

GROVE G4N Gate Valves

Through-conduit, double block-and-bleed slab gate valves with fully protected seat faces for long-lasting, drop-tight shutoff in liquid pipelines

TECHNOLOGY



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GROVE G4N Gate Valves

GENERAL INFORMATION

Applications

- Pipeline main valves
- Manifolds
- Storage tanks
- Pig launchers and receivers
- Station valves
- Oil and gas transmission
- Distribution industry

Product Range

Size		ASME Class					
in.	(mm)	150	300	400	600	900	1500
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	(1300)	•	•	•	•		
58	(1450)	•	•	•	•		
60	(1500)	•	•	•	•		

Standard Design Features

- Stem seals: self-energized non-rolling lip seals
- No side load and friction drag on the stem – low operating thrust
- Stem protector and gate position indicator
- Through-conduit, self-cleaning, floating slab gate
- Floating seat always in contact with the gate
- Metal-to-metal primary seal, protected O-ring secondary seal
- Block-and-bleed and double block-and-bleed design
- Top-entry body for in-line maintenance
- API 6D standard
- Fabricated body construction
- Flexible product design arrangements

Optional Features

- Built-in sealant injection system for emergency sealing
- Reverse-acting gate
- Graphite packing fire-safe sealing
- OS&Y bonnet design
- Back seat
- Seat skirts for dirty fluid application
- Metal-to-metal with tungsten carbide coating (TCC)

STANDARD DESIGN FEATURES

Valve Construction

The body on Cameron's GROVE® G4N gate valve is fabricated of welded steel plates and forged rolled ends.

As the size and the pressure class increases, the valve body is reinforced with multiple welded ribs.

The pressure-containing plates are sandblasted and ultrasonically inspected.

Various welding procedures are available based on material, thickness and joint requirements from welding personnel qualified to ASME IX.

Non-destructive magnetic and ultrasonic inspections of the welding are performed per ASME VIII Division 1 Approved VI/XII.

Seat Construction

Both the gate and the seats are floating parts. The initial seal, at extremely low pressure differential, is obtained by a series of springs behind the seats pushing against the gate.

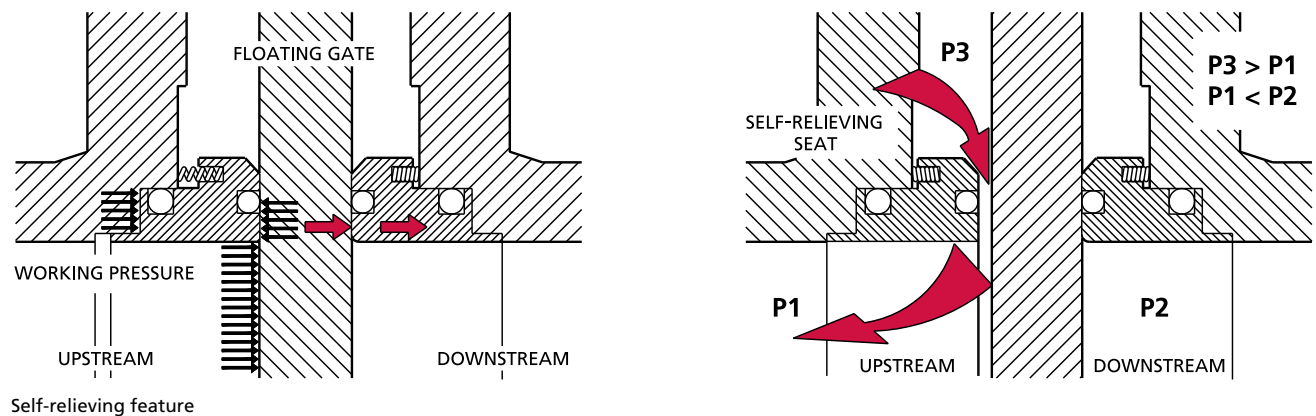
When the gate is closed, the forces derived from upstream working pressure push the gate tightly against the downstream seats. This results in upstream and downstream bubble-tight seals that work independently under all pressure conditions.

When the gate is open, the unbalanced pressure principal ensures that both upstream and downstream seats are forced against the gate, resulting in through-conduit port without access to the line and the body cavity.

Sealing is performed by both a primary metal-to-metal seal and a secondary, protected O-ring seal.

Self-Relieving Features

The seat design features an automatic internal body relief for protection against overpressure in the body cavity. The overpressure, higher than the upstream line pressure, overcomes the piston force to move the seat away from the gate.



STANDARD DESIGN FEATURES (CONT.)



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

GROVE G4N gate valves are ideally suited for services requiring block-and-bleed or double block-and-bleed.

The GROVE bubble-tight independent upstream and independent downstream seal design permits venting and draining of the line fluids from the body cavity.

Small body cavities permit rapid drainage.

Body Drain

The body drain is located in the lowest part of the side point of the body cavity, and it is achieved by means of an NPT drain valve with safety plug.

A 1/2" NPT bonnet plug allows for the possibility of flushing through the bonnet and drain.

Stem and Gate Construction

The stem and gate connection promotes the floating movement of the gate.

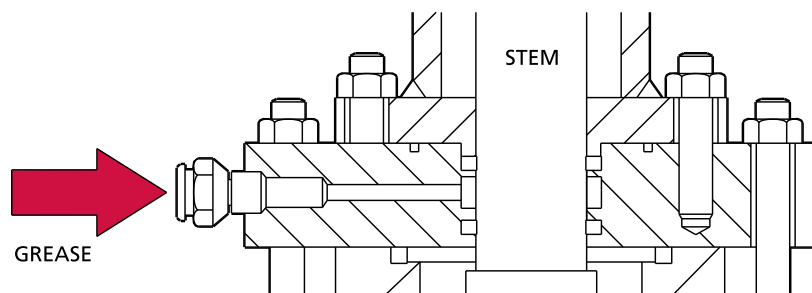
The slab gate is aligned between the two floating seats and between the side guides, which are part of the seats. This allows for self-alignment to compensate for pipe movement and stresses in the pipeline.

Mechanical stops are adjusted to provide the vertical alignment of the gate port with the seats.

A visible gate-position indicator rod and a stem protector are provided as a standard feature on handwheel-, gearbox- and motor-operated valves.

Stem Seals

The stem is sealed with a primary and secondary ring energized lip seal made from abrasion-resistant material in a non-rolling configuration with provisions for emergency sealant injection between them.



Internal Coating

Internal trim parts (gate, seats and stem) usually are electroless nickel plated (ENP). The chemical process provides corrosion-resistance and low wear to the parts during operation. Depending on the type of the fluid, a variety of corrosion-resistant and hard overlays can be applied in the critical sealing areas.



Maintenance

The GROVE G4N top-entry gate valve is designed to be in-line repairable.

The complete disassembly of the yoke and bonnet can be achieved after line depressurization without removing the gate from the seats. In this case, the stem gaskets and the body bonnet O-ring can be replaced.

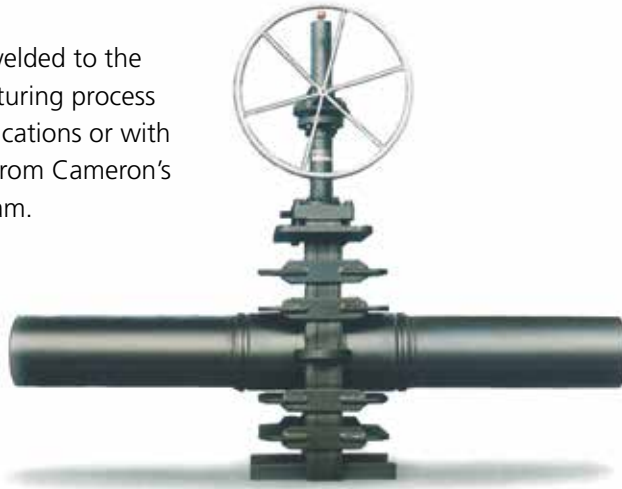
Using a simple wedge tool, the gate can be disengaged from the seats and all these parts can be disassembled, checked and eventually replaced, if necessary.

The valves are equipped with handling devices such as lifting lugs and eyebolts.

