. In the absence of line pressure, coil springs around the seat unit provide a tight seal by keeping the seat in contact with the ball surface.



OPTIONAL FEATURES

TK Super Seal

Cameron developed the TK Super Seal to offer customers an option that significantly extends stem seal life.

Benefits

- Increased stem seal life
- Reduces chemical compatibility concerns
- Simplifies replacement of stem seals
- Provides superior secondary sealant injection
- Easily retrofitted on existing TK ball valves

Underground Extensions

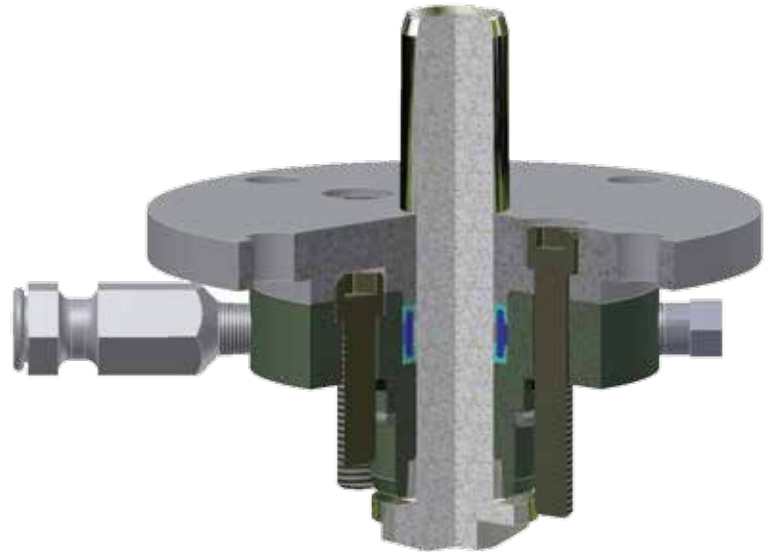
TK ball valves are well suited for underground installations or remote services. Valves fitted with stem extensions can have extended vent drains. As an option, vent and drain lines can have two isolation valves – one next to the main valve and one at the top of the extension line ending below the valve operator.

Locking Devices

Standard key-operated locks and special safety interlock systems can be fitted on all TK valves. Lever-operated valves lock between bonnet and valve stop plate for maximum security and ease of installation. Gear-operated valves lock between input shaft and gearbox operation.

Grit-Excluder Seat Design

In some abrasive applications, solid particles can get trapped behind the seat holders. This can make the valve difficult to operate and cause premature wear of the seat O-rings or seals. The grit-excluder seat design reduces this problem by restricting the pathway of particles entering the area behind the seat holders. This seat design is available on both soft- and metal-seated valves.



CERTIFICATIONS AND COMPLIANCE

Cameron's TK products are designed and manufactured to international product standards and other approvals. TK proudly holds the second API 6D license 6D-0002.

- ISO 9001-2008
- APT 6D
- API 6FA
- API607
- SIL3 Capable
- NACE MR0175
- PED
- Fugitive Emissions Testing to Shell SPE 77/312
- CRN
- GOST



MATERIALS

Body and Trim

TK can provide appropriate materials for your unique service conditions. Multiple industry-accepted material selections are available.

TK OF Valves – Soft-Seated Insert

Soft-seat insert material selections include reinforced Teflon®, nylon, PEEK and other special materials. Contact our inside sales and engineering team for appropriate materials for your service conditions.

TK MF Valves – Metal-to-Metal Seat Sealing

The primary metal-seated option is a proprietary tungsten carbide coating for seat and ball sealing surfaces. Other special materials are available to meet your service conditions.

Weld Overlays

Cameron's engineering and manufacturing team are recognized leaders in weld overlay and metal-to-metal seat sealing technology. Non-corrosive weld overlays can be provided ranging from seat pocket protection to full internal wetted areas of the valve. Standard materials for overlay are 316 Stainless Steel or Inconel® 625 over forged carbon steel base materials.

Stem, Trunnion and Seat-to-Body-Seals

Elastomers are provided according to service requirements including special materials for high/low temperature and chemical compatibility. TK also provides lip seal stem sealing with our TK Super Seal option and seat-to-body lip seal sealing options for extended seal life and where chemical compatibility is a concern.

TYPICAL APPLICATIONS

- Oil and gas pipeline including high H₂S/CO₂ content
- Produced water/brine
- Suction and discharge isolation
- Station isolation
- Meter isolation
- Emergency shutdown (ESD)
- Coke cutting water
- Blowdown
- Offshore riser valves
- Launcher/receiver valves
- Low- and high-temperature service
- Fluid and gas well injection
- Double isolation (twin ball designs)
- Slurry service
- Coal gasification

Contact our inside sales and engineering team for your critical service conditions.



TK OF SOFT-SEATED DESIGN MATRIX

Size		Bore		ASME Class					
in.	mm	in.	mm	150	300	600	900	1500	2500
3/4	20	0.75	19					●	●
1	25	1.00	25				●	●	●
1-1/2	40	1.50	38				●	●	●
2 x 1-1/2	50 x 40	1.50	38	●	●	●	●	●	■
2 x 2	50	2.00	51	●	●	■	■	■	■
3 x 2	75 x 50	2.00	51	●	●	■	■	■	■
3 x 3	75	3.00	76	●	■	■	■	■	▽
4 x 3	100 x 75	3.00	76	■	■	■	■	■	▽
4 x 4	100	4.00	102	■	■	■	■	▽	▽
6 x 4	150 x 100	4.00	102	■	■	■	■	▽	▽
6 x 6	150	6.00	152	▽	▽	▽	▽	▽	
6 x 6	150	5.25	133						▽
8 x 6	200 x 150	6.00	152	▽	▽	▽	▽	▽	
8 x 6	200 x 150	5.25	133						▽
8 x 8	200 x 200	8.00	203	▽	▽	▽	▽	▽	
8 x 8	200 x 200	7.13	181						▽
10 x 8	250 x 200	8.00	203	▽	▽	▽	▽	▽	
10 x 8	250 x 200	7.56	192						▽
10 x 10	250	10.00	254	▽	▽	▽	▽	▽	
10 x 10	250	8.87	225						▽
12 x 10	300 x 250	10.00	254	▽	▽	▽	▽	▽	
12 x 10	300 x 250	8.87	225						▽
12 x 12	300	12.00	305	▽	▽	▽	▽	▽	
12 x 12	300	10.50	267						▽
14 x 12	350 x 300	12.00	305	▽	▽	▽	▽	▽	
14 x 12	350 x 300	10.50	267						▽
14 x 14	350	13.25	337	▽	▽	▽	▽	▽	
14 x 14	350	10.16	258						▽
16 x 14	400 x 350	13.25	337	▽	▽	▽	▽	▽	
16 x 14	400 x 350	10.16	258						▽
16 x 16	400	15.25	387	▽	▽	▽	▽	▽	
16 x 16	400	12.43	316						▽
18 x 16	450 x 400	15.25	387	▽	▽	▽	▽	▽	
18 x 16	450 x 400	12.43	316						▽
18 x 18	450	17.25	438	▽	▽	▽	▽	▽	
20 x 18	500 x 450	17.25	438	▽	▽	▽	▽	▽	
20 x 20	500	19.25	489	▽	▽	▽			
20 x 20	500	17.94	456					▽	
22 x 20	550 x 500	19.25	489	▽	▽	▽			
22 x 22	550	21.25	540	▽	▽	▽			
24 x 22	600 x 550	21.25	540	▽	▽	▽			
24 x 24	600	23.25	591	▽	▽	▽			
24 x 24	600	22.50	572				▽		
26 x 24	650 x 600	23.25	591	▽	▽	▽			
26 x 24	650 x 600	22.50	572				▽		
26 x 26	650	★	★			▽			
28	700	★	★	▽	▽	▽	▽		
28	700	26.25	667				▽		
30	750	★	★	▽	▽	▽	▽		
36	900	★	★	▽	▽	▽			

- Seat-Supported Design – Two-Piece Body
- Trunnion Design – Two-Piece Body
- ▽ Trunnion Design – Three-Piece Body
- Seat-Supported Studded Outlet Design – Two-Piece Body
- Trunnion Studded Outlet Design – Two-Piece Body
- ★ Consult Engineering

TK MF METAL-SEATED DESIGN MATRIX

Size		Bore		ASME Class					
in.	mm	in.	mm	150	300	600	900	1500	2500
1-1/2	40	1.50	38	■	■	■	■	■	■
2 x 1-1/2	50 x 40	1.50	38	■	■	■	■	■	■
2 x 2	50	2.00	51	●	●	■	■	■	■
3 x 2	75 x 50	2.00	51	●	●	■	■	■	■
3 x 3	75	3.00	76	■	■	■	■	■	■
3 x 3	75	2.44	62						▽
4 x 3	100 x 75	3.00	76	■	■	■	■	■	■
4 x 3	100 x 75	2.44	62						▽
4 x 4	100	4.00	102	■	■	■	■	▽	▽
6 x 4	150 x 100	4.00	102	■	■	■	■	▽	▽
6 x 6	150	6.00	152	▽	▽	▽	▽	▽	▽
6 x 6	150	5.25	133						▽
8 x 6	200 x 150	6.00	152	▽	▽	▽	▽	▽	▽
8 x 6	200 x 150	5.25	133						▽
8 x 8	200 x 200	8.00	203	▽	▽	▽	▽		
8 x 8	200 x 200	7.56	192					▽	
8 x 8	200 x 200	7.13	181						▽
10 x 8	250 x 200	8.00	203	▽	▽	▽	▽		
10 x 8	250 x 200	7.56	192					▽	
10 x 8	250 x 200	7.13	181						▽
10 x 10	250	10.00	254	▽	▽	▽	▽		
10 x 10	250	9.41	239					▽	
10 x 10	250	8.87	225						▽
12 x 10	300 x 250	10.00	254	▽	▽	▽	▽		
12 x 10	300 x 250	9.41	239					▽	
12 x 10	300 x 250	8.87	225						▽
12 x 12	300	12.00	305	▽	▽	▽	▽		
12 x 12	300	11.30	287					▽	
12 x 12	300	★	★						▽
14 x 12	350 x 300	12.00	305	▽	▽	▽	▽		
14 x 12	350 x 300	11.30	287					▽	
14 x 12	350 x 300	★	0						▽
14 x 14	350	13.25	337	▽	▽	▽	▽		
14 x 14	350	12.50	318					▽	
14 x 14	350	★	★						▽
16 x 14	400 x 350	13.25	337	▽	▽	▽	▽		
16 x 14	400 x 350	12.50	318					▽	
16 x 14	400 x 350	★	0						▽
16 x 16	400	15.25	387	▽	▽	▽	▽		
16 x 16	400	14.25	362					▽	
16 x 16	400	★	★						▽
18 x 16	450 x 400	15.25	387	▽	▽	▽	▽		
18 x 16	450 x 400	14.25	362					▽	
18 x 16	450 x 400	★	★						▽
18 x 18	450	17.25	438	▽	▽	▽	▽		
18 x 18	450	★	★					▽	
20 x 18	500 x 450	17.25	438	▽	▽	▽			
20 x 18	500 x 450	★	★					▽	
20 x 20	500	19.25	489	▽	▽				
20 x 20	500	★	★			▽			

- Seat-Supported Design – Two-Piece Body
- Trunnion Design – Two-Piece Body
- ▽ Trunnion Design – Three-Piece Body
- Seat-Supported Studded Outlet Design – Two-Piece Body
- Trunnion Studded Outlet Design – Two-Piece Body
- ★ Consult Engineering

TK MF METAL-SEATED DESIGN MATRIX (CONT.)

