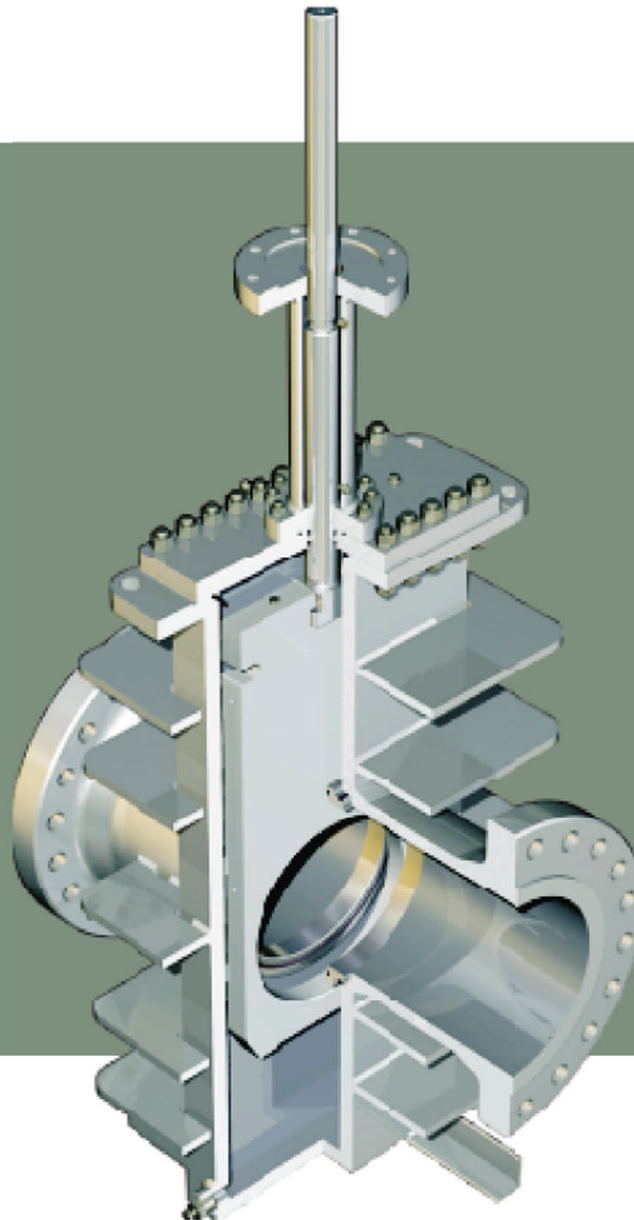


GROVE G4N[®] Through Conduit Gate Valve



For Benelux:



WEGMAN

Utrecht, The Netherlands

T: +31 (0)30 263 4000

F: +31 (0)30 263 4005

wegman@wegman.nl

GROVE[®]

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THROUGH CONDUIT GATE VALVE****FEATURES AND BENEFITS**

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G4N THROUGH CONDUIT GATE VALVE GENERAL INFORMATION

THE COMPANY

Cameron's Valves & Measurement (V&M) group is a leading provider of valves and measurement systems to the Oil and Gas industry.

The Engineered Valves division provides large-diameter valves for use in natural gas, LNG, crude oil and refined products transmission lines as well as in many other general industrial applications.

Rigorously tested, field-proven and backed by superior aftermarket service, Cameron's GROVE valves are among the best known valves in the world.

APPLICATIONS

The G4N is one of a full range of gate valves offered by GROVE in accordance with the API 6D Standard.

The fabricated body construction makes the GROVE G4N Gate Valve a very flexible product from the point of view of design arrangements and short deliveries.

The Top Entry construction means also easy maintenance in the wide range of applications: pipeline main valves, manifolds, storage tanks, pig launcher traps, station valves.

The traditional field of application is in the oil and gas transmission, distribution industry.

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 Gate
- Metal-to-Metal Primary Seal, Protected O-Ring Secondary Seal
- Block-and-Bleed and Double-Block-and-Bleed Design
- Upper Stem Seal Gasket Replaceable with Pressure In-Line
- "Top Entry" Body for In-Line Maintenance

OPTIONAL FEATURES UPON REQUEST

- 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)

RANGE OF PRODUCTION

in.	SIZE	ASME CLASS					
	(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)	●	●	●	●		

G4N THROUGH CONDUIT GATE VALVE STANDARD DESIGN FEATURES

VALVE CONSTRUCTION

The body has a characteristic “rectangular body-ribbed” look, distinguishing it from other GROVE gate valves.

The body 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.

A wide collection of procedures covers the request for welding of various types of materials, thicknesses and joints.

The welding personnel are qualified according to ASME IX.

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

SEATS CONSTRUCTION

Both gate and seats are floating parts. The initial seal, at extremely low pressure differential, is obtained by the floating seats being forced against the gate by the spring force.

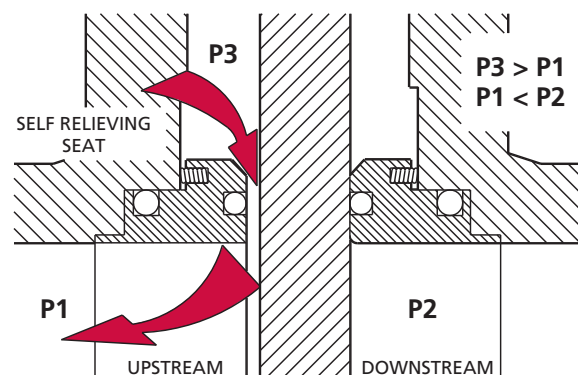
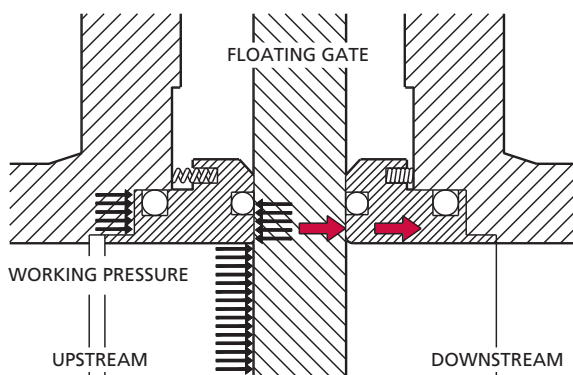
When the gate is closed, the forces derived from upstream working pressure push the gate tightly against the downstream seats. This results in upstream and downstream bubble-tight seals which work independently under all pressure conditions.

When the gate is open, the unbalanced pressure principal assures that both upstream and downstream seats are forced against the gate thus assuring through conduit port without access between 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.



G4N THROUGH CONDUIT GATE VALVE STANDARD DESIGN FEATURES



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 a NPT drain valve with safety plug.