OPTIONAL FEATURES

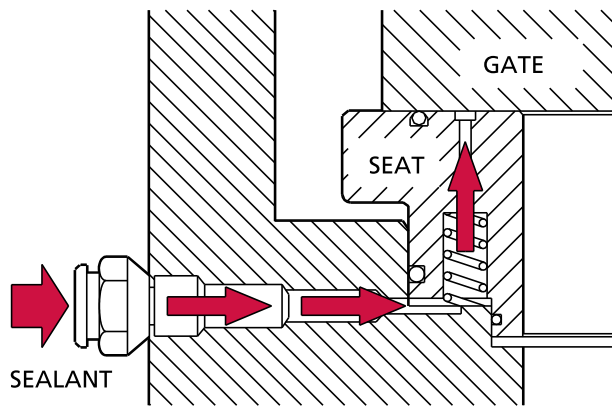
Transition Pieces

Transition pieces can be welded to the valve during the manufacturing process based on customer specifications or with engineering consultancy from Cameron's dedicated engineering team.



Emergency Seat Seal

All GROVE G4N gate valves are designed to not require sealants; however, if the metal-to-metal primary seal and the secondary O-ring seal are damaged, an emergency shutoff may be obtained with a sealant injected into an optional, specially designed groove in the seat ring assembly.



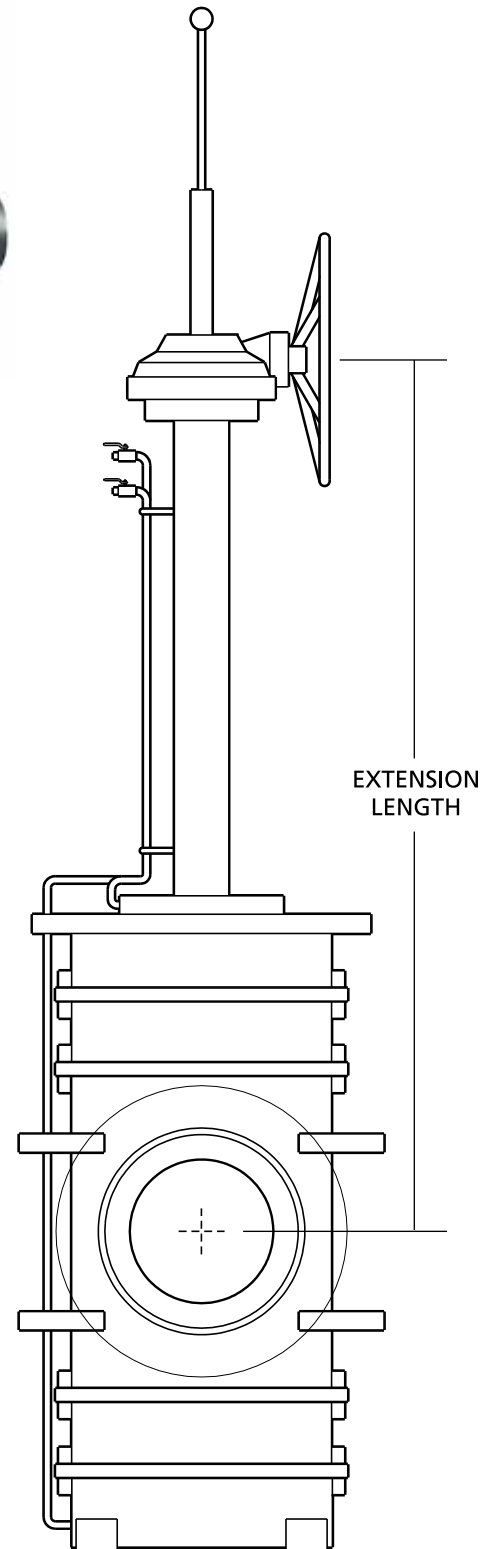
Emergency seat seal

Stem Extensions

GROVE G4N gate valves can be provided with optional stem extensions to permit buried or underground installations in remote or inaccessible areas.

When used for buried valve service, they can be furnished water-tight, and the piping of the vent, drain and grease injection system also will be extended.

When ordering extensions, please specify the distance required from the valve centerline to the handwheel centerline.



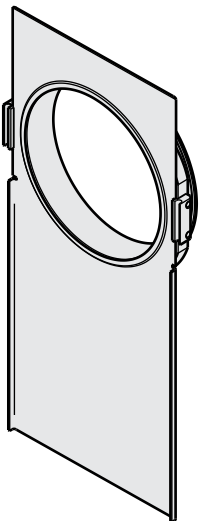
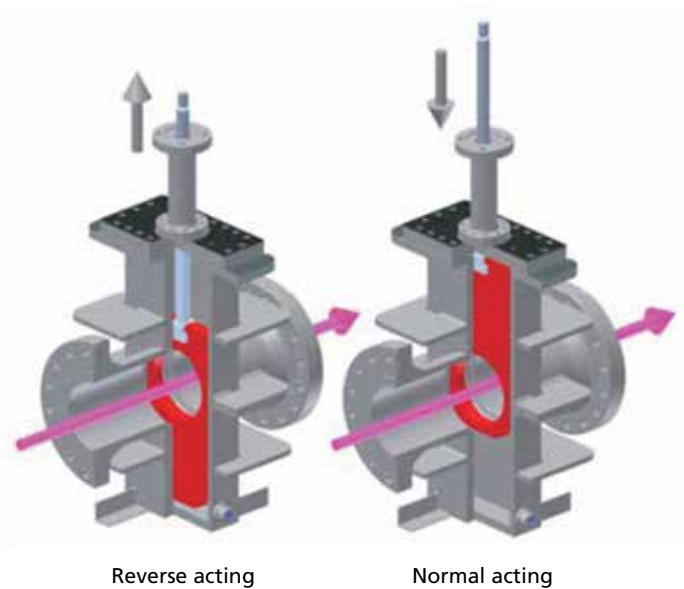
Reverse-Acting Gate Design for Fail-to-Close Applications

If the valve normally is open and fail-to-close is required, the valve can be supplied as reverse acting (gate moves upward to close).

Normal-Acting Gate Design for Fail-to-Open Applications

If the valve normally is closed and fail-to-open is required, the valve can be supplied as normal acting (gate moves upward to open) with a special seat design, where the pressure in the body cavity allows the valve to open easily on demand.

The special seat design for this application maintains the bi-directionality of the valve to avoid installation mistakes.



Seat Skirts for Dirty Fluid Application

GROVE G4N gate valves can be supplied with protection skirts when the valves are used in dirty fluid applications.

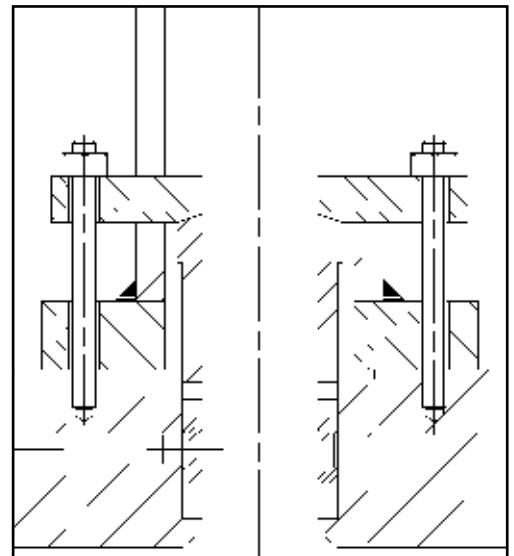
This feature is applicable to both the normal-acting design and the reverse-acting design.

Due to the skirt design, a simple wedge tool can be used to disassemble and reassemble the seats.

OS&Y Bonnet and Back Seat

GROVE G4N gate valves can be supplied with an OS&Y bonnet and back seat.

This bonnet design incorporates the stem sealing injection system with a lantern ring in the middle of the stem graphite packing.



SPECIAL APPLICATIONS

Vertical Installation

GROVE G4N gate valves can be designed for vertical installation in pipelines.

The valve is supplied together with special equipment that permits the gate and the seats to be removed while being supported during lateral disassembly.

Metal-Seated Gate Valves

Metal-seated options are available for a variety of applications, including:

- Abrasive fluids
- Service temperatures over the pressure/temperature ratings of the soft-seat insert materials
- Service conditions requiring full reliability such as emergency shutdown valves (ESDV).

Plating and Coating Technologies

A range of plating and coating materials are available to suit specific service requirements for metal-seated gate valves.