Size		Bore		ASME Class					
in.	mm	in.	mm	150	300	600	900	1500	2500
20 x 20	500	18.63	473				▽		
20 x 20	500	★	★					▽	
22 x 20	550 x 500	19.25	489	▽	▽				
22 x 20	550 x 500	★	★			▽			
22 x 20	550 x 500	18.63	473				▽		
22 x 22	550	21.25	540	▽	▽	▽			
24 x 22	600 x 550	21.25	540	▽	▽				
24 x 22	600 x 550	★	★			▽			
24 x 24	600	23.25	591	▽	▽	▽			
24 x 24	600	22.50	572				▽		
26 x 24	650 x 600	23.25	591	▽	▽	▽			
26 x 24	650 x 600	22.50	572				▽		
26 x 26	650	★	★			▽			
28	700	★	★	▽	▽	▽			
30	750	29.00	737	▽	▽	▽	▽		
36	900	34.50	876	▽	▽				
36	900	★	★			▽			

- Seat-Supported Design – Two-Piece Body
- Trunnion Design – Two-Piece Body
- ▽ Trunnion Design – Three-Piece Body
- Seat-Supported Studded Outlet Design – Two-Piece Body
- Trunnion Studded Outlet Design – Two-Piece Body
- ★ Consult Engineering

PRESSURE RATING 2000, 3000 AND 5000 DESIGN MATRIX

Size		Bore		Pressure Rating		
in.	mm	in.	mm	2000	3000	5000
1-13/16	46	★	★	■	■	■
2-1/16	52	2.09	53	■	■	■
2-9/16	65	★	★	■	■	■
3-1/8	80	3.16	80	■	■	■
4-1/16	103	4.09	104	■	■	▽
5-1/8	130	★	★	▽	▽	▽
7-1/16	180	6.00	152	▽	▽	▽
9	229	8.03	204	▽	▽	▽
11	280	10.00	254	▽	▽	
11	280	8.875	225			▽

SPECIAL FLANGE BOLTING FOR STUDED OUTLET DESIGNS

ASME Class 150 Raised-Face Valves

Valve Size in.	Stud Bolt Size	Capscrew Size	Quantity
1/2	1/2 - 13 x 1-3/4	1/2 - 13 x 1-1/4	4
3/4	1/2 - 13 x 1-3/4	1/2 - 13 x 1-1/4	4
1	1/2 - 13 x 2	1/2 - 13 x 1-1/4	4
1-1/4	1/2 - 13 x 2	1/2 - 13 x 1-1/4	4
1-1/2	1/2 - 13 x 2	1/2 - 13 x 1-1/2	4
2 x 1-1/2	5/8 - 11 x 2-1/4	5/8 - 11 x 1-1/2	4
2 x 2	5/8 - 11 x 2-1/4	5/8 - 11 x 1-1/2	4
3 x 2	5/8 - 11 x 2-1/2	5/8 - 11 x 1-3/4	4
3 x 3	5/8 - 11 x 2-1/2	5/8 - 11 x 1-3/4	4
4 x 4	5/8 - 11 x 2-1/2	5/8 - 11 x 1-3/4	8
6 x 4	3/4 - 10 x 2-3/4	3/4 - 10 x 2	8

Space limitations prohibit the use of through stud bolts on one end of the smaller ASME Class 150 valves. These valves have one end drilled and tapped to accept a shorter-than-standard bolt or capscrew. Stud bolt and capscrew sizes listed below are for information purposes only and are not furnished with the valves. The use of stud bolts is preferred.

FLOW COEFFICIENTS (C_v)

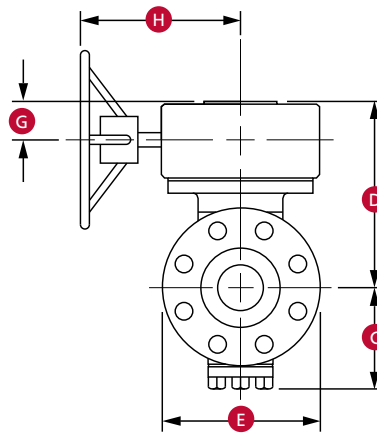
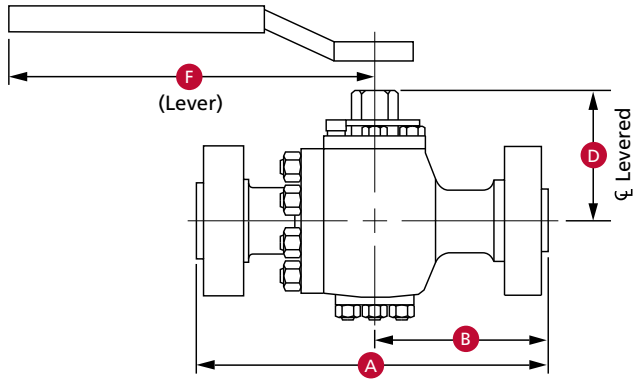
(Flow coefficient, or C_v , by definition, is the volume of water in gal/min at 60° F that will flow through a given element with a pressure drop of 1 psi).

Size in.	ASME/ANSI CLASS					
	150	300	600	900	1500	2500
1/2	16	14	12	11	11	10
3/4	44	38	34	31	30	29
1	90	78	69	63	63	27
1-1/4	153	136	120	113	113	54
1-1/2	227	211	187	167	167	92
2 x 1-1/2	125	125	125	124	124	-
2 x 2	463	420	361	322	322	291
3 x 2	183	183	183	183	182	182
3 x 3	1247	1057	943	911	820	739
4 x 3	504	504	502	502	501	500
4 x 4	2489	2156	1811	1760	1610	1450
6 x 4	735	734	734	733	733	732
6 x 6	5458	5393	4581	4386	4079	2528
8 x 6	2022	2021	2018	2016	2014	1485
10 x 6	1458	1458	1457	1457	1457	1099
8 x 8	10,721	10,235	8920	8446	7978	5301
10 x 8	4183	4181	4169	4166	4158	3307
12 x 8	2941	2940	2939	2938	2937	2385
10 x 10	17,756	17,202	14,614	14,164	13,029	8431
12 x 10	7342	7338	7316	7302	7283	5933
12 x 12	26,714	25,917	22,782	21,230	19,619	12,348
14 x 12	14,080	14,043	13,984	13,924	13,814	-
16 x 12	9031	9027	9017	9009	8994	-
14 x 14	32,609	30,936	28,641	26,625	24,083	-
16 x 14	14,785	14,765	14,725	14,688	14,622	-
16 x 16	44,627	42,550	39,141	36,642	33,110	-
18 x 16	20,841	20,821	20,752	20,703	20,582	-
20 x 16	14,843	14,837	14,820	14,810	14,783	-
18 x 18	57,799	56,171	51,396	48,645	43,329	-
20 x 18	28,064	28,023	27,914	27,847	27,667	-
20 x 20	74,763	71,830	65,432	62,207	55,426	-
24 x 20	26,734	26,720	26,676	26,650	26,582	-
22 x 22	91,770	88,511	81,273	-	-	-
24 x 24	113,221	109,382	98,940	93,948	83,892	-
30 x 24	35,617	35,604	35,571	-	-	-
26 x 26	132,159	126,650	117,426	-	-	-
30 x 26	51,377	51,337	51,238	-	-	-
28 x 28	154,783	148,828	138,726	-	-	-
30 x 30	182,779	176,007	161,903	-	-	-
36 x 30	63,626	63,565	63,458	-	-	-
36 x 36	264,986	248,911	226,668	-	-	-

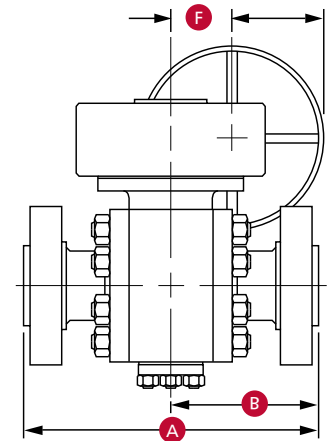
Dimensional Data

CLASS 150

Two-Piece



Three -Piece



Two-Piece Dimensions

Size in. (mm)	A		B		C	D	D (Lever)	E	F	F (Lever)	G	H	I	Weight lb (kg)	
	RF	RTJ	RF	RTJ										Gear	Lever
2 x 1-1/2 * (50 x 40)	7 (178)	7.50 (191)	3.50 (89)	3.75 (95)	3 (76)	8.12 (206)	4.75 (121)	6 (152)	3.39 (86)	23 (584)	2.66 (68)	9.36 (238)	2.96 (75)	68 (31)	33 (15)
2 x 2 * (50 x 50)	7 (178)	7.50 (191)	3.81 (97)	4.06 (103)	3 (76)	8.75 (222)	5.88 (149)	6 (152)	3.39 (86)	23 (584)	2.66 (68)	9.36 (238)	2.96 (75)	73 (33)	38 (17)
3 x 2 * (80 x 50)	8 (203)	8.50 (216)	4 (102)	4.25 (108)	3.75 (95)	9.06 (230)	6.19 (157)	7.50 (191)	3.39 (86)	23 (584)	2.66 (68)	9.36 (238)	2.96 (75)	96 (44)	61 (28)
3 x 3 * (80 x 80)	8 (203)	8.50 (216)	4.75 (121)	5 (127)	5.25 (133)	9.87 (251)	6.94 (176)	7.50 (191)	3.39 (86)	33 (838)	2.66 (68)	9.28 (236)	3.94 (100)	112 (51)	71 (32)
4 x 3 (100 x 80)	9 (229)	9.50 (241)	3.69 (94)	3.94 (100)	5.25 (133)	9.87 (251)	6.94 (176)	9 (229)	3.39 (86)	33 (838)	2.66 (68)	9.28 (236)	3.94 (100)	134 (61)	93 (42)
4 x 4 (100 x 100)	9 (229)	9.50 (241)	5.19 (132)	5.44 (138)	6.25 (159)	10.81 (275)	8.13 (207)	9 (229)	3.39 (86)	44 (1118)	2.66 (68)	9.28 (236)	3.94 (100)	157 (71)	121 (55)
6 x 4 (150 x 100)	10.50 (267)	11 (279)	5.25 (133)	5.50 (140)	6.25 (159)	10.81 (275)	8.13 (207)	11 (279)	3.39 (86)	44 (1118)	2.66 (68)	9.28 (236)	3.94 (100)	211 (96)	175 (79)

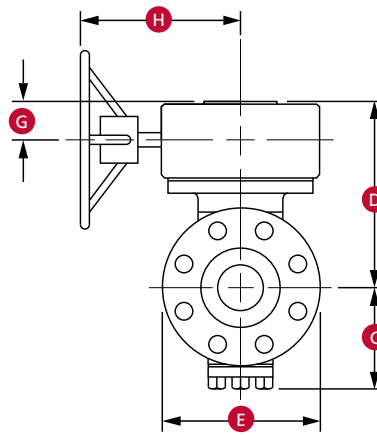
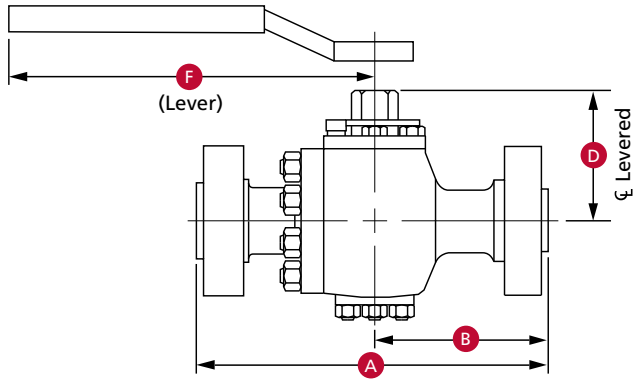
* Upstream sealing seat-supported design. See general notes on page 21.