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

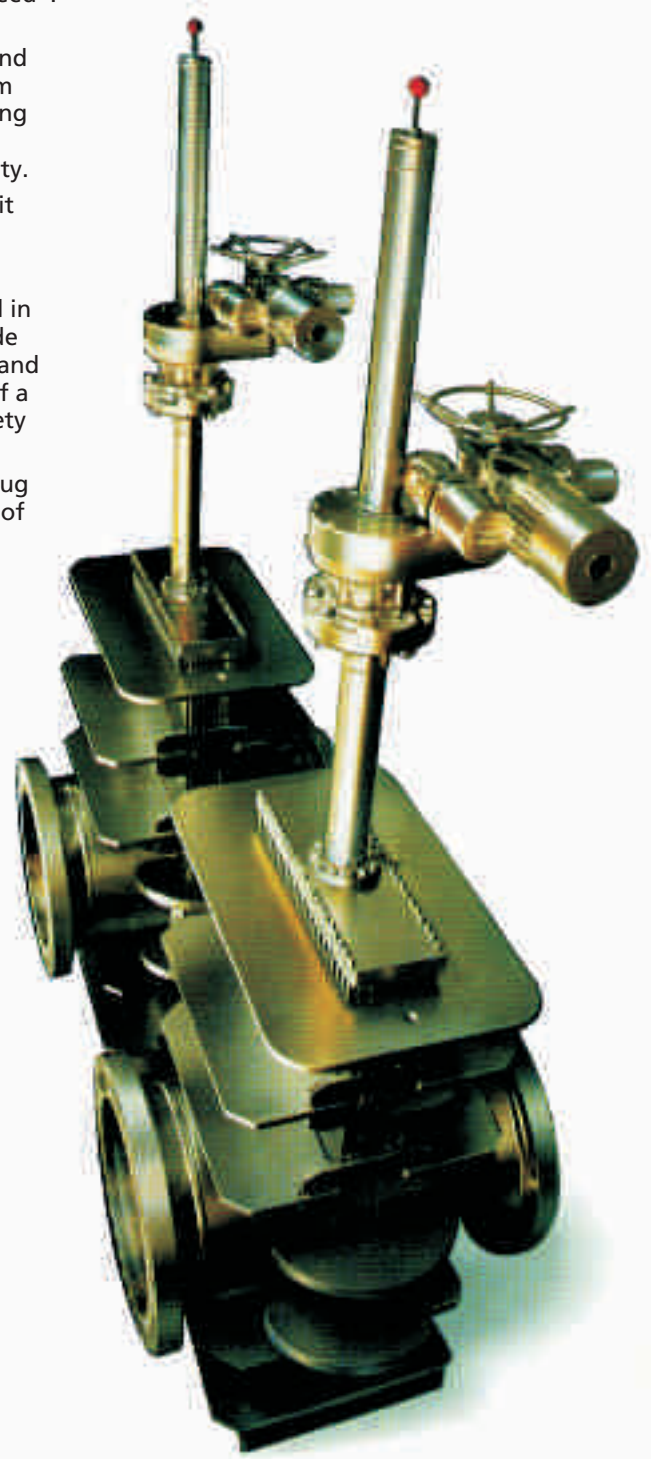
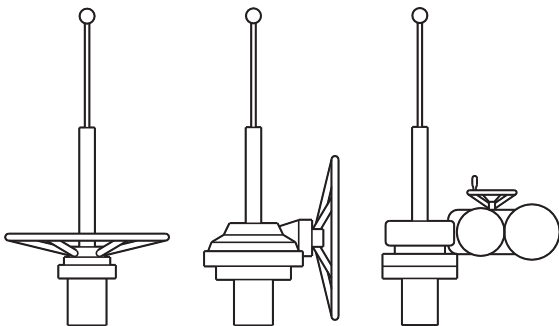
STEM AND GATE CONSTRUCTION

The stem/gate connection is such to guarantee the floating movements 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.

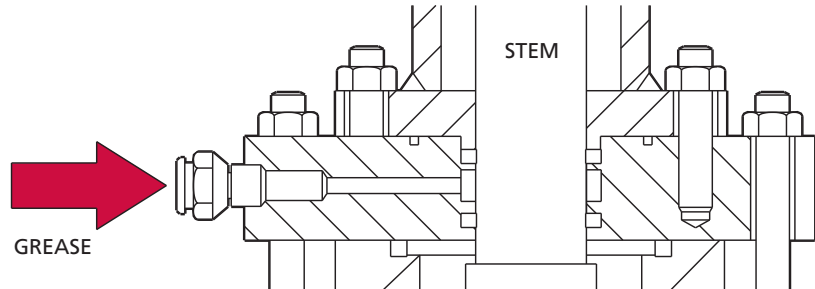


G4N THROUGH CONDUIT GATE VALVE STANDARD DESIGN FEATURES

STEM SEALS

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

When the valve is in the closed position and the body pressure is vented to atmosphere, the secondary lip seal can be replaced.



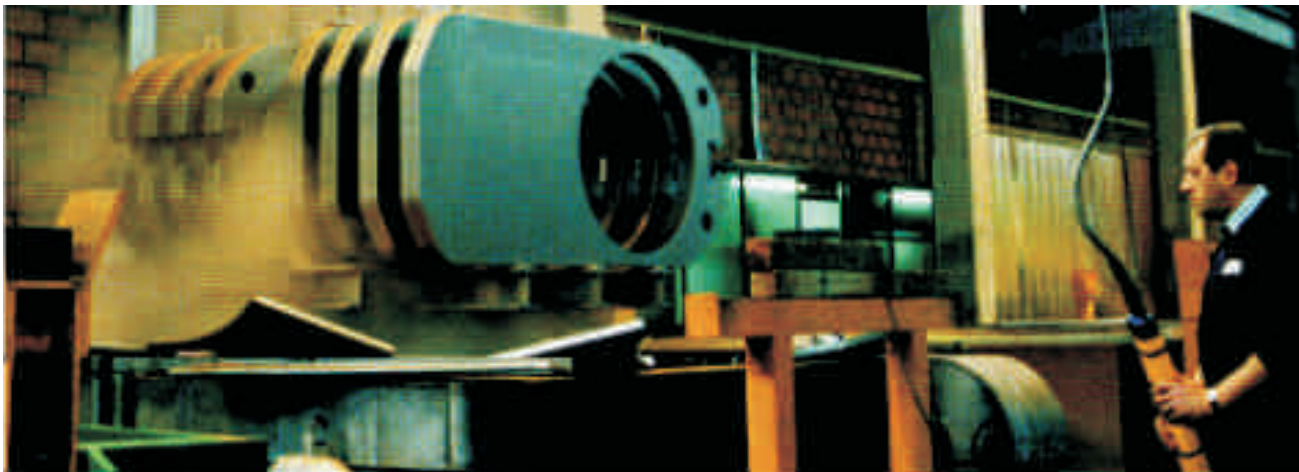
INTERNAL COATING...

Internal trim parts (gate, seats, stem) are usually 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.

....AND PROCESSES

All welding as well as internal and external coating are supported by detailed procedures.

GROVE operates its own in-house Electroless Nickel Plating (ENP) facility. ASTM B733 is the standard for process and plating control.



MAINTENANCE

The GROVE G4N Top Entry Gate Valve is designed to be maintained without removing the body from the line.

When the valve is in the closed position and the body pressure is vented to atmosphere, in case of damage the secondary lip seal can be replaced by removing the yoke only.

The complete disassembly of yoke and bonnet can be achieved after the 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.



