

GROVE B8 Fully Welded Body Ball Valves

TECHNOLOGY



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GROVE B8 Fully Welded Body Ball Valves

OVERVIEW AND APPLICATIONS

Cameron's GROVE® B8 valve is a fully welded body design which reduces the number of potential leak paths and is fully compliant with ISO 14313/API 6D.

The welded body configuration allows for considerable reduction in weight, especially in short pattern (B8a) weld end by weld end (WE x WE) configurations. The B8 design is well-suited for several applications and is available in optional high-alloy trims. The B8 ring forged design is ideal for severe applications in high-pressure and corrosive service and can be trimmed to meet exact customer specifications. The B8a is the same as the B8, except it indicates a WE x WE configuration with end-to-end length shorter than standard ISO 14313/API 6D WE x WE published dimensions.

The B8 fully welded body ball valve is engineered for heavy-duty, maintenance-free performance.

It is commonly selected for a number of applications, including:

- Gas transmission
- Gas separation systems
- Compressor stations
- Products pipeline
- Natural gas storage
- CO2 services
- Measurements skids
- Dryer Service
- Offshore and subsea applications
- Dehydration systems
- NGL plants and pipelines

The B8 family of valves includes the B8.1 for valves 4" (100 mm) and smaller in diameter. The B8 and B8a are used for valves 6" (150 mm) in diameter and larger.

Differences in this catalog will be indicated.

RANGE OF PRODUCTION

Size		ASME CLASS						
(in.)	(mm)	150	300	400	600	900	1500	2500
2	(50)	●	●	●	●	●	●	●
3	(80)	●	●	●	●	●	●	●
4	(100)	●	●	●	●	●	●	●
6	(150)	■	■	■	■	■	■	●
8	(200)	■	■	■	■	■	■	■
10	(250)	■	■	■	■	■	■	■
12	(300)	■	■	■	■	■	■	■
14	(350)	■	■	■	■	■	■	■
16	(400)	■	■	■	■	■	■	■
18	(450)	■	■	■	■	■	■	■
20	(500)	■	■	■	■	■	■	■
22	(550)	■	■	■	■	■	■	■
24	(600)	■	■	■	■	■	■	■
26	(650)	■	■	■	■	■	■	■
28	(700)	■	■	■	■	■	■	■
30	(750)	■	■	■	■	■	■	■
32	(800)	■	■	■	■	■	■	■
34	(850)	■	■	■	■	■	■	■
36	(900)	■	■	■	■	■	■	■
38	(950)	■	■	■	■	■	■	■
40	(1000)	■	■	■	■	■	■	■
42	(1050)	■	■	■	■	■	■	■
48	(1200)	■	■	■	■	■	■	■
54	(1350)	■	■	■	■	■	■	■
56	(1400)	■	■	■	■	■	■	■
60	(1500)	■	■	■	■	■	■	■

GROVE B8, B8a and B8.1

DESIGN FEATURES

Standard Features

The B8.1 is a welded-body, forged-steel trunnion valve, covering sizes 2" (50 mm) through 6" (150 mm) (reduced bore) in ASME pressure classes 150 through 2500.

The B8 is a welded-body, forged-steel, trunnion bearing block valve, covering sizes 6" (150 mm) through 60" (1500 mm) in ASME pressure classes 150 through 2500.

- Body construction – Body is made from three forged parts, and the all-welded construction reduces leak paths to the environment and is available in a wide selection of materials
- Trunnion mounted ball
- Triple-barrier stem seals
- Stem separate from ball
- Anti blowout stem design
- Low-friction, metal-backed, self-lubricating PTFE sleeve bearings and thrust washers reduce torque and extend service life
- Primary metal, secondary soft (PMSS) – Metal-to-metal seat to ball seal and secondary protected O-ring seal in the B8 and B8a
- Plastic polymer insert for soft sealing in the B8.1
- Double piston effect (DPE) – Double-barrier sealing in both directions in the B8 and B8a
- Single piston effect (SPE) – Provides sealing from pipeline direction in the B8.1
- Block-and-bleed and double block-and-bleed
- Cavity-relief valve for overpressure due to liquid thermal expansion in the B8 and B8a
- Stem and seat sealant injection system
- Factory-positioned external stops
- Integral stop in the adapter plate for a permanent reference to open and closed positions
- Electroless nickel plating (ENP) on pressure-controlling parts and stem
- Bearing block trunnion design on B8 and B8a

Optional Features

- Self-relieving seat rings for B8 and B8a
- Soft seats (polymer inserts) for B8 and B8a
- Spring-energized gaskets, made of PTFE with various grades of fillers, for stem and seats (lip seals for DPE seats)
- Metal-to-metal seat sealing
- Stainless or Inconel overlay in critical sealing areas
- Antistatic device
- Cavity-relief valve for overpressure due to liquid thermal expansion in the B8.1
- Stem extensions
- Transition pieces
- Fully welded bonnet

Standards of Compliance

- ISO 14313/API 6D
- ASME B16.34
- ISO 17423/API 6DSS
- API 6FA and API 607*
- ISO 15156/NACE MR0175**

* Contact Cameron for specific information.

** Materials of construction are in compliance within the limits of use defined by ISO 15156



NACE MR0175.

BODY, BALL AND STEM CONSTRUCTION

Body Construction

The body utilizes rolled ring forgings, which are available in a large array of materials, making the B8 well-suited for special applications as well as standard service. The body is made from three forged parts, and its all-welded construction has fewer leak paths than traditional ball valves. A cavity-relief valve is installed in the body to relieve any overpressurization encountered during service or testing (optional in the B8.1). Integrity of sealing surfaces can be monitored without pressure in the pipeline by pressurizing the body cavity (optional in the B8.1).

All welding processes for the body are suited to the materials of construction and are qualified and performed according to ASME Section IX. Non-destructive tests (NDTS) are performed per ASME VIII Division 1, App. 12 on the circumferential weld joints of the body.

The compact shape of the body allows for the easy absorption of the bending loads coming from the pipeline.



Trunnion Mounted Ball Construction

The B8 and B8a (>4" or 100 mm) have a bearing block design that absorbs the pressure end load (side load) for the stem, reducing torques and allowing gearboxes and actuators to be sized smaller than competing valves of the same size and working pressure.

The B8.1 (2" to 4" or 50 to 100 mm) utilizes a traditional trunnion mounted ball with torques significantly less than floating ball valves. The ball rotates on a pair of self-lubricated bearings.

The side load, produced from the line pressure against the closed ball, is totally absorbed by the body through the upper and lower bearing retainers.

The slot and tongue connection between the ball and stem is designed to reduce stresses in the stem and ball.

Stem Construction

The stem of the GROVE B8 has an anti-blowout design that prevents ejection of the stem when the valve is under pressure. The combination of the rugged stem and ball design provides this in compliance with ISO 14313/API 6D requirements. The stem features triple-barrier seals to isolate the stem from line pressure and to seal from the atmosphere.

Low-friction, metal-backed, self-lubricating PTFE sleeve bearings and thrust washers reduce stem torque and extend service life of the valve. The stem function by design is to only transmit torque required to operate the valve.

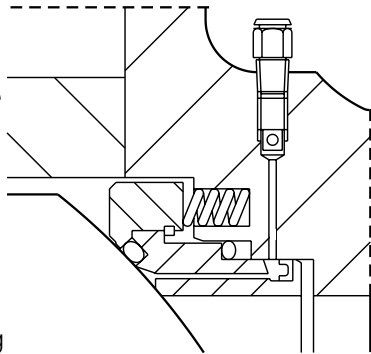
The absence of a side load on the stem ensures low operating torque and long life.



SEAT DESIGN

Seat Seal

The floating seats are free to move slightly along the longitudinal axis of the bi-directional valve. The initial seal at extremely low pressure differential, or vacuum conditions, is obtained through the force of the springs acting on the floating seats. Line pressure, behind the seat ring, supplements the seat spring load to force the seat tightly against the ball.



The sealing is performed by PMSS seat to ball in the B8 and B8a. The soft sealing between the seat and the ball is achieved by an elastomeric O-ring, plastic O-ring, or insert, depending on the service conditions. In the B8.1, the seat seal is a soft polymeric seal.

A secondary sealant injection system is provided for emergency seat sealing. In addition to the seat injection fittings, a check valve installed in the body prevents escape of the internal fluid.

Double Piston Effect (DPE) Seat Design

The GROVE B8 seat design allows for both seats to seal with pressure acting from the same side of the valve. With line pressure in the body cavity, or in the event of one seat becoming damaged, the user has the added advantage of the opposite seat sealing.

There is a double barrier in both directions. Sealing is ensured regardless of the direction of flow through the valve. The upstream seat (1) becomes damaged and leaks, and pressures entering the body cavity act on the downstream seat (2), sealing the downstream seat tightly against the ball.

NOTE: The DPE feature and the double block-and-bleed (DBB) feature are not to be confused with one another.

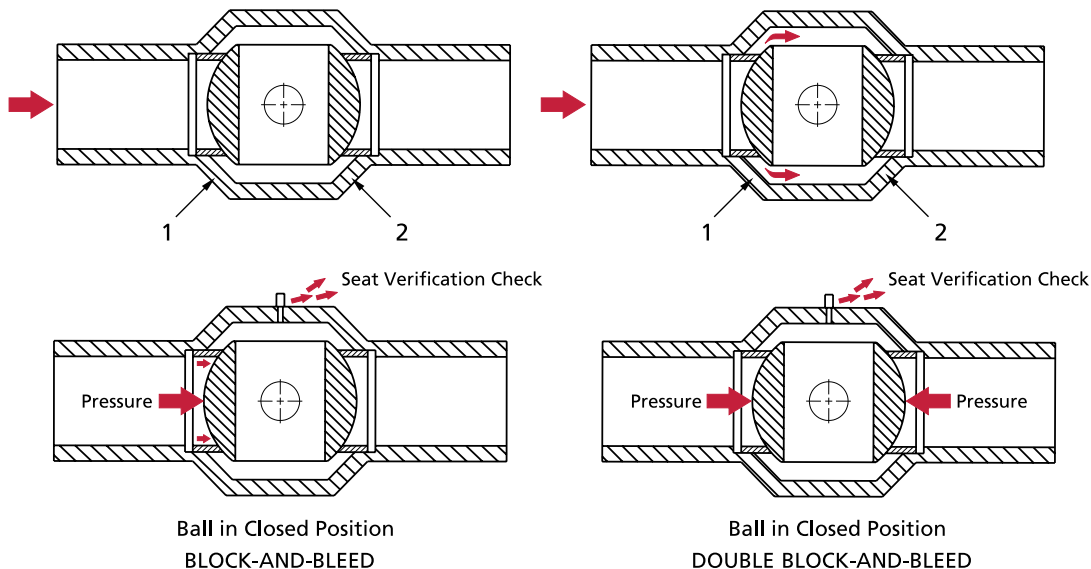
Double Block-and-Bleed/Block-and-Bleed

The double block-and-bleed and block-and-bleed features are used to ensure valve integrity and to safeguard downstream work.

Block-and-Bleed – With the ball in a closed position and the pressure applied to one side of the ball, the liquid/gas can be relieved through the drain valve in the body shell. The block-and-bleed feature is standard on the B8, B8a and B8.1 valves.

Double Block-and-Bleed – A single valve with two seating surfaces that, in the closed position, provides a seal against pressure from both ends of the valve with a means of venting/bleeding the cavity between the seating surfaces (ISO 14313/API 6D). The double block-and-bleed feature is standard on the B8, B8a and B8.1 valves.

Double Isolation-and-Bleed – A single valve with two seating surfaces, each of which, in the closed position, provides a seal against pressure from a single source, with a means of venting/bleeding the cavity between the seating surfaces (ISO 14313/API 6D). The double isolation-and-bleed feature is standard on the B8 and B8a with DPE seats.



ADDITIONAL STANDARD FEATURES AND MAINTENANCE

Ball Position

The ball open and closed positions are ensured by factory-positioned stops and provide clear indication of ball position. A valve provided with a manual gearbox or actuator assembled to the valve will utilize the actuator stops as primary stops.

Actuation

All GROVE B8 and B8a valves are manufactured with an adapter plate to enable fitting of electric, hydraulic or pneumatic actuators. The mounting of actuators on new valves is performed at the manufacturing plant, ensuring the integrity of the completed assembly. However, it can be performed in the field, if required. A B8 or B8a manual valve can be converted to accept an actuator.

Coating Processes

Internal trim parts (balls, seats and stem) are plated with an electroless nickel plating (ENP) as a standard. The process provides corrosion resistance and low wear to the parts during operation.

Cameron operates its own in-house ENP facility, and strict quality control procedures for critical process conditions and for plated components maintain plating consistency.

Depending on the type of fluid, Cameron offers a variety of corrosion-resistant and hard overlays that can be applied in the critical sealing areas. All coating and plating procedures are supported by detailed procedures.

Fire Safe

Standard GROVE B8 fully welded body ball valves are fire safe to API 6FA and API 607. Contact Cameron for specific information.

Maintenance

Even if the welded body construction precludes job site disassembly, some maintenance operations can be performed. A complete replacement of the stem, gland plate and stem seals can be achieved with the valve installed in the line without pressure.

Secondary sealant injection fittings are standard on the B8 and B8a welded body valve and are to be used to provide emergency seat sealing. Sealant also can be injected into the stem sealing area through a standard injection fitting to allow for temporary sealing.

Flushing through the relief valve port and drain valve connections is possible, provided that there is no pressure in the line.

Note: Sealant is not required for the normal operation of the valve.

OPTIONAL FEATURES

Stem Extensions

Stem extensions are easily fitted to GROVE B8 fully welded body ball valves, making the valve suitable for inaccessible areas or buried service.

The drain and secondary sealant injection system are, as a standard, piped to the top of the extension for ease of operation. When ordering extensions, specify the distance required from the valve centerline to the top of the mounting flange.

Double Block-and-Bleed (Fully Open Position)

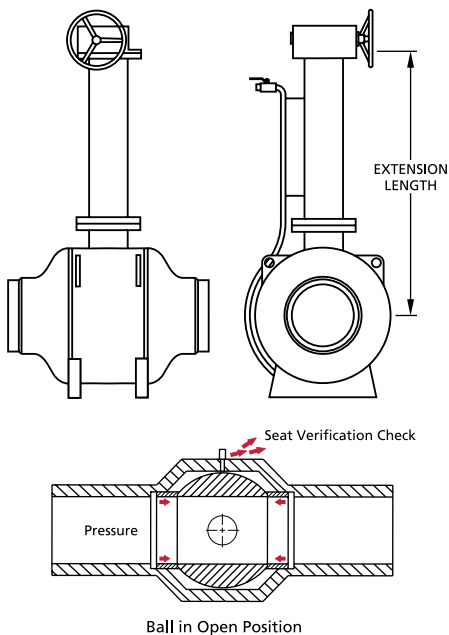
This option is required to give the field operator the ability to test the seat's sealing condition.

With the ball in the open position and the pressure in the line, the liquid/gas trapped in the body cavity can be drained/relieved through the drain valve. Once fully drained, the seat sealing can be evaluated.

ATTENTION: This is an optional feature; the request must be specified at the bid stage.

Transition Pieces

Cameron can weld transition pieces to the valve during the manufacturing process. Transition pieces can be supplied by the customer or provided by Cameron to meet customer requirements. Qualified weld procedures are used to weld transition pieces to the valve end connection(s).