Three-Piece Dimensions

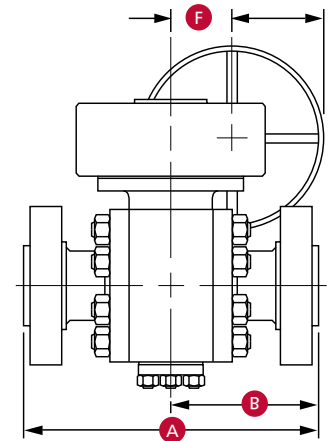
Size in. (mm)	A		B		C	D	E	F	G	H	I	Weight lb (kg)
	RF	RTJ	RF	RTJ								
6 x 6 (150 x 150)	15.50 (394)	16 (406)	7.75 (197)	8 (203)	8.13 (207)	13 (330)	15.13 (384)	3.39 (86)	2.66 (68)	11.25 (286)	7.88 (200)	500 (227)
8 x 6 (200 x 150)	18 (457)	18.50 (470)	9 (229)	9.25 (235)	8.13 (207)	13 (330)	15.13 (384)	3.39 (86)	2.66 (68)	11.25 (286)	7.88 (200)	569 (258)
8 x 8 (200 x 200)	18 (457)	18.50 (470)	9 (229)	9.25 (235)	9.94 (253)	14.69 (373)	18.25 (464)	3.39 (86)	2.66 (68)	11.25 (286)	7.88 (200)	707 (321)
10 x 6 (250 x 150)	21 (533)	21.50 (546)	10.50 (267)	10.75 (273)	8.13 (207)	13 (330)	16 (406)	3.39 (86)	2.66 (68)	11.25 (286)	7.88 (200)	661 (300)
10 x 8 (250 x 200)	21 (533)	21.50 (546)	10.50 (267)	10.75 (273)	9.94 (253)	14.69 (373)	18.25 (464)	3.39 (86)	2.66 (68)	11.25 (286)	7.88 (200)	806 (366)
10 x 10 (250 x 250)	21 (533)	21.50 (546)	10.50 (267)	10.75 (273)	11.06 (281)	17.64 (448)	20.50 (521)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	1145 (519)
12 x 10 (300 x 250)	24 (601)	24.50 (622)	12 (305)	12.25 (311)	11.06 (281)	17.64 (448)	20.50 (521)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	1303 (591)
12 x 12 (300 x 300)	24 (601)	24.50 (622)	12 (305)	12.25 (311)	12.81 (325)	19.39 (496)	24.25 (616)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	1722 (781)
14 x 12 (350 x 300)	27 (686)	27.50 (699)	13.50 (343)	13.75 (350)	12.81 (325)	19.39 (493)	24.25 (616)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	1898 (861)
14 x 14 (350 x 350)	27 (686)	27.50 (686)	13.50 (343)	13.75 (350)	14.44 (367)	21.01 (534)	27.25 (692)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	2247 (1020)
16 x 12 (400 x 300)	30 (762)	30.50 (775)	15 (381)	15.25 (388)	12.81 (326)	19.39 (493)	24.25 (617)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	2138 (970)
16 x 14 (400 x 350)	30 (762)	30.50 (775)	15 (381)	15.25 (388)	14.44 (367)	21.01 (534)	27.25 (692)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	2485 (1127)
16 x 16 (400 x 400)	30 (762)	30.50 (775)	15 (381)	15.25 (387)	16.63 (422)	22.70 (577)	30.63 (778)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	3088 (1401)
18 x 16 (450 x 400)	34 (864)	34.50 (876)	17 (432)	17.25 (438)	16.63 (422)	22.70 (577)	30.63 (778)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	3310 (1501)
18 x 18 (450 x 450)	34 (864)	34.50 (876)	17 (432)	17.25 (438)	18.25 (464)	26.13 (664)	33.69 (856)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	4571 (2073)
20 x 16 (500 x 400)	36 (914)	36.50 (927)	18 (457)	18.25 (464)	16.63 (422)	22.70 (577)	30.63 (778)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	3554 (1612)
20 x 18 (500 x 450)	36 (914)	36.50 (927)	18 (457)	18.25 (464)	18.25 (464)	26.13 (664)	33.69 (856)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	4847 (2199)
20 x 20 (500 x 500)	36 (914)	36.5 (927)	18 (457)	18.25 (464)	20 (508)	27.88 (708)	37.13 (943)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	5025 (2280)
22 x 20 (550 x 500)	40 (1016)	40.50 (1029)	20 (508)	20.25 (514)	20 (508)	27.88 (708)	37.13 (943)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	5467 (2480)
22 x 22 (550 x 550)	40 (1016)	40.5 (1029)	20 (508)	20.25 (514)	20.75 (527)	28.63 (727)	38.50 (978)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	6037 (2738)
24 x 20 (600 x 500)	42 (1067)	42.50 (1080)	21 (533)	21.25 (540)	20 (508)	27.88 (708)	37.13 (943)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	5867 (2661)
24 x 22 (600 x 550)	42 (1067)	42.5 (1080)	21 (533)	21.25 (540)	20.75 (527)	28.63 (727)	38.5 (978)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	6463 (2932)
24 x 24 (600 x 600)	42 (1067)	42.50 (1080)	21 (533)	21.250 (540)	23.88 (607)	31.76 (807)	44.63 (1134)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	8981 (4074)
26 x 26 (650 x 650)	45 (1143)	45 (1143)	22.50 (572)	22.50 (572)	27.13 (689)	37.19 (945)	49.75 (1264)	16.97 (431)	6.21 (158)	24.46 (621)	17.72 (450)	12,215 (5541)
30 x 24 (750 x 600)	51 (1295)	51 (1295)	25.50 (648)	25.50 (648)	23.88 (607)	31.76 (808)	44.63 (1134)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	10,881 (4936)
30 x 26 (750 x 650)	51 (1295)	51 (1295)	25.50 (648)	25.50 (648)	27.13 (689)	37.19 (945)	49.75 (1264)	16.97 (431)	6.21 (158)	24.46 (621)	17.72 (450)	13,695 (6212)
30 x 30 (750 x 750)	51 (1295)	51 (1295)	25.50 (648)	25.50 (648)	30 (762)	40.06 (1018)	55.38 (1407)	16.97 (431)	6.21 (158)	24.46 (621)	17.72 (450)	16,753 (7599)
36 x 30 (900 x 750)	60 (1524)	60 (1524)	30 (762)	30 (762)	30 (762)	40.06 (1018)	55.38 (1407)	16.97 (431)	6.21 (158)	24.46 (621)	17.72 (450)	19,753 (8960)
36 x 36 (900 x 900)	60 (1524)	60 (1524)	30 (762)	30 (762)	34 (864)	-	63.63 (1616)	-	-	-	-	-

CLASS 300

Two-Piece



Three -Piece



Two-Piece Dimensions

Size in. (mm)	A		B		C	D	D (Lever)	E	F	F (Lever)	G	H	I	Weight lb (kg)	
	RF	RTJ	RF	RTJ										Gear	Lever
2 x 1-1/2 * (50 x 40)	8.50 (216)	9.13 (232)	4 (102)	4.33 (110)	3.25 (83)	7 (178)	4.75 (121)	6.50 (165)	2.63 (67)	23 (584)	1.54 (39)	8.42 (214)	5 (127)	72 (33)	34 (15)
2 x 2 * (50 x 50)	8.50 (216)	9.13 (232)	3.94 (100)	4.25 (108)	3.25 (83)	7.63 (194)	5.88 (149)	6.50 (165)	2.63 (67)	23 (584)	1.54 (39)	8.42 (214)	5 (127)	83 (38)	45 (20)
3 x 2 (80 x 50)	11.13 (283)	11.75 (299)	5.56 (141)	5.88 (149)	4.13 (105)	7.63 (194)	5.88 (149)	8.25 (210)	2.63 (67)	23 (584)	1.54 (39)	8.42 (214)	5 (127)	102 (46)	64 (29)
3 x 3 * (80 x 80)	11.13 (283)	11.75 (299)	4.88 (124)	5.19 (132)	5.25 (133)	9.87 (251)	6.94 (176)	8.25 (210)	3.39 (86)	33 (838)	2.66 (68)	9.28 (236)	3.94 (100)	136 (62)	95 (43)
4 x 3 (100 x 80)	12 (305)	12.63 (321)	5.44 (138)	5.75 (146)	5.25 (133)	9.87 (251)	6.94 (176)	10 (254)	3.39 (86)	33 (838)	2.66 (68)	9.28 (236)	3.94 (100)	161 (73)	121 (55)
4 x 4 (100 x 100)	12 (305)	12.63 (321)	5.50 (140)	5.81 (148)	6.25 (159)	10.81 (275)	8.13 (206)	10 (254)	3.39 (86)	44 (1118)	2.66 (68)	10.66 (271)	5.91 (150)	204 (93)	168 (76)
6 x 4 (150 x 100)	15.88 (403)	16.50 (419)	7.94 (202)	8.25 (210)	6.25 (159)	10.81 (275)	8.13 (207)	12.50 (318)	3.39 (86)	44 (1118)	2.66 (68)	10.66 (271)	5.91 (150)	258 (117)	222 (101)

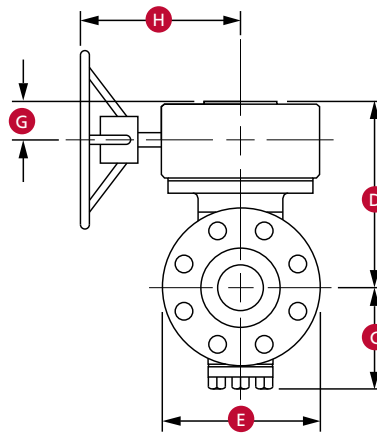
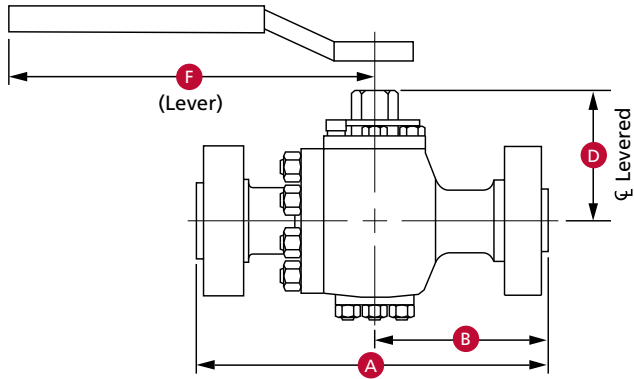
* Upstream sealing seat-supported design. See general notes on page 21.

Three-Piece Dimensions

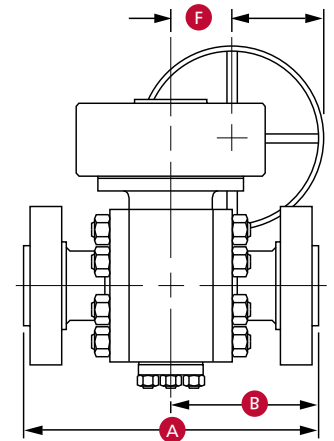
Size in. (mm)	A		B		C	D	E	F	G	H	I	Weight lb (kg)
	RF	RTJ	RF	RTJ								
6 x 6 (150 x 150)	15.88 (403)	16.50 (419)	7.94 (208)	8.25 (210)	8.13 (207)	13 (330)	15.13 (384)	3.39 (86)	2.66 (68)	11.25 (289)	7.88 (200)	557 (253)
8 x 6 (200 x 150)	19.75 (502)	20.38 (518)	9.88 (251)	10.19 (259)	8.13 (207)	13 (330)	15.13 (384)	3.39 (86)	2.66 (68)	11.25 (289)	7.88 (200)	663 (301)
8 x 8 (200 x 200)	19.75 (502)	20.38 (518)	9.88 (251)	10.19 (259)	9.94 (253)	14.69 (373)	18.25 (464)	3.39 (86)	2.66 (68)	12.04 (306)	9.85 (250)	808 (367)
10 x 6 (250 x 150)	22.38 (569)	23 (584)	11.19 (284)	11.50 (292)	8.13 (207)	13 (330)	17.50 (445)	3.39 (86)	2.66 (68)	11.25 (289)	7.88 (200)	779 (353)
10 x 8 (250 x 200)	22.38 (569)	23 (584)	11.19 (284)	11.50 (292)	9.94 (253)	14.69 (373)	18.25 (464)	3.39 (86)	2.66 (68)	12.04 (306)	9.85 (250)	932 (423)
10 x 10 (250 x 250)	22.38 (569)	23 (584)	11.19 (284)	11.50 (292)	11.06 (281)	17.64 (448)	20.50 (521)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	1249 (567)
12 x 10 (300 x 250)	25.50 (648)	26.13 (664)	12.75 (324)	13.06 (332)	11.06 (281)	17.64 (448)	20.50 (521)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	1439 (653)
12 x 12 (300 x 300)	25.50 (648)	26.13 (664)	12.75 (324)	13.06 (332)	12.81 (325)	19.39 (493)	24.25 (616)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	1924 (873)
14 x 12 (350 x 300)	30 (762)	30.63 (778)	15 (381)	15.31 (389)	12.81 (325)	19.39 (493)	24.25 (616)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	2214 (1004)
14 x 14 (350 x 350)	30 (762)	30.63 (778)	15 (381)	15.31 (389)	14.44 (367)	21.01 (534)	27.25 (692)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	2531 (1148)
16 x 12 (400 x 300)	33 (838)	33.63 (854)	16.50 (419)	16.81 (427)	12.81 (325)	19.39 (493)	25.50 (648)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	2466 (1119)
16 x 14 (400 x 350)	33 (838)	33.63 (854)	16.50 (419)	16.81 (427)	14.44 (367)	21.01 (534)	27.25 (692)	5.12 (130)	3.34 (85)	15.23 (387)	11.81 (300)	2807 (1273)
16 x 16 (400 x 400)	33 (838)	33.63 (854)	16.50 (419)	16.81 (427)	16.63 (422)	22.70 (577)	30.63 (778)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	3482 (1579)
18 x 16 (450 x 400)	36 (914)	36.63 (930)	18 (457)	18.31 (465)	16.63 (422)	22.70 (577)	30.63 (778)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	3803 (1725)
18 x 18 (450 x 450)	36 (914)	36.63 (930)	18 (457)	18.31 (465)	18.25 (464)	26.13 (664)	33.69 (856)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	4959 (2249)
20 x 16 (500 x 400)	39 (991)	39.75 (1010)	19.50 (495)	19.88 (505)	16.63 (422)	22.70 (577)	30.63 (778)	8.31 (237)	3.34 (86)	17.61 (447)	11.81 (300)	4178 (1895)
20 x 18 (500 x 450)	39 (991)	39.75 (1010)	19.50 (495)	19.88 (505)	18.25 (464)	26.13 (664)	33.69 (856)	10.35 (263)	4.07 (103)	19.68 (500)	9.85 (250)	5379 (2440)
20 x 20 (500 x 500)	39 (991)	39.75 (1010)	19.50 (495)	19.88 (505)	20 (508)	27.88 (708)	37.13 (943)	10.35 (263)	4.07 (103)	20.07 (510)	17.72 (450)	5567 (2525)
22 x 20 (550 x 500)	43 (1092)	43.88 (1115)	21.50 (546)	21.94 (557)	20 (508)	27.88 (708)	37.13 (943)	10.35 (263)	4.07 (103)	20.07 (510)	17.72 (450)	6107 (2770)
22 x 22 (550 x 550)	43 (1092)	43.88 (1115)	21.50 (54)	21.94 (557)	20.75 (527)	28.63 (727)	38.50 (978)	10.35 (263)	4.07 (103)	20.07 (510)	17.72 (450)	6663 (3022)
24 x 20 (600 x 500)	45 (1143)	45.88 (1165)	22.50 (572)	22.94 (583)	2 (51)	27.88 (708)	37.13 (943)	10.35 (263)	4.07 (103)	20.07 (510)	17.72 (450)	6727 (3051)
24 x 22 (600 x 550)	45 (1143)	45.88 (1165)	22.50 (572)	22.94 (583)	20.75 (527)	28.63 (727)	38.50 (978)	10.35 (263)	4.07 (103)	20.07 (510)	17.72 (450)	7283 (3304)
24 x 24 (600 x 600)	45 (1143)	45.88 (1165)	22.50 (572)	22.94 (583)	23.88 (607)	32.06 (814)	44.63 (1134)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	9879 (4481)
26 x 26 (650 x 650)	49 (1245)	50 (1270)	24.50 (622)	25 (635)	27.13 (689)	37.19 (945)	49.75 (1264)	16.97 (431)	6.21 (158)	24.46 (621)	17.72 (450)	13,297 (6031)
30 x 24 (750 x 600)	55 (1397)	56 (1422)	27.50 (699)	28 (711)	23.88 (607)	32.06 (814)	44.63 (1134)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	6119 (2776)
30 x 26 (750 x 650)	55 (1397)	56 (1422)	27.50 (699)	28 (711)	27.13 (689)	37.19 (945)	49.75 (1264)	16.97 (431)	6.21 (158)	24.46 (621)	17.72 (450)	15,117 (6857)
30 x 30 (750 x 750)	55 (1397)	56 (1422)	27.50 (699)	28 (711)	30 (762)	40.06 (1018)	55.38 (1407)	16.97 (431)	6.21 (156)	24.46 (62)	17.72 (450)	18,115 (8217)
36 x 30 (900 x 750)	68 (1727)	69.13 (1756)	34 (864)	34.56 (878)	30 (762)	40.06 (1018)	55.38 (1407)	16.97 (431)	6.21 (158)	24.46 (621)	17.72 (450)	22,375 (10149)
36 x 36 (900 x 900)	68 (1727)	69.13 (1756)	34 (864)	34.56 (878)	34.00 (864)	-	63.63 (1616)	-	-	-	17.72 (450)	-