- Tungsten carbide powders applied with high-velocity spray systems can be applied in-house using Cameron's HVOF system.
- Depending on service conditions, electroless nickel plating (ENP) can be applied in the hard version, corresponding to ASTM B733 SC4 Type III, Class 2 – NiP1275.
- Cameron's ENP process has been specially developed for valve applications and is applied using an in-house plating facility.
- Qualification testing can be performed at third-party or in-house facilities.



MATERIAL SPECIFICATIONS

Materials Selection

The following is a typical listing of materials for valves, ASME Classes 150 to 1500, for standard applications.

Standard Models and Materials	
Body	Fe 510 EN 10025 (Eq. A572 Gr. 50) P355 NL2 – EN 10028
Bonnet	Fe 510 EN 10025 (Eq. A572 Gr. 50) P355 NL2 – EN 10028
Stem	AISI 4140 (Electroless Nickel Plating)
Bolting	A193 B7, A194 2H, A193 B7M, A194 2HM A320 L7, A194 Gr. 7, A320 L7M, A194 Gr. 7M

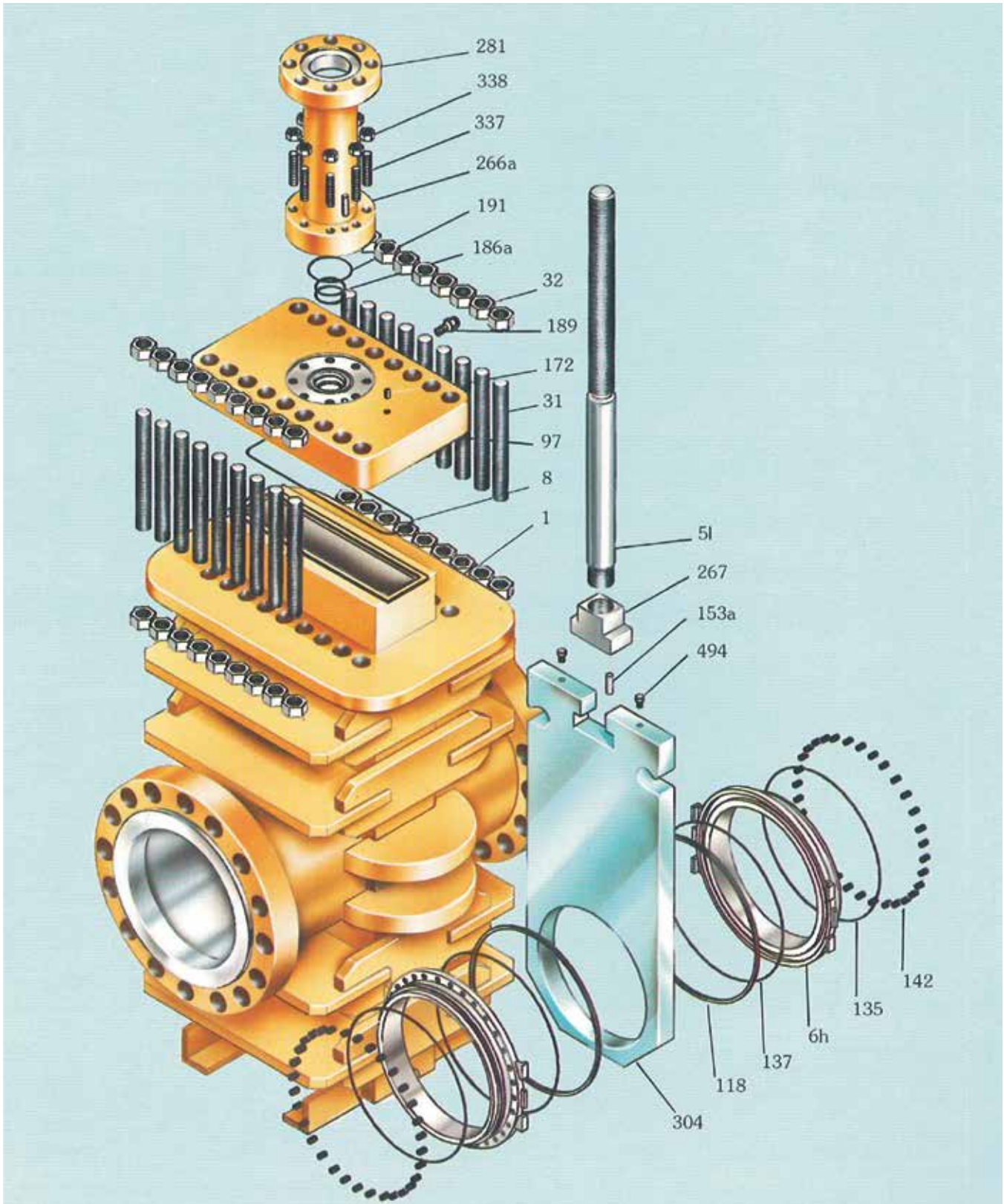
Internal Parts	
Gate	Fe 510 EN 10025 (Eq. A572 Gr. 50) P355 NL2 – EN 10028
Seats	A105, A350 LF2
Springs	AISI 302, Inconel® (Different Grades) Elgiloy

Sealing Materials	
Stem Gaskets	NBR (Nitrile) FKM (Viton® Different Grades) HNBR (Hydrogenated Nitrile) Graphite Packing (for OS&Y Bonnet)
Seat/Bonnet Gaskets	NBR (Nitrile) FKM (Viton Different Grades) HNBR (Hydrogenated Nitrile)

Planting/Coating	
0.001"	25 microns Electroless Nickel Plating
0.003"	75 microns Electroless Nickel Plating

NACE Requirements	
On Request	GROVE G4N gate valves are supplied fully in accordance with NACE MR0175.

VALVE ASSEMBLY



Item	Description
1	Body
5l	Stem
6h	Seat
8	Body O-ring
31	Body Stud
32	Body Stud Nut
97	Bonnet
118	Seat Ring
135	Seat Gasket O-ring
137	Seal O-ring
142	Cylindrical Spring
153a	Driver Safety Pin
172	Vent Plug
186a	Stem Seal Gasket
189	Stem Grease Fitting
191	Lower Extension O-ring
266b	Adapter Plate Stop Spring Pin
267	Stem Head
281	Yoke Unit
304	Gate
337	Yoke Stud
338	Yoke Stud Nut
494	Adjusting Screw

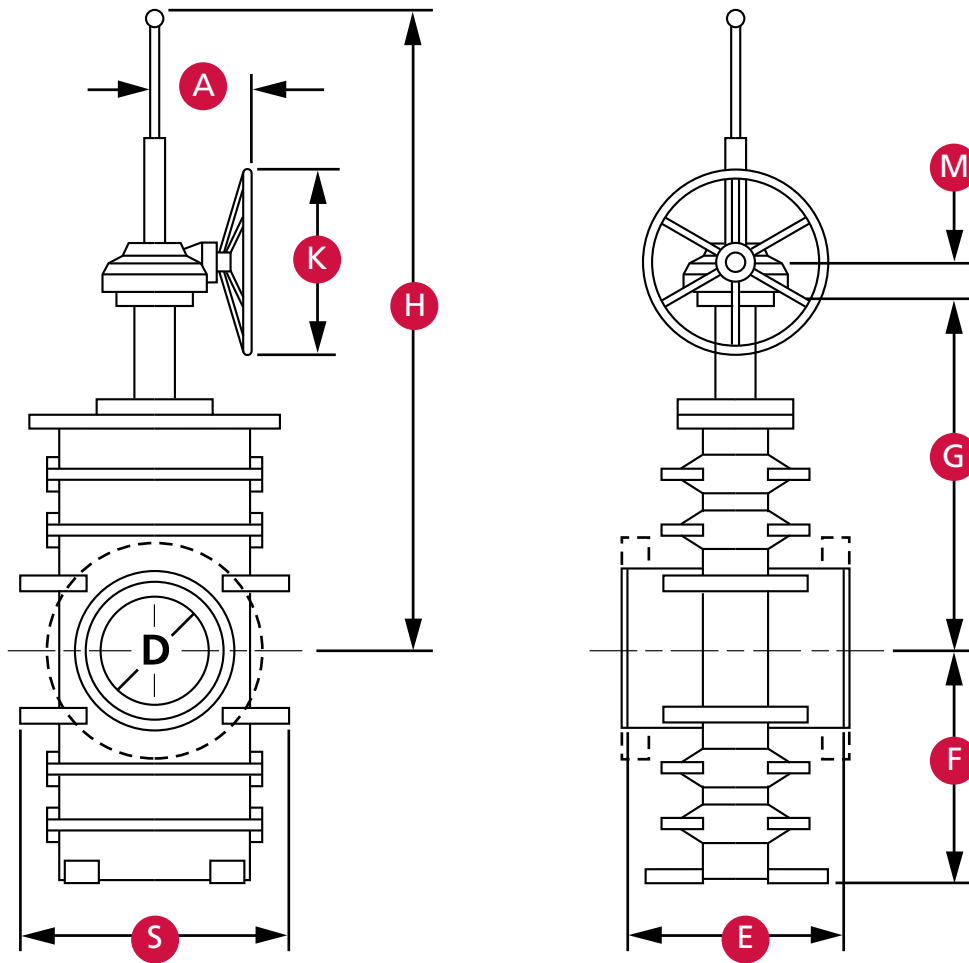
Dimensions and Weights

ASME CLASS 150

Sizes 4" through 60" (100 mm through 1500 mm)

Larger on request.

