



**Cast
Stainless
Steel Valves**

**Gate/Globe
Check**

Since 1883

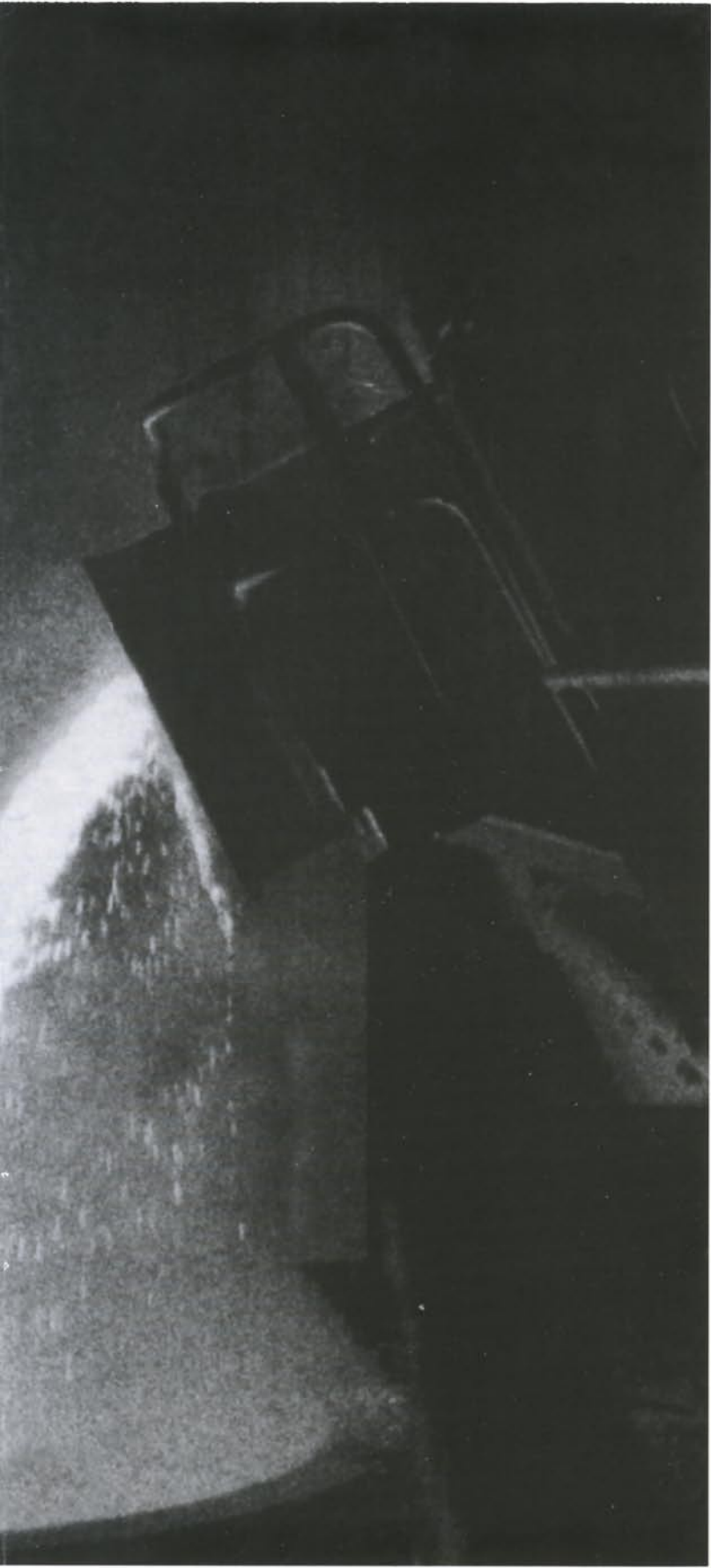
OIC's philosophy has stressed administrative ability, research activities and production developments that have resulted in continuing improvements in the manufacture of precision valves.

Today...Modern manufacturing facilities are utilized for the production and shipment of valves to all parts of the world.

Quality of materials, perfection of workmanship, testing and inspection make OIC Valves the choice of the petroleum and chemical industries.

OIC Stainless Steel Valves are constructed in accordance with the specifications of American Standards Organizations with the primary objective of guaranteeing uniformity in production. These standards are those universally used in the Oil, Petrochemical and Chemical industries. Due to their comprehensive nature they give a clear definition of the product. Standardized production in accordance with these specifications embrace the standards and codes for recommended materials, dimensional requirements and temperature/pressure ratings.





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Standards

ASTM - American Society for Testing and Materials
ASME - American Society of Mechanical Engineers
API - American Petroleum Institute
ANSI - American National Standards Institute

Standards of Manufacture

ASME/ANSI: B16.5
ASME/ANSI: B16.10
ASME/ANSI: B16.34
ASME/ANSI: B31.3
API: 600
ASTM: 182/193/194/276/351/744
MSS-SP25 and SP45
API 598

Quality Control

Visual Examination: MSS SP55
API 598
Liquid Penetrant (Optional)
Radiographic Examination (Optional)
Ultrasonic Examination (Optional)



Reference Standard & Specification

ASME/ANSI Standards - American National Standards Institute

B1.1	Unified Screw Threads
B2.1	Pipe Threads (Except Dryseal)
B16.5	Steel Pipe Flanges Flanged Fittings
B16.10	Face-to-Face and End-to-End Dimensions of Ferrous Valves
B16.11	Forged Steel Fittings, Socket Welding and Threaded
B16.20	Ring-Joint Gaskets and Grooves for Steel Pipe Flanges
B16.21	Nonmetallic Gaskets for Pipe Flanges
B16.25	Buttwelding Ends
B16.34	Steel Valves Flanged and Buttwelding End
B16.47	Large Diameter Steel Flanges
B18.2.1	Square and Hex Bolts and Screws
B18.2.2	Square and Hex Nuts
B31.1	Power Piping
B31.2	Fuel Gas Piping
B31.3	Chemical Plant and Petroleum Refining Piping
B31.4	Liquid Petroleum Transportation Piping Systems
B31.5	Refrigeration Piping Systems
B31.7	Nuclear Power Piping
B31.8	Gas Transmission and Distribution Piping Systems
B36.10	Wrought-Steel and Wrought-Iron Pipe