Fully Welded Bonnet

If requested, the GROVE B8 fully welded body ball valve can be supplied with the fully welded bonnet. This design further reduces possible leak paths.

Metal-to-Metal Seats

The sealing surfaces between the seat and ball can be completely metallic. This trim is recommended whenever the standard seating is not suitable because of the unfavorable combination of pressure, temperature, chemical composition of the fluid, or when solids or abrasive particles are present.

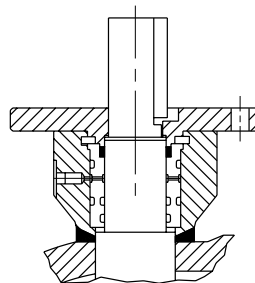
Metal-to-metal seats utilize a coating on the ball and seats that is applied by means of high-velocity oxygen fueled (HVOF) using tungsten carbide or Stellite powders. The most suitable materials are selected based on the specific service the valve is intended for.

Cameron operates its own in-house HVOF process for the supply of quality metal-to-metal seated valves.

Additional Optional Features

The following additional options also are offered on the GROVE B8 fully welded body ball valve:

- Self-relieving seats (B8 and B8a)
- Soft seats (polymer inserts) for B8 and B8a
- Spring-energized gaskets, made of PTFE with various grades of fillers, for stem and seats (lip seals for DPE seats)
- Stainless or Inconel overlay in critical sealing areas
- Antistatic devices
- Cavity-relief valve for overpressure due to liquid thermal expansion on the B8.1



SPECIAL APPLICATIONS

Subsea Service

A valve specified for subsea service accounts for the critical need for corrosion protection of both internal and external surfaces, as well as providing a rugged and durable product designed to withstand the harsh service conditions expected in subsea service.

Cameron has the capability to provide a valve package, including the valve, actuator and transition pieces fully assembled, tested and inspected.

Sour Gas Service

A careful selection of materials is provided: carbon steel with low sulfur content, weld metal and heat affected zone (HAZ) hardness within ISO 15156/NACE MR0175 limits, UT and LP non-destructive examination and appropriate selection of seal materials.



GROVE B8.1

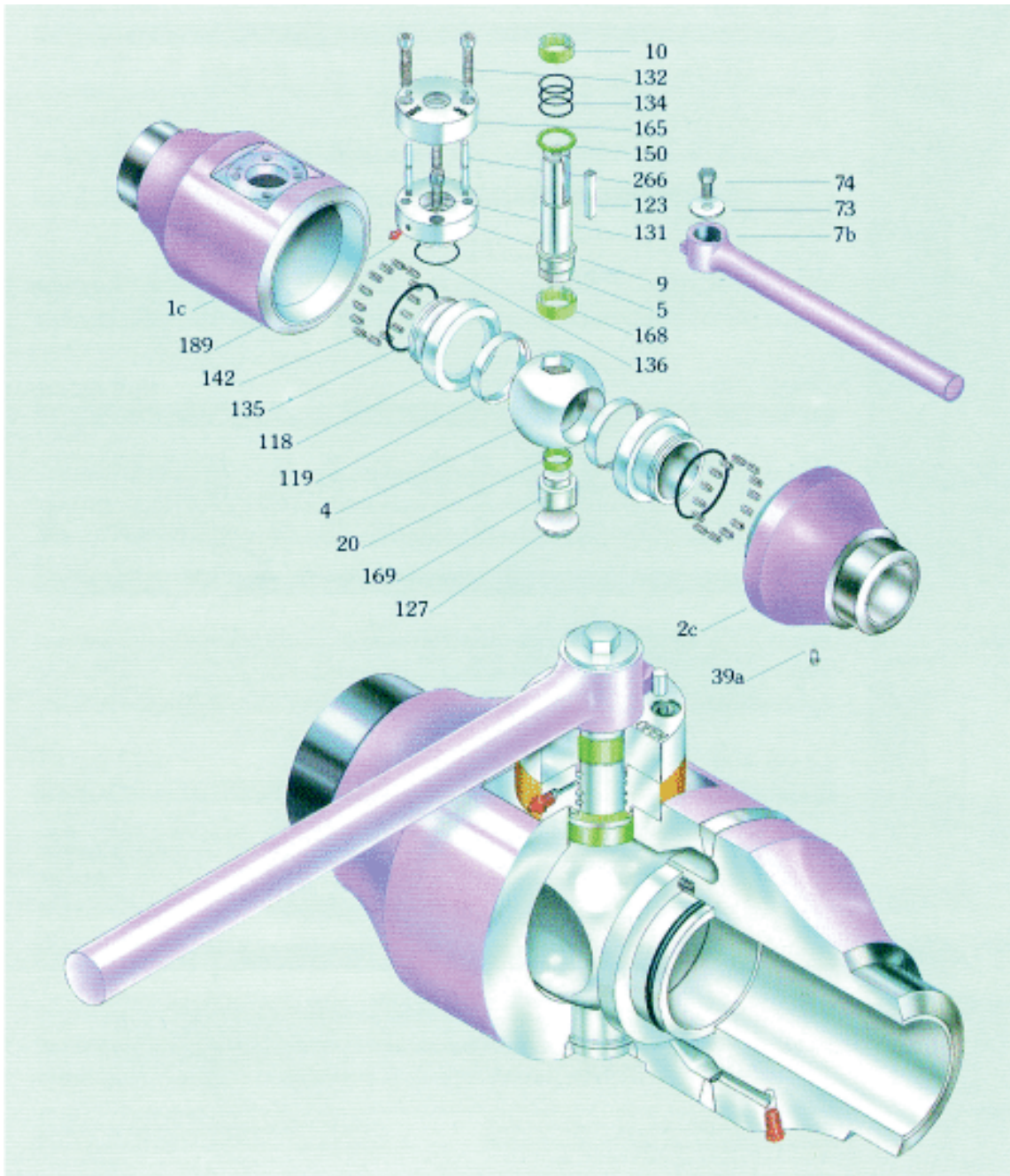
MATERIALS SELECTION

The GROVE B8.1 fully welded body ball valve has been designed for use with various combinations of materials which are selected depending on the customer's service conditions.

The following is a typical listing of materials for valves in ASME Classes 150 through 2500 for standard applications.

Pressure Retaining Parts	
Body	A350 LF2, A182 F316L, A182 F51
Stem/Trunnion	AISI 4140, A564 Gr. 630 (17-4 PH), Alloy 718, Duplex and Superduplex
Capscrews	A193 B7, A193 B7M, A320 L7, A320 L7M
Internal Parts	
Ball	A350 LF2, A105, AISI 4140, A182 F316, 17-4 PH, Duplex and Superduplex, Alloy 625, Alloy 718
Seats	A350 LF2, A105, AISI 4140, A182 F316, 17-4 PH, Duplex and Superduplex, Alloy 625, Alloy 718
Springs	AISI 302, Inconel (Different Grades), Elgiloy
Sealing Materials	
Stem Gasket	NBR (Nitrile) FKM (Viton, Various Grades Available) HNBR (Hydrogenated Nitrile)
Seat/Body Gasket	NBR (Nitrile) FKM (Viton, Various Grades Available) HNBR (Hydrogenated Nitrile)
Seat/Ball Gasket	PTFE Nylon PEEK PCTFE
Plating/Coating	
25 microns (0.001")	Electroless Nickel Plating (ENP)
75 microns (0.003")	Electroless Nickel Plating (ENP)
120 microns (0.0045")	Tungsten Carbide Coating
Alloy Overlay	
Seal Area	AISI 316L, Alloy 625
Sour Service (NACE) Requirements	
GROVE B8.1 fully welded body ball valves can be supplied in accordance with the material requirements of ISO 15156/NACE MR0175.	

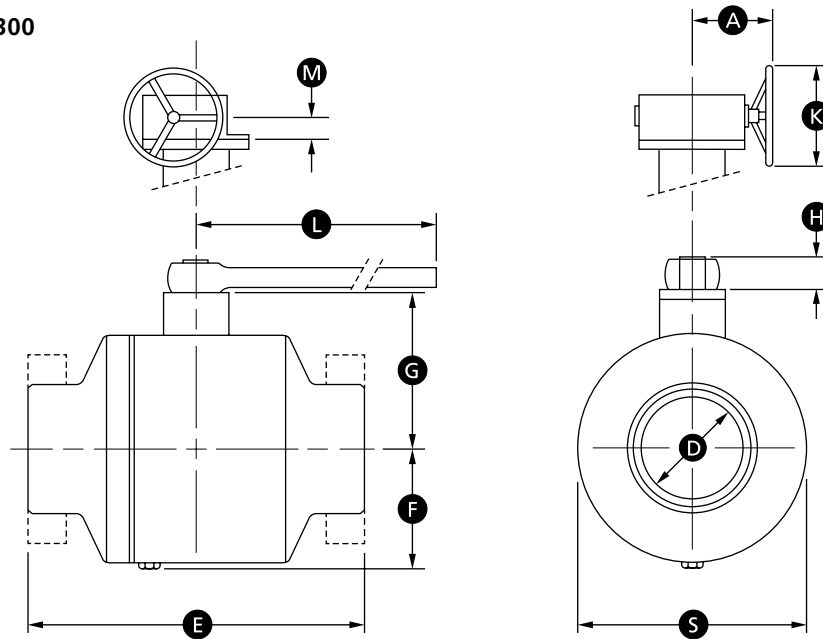
VALVE ASSEMBLY AND CROSS SECTION



Item	Description	Item	Description	Item	Description
1c	Body	39a	Drain	136	Gland Plate O-ring
2c	Closure	118	Seat Ring	142	Seat Spring
4	Ball	119	Seat Insert	150	Upper Thrust Washer
5	Stem	123	Stem Key	165	Bearing Housing
7b	Wrench	127	Lower Trunnion Plate	168	Stem Bearing
9	Top Cover	131	Gland Plate Capscrew	169	Lower Trunnion
10	Gland Bushing	132	Adapter Plate Capscrew	189	Stem Grease Fitting
20	Trunnion Bearing	134	Stem O-ring	266	Stop Pin
		135	Seat Gasket O-ring		

DIMENSIONS AND WEIGHTS

ASME CLASSES 150 AND 300



ASME CLASS 150

SIZE	in. (mm)	D	E			F	G	S	H	L	A	K	M	WEIGHT	
			WE	RF	RTJ									WE	RF/RTJ
2	2	2	8-1/2	7	7-1/2	3-1/4	4-1/8	6-1/4	1-3/4	12	-	-	-	37	49
(50)	(51)	(51)	(216)	(178)	(191)	(83)	(105)	(160)	(44)	(305)	-	-	-	(17)	(22)
3 x 2 x 3	2	2	11-1/8	8	8-1/2	3-1/4	4-1/8	6-1/4	1-3/4	12	-	-	-	44	55
(80 x 50 x 80)	(51)	(51)	(283)	(203)	(216)	(83)	(105)	(160)	(44)	(305)	-	-	-	(20)	(25)
3	3	3	11-1/8	8	8-1/2	4-5/8	5-1/4	8-5/8	2	17-3/4	-	-	-	62	77
(80)	(76)	(76)	(283)	(203)	(216)	(117)	(133)	(219)	(51)	(451)	-	-	-	(28)	(35)
4 x 3 x 4	3	3	12	9	9-1/2	4-5/8	5-1/4	8-5/8	2	17-3/4	-	-	-	73	90
(100 x 80 x 100)	(76)	(76)	(305)	(229)	(241)	(117)	(133)	(219)	(51)	(451)	-	-	-	(33)	(41)
4	4	4	12	9	9-1/2	5-1/2	6-1/4	9-5/8	2-3/8	36	-	-	-	110	139
(100)	(102)	(102)	(305)	(229)	(241)	(140)	(159)	(244)	(60)	(914)	-	-	-	(50)	(63)
6 x 4 x 6	4	4	18	15-1/2	16	5-1/2	6-1/4	9-5/8	2-3/8	36	-	-	-	132	165
(150 x 100 x 150)	(102)	(102)	(457)	(394)	(406)	(140)	(159)	(244)	(60)	(914)	-	-	-	(60)	(75)

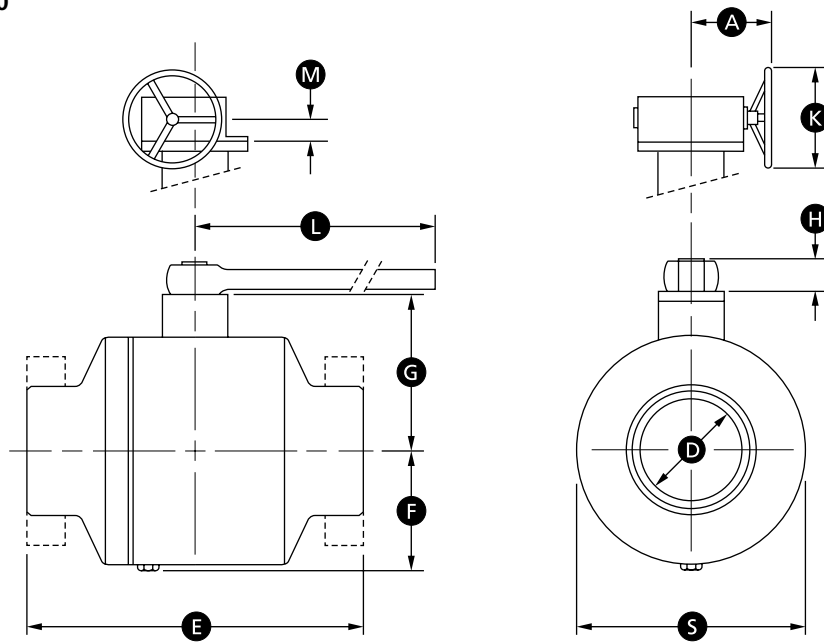
ASME CLASS 300

SIZE	in. (mm)	D	E			F	G	S	H	L	A	K	M	WEIGHT	
			WE	RF	RTJ									WE	RF/RTJ
2	2	2	8-1/2	8-1/2	9-1/8	3-1/4	4-1/8	6-3/8	1-3/4	17-3/4	-	-	-	42	53
(50)	(51)	(51)	(216)	(216)	(232)	(83)	(105)	(162)	(44)	(451)	-	-	-	(19)	(24)
3 x 2 x 3	2	2	11-1/8	11-1/8	11-3/4	3-1/4	4-1/8	6-3/8	1-3/4	17-3/4	-	-	-	53	66
(80 x 50 x 80)	(51)	(51)	(283)	(283)	(298)	(83)	(105)	(162)	(44)	(451)	-	-	-	(24)	(30)
3	3	3	11-1/8	11-1/8	11-3/4	4-5/8	5-1/4	8-3/4	2	36	-	-	-	75	93
(80)	(76)	(76)	(283)	(283)	(298)	(117)	(133)	(222)	(51)	(914)	-	-	-	(34)	(42)
4 x 3 x 4	3	3	12	12	12-5/8	4-5/8	5-1/4	8-3/4	2	36	-	-	-	99	123
(100 x 80 x 100)	(76)	(76)	(305)	(305)	(321)	(117)	(133)	(222)	(51)	(914)	-	-	-	(45)	(56)
4	4	4	12	12	12-5/8	5-1/2	6-1/4	9-5/8	2-3/8	36	-	-	-	150	187
(100)	(102)	(102)	(305)	(305)	(321)	(140)	(159)	(244)	(60)	(914)	-	-	-	(68)	(85)
6 x 4 x 6	4	4	18	18	16-1/2	5-1/2	6-1/4	9-5/8	2-3/8	36	-	-	-	194	243
(150 x 100 x 150)	(102)	(102)	(457)	(457)	(419)	(140)	(159)	(244)	(60)	(914)	-	-	-	(88)	(110)