Reduced-bore valves also are available.



Size in. (mm)	D	E			F	G	S	H	A	K	M	Weight lb (kg)	
		WE	RF	RTJ								WE	RF/RTJ
4 (100)	4 (102)	12 (305)	9 (229)	9-1/2 (241)	10-1/2 (267)	20-1/4 (514)	9-1/8 (232)	35-1/2 (901)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	198 (90)	220 (100)
6 (150)	6 (152)	15-7/8 (403)	10-1/2 (267)	11 (279)	13-3/8 (339)	24-7/8 (631)	11-3/8 (288)	43-1/2 (1104)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	397 (180)	441 (200)
8 (200)	8 (203)	16-1/2 (419)	11-1/2 (292)	12 (305)	16-1/2 (420)	31-1/2 (799)	13-1/8 (334)	54-3/8 (1380)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	694 (315)	772 (350)
10 (250)	10 (254)	18 (457)	13 (330)	13-1/2 (343)	19-5/8 (499)	37-3/8 (950)	15-5/8 (396)	64-1/4 (1633)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	992 (450)	1102 (500)
12 (300)	12 (305)	19-3/4 (502)	14 (356)	14-1/2 (368)	22-1/2 (570)	42-1/2 (1078)	17-5/8 (448)	73-1/2 (1868)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	1148 (521)	1275 (579)
14 (350)	13-1/4 (337)	22-1/2 (572)	15 (381)	15-1/2 (394)	24-3/8 (618)	45-5/8 (1158)	19-1/8 (486)	79-1/8 (2009)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	1786 (810)	1984 (900)
16 (400)	15-1/4 (387)	24 (610)	16 (406)	16-1/2 (419)	27-7/8 (709)	52-5/8 (1338)	21-3/4 (554)	90-1/2 (2299)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	2021 (917)	2245 (1018)
18 (450)	17-1/4 (438)	26 (660)	17 (432)	17-1/2 (445)	30-3/8 (770)	57-3/8 (1456)	26-1/2 (672)	99-3/8 (2525)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	2976 (1350)	3307 (1500)
20 (500)	19-1/4 (489)	28 (711)	18 (457)	18-1/2 (470)	33-3/8 (847)	61-7/8 (1571)	28-3/8 (720)	108-1/4 (2748)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	3571 (1620)	3968 (1800)
22 (550)	21-1/4 (540)	*	*	*	37-3/4 (960)	70-3/4 (1796)	35-3/8 (900)	122-1/2 (3110)	8-5/8 (220)	19-5/8 (500)	2-7/8 (74)	4365 (1980)	4850 (2200)
24 (600)	23-1/4 (591)	32 (813)	20 (508)	20-1/2 (521)	40-3/8 (1026)	73-1/8 (1858)	39-5/8 (1005)	128-3/4 (3269)	8-5/8 (220)	19-5/8 (500)	2-7/8 (74)	5159 (2340)	5732 (2600)
26 (650)	25 (635)	34 (864)	22 (559)	*	44-1/8 (1120)	81-7/8 (2081)	45-1/4 (1150)	141-3/8 (3590)	8-5/8 (220)	19-5/8 (500)	2-7/8 (74)	5952 (2700)	6614 (3000)
28 (700)	27 (686)	36 (914)	24 (610)	*	47-1/4 (1199)	85-5/8 (2175)	50-7/8 (1292)	150-1/4 (3817)	9-1/2 (241)	19-5/8 (500)	3-5/8 (92)	6944 (3150)	7716 (3500)
30 (750)	29 (737)	36 (914)	26 (660)	*	50-3/8 (1280)	90-3/4 (2306)	54-1/2 (1384)	159-5/8 (4056)	9-1/2 (241)	19-5/8 (500)	3-5/8 (92)	7937 (3600)	8818 (4000)
32 (800)	30-3/4 (781)	38 (965)	28 (711)	*	53 (1345)	98 (2488)	57-1/2 (1460)	170-7/8 (4340)	12-5/8 (320)	19-5/8 (500)	4 (102)	9127 (4140)	10141 (4600)
34 (850)	32-3/4 (832)	40 (1016)	30 (762)	*	55-7/8 (1420)	103-1/4 (2623)	60-5/8 (1540)	180-1/8 (4575)	12-5/8 (320)	19-5/8 (500)	4 (102)	10,318 (4680)	11,464 (5200)
36 (900)	34-1/2 (876)	40 (1016)	32 (813)	*	58-7/8 (1495)	107-1/2 (2730)	65 (1652)	188-1/4 (4783)	12-5/8 (320)	19-5/8 (500)	4 (102)	11,250 (5103)	12,500 (5670)
38 (950)	36-1/2 (927)	*	*	*	62-1/4 (1580)	115-1/8 (2923)	66-1/2 (1690)	199-3/4 (5075)	12-5/8 (320)	19-5/8 (500)	4 (102)	12,500 (5670)	13,889 (6300)
40 (1000)	38-1/2 (978)	*	*	*	64-1/2 (1639)	122 (3099)	70-1/8 (1780)	210-1/8 (5337)	12-5/8 (320)	19-5/8 (500)	4 (102)	13,889 (6300)	15,432 (7000)
42 (1050)	40-1/4 (1022)	*	*	*	68-1/8 (1730)	125-3/8 (3185)	72-1/2 (1840)	218-1/2 (5550)	16-1/8 (410)	31-1/2 (800)	4-1/2 (115)	15,278 (6930)	16,975 (7700)
48 (1200)	46 (1168)	*	*	*	76-7/8 (1953)	140-7/8 (3578)	79-3/8 (2016)	245-1/4 (6230)	16-1/8 (410)	31-1/2 (800)	4-1/2 (115)	19,643 (8910)	21,826 (9900)
54 (1350)	51-3/4 (1314)	*	*	*	86-1/4 (2190)	159 (4040)	91 (2310)	278 (7060)	17-7/8 (453)	31-1/2 (800)	5-7/8 (150)	24,405 (11,070)	27,117 (12,300)
56 (1400)	53-3/4 (1365)	*	*	*	89-3/8 (2270)	164-5/8 (4180)	94-1/8 (2390)	287-3/8 (7300)	17-7/8 (453)	31-1/2 (800)	5-7/8 (150)	26,191 (11,880)	29,101 (13,200)
60 (1500)	57-1/2 (1461)	*	*	*	95-1/2 (2425)	176 (4470)	100-3/8 (2550)	306-7/8 (7795)	19-5/8 (500)	31-1/2 (800)	6-1/8 (155)	29,762 (13,500)	33,069 (15,000)

* Upon request.

Flanges up to 24" (600 mm), except 22" (550 mm), in accordance with ASME B16.5; 22" (550 mm) and above 24" (600 mm) in accordance with MSS-SP-44, if applicable.

Shaded dimensions in accordance with ISO 14313. Butt-weld ends according to ASME B16.25.