CLASS 600

Two-Piece



Three -Piece



Two-Piece Dimensions

Size in. (mm)	A		B		C	D	D (Lever)	E	F	F (Lever)	G	H	I	Weight lb (kg)	
	RF	RTJ	RF	RTJ										Gear	Lever
2 x 1-1/2 * (50 x 40)	11.50 (291)	11.63 (295)	5.75 (146)	5.82 (148)	3.25 (83)	7 (178)	4.75 (121)	6.50 (165)	2.63 (67)	23 (584)	1.54 (39)	8.42 (214)	5 (127)	78 (35)	40 (18)
2 x 2 (50 x 50)	11.50 (291)	11.63 (295)	5.75 (146)	5.81 (148)	4 (102)	8.75 (222)	5.88 (149)	6.50 (165)	3.39 (86)	23 (584)	2.66 (68)	9.28 (236)	3.94 (100)	90 (41)	55 (25)
3 x 2 (80 x 50)	14 (356)	14.13 (359)	7 (178)	7.06 (179)	4 (102)	8.75 (222)	5.88 (149)	8.25 (210)	3.39 (86)	23 (584)	2.66 (68)	9.28 (236)	3.94 (100)	113 (51)	78 (35)
3 x 3 (80 x 80)	14 (356)	14.13 (359)	7 (178)	7.06 (179)	5.25 (133)	9.87 (251)	6.94 (176)	8.25 (210)	3.39 (86)	33 (838)	2.66 (68)	10.66 (271)	5.91 (150)	149 (68)	108 (49)
4 x 3 (100 x 80)	17 (432)	17.13 (435)	8.50 (216)	8.56 (217)	5.25 (133)	9.87 (251)	6.94 (176)	10.75 (273)	3.39 (86)	33 (838)	2.66 (68)	10.66 (271)	5.91 (150)	197 (89)	157 (71)
4 x 4 (100 x 100)	17 (432)	17.13 (435)	8.50 (216)	8.56 (217)	6.25 (159)	10.81 (275)	8.13 (207)	10.75 (273)	3.39 (86)	44 (1118)	2.66 (68)	11.25 (286)	7.88 (200)	252 (114)	215 (98)
6 x 4 (150 x 100)	22 (559)	22.13 (562)	11 (279)	11.06 (281)	6.25 (159)	10.81 (275)	8.13 (207)	14 (357)	3.39 (86)	44 (1118)	2.66 (68)	11.25 (286)	7.88 (200)	361 (164)	323 (147)

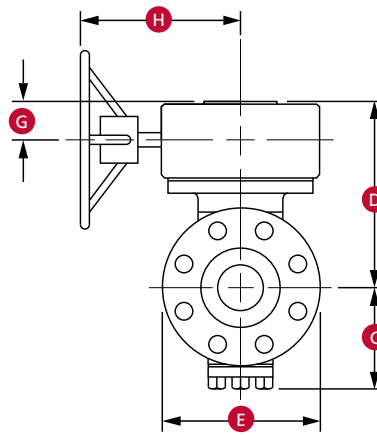
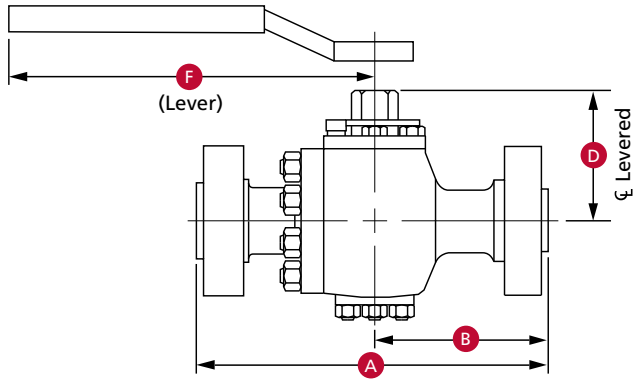
* Upstream sealing seat-supported design. See general notes on page 21.

Three-Piece Dimensions

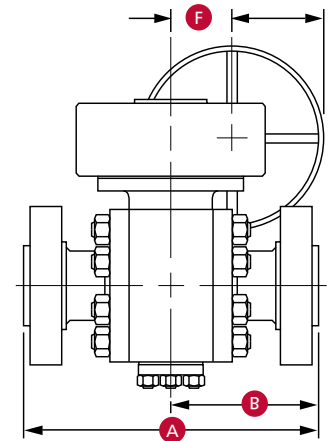
Size in. (mm)	A		B		C	D	E	F	G	H	I	Weight lb (kg)
	RF	RTJ	RF	RTJ								
6 x 6 (150 x 150)	22 (559)	22.13 (562)	11 (279)	11.06 (281)	8.13 (207)	13.36 (339)	15.13 (384)	4.11 (104)	2.78 (71)	13.64 (347)	9.85 (250)	643 (292)
8 x 6 (200 x 150)	26 (660)	26.13 (664)	13 (330)	13.06 (332)	8.13 (207)	13.36 (339)	16.50 (419)	4.11 (104)	2.78 (71)	13.64 (347)	9.85 (250)	771 (350)
8 x 8 (200 x 200)	26 (660)	26 (660)	13 (330)	13.06 (332)	10.13 (257)	16.01 (407)	19 (483)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	1273 (577)
10 x 6 (250 x 150)	31 (787)	31.13 (791)	15.50 (394)	15.56 (395)	8.13 (207)	13.36 (339)	20 (508)	4.11 (104)	2.78 (71)	13.64 (347)	9.85 (250)	1027 (466)
10 x 8 (250 x 200)	31 (787)	31.13 (791)	15.50 (394)	15.56 (395)	10.13 (257)	16.01 (407)	20 (508)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	1531 (694)
10 x 10 (250 x 250)	31 (787)	31.13 (791)	15.50 (394)	15.56 (395)	11.06 (281)	17.64 (448)	20.50 (521)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	1782 (808)
12 x 10 (300 x 250)	33 (838)	33.13 (842)	16.50 (419)	16.56 (421)	11.06 (281)	17.64 (448)	22 (559)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	1937 (879)
12 x 12 (300 x 300)	33 (838)	33.13 (842)	16.50 (419)	16.56 (421)	14.06 (357)	20.39 (518)	25.75 (654)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	2952 (1339)
14 x 12 (350 x 300)	35 (889)	35.13 (892)	17.50 (445)	17.56 (446)	14.06 (357)	20.39 (518)	25.75 (654)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	3122 (1416)
14 x 14 (350 x 350)	35 (889)	35.13 (892)	17.50 (445)	17.56 (446)	14.94 (380)	22.85 (580)	28 (711)	10.35 (263)	4.78 (121)	20.56 (522)	11.81 (300)	3998 (1814)
16 x 12 (400 x 300)	39 (991)	39.13 (994)	19.50 (495)	19.56 (497)	14.06 (357)	20.39 (518)	27 (686)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	3560 (1615)
16 x 14 (400 x 350)	39 (991)	39.13 (994)	19.50 (495)	19.56 (497)	14.94 (380)	22.85 (580)	28 (711)	10.35 (263)	4.78 (121)	20.56 (522)	11.81 (300)	4412 (2001)
16 x 16 (400 x 400)	39 (991)	39.13 (994)	19.50 (495)	19.56 (497)	16.63 (422)	24.57 (624)	30.63 (778)	10.35 (263)	4.07 (103)	20.07 (510)	17.72 (450)	4311 (1955)
18 x 16 (450 x 400)	43 (1092)	43.13 (1096)	21.50 (546)	21.56 (548)	16.63 (422)	24.57 (624)	30.63 (778)	10.35 (263)	4.07 (103)	20.07 (510)	17.72 (450)	4725 (2143)
18 x 18 (450 x 450)	43 (1092)	43.13 (1096)	21.50 (546)	21.56 (548)	18.25 (464)	26.43 (671)	33.69 (858)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	6582 (2986)
20 x 16 (500 x 400)	47 (1199)	47.25 (1200)	23.50 (597)	23.63 (600)	16.63 (422)	24.57 (624)	32 (813)	10.35 (263)	4.07 (103)	20.07 (510)	17.72 (450)	5225 (2370)
20 x 18 (500 x 450)	47 (1199)	47.25 (1200)	23.50 (597)	23.63 (600)	18.25 (464)	26.43 (671)	33.69 (856)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	7082 (3212)
20 x 20 (500 x 500)	47 (1199)	47.25 (1200)	23.50 (597)	23.63 (600)	20 (508)	28.18 (716)	37.13 (943)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	7190 (3261)
22 x 20 (550 x 500)	51 (1295)	51.38 (1305)	25.50 (648)	25.69 (653)	20 (508)	28.18 (716)	37.13 (943)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	3910 (1774)
22 x 22 (550 x 550)	51 (1295)	51.38 (130)	25.50 (648)	25.69 (653)	22 (559)	30.18 (767)	41 (1041)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	10,463 (4746)
24 x 20 (600 x 500)	55 (1397)	55.38 (1407)	27.50 (699)	27.69 (703)	20 (508)	28.18 (716)	37.13 (943)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	8590 (3896)
24 x 22 (600 x 550)	55 (1397)	55.38 (1407)	27.50 (699)	27.69 (703)	22 (559)	30.18 (767)	41 (1041)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	11,143 (5054)
24 x 24 (600 x 600)	55 (1397)	55.38 (1407)	27.50 (699)	27.69 (703)	23.88 (607)	-	44.75 (1137)	-	-	-	17.72 (450)	-
26 x 26 (650 x 650)	57 (1448)	57.50 (1461)	28.50 (724)	28.75 (730)	27.13 (689)	-	49.75 (1264)	-	-	-	17.72 (450)	-
30 x 24 (750 x 600)	61 (1549)	61.50 (1562)	30.50 (775)	30.75 (781)	29.75 (756)	43.69 (1110)	55.44 (1408)	15 (381)	7.73 (196)	30.08 (764)	17.72 (450)	23,187 (10,517)
30 x 26 (750 x 650)	65 (1651)	65.50 (1664)	32.50 (826)	32.75 (832)	27.13 (689)	-	49.75 (1264)	-	-	-	17.72 (450)	-
30 x 30 (750 x 750)	65 (1651)	65.50 (1664)	325.25 (8261)	32.75 (832)	31.69 (805)	-	59.25 (1505)	-	-	-	17.72 (450)	-
36 x 30 (900 x 750)	82 (2083)	82.63 (2099)	41 (1041)	41.31 (1049)	31.69 (805)	-	59.25 (1505)	-	-	-	17.72 (450)	-
36 x 36 (900 x 900)	82 (2083)	82.63 (2099)	41 (1041)	41.31 (1049)	36 (914)	-	67.63 (1718)	-	-	-	17.72 (450)	-