Flanges in accordance with ASME B16.5
Butt welding ends according to ASME B16.25

Shaded bore sizes (D) according to ISO 14313/API 6D
Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

ASME CLASSES 400 AND 600



ASME CLASS 400

SIZE	in. (mm)	D	E			F	G	S	H	L	A	K	M	WEIGHT	
			WE	RF	RTJ									WE	RF/RTJ
2	2	2	*	*	*	3-1/4	4-1/8	6-3/8	1-3/4	17-3/4	-	-	-	44	55
(50)	(51)	(51)	*	*	*	(83)	(105)	(162)	(44)	(451)	-	-	-	(20)	(25)
3 x 2 x 3	2	2	*	*	*	3-1/4	4-1/8	6-3/8	1-3/4	17-3/4	-	-	-	55	71
(80 x 50 x 80)	(51)	(51)	*	*	*	(83)	(105)	(162)	(44)	(451)	-	-	-	(25)	(32)
3	3	3	*	*	*	4-5/8	5-1/4	8-3/4	2	36	-	-	-	93	117
(80)	(76)	(76)	*	*	*	(117)	(133)	(222)	(51)	(914)	-	-	-	(42)	(53)
4 x 3 x 4	3	3	16	16	16-1/8	4-5/8	5-1/4	8-3/4	2	36	-	-	-	106	132
(100 x 80 x 100)	(76)	(76)	(406)	(406)	(410)	(117)	(133)	(222)	(51)	(914)	-	-	-	(48)	(60)
4	4	4	16	16	16-1/8	5-5/8	6-1/4	9-3/4	2-3/8	-	*	*	*	168	209
(100)	(102)	(102)	(406)	(406)	(410)	(143)	(159)	(248)	(60)	-	*	*	*	(76)	(95)
6 x 4 x 6	4	4	19-1/2	19-1/2	19-5/8	5-5/8	6-1/4	9-3/4	2-3/8	-	*	*	*	212	265
(150 x 100 x 150)	(102)	(102)	(495)	(495)	(498)	(143)	(159)	(248)	(60)	-	*	*	*	(96)	(120)

ASME CLASS 600

SIZE	in. (mm)	D	E			F	G	S	H	L	A	K	M	WEIGHT	
			WE	RF	RTJ									WE	RF/RTJ
2	2	2	11-1/2	11-1/2	11-5/8	3-3/8	4-1/8	6-1/2	1-3/4	24	-	-	-	46	60
(50)	(51)	(51)	(292)	(292)	(295)	(86)	(105)	(165)	(44)	(610)	-	-	-	(21)	(27)
3 x 2 x 3	2	2	14	14	14-1/8	3-3/8	4-1/8	6-1/2	1-3/4	24	-	-	-	64	79
(80 x 50 x 80)	(51)	(51)	(356)	(356)	(359)	(86)	(105)	(165)	(44)	(610)	-	-	-	(29)	(36)
3	3	3	14	14	14-1/8	4-3/4	6-1/8	8-7/8	2-3/8	-	*	*	*	108	137
(80)	(76)	(76)	(356)	(356)	(359)	(121)	(156)	(225)	(60)	-	*	*	*	(49)	(62)
4 x 3 x 4	3	3	17	17	17-1/8	4-3/4	6-1/8	8-7/8	2-3/8	-	*	*	*	150	187
(100 x 80 x 100)	(76)	(76)	(432)	(432)	(435)	(121)	(156)	(225)	(60)	-	*	*	*	(68)	(85)
4	4	4	17	17	17-1/8	5-3/4	7-1/2	9-7/8	2-3/8	-	*	*	*	209	262
(100)	(102)	(102)	(432)	(432)	(435)	(146)	(191)	(251)	(60)	-	*	*	*	(95)	(119)
6 x 4 x 6	4	4	22	22	22-1/8	5-3/4	7-1/2	9-7/8	2-3/8	-	*	*	*	247	309
(150 x 100 x 150)	(102)	(102)	(559)	(559)	(562)	(146)	(191)	(251)	(60)	-	*	*	*	(112)	(140)

* Dimension on request

Flanges in accordance with ASME B16.5

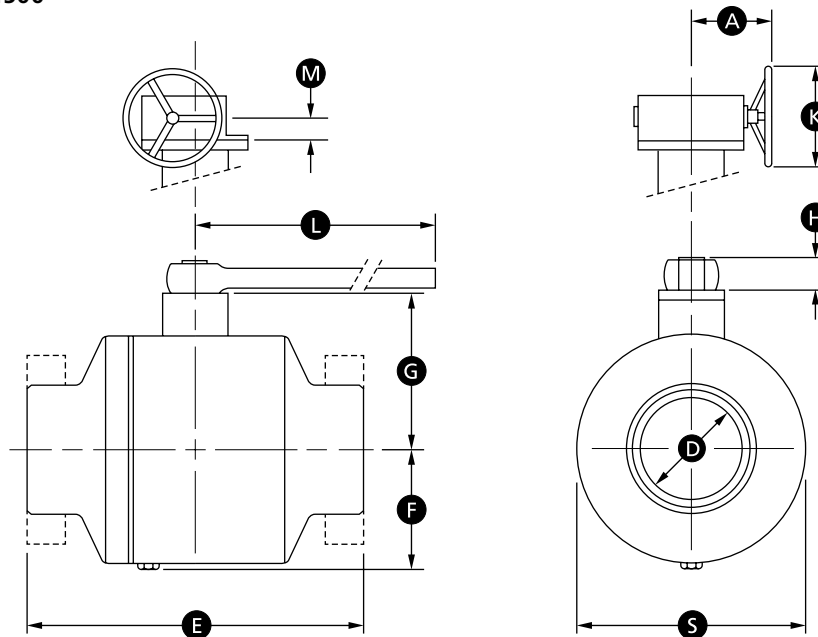
Butt welding ends according to ASME B16.25

Shaded bore sizes (D) according to ISO 14313/API 6D

Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

DIMENSIONS AND WEIGHTS (continued)

ASME CLASSES 900 AND 1500



ASME CLASS 900

SIZE	in. (mm)	D	E			F	G	S	H	L	A	K	M	WEIGHT	
			WE	RF	RTJ									WE	RF/RTJ
2	2	2	14-1/2	14-1/2	14-5/8	3-1/2	4-5/8	6-7/8	2-3/8	24	-	-	-	88	110
(50)	(51)	(51)	(368)	(368)	(371)	(89)	(117)	(175)	(60)	(610)	-	-	-	(40)	(50)
3 x 2 x 3	2	2	15	15	15-1/8	3-1/2	4-5/8	6-7/8	2-3/8	24	-	-	106	134	55
(80 x 50 x 80)	(51)	(51)	(381)	(381)	(384)	(89)	(117)	(175)	(60)	(610)	-	-	-	(48)	(61)
3	3	3	15	15	15-1/8	4-7/8	6-1/8	9-3/8	2-3/8	-	*	*	*	134	170
(80)	(76)	(76)	(381)	(381)	(384)	(124)	(156)	(238)	(60)	-	*	*	*	(61)	(77)
4 x 3 x 4	3	3	18	18	18-1/8	4-7/8	6-1/8	9-3/8	2-3/8	-	*	*	*	170	214
(100 x 80 x 100)	(76)	(76)	(457)	(457)	(460)	(124)	(156)	(238)	(60)	-	*	*	*	(77)	(97)
4	4	4	18	18	18-1/8	6	7-1/2	10-3/8	2-3/8	-	*	*	*	236	295
(100)	(102)	(102)	(457)	(457)	(460)	(152)	(191)	(264)	(60)	-	*	*	*	(107)	(134)
6 x 4 x 6	4	4	24	24	24-1/8	6	7-1/2	10-3/8	2-3/8	-	*	*	*	335	419
(150 x 100 x 150)	(102)	(102)	(610)	(610)	(613)	(152)	(191)	(264)	(60)	-	*	*	*	(152)	(190)

ASME CLASS 1500

SIZE	in. (mm)	D	E			F	G	S	H	L	A	K	M	WEIGHT	
			WE	RF	RTJ									WE	RF/RTJ
2	2	2	14-1/2	14-1/2	14-5/8	4-1/4	4-5/8	8-3/4	2-3/8	-	*	*	*	99	126
(50)	(51)	(51)	(368)	(368)	(371)	(108)	(117)	(222)	(60)	-	*	*	*	(45)	(57)
3 x 2 x 3	2	2	18-1/2	18-1/2	18-5/8	4-1/4	4-5/8	8-3/4	2-3/8	-	*	*	*	128	161
(80 x 50 x 80)	(51)	(51)	(470)	(470)	(473)	(108)	(117)	(222)	(60)	-	*	*	*	(58)	(73)
3	3	3	18-1/2	18-1/2	18-5/8	6-1/8	6-1/8	11-7/8	2-3/8	-	*	*	*	196	247
(80)	(76)	(76)	(470)	(470)	(473)	(156)	(156)	(302)	(60)	-	*	*	*	(89)	(112)
4 x 3 x 4	3	3	21-1/2	21-1/2	21-5/8	6-1/8	6-1/8	11-7/8	2-3/8	-	*	*	*	229	287
(100 x 80 x 100)	(76)	(76)	(546)	(546)	(549)	(156)	(156)	(302)	(60)	-	*	*	*	(104)	(130)
4	4	4	21-1/2	21-1/2	21-5/8	7-3/8	7-1/2	13-1/4	2-3/8	-	*	*	*	335	419
(100)	(102)	(102)	(546)	(546)	(549)	(187)	(191)	(337)	(60)	-	*	*	*	(152)	(190)
6 x 4 x 6	4	4	27-3/4	27-3/4	28	7-3/8	7-1/2	13-1/4	2-3/8	-	*	*	*	511	639
(150 x 100 x 150)	(102)	(102)	(705)	(705)	(711)	(187)	(191)	(337)	(60)	-	*	*	*	(232)	(290)

* Dimension on request

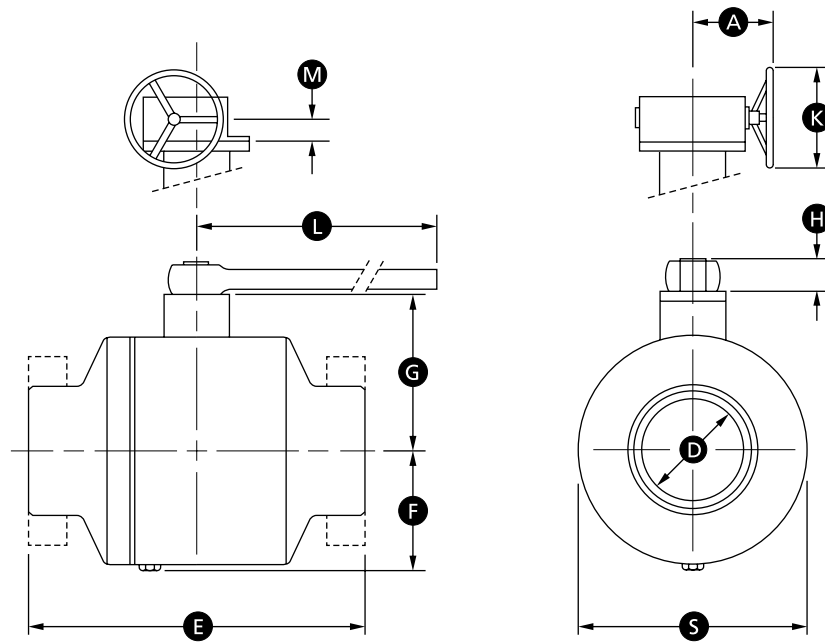
Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

Shaded bore sizes (D) according to ISO 14313/API 6D

Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

ASME CLASS 2500



ASME CLASS 2500

SIZE	in. (mm)	D	E			F	G	S	H	L	A	K	M	WEIGHT	
			WE	RF	RTJ									WE	RF/RTJ
2	1-3/4	17-3/4	17-3/4	17-7/8	4-1/4	6-1/4	7-7/8	2-1/2	36	-	-	-	**	**	
(50)	(44)	(451)	(451)	(454)	(110)	(160)	(200)	(65)	(915)	-	-	-	**	**	
3	2-1/2	22-3/4	22-3/4	23	5-1/2	7-1/8	9-7/8	2-1/2	-	*	*	*	**	**	
(80)	(64)	(578)	(578)	(584)	(140)	(181)	(250)	(65)	-	*	*	*	**	**	
4	3-1/2	26-1/2	26-1/2	26-7/8	7-7/8	10-3/8	14-1/2	3	-	*	*	*	**	**	
(100)	(89)	(673)	(673)	(683)	(200)	(265)	(370)	(75)	-	*	*	*	**	**	
6	5-1/8	36	36	36-1/2	9-1/4	11-3/8	17	4-3/4	-	*	*	*	**	**	
(150)	(131)	(914)	(914)	(927)	(235)	(290)	(430)	(120)	-	*	*	*	**	**	

* Dimension on request

** For this data, contact Cameron

Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

Shaded bore sizes (D) according to ISO 14313/API 6D

Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

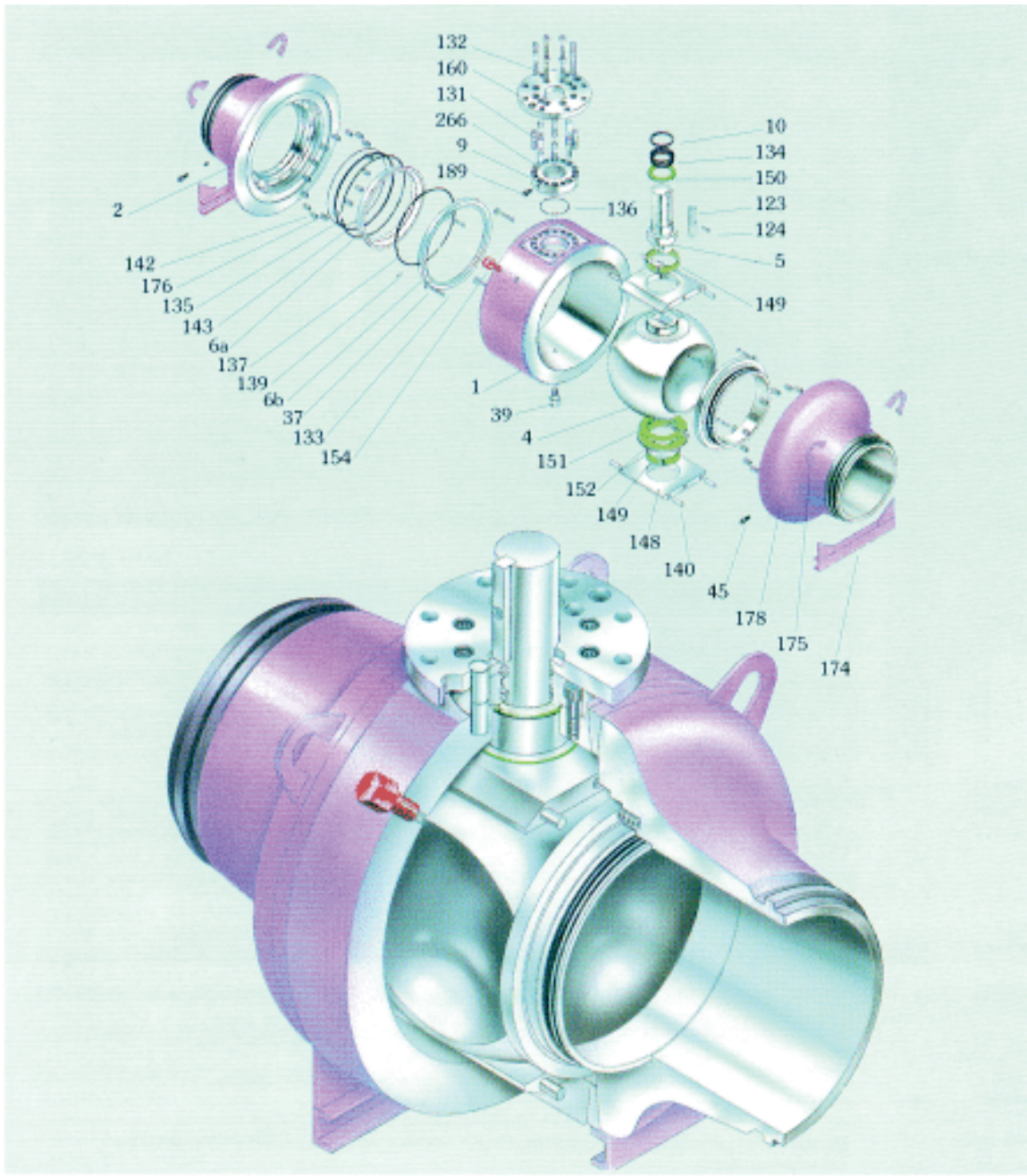
GROVE B8 and B8a

MATERIALS SELECTION

The GROVE B8 and B8a fully welded body ball valves have been designed for use with various combinations of materials which are selected dependent on the customer's service conditions. The following is a typical listing of materials for valves in ASME Classes 150 through 2500 for standard applications.