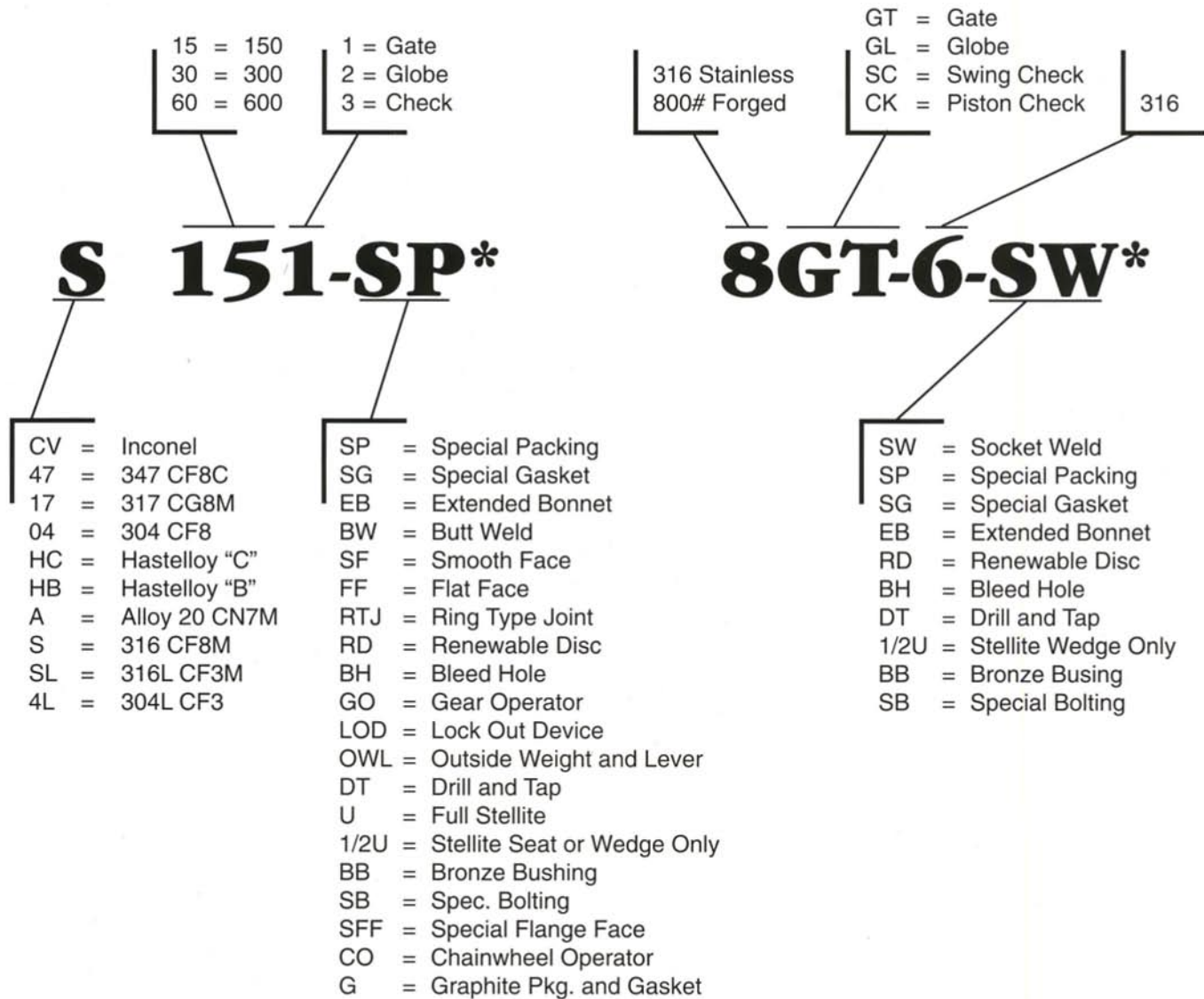
API Standards - American Petroleum Institute

6D	Specification for Pipeline Valves
597	Steel Venturi Gate Valves, Flanged or Buttwelding End
598	Valve Inspection and Test
600	Steel Gate Valves, Flanged or Buttwelding Ends
603	Class 150 Gate Valves

MSS Standard Practices - Manufacturers Standardization Society of the Valve and Fittings Industry

SP-6	Finishes for Contact Faces of Connecting End Flanges of Ferrous Valves and Fittings
SP-9	Spot-Facing Standard
SP-25	Standard Marking System for Valves, Fittings, Flanges and Unions
SP-42	150-Lb. Corrosion Resistant Cast Flanged Valves
SP-45	Bypass and Drain Connection Standard
SP-53	Quality Standard for Steel Castings-Dry Particle Magnetic Inspection Method
SP-54	Quality Standard for Steel Castings-Radiographic Inspection Method
SP-55	Quality Standard for Steel Castings-Visual Method
SP-61	Hydrostatic Testing of Steel Valves
SP-67	Butterfly Valves
SP-81	Stainless Steel Knife Gate Valves
SP-82	Valves Pressure Testing Methods

Figure Number Selection



*For multiple modifications continue adding letter designations with a hyphen between modifications.

Note: 800 Series valves are shown in separate forged stainless catalogue.

Terms and Conditions

Approval

All quotations, contracts, orders or agreements are subject to approval and/or acceptance by the main office of OIC Valve Stainless Division of Newman's.

We reserve the right to correct clerical or stenographic errors in quotations, orders, invoices and other contracts, agreements or documents. Prices and designs are subject to change without notice.

Changes

Orders cannot be cancelled or specifications changed, without the consent of OIC Valve; and then only in terms of indemnifying us against loss.

Claims

All claims for shortages, corrections or deductions must be made within 10 days after receipt of goods. Responsibility for goods lost or damaged in transit, rests with carrier, and claims should be filed with the carrier by the consignee.

Delivery

We assume no responsibility for delays in delivery or defaults resulting from strikes, work stoppages, fires, floods, accidents, inability to

obtain materials, or any other cause unavoidable and beyond our control.

Returns

No goods may be returned without our written permission and we assume no responsibility for any goods returned without such permission. On standard items a minimum charge of 25% of the invoiced price will be charged. All returns are to be made with freight prepaid. Special or non standard valves are not returnable.

Special Orders

Order for special goods must be in writing and accompanied with detailed prints and/or set of specifications, unless specifications on the order are definite and complete. Such orders cannot be cancelled unless customer agrees to pay for all work including engineering completed up to the time of cancellation.

Taxes

OIC quotations and/or contracts do not include any municipal, state or Federal sales, excise, use occupational or other taxes, and any such tax, if paid by us, will be charged to the purchaser.

Warranty

OIC Valve Stainless Division of Newman's hereinafter referred to as "OIC" warrants its product against defects in material and workmanship for a period of one (1) year from date of shipment from OIC, where such product is not misused, abused, accidentally or willfully damaged.

It is expressly agreed that the exclusive remedy under this warranty is (i) repair of the product, F.O.B. factory, (ii) replacement of any part or parts proven defective in material or workmanship, or (iii) refund of any monies paid. The choices of these remedies shall be at the sole discretion of OIC. Before any obligation arises under this warranty, OIC shall have the right to inspect the product on site or at its plant, freight prepaid, to determine if it has any liability under the aforementioned terms.

It is expressly agreed that under no circumstances will OIC be responsible for any other damages including consequential or special damages of any kind. The total liability of OIC is limited solely to repair, replacement or refund, as expressly agreed and set out herein.

THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE associated with the sale of any of OIC's products. There are no express warranties associated with the sale of any product other than those expressly set out above. Any valve application indicated in OIC's literature is merely an example and is not to be understood as a recommendation of suggested use and is not intended to cause any customer reliance. Any alteration, modification, or unauthorized repair to the product shall void this warranty. All terms of this agreement are to be construed under Texas law.