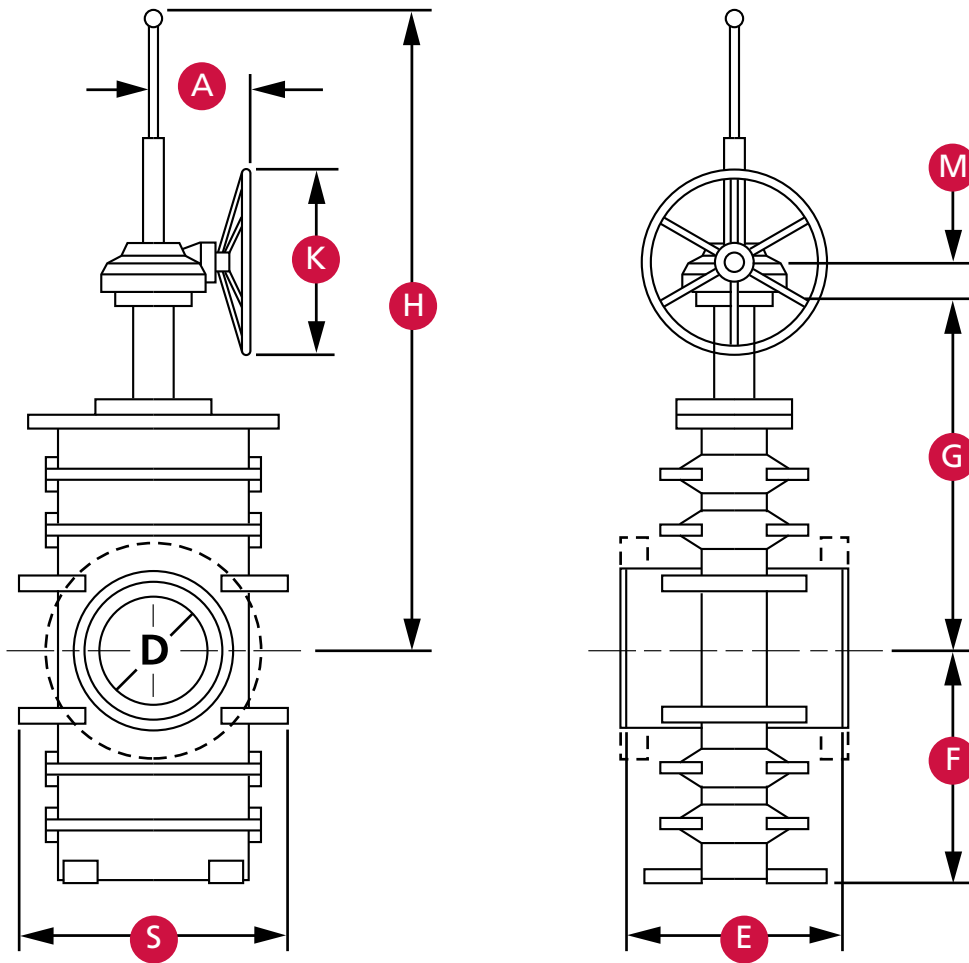
Dimensions and Weights

ASME CLASS 300

Sizes 4" through 60" (100 mm through 1500 mm)

Larger on request.

Reduced-bore valves also are available.



Size in. (mm)	D	E			F	G	S	H	A	K	M	Weight lb (kg)	
		WE	RF	RTJ								WE	RF/RTJ
4 (100)	4 (102)	12 (305)	9 (229)	9 1/2 (241)	10 1/2 (267)	20 1/4 (514)	9 1/8 (232)	35 1/2 (901)	7 7/8 (200)	11 3/4 (300)	2 1/4 (56)	198 (90)	220 (100)
6 (150)	6 (152)	15-7/8 (403)	10-1/2 (267)	11 (279)	13-3/8 (339)	24-7/8 (631)	11-3/8 (288)	43-1/2 (1104)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	397 (180)	441 (200)
8 (200)	8 (203)	16-1/2 (419)	11-1/2 (292)	12 (305)	16-1/2 (420)	31-1/2 (799)	13-1/8 (334)	54-3/8 (1380)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	694 (315)	772 (350)
10 (250)	10 (254)	18 (457)	13 (330)	13-1/2 (343)	19-5/8 (499)	37-3/8 (950)	15-5/8 (396)	64-1/4 (1633)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	992 (450)	1102 (500)
12 (300)	12 (305)	19-3/4 (502)	14 (356)	14-1/2 (368)	22-1/2 (570)	42-1/2 (1078)	17-5/8 (448)	73-1/2 (1868)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	1148 (521)	1275 (579)
14 (350)	13-1/4 (337)	22-1/2 (572)	15 (381)	15-1/2 (394)	24-3/8 (618)	45-5/8 (1158)	19-1/8 (486)	79-1/8 (2009)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	1786 (810)	1984 (900)
16 (400)	15-1/4 (387)	24 (610)	16 (406)	16-1/2 (419)	27-7/8 (709)	52-5/8 (1338)	21-3/4 (554)	90-1/2 (2299)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	2021 (917)	2245 (1018)
18 (450)	17-1/4 (438)	26 (660)	17 (432)	17-1/2 (445)	30-3/8 (770)	57-3/8 (1456)	26-1/2 (672)	99-3/8 (2525)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	2976 (1350)	3307 (1500)
20 (500)	19-1/4 (489)	28 (711)	18 (457)	18-1/2 (470)	33-3/8 (847)	61-7/8 (1571)	28-3/8 (720)	108-1/4 (2748)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	3571 (1620)	3968 (1800)
22 (550)	21-1/4 (540)	*	*	*	37-3/4 (960)	70-3/4 (1796)	35-3/8 (900)	122-1/2 (3110)	8-5/8 (220)	19-5/8 (500)	2-7/8 (74)	4365 (1980)	4850 (2200)
24 (600)	23-1/4 (591)	45 (1143)	45 (1143)	45-7/8 (1166)	40-3/8 (1026)	73-1/8 (1858)	39-5/8 (1005)	128-3/4 (3269)	8-5/8 (220)	19-5/8 (500)	2-7/8 (74)	5159 (2340)	5732 (2600)
26 (650)	25 (635)	34 (864)	22 (559)	*	44-1/8 (1120)	81-7/8 (2081)	45-1/4 (1150)	141-3/8 (3590)	8-5/8 (220)	19-5/8 (500)	2-7/8 (74)	5952 (2700)	6614 (3000)
28 (700)	27 (686)	36 (914)	24 (610)	*	47-1/4 (1199)	85-5/8 (2175)	50-7/8 (1292)	150-1/4 (3817)	9-1/2 (241)	19-5/8 (500)	3-5/8 (92)	6944 (3150)	7716 (3500)
30 (750)	29 (737)	36 (914)	26 (660)	*	50-3/8 (1280)	90-3/4 (2306)	54-1/2 (1384)	159-5/8 (4056)	9-1/2 (241)	19-5/8 (500)	3-5/8 (92)	7937 (3600)	8818 (4000)
32 (800)	30-3/4 (781)	38 (965)	28 (711)	*	53 (1345)	98 (2488)	57-1/2 (1460)	170-7/8 (4340)	12-5/8 (320)	19-5/8 (500)	4 (102)	9127 (4140)	10141 (4600)
34 (850)	32-3/4 (832)	40 (1016)	30 (762)	*	55-7/8 (1420)	103-1/4 (2623)	60-5/8 (1540)	180-1/8 (4575)	12-5/8 (320)	19-5/8 (500)	4 (102)	10,318 (4680)	11,464 (5200)
36 (900)	34-1/2 (876)	40 (1016)	32 (813)	*	58-7/8 (1495)	107-1/2 (2730)	65 (1652)	188-1/4 (4783)	12-5/8 (320)	19-5/8 (500)	4 (102)	11,250 (5103)	12,500 (5670)
38 (950)	36-1/2 (927)	*	*	*	62-1/4 (1580)	115-1/8 (2923)	66-1/2 (1690)	199-3/4 (5075)	12-5/8 (320)	19-5/8 (500)	4 (102)	12,500 (5670)	13,889 (6300)
40 (1000)	38-1/2 (978)	*	*	*	64-1/2 (1639)	122 (3099)	70-1/8 (1780)	210-1/8 (5337)	12-5/8 (320)	19-5/8 (500)	4 (102)	13,889 (6300)	15,432 (7000)
42 (1050)	40-1/4 (1022)	*	*	*	68-1/8 (1730)	125-3/8 (3185)	72-1/2 (1840)	218-1/2 (5550)	16-1/8 (410)	31-1/2 (800)	4-1/2 (115)	15,278 (6930)	16,975 (7700)
48 (1200)	46 (1168)	*	*	*	76-7/8 (1953)	140-7/8 (3578)	79-3/8 (2016)	245-1/4 (6230)	16-1/8 (410)	31-1/2 (800)	4-1/2 (115)	19,643 (8910)	21,826 (9900)
54 (1350)	51-3/4 (1314)	*	*	*	86-1/4 (2190)	159 (4040)	91 (2310)	278 (7060)	17-7/8 (453)	31-1/2 (800)	5-7/8 (150)	24,405 (11,070)	27,117 (12,300)
56 (1400)	53-3/4 (1365)	*	*	*	89-3/8 (2270)	164-5/8 (4180)	94-1/8 (2390)	287-3/8 (7300)	17-7/8 (453)	31-1/2 (800)	5-7/8 (150)	26,191 (11,880)	29,101 (13,200)
60 (1500)	57-1/2 (1461)	*	*	*	95-1/2 (2425)	176 (4470)	100-3/8 (2550)	306-7/8 (7795)	19-5/8 (500)	31-1/2 (800)	6-1/8 (155)	29,762 (13,500)	33,069 (15,000)

* Upon request.