Pressure Retaining Parts	
Body	A350 LF2, A182 F51, A350 LF2 Fully Clad with Alloy 625
Stem/Trunnion	AISI 4140, A564 Gr. 630 (17-4 PH), Alloy 718, Duplex and Superduplex
Capscrews	A193 B7, A193 B7M, A320 L7, A320 L7M
Internal Parts	
Ball	A350 LF2, A105, A694 F65, A182 F316, 17-4 PH, Duplex and Superduplex, Alloy 625, Alloy 718, A350 LF2/A694 F65 fully clad with Alloy 625
Seats	A350 LF2, A105, A694 F65, A182 F316, 17-4 PH, Duplex and Superduplex, Alloy 625, Alloy 718
Springs	AISI 302, Inconel (Different Grades), Elgiloy
Sealing Materials	
Stem Gasket	NBR (Nitrile) FKM (Viton, Various Grades Available) HNBR (Hydrogenated Nitrile)
Seats/Body Gasket	NBR (Nitrile) FKM (Viton, Various Grades Available) HNBR (Hydrogenated Nitrile)
Seats/Ball Gasket	
For ASME Class 150 to 900, elastomer O-ring is used. The material selections are:	
	NBR (Nitrile) FKM (Viton, Various Grades Available) HNBR (Hydrogenated Nitrile)
For ASME Class 1500 to 2500, plastic O-ring or insert is used. The material selections are:	
	Nylon PEEK PCTFE
Plating/Coating	
25 microns (0.001")	Electroless Nickel Plating (ENP)
75 microns (0.003")	Electroless Nickel Plating (ENP)
120 microns (0.0045")	Tungsten Carbide Coating
Alloy Overlay	
Seal Area	AISI 316L, Alloy 625
Sour Service (NACE) Requirements	
GROVE B8 and B8a fully welded body ball valves can be supplied in accordance with the material requirements of ISO 15156/NACE MR0175.	

VALVE ASSEMBLY AND CROSS SECTION

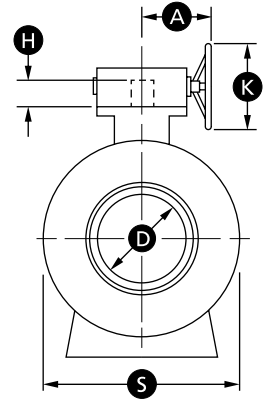
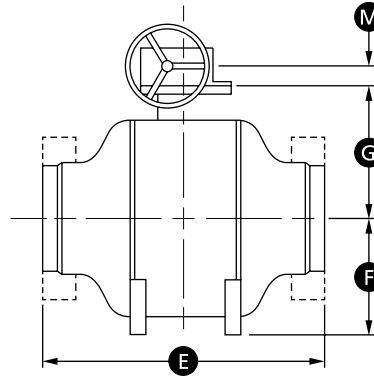


Item	Description	Item	Description	Item	Description
1	Body	123	Stem Key	148	Bearing Retainer
2	Closure	124	Stem Key Capscrew	149	Bearing
4	Ball	131	Gland Plate Capscrew	150	Upper Thrust Washer
5	Stem	132	Adapter Plate Capscrew	151	Lower Thrust Washer
6b	Outer Seat Ring	133	Puller Bushing Capscrew	152	Spacer
6a	Inner Seat Ring	134	Stem O-ring	154	Relief Valve
9	Top Cover	135	Seat Gasket O-ring	160	Adapter Plate
10	Gland Bushing	136	Gland Plate O-ring	174	Support Legs
37	Seat Stop Washer	137	Seal O-ring	175	Lifting Lugs
39	Drain Valve	139	Seat Spring Pin	176	Grease U-gasket
45	Seat Grease Fitting	140	Bearing Retainer Pin	178	Check Valve
		142	Cylindrical Spring	189	Stem Grease Fitting
		143	Seat Lock Ring	266	Stop Pin

GROVE B8 DIMENSIONS AND WEIGHTS

ASME CLASS 150

Larger sizes available on request.
Reduced-bore valves also available.



ASME CLASS 150

SIZE	in. (mm)	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	lb (kg) RF/RTJ
6	6	6	18	15-1/2	16	11-7/8	8-1/2	11-7/8	2-3/4	*	*	*	397	507
(150)	(152)	(152)	(457)	(394)	(406)	(302)	(216)	(302)	(70)	*	*	*	(180)	(230)
8	8	8	20-1/2	18	18-1/2	13-3/8	9-7/8	15-5/8	2-3/4	*	*	*	441	551
(200)	(203)	(203)	(521)	(457)	(470)	(340)	(251)	(397)	(70)	*	*	*	(200)	(250)
10	10	10	22	21	21-1/2	14-7/8	11-5/8	18-1/4	2-3/4	*	*	*	573	705
(250)	(254)	(254)	(559)	(533)	(546)	(378)	(295)	(464)	(70)	*	*	*	(260)	(320)
12	12	12	25	24	24-1/2	16-3/8	13-1/2	21-5/8	2-3/4	*	*	*	882	1080
(300)	(305)	(305)	(635)	(610)	(622)	(416)	(343)	(549)	(70)	*	*	*	(400)	(490)
14	13-1/4	13-1/4	30	27	27-1/2	18-3/8	14-5/8	23	3-3/4	*	*	*	1301	1587
(350)	(337)	(337)	(762)	(686)	(699)	(467)	(371)	(584)	(95)	*	*	*	(590)	(720)
16	15-1/4	15-1/4	33	30	30-1/2	19-7/8	16-1/4	26-3/8	3-3/4	*	*	*	1962	2381
(400)	(387)	(387)	(838)	(762)	(775)	(505)	(413)	(670)	(95)	*	*	*	(890)	(1080)
18	17-1/4	17-1/4	36	34	34-1/2	21-1/2	18	29-7/8	4-1/2	*	*	*	2690	3219
(450)	(438)	(438)	(914)	(864)	(876)	(546)	(457)	(759)	(114)	*	*	*	(1220)	(1460)
20	19-1/4	19-1/4	39	36	36-1/2	23-1/8	19-3/8	32-7/8	4-1/2	*	*	*	3439	4056
(500)	(489)	(489)	(991)	(914)	(927)	(587)	(492)	(835)	(114)	*	*	*	(1560)	(1840)
22	21-1/4	21-1/4	*	*	*	24-7/8	21-1/8	36-1/4	4-1/2	*	*	*	4541	5379
(550)	(540)	(540)	*	*	*	(632)	(537)	(921)	(114)	*	*	*	(2060)	(2440)
24	23-1/4	23-1/4	45	42	42-1/2	26-3/8	22-1/2	38-7/8	7-1/8	*	*	*	5710	6746
(600)	(591)	(591)	(1143)	(1067)	(1080)	(670)	(572)	(987)	(181)	*	*	*	(2590)	(3060)
26	25	25	49	45	*	28-1/4	24-1/2	41-3/4	7-1/8	*	*	*	7033	8245
(650)	(635)	(635)	(1245)	(1143)	*	(718)	(622)	(1060)	(181)	*	*	*	(3190)	(3740)
28	27	27	53	49	*	29-5/8	25-7/8	44-3/4	7-1/8	*	*	*	8488	9943
(700)	(686)	(686)	(1346)	(1245)	*	(752)	(657)	(1137)	(181)	*	*	*	(3850)	(4510)
30	29	29	55	51	*	31-3/4	27-1/2	48-5/8	7-1/8	*	*	*	9810	11,464
(750)	(737)	(737)	(1397)	(1295)	*	(806)	(699)	(1235)	(181)	*	*	*	(4450)	(5200)
32	30-3/4	30-3/4	60	54	*	33-1/4	29	51	8-1/8	*	*	*	11,684	13,426
(800)	(781)	(781)	(1524)	(1372)	*	(845)	(737)	(1295)	(206)	*	*	*	(5300)	(6090)
34	32-3/4	32-3/4	64	58	*	34-3/8	30-7/8	53-3/8	8-1/8	*	*	*	13,933	15,917
(850)	(832)	(832)	(1626)	(1473)	*	(873)	(784)	(1356)	(206)	*	*	*	(6320)	(7220)
36	34-1/2	34-1/2	68	60	*	35-3/4	32-3/8	56-3/4	8-1/8	*	*	*	16,138	18,298
(900)	(876)	(876)	(1727)	(1524)	*	(908)	(822)	(1441)	(206)	*	*	*	(7320)	(8300)
40	38-1/2	38-1/2	*	*	*	39-3/8	35-5/8	63-7/8	8-1/8	*	*	*	22,134	24,802
(1000)	(978)	(978)	*	*	*	(1000)	(905)	(1622)	(206)	*	*	*	(10,040)	(11,250)
42	40-1/4	40-1/4	*	*	*	40-3/4	38-1/8	67-3/8	8-1/8	*	*	*	25,375	28,241
(1050)	(1022)	(1022)	*	*	*	(1035)	(968)	(1711)	(206)	*	*	*	(11,510)	(12,810)
46	44	44	*	*	*	44-5/8	42-1/2	74-1/2	8-1/8	*	*	*	32,518	35,692
(1150)	(1118)	(1118)	*	*	*	(1133)	(1080)	(1892)	(206)	*	*	*	(14,750)	(16,190)
48	46	46	*	*	*	46-3/8	44-3/8	77-1/2	8-1/8	*	*	*	36,508	39,815
(1200)	(1168)	(1168)	*	*	*	(1178)	(1127)	(1969)	(206)	*	*	*	(16,560)	(18,060)
56	55	55	*	*	*	52-3/4	50-3/8	89-3/4	9-5/8	-	-	-	54,652	58,047
(1400)	(1397)	(1397)	*	*	*	(1340)	(1280)	(2280)	(244)	-	-	-	(24,790)	(26,330)
60	57-1/2	57-1/2	*	*	*	56-3/8	55-1/8	96-3/8	9-5/8	-	-	-	65,013	68,144
(1500)	(1461)	(1461)	*	*	*	(1432)	(1400)	(2448)	(244)	-	-	-	(29,490)	(30,910)

*Dimension on request

Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

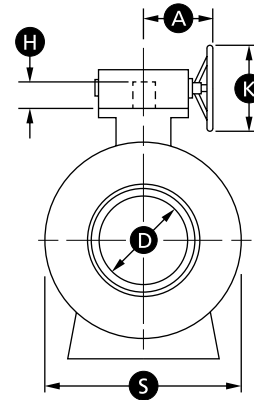
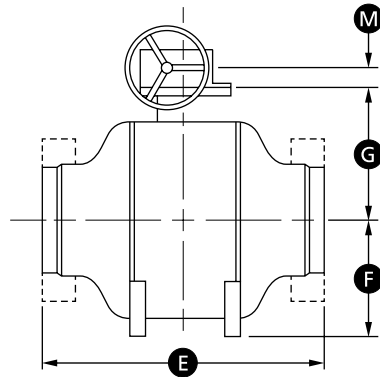
Shaded bore sizes (D) according to ISO 14313

Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

GROVE B8 DIMENSIONS AND WEIGHTS (continued)

ASME CLASS 300

Larger sizes available on request.
Reduced-bore valves also available.