Gate Valves

150/300/600 Lb. Class

Stainless Steel Gate Valves

Outside Screw and Yoke
Rising Stem
Non-rising Handwheel
Integral Seats
Removable Yoke Sleeve

Bonnet Bushing (Integral)

The bonnet bushing or backseat is in cast stainless steel and forms part of the trim. Special attention is given both to its machining and heat treatment to insure a proper seat.

Bonnet Bolting

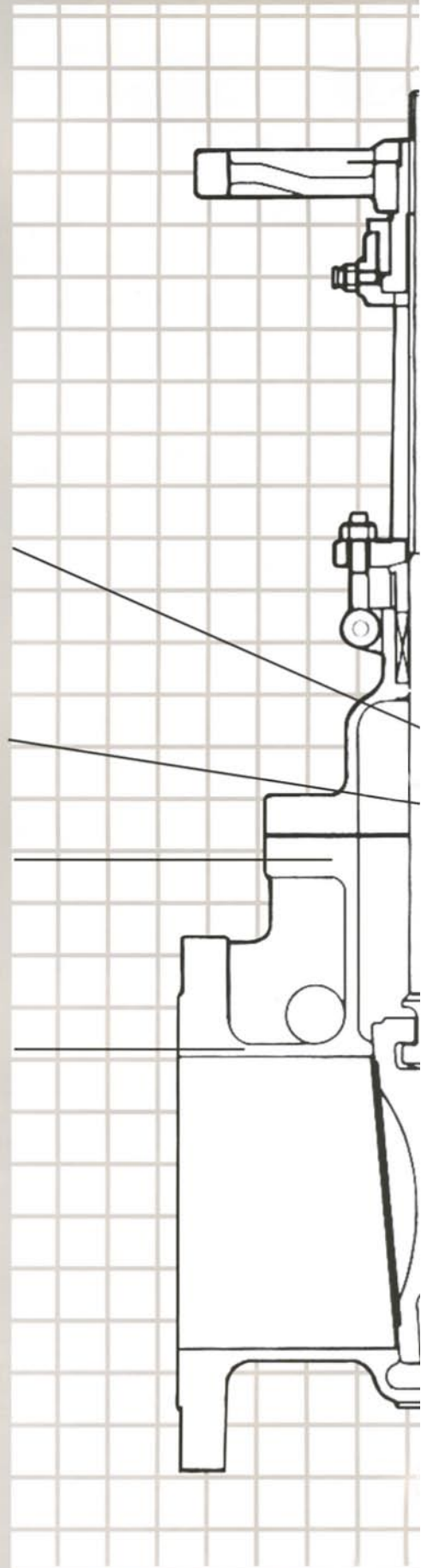
Bonnet studs and nuts are manufactured from alloy or stainless steel to the relevant ASTM standard.

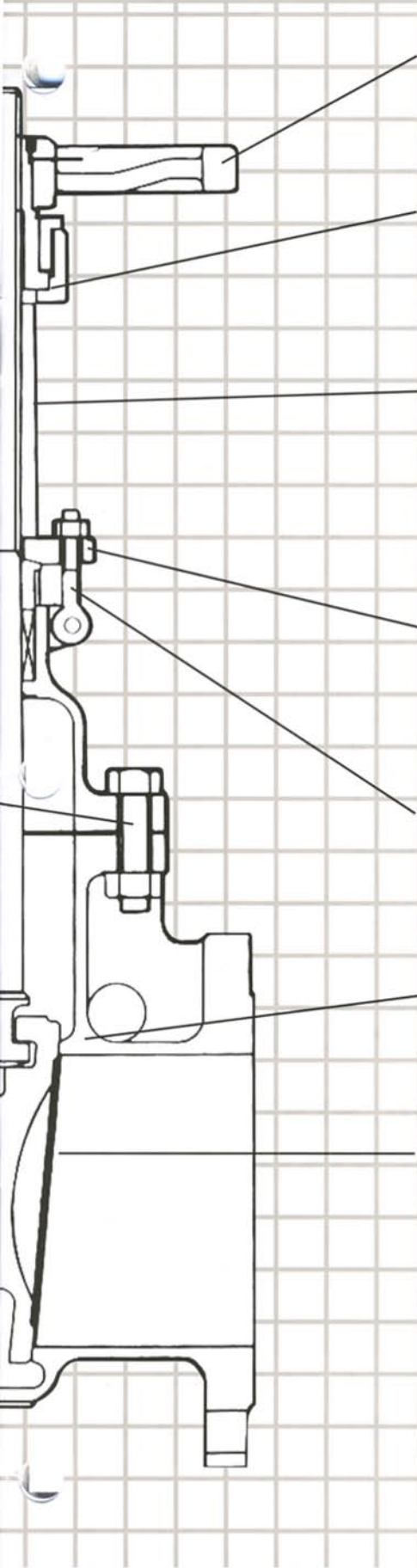
Bonnet

The bonnet is in stainless steel. It is machined to accept the yoke sleeve and incorporates a stuffing box dimensioned in accordance with the API standard.

Body

The body is in stainless steel and is carefully designed in all its details. The basic dimensions, i.e. wall thickness, face-to-face and flanges comply with the relevant API and ANSI standards. The sealing surfaces for connection to the bonnet are flat finish in the 150-lb. Class in sizes 1/2" - 1" and 3" and up; Recessed in 1 1/2" and 2". Recessed in all sizes 300-lb. and 600-lb. Class. Bosses may be provided for drain taps or by-pass piping.





Handwheel

The nodular iron handwheels are well shaped and large enough to give ease of movement when operating the valve, even under maximum differential pressure.

Yoke Sleeve

The yoke sleeve is made from ductile iron A439 Gr D2C having high resistance to wear and a high melting point. It is designed to permit removal from the bonnet or the yoke while the valve is in service. Gate valved 6"-600-lb. class and above are fitted with a ball thrust bearing.

Stem

The stem is in forged stainless steel and is part of the trim. The stem is provided with a T-head. A ground backseat is provided to ensure perfectly tight seal to the stuffing box when the valve is fully open. The stem is ground to minimize friction and prevent damage to gland packing. The threading is trapezoidal ACME type. Dimensions comply with the applicable standard.

Gland and Flange

They are in stainless steel and are normally supplied in two pieces. The contact surfaces between gland and gland flange have a spherical profile to permit the gland to descend parallel to the stem even if the eyebolts are evenly tightened.

Gland Bolts and Nuts

The forged stainless steel gland bolts are of the eyebolt type which can be swung outward for ease of gland repacking. They are fixed to the bonnet by solid bolt pin tack welded.

Seat Rings (Integral)

The rings are cast integral to the body and are part of the trim. Special attention is given to the sealing surfaces which are ground and lapped for a perfectly tight seal.

Wedge

The wedge is part of the trim. It is cast stainless steel or specified alloy. It is normally supplied as flexible or solid. It is connected to the stem by means of a T-joint. The guides on each side of the wedge are machined for proper alignment with the body guides. Special attention is given to the seating surfaces which are ground and lapped to insure a perfectly tight seal.