Flanges up to 24" (600 mm), except 22" (550 mm), in accordance with ASME B16.5; 22" (550 mm) and above 24" (600 mm) in accordance with MSS-SP-44, if applicable.

Shaded dimensions in accordance with ISO 14313. Butt-weld ends according to ASME B16.25.

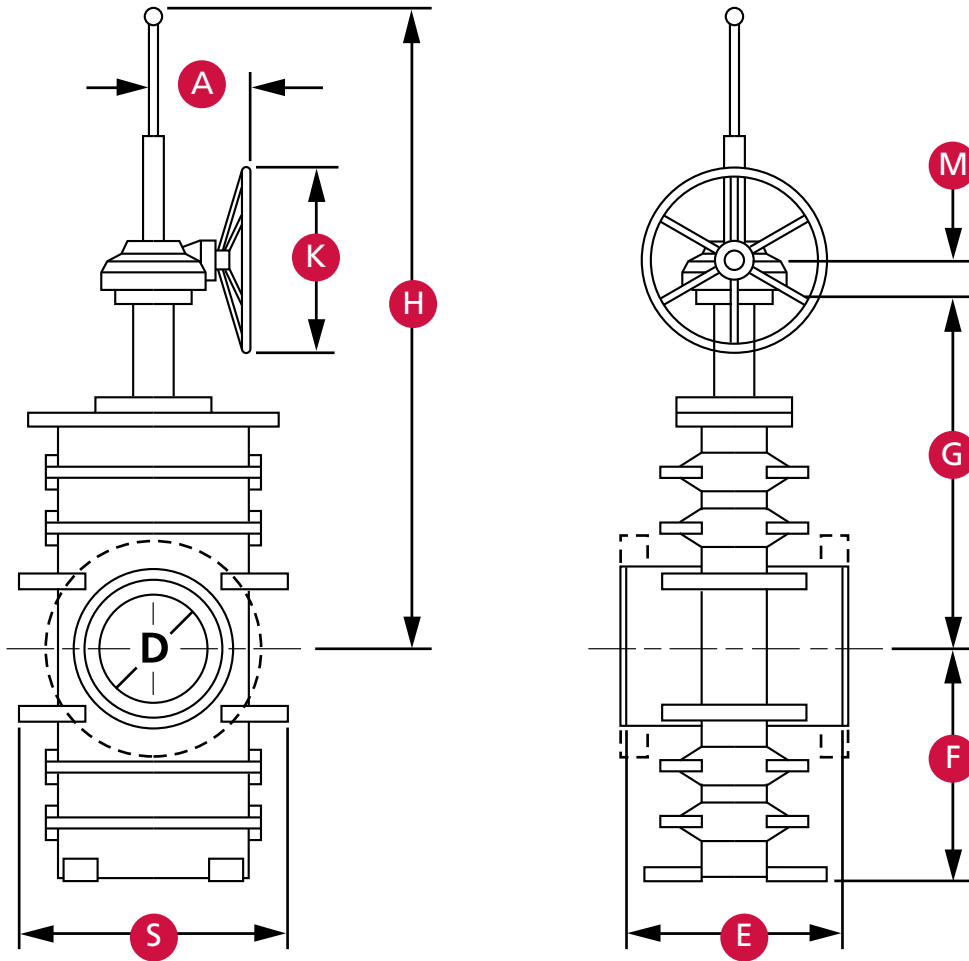
Dimensions and Weights

ASME CLASS 600

Sizes 4" through 60" (100 mm through 1500 mm)

Larger on request.

Reduced-bore valves also are available.