ASME CLASS 300

SIZE	in. (mm)	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	lb (kg) RF/RTJ
6	6	6	18	18	16-1/2	11-7/8	8-1/2	12	2-3/4	*	*	*	419	529
(150)	(152)	(152)	(457)	(457)	(419)	(302)	(216)	(305)	(70)	*	*	*	(190)	(240)
8	8	8	20-1/2	19-3/4	20-3/8	13-3/8	9-7/8	15-7/8	2-3/4	*	*	*	463	573
(200)	(203)	(203)	(521)	(502)	(518)	(340)	(251)	(403)	(70)	*	*	*	(210)	(260)
10	10	10	22	22-3/8	23	14-7/8	11-5/8	18-3/8	3-3/4	*	*	*	617	750
(250)	(254)	(254)	(559)	(568)	(584)	(378)	(295)	(467)	(95)	*	*	*	(280)	(340)
12	12	12	25	25-1/2	26-1/8	16-3/8	13-1/2	21-3/4	3-3/4	*	*	*	926	1124
(300)	(305)	(305)	(635)	(648)	(664)	(416)	(343)	(552)	(95)	*	*	*	(420)	(510)
14	13-1/4	13-1/4	30	30	30-5/8	18-3/8	14-5/8	23-1/4	4-1/2	*	*	*	1367	1675
(350)	(337)	(337)	(762)	(762)	(778)	(467)	(371)	(591)	(114)	*	*	*	(620)	(760)
16	15-1/4	15-1/4	33	33	33-5/8	19-7/8	16-1/4	26-3/4	4-1/2	*	*	*	2072	2491
(400)	(387)	(387)	(838)	(838)	(854)	(505)	(413)	(679)	(114)	*	*	*	(940)	(1130)
18	17-1/4	17-1/4	36	36	36-5/8	21-1/2	18	30-1/4	4-1/2	*	*	*	2822	3373
(450)	(438)	(438)	(914)	(914)	(930)	(546)	(457)	(768)	(114)	*	*	*	(1280)	(1530)
20	19-1/4	19-1/4	39	39	39-3/4	23-1/8	16-7/8	33-1/4	7-1/8	*	*	*	3616	4277
(500)	(489)	(489)	(991)	(991)	(1010)	(587)	(429)	(845)	(181)	*	*	*	(1640)	(1940)
22	21-1/4	21-1/4	43	43	43-7/8	24-7/8	21-1/8	36-5/8	7-1/8	*	*	*	4784	5644
(550)	(540)	(540)	(1092)	(1092)	(1114)	(632)	(537)	(930)	(181)	*	*	*	(2170)	(2560)
24	23-1/4	23-1/4	45	45	45-7/8	26-3/8	22-1/2	39-1/4	7-1/8	*	*	*	6019	7099
(600)	(591)	(591)	(1143)	(1143)	(1165)	(670)	(572)	(997)	(181)	*	*	*	(2730)	(3220)
26	25	25	49	49	50	28-1/4	24-1/2	42-1/8	8-1/8	*	*	*	7385	8686
(650)	(635)	(635)	(1245)	(1245)	(1270)	(718)	(622)	(1070)	(206)	*	*	*	(3350)	(3940)
28	27	27	53	53	54	29-5/8	25-7/8	45-1/4	8-1/8	*	*	*	8929	10,450
(700)	(686)	(686)	(1346)	(1346)	(1372)	(752)	(657)	(1149)	(206)	*	*	*	(4050)	(4740)
30	29	29	55	55	56	31-3/4	27-1/2	49-1/8	8-1/8	*	*	*	10,317	12,059
(750)	(737)	(737)	(1397)	(1397)	(1422)	(806)	(699)	(1248)	(206)	*	*	*	(4680)	(5470)
32	30-3/4	30-3/4	60	60	61-1/8	33-1/4	29	51-1/2	8-1/8	*	*	*	12,280	14,109
(800)	(781)	(781)	(1524)	(1524)	(1553)	(845)	(737)	(1308)	(206)	*	*	*	(5570)	(6400)
34	32-3/4	32-3/4	64	64	65-1/8	34-3/8	30-7/8	53-7/8	8-1/8	*	*	*	14,660	16,733
(850)	(832)	(832)	(1626)	(1626)	(1654)	(873)	(784)	(1368)	(206)	*	*	*	(6650)	(7590)
36	34-1/2	34-1/2	68	68	69-1/8	35-3/4	32-3/8	57-3/8	8-1/8	*	*	*	16,975	19,246
(900)	(876)	(876)	(1727)	(1727)	(1756)	(908)	(822)	(1457)	(206)	*	*	*	(7700)	(8730)
40	38-1/2	38-1/2	*	*	*	39-3/8	35-5/8	64-1/2	8-1/8	*	*	*	23,280	26,080
(1000)	(978)	(978)	*	*	*	(1000)	(905)	(1638)	(206)	*	*	*	(10,560)	(11,830)
42	40-1/4	40-1/4	*	*	*	40-3/4	38-1/8	68-1/8	9-5/8	*	*	*	26,698	29,718
(1050)	(1022)	(1022)	*	*	*	(1035)	(968)	(1730)	(244)	*	*	*	(12,110)	(13,480)
46	44	44	*	*	*	44-5/8	42-1/2	75-1/4	9-5/8	*	*	*	34,193	37,544
(1150)	(1118)	(1118)	*	*	*	(1133)	(1080)	(1911)	(244)	*	*	*	(15,510)	(17,030)
48	46	46	*	*	*	46-3/8	44-3/8	78-1/4	9-5/8	*	*	*	38,404	41,887
(1200)	(1168)	(1168)	*	*	*	(1178)	(1127)	(1988)	(244)	*	*	*	(17,420)	(19,000)
56	55	55	*	*	*	52-3/4	50-3/8	90-3/4	9-5/8	-	-	-	57,496	61,067
(1400)	(1397)	(1397)	*	*	*	(1340)	(1280)	(2305)	(244)	-	-	-	(26,080)	(27,700)
60	57-1/2	57-1/2	*	*	*	56-3/8	55-1/8	97-1/2	9-5/8	-	-	-	68,386	71,671
(1500)	(1461)	(1461)	*	*	*	(1432)	(1400)	(2477)	(244)	-	-	-	(31,020)	(32,510)

*Dimension on request

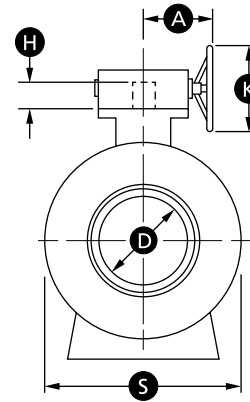
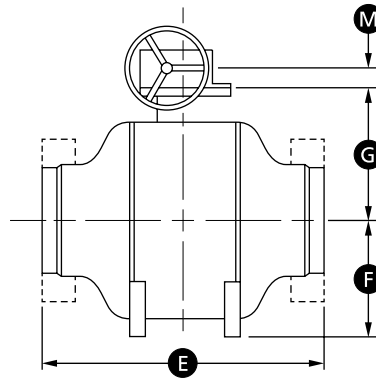
Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

Shaded bore sizes (D) according to ISO 14313

Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

ASME CLASS 400



Larger sizes available on request.
Reduced-bore valves also available.

ASME CLASS 400

SIZE	in. (mm)	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	lb (kg)
6	6	6	19-1/2	19-1/2	19-5/8	12-1/8	8-1/2	12-1/8	2-3/4	*	*	*	485	617
(150)	(152)	(152)	(495)	(495)	(498)	(308)	(216)	(308)	(70)	*	*	*	(220)	(280)
8	8	8	23-1/2	23-1/2	23-5/8	13-5/8	9-7/8	16	3-3/4	*	*	*	529	661
(200)	(203)	(203)	(597)	(597)	(600)	(346)	(251)	(406)	(95)	*	*	*	(240)	(300)
10	10	10	26-1/2	26-1/2	26-5/8	15-1/4	11-5/8	18-5/8	3-3/4	*	*	*	705	860
(250)	(254)	(254)	(673)	(673)	(676)	(387)	(295)	(473)	(95)	*	*	*	(320)	(390)
12	12	12	30	30	30-1/8	16-3/4	13-1/2	22	3-3/4	*	*	*	1058	1301
(300)	(305)	(305)	(762)	(762)	(765)	(425)	(343)	(559)	(95)	*	*	*	(480)	(590)
14	13-1/4	13-1/4	32-1/2	32-1/2	32-5/8	18-3/4	14-5/8	23-1/2	4-1/2	*	*	*	1587	1918
(350)	(337)	(337)	(826)	(826)	(829)	(476)	(371)	(597)	(114)	*	*	*	(720)	(870)
16	15-1/4	15-1/4	35-1/2	35-1/2	35-5/8	20-3/8	16-1/4	27	4-1/2	*	*	*	2381	2866
(400)	(387)	(387)	(902)	(902)	(905)	(518)	(413)	(686)	(114)	*	*	*	(1080)	(1300)
18	17-1/4	17-1/4	38-1/2	38-1/2	38-5/8	21-7/8	18	30-1/2	7-1/8	*	*	*	3241	3880
(450)	(438)	(438)	(978)	(978)	(981)	(556)	(457)	(775)	(181)	*	*	*	(1470)	(1760)
20	19-1/4	19-1/4	41-1/2	41-1/2	41-3/4	23-1/2	19-3/8	33-1/2	7-1/8	*	*	*	4145	4894
(500)	(489)	(489)	(1054)	(1054)	(1060)	(597)	(492)	(851)	(181)	*	*	*	(1880)	(2220)
22	21-1/4	21-1/4	45	45	45-3/8	25-3/8	21-1/8	37	7-1/8	*	*	*	5489	6481
(550)	(540)	(540)	(1143)	(1143)	(1153)	(645)	(537)	(940)	(181)	*	*	*	(2490)	(2940)
24	23-1/4	23-1/4	48-1/2	48-1/2	48-7/8	26-7/8	22-1/2	39-5/8	8-1/8	*	*	*	6900	8135
(600)	(591)	(591)	(1232)	(1232)	(1241)	(683)	(572)	(1006)	(206)	*	*	*	(3130)	(3690)
26	25	25	51-1/2	51-1/2	52	28-7/8	24-1/2	42-1/2	8-1/8	*	*	*	8488	9965
(650)	(635)	(635)	(1308)	(1308)	(1321)	(733)	(622)	(1080)	(206)	*	*	*	(3850)	(4520)
28	27	27	55	55	55-1/2	30-1/4	25-7/8	45-5/8	8-1/8	*	*	*	10,251	12,015
(700)	(686)	(686)	(1397)	(1397)	(1410)	(768)	(657)	(1159)	(206)	*	*	*	(4650)	(5450)
30	29	29	60	60	60-1/2	32-3/8	27-1/2	49-5/8	8-1/8	*	*	*	11,861	13,845
(750)	(737)	(737)	(1524)	(1524)	(1537)	(822)	(699)	(1260)	(206)	*	*	*	(5380)	(6280)
32	30-3/4	30-3/4	65	65	65-5/8	33-7/8	29	52	8-1/8	*	*	*	14,109	16,204
(800)	(781)	(781)	(1651)	(1651)	(1667)	(860)	(737)	(1321)	(206)	*	*	*	(6400)	(7350)
34	32-3/4	32-3/4	70	70	70-5/8	35-1/8	30-7/8	54-1/2	8-1/8	*	*	*	16,843	19,224
(850)	(832)	(832)	(1778)	(1778)	(1794)	(892)	(784)	(1384)	(206)	*	*	*	(7640)	(8720)
36	34-1/2	34-1/2	74	74	74-5/8	36-1/2	32-3/8	58	8-1/8	*	*	*	19,489	22,112
(900)	(876)	(876)	(1880)	(1880)	(1895)	(927)	(822)	(1473)	(206)	*	*	*	(8840)	(10,030)
40	38-1/2	38-1/2	*	*	*	40-1/8	35-5/8	65-1/8	9-5/8	*	*	*	26,742	29,938
(1000)	(978)	(978)	*	*	*	(1019)	(905)	(1654)	(244)	*	*	*	(12,130)	(13,580)
42	40-1/4	40-1/4	*	*	*	41-1/2	38-1/8	68-3/4	9-5/8	*	*	*	30,644	34,105
(1050)	(1022)	(1022)	*	*	*	(1054)	(968)	(1746)	(244)	*	*	*	(13,900)	(15,470)
46	44	44	*	*	*	45-5/8	42-1/2	76	9-5/8	*	*	*	39,264	43,100
(1150)	(1118)	(1118)	*	*	*	(1159)	(1080)	(1930)	(244)	*	*	*	(17,810)	(19,550)
48	46	46	*	*	*	47-3/8	44-3/8	79	9-5/8	*	*	*	44,092	48,082
(1200)	(1168)	(1168)	*	*	*	(1203)	(1127)	(2007)	(244)	*	*	*	(20,000)	(21,810)
56	55	55	*	*	*	53-3/4	50-3/8	91-5/8	11	-	-	-	66,027	70,106
(1400)	(1397)	(1397)	*	*	*	(1365)	(1280)	(2327)	(279)	-	-	-	(29,950)	(31,800)
60	57-1/2	57-1/2	*	*	*	57-1/2	55-1/8	98-3/8	11	-	-	-	78,527	82,297
(1500)	(1461)	(1461)	*	*	*	(1461)	(1400)	(2499)	(279)	-	-	-	(35,620)	(37,330)

*Dimension on request

Flanges in accordance with ASME B16.5

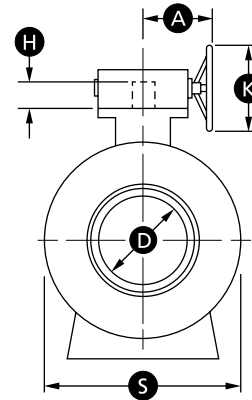
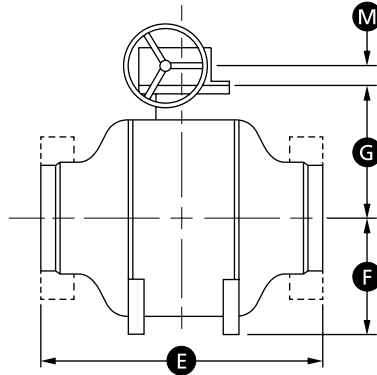
Butt welding ends according to ASME B16.25

Shaded bore sizes (D) according to ISO 14313

Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

GROVE B8 DIMENSIONS AND WEIGHTS (continued)

ASME CLASS 600



Larger sizes available on request.
Reduced-bore valves also available.

ASME CLASS 600

SIZE	in. (mm)	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	RF/RTJ
6	6	6	22	22	22-1/8	12-1/4	8-1/2	12-1/4	2-3/4	*	*	*	529	661
(150)	(152)	(152)	(559)	(559)	(562)	(311)	(216)	(311)	(70)	*	*	*	(240)	(300)
8	8	8	26	26	26-1/8	13-3/4	9-7/8	16-1/8	3-3/4	*	*	*	573	705
(200)	(203)	(203)	(660)	(660)	(664)	(349)	(251)	(410)	(95)	*	*	*	(260)	(320)
10	10	10	31	31	31-1/8	15-3/8	11-5/8	18-7/8	3-3/4	*	*	*	750	926
(250)	(254)	(254)	(787)	(787)	(791)	(391)	(295)	(479)	(95)	*	*	*	(340)	(420)
12	12	12	33	33	33-1/8	16-7/8	13-1/2	22-1/4	3-3/4	*	*	*	1146	1389
(300)	(305)	(305)	(838)	(838)	(841)	(429)	(343)	(565)	(95)	*	*	*	(520)	(630)
14	13-1/4	13-1/4	35	35	35-1/8	18-7/8	14-5/8	23-3/4	4-1/2	*	*	*	1698	2050
(350)	(337)	(337)	(889)	(889)	(892)	(479)	(371)	(603)	(114)	*	*	*	(770)	(930)
16	15-1/4	15-1/4	39	39	39-1/8	20-1/2	16-1/4	27-1/4	4-1/2	*	*	*	2557	3086
(400)	(387)	(387)	(991)	(991)	(994)	(521)	(413)	(692)	(114)	*	*	*	(1160)	(1400)
18	17-1/4	17-1/4	43	43	43-1/8	22-1/8	18	30-7/8	7-1/8	*	*	*	3483	4167
(450)	(438)	(438)	(1092)	(1092)	(1095)	(562)	(457)	(784)	(181)	*	*	*	(1580)	(1890)
20	19-1/4	19-1/4	47	47	47-1/4	23-3/4	19-3/8	33-7/8	7-1/8	*	*	*	4453	5269
(500)	(489)	(489)	(1194)	(1194)	(1200)	(603)	(492)	(860)	(181)	*	*	*	(2020)	(2390)
22	21-1/4	21-1/4	51	51	51-3/8	25-5/8	21-1/8	37-3/8	8-1/8	*	*	*	5908	6966
(550)	(540)	(540)	(1295)	(1295)	(1305)	(651)	(537)	(949)	(206)	*	*	*	(2680)	(3160)
24	23-1/4	23-1/4	55	55	55-3/8	27-1/8	22-1/2	40-1/8	8-1/8	*	*	*	7429	8752
(600)	(591)	(591)	(1397)	(1397)	(1407)	(689)	(572)	(1019)	(206)	*	*	*	(3370)	(3970)
26	25	25	57	57	57-1/2	29-1/8	24-1/2	43	8-1/8	*	*	*	9127	10,714
(650)	(635)	(635)	(1448)	(1448)	(1461)	(740)	(622)	(1092)	(206)	*	*	*	(4140)	(4860)
28	27	27	61	61	61-1/2	30-1/2	25-7/8	46-1/8	8-1/8	*	*	*	11,023	12,919
(700)	(686)	(686)	(1549)	(1549)	(1562)	(775)	(657)	(1172)	(206)	*	*	*	(5000)	(5860)
30	29	29	65	65	65-1/2	32-5/8	27-1/2	50-1/8	9-5/8	*	*	*	12,743	14,881
(750)	(737)	(737)	(1651)	(1651)	(1664)	(829)	(699)	(1273)	(244)	*	*	*	(5780)	(6750)
32	30-3/4	30-3/4	70	70	70-5/8	34-1/4	29	52-1/2	9-5/8	*	*	*	15,168	17,438
(800)	(781)	(781)	(1778)	(1778)	(1794)	(870)	(737)	(1334)	(244)	*	*	*	(6880)	(7910)
34	32-3/4	32-3/4	76	76	76-5/8	35-3/8	30-7/8	55	9-5/8	*	*	*	18,100	20,679
(850)	(832)	(832)	(1930)	(1930)	(1946)	(899)	(784)	(1397)	(244)	*	*	*	(8210)	(9380)
36	34-1/2	34-1/2	82	82	82-5/8	36-7/8	32-3/8	58-1/2	9-5/8	*	*	*	20,944	23,765
(900)	(876)	(876)	(2083)	(2083)	(2099)	(937)	(822)	(1486)	(244)	*	*	*	(9500)	(10,780)
40	38-1/2	38-1/2	*	*	*	40-1/2	35-5/8	65-7/8	9-5/8	*	*	*	28,748	32,187
(1000)	(978)	(978)	*	*	*	(1029)	(905)	(1673)	(244)	*	*	*	(13,040)	(14,600)
42	40-1/4	40-1/4	*	*	*	42	38-1/8	69-1/2	9-5/8	*	*	*	32,959	36,684
(1050)	(1022)	(1022)	*	*	*	(1067)	(968)	(1765)	(244)	*	*	*	(14,950)	(16,640)
46	44	44	*	*	*	46-1/8	42-1/2	76-3/4	9-5/8	*	*	*	42,218	46,362
(1150)	(1118)	(1118)	*	*	*	(1172)	(1080)	(1949)	(244)	*	*	*	(19,150)	(21,030)
48	46	46	85-7/8	85-7/8	*	47-7/8	44-3/8	79-7/8	9-5/8	*	*	*	47,399	51,720
(1200)	(1168)	(1168)	(2181)	(2181)	*	(1216)	(1127)	(2029)	(244)	*	*	*	(21,500)	(23,460)
56	55	55	*	*	*	54-3/8	50-3/8	92-5/8	11	-	-	-	70,988	75,397
(1400)	(1397)	(1397)	*	*	*	(1381)	(1280)	(2353)	(279)	-	-	-	(32,200)	(34,200)
60	57-1/2	57-1/2	*	*	*	58-1/8	55-1/8	99-3/8	11	-	-	-	84,436	88,492
(1500)	(1461)	(1461)	*	*	*	(1476)	(1400)	(2524)	(279)	-	-	-	(38,300)	(40,140)