Stainless Steel Gate Valves

Features

Cast stainless steel body and bonnet. Rising stem. Outside screw and yoke. Solid 1/2" - 3"; 4"-up flexible wedge integral seat rings, stem back seat design.

Material Specifications

- Handwheel nut: 300 series Stainless Steel
- Handwheel: Nodular iron
- Yoke nut: 300 or 400 series Stainless Steel
- Yoke Sleeve: A439 Gr D2C
- Stem: A276-316
- Gland eye bolt and nut: 304SS
- Gland flange: CF8M
- Gland: A276-316
- Stem packing: PTFE¹ or graphite²
- Back seat bushing: Integral
- Bonnet: A351-CF8M (316)
- Bonnet Gasket: PTFE¹ or graphite²
- Bonnet nut: A194-8/8F
- Bonnet bolt: A193-B8
- Body: A351-CF8M (316)
- Seat ring: Cast Integral in body
- Wedge: A351-CF8M (316)

¹PTFE (Teflon), is a registered trademark of E.I. DuPont.
Temperature limit 400°F

²Graphite

Alloy 20, Hastelloy "B" and "C" also available upon request.

Pressure/Temperature Ratings

Per ASME B16.34-1996

Seat Test: 303 PSI (Hydrostatic)
100 PSI (Air)

Shell Test: 425 PSI (Hydrostatic)

°F	PSI	°F	PSI	°F	PSI
100	275	400	195	700	110
				750	95
200	240	500	170	800	80
				850	65
300	215	600	140	900	50
		650	125	1000	20

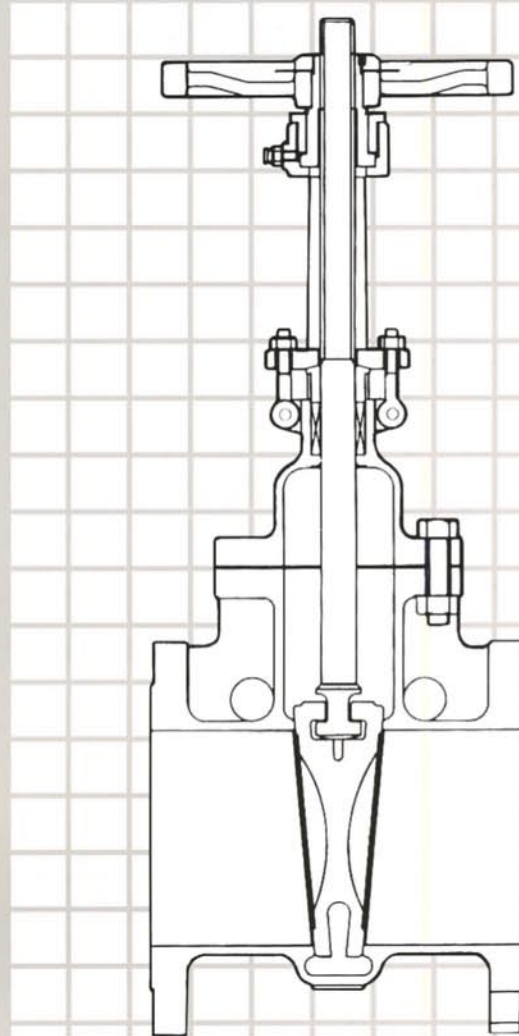
Dimensions

Design and dimensions in accordance with ASME B16.34 1/2"-24"

Flanged ends according to ASME B 16.5-raised face type

Face-to-face dimensions to ASME B 16.10

SIZE	1/2	3/4	1	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18*	20*	24*
FACE TO FACE (FLG)	4 1/4	4 5/8	5	6 1/2	7	7 1/2	8	9	10 1/2	11 1/2	13	14	15	16	17	18	20
CENTER TO TOP-OPEN	7	7 5/8	8 3/4	10 7/8	14 3/16	14 1/2	18 1/8	21 3/4	28 7/8	36 1/2	44 15/16	53	57 3/4	67 3/4	72 13/16	80 1/2	99
HANDWHEEL DIAMETER	3 15/16	3 15/16	4 3/4	6 1/2	7	7	8	9	10	12	14	16	20	22	24	24	25 1/2



150-Lb.

Fig. No. S151₁

Fig. No. S151G₂



Stainless Steel Gate Valves

Features

Cast stainless steel body and bonnet. Rising stem.
Outside screw and yoke. 1"-21/2 solid; 3' - up flexible
wedge. Integral seat rings, stem backseat design.

Material Specifications

Handwheel nut: 300 series Stainless Steel
Handwheel: Nodular iron
Yoke nut: 300 or 400 series Stainless Steel
Yoke Sleeve: A439 GR. D2C
Stem: 276-316
Gland eye bolt and nut: 304SS
Gland flange: CF8M
Gland: A276-316
Stem packing: PTFE¹ or graphite²
Back seat bushing: Integral
Bonnet: A351-CF8M
Bonnet Gasket: PTFE¹ or graphite²
Bonnet nut: A194-8/8F
Bonnet bolt: A193-B8
Body: A351-CF8M (316)
Seat ring: Cast Integral in body
Wedge: A351-CF8M (316)
¹PTFE (Teflon), is a registered trademark of E.I. DuPont.
Temperature limit 400°F
²Graphite
Alloy 20, Hastelloy "B" and "C" also available upon request.

Pressure/Temperature Ratings

Per ASME B16.34-1996
Seat Test: 792 PSI (Hydrostatic)
100 PSI (Air)
Shell Test: 1100 PSI (Hydrostatic)

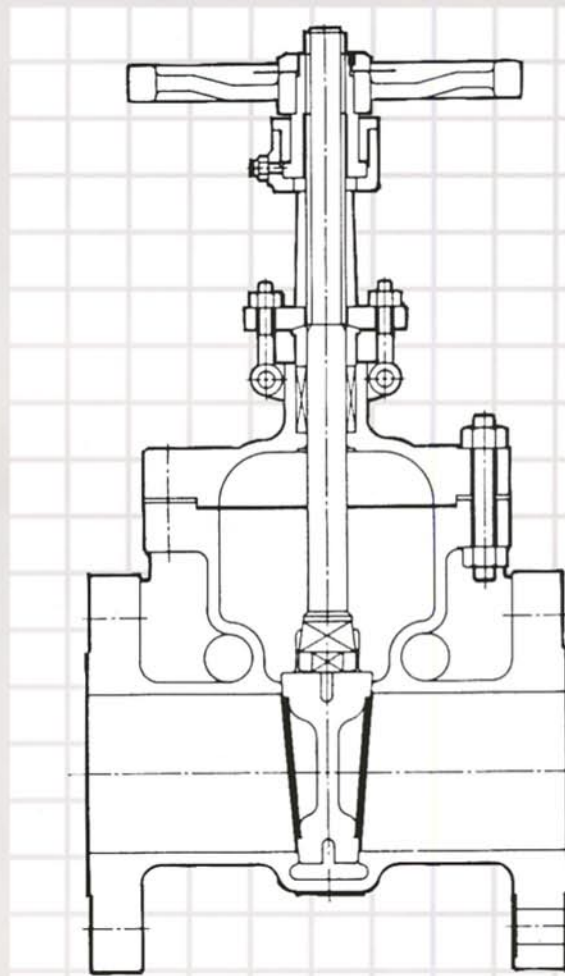
°F	PSI	°F	PSI	°F	PSI	°F	PSI
100	720	400	515	700	430	1000	365
				750	425		
200	620	500	480	800	415		
				850	405		
300	560	600	450	900	395		
				950	395		