CLASS 900

Two-Piece



Three -Piece



Two-Piece Dimensions

Size in. (mm)	A		B		C	D	D (Lever)	E	F	F (Lever)	G	H	I	Weight lb (kg)	
	RF	RTJ	RF	RTJ										Gear	Lever
3/4 x 3/4 * (20 x 20)	9 (229)	9 (229)	4 (102)	4 (102)	-	-	3 (76)	5.13 (130)	-	9 (229)	-	-	-	-	20 (9)
1 x 1 * (25 x 25)	10 (254)	10 (254)	4 (102)	4 (102)	-	-	3.13 (84)	5.88 (149)	-	9 (229)	-	-	-	-	26 (12)
1-1/2 x 1-1/2 * (40 x 40)	12 (305)	12 (305)	5.75 (146)	5.75 (146)	-	-	5.04 (128)	7 (178)	-	15 (381)	-	-	-	-	40 (18)
2 x 1-1/2 * (50 x 40)	14.50 (368)	14.63 (372)	7.25 (184)	7.31 (186)	4.25 (108)	7.32 (186)	5.44 (138)	8.50 (216)	2.63 (67)	23 (584)	1.54 (39)	10.30 (262)	9 (229)	117 (53)	79 (36)
2 x 2 (50 x 50)	14.50 (368)	14.63 (372)	6.50 (165)	6.56 (167)	4.75 (121)	9.37 (238)	6.56 (167)	8.50 (216)	3.39 (86)	33 (838)	2.66 (68)	10.66 (271)	5.91 (150)	140 (64)	107 (49)
3 x 2 (80 x 50)	15 (381)	15.13 (384)	6.88 (175)	6.94 (176)	4.75 (121)	9.37 (238)	6.56 (167)	9.50 (241)	3.39 (86)	33 (838)	2.66 (68)	10.66 (271)	5.91 (150)	156 (71)	123 (56)
3 x 3 (80 x 80)	15 (381)	15.13 (384)	6.69 (170)	6.75 (172)	5.56 (141)	9.87 (251)	7.38 (188)	9.50 (241)	3.39 (86)	33 (838)	2.66 (68)	10.66 (271)	5.91 (150)	200 (91)	165 (75)
4 x 3 (100 x 80)	18 (457)	18.13 (461)	7.63 (194)	7.69 (195)	5.56 (141)	9.87 (251)	7.38 (188)	11.50 (292)	3.39 (86)	33 (838)	2.66 (68)	10.66 (271)	5.91 (150)	250 (113)	215 (98)
4 x 4 (100 x 100)	18 (457)	18.13 (461)	7.44 (189)	7.50 (191)	6.94 (176)	12.11 (308)	9.13 (232)	11.50 (292)	4.11 (104)	44 (1118)	2.78 (71)	12.85 (326)	7.88 (200)	358 (162)	312 (142)
6 x 4 (150 x 100)	24 (610)	24.13 (613)	12 (305)	12.06 (306)	6.94 (176)	12.11 (308)	9.13 (232)	15 (381)	4.11 (104)	44 (1118)	2.78 (71)	12.85 (326)	7.88 (200)	500 (227)	454 (206)

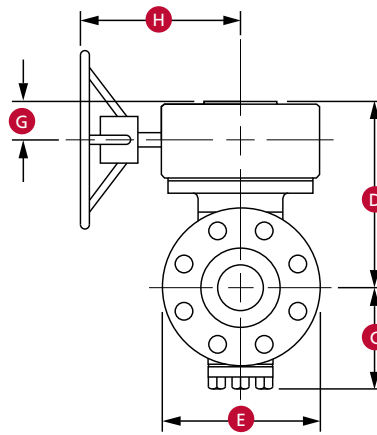
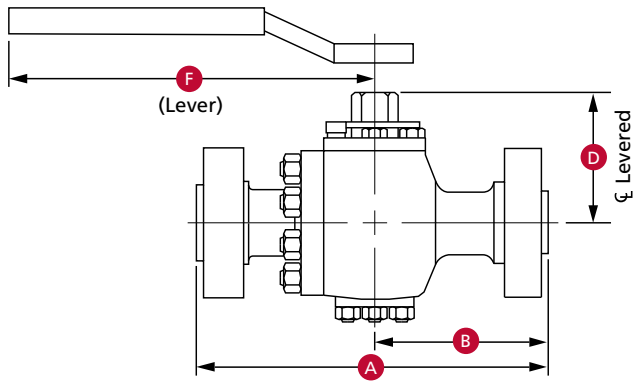
* Upstream sealing seat-supported design. See general notes on page 21.

Three-Piece Dimensions

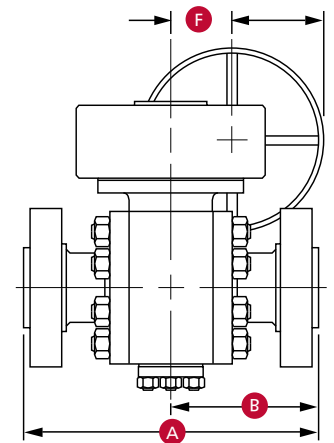
Size in. (mm)	A		B		C	D	E	F	G	H	I	Weight lb (kg)
	RF	RTJ	RF	RTJ								
6 x 6 (150 x 150)	24 (610)	24.13 (613)	12 (305)	12.06 (306)	8.13 (207)	13.36 (339)	15.13 (384)	4.11 (104)	2.78 (71)	13.64 (347)	11.81 (300)	731 (332)
8 x 6 (200 x 150)	29 (737)	29.13 (740)	14.50 (368)	14.56 (370)	8.13 (207)	13.36 (339)	18.50 (470)	4.11 (104)	2.78 (71)	13.64 (347)	11.81 (300)	945 (429)
8 x 8 (200 x 200)	29 (737)	29.13 (740)	14.50 (368)	14.56 (370)	10.13 (257)	16.01 (40)	19 (483)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	1475 (669)
10 x 6 (250 x 150)	33 (838)	33.13 (842)	16.50 (419)	16.56 (421)	8.13 (207)	13.36 (339)	21.50 (546)	4.11 (104)	2.78 (71)	13.64 (347)	11.81 (300)	1177 (534)
10 x 8 (250 x 200)	33 (838)	33.13 (842)	16.50 (419)	16.56 (421)	10.13 (257)	16.01 (407)	21.50 (546)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	1739 (789)
10 x 10 (250 x 250)	33 (838)	33.13 (842)	16.50 (419)	16.56 (421)	11.06 (281)	17.64 (448)	21.50 (546)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	1959 (889)
12 x 10 (300 x 250)	38 (965)	38.13 (969)	19 (483)	19.06 (484)	11.06 (281)	17.64 (448)	24 (610)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	2310 (1048)
12 x 12 (300 x 300)	38 (965)	38.13 (969)	19 (483)	19.06 (484)	14.06 (357)	21.98 (558)	25.75 (654)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	3357 (1523)
14 x 12 (350 x 300)	40.50 (1029)	40.88 (1038)	20.25 (514)	20.44 (519)	14.06 (357)	21.98 (558)	25.75 (654)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	3541 (1606)
14 x 14 (350 x 350)	40.50 (1029)	40.88 (1038)	20.25 (514)	20.44 (519)	14.69 (373)	22.85 (580)	28 (711)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	4612 (2092)
16 x 12 (400 x 300)	44.50 (1130)	44.88 (1140)	22.25 (565)	22.44 (570)	14.06 (357)	21.98 (558)	27.75 (705)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	3741 (1697)
16 x 14 (400 x 350)	44.50 (1130)	44.88 (1140)	22.25 (565)	22.44 (570)	14.69 (373)	22.85 (580)	28 (711)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	4832 (2192)
16 x 16 (400 x 400)	44.50 (1130)	44.88 (1140)	22.25 (565)	22.44 (570)	16.63 (422)	24.87 (632)	30.63 (778)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	5161 (2341)
18 x 16 (450 x 400)	48 (1219)	48.50 (1232)	24 (610)	24.25 (616)	16.63 (422)	24.87 (632)	31 (787)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	5721 (2595)
18 x 18 (450 x 450)	48 (1219)	48.50 (1232)	24 (610)	24.25 (616)	18.25 (464)	26.43 (671)	33.69 (856)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	7262 (3294)
20 x 16 (500 x 400)	52 (1321)	52.50 (1334)	26 (660)	26.25 (667)	16.63 (422)	24.87 (632)	33.75 (857)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	6301 (2858)
20 x 18 (500 x 450)	52 (1321)	52.50 (1334)	26 (660)	26.25 (667)	18.25 (467)	26.43 (671)	33.75 (857)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	7742 (3512)
20 x 20 (500 x 500)	52 (1321)	52.50 (1334)	26 (660)	26.25 (667)	21.75 (553)	-	40.50 (1029)	-	-	-	17.72 (450)	-
22 x 20 (550 x 500)	56 (1422)	56 (1422)	28 (711)	28 (711)	21.75 (553)	-	40.50 (1029)	-	-	-	17.72 (450)	-
22 x 22 (550 x 550)	52 (1321)	52 (1321)	26 (660)	26 (660)	22 (559)	-	41 (1041)	-	-	-	17.72 (450)	-
24 x 20 (600 x 500)	61 (1549)	61.75 (1568)	30.50 (775)	30.88 (784)	21.75 (553)	-	41 (1041)	-	-	-	17.72 (450)	-
24 x 22 (600 x 550)	61 (1549)	61.75 (1569)	30.50 (775)	30.88 (784)	22 (559)	-	41 (1041)	-	-	-	17.72 (450)	-
24 x 24 (600 x 600)	61 (1549)	61.75 (1569)	30.50 (775)	30.88 (784)	23.88 (607)	34.06 (865)	44.75 (1137)	2.65 (67)	4.27 (109)	24.43 (621)	17.72 (450)	14,484 (6570)

CLASS 1500

Two-Piece



Three -Piece



Two-Piece Dimensions

Size in. (mm)	A		B		C	D	D (Lever)	E	F	F (Lever)	G	H	I	Weight lb (kg)	
	RF	RTJ	RF	RTJ										Gear	Lever
3/4 x 3/4 * (20 x 20)	8.5 (216)	8.50 (216)	3.5 (89)	3.5 (89)	-	-	3 (76)	4.63 (118)	-	9 (229)	-	-	-	-	11 (5)
1 x 1 * (25 x 25)	10 (254)	10 (254)	5.25 (133)	5.25 (133)	-	-	3.13 (80)	4.88 (124)	-	9 (229)	-	-	-	-	15 (7)
1-1/2 x 1-1/2 * (40 x 40)	12 (305)	12 (305)	5.75 (146)	5.75 (146)	-	-	4.75 (121)	6.13 (156)	-	15 (381)	-	-	-	-	30 (14)
2 x 1-1/2 * (50 x 40)	14.50 (368)	14.63 (372)	7.25 (184)	7.31 (186)	4.25 (108)	7.32 (186)	5.44 (138)	8.50 (216)	2.63 (67)	23 (584)	1.54 (39)	10.30 (262)	9 (229)	117 (53)	79 (36)
2 x 2 (50 x 50)	14.50 (368)	14.63 (372)	6.50 (165)	6.56 (167)	4.75 (121)	9.37 (238)	6.56 (167)	8.50 (216)	3.39 (86)	23 (584)	2.66 (68)	10.66 (271)	5.91 (150)	140 (64)	107 (49)
3 x 2 (80 x 50)	18.50 (470)	18.63 (473)	9.25 (235)	9.31 (237)	4.75 (121)	9.37 (238)	6.56 (167)	10.50 (267)	3.39 (86)	23 (584)	2.66 (68)	10.66 (271)	5.91 (150)	195 (89)	162 (74)
3 x 3 (80 x 80)	18.50 (470)	18.63 (473)	9.25 (235)	9.31 (237)	5.56 (141)	9.87 (251)	7.38 (188)	10.50 (267)	3.39 (86)	33 (838)	2.66 (68)	11.25 (286)	7.88 (200)	250 (113)	214 (97)
4 x 3 (100 x 80)	21.50 (546)	21.63 (549)	10.75 (273)	10.81 (275)	5.56 (141)	9.87 (251)	7.38 (188)	12.25 (311)	3.39 (86)	33 (838)	2.66 (68)	11.25 (286)	7.88 (200)	309 (140)	274 (124)

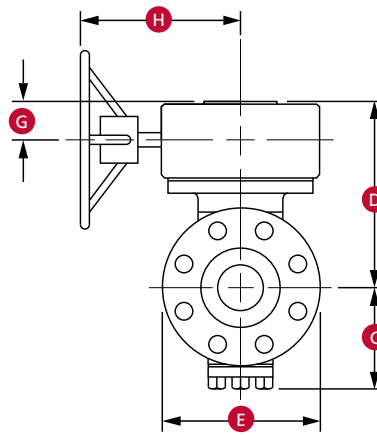
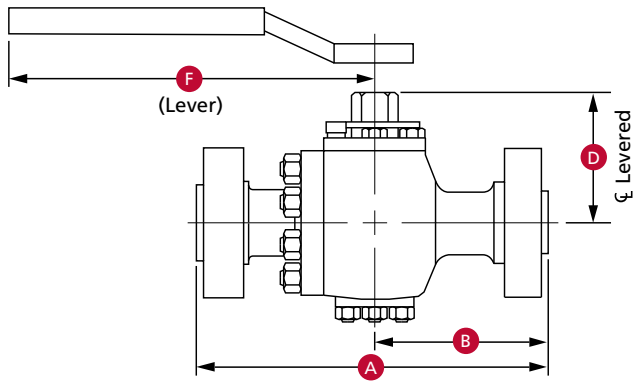
* Upstream sealing seat-supported design. See general notes on page 21.