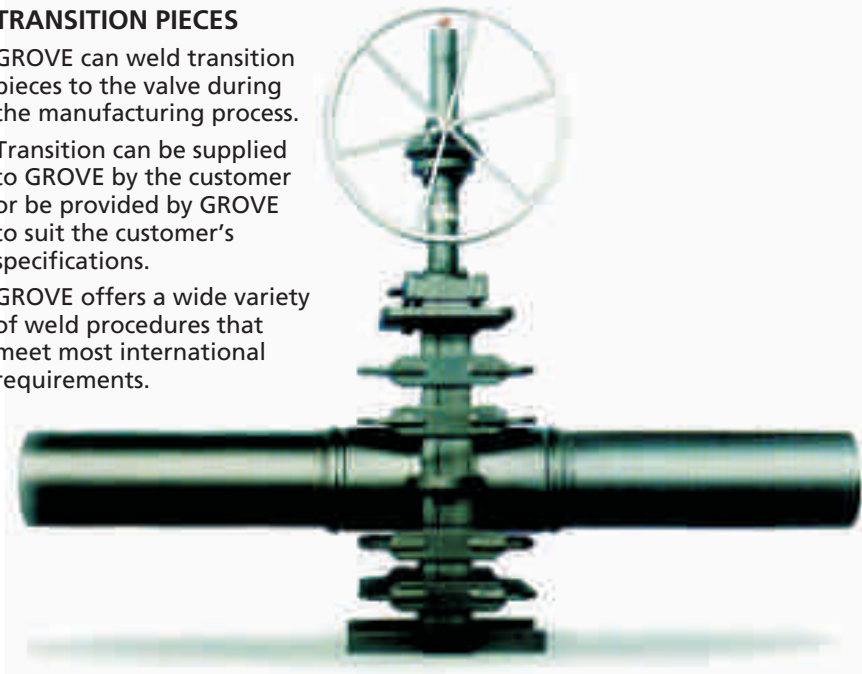
G4N THROUGH CONDUIT GATE VALVE OPTIONAL FEATURES

TRANSITION PIECES

GROVE can weld transition pieces to the valve during the manufacturing process.

Transition can be supplied to GROVE by the customer or be provided by GROVE to suit the customer's specifications.

GROVE offers a wide variety of weld procedures that meet most international requirements.



EMERGENCY SEAT SEAL

If a high content of debris contaminates the fluid, the possibility of leakage, due to erosion, is greater than when the valve is used for normal service.

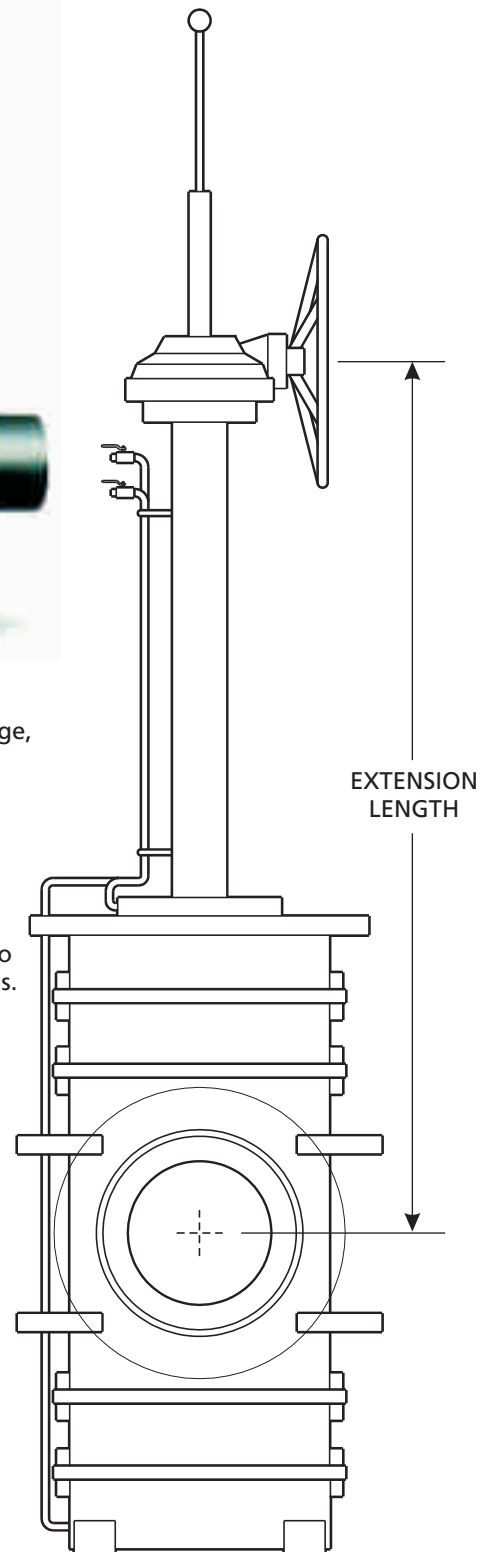
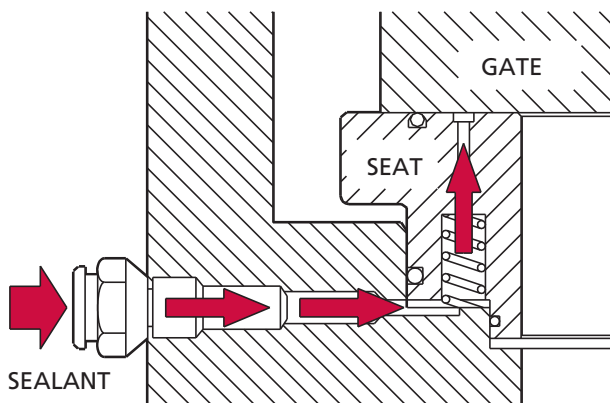
All GROVE valves are designed not to require sealants; however, if the Metal-to-Metal primary seal and the secondary O-ring seal are damaged, an Emergency Shut-Off may be obtained with a sealant injected into an optional, specially designed, groove in the seat ring assembly.

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 grease injection system will also be extended.

When ordering extensions, please specify the distance required from the valve center-line to the handwheel center-line.



G4N THROUGH CONDUIT GATE VALVE OPTIONAL FEATURES

“REVERSE-ACTING” GATE DESIGN FOR FAIL TO CLOSE APPLICATIONS

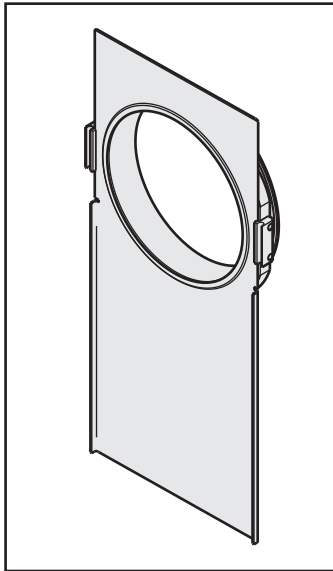
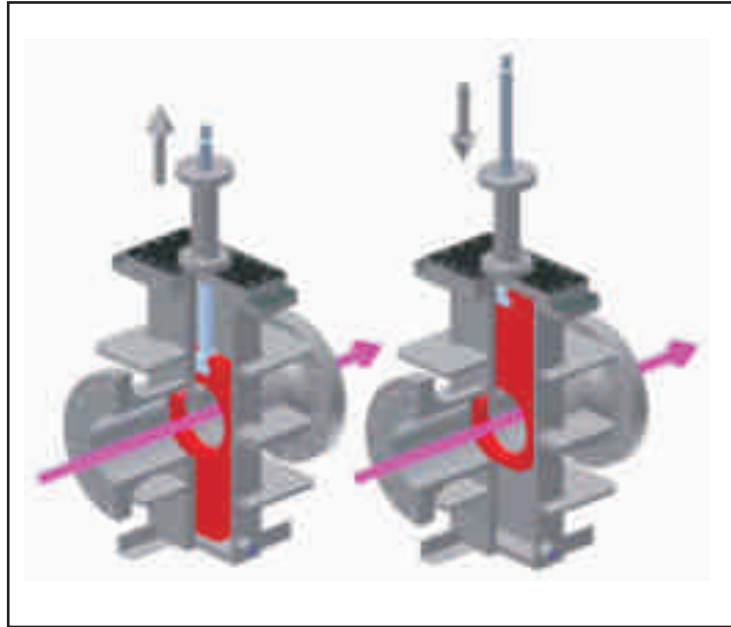
If the valve is normally open and a very safe “fail to close” is required, the valve can be supplied as “Reverse Acting” type (gate moves upward to close).