Dimensions

Design and dimensions in accordance with ASME B16.34
Flanged ends according to ASME B 16.5-raised face type
Face-to-face dimensions to ASME B 16.10

SIZE	1	1 1/2	2	2 1/2	3	4	6	8	10	12	14*	16*	18*	20*	24*
FACE TO FACE	6 1/2	7 1/2	8 1/2	9 1/2	11 1/8	12	15 7/8	16 1/2	18	19 3/4	30	33	36	39	45
CENTER TO TOP-OPEN	9 3/4	13 1/8	15 1/4	17	19 3/16	23 3/8	31 1/4	38 3/8	46 1/4	54 15/16	65 3/8	80 3/4	91	122	143
HANDWHEEL DIAMETER	7	8	8	8	9	10	14	16	18	20	22	28	31 1/2	35 7/8	43

*Other sizes available upon request
*This size not normally stocked



300-Lb.

Fig. No. S301₁

Fig. No. S301G₂



Stainless Steel Gate Valves

Features

Cast stainless steel body and bonnet. Rising stem.
 Outside screw and yoke. 1 1/2" 2"-up flexible wedge.
 Integral seat rings. Gland repackable under pressure.

Material Specifications

Handwheel nut: 300 series Stainless Steel
 Handwheel: Nodular iron
 Yoke nut: 300 series Stainless Steel
 Yoke Sleeve: A439 GR. D2C
 Stem: A276-316
 Gland eye bolt and nut: 304SS
 Gland flange: CF8M
 Gland: A276-316
 Stem packing: PTFE₁ or graphite₂
 Back seat bushing: Integral
 Bonnet: A351-CF8M
 Bonnet Gasket: A182 GR.F316 or graphite₂
 Bonnet nut: A194-8/8F
 Bonnet bolt: A193-B8
 Body: A351-CF8M (316)
 Seat ring: Cast Integral in body
 Wedge: A351-CF8M (316)
₁PTFE (Teflon), is a registered trademark of E.I. DuPont.
 Temperature limit 400°F
₂Graphite
 Blue asbestos available on request
Alloy 20, Hastelloy "B" and "C" also available upon request.

Pressure/Temperature Ratings

Per ASME B16.34-1996
 Seat Test: 1584 PSI (Hydrostatic)
 100 PSI (Air)
 Shell Test: 2175 PSI (Hydrostatic)

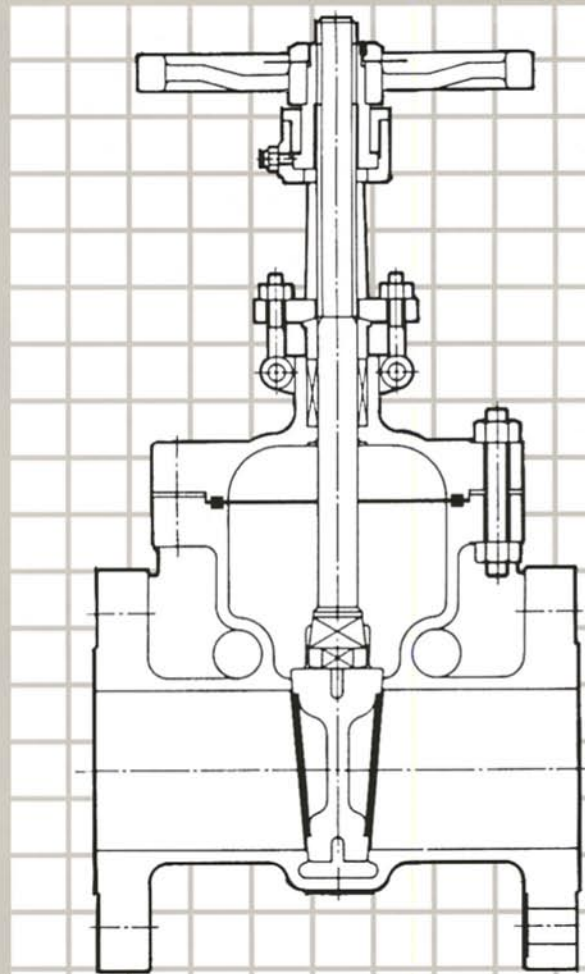
°F	PSI	°F	PSI	°F	PSI	°F	PSI
100	1440	400	1030	700	865	1000	725
			750	845			
200	1240	500	955	800	830		
				850	810		
300	1120	600	905	900	790		
				950	775		

Dimensions

Design and dimensions in accordance with ASME B16.34 1-1/2"-8"
 API 600 10"-24". Flanged ends according to ASME B 16.5. - raised
 face type. Face-to-face dimensions to ASME B16.10

SIZE	1 1/2	2	2 1/2	3	4	6	8	10	12	14*	16*	18*	20*	24*
FACE TO FACE	9 1/2	11 1/2	13	14	17	22	26	31	33	35	39	43	47	55
CENTER TO TOP-OPEN	14 5/16	15 13/16	20	20 1/8	25 1/4	33	41 15/16	51 3/8	58 5/8	65 5/16	83 1/16	93 1/16	102 1/8	124 1/8
HANDWHEEL DIAMETER	8	8	9	10	12	18	20	22	24	26	42 7/8	42 7/8	50 1/4	50 1/4

*Other sizes available upon request
 *This size not normally stocked



600-Lb.

Fig. No. S601₁

Fig. No. S601G₂



Globe Valves

150/300/600 Lb. Class

Stainless Steel Globe Valves

Outside Screw and Yoke
Rising Stem and Handwheel
Swivel Disc Plug
Integral Body Seat Ring

Gland and Flange

They are in stainless steel and are normally supplied in two pieces. The contact surfaces between gland and gland flange have a spherical profile to permit the gland to descend parallel to the stem even if the eyebolts are unevenly tightened.