*Dimension on request

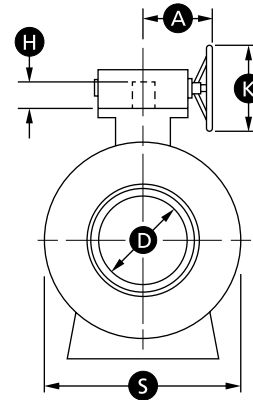
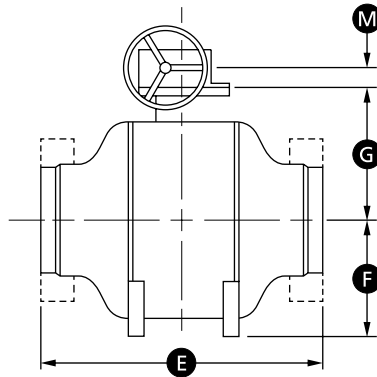
Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

Shaded bore sizes (D) according to ISO 14313

Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

ASME CLASS 900



Larger sizes available on request.
Reduced-bore valves also available.

ASME CLASS 900

SIZE	in. (mm)	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	RF/RTJ
6	6	6	24	24	24-1/8	9-7/8	9-1/2	13-1/4	3-3/4	*	*	*	640	800
(150)	(152)	(152)	(610)	(610)	(613)	(251)	(241)	(337)	(95)	*	*	*	(290)	(363)
8	8	8	29	29	29-1/8	11-3/8	10-7/8	16-1/2	3-3/4	*	*	*	694	854
(200)	(203)	(203)	(737)	(737)	(740)	(289)	(276)	(419)	(95)	*	*	*	(315)	(387)
10	10	10	33	33	33-1/8	13-5/8	12-1/2	20-1/8	4-1/2	*	*	*	907	1120
(250)	(254)	(254)	(838)	(838)	(841)	(346)	(318)	(511)	(114)	*	*	*	(411)	(508)
12	12	12	38	38	38-1/8	15-3/8	14-3/8	23-5/8	4-1/2	*	*	*	1387	1681
(300)	(305)	(305)	(965)	(965)	(968)	(391)	(365)	(600)	(114)	*	*	*	(629)	(762)
14	12-3/4	12-3/4	40-1/2	40-1/2	40-7/8	17-3/4	15-3/8	26-3/4	4-1/2	*	*	*	2054	2481
(350)	(324)	(324)	(1029)	(1029)	(1038)	(451)	(391)	(679)	(114)	*	*	*	(932)	(1125)
16	14-3/4	14-3/4	44-1/2	44-1/2	44-7/8	19-5/8	16-7/8	30-3/8	7-1/8	*	*	*	3094	3735
(400)	(375)	(375)	(1130)	(1130)	(1140)	(498)	(429)	(772)	(181)	*	*	*	(1404)	(1694)
18	16-3/4	16-3/4	48	48	48-1/2	21-5/8	19-1/8	33-1/2	7-1/8	*	*	*	4215	5042
(450)	(425)	(425)	(1219)	(1219)	(1232)	(549)	(486)	(851)	(181)	*	*	*	(1912)	(2287)
20	18-5/8	18-5/8	52	52	52-1/2	23-1/4	20-7/8	36-1/4	8-1/8	*	*	*	5388	6375
(500)	(473)	(473)	(1321)	(1321)	(1334)	(591)	(530)	(921)	(206)	*	*	*	(2444)	(2892)
22	20-5/8	20-5/8	*	*	*	25-3/4	21-7/8	40-1/2	8-1/8	*	*	*	7149	8429
(550)	(524)	(524)	*	*	*	(654)	(556)	(1029)	(206)	*	*	*	(3243)	(3824)
24	22-1/2	22-1/2	61	61	61-3/4	27-1/2	24-3/8	43-3/4	9-5/8	*	*	*	8990	10,590
(600)	(572)	(572)	(1549)	(1549)	(1568)	(699)	(619)	(1111)	(244)	*	*	*	(4078)	(4804)
26	24-3/8	24-3/8	*	*	*	29-7/8	26-1/4	47-1/4	9-5/8	*	*	*	11,044	12,964
(650)	(619)	(619)	*	*	*	(759)	(667)	(1200)	(244)	*	*	*	(5009)	(5881)
28	26-1/4	26-1/4	*	*	*	31-7/8	27-7/8	50-3/4	9-5/8	*	*	*	13,338	15,632
(700)	(667)	(667)	*	*	*	(810)	(708)	(1289)	(244)	*	*	*	(6050)	(7091)
30	28-1/8	28-1/8	*	*	*	32-3/4	29-5/8	53-3/8	9-5/8	*	*	*	15,418	18,006
(750)	(714)	(714)	*	*	*	(832)	(752)	(1356)	(244)	*	*	*	(6994)	(8168)
32	30	30	*	*	*	35-7/8	31-7/8	57-1/2	9-5/8	*	*	*	18,353	21,100
(800)	(762)	(762)	*	*	*	(911)	(810)	(1461)	(244)	*	*	*	(8325)	(9571)
34	31-7/8	31-7/8	*	*	*	37-3/4	33-3/8	61	9-5/8	*	*	*	21,901	25,022
(850)	(810)	(810)	*	*	*	(959)	(848)	(1549)	(244)	*	*	*	(9934)	(11,350)
36	33-3/4	33-3/4	*	*	*	40-1/8	34-3/4	64-3/8	11	*	*	*	25,342	28,756
(900)	(857)	(857)	*	*	*	(1019)	(883)	(1635)	(279)	*	*	*	(11,495)	(13,044)
40	37-5/8	37-5/8	*	*	*	44-1/8	38-1/4	71-1/4	11	*	*	*	34,785	38,946
(1000)	(956)	(956)	*	*	*	(1121)	(972)	(1810)	(279)	*	*	*	(15,778)	(17,666)
42	39-5/8	39-5/8	*	*	*	47-1/4	41-3/4	74-3/4	11	*	*	*	39,880	44,388
(1050)	(1006)	(1006)	*	*	*	(1200)	(1060)	(1899)	(279)	*	*	*	(18,090)	(20,134)
46	43-3/8	43-3/8	*	*	*	50-3/8	43-3/4	81-1/2	11	*	*	*	51,084	56,099
(1150)	(1102)	(1102)	*	*	*	(1280)	(1111)	(2070)	(279)	*	*	*	(23,172)	(25,446)
48	45-1/4	45-1/4	*	*	*	52-3/8	45-1/4	85	11	*	*	*	57,352	62,581
(1200)	(1149)	(1149)	*	*	*	(1330)	(1149)	(2159)	(279)	*	*	*	(26,015)	(28,387)

*Dimension on request

Flanges in accordance with ASME B16.5

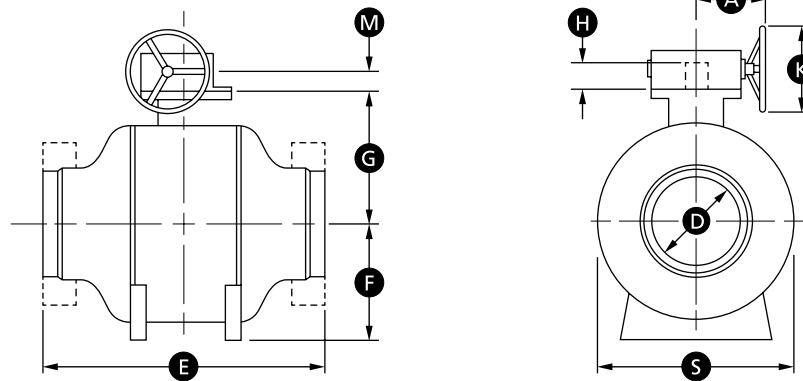
Butt welding ends according to ASME B16.25

Shaded bore sizes (D) according to ISO 14313

Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

GROVE B8 DIMENSIONS AND WEIGHTS (continued)

ASME CLASS 1500



Larger sizes available on request.
Reduced-bore valves also available.

ASME CLASS 1500

SIZE	in. (mm)	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	RF/RTJ
6		5-3/4	27-3/4	27-3/4	28	12-5/8	11	16-7/8	3-3/4	*	*	*	767	959
(150)		(146)	(705)	(705)	(711)	(321)	(279)	(429)	(95)	*	*	*	(348)	(435)
8		7-5/8	32-3/4	32-3/4	33-1/8	14-5/8	12-7/8	21-1/8	4-1/2	*	*	*	831	1023
(200)		(194)	(832)	(832)	(841)	(371)	(327)	(537)	(114)	*	*	*	(377)	(464)
10		9-1/2	39	39	39-3/8	17-3/8	15-3/8	25-3/4	4-1/2	*	*	*	1087	1343
(250)		(241)	(991)	(991)	(1000)	(441)	(391)	(654)	(114)	*	*	*	(493)	(609)
12		11-3/8	44-1/2	44-1/2	45-1/8	19-5/8	16-5/8	30-1/4	4-1/2	*	*	*	1662	2014
(300)		(289)	(1130)	(1130)	(1146)	(498)	(422)	(768)	(114)	*	*	*	(754)	(914)
14		12-1/2	49-1/2	49-1/2	50-1/4	22-5/8	19-5/8	34-1/4	7-1/8	*	*	*	2461	2973
(350)		(318)	(1257)	(1257)	(1276)	(575)	(498)	(870)	(181)	*	*	*	(1117)	(1349)
16		14-1/4	54-1/2	54-1/2	55-3/8	25-1/4	22	38-3/4	7-1/8	*	*	*	3708	4475
(400)		(362)	(1384)	(1384)	(1407)	(641)	(559)	(984)	(181)	*	*	*	(1682)	(2030)
18		16-1/4	*	*	*	27-3/4	23-1/4	42-7/8	8-1/8	*	*	*	5051	6042
(450)		(413)	*	*	*	(705)	(591)	(1089)	(206)	*	*	*	(2291)	(2741)
20		18	*	*	*	29-7/8	28-1/2	46-3/8	9-5/8	*	*	*	6457	7640
(500)		(457)	*	*	*	(759)	(724)	(1178)	(244)	*	*	*	(2929)	(3466)
22		19-3/4	*	*	*	33	30-1/4	51-7/8	9-5/8	*	*	*	8567	10,101
(550)		(502)	*	*	*	(838)	(768)	(1318)	(244)	*	*	*	(3886)	(4582)
24		21-5/8	*	*	*	35-1/8	32	55-7/8	9-5/8	*	*	*	10,773	12,691
(600)		(549)	*	*	*	(892)	(813)	(1419)	(244)	*	*	*	(4887)	(5757)
26		23-1/2	*	*	*	38-1/4	35-1/2	60-1/2	11	*	*	*	13,234	15,536
(650)		(597)	*	*	*	(972)	(902)	(1537)	(279)	*	*	*	(6003)	(7047)
28		25-1/4	*	*	*	40-7/8	37	65	11	*	*	*	15,983	18,732
(700)		(641)	*	*	*	(1038)	(940)	(1651)	(279)	*	*	*	(7250)	(8497)
30		27	*	*	*	42	40-3/4	68-3/8	11	*	*	*	18,477	21,577
(750)		(686)	*	*	*	(1067)	(1035)	(1737)	(279)	*	*	*	(8381)	(9788)
32		28-3/4	*	*	*	45-7/8	41-3/4	73-5/8	11	*	*	*	21,993	25,285
(800)		(730)	*	*	*	(1165)	(1060)	(1870)	(279)	*	*	*	(9976)	(11,470)
34		30-1/2	*	*	*	48-3/8	44-7/8	78-1/8	11	*	*	*	26,244	29,985
(850)		(775)	*	*	*	(1229)	(1140)	(1984)	(279)	*	*	*	(11,905)	(13,601)
36		32-1/4	*	*	*	51-3/8	46-1/2	82-3/8	11	*	*	*	30,368	34,460
(900)		(819)	*	*	*	(1305)	(1181)	(2092)	(279)	*	*	*	(13,775)	(15,631)

*Dimension on request

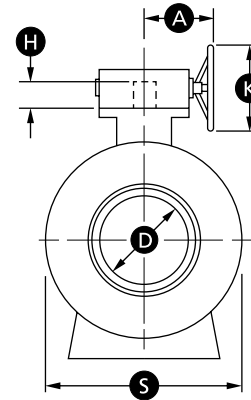
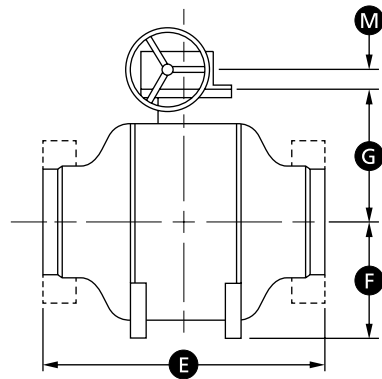
Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

Shaded bore sizes (D) according to ISO 14313

Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

ASME CLASS 2500



Larger sizes available on request.
Reduced-bore valves also available.