The reverse acting gate allows less accumulation of debris, or heavy substances on the lower part of the body.

“NORMAL-ACTING” GATE DESIGN FOR FAIL TO OPEN APPLICATIONS

If the valve is normally closed and a very safe “fail to open” is required, the valve can be supplied as “Normal Acting” type (gate moves upward to open) with a special seats design where the pressure in the body cavity it is always guaranteed to assure easy open capacity on demand.

The special seat design for this application maintain 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 gate normal acting design and gate reverse acting design.

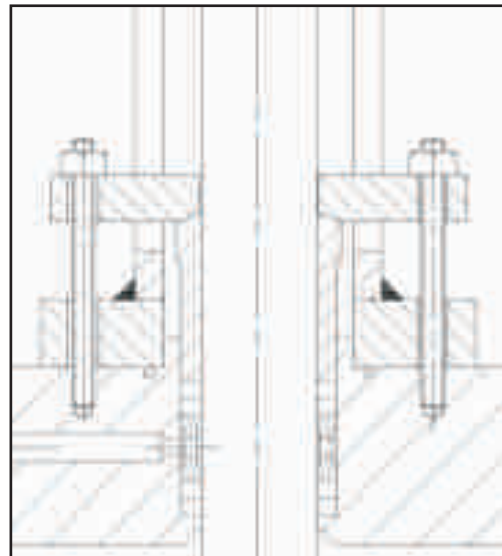
The characteristic of GROVE skirts design is the possibility to use the same simple wedge tool of standard design to disassemble and reassemble the seats.

OS&Y BONNET AND BACK SEAT

GROVE G4N Gate Valves can be supplied with OS&Y bonnet design and back seat.

The GROVE G4N Gate Valves with this bonnet design have the stem sealing injection system with lantern ring in the middle of stem graphite packing.

When the valve is in back seat position the stem packing ring can be replaced with the pressure in the body cavity.



G4N SPECIAL APPLICATIONS



VERTICAL INSTALLATION

A special version of the valve can be installed into vertical 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

Service conditions

The selection of a metal seated valve is dependent on the service conditions such as:

- Abrasive fluids
- Service temperatures over the pressure/temperature ratings of the soft seat insert materials
- Service conditions requiring full reliability such as Emergency Shut Down Valves (ESDV).

PLATING AND COATING TECHNOLOGIES

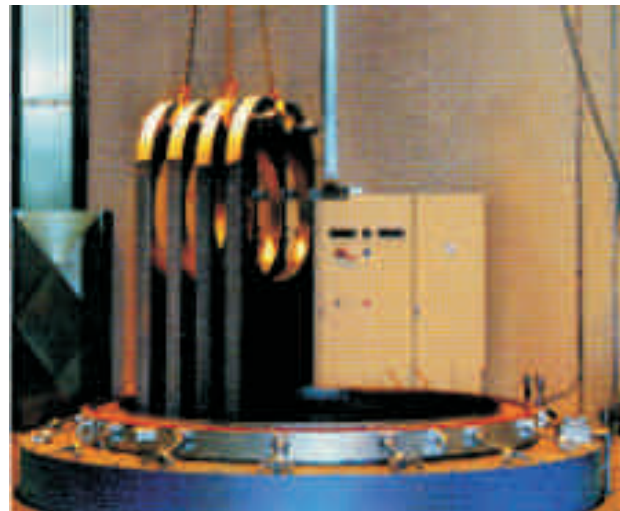
A range of coating and plating materials are available to suit specific service requirements for metal seated gate valves.

Tungsten Carbide powders applied with high velocity spray systems can be applied in-house using GROVE 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.

The GROVE ENP process has been specially developed for valve applications and is applied using GROVE in-house plating facility.

Qualification testing can be performed at third party or GROVE's in-house facility.



G4N THROUGH CONDUIT GATE VALVE MATERIALS SPECIFICATION

MATERIALS SELECTION

The GROVE G4N Gate Valve has been designed for use with various materials or combinations of materials which are dependent on the customer's service conditions.

The following is a typical listing of materials for valves ASME Class 150 - 1500 for standard applications.

PRESSURE RETAINING PARTS

Body	A572 Gr. 50 (eq. to Fe 510 EN 10025) P355 NL2 - EN 10028
Bonnet	A572 Gr. 50, (eq. to Fe 510 EN 10025) 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	A572 Gr. 50, (eq. to Fe 510 EN 10025) 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)