Gland Bolts and Nuts

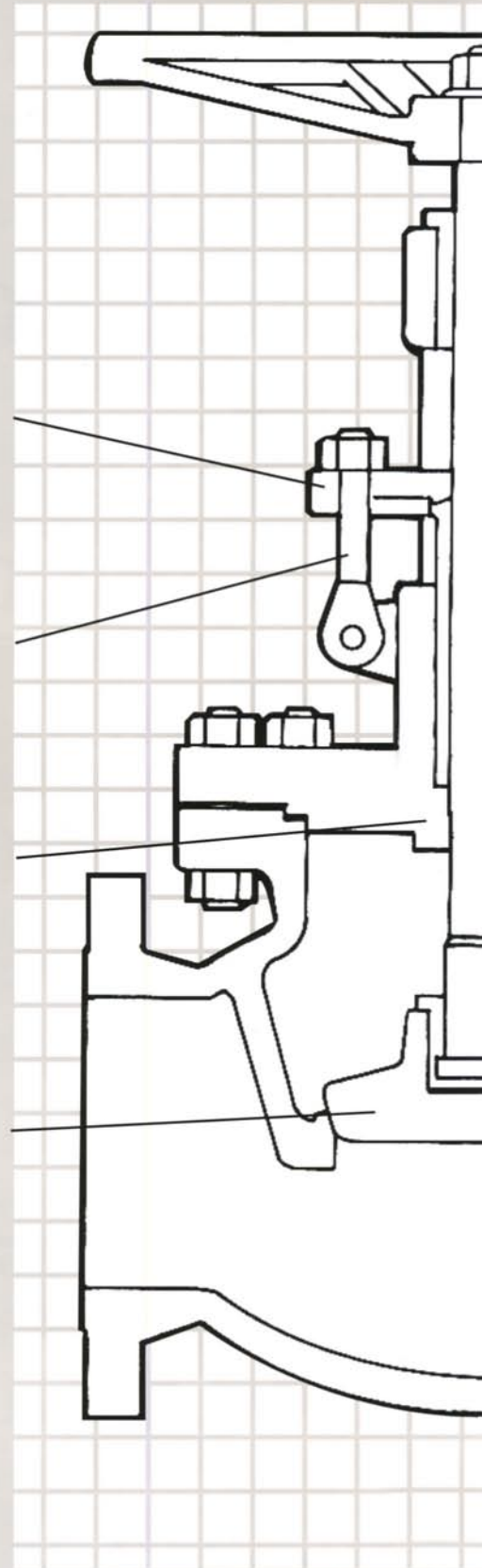
The forged stainless steel gland bolts are of the eyebolt type which can be swung outward for ease of gland repacking. They are fixed to the bonnet by solid bolt pin tack welded.

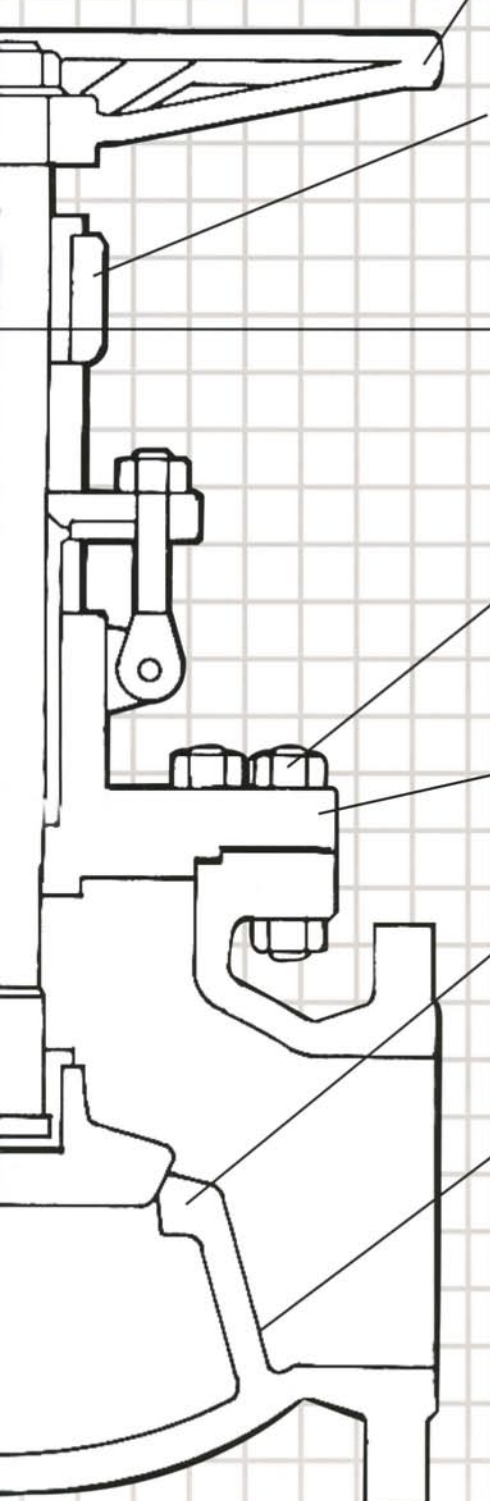
Bonnet Bushing (Integral)

The bonnet bushing or backseat is in cast stainless steel and forms part of the trim. Special attention is given to its machining and heat treatment to insure a proper seat for gland repacking. Special attention is given to the seating face which is ground and lapped, for a perfectly tight seal.

Disc

The disc is part of the trim. It is in cast stainless steel. It is normally supplied as a tapered type. Special attention is given to the seating face which is ground and lapped, for a perfectly tight seal.





Handwheel

The nodular iron handwheels are well shaped and large enough to give ease of movement when operating the valve, even under the maximum differential pressure.

Yoke Sleeve

The yoke sleeve is made from ductile iron having high resistance to wear and a high melting point. It is screwed into the bonnet and properly sized to withstand the stresses which develop when opening and closing the valve.

Stem

The stem is stainless steel and is part of the trim. A ground backseat is provided to ensure a perfectly tight seat to the stuffing box when the valve is fully open. The stem is attached to the disc by means of a threaded ring which allows the disc to rotate. The stem is ground to minimize friction and prevent damage to gland packing.

Bonnet Bolting

Bonnet studs and nuts are manufactured from stainless steel to the relevant ASTM standard.

Bonnet

The bonnet is in stainless steel. It is machined to accept the yoke sleeve and incorporates a stuffing box dimensioned in accordance with the API standard and MSS SP standard.

Seat Ring (Integral)

The ring is cast integral in the body and is part of the trim. Special attention is given to the seating face which is ground and lapped, for a perfectly tight seal.

Body

The body is in stainless steel. The basic dimensions, i.e. wall thickness, face-to-face and flanges comply with the relevant API and ANSI standards. The body-to-bonnet flange is circular. The sealing surfaces for connection to the bonnet are recessed in the 150-lb. 300-lb. and 600-lb. series. Bosses may be provided for drain taps and by-pass piping.



Stainless Steel Globe Valves

Features

Cast stainless steel body and bonnet.
 Outside screw and yoke, rising stem and handwheel,
 taper type disc, integral seat ring, removable stem nut,
 gland repackable under pressure.