Three-Piece Dimensions

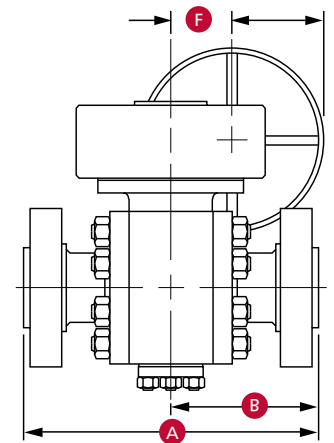
Size in. (mm)	A		B		C	D	E	F	G	H	I	Weight lb (kg)
	RF	RTJ	RF	RTJ								
4 x 4 (100 x 100)	21.50 (546)	21.63 (549)	10.75 (273)	10.81 (275)	6.94 (176)	12.11 (308)	12.94 (329)	4.11 (104)	2.78 (71)	12.85 (326)	7.88 (200)	504 (229)
6 x 4 (150 x 100)	27.75 (705)	28 (711)	13.88 (353)	14 (356)	6.94 (176)	12.11 (308)	15.50 (394)	4.11 (104)	2.78 (71)	12.85 (326)	7.88 (200)	708 (321)
6 x 6 (150 x 150)	27.75 (705)	28 (711)	13.88 (353)	14 (356)	9 (229)	15.14 (385)	16.75 (426)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	1175 (533)
8 x 6 (200 x 150)	32.75 (832)	33.13 (842)	16.38 (416)	16.56 (421)	9 (229)	15.14 (385)	19 (483)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	1447 (656)
8 x 8 (200 x 200)	32.75 (832)	33.13 (842)	16.38 (416)	16.56 (421)	10.63 (270)	17.01 (432)	19.63 (499)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	1889 (857)
10 x 8 (250 x 200)	39 (991)	39.38 (1000)	19.50 (495)	19.69 (500)	10.63 (270)	17.01 (432)	23 (584)	8.31 (211)	3.34 (85)	17.61 (447)	11.81 (300)	2398 (1088)
10 x 10 (250 x 250)	39 (991)	39.38 (1000)	19.50 (495)	19.69 (500)	13 (330)	21.10 (536)	24.50 (622)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	3536 (1604)
12 x 10 (300 x 250)	44.50 (1130)	45.13 (1146)	22.25 (565)	22.56 (573)	13.25 (337)	21.10 (536)	26.50 (673)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	4114 (1866)
12 x 12 (300 x 300)	44.50 (1130)	45.13 (1146)	22.25 (565)	22.56 (573)	14.69 (373)	22.79 (579)	27.50 (699)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	5149 (2336)
14 x 12 (350 x 300)	49.50 (1257)	50.25 (1276)	24.75 (629)	25.13 (638)	14.69 (424)	22.79 (579)	29.50 (749)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	5709 (2590)
14 x 14 (350 x 350)	49.50 (1257)	50.25 (1276)	24.75 (629)	25.13 (638)	16.31 (414)	24.43 (621)	29.75 (756)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	6511 (2953)
16 x 14 (400 x 350)	54.50 (1384)	55.38 (1407)	27.25 (692)	27.69 (703)	16.31 (414)	24.43 (621)	32.50 (826)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	7231 (3280)
16 x 16 (400 x 400)	54.50 (1384)	55.38 (1407)	27.25 (692)	27.69 (703)	18.31 (465)	26.43 (671)	33.63 (854)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	8544 (3876)
18 x 16 (450 x 400)	60.50 (1537)	61.38 (1559)	30.25 (768)	30.69 (780)	18.31 (465)	26.43 (671)	36 (914)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	9524 (4320)
18 x 18 (450 x 450)	60.50 (1537)	61.38 (1559)	30.25 (76)	30.69 (780)	23.44 (595)	-	42.75 (1086)	-	-	-	17.72 (450)	-
20 x 16 (500 x 400)	65.50 (1664)	66.38 (1686)	32.75 (832)	33.19 (843)	18.31 (465)	26.43 (671)	38.75 (984)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	10,624 (4819)
20 x 18 (500 x 450)	65.50 (1664)	66.38 (1686)	32.75 (832)	33.19 (843)	23.44 (595)	-	42.75 (1086)	-	-	-	17.72 (450)	-
20 x 20 (500 x 500)	65.50 (1664)	66.38 (1686)	32.75 (832)	33.19 (843)	24.19 (614)	-	44 (1118)	-	-	-	17.72 (450)	-
24 x 20 (600 x 500)	76.50 (1943)	77.63 (1972)	38.25 (972)	38.81 (986)	24.19 (614)	-	46 (1168)	-	-	-	17.72 (450)	-
24 x 24 (600 x 600)	76.50 (1943)	77.63 (1972)	38.25 (972)	38.81 (986)	29 (737)	-	54 (1372)	-	-	-	17.72 (450)	-

CLASS 2500

Two-Piece



Three -Piece



Two-Piece Dimensions

Size in. (mm)	A		B		C	D	D (Lever)	E	F	F (Lever)	G	H	I	Weight lb (kg)	
	RF	RTJ	RF	RTJ										Gear	Lever
3/4 x 3/4 * (20 x 20)	10.75 (273)	10.75 (273)	5.19 (132)	5.19 (132)	-	-	3 (76)	4.63 (118)	-	9 (229)	-	-	-	-	11 (5)
1 x 1 * (25 x 25)	12.13 (308)	12.13 (308)	6.38 (162)	6.38 (162)	-	-	3.13 (80)	4.88 (124)	-	9 (229)	-	-	-	-	15 (7)
1-1/2 x 1-1/2 * (40 x 40)	15.13 (1299)	15.25 (387)	7.56 (192)	7.56 (192)	-	-	4.75 (121)	6.13 (156)	-	15 (381)	-	-	-	-	30 (14)
2 x 1-1/2 (50 x 40)	17.75 (451)	17.88 (454)	8.88 (226)	8.94 (227)	9.25 (235)	9.39 (238)	6.90 (175)	9.25 (235)	3.38 (86)	33 (838)	1.55 (39)	10.30 (262)	5 (127)	125 (57)	90 (41)
2 x 2 (50 x 50)	17.75 (451)	17.88 (454)	8 (203)	8.06 (205)	5.63 (143)	10.69 (272)	7.75 (197)	9.25 (235)	3.39 (86)	23 (584)	2.66 (68)	12.09 (307)	8.86 (225)	232 (105)	193 (88)
3 x 2 (80 x 50)	22.75 (578)	23 (584)	11.31 (287)	11.44 (291)	5.63 (143)	10.69 (272)	7.75 (197)	12 (305)	3.39 (86)	23 (584)	2.66 (68)	12.09 (307)	8.86 (225)	336 (152)	297 (135)

* Upstream sealing seat-supported design. See general notes on page 21.

Three-Piece Dimensions

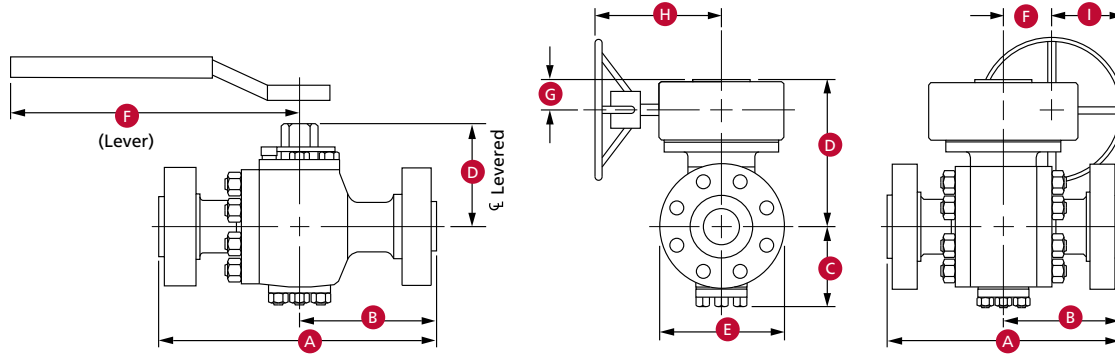
Size in. (mm)	A		B		C	D	E	F	G	H	I	Weight lb (kg)
	RF	RTJ	RF	RTJ								
3 x 3 (80 x 80)	22.75 (578)	23 (584)	11.38 (289)	11.50 (292)	6.63 (168)	11.67 (296)	12 (305)	4.11 (104)	2.78 (71)	13.64 (347)	9.85 (250)	543 (246)
4 x 3 (100 x 80)	26.50 (673)	26.88 (683)	13.25 (337)	13.44 (341)	6.63 (168)	11.67 (296)	14 (356)	4.11 (104)	2.78 (71)	13.64 (347)	9.85 (250)	645 (293)
4 x 4 (100 x 100)	26.50 (673)	26.88 (683)	13.25 (337)	13.44 (341)	7.63 (194)	12.67 (322)	14 (356)	4.11 (104)	2.78 (71)	13.64 (347)	11.81 (300)	759 (344)
6 x 4 (150 x 100)	36 (914)	36.50 (927)	18 (457)	18.25 (464)	7.63 (194)	12.67 (322)	19 (483)	4.11 (104)	2.78 (71)	13.64 (347)	11.81 (300)	1231 (558)
6 x 6 (150 x 150)	36 (914)	36.50 (927)	18 (457)	18.25 (464)	9.94 (253)	16.01 (407)	19 (483)	8.31 (211)	3.34 (85)	18 (457)	17.72 (450)	1948 (884)
8 x 6 (200 x 150)	40.25 (1022)	40.88 (1038)	20.13 (511)	20.44 (519)	9.94 (253)	16.01 (407)	21.75 (553)	8.31 (211)	3.34 (85)	18 (457)	17.72 (450)	2344 (1063)
8 x 8 (200 x 200)	40.25 (1022)	40.88 (1038)	20.13 (511)	20.44 (519)	14.19 (360)	21.85 (555)	26 (660)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	4097 (1858)
10 x 8 (250 x 200)	50 (1270)	50.88 (1292)	25 (635)	25.44 (646)	14.19 (360)	21.85 (555)	26.50 (673)	10.35 (263)	4.78 (121)	20.95 (532)	17.72 (450)	5217 (2366)
10 x 10 (250 x 250)	50 (1270)	50.88 (1292)	25 (635)	25.44 (646)	17.50 (445)	25.56 (649)	32 (813)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	7442 (3376)
12 x 10 (300 x 250)	56 (1422)	56.88 (1445)	28 (711)	25.44 (646)	17.50 (445)	25.56 (649)	32 (813)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	8502 (3856)
12 x 12 (300 x 300)	56 (1422)	56.88 (1445)	28 (711)	25.44 (646)	18.63 (473)	26.68 (678)	34.25 (870)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	10,033 (4551)
14 x 12 (350 x 300)	56 (1422)	56.88 (1445)	28 (711)	25.44 (646)	18.63 (473)	26.68 (678)	34.25 (870)	16.97 (431)	4.33 (110)	24.46 (621)	17.72 (450)	10,033 (4551)
14 x 14	Available Upon Request											
16 x 14	Available Upon Request											
16 x 16	Available Upon Request											

* Upstream sealing seat-supported design. See general notes on page 21.

General Notes Concerning Dimensional Data

1. The sizes and ratings shown are not exclusive. Consult Cameron for additional information.
2. Dimension "A" (end-to-end) is the same for both raised-face and welding-end valves.
3. Dimension "B" is measured on the body end of two-piece valves and is with respect to a raised-face length.
4. Dimension "C" includes flange and bolt heads.
5. Dimension "E" (extreme width) does not include accessories such as bleed plugs, drains plugs and more.
6. Dimension "D" and "G" through "J" are for a typical gearbox. Dimension "I" includes dish in handwheel.
7. Weights are for a flanged valve and include the gearbox unless otherwise noted.
8. Dimensions shown may be revised from time to time. Use certified dimensional drawings in critical areas.