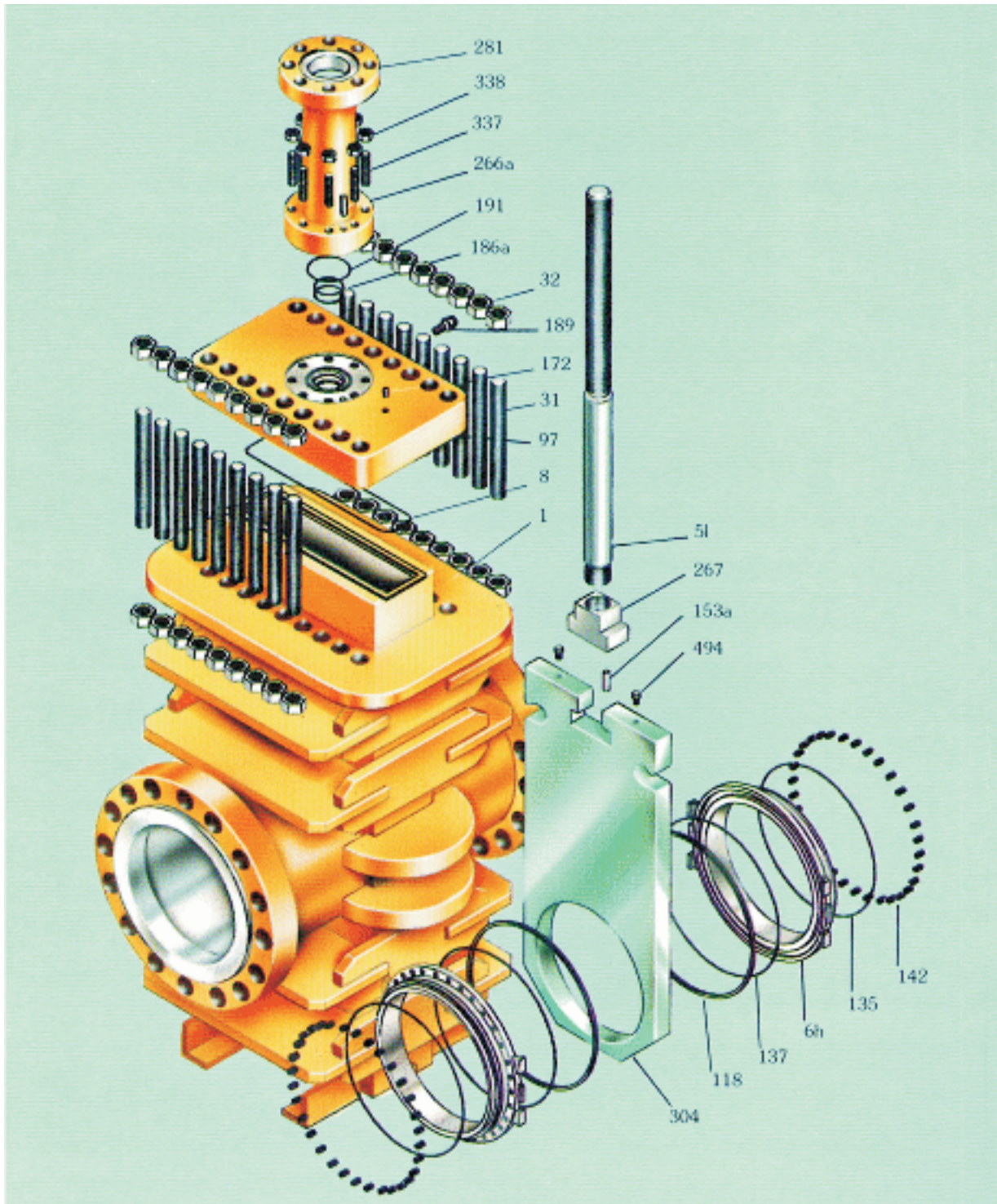
PLATING/COATING

0.001 inch	25 microns ENP Electroless Nickel Plating
0.003 inch	75 microns ENP Electroless Nickel Plating

NACE REQUIREMENTS

GROVE G4N Gate Valves can be supplied in accordance with the material requirements of ISO 15156/NACE MR0175

G4N THROUGH CONDUIT GATE VALVE ASSEMBLY



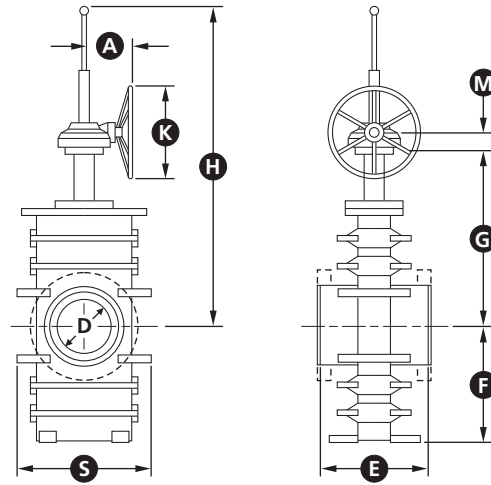
Item	Description	118	Seat Ring	191	Lower Extension O-Ring
1	Body	135	Seat Gasket O-Ring	266 <i>b</i>	Adapter Plate Stop Spring Pin
5/	Stem	137	Seal O-Ring	267	Stem Head
6 <i>h</i>	Seat	142	Cylindrical Spring	281	Yoke Unit
8	Body O-Ring	153 <i>a</i>	Driver Safety Pin	304	Gate
31	Body Stud	172	Vent Plug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

G4N THROUGH CONDUIT GATE VALVE

DIMENSIONS & WEIGHTS

ASME CLASS 150

Larger on request.
Reduced-bore valves also 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)	10318 (4680)	11464 (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)	11250 (5103)	12500 (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)	12500 (5670)	13889 (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)	13889 (6300)	15432 (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)	15278 (6930)	16975 (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)	19643 (8910)	21826 (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)	24405 (11070)	27117 (12300)
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)	26191 (11880)	29101 (13200)
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)	29762 (13500)	33069 (15000)

* Upon Request

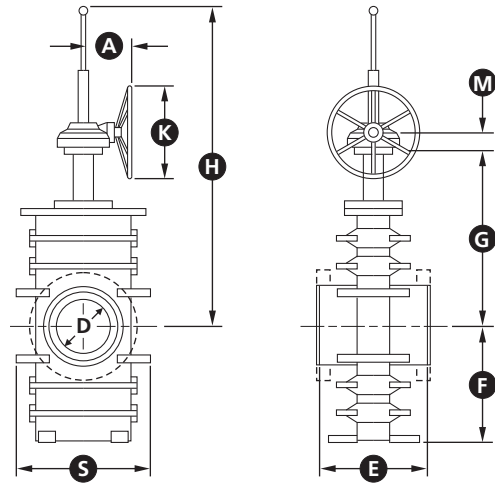
Flanges up to 24 in. (600 mm) except 22 in. (550 mm) in accordance with ASME B16.5;
22 in. (550 mm) and above 24 in. (600 mm) in accordance with MSS-SP-44 if applicable.

Shaded Dimensions in accordance to ISO 14313
Butt Welding Ends according to ASME B16.25.