Material Specifications

Handwheel nut: 300 series stainless steel
 Handwheel: Nodular iron
 Stem: A276-316
 Gland eye bolt and nut: 304SS
 Gland flange: CF8M
 Gland: A276-316
 Yoke bushing: A439 Gr D2C
 Stem packing: PTFE₁ or graphite₂
 Back seat bushing: Integral
 Bonnet: A351-CF8M
 Bonnet Gasket: PTFE₁ or graphite₂
 Bonnet nut: A194-8/8F
 Bonnet bolt: A193-B8
 Body: A351-CF8M
 Seat ring: Integral
 Disc: A351-CF8M
₁PTFE (Teflon), is a registered trademark of E.I. DuPont.
 Temperature limit is 400°F
Alloy 20, Hastelloy "B" and "C" also available upon request.

Pressure/Temperature Ratings

Per ASME B16.34-1996
 Seat Test: 303 PSI (Hydrostatic)
 100 PSI (Air)
 Shell Test: 425 PSI (Hydrostatic)

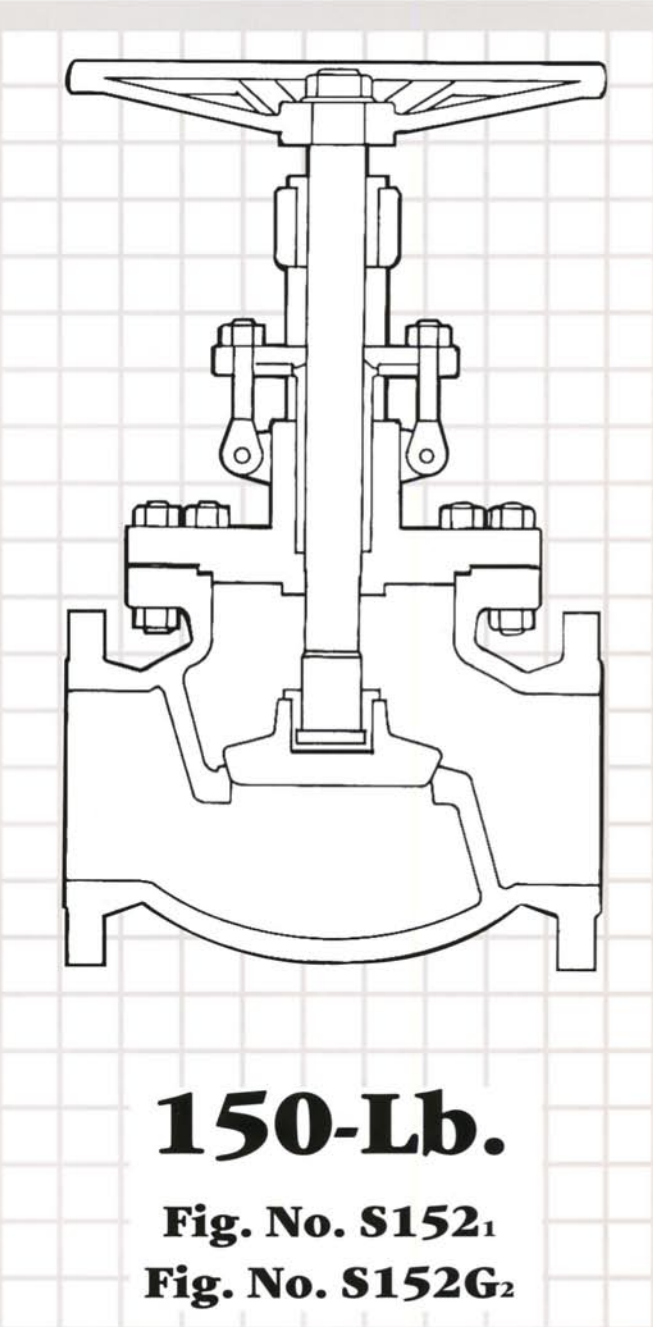
°F	PSI	°F	PSI	°F	PSI
100	275	400	195	700	110
				750	95
200	240	500	170	800	80
				850	65
300	215	600	140	900	50
				1000	20

Dimensions

Design and dimensions in accordance with ASME B16.34
 Flanged ends according to ASME B 16.5-raised face type
 Face-to-face dimensions to ASME B 16.10

SIZE	1/2	3/4	1	1 1/2	2	2 1/2	3	4	6	8	10	12*
FACE TO FACE	4 1/4	4 5/8	5	6 1/2	8	8 1/2	9 1/2	11 1/2	16	19 1/2	24 1/2	27 1/2
CENTER TO TOP-OPEN	7	7 5/16	8 3/4	10 3/16	11 1/2	12 7/8	14	16 1/2	19 5/8	22 3/4	38 1/4	43 1/4
HANDWHEEL DIAMETER	3 15/16	3 15/16	4 3/4	6 1/2	8	9	10	12	14	16	20	22

*Other sizes available upon request
 †This size not normally stocked



150-Lb.

Fig. No. S152₁

Fig. No. S152G₂



Stainless Steel Globe Valves

Features

Cast stainless steel body and bonnet.
 Outside screw and yoke, rising stem and handwheel,
 taper type disc, integral seat ring, removable stem nut,
 gland repackable under pressure.

Material Specifications

Handwheel nut: 300 series Stainless Steel
 Handwheel: Nodular iron
 Stem: A276-316
 Gland eye bolt and nut: 304SS
 Gland flange: CF8M
 Gland: A276-316
 Yoke bushing: A439 Gr D₂C
 Stem packing: PTFE₁ or graphite₂
 Back seat bushing: Integral
 Bonnet: A351-CF8M
 Bonnet Gasket: PTFE₁ or graphite₂
 Bonnet nut: A194-8/8F
 Bonnet bolt: A193-B8
 Body: A351-CF8M
 Seat ring: Integral
 Disc: A351-CF8M
¹PTFE (Teflon), is a registered trademark of E.I. DuPont.
 Temperature limit is 400°F
Alloy 20, Hastelloy "B" and "C" also available upon request.

Pressure/Temperature Ratings

Per ASME B16.34-1996
 Seat Test: 792 PSI (Hydrostatic)
 100 PSI (Air)
 Shell Test: 1100 PSI (Hydrostatic)