PRESSURE RATING 2000, 3000 AND 5000



Pressure Rating 2000 Dimensions

2000 psi WP

4000 psi Test

Size in. (mm)	A		B		C	D	D (Lever)	E	F	F (Lever)	G	H	I	Weight lb (kg)	
	RF	RTJ	RF	RTJ										Gear	Lever
2-1/16	11.50	11.63	5.75	5.81	4.75	9.37	6.56	6.50	2.63	33.00	1.54	10.66	5.91	93	55
50	292	295	146	148	121	238	167	165	67	838	39	271	150	42	25
3-1/8	15.00	14.13	6.69	6.75	5.56	9.88	7.38	10.75	2.63	33.00	1.55	10.66	5.91	200	157
80	381	359	170	171	141	251	187	273	67	838	39	271	150	91	71
4-1/16	17.00	17.13	8.50	8.56	6.94	12.11	9.13	10.75	2.63	44.00	1.55	12.85	7.88	255	215
100	432	435	216	217	176	308	232	273	67	1118	39	326	200	116	98
7-1/16	24.00	22.13	12.00	11.06	8.13	13.36	-	15.13	6.06	-	3.01	13.64	11.81	752	-
200	610	562	305	281	206	339	-	384	154	-	76	346	300	341	-

Pressure Rating 3000 Dimensions

3000 psi WP

6000 psi Test

Size in. (mm)	A		B		C	D	D (Lever)	E	F	F (Lever)	G	H	I	Weight lb (kg)	
	RF	RTJ	RF	RTJ										Gear	Lever
2-1/16	14.50	14.63	6.50	6.56	4.88	9.38	6.56	8.50	2.63	33.00	2.66	10.66	5.91	168	107
50	368	371	165	167	124	238	167	216	67	838	68	271	150	76	49
3-1/8	15.00	15.13	7.19	7.25	6.00	9.88	7.38	9.50	2.63	33.00	2.66	11.25	7.88	217	194
80	381	384	183	184	152	251	187	241	67	838	68	286	200	98	88
4-1/16	18.00	18.25	7.44	7.50	6.94	12.11	-	11.50	3.53	-	2.78	12.85	7.88	397	-
100	457	464	189	191	176	308	-	292	90	-	71	326	200	180	-
7-1/16	24.00	24.13	12.00	12.06	9.00	15.14	-	16.75	5.74	-	3.34	17.61	11.81	1044	-
200	610	613	305	306	229	385	-	425	146	-	85	447	300	474	-
9	-	29.13	-	14.56	10.63	17.01	-	19.63	8.31	-	3.34	17.61	11.81	1890	-
230	-	740	-	370	270	432	-	499	211	-	85	447	300	857	-
11	-	33.13	-	16.56	13.00	21.10	-	24.50	10.35	-	4.78	20.95	17.72	3540	-
280	-	841	-	421	330	536	-	622	263	-	121	532	450	1606	-

Pressure Rating 5000 Dimensions

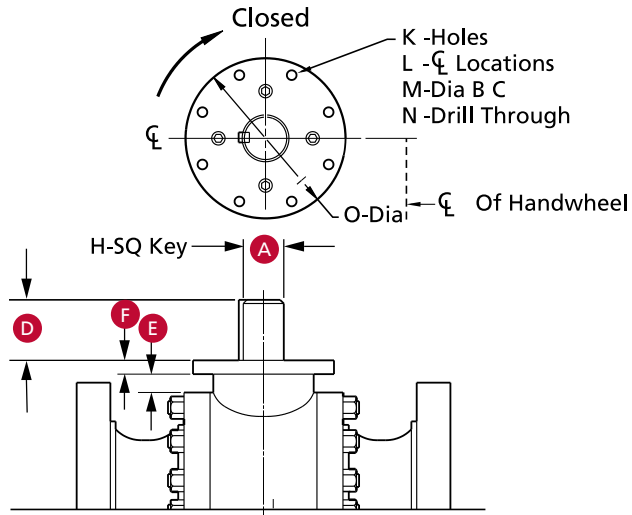
5000 psi WP

7500 psi Test

Size in. (mm)	A		B		C	D	D (Lever)	E	F	F (Lever)	G	H	I	Weight lb (kg)	
	RF	RTJ	RF	RTJ										Gear	Lever
2-1/16	-	14.63	-	6.56	5.63	10.69	7.75	8.50	3.39	33.00	2.66	11.25	7.88	235	115
50	-	371	-	167	143	271	197	216	86	838	68	286	200	107	52
3-1/8	18.50	18.63	8.13	8.25	6.63	11.67	9.94	11.00	3.53	33.00	2.78	13.64	9.85	382	295
80	470	473	206	210	168	296	252	279	90	838	71	346	250	173	134
4-1/16	21.50	21.63	10.69	10.81	7.63	12.67	-	14.00	4.84	-	278	13.64	11.81	630	-
100	546	549	271	275	194	322	-	356	123	-	71	346	300	286	-
7-1/16	-	28.00	-	14.00	9.94	16.01	-	18.88	5.74	-	3.34	18.00	17.72	1470	-
200	-	711	-	356	252	407	-	479	146	-	85	457	450	667	-
11	-	50.88	-	25.44	17.50	25.56	-	32.00	16.97	-	4.33	24.46	17.72	7450	-
280	-	1292	-	646	445	649	-	813	431	-	110	621	450	3379	-

Topworks Data

CLASSES 150 TO 300

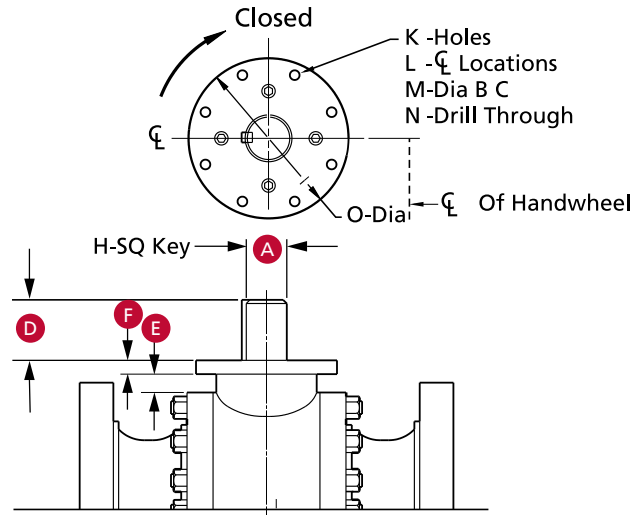


Dimensions

G-1

Ball Size in.	A	D	E	F	H	K	L	M	N	O
2 x 1-1/2	0.935	1-15/16	3/4	1/2	1/4	4	ON	5.00	9/16	6.00
2 x 2	1.059	2-1/16	3/4	1/2	1/4	8	ON	5.00	9/16	6.00
3 x 2	1.059	2-1/16	3/4	1/2	1/4	8	ON	5.00	9/16	6.00
4 x 3	1.508	3-1/8	1	1/2	3/8	4	STR	6.00	11/16	7.25
6 x 4 (L)	1.685	3-1/16	1	1/2	3/8	4	ON	6.00	11/16	7.25
3 x 3	1.508	3-1/8	1	1/2	3/8	4	STR	6.00	11/16	7.25
4 x 3	1.508	3-1/8	1	1/2	3/8	4	STR	6.00	11/16	7.25
4 x 4	1.685	3-1/16	1	1/2	3/8	4	ON	6.00	11/16	7.25
6 x 4	1.685	3-1/16	1	1/2	3/8	4	ON	6.00	11/16	7.25
6 x 6	1.997	2-23/32	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
8 x 6	1.997	2-23/32	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
8 x 8	1.997	2-23/32	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
10 x 6	1.997	2-23/32	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
10 x 8	1.997	2-23/32	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
10 x 10	2.251	3-11/16	1-11/16	3/4	1/2	8	STR	8.31	11/16	9.63
12 x 10	2.251	3-11/16	1-11/16	3/4	1/2	8	STR	8.31	11/16	9.63
12 x 12	2.251	3-11/16	1-11/16	3/4	1/2	8	STR	8.31	11/16	9.63
14 x 12	2.251	3-11/16	1-11/16	3/4	1/2	8	STR	8.31	11/16	9.63
14 x 14	2.251	4-5/16	1-3/4	3/4	1/2	8	STR	10.50	11/16	12.00
16 x 12	2.251	3-11/16	1-11/16	3/4	1/2	8	STR	8.31	11/16	9.63
16 x 14	2.251	4-5/16	1-3/4	3/4	1/2	8	STR	10.50	11/16	12.00
16 x 16	3.250	5	1-3/4	3/4	7/8	8	STR	11.75	13/16	12.00
18 x 16	3.250	5	1-3/4	3/4	7/8	8	STR	11.75	13/16	12.00
18 x 18	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
20 x 16	3.250	5	1-3/4	3/4	7/8	8	STR	11.75	13/16	12.00
20 x 18	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
20 x 20	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
22 x 20	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
22 x 22	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
24 x 20	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
24 x 22	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
24 x 24	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
26 x 26	4.750	8-1/2	2-1/2	1	1-1/4	8	STR	16.00	13/16	18.75
30 x 24	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
30 x 26	4.750	8-1/2	2-1/2	1	1-1/4	8	STR	16.00	13/16	18.75
30 x 30	4.750	8-1/2	2-1/2	1	1-1/4	8	STR	16.00	13/16	18.75
36 x 30	4.750	8-1/2	2-1/2	1	1-1/4	8	STR	16.00	13/16	18.75
36 x 36	5.494	10-1/2	3-1/4	2	1-1/2	8	STR	29.00	1-3/8	31.88

CLASS 600

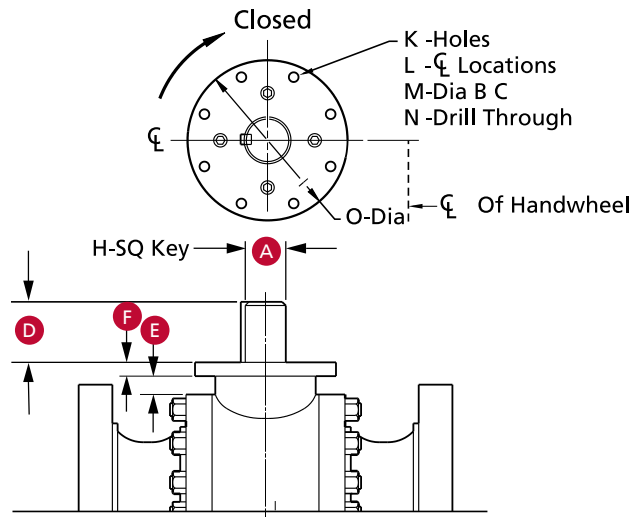


Dimensions

G-2

Ball Size in.	A	D	E	F	H	K	L	M	N	O
2 x 1-1/2	0.935	1-15/16	3/4	1/2	1/4	4	STR	5.00	9/16	6.00
2 x 2	1.059	2-1/16	3/4	1/2	1/4	4	STR	5.00	9/16	6.00
3 x 2	1.059	2-1/16	3/4	1/2	1/4	4	STR	5.00	9/16	6.00
3 x 3	1.508	3-1/8	1	1/2	3/8	4	STR	6.00	11/16	7.25
4 x 3	1.508	3-1/8	1	1/2	3/8	4	STR	6.00	11/16	7.25
4 x 4	1.685	3-1/16	1	1/2	3/8	4	STR	6.00	11/16	7.25
6 x 4	1.685	3-1/16	1	1/2	3/8	4	STR	6.00	11/16	7.25
6 x 6	1.997	2-23/32	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
8 x 6	1.997	2-23/32	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
8 x 8	1.997	3-11/16	1	3/4	1/2	8	STR	8.31	11/16	9.63
10 x 6	1.997	2-23/32	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
10 x 8	1.997	3-11/16	1	3/4	1/2	8	STR	8.31	11/16	9.63
10 x 10	2.251	3-11/16	1-11/16	3/4	1/2	8	STR	8.31	11/16	9.63
12 x 10	2.251	3-11/16	1-11/16	3/4	1/2	8	STR	8.31	11/16	9.63
12 x 12	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
14 x 12	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
14 x 14	3.244	5-7/16	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
16 x 12	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
16 x 14	3.244	5-7/16	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
16 x 16	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
18 x 16	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
18 x 18	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
20 x 16	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
20 x 18	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
20 x 20	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
22 x 20	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
22 x 22	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
24 x 20	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
24 x 22	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
24 x 24	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
26 x 26	4.750	8-1/2	2-1/2	1	1-1/4	8	STR	16.00	13/16	18.75
28 x 28	5.494	10	3-1/4	1-1/4	1-1/4	8	STR	23.00	1-3/8	29.69
30 x 26	4.750	8-1/2	2-1/2	1	1-1/4	8	STR	16.00	13/16	18.75
30 x 30	5.994	11-1/2	2-1/2	2	1-1/2	8	STR	29.00	1-3/8	31.88
36 x 30	5.994	11-1/2	2-1/2	2	1-1/2	8	STR	29.00	1-3/8	31.88
36 x 36	5.994	10	2-1/2	2	1-1/2	8	STR	29.00	1-3/8	31.88