G4N THROUGH CONDUIT GATE VALVE

DIMENSIONS & WEIGHTS

ASME CLASS 300



Larger on request.
Reduced-bore valves also 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)	12 (305)	12 5/8 (321)	10 7/8 (277)	20 3/8 (519)	9 1/2 (242)	35 5/8 (906)	7 7/8 (200)	11 3/4 (300)	2 1/4 (56)	298 (135)	331 (150)
6 (150)	6 (152)	15 7/8 (403)	15 7/8 (403)	16 1/2 (419)	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)	496 (225)	551 (250)
8 (200)	8 (203)	16 1/2 (419)	16 1/2 (419)	17 1/8 (435)	16 1/2 (420)	31 1/8 (791)	13 1/8 (334)	54 1/8 (1374)	7 7/8 (200)	11 3/4 (300)	2 1/4 (56)	813 (369)	904 (410)
10 (250)	10 (254)	18 (457)	18 (457)	18 5/8 (473)	19 5/8 (499)	37 5/8 (956)	18 7/8 (480)	64 5/8 (1641)	7 7/8 (200)	11 3/4 (300)	2 1/4 (56)	1171 (531)	1301 (590)
12 (300)	12 (305)	19 3/4 (502)	19 3/4 (502)	20 3/8 (518)	22 1/2 (570)	43 1/8 (1096)	21 1/8 (538)	74 3/8 (1889)	7 7/8 (200)	11 3/4 (300)	2 1/4 (56)	1548 (702)	1720 (780)
14 (350)	13 1/4 (337)	30 (762)	30 (762)	30 5/8 (778)	24 3/8 (618)	45 5/8 (1158)	22 1/2 (570)	79 7/8 (2029)	8 5/8 (220)	19 5/8 (500)	2 7/8 (74)	2183 (990)	2425 (1100)
16 (400)	15 1/4 (387)	33 (838)	33 (838)	33 5/8 (854)	27 3/4 (705)	52 1/4 (1327)	31 3/4 (806)	90 3/4 (2306)	8 5/8 (220)	19 5/8 (500)	2 7/8 (74)	2976 (1350)	3307 (1500)
18 (450)	17 1/4 (438)	36 (914)	36 5/8 (930)	30 7/8 (930)	30 3/8 (785)	55 7/8 (1420)	34 3/4 (882)	99 3/8 (2525)	9 1/2 (241)	19 5/8 (500)	3 5/8 (92)	3770 (1710)	4189 (1900)
20 (500)	19 1/4 (489)	39 (991)	39 (991)	39 3/4 (1010)	34 7/8 (885)	64 1/2 (1638)	37 3/8 (950)	113 (2870)	9 1/2 (241)	19 5/8 (500)	3 5/8 (92)	4762 (2160)	5291 (2400)
22 (550)	21 1/4 (540)	43 (1092)	43 (1092)	43 7/8 (1114)	37 1/2 (954)	69 3/8 (1761)	41 3/8 (1050)	121 3/8 (3084)	9 1/2 (241)	19 5/8 (500)	3 5/8 (92)	5655 (2565)	6283 (2850)
24 (600)	23 1/4 (591)	45 (1143)	45 (1143)	45 7/8 (1165)	40 3/4 (1034)	75 1/8 (1907)	44 1/8 (1122)	131 3/4 (3348)	12 5/8 (320)	19 5/8 (500)	4 (102)	6746 (3060)	7496 (3400)
26 (650)	25 (635)	49 (1245)	49 (1245)	50 (1270)	44 1/8 (1120)	81 3/8 (2068)	47 1/4 (1200)	142 7/8 (3630)	12 5/8 (320)	19 5/8 (500)	4 (102)	8333 (3780)	9259 (4200)
28 (700)	27 (686)	53 (1346)	53 (1346)	53 (1372)	46 7/8 (1190)	86 1/4 (2190)	51 1/8 (1300)	152 1/2 (3875)	16 1/8 (410)	31 1/2 (800)	4 1/2 (115)	9921 (4500)	11023 (5000)
30 (750)	29 (737)	55 (1397)	55 (1397)	56 (1422)	50 3/4 (1290)	92 (2337)	56 1/8 (1424)	162 1/2 (4127)	16 1/8 (410)	31 1/2 (800)	4 1/2 (115)	11627 (5274)	12919 (5860)
32 (800)	30 3/4 (781)	60 (1524)	60 (1524)	61 1/8 (1553)	53 1/8 (1350)	98 1/4 (2495)	57 7/8 (1470)	171 5/8 (4360)	16 1/8 (410)	31 1/2 (800)	4 1/2 (115)	13294 (6030)	14771 (6700)
34 (850)	32 3/4 (832)	64 (1626)	64 (1626)	65 1/8 (1654)	56 3/4 (1440)	103 3/4 (2635)	61 3/4 (1570)	181 1/2 (4610)	16 1/8 (410)	31 1/2 (800)	4 1/2 (115)	15476 (7020)	17196 (7800)
36 (900)	34 1/2 (876)	68 (1727)	68 (1727)	69 1/8 (1756)	59 1/2 (1510)	107 1/2 (2731)	65 1/2 (1664)	190 1/4 (4832)	17 7/8 (453)	31 1/2 (800)	5 7/8 (150)	17460 (7920)	19400 (8800)
38 (950)	36 1/2 (927)	*	*	*	62 1/4 (1580)	113 3/4 (2890)	68 7/8 (1750)	200 3/4 (5100)	17 7/8 (453)	31 1/2 (800)	5 7/8 (150)	19841 (9000)	22046 (10000)
40 (1000)	38 1/2 (978)	76 (1931)	76 (1931)	*	64 1/2 (1639)	118 3/4 (3016)	76 1/2 (1943)	207 1/2 (5272)	17 7/8 (453)	31 1/2 (800)	5 7/8 (150)	20863 (9464)	23181 (10515)
42 (1050)	40 1/4 (1022)	*	*	*	68 1/2 (1740)	125 3/8 (3185)	76 1/2 (1943)	220 1/4 (5595)	17 7/8 (453)	31 1/2 (800)	5 7/8 (150)	25000 (11340)	27778 (12600)
48 (1200)	46 (1168)	90 (2286)	90 (2286)	*	76 7/8 (1953)	140 (3555)	79 3/8 (2016)	248 3/4 (6317)	26 (660)	31 1/2 (800)	8 1/2 (215)	35794 (16236)	39771 (18040)
54 (1350)	51 3/4 (1314)	*	*	*	86 1/4 (2190)	157 1/8 (3990)	98 (2490)	278 7/8 (7085)	26 (660)	31 1/2 (800)	8 1/2 (215)	46429 (21060)	51588 (23400)
56 (1400)	53 3/4 (1365)	*	*	*	89 5/8 (2275)	162 3/4 (4135)	101 5/8 (2580)	287 3/4 (7310)	26 (660)	31 1/2 (800)	8 1/2 (215)	50992 (23130)	50658 (25700)
60 (1500)	57 1/2 (1461)	*	*	*	95 1/2 (2425)	176 3/8 (4480)	109 (2770)	308 1/4 (7830)	-	-	-	61112 (27720)	67902 (30800)

* Upon Request

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

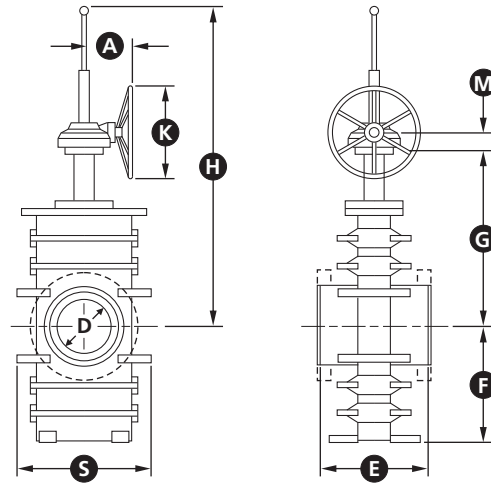
Shaded Dimensions in accordance to ISO 14313
Butt Welding Ends according to ASME B16.25.