ASME CLASS 2500

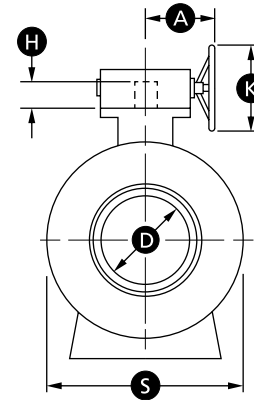
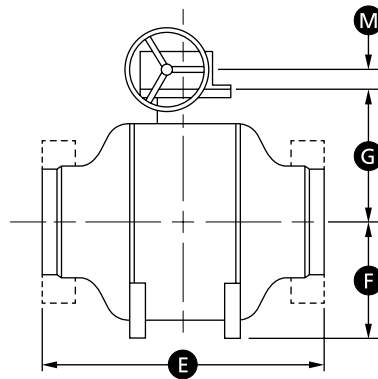
SIZE	in. (mm)	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	RF/RTJ
8	7-1/8	40-1/4	40-1/4	40-7/8	15-1/8	15-1/2	26	5-1/2	*	*	*	-	-	
(200)	(181)	(1022)	(1022)	(1038)	(385)	(393)	(660)	(140)	*	*	*	-	-	
10	8-7/8	50	50	50-7/8	17-1/8	18-1/4	31-1/8	5-1/2	*	*	*	-	-	
(250)	(225)	(1270)	(1270)	(1292)	(435)	(465)	(790)	(140)	*	*	*	-	-	
12	10-1/2	56	56	56-7/8	19-5/8	20-1/2	34-1/4	5-1/2	*	*	*	-	-	
(300)	(267)	(1422)	(1422)	(1445)	(500)	(521)	(870)	(140)	*	*	*	-	-	
14	11-1/2	*	*	*	*	*	*	*	*	*	*	*	*	
(350)	(292)	*	*	*	*	*	*	*	*	*	*	*	*	
16	13-1/8	*	*	*	*	*	*	*	*	*	*	*	*	
(400)	(333)	*	*	*	*	*	*	*	*	*	*	*	*	
18	14-3/4	*	*	*	*	*	*	*	*	*	*	*	*	
(450)	(374)	*	*	*	*	*	*	*	*	*	*	*	*	
20	16-1/2	*	*	*	*	*	*	*	*	*	*	*	*	
(500)	(419)	*	*	*	*	*	*	*	*	*	*	*	*	
22	*	*	*	*	*	*	*	*	*	*	*	*	*	
(550)	*	*	*	*	*	*	*	*	*	*	*	*	*	
24	*	*	*	*	*	*	*	*	*	*	*	*	*	
(600)	*	*	*	*	*	*	*	*	*	*	*	*	*	

*Dimension on request
Flanges in accordance with ASME B16.5
Butt welding ends according to ASME B16.25

Shaded bore sizes (D) according to ISO 14313
Shaded end-to-end dimensions (E) according to ISO 14313/API 6D

GROVE B8a DIMENSIONS AND WEIGHTS

ASME CLASS 150



Larger sizes available on request.
Reduced-bore valves also available.

ASME CLASS 150

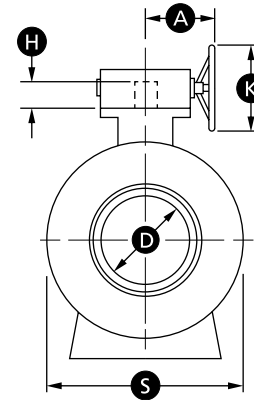
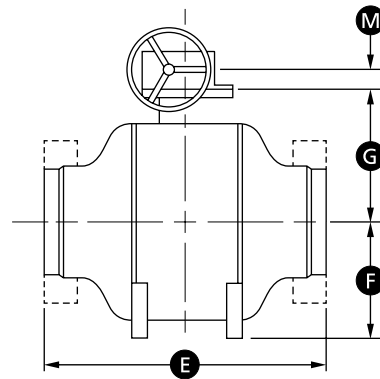
SIZE	in.	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	RF/RTJ
6	6	6	18	*	*	11-7/8	8-1/2	11-7/8	2-3/4	*	*	*	397	507
(150)	(152)	(152)	(457)	*	*	(302)	(216)	(302)	(70)	*	*	*	(180)	(230)
8	8	8	20-1/2	*	*	13-3/8	9-7/8	15-5/8	2-3/4	*	*	*	441	551
(200)	(203)	(203)	(521)	*	*	(340)	(251)	(397)	(70)	*	*	*	(200)	(250)
10	10	10	22	*	*	14-7/8	11-5/8	18-1/4	2-3/4	*	*	*	573	705
(250)	(254)	(254)	(559)	*	*	(378)	(295)	(464)	(70)	*	*	*	(260)	(320)
12	12	12	25	*	*	16-3/8	13-1/2	21-5/8	2-3/4	*	*	*	882	1080
(300)	(305)	(305)	(635)	*	*	(416)	(343)	(549)	(70)	*	*	*	(400)	(490)
14	13-1/4	13-1/4	28-1/2	*	*	18-3/8	14-5/8	23	3-3/4	*	*	*	1301	1587
(350)	(337)	(337)	(724)	*	*	(467)	(371)	(584)	(95)	*	*	*	(590)	(720)
16	15-1/4	15-1/4	30-1/2	*	*	19-7/8	16-1/4	26-3/8	3-3/4	*	*	*	1962	2381
(400)	(387)	(387)	(775)	*	*	(505)	(413)	(670)	(95)	*	*	*	(890)	(1080)
18	17-1/4	17-1/4	33-1/2	*	*	21-1/2	18	29-7/8	4-1/2	*	*	*	2690	3219
(450)	(438)	(438)	(851)	*	*	(546)	(457)	(759)	(114)	*	*	*	(1220)	(1460)
20	19-1/4	19-1/4	35-1/2	*	*	23-1/8	19-3/8	32-7/8	4-1/2	*	*	*	3439	4056
(500)	(489)	(489)	(902)	*	*	(587)	(492)	(835)	(114)	*	*	*	(1560)	(1840)
22	21-1/4	21-1/4	38-1/2	*	*	24-7/8	21-1/8	36-1/4	4-1/2	*	*	*	4541	5379
(550)	(540)	(540)	(978)	*	*	(632)	(537)	(921)	(114)	*	*	*	(2060)	(2440)
24	23-1/4	23-1/4	42	*	*	26-3/8	22-1/2	38-7/8	7-1/8	*	*	*	5710	6746
(600)	(591)	(591)	(1067)	*	*	(670)	(572)	(987)	(181)	*	*	*	(2590)	(3060)
26	25	25	44-1/2	*	*	28-1/4	24-1/2	41-3/4	7-1/8	*	*	*	7033	8245
(650)	(635)	(635)	(1130)	*	*	(718)	(622)	(1060)	(181)	*	*	*	(3190)	(3740)
28	27	27	47	*	*	29-5/8	25-7/8	44-3/4	7-1/8	*	*	*	8488	9943
(700)	(686)	(686)	(1194)	*	*	(752)	(657)	(1137)	(181)	*	*	*	(3850)	(4510)
30	29	29	49	*	*	31-3/4	27-1/2	48-5/8	7-1/8	*	*	*	9810	11,464
(750)	(737)	(737)	(1245)	*	*	(806)	(699)	(1235)	(181)	*	*	*	(4450)	(5200)
32	30-3/4	30-3/4	51-1/2	*	*	33-1/4	29	51	8-1/8	*	*	*	11,684	13,426
(800)	(781)	(781)	(1308)	*	*	(845)	(737)	(1295)	(206)	*	*	*	(5300)	(6090)
34	32-3/4	32-3/4	54-1/2	*	*	34-3/8	30-7/8	53-3/8	8-1/8	*	*	*	13,933	15,917
(850)	(832)	(832)	(1384)	*	*	(873)	(784)	(1356)	(206)	*	*	*	(6320)	(7220)
36	34-1/2	34-1/2	56-1/2	*	*	35-3/4	32-3/8	56-3/4	8-1/8	*	*	*	16,138	18,298
(900)	(876)	(876)	(1435)	*	*	(908)	(822)	(1441)	(206)	*	*	*	(7320)	(8300)
40	38-1/2	38-1/2	65	*	*	39-3/8	35-5/8	63-7/8	8-1/8	*	*	*	22,134	24,802
(1000)	(978)	(978)	(1651)	*	*	(1000)	(905)	(1622)	(206)	*	*	*	(10,040)	(11,250)
42	40-1/4	40-1/4	66-1/2	*	*	40-3/4	38-1/8	67-3/8	8-1/8	*	*	*	25,375	28,241
(1050)	(1022)	(1022)	(1689)	*	*	(1035)	(968)	(1711)	(206)	*	*	*	(11,510)	(12,810)
46	44	44	73	*	*	44-5/8	42-1/2	74-1/2	8-1/8	*	*	*	32,518	35,692
(1150)	(1118)	(1118)	(1854)	*	*	(1133)	(1080)	(1892)	(206)	*	*	*	(14,750)	(16,190)
48	46	46	76	*	*	46-3/8	44-3/8	77-1/2	8-1/8	*	*	*	36,508	39,815
(1200)	(1168)	(1168)	(1930)	*	*	(1178)	(1127)	(1969)	(206)	*	*	*	(16,560)	(18,060)
56	55	55	87	*	*	52-3/4	50-3/8	89-3/4	9-5/8	-	-	-	54,652	58,047
(1400)	(1397)	(1397)	(2210)	*	*	(1340)	(1280)	(2280)	(244)	-	-	-	(24,790)	(26,330)
60	57-1/2	57-1/2	92-1/2	*	*	56-3/8	55-1/8	96-3/8	9-5/8	-	-	-	65,013	68,144
(1500)	(1461)	(1461)	(2350)	*	*	(1432)	(1400)	(2448)	(244)	-	-	-	(29,490)	(30,910)

*Dimension on request

Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

ASME CLASS 300



Larger sizes available on request.
Reduced-bore valves also available.

ASME CLASS 300

SIZE	in. (mm)	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	RF/RTJ
6	6	6	18	*	*	11-7/8	8-1/2	12	2-3/4	*	*	*	419	529
(150)	(152)	(152)	(457)	*	*	(302)	(216)	(305)	(70)	*	*	*	(190)	(240)
8	8	8	20-1/2	*	*	13-3/8	9-7/8	15-7/8	2-3/4	*	*	*	463	573
(200)	(203)	(203)	(521)	*	*	(340)	(251)	(403)	(70)	*	*	*	(210)	(260)
10	10	10	22	*	*	14-7/8	11-5/8	18-3/8	3-3/4	*	*	*	617	750
(250)	(254)	(254)	(559)	*	*	(378)	(295)	(467)	(95)	*	*	*	(280)	(340)
12	12	12	25	*	*	16-3/8	13-1/2	21-3/4	3-3/4	*	*	*	926	1124
(300)	(305)	(305)	(635)	*	*	(416)	(343)	(552)	(95)	*	*	*	(420)	(510)
14	13-1/4	13-1/4	28-1/2	*	*	18-3/8	14-5/8	23-1/4	4-1/2	*	*	*	1367	1675
(350)	(337)	(337)	(724)	*	*	(467)	(371)	(591)	(114)	*	*	*	(620)	(760)
16	15-1/4	15-1/4	30-1/2	*	*	19-7/8	16-1/4	26-3/4	4-1/2	*	*	*	2072	2491
(400)	(387)	(387)	(775)	*	*	(505)	(413)	(679)	(114)	*	*	*	(940)	(1130)
18	17-1/4	17-1/4	33-1/2	*	*	21-1/2	18	30-1/4	4-1/2	*	*	*	2822	3373
(450)	(438)	(438)	(851)	*	*	(546)	(457)	(768)	(114)	*	*	*	(1280)	(1530)
20	19-1/4	19-1/4	35-1/2	*	*	23-1/8	16-7/8	33-1/4	7-1/8	*	*	*	3616	4277
(500)	(489)	(489)	(902)	*	*	(587)	(429)	(845)	(181)	*	*	*	(1640)	(1940)
22	21-1/4	21-1/4	38-1/2	*	*	24-7/8	21-1/8	36-5/8	7-1/8	*	*	*	4784	5644
(550)	(540)	(540)	(978)	*	*	(632)	(537)	(930)	(181)	*	*	*	(2170)	(2560)
24	23-1/4	23-1/4	42	*	*	26-3/8	22-1/2	39-1/4	7-1/8	*	*	*	6019	7099
(600)	(591)	(591)	(1067)	*	*	(670)	(572)	(997)	(181)	*	*	*	(2730)	(3220)
26	25	25	44-1/2	*	*	28-1/4	24-1/2	42-1/8	8-1/8	*	*	*	7385	8686
(650)	(635)	(635)	(1130)	*	*	(718)	(622)	(1070)	(206)	*	*	*	(3350)	(3940)
28	27	27	47	*	*	29-5/8	25-7/8	45-1/4	8-1/8	*	*	*	8929	10,450
(700)	(686)	(686)	(1194)	*	*	(752)	(657)	(1149)	(206)	*	*	*	(4050)	(4740)
30	29	29	49	*	*	31-3/4	27-1/2	49-1/8	8-1/8	*	*	*	10,317	12,059
(750)	(737)	(737)	(1245)	*	*	(806)	(699)	(1248)	(206)	*	*	*	(4680)	(5470)
32	30-3/4	30-3/4	51-1/2	*	*	33-1/4	29	51-1/2	8-1/8	*	*	*	12,280	14,109
(800)	(781)	(781)	(1308)	*	*	(845)	(737)	(1308)	(206)	*	*	*	(5570)	(6400)
34	32-3/4	32-3/4	54-1/2	*	*	34-3/8	30-7/8	53-7/8	8-1/8	*	*	*	14,660	16,733
(850)	(832)	(832)	(1384)	*	*	(873)	(784)	(1368)	(206)	*	*	*	(6650)	(7590)
36	34-1/2	34-1/2	56-1/2	*	*	35-3/4	32-3/8	57-3/8	8-1/8	*	*	*	16,975	19,246
(900)	(876)	(876)	(1435)	*	*	(908)	(822)	(1457)	(206)	*	*	*	(7700)	(8730)
40	38-1/2	38-1/2	65	*	*	39-3/8	35-5/8	64-1/2	8-1/8	*	*	*	23,280	26,080
(1000)	(978)	(978)	(1651)	*	*	(1000)	(905)	(1638)	(206)	*	*	*	(10,560)	(11,830)
42	40-1/4	40-1/4	66-1/2	*	*	40-3/4	38-1/8	68-1/8	9-5/8	*	*	*	26,698	29,718
(1050)	(1022)	(1022)	(1689)	*	*	(1035)	(968)	(1730)	(244)	*	*	*	(12,110)	(13,480)
46	44	44	73	*	*	44-5/8	42-1/2	75-1/4	9-5/8	*	*	*	34,193	37,544
(1150)	(1118)	(1118)	(1854)	*	*	(1133)	(1080)	(1911)	(244)	*	*	*	(15,510)	(17,030)
48	46	46	76	*	*	46-3/8	44-3/8	78-1/4	9-5/8	*	*	*	38,404	41,887
(1200)	(1168)	(1168)	(1930)	*	*	(1178)	(1127)	(1988)	(244)	*	*	*	(17,420)	(19,000)
56	55	55	87	*	*	52-3/4	50-3/8	90-3/4	9-5/8	-	-	-	57,496	61,067
(1400)	(1397)	(1397)	(2210)	*	*	(1340)	(1280)	(2305)	(244)	-	-	-	(26,080)	(27,700)
60	57-1/2	57-1/2	92-1/2	*	*	56-3/8	55-1/8	97-1/2	9-5/8	-	-	-	68,386	71,671
(1500)	(1461)	(1461)	(2350)	*	*	(1432)	(1400)	(2477)	(244)	-	-	-	(31,020)	(32,510)

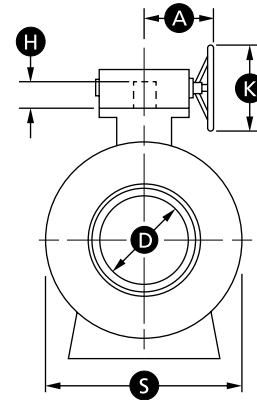
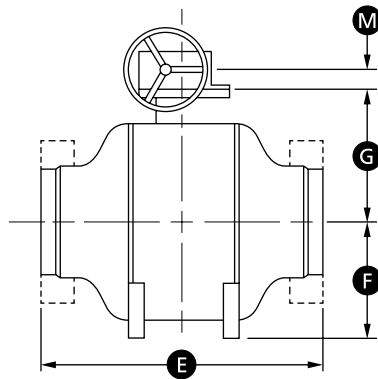
*Dimension on request

Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

GROVE B8a DIMENSIONS AND WEIGHTS (continued)

ASME CLASS 600



Larger sizes available on request.
Reduced-bore valves also available.