CLASS 900

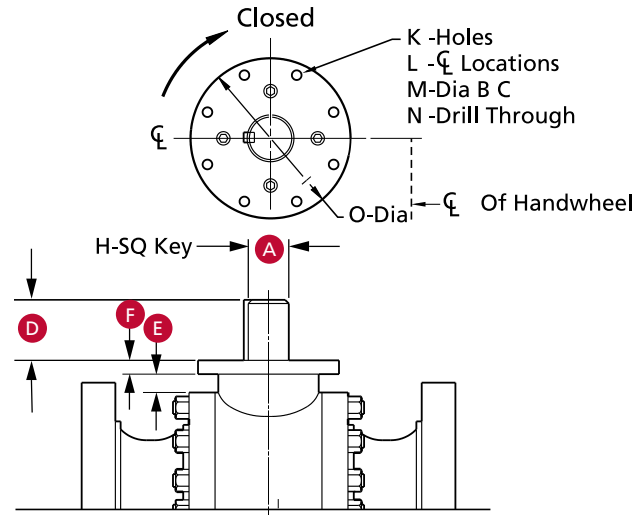


Dimensions

G-3

Ball Size in.	A	D	E	F	H	K	L	M	N	O
1-1/2 x 1-1/2	1.059	2	3/4	1/2	1/4	8	ON	5.00	9/16	6.00
2 x 1-1/2	1.059	2	3/4	1/2	1/4	8	ON	5.00	9/16	6.00
2 x 2	1.184	1-11/16	15/16	1/2	1/4	4	STR	5.00	9/16	6.00
3 x 2	1.184	1-11/16	15/16	1/2	1/4	4	STR	5.00	9/16	6.00
3 x 3	1.508	3-1/8	3/4	1/2	3/8	4	ON	6.00	11/16	7.25
4 x 3	1.508	3-1/8	3/4	1/2	3/8	4	ON	6.00	11/16	7.25
4 x 4	1.685	2-23/32	1-1/4	1/2	3/8	4	STR	6.50	13/16	8.50
6 x 4	1.685	2-23/32	1-1/4	1/2	3/8	4	STR	6.50	13/16	8.50
6 x 6	1.997	2-23/32	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
8 x 6	1.997	2-23/32	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
8 x 8	1.997	3-11/16	1	3/4	1/2	8	STR	8.31	11/16	9.63
10 x 6	1.997	3-1/2	1-5/16	1/2	1/2	4	STR	6.50	13/16	8.50
10 x 8	1.997	3-11/16	1	3/4	1/2	8	STR	8.31	11/16	9.63
10 x 10	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
12 x 10	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
12 x 12	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
14 x 12	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
14 x 14	3.244	5-7/16	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
16 x 12	3.224	5-1/2	1-1/2	1	7/8	8	STR	11/75	13/16	13.50
16 x 14	3.244	5-7/16	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
16 x 16	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
18 x 16	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
18 x 18	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
20 x 16	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
20 x 18	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
20 x 20	5.494	5-3/4	2-1/8	1-7/8	1-1/2	8	STR	16.00	1-3/8	20.00
22 x 20	5.494	5-3/4	2-1/8	1-7/8	1-1/2	8	STR	16.00	1-3/8	20.00
22 x 22	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
24 x 20	5.494	5-3/4	2-1/8	1-7/8	1-1/2	8	STR	16.00	1-3/8	20.00
24 x 22	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
24 x 24	5.243	6-1/4	2-1/2	1	1-1/2	8	STR	16.00	1-5/16	18.75
30 x 30	5.994	10-7/8	2-1/2	2	1-1/2	8	STR	29.00	1-3/8	31.88

CLASS 1500

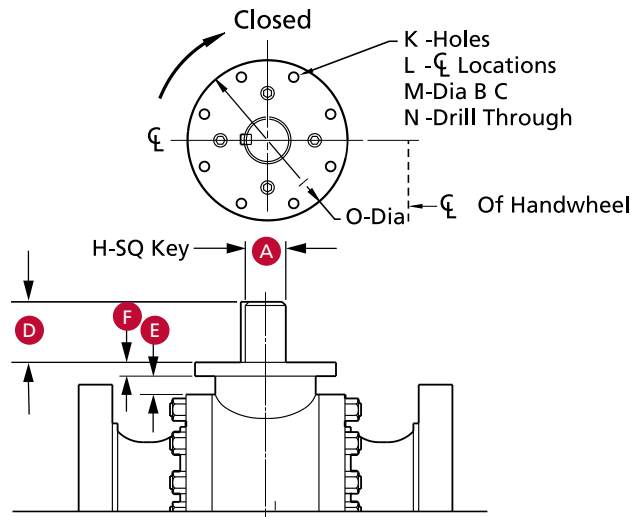


Dimensions

G-4

Ball Size in.	A	D	E	F	H	K	L	M	N	O
1-1/2 x 1-1/2	1.059	2	3/4	1/2	1/4	8	ON	5.00	9/16	6.00
2 x 1-1/2	1.059	2	3/4	1/2	1/4	8	ON	5.00	9/16	6.00
2 x 2	1.184	1-11/16	15/16	1/2	1/4	4	STR	5.00	9/16	6.00
3 x 2	1.184	1-11/16	15/16	1/2	1/4	4	STR	5.00	9/16	6.00
3 x 3	1.508	3-1/8	3/4	1/2	3/8	4	STR	6.00	11/16	7.25
4 x 3	1.508	3-1/8	3/4	1/2	3/8	4	STR	6.00	11/16	7.25
4 x 4	1.685	2-23/32	1-1/4	1/2	3/8	4	STR	6.50	13/16	8.50
6 x 4	1.685	2-23/32	1-1/4	1/2	3/8	4	STR	6.50	13/16	8.50
6 x 6	2.247	3-11/16	1-3/8	5/8	1/2	8	STR	8.31	11/16	9.63
8 x 6	2.247	3-11/16	1-3/8	5/8	1/2	8	STR	8.31	11/16	9.63
8 x 8	2.750	3-13/16	1-1/2	3/4	1/2	8	STR	10.50	11/16	12.50
10 x 8	2.750	3-13/16	1-1/2	3/4	1/2	8	STR	10.50	11/16	12.50
10 x 10	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
12 x 10	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
12 x 12	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
14 x 12	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
14 x 14	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
16 x 14	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
16 x 16	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
18 x 16	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
18 x 18	4.750	8-1/2	2-1/2	1	1-1/4	8	STR	16.00	13/16	18.75
20 x 16	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
20 x 18	4.750	8-1/2	2-1/2	1	1-1/4	8	STR	16.00	13/16	18.75
20 x 20	4.750	8-1/2	2-1/2	1	1-1/4	8	STR	16.00	13/16	18.75
24 x 20	4.750	8-1/2	2-1/2	1	1-1/4	8	STR	16.00	13/16	18.75
24 x 24	5.494	10	2-1/2	2	1-1/2	8	STR	29.00	1-3/8	31.88

CLASS 2500

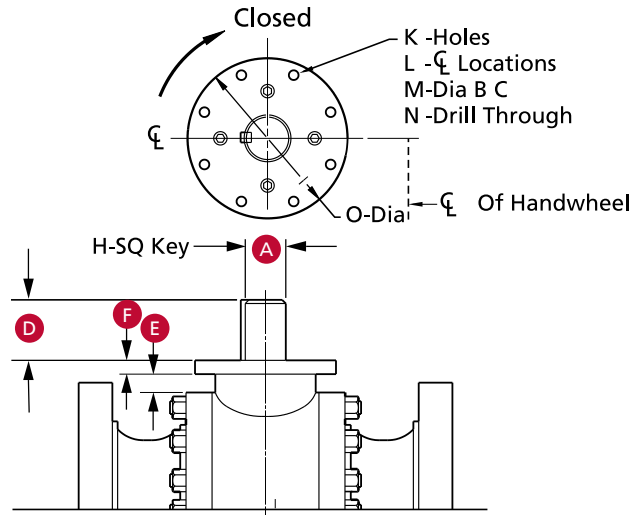


Dimensions

G-5

Ball Size in.	A	D	E	F	H	K	L	M	N	O
1-1/2 x 1-1/2	1.375	2	1-1/8	1/2	3/8	4	STR	5.25	9/16	6.00
2 x 2	1.502	2-13/16	1-1/2	1/2	3/8	4	ON	6.00	11/16	7.25
3 x 2	1.502	2-13/16	1-1/2	1/2	3/8	4	ON	6.00	11/16	7.25
3 x 3	1.508	2-23/32	1-1/4	1/2	3/8	4	STR	6.50	13/16	8.50
4 x 3	1.508	2-23/32	1-1/4	1/2	3/8	4	STR	6.50	13/16	8.50
4 x 4	1.997	2-23/32	1-1/4	1/2	1/2	4	STR	6.50	13/16	8.50
6 x 4	1.997	2-23/32	1-1/4	1/2	1/2	4	STR	6.50	13/16	8.50
6 x 6	2.247	4	1-3/8	5/8	1/2	8	STR	8.31	11/16	9.63
8 x 6	2.247	4	1-3/8	5/8	1/2	8	STR	8.31	11/16	9.63
8 x 8	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
10 x 8	3.244	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
10 x 10	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
12 x 10	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
12 x 12	3.744	5-1/2	1-1/2	1	7/8	8	STR	11.75	13/16	13.50
14 x 12	3.744	5-1/2	1/21	1	7/8	8	STR	11.75	13/16	13.50
14 x 14	5.000	6-1/2	3-1/2	1	1-1/2	8	STR	16.00	1-5/16	18.75
16 x 14	5.000	6-1/2	3-1/2	1	1-1/2	8	STR	16.00	1-5/16	18.75
16 x 16	5.494	7-7/8	3-1/2	1	1-1/2	8	STR	16.00	1-5/16	18.75
18 x 16	5.494	7-7/8	3-1/2	1	1-1/2	8	STR	16.00	1-5/16	18.75

PRESSURE RATING 2000, 3000 AND 5000



Pressure Rating 2000 Dimensions

Size in.	A	D	E	F	H	K	L	M	N	O
2-1/16	1.502	2-1/4	3/4	1/2	1/4	4	STR	5	9/16	6
3-1/8	1.508	3-3/16	1	1/2	3/8	4	STR	6	11/16	7-1/4
4-1/16	1.685	2-23/32	1-1/4	1/2	3/8	4	STR	6-1/2	13/16	8-1/2
7-1/16	1.997	2-3/4	1-5/16	1/2	1/2	4	STR	6-1/2	13/16	8-1/2

Pressure Rating 3000 Dimensions

Size in.	A	D	E	F	H	K	L	M	N	O
2-1/16	1.502	2-7/8	1-1/2	1/2	3/8	4	ON	6	11/16	7-1/4
3-1/8	1.508	3-3/16	1	1/2	3/8	4	STR	6	11/16	7-1/4
4-1/16	1.685	2-23/32	1-1/4	1/2	3/8	4	STR	6-1/2	13/16	8-1/2
7-1/16	1.997	3-3/4	1-3/8	5/8	1/2	8	STR	8-5/16	11/16	9-5/8
9	2.75	3-13/16	1-1/2	3/4	1/2	8	STR	10-1/2	11/16	12-1/2
11	3.244	5.5	1.5	1	7/8	8	STR	11.75	13/16	13.5

Pressure Rating 5000 Dimensions

Size in.	A	D	E	F	H	K	L	M	N	O
2-1/16	1.502	2-7/8	1-1/2	1/2	3/8	4	ON	6	11/16	7-1/4
3-1/8	1.508	2-3/4	1-1/4	1/2	3/8	4	STR	6-1/2	13/16	8-1/2
4-1/16	1.997	2-3/4	1-1/4	1/2	1/2	4	STR	6-1/2	13/16	8-1/2
7-1/16	1.997	3-3/4	1-3/8	5/8	1/2	8	STR	8-5/16	11/16	9-5/8
11	3.744	5.5	1.5	1	7/8	8	STR	11.75	13/16	13.5

CAMSERV™ Aftermarket Services for Valves and Actuation

WE BUILD IT. WE BACK IT.



Global Network and Local Support

Cameron is well-positioned to deliver total aftermarket support, quickly and efficiently, with unmatched OEM expertise. Our highly skilled engineers and technicians are available around the clock, seven days a week, to respond to customer queries, troubleshoot problems and offer reliable solutions.

Easily Accessible Parts and Spare Valves

- OEM spare valves, actuators and parts (including non-Cameron brands)
- Handling, storage, packaging and delivery
- Dedicated stocking program



Comprehensive Aftermarket Services Portfolio

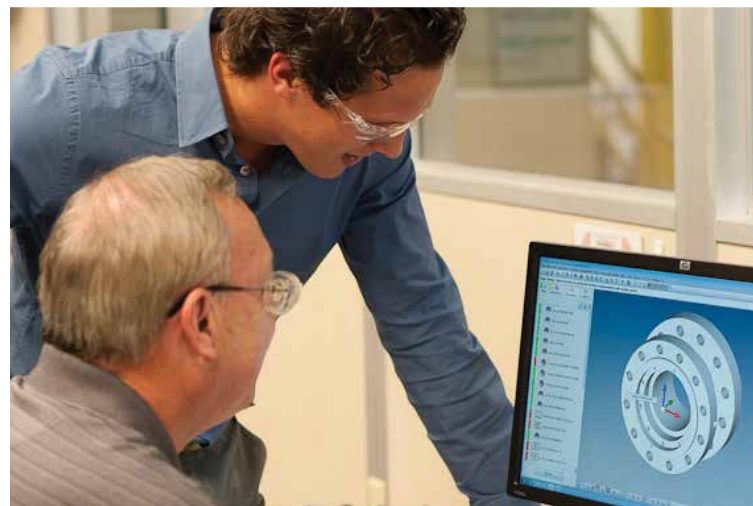
- Parts and spare valves
- Repair
- Field services
- Preventative maintenance
- Equipment testing and diagnostics
- Remanufacturing
- Asset preservation
- Customer property management
- Training and recertification services
- Warranty



Customized Total Valve CareSM (TVC) Programs

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- Spare parts and asset management
- Operational support



3250 Briarpark Drive, Suite 300

Houston, TX 77042

USA

Tel 281 499 8511

For more information about TK ball valves:

www.c-a-m.com/TK

TK@c-a-m.com



HSE Policy Statement

At Cameron, we are committed ethically, financially and personally to a working environment where no one gets hurt and nothing gets harmed.