G4N THROUGH CONDUIT GATE VALVE

DIMENSIONS & WEIGHTS

ASME CLASS 400

Larger on request.
Reduced-bore valves also 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)	16 (406)	16 (406)	16 1/8 (410)	10 1/4 (260)	19 1/2 (494)	10 1/4 (260)	34 1/2 (875)	7 7/8 (200)	11 3/4 (300)	2 1/4 (56)	353 (160)	392 (178)
6 (150)	6 (152)	19 1/2 (495)	19 1/2 (495)	19 5/8 (498)	13 3/8 (339)	24 7/8 (631)	11 3/4 (348)	43 1/2 (1104)	7 7/8 (200)	11 3/4 (300)	2 1/4 (56)	573 (260)	637 (289)
8 (200)	8 (203)	23 1/2 (597)	23 1/2 (597)	23 5/8 (600)	16 1/2 (420)	31 3/4 (806)	20 1/8 (510)	54 5/8 (1389)	7 7/8 (200)	11 3/4 (300)	2 1/4 (56)	926 (420)	1025 (465)
10 (250)	10 (254)	26 1/2 (673)	26 1/2 (673)	26 5/8 (676)	19 1/4 (489)	36 3/8 (924)	21 5/8 (550)	63 3/8 (1610)	7 7/8 (200)	11 3/4 (300)	2 1/4 (56)	1389 (630)	1543 (700)
12 (300)	12 (305)	30 (762)	30 (762)	30 1/8 (765)	22 1/2 (570)	43 (1093)	26 1/8 (664)	75 (1904)	8 5/8 (220)	19 5/8 (500)	2 7/8 (74)	1808 (820)	2009 (911)
14 (350)	13 1/4 (337)	32 1/2 (826)	32 1/2 (826)	32 5/8 (839)	24 3/8 (618)	46 5/8 (1184)	28 1/8 (714)	80 3/4 (2052)	8 5/8 (220)	19 5/8 (500)	2 7/8 (74)	2337 (1060)	2597 (1178)
16 (400)	15 1/4 (387)	35 1/2 (902)	35 1/2 (902)	35 5/8 (905)	27 3/4 (705)	53 (1345)	32 1/4 (820)	91 3/8 (2321)	8 5/8 (220)	19 5/8 (500)	2 7/8 (74)	3527 (1600)	3919 (1778)
18 (450)	17 1/4 (438)	38 1/2 (978)	38 1/2 (978)	38 5/8 (981)	31 1/2 (800)	58 3/8 (1483)	35 7/8 (910)	102 3/8 (2600)	9 1/2 (241)	19 5/8 (500)	3 5/8 (92)	4519 (2050)	5022 (2278)
20 (500)	19 1/4 (489)	41 1/2 (1054)	41 1/2 (1054)	41 3/4 (1060)	34 1/8 (867)	63 7/8 (1622)	38 5/8 (980)	112 1/8 (2847)	12 5/8 (320)	19 5/8 (500)	4 (102)	4850 (2200)	5389 (2444)
22 (550)	21 1/4 (540)	45 (1143)	45 (1143)	45 3/8 (1153)	37 3/4 (960)	70 (1778)	42 7/8 (1090)	122 1/4 (3105)	12 5/8 (320)	19 5/8 (500)	4 (102)	7275 (3300)	8084 (3667)
24 (600)	23 1/4 (591)	48 1/2 (1232)	48 1/2 (1232)	48 7/8 (1241)	41 (1040)	75 3/4 (1923)	46 1/2 (1180)	131 1/2 (3340)	12 5/8 (320)	19 5/8 (500)	4 (102)	8818 (4000)	9798 (4444)
26 (650)	25 (635)	51 1/2 (1308)	51 1/2 (1308)	52 (1321)	44 1/8 (1120)	81 1/8 (2060)	50 1/4 (1275)	141 3/8 (3591)	16 1/8 (410)	31 1/2 (800)	4 1/2 (115)	10582 (4800)	11758 (5333)
28 (700)	27 (686)	55 (1397)	55 (1397)	55 1/2 (1410)	47 3/4 (1214)	85 7/8 (2182)	53 1/2 (1360)	151 5/8 (3852)	16 1/8 (410)	31 1/2 (800)	4 1/2 (115)	12125 (5500)	13473 (6111)
30 (750)	29 (737)	60 (1524)	60 (1524)	60 1/2 (1537)	51 (1295)	92 3/4 (2357)	56 1/2 (1435)	164 1/8 (4170)	17 7/8 (453)	31 1/2 (800)	5 7/8 (150)	14330 (6500)	15922 (7222)
32 (800)	30 3/4 (781)	65 (1651)	65 (1651)	65 5/8 (1667)	53 1/8 (1350)	96 1/8 (2442)	61 (1550)	170 (4317)	17 7/8 (453)	31 1/2 (800)	5 7/8 (150)	16755 (7600)	18617 (8445)
34 (850)	32 3/4 (832)	70 (1778)	70 (1778)	70 5/8 (1794)	56 1/8 (1425)	102 3/8 (2600)	64 5/8 (1640)	179 1/2 (4560)	17 7/8 (453)	31 1/2 (800)	5 7/8 (150)	19180 (8700)	21311 (9667)
36 (900)	34 1/2 (876)	74 (1880)	74 (1880)	74 5/8 (1895)	59 7/8 (1520)	107 1/8 (2721)	67 7/8 (1725)	189 5/8 (4817)	19 5/8 (500)	31 1/2 (800)	6 1/8 (155)	21826 (9900)	24251 (11000)
38 (950)	36 1/2 (927)	*	*	*	62 1/4 (1580)	114 1/8 (2900)	71 7/8 (1825)	199 5/8 (5070)	19 5/8 (500)	31 1/2 (800)	6 1/8 (155)	24692 (11200)	27435 (12444)
40 (1000)	38 1/2 (978)	82 (2083)	82 (2083)	*	65 1/4 (1656)	119 1/2 (3034)	75 3/8 (1913)	209 1/2 (5320)	19 5/8 (500)	31 1/2 (800)	6 1/8 (155)	29321 (13300)	32579 (14778)
42 (1050)	40 1/4 (1022)	*	*	*	68 1/2 (1740)	125 3/4 (3195)	78 3/4 (2000)	218 3/4 (5556)	19 5/8 (500)	31 1/2 (800)	6 1/8 (155)	31967 (14500)	35519 (16111)
48 (1200)	46 (1168)	*	*	*	77 1/2 (1970)	140 3/4 (3575)	89 5/8 (2275)	248 (6300)	26 (660)	31 1/2 (800)	8 1/2 (215)	45018 (20420)	50020 (22689)
54 (1350)	51 3/4 (1314)	*	*	*	87 (2210)	160 1/4 (4070)	100 3/8 (2550)	277 1/8 (7040)	-	-	-	60627 (27500)	67363 (30555)
56 (1400)	53 3/4 (1365)	*	*	*	90 1/8 (2290)	165 3/8 (4200)	104 3/8 (2650)	287 3/8 (7300)	-	-	-	66138 (30000)	73487 (33333)
60 (1500)	57 1/2 (1461)	*	*	*	96 1/8 (2440)	177 1/8 (4500)	111 1/4 (2825)	306 1/2 (7785)	-	-	-	78704 (35700)	87449 (39666)

* Upon Request

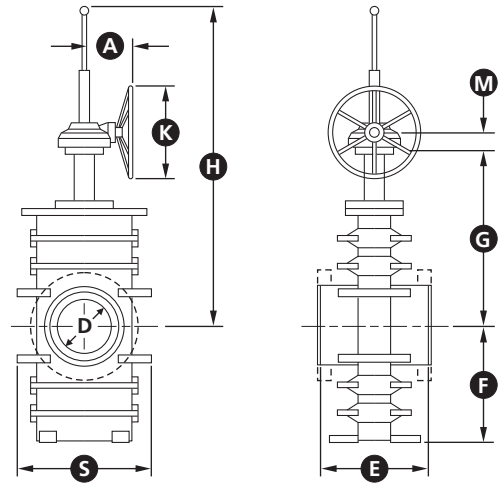
Flanges up to 24 in. (600 mm) except 22 in. (550 mm) in accordance with ASME B16.5;
22 in. (550 mm) and above 24 in. (600 mm) in accordance with MSS-SP-44 if applicable.

Shaded Dimensions in accordance to ISO 14313
Butt Welding Ends according to ASME B16.25.