Size in. (mm)	D	E			F	G	S	H	A	K	M	Weight lb (kg)	
		WE	RF	RTJ								WE	RF/RTJ
4 (100)	4 (102)	17 (432)	17 (432)	17-1/8 (435)	10-7/8 (277)	20-5/8 (524)	9-1/2 (242)	35-7/8 (911)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	595 (270)	661 (300)
6 (150)	6 (152)	22 (559)	22 (559)	22-1/8 (562)	13-3/8 (339)	25-3/4 (654)	14-1/8 (358)	44-3/8 (1126)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	683 (310)	844 (380)
8 (200)	8 (203)	26 (660)	26 (660)	26-1/8 (664)	16-1/2 (420)	32-3/8 (822)	16-1/4 (414)	55-3/8 (1405)	7-7/8 (200)	11-3/4 (300)	2-1/4 (56)	1162 (527)	1119 (508)
10 (250)	10 (254)	31 (787)	31 (787)	31-1/8 (791)	19-5/8 (499)	37-3/4 (960)	21-1/2 (546)	65-1/2 (1663)	8-7/8 (225)	19-3/4 (300)	2-1/4 (56)	1786 (810)	1984 (900)
12 (300)	12 (305)	33 (838)	33 (838)	33-1/8 (841)	22-1/2 (570)	43-3/4 (1111)	25-3/8 (644)	75-5/8 (1921)	8-7/8 (225)	19-3/4 (500)	2-1/4 (56)	2519 (1143)	2646 (1200)
14 (350)	13-1/4 (337)	35 (889)	35 (889)	35-1/8 (892)	24-3/8 (618)	46-1/4 (1176)	28-1/8 (714)	81-1/8 (2062)	9-7/8 (241)	19-3/4 (500)	3-1/4 (74)	2698 (1224)	2998 (1360)
16 (400)	15-1/4 (387)	39 (991)	39 (991)	39-1/8 (994)	27-7/8 (709)	52-3/8 (1329)	31-5/8 (802)	91-7/8 (2333)	12-7/8 (320)	19-3/4 (500)	4-1/4 (108)	4474 (2030)	4971 (2255)
18 (450)	17-1/4 (438)	43 (1092)	43 (1092)	43-1/2 (1095)	31-1/8 (789)	58-3/8 (1484)	34-3/4 (882)	102-3/8 (2601)	12-7/8 (320)	19-3/4 (500)	4-1/4 (108)	5754 (2610)	6393 (2900)
20 (500)	19-1/4 (489)	47 (1194)	47 (1194)	47-1/4 (1200)	34-1/8 (866)	65 (1652)	38-7/8 (980)	113-3/8 (2879)	12-7/8 (320)	19-3/4 (500)	4-1/4 (108)	7341 (3330)	8157 (3700)
22 (550)	21-1/4 (540)	51 (1295)	51 (1295)	51-3/8 (1305)	38-3/8 (974)	73-3/8 (1863)	41-1/4 (1065)	126-1/2 (3212)	16-5/8 (410)	31-5/8 (803)	4-7/8 (124)	8929 (4050)	9921 (4500)
24 (600)	23-1/4 (591)	55 (1397)	55 (1397)	55-3/8 (1407)	41-3/8 (1051)	78-5/8 (1997)	46-1/4 (1174)	136 (3454)	16-5/8 (410)	31-5/8 (803)	4-7/8 (124)	9700 (4400)	11,067 (5020)
26 (650)	25 (635)	57 (1448)	57 (1448)	57-1/2 (1461)	44-3/4 (1138)	83-7/8 (2130)	50-1/4 (1276)	146-3/4 (3729)	17-5/8 (453)	31-5/8 (803)	5-7/8 (149)	13,115 (5949)	14,572 (6610)
28 (700)	27 (686)	61 (1549)	61 (1549)	61-1/2 (1582)	48 (1219)	88-1/4 (2241)	53-7/8 (1370)	155 (3938)	17-1/2 (453)	31-5/8 (803)	5-5/8 (143)	14,881 (6750)	16,535 (7500)
30 (750)	29 (737)	65 (1651)	65 (1651)	65-1/2 (1654)	51-3/8 (1305)	93-7/8 (2383)	57-7/8 (1469)	165-1/8 (4193)	19-1/2 (500)	31-5/8 (803)	6-5/8 (168)	17,262 (7830)	19,180 (8700)
32 (800)	30-3/4 (781)	70 (1778)	70 (1778)	70-5/8 (1794)	54-1/8 (1375)	100-3/8 (2550)	60 (1525)	175-3/8 (4455)	19-5/8 (500)	31-5/8 (803)	6 (152)	19,841 (9000)	22,046 (10,000)
34 (850)	32-3/4 (832)	76 (1930)	76 (1930)	76-5/8 (1946)	57-7/8 (1450)	106-7/8 (2715)	63-5/8 (1615)	186 (4725)	19-5/8 (500)	31-5/8 (803)	6 (152)	22,818 (10,350)	25,353 (11,500)
36 (900)	34-1/2 (876)	82 (2083)	82 (2083)	82-5/8 (2099)	60-1/4 (1530)	110-7/8 (2815)	68-1/4 (1732)	195-1/4 (4971)	20-5/8 (660)	31-5/8 (803)	8 (203)	25,992 (11,790)	28,880 (13,100)
38 (950)	36-1/2 (927)	*	*	*	63 (1600)	116-1/2 (2960)	70-7/8 (1800)	206-1/4 (5250)	26-5/8 (660)	31-5/8 (803)	8 (203)	29,762 (13,500)	33,069 (15,000)
40 (1000)	38-1/2 (978)	*	*	*	66-1/8 (1680)	122-1/4 (3105)	74 (1880)	215-3/8 (5470)	26-5/8 (660)	31-5/8 (803)	8 (203)	33,730 (15,300)	37,478 (17,000)
42 (1050)	40-1/4 (1022)	96 (2439)	96 (2439)	96-5/8 (2455)	69-5/8 (1770)	128-3/4 (3270)	77-1/8 (1958)	225-3/8 (5725)	-	-	-	37,639 (17,073)	41,821 (18,970)
48 (1200)	46 (1168)	*	*	*	78-3/4 (2000)	145-5/8 (3700)	88-1/4 (2240)	255-1/8 (6480)	-	-	-	52,580 (23,850)	58,422 (26,500)
54 (1350)	51-3/4 (1314)	*	*	*	87-3/4 (2230)	163-3/8 (4150)	99 (2515)	285-7/8 (7260)	-	-	-	71,627 (32,490)	79,586 (36,100)
56 (1400)	53-3/4 (1365)	*	*	*	91-1/8 (2315)	168-1/2 (4280)	102-3/8 (2600)	295-5/8 (7510)	-	-	-	79,366 (36,000)	88,184 (40,000)
60 (1500)	57-1/2 (1461)	*	*	*	97-1/2 (2475)	179-7/8 (4570)	109-1/2 (2780)	315 (8000)	-	-	-	97,223 (44,100)	108,025 (49,000)
60 (1500)	57-1/2 (1461)	*	*	*	95-1/2 (2425)	176 (4470)	100-3/8 (2550)	306-7/8 (7795)	19-5/8 (500)	31-1/2 (800)	6-1/8 (155)	29,762 (13,500)	33,069 (15,000)

* Upon request.

Flanges up to 24" (600 mm), except 22" (550 mm), in accordance with ASME B16.5; 22" (550 mm) and above 24" (600 mm) in accordance with MSS-SP-44, if applicable.

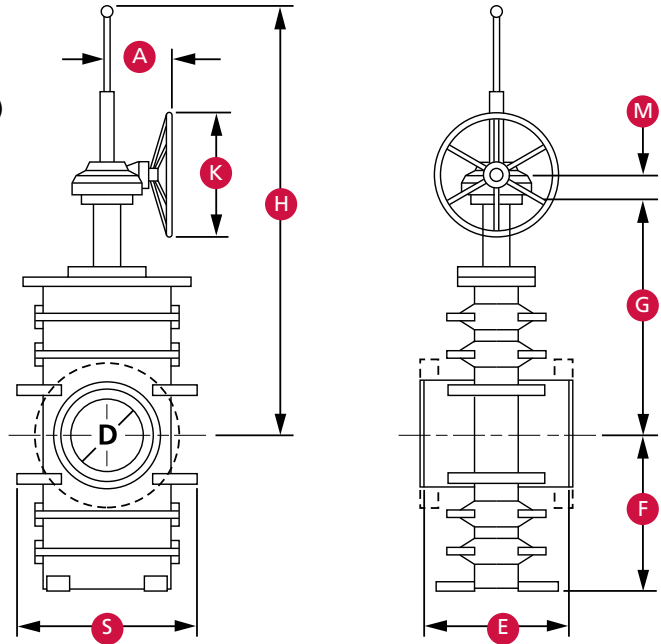
Shaded dimensions in accordance with ISO 14313. Butt-weld ends according to ASME B16.25.

Dimensions and Weights

ASME CLASS 900

Sizes 4" through 36" (100 mm through 900 mm)

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



Size in. (mm)	D	E			F	G	S	H	A	K	M	Weight lb (kg)	
		WE	RF	RTJ								WE	RF/RTJ
4 (100)	4 (102)	18 (457)	18 (457)	18-1/8 (460)	11-1/8 (282)	21-1/4 (539)	10-3/8 (262)	36-3/8 (924)	7-7/8 (200)	11-3/4 (300)	2-1/4 (57)	1026 (466)	1080 (490)
6 (150)	6 (152)	24 (610)	24 (610)	24-1/8 (613)	13-1/2 (344)	25-7/8 (657)	17-3/4 (450)	44-1/2 (1129)	7-7/8 (200)	11-3/4 (300)	2-1/4 (57)	1257 (570)	1323 (600)
8 (200)	8 (203)	29 (737)	29 (737)	29-1/8 (740)	16-7/8 (430)	32-1/8 (816)	20-7/8 (530)	55-3/4 (1417)	8-5/8 (220)	19-5/8 (500)	2-7/8 (73)	1675 (760)	1764 (800)
10 (250)	10 (254)	33 (838)	33 (838)	33-1/8 (841)	19-3/4 (501)	38-1/8 (967)	22-1/4 (566)	66-3/8 (1685)	9-1/2 (241)	19-5/8 (500)	3-5/8 (92)	2304 (1045)	2425 (1100)
12 (300)	12 (305)	38 (965)	38 (965)	38-1/8 (968)	23 (585)	44-3/4 (1136)	26-1/4 (668)	78 (1982)	12-5/8 (320)	19-5/8 (500)	4 (102)	3142 (1425)	3307 (1500)
14 (350)	12-3/4 (324)	40-1/2 (1029)	40-1/2 (1029)	40-7/8 (1038)	25-1/8 (638)	48-1/4 (1224)	32 (812)	83-7/8 (2130)	12-5/8 (320)	19-5/8 (500)	4 (102)	4189 (1900)	4409 (2000)
16 (400)	14-3/4 (375)	44-1/2 (1130)	44-1/2 (1130)	44-7/8 (1140)	28-3/8 (720)	53-7/8 (1370)	34-1/2 (876)	93-3/4 (2381)	12-5/8 (320)	19-5/8 (500)	4 (102)	5655 (2565)	5952 (2700)
18 (450)	16-3/4 (425)	48 (1219)	48 (1219)	48-1/2 (1232)	31-3/4 (806)	61 (1549)	36-3/4 (932)	106 (2693)	16-1/8 (410)	31-1/2 (800)	4-1/2 (115)	7226 (3278)	7606 (3450)
20 (500)	18-5/8 (473)	52 (1321)	52 (1321)	52-1/2 (1334)	34-5/8 (881)	67-1/8 (1704)	38-3/4 (984)	116 (2945)	16-1/8 (410)	31-1/2 (800)	4-1/2 (115)	9370 (4250)	9921 (4500)
22 (550)	20-5/8 (524)	* *	* *	* *	38-3/4 (985)	73-1/4 (1860)	44-1/2 (1130)	128-1/8 (3255)	17-7/8 (454)	31-1/2 (800)	5-7/8 (150)	11,938 (5415)	12,566 (5700)
24 (600)	22-1/2 (572)	61 (1549)	61 (1549)	61-3/4 (1568)	41-3/4 (1061)	79-5/8 (2023)	47-1/8 (1196)	138-1/8 (3509)	19-5/8 (500)	31-1/2 (800)	6-1/8 (155)	14,917 (6766)	15,702 (7123)
26 (650)	24-3/8 (619)	67 (1702)	67 (1702)	* *	45-3/8 (1153)	85-1/8 (2162)	51-3/8 (1306)	147-7/8 (3756)	19-5/8 (500)	31-1/2 (800)	6-1/8 (155)	18,287 (8295)	19,467 (8830)
28 (700)	26-1/4 (667)	* *	* *	* *	48-3/8 (1230)	89-3/4 (2280)	55-1/8 (1400)	159 (4040)	26 (660)	31-1/2 (800)	8-1/2 (215)	23,038 (10,450)	24,251 (11,000)
30 (750)	28-1/8 (714)	70-7/8 (1800)	70-7/8 (1800)	* *	52-1/4 (1327)	98-1/4 (2496)	58-1/2 (1485)	172-1/2 (4376)	26 (660)	31-1/2 (800)	8-1/2 (215)	28,880 (13,100)	30,512 (13,840)
36 (900)	33-1/2 (853)	78 (1981)	78 (1981)	* *	60-1/4 (1530)	111-1/4 (2825)	78-3/4 (2000)	192-1/2 (4890)	26 (660)	31-1/2 (800)	8-1/2 (215)	34,172 (15,500)	- -