ASME CLASS 600

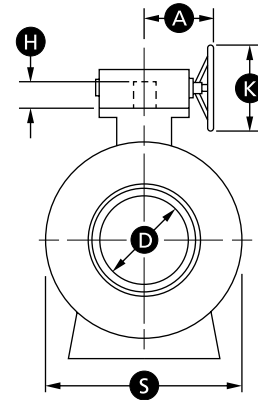
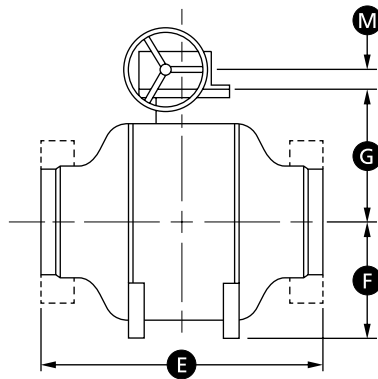
SIZE	in. (mm)	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	RF/RTJ
6	6	6	18	*	*	12-1/4	8-1/2	12-1/4	2-3/4	*	*	*	529	661
(150)	(152)	(152)	(457)	*	*	(311)	(216)	(311)	(70)	*	*	*	(240)	(300)
8	8	8	21-1/2	*	*	13-3/4	9-7/8	16-1/8	3-3/4	*	*	*	573	705
(200)	(203)	(203)	(546)	*	*	(349)	(251)	(410)	(95)	*	*	*	(260)	(320)
10	10	10	23-1/2	*	*	15-3/8	11-5/8	18-7/8	3-3/4	*	*	*	750	926
(250)	(254)	(254)	(597)	*	*	(391)	(295)	(479)	(95)	*	*	*	(340)	(420)
12	12	12	26-1/2	*	*	16-7/8	13-1/2	22-1/4	3-3/4	*	*	*	1146	1389
(300)	(305)	(305)	(673)	*	*	(429)	(343)	(565)	(95)	*	*	*	(520)	(630)
14	13-1/4	13-1/4	28-1/2	*	*	18-7/8	14-5/8	23-3/4	4-1/2	*	*	*	1698	2050
(350)	(337)	(337)	(724)	*	*	(479)	(371)	(603)	(114)	*	*	*	(770)	(930)
16	15-1/4	15-1/4	30-1/2	*	*	20-1/2	16-1/4	27-1/4	4-1/2	*	*	*	2557	3086
(400)	(387)	(387)	(775)	*	*	(521)	(413)	(692)	(114)	*	*	*	(1160)	(1400)
18	17-1/4	17-1/4	33-1/2	*	*	22-1/8	18	30-7/8	7-1/8	*	*	*	3483	4167
(450)	(438)	(438)	(851)	*	*	(562)	(457)	(784)	(181)	*	*	*	(1580)	(1890)
20	19-1/4	19-1/4	35-1/2	*	*	23-3/4	19-3/8	33-7/8	7-1/8	*	*	*	4453	5269
(500)	(489)	(489)	(902)	*	*	(603)	(492)	(860)	(181)	*	*	*	(2020)	(2390)
22	21-1/4	21-1/4	38-1/2	*	*	25-5/8	21-1/8	37-3/8	8-1/8	*	*	*	5908	6966
(550)	(540)	(540)	(978)	*	*	(651)	(537)	(949)	(206)	*	*	*	(2680)	(3160)
24	23-1/4	23-1/4	42	*	*	27-1/8	22-1/2	40-1/8	8-1/8	*	*	*	7429	8752
(600)	(591)	(591)	(1067)	*	*	(689)	(572)	(1019)	(206)	*	*	*	(3370)	(3970)
26	25	25	44-1/2	*	*	29-1/8	24-1/2	43	8-1/8	*	*	*	9127	10,714
(650)	(635)	(635)	(1130)	*	*	(740)	(622)	(1092)	(206)	*	*	*	(4140)	(4860)
28	27	27	47	*	*	30-1/2	25-7/8	46-1/8	8-1/8	*	*	*	11,023	12,919
(700)	(686)	(686)	(1194)	*	*	(775)	(657)	(1172)	(206)	*	*	*	(5000)	(5860)
30	29	29	49	*	*	32-5/8	27-1/2	50-1/8	9-5/8	*	*	*	12,743	14,881
(750)	(737)	(737)	(1245)	*	*	(829)	(699)	(1273)	(244)	*	*	*	(5780)	(6750)
32	30-3/4	30-3/4	51-1/2	*	*	34-1/4	29	52-1/2	9-5/8	*	*	*	15,168	17,438
(800)	(781)	(781)	(1308)	*	*	(870)	(737)	(1334)	(244)	*	*	*	(6880)	(7910)
34	32-3/4	32-3/4	54-1/2	*	*	35-3/8	30-7/8	55	9-5/8	*	*	*	18,100	20,679
(850)	(832)	(832)	(1384)	*	*	(899)	(784)	(1397)	(244)	*	*	*	(8210)	(9380)
36	34-1/2	34-1/2	56-1/2	*	*	36-7/8	32-3/8	58-1/2	9-5/8	*	*	*	20,944	23,765
(900)	(876)	(876)	(1435)	*	*	(937)	(822)	(1486)	(244)	*	*	*	(9500)	(10,780)
40	38-1/2	38-1/2	65	*	*	40-1/2	35-5/8	65-7/8	9-5/8	*	*	*	28,748	32,187
(1000)	(978)	(978)	(1651)	*	*	(1029)	(905)	(1673)	(244)	*	*	*	(13,040)	(14,600)
42	40-1/4	40-1/4	66-1/2	*	*	42	38-1/8	69-1/2	9-5/8	*	*	*	32,959	36,684
(1050)	(1022)	(1022)	(1689)	*	*	(1067)	(968)	(1765)	(244)	*	*	*	(14,950)	(16,640)
46	44	44	73	*	*	46-1/8	42-1/2	76-3/4	9-5/8	*	*	*	42,218	46,362
(1150)	(1118)	(1118)	(1854)	*	*	(1172)	(1080)	(1949)	(244)	*	*	*	(19,150)	(21,030)
48	46	46	76	*	*	47-7/8	44-3/8	79-7/8	9-5/8	*	*	*	47,399	51,720
(1200)	(1168)	(1168)	(1930)	*	*	(1216)	(1127)	(2029)	(244)	*	*	*	(21,500)	(23,460)
56	55	55	87	*	*	54-3/8	50-3/8	92-5/8	11	-	-	-	70,988	75,397
(1400)	(1397)	(1397)	(2210)	*	*	(1381)	(1280)	(2353)	(279)	-	-	-	(32,200)	(34,200)
60	57-1/2	57-1/2	92-1/2	*	*	58-1/8	55-1/8	99-3/8	11	-	-	-	84,436	88,492
(1500)	(1461)	(1461)	(2350)	*	*	(1476)	(1400)	(2524)	(279)	-	-	-	(38,300)	(40,140)

*Dimension on request

Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

ASME CLASS 900



Larger sizes available on request.
Reduced-bore valves also available.

ASME CLASS 900

SIZE	in. (mm)	D	E			F	G	S	H	A	K	M	WEIGHT	
			WE	RF	RTJ								WE	RF/RTJ
6	6	6	20	*	*	9-7/8	9-1/2	13-1/4	3-3/4	*	*	*	640	800
(150)	(152)	(508)	(508)	*	*	(251)	(241)	(337)	(95)	*	*	*	(290)	(363)
8	8	8	23-1/2	*	*	11-3/8	10-7/8	16-1/2	3-3/4	*	*	*	694	854
(200)	(203)	(597)	(597)	*	*	(289)	(276)	(419)	(95)	*	*	*	(315)	(387)
10	10	10	25-1/2	*	*	13-5/8	12-1/2	20-1/8	4-1/2	*	*	*	907	1120
(250)	(254)	(648)	(648)	*	*	(346)	(318)	(511)	(114)	*	*	*	(411)	(508)
12	12	12	29-1/2	*	*	15-3/8	14-3/8	23-5/8	4-1/2	*	*	*	1387	1681
(300)	(305)	(749)	(749)	*	*	(391)	(365)	(600)	(114)	*	*	*	(629)	(762)
14	12-3/4	12-3/4	31-1/2	*	*	17-3/4	15-3/8	26-3/4	4-1/2	*	*	*	2054	2481
(350)	(324)	(800)	(800)	*	*	(451)	(391)	(679)	(114)	*	*	*	(932)	(1125)
16	14-3/4	14-3/4	33-1/2	*	*	19-5/8	16-7/8	30-3/8	7-1/8	*	*	*	3094	3735
(400)	(375)	(851)	(851)	*	*	(498)	(429)	(772)	(181)	*	*	*	(1404)	(1694)
18	16-3/4	16-3/4	36-1/2	*	*	21-5/8	19-1/8	33-1/2	7-1/8	*	*	*	4215	5042
(450)	(425)	(927)	(927)	*	*	(549)	(486)	(851)	(181)	*	*	*	(1912)	(2287)
20	18-5/8	18-5/8	38-1/2	*	*	23-1/4	20-7/8	36-1/4	8-1/8	*	*	*	5388	6375
(500)	(473)	(978)	(978)	*	*	(591)	(530)	(921)	(206)	*	*	*	(2444)	(2892)
22	20-5/8	20-5/8	42	*	*	25-3/4	21-7/8	40-1/2	8-1/8	*	*	*	7149	8429
(550)	(524)	(1067)	(1067)	*	*	(654)	(556)	(1029)	(206)	*	*	*	(3243)	(3824)
24	22-1/2	22-1/2	45	*	*	27-1/2	24-3/8	43-3/4	9-5/8	*	*	*	8990	10,590
(600)	(572)	(1143)	(1143)	*	*	(699)	(619)	(1111)	(244)	*	*	*	(4078)	(4804)
26	24-3/8	24-3/8	47-1/2	*	*	29-7/8	26-1/4	47-1/4	9-5/8	*	*	*	11,044	12,964
(650)	(619)	(1207)	(1207)	*	*	(759)	(667)	(1200)	(244)	*	*	*	(5009)	(5881)
28	26-1/4	26-1/4	50	*	*	31-7/8	27-7/8	50-3/4	9-5/8	*	*	*	13,338	15,632
(700)	(667)	(1270)	(1270)	*	*	(810)	(708)	(1289)	(244)	*	*	*	(6050)	(7091)
30	28-1/8	28-1/8	52	*	*	32-3/4	29-5/8	53-3/8	9-5/8	*	*	*	15,418	18,006
(750)	(714)	(1321)	(1321)	*	*	(832)	(752)	(1356)	(244)	*	*	*	(6994)	(8168)
32	30	30	54-1/2	*	*	35-7/8	31-7/8	57-1/2	9-5/8	*	*	*	18,353	21,100
(800)	(762)	(1384)	(1384)	*	*	(911)	(810)	(1461)	(244)	*	*	*	(8325)	(9571)
34	31-7/8	31-7/8	57	*	*	37-3/4	33-3/8	61	9-5/8	*	*	*	21,901	25,022
(850)	(810)	(1448)	(1448)	*	*	(959)	(848)	(1549)	(244)	*	*	*	(9934)	(11,350)
36	33-3/4	33-3/4	59-1/2	*	*	40-1/8	34-3/4	64-3/8	11	*	*	*	25,342	28,756
(900)	(857)	(1511)	(1511)	*	*	(1019)	(883)	(1635)	(279)	*	*	*	(11,495)	(13,044)

*Dimension on request

Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

Quality System and Qualification Testing

Quality Assurance Program

Cameron runs a high-level quality control program to ensure all products are manufactured to the highest standards using the latest technology. Cameron's quality system is based on ISO 9000 and API Q1 codes.

All valves are designed in accordance with the most stringent industry procedures and standards and are built according to the European directives PED and ATEX, upon request. Cameron monitors and controls all phases of valve production, inspection and testing to maintain compliance to quality requirements.

R&D Laboratory

GROVE valves are designed in accordance with applicable industry specifications. Cameron can design valves in accordance with customer codes and specifications upon request. All designs are subjected to full in-house qualification testing. Cameron's in-house testing facilities and participation with the major oil and gas companies' R&D programs allow Cameron to supply products featuring advanced technology.

Hydraulic and gas sealing testing, functional testing, cycling and torque testing are carried out on prototype valves. This testing validates the valve design and verifies the maximum allowable seat leakage rate and the expected service life.

High-pressure Gas Testing

Customer specifications may require more detailed testing in addition to conventional hydrostatic testing. Cameron is fully equipped to carry out enhanced gas testing at ambient, low or high temperatures using our in-house, specially equipped, state-of-the-art test bunkers.

External leakage rates (if any) are detected by means of a mass spectrometer. Leakage through the seats (if any) is measured by means of calibrated flow meters.

For low- or high-temperature service, gas testing can be performed to customer-specified critical conditions.

Cameron's facilities are capable of testing a wide range of valve sizes and pressure classes.

Inspection and Testing

Cameron monitors and verifies all phases of valve production from material receipt to final inspection, including a liaison with third-party inspectors and certifying authorities.

All products are supplied with certified test reports, which include the chemical and physical analyses of pressure-containing components, as well as hydrostatic pressure test reports. NDE and other specified examinations are included in the final certification if requested.

All valves are hydrostatically pressure-tested in accordance with ISO 14313/API 6D. A complete range of equipment and instrumentation is available to perform both standard and special test requirements.



CAMSERV™ 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

Customized asset management plans that optimize uptime, availability and dedicated services.

- Engineering consultancy
- Site management
- Flange management
- Startup and commissioning
- Spare parts and asset management
- Operational support



Trademark Information

GROVE is a registered trademark of Cameron. CAMSERV is a trademark of Cameron.

This document contains references to registered trademarks or product designations, which are not owned by Cameron.

Trademark	Owner	Common Name	Comparable Cameron Abbreviated Name (in trim charts)
Inconel	Special Metals Corporation		
Stellite	Stoody Deloro Stellite, Inc.		
Teflon	E.I. DuPont De Nemours & Company		





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HSSE Policy Statement

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