G4N THROUGH CONDUIT GATE VALVE

DIMENSIONS & WEIGHTS

ASME CLASS 600



Larger on request.
Reduced-bore valves also 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 (500)	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)	11067 (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)	13115 (5949)	14572 (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)	14881 (6750)	16535 (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)	17262 (7830)	19180 (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)	19841 (9000)	22046 (10000)
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)	22818 (10350)	25353 (11500)
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)	25992 (11790)	28880 (13100)
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)	29762 (13500)	33069 (15000)
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)	33730 (15300)	37478 (17000)
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)	-	-	-	37639 (17073)	41821 (18970)
48 (1200)	46 (1168)	*	*	*	78 3/4 (2000)	145 5/8 (3700)	88 1/4 (2240)	255 1/8 (6480)	-	-	-	52580 (23850)	58422 (26500)
54 (1350)	51 3/4 (1314)	*	*	*	87 3/4 (2230)	163 3/8 (4150)	99 (2515)	285 7/8 (7260)	-	-	-	71627 (32490)	79586 (36100)
56 (1400)	53 3/4 (1365)	*	*	*	91 1/8 (2315)	168 1/2 (4280)	102 3/8 (2600)	295 5/8 (7510)	-	-	-	79366 (36000)	88184 (40000)
60 (1500)	57 1/2 (1461)	*	*	*	97 1/2 (2475)	179 7/8 (4570)	109 1/2 (2780)	315 (8000)	-	-	-	97223 (44100)	108025 (49000)

* Upon Request

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

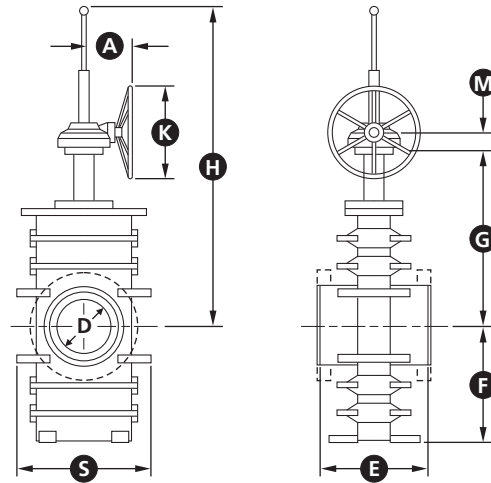
Shaded Dimensions in accordance to ISO 14313
Butt Welding Ends according to ASME B16.25.

G4N THROUGH CONDUIT GATE VALVE

DIMENSIONS & WEIGHTS

ASME CLASS 900

Larger on request.
Reduced-bore valves also 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)	11938 (5415)	12566 (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)	14917 (6766)	15702 (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)	18287 (8295)	19467 (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)	23038 (1045)	24251 (11000)
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)	28880 (13100)	30512 (13840)
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)	34172 (15500)	-

* Upon Request

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

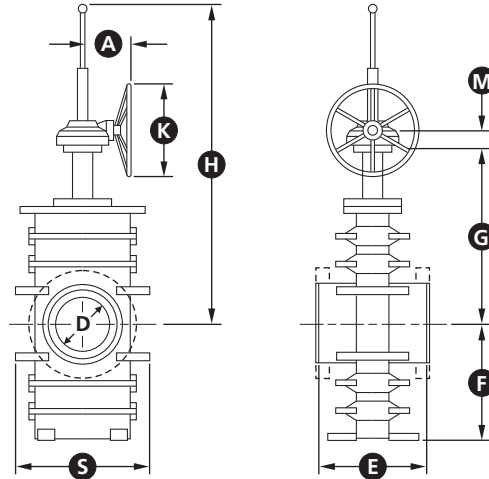
Shaded Dimensions in accordance to ISO 14313
Butt Welding Ends according to ASME B16.25.

G4N THROUGH CONDUIT GATE VALVE

DIMENSIONS & WEIGHTS

ASME CLASS 1500

Larger on request.
Reduced-bore valves also 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)	10774 (4887)	11341 (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)	13746 (6235)	14469 (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)	16718 (7583)	17598 (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)	18650 (8459)	19631 (8905)

* Upon Request

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

Shaded Dimensions in accordance to ISO 14313
Butt Welding Ends according to ASME B16.25.

G4N QUALITY SYSTEM AND QUALIFICATION SYSTEM

QUALITY ASSURANCE PROGRAM

GROVE operates a high level quality assurance program to ensure that all products are designed and manufactured to the highest standards available using the latest technology.

GROVE Quality Assurance Program covers the entire operation from order entry to final inspection and field service in accordance with:

ISO 9001, API Q1

GROVE has held the ISO 9001 Certificate of conformity since 1990 and maintains the license for API Monogram. (API licence No. 6D-0001 and 6D-0001.1).

All products are supplied with Certified Test Reports which include chemical-physical analysis of the materials, pressure testing along with any other specified special test certification.



INSPECTION, TESTING ...

The GROVE Quality Control department verifies all processes from material receipt, to final customer inspection including a liaison with approved inspection and certifying authorities.

All products can be supplied with Certified Test Reports which include Pressure Testing, NDT, chemical-physical analysis, along with any other specified test certifications.

All of the valves are hydrostatically tested per API 6D Standard.

A complete range of equipment and instrumentation are available to perform standard and special tests.

... AND PROCESSES

All welding as well as internal and external coating are supported by detailed procedures. GROVE operates its own in-house Electroless Nickel Plating (ENP) facility.

In-house HVOF process for TCC application and in-house welding overlay with 5 axis robot.

Strict quality control procedures for critical process conditions and for the plated components maintain plating consistency. Vendors of special processes are carefully selected as an ISO 9000 Approved Facility or pre-qualified and surveyed by GROVE.



RESEARCH AND DEVELOPMENT LAB

GROVE G4N Gate Valves are designed in accordance with the applicable or requested codes and are subjected to full in-house qualification testing.

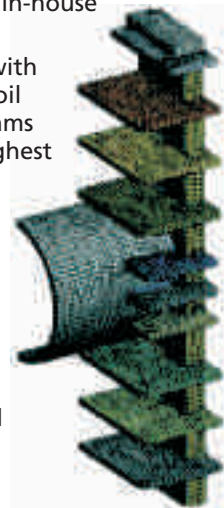
Our in-house testing facilities with the participation of the major oil and gas companies R&D programs allows GROVE to supply the highest quality products.

Hydraulic and gas sealing tests, functional tests, cycling and torque tests are all carried out on prototype valves.

These test procedures ensure that the design safety factors, the maximum allowable leakage rates and the expected valve service life are achieved.

STRUCTURAL VERIFICATION

The GROVE engineering department operates the most advanced 3D CAD system and conducts Finite Element Analysis (FEA) to simulate various load conditions to determine a components suitability for the intended service.



HIGH PRESSURE GAS TESTING

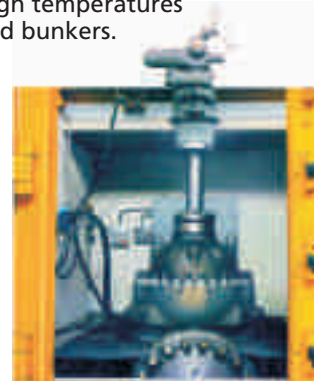
Customer specifications may require more detailed testing in addition to conventional hydrostatic testing.

GROVE is fully equipped to carry enhanced gas tests, at ambient, low and high temperatures using specially equipped bunkers.

External leakage rates (if any) are verified by means of a mass spectrometer.

Leakages through the seats (if any) are verified by means of calibrated flow meters.

For low and high temperature service, gas testing can be performed to customer specified critical conditions. GROVE maintains test facilities for various valve dimensions.



TRADEMARK INFORMATION

GROVE® is a registered trademark which is owned by Cameron.

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

Trademark	Owner
CELCON	Hoechst Celanese Corporation
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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

For Benelux:



WEGMAN

Utrecht, The Netherlands

T: +31 (0)30 263 4000

F: +31 (0)30 263 4005

wegman@wegman.nl



VALVES & MEASUREMENT 3250
Briarpark Drive, Suite 300 Houston, Texas
77042
USA Toll Free 800 323 9160

For the most current contact and location information go to: www.c-a-m.com/valvesandmeasurement