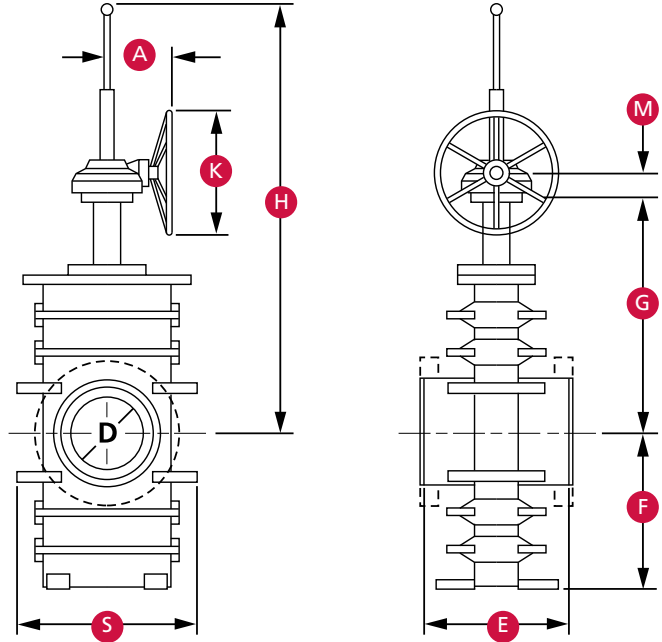
* Upon request.
Flanges up to 24" (600 mm), except 22" (550 mm), in accordance with ASME B16.5;
22" (550 mm) and above 24" (600 mm) in accordance with MSS-SP-44, if applicable.

Shaded dimensions in accordance with ISO 14313.
Butt-weld ends according to ASME B16.25.

ASME CLASS 1500

Sizes 4" through 24" (100 mm through 600 mm)

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



Size in. (mm)	D	E			F	G	S	H	A	K	M	Weight lb (kg)	
		WE	RF	RTJ								WE	RF/RTJ
4 (100)	4 (102)	21-1/2 (546)	21-1/2 (546)	21-5/8 (549)	10-5/8 (270)	21-3/4 (554)	17-3/8 (445)	36-3/4 (935)	7-7/8 (200)	19-5/8 (300)	2-1/4 (57)	1115 (506)	1173 (532)
6 (150)	5-3/4 (146)	27-3/4 (705)	27-3/4 (705)	28 (711)	14-1/8 (359)	28 (711)	21-3/4 (538)	48 (1219)	8-5/8 (220)	19-5/8 (300)	2-7/8 (74)	1423 (645)	1498 (679)
8 (200)	7-5/8 (194)	32-3/4 (832)	32-3/4 (832)	33-1/8 (841)	16-7/8 (430)	33-3/4 (858)	25-7/8 (640)	58-1/4 (1480)	9-1/2 (241)	19-5/8 (500)	3-5/8 (92)	1885 (855)	1985 (900)
10 (250)	9-1/2 (241)	39 (991)	39 (991)	39-3/8 (1000)	20-1/4 (515)	39-1/2 (1003)	28-1/4 (735)	68-7/8 (1750)	12-5/8 (320)	19-5/8 (500)	4 (102)	3344 (1517)	3520 (1596)
12 (300)	11-3/8 (289)	44-1/2 (1130)	44-1/2 (1130)	45-1/8 (1146)	23-1/4 (590)	45-5/8 (1160)	32-1/4 (830)	79-3/4 (2025)	16-1/8 (410)	31-1/2 (800)	4-1/2 (115)	4458 (2022)	4693 (2129)
14 (350)	12-1/2 (318)	49-1/2 (1257)	49-1/2 (1257)	50-1/4 (1276)	26-5/8 (675)	52-1/2 (1335)	36 (925)	90-1/8 (2290)	16-1/8 (410)	31-1/2 (800)	4-1/2 (115)	5052 (2292)	5318 (2412)
16 (400)	14-1/4 (362)	54-1/2 (1384)	54-1/2 (1384)	55-3/8 (1407)	29-3/4 (755)	57-7/8 (1470)	40-1/2 (1020)	100-5/8 (2555)	17-7/8 (453)	31-1/2 (800)	5-7/8 (150)	8377 (3800)	8818 (4000)
18 (450)	16 (406)	60-1/2 (1537)	60-1/2 (1537)	61-3/8 (1559)	32-1/8 (816)	62-3/4 (1593)	44-3/4 (1134)	108-1/8 (2747)	19-5/8 (500)	31-1/2 (800)	6-1/8 (155)	10,774 (4887)	11,341 (5144)
20 (500)	17-7/8 (454)	65-1/2 (1664)	65-1/2 (1664)	66-3/8 (1686)	35-5/8 (906)	68-1/2 (1741)	47-3/4 (1200)	119-1/8 (3026)	19-5/8 (500)	31-1/2 (800)	6-1/8 (155)	13,746 (6235)	14,469 (6563)
22 (550)	19-5/8 (500)	*	*	*	39-3/8 (1000)	75 (1905)	51-1/2 (1310)	131-7/8 (3350)	26 (660)	31-1/2 (800)	8-1/2 (215)	16,718 (7583)	17,598 (7982)
24 (600)	21-1/2 (546)	76-1/2 (1943)	76-1/2 (1943)	77-5/8 (1972)	42-3/4 (1086)	82-1/8 (2087)	55-1/8 (1405)	143-1/4 (3638)	26 (660)	31-1/2 (800)	8-1/2 (215)	18,650 (8459)	19,631 (8905)

* Upon request.
Flanges up to 24" (600 mm), except 22" (550 mm), in accordance with ASME B16.5;
22" (550 mm) and above 24" (600 mm) in accordance with MSS-SP-44, if applicable.

Shaded dimensions in accordance with ISO 14313.
Butt-weld ends according to ASME B16.25.

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



Customized Total Valve Care™ (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.

Registered Trademark	Owner
Celcon	Hoechst Celanese Corporation
Delrin	E.I. DuPont De Nemours & Company
Fluorel	Minnesota Mining and Manufacturing Company
Hastelloy	Haynes International, Inc.
Hycar	Hydrocarbon Chemical and Rubber Company
Hypalon	E.I. DuPont De Nemours & Company
Inconel	INCO Nickel Sales, Inc.
Monel	INCO Alloys International, Inc.
Nordel	E.I. DuPont De Nemours & Company
Stellite	Stoody Deloro Stellite, Inc.
Teflon	E.I. DuPont De Nemours & Company
Viton	E.I. DuPont De Nemours & Company

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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.