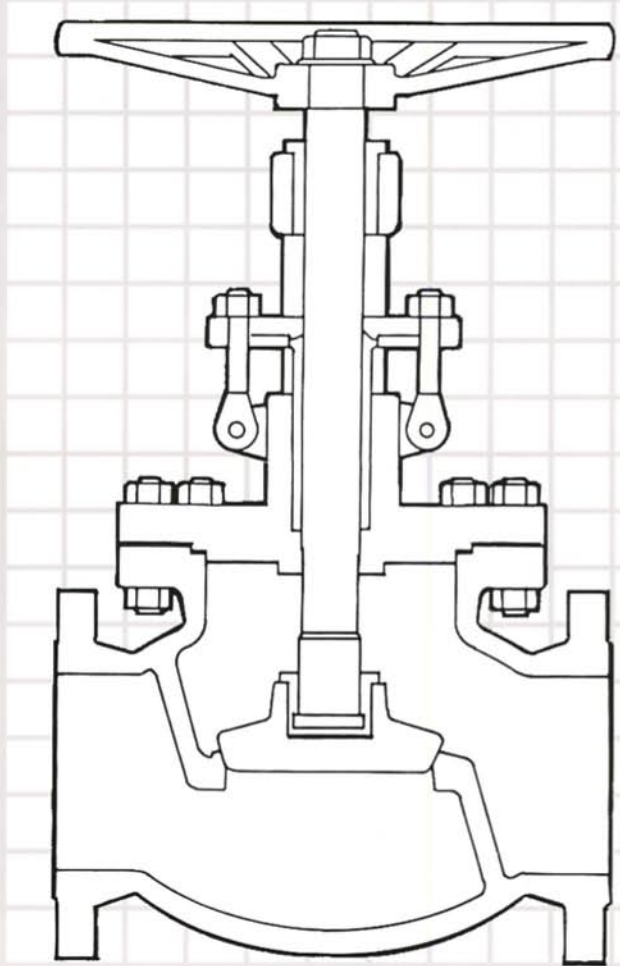
°F	PSI	°F	PSI	°F	PSI	°F	PSI
100	720	400	515	700	430	1000	365
				750	425		
200	620	500	480	800	415		
				850	405		
300	560	600	450	900	395		
				950	385		

Dimensions

Design and dimensions in accordance with ASME B16.34
 Flanged ends according to ASME B 16.5. - raised face type.
 Face-to-face dimensions to ASME B16.10

SIZE	1 1/2	2	2 1/2	3	4	6	8	10	12*
FACE TO FACE	9	10 1/2	11 1/2	12 1/2	14	17 1/2	22	24 1/2	28
CENTER TO TOP-OPEN	11 1/4	12 5/8	14	16 1/4	18 1/2	22 13/16	29 7/16	38 1/4	43 5/16
HANDWHEEL DIAMETER	8	9	10	12	14	18	24	22	26

*Other sizes available upon request
 *This size not normally stocked



300-Lb.

Fig. No. S302₁

Fig. No. S302G₂



Stainless Steel Globe Valves

Features

Cast stainless steel body and bonnet.
 Outside screw and yoke, rising stem and handwheel,
 taper type disc, integral seat ring, removable stem nut,
 gland repackable under pressure.

Material Specifications

Handwheel nut: 300 series Stainless Steel
 Handwheel: Nodular iron
 Stem: A276-316
 Gland eye bolt and nut: 304SS
 Gland flange: CF8M
 Gland: A276-316
 Yoke bushing: A439 Gr D2C
 Stem packing: PTFE₁ or graphite₂
 Back seat bushing: Integral
 Bonnet: A351-CF8M
 Bonnet Gasket: A182-F316 or graphite₂
 Bonnet nut: A194-8/8F
 Bonnet bolt: A193-B8
 Body: A351-CF8M
 Seat ring: Integral
 Disc: A351-CF8M
 PTFE (Teflon), is a registered trademark of E.I. DuPont.
 Temperature limit is 400°F
Alloy 20, Hastelloy "B" and "C" also available upon request.

Pressure/Temperature Ratings

Per ASME B16.34-1996
 Seat Test: 1584 PSI (Hydrostatic)
 100 PSI (Air)
 Shell Test: 2175 PSI (Hydrostatic)

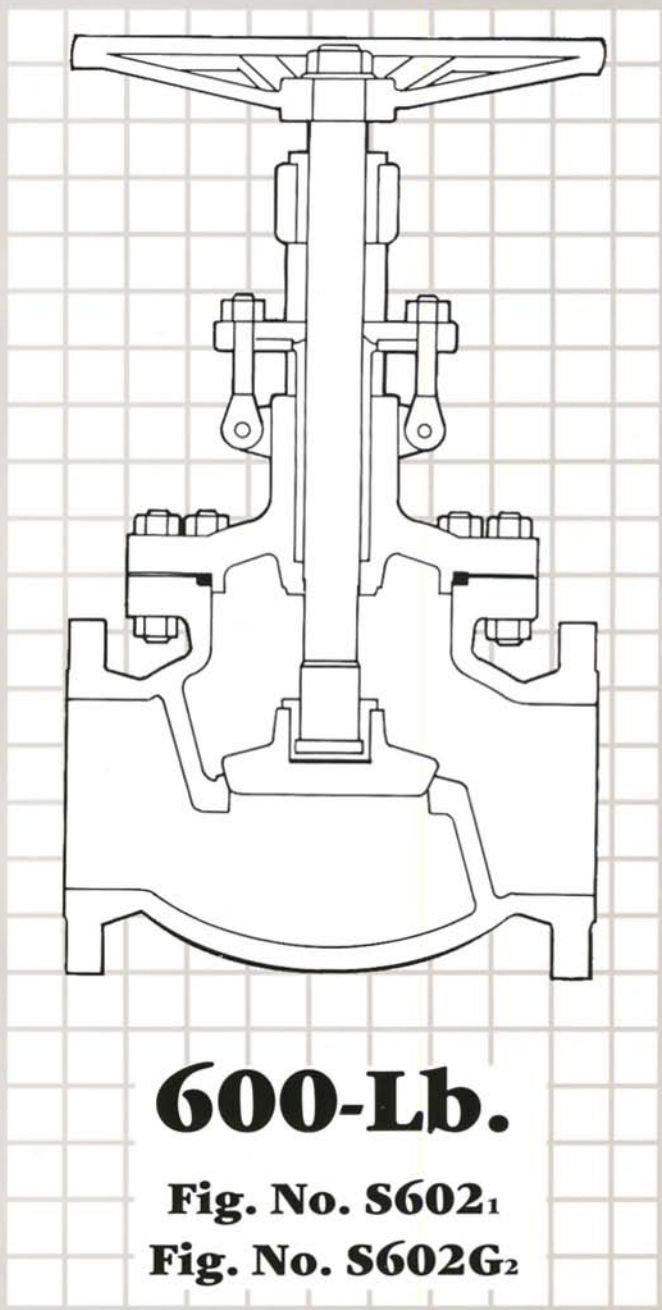
°F	PSI	°F	PSI	°F	PSI
100	1440	400	1030	700	865
				750	845
200	1240	500	955	800	830
				850	810
300	1120	600	905	900	790
				950	775

Dimensions

Design and dimensions in accordance with ASME B16.34
 Flanged ends according to ASME B 16.5. - raised face type.
 Face-to-face dimensions to ASME B16.10

SIZE	1 1/2	2	2 1/2	3	4	6	8*	10*	12*
FACE TO FACE	9 1/2	11 1/2	13	14	17	22	26	31	33
CENTER TO TOP-OPEN	11 7/8	16	16 1/2	20 9/16	25 7/16	34 5/16	38 3/8	34 3/16	43 3/16
HANDWHEEL DIAMETER	8 1/2	11 1/2	13	14	17	24	26	24	26

*Other sizes available upon request
 †This size not normally stocked





Check Valves

150/300/600 Lb. Class

Stainless Steel Check Valves

Swing Type Disc
Integral Body Seat Ring
Bolted Body-To-Cap
Connection

Hinge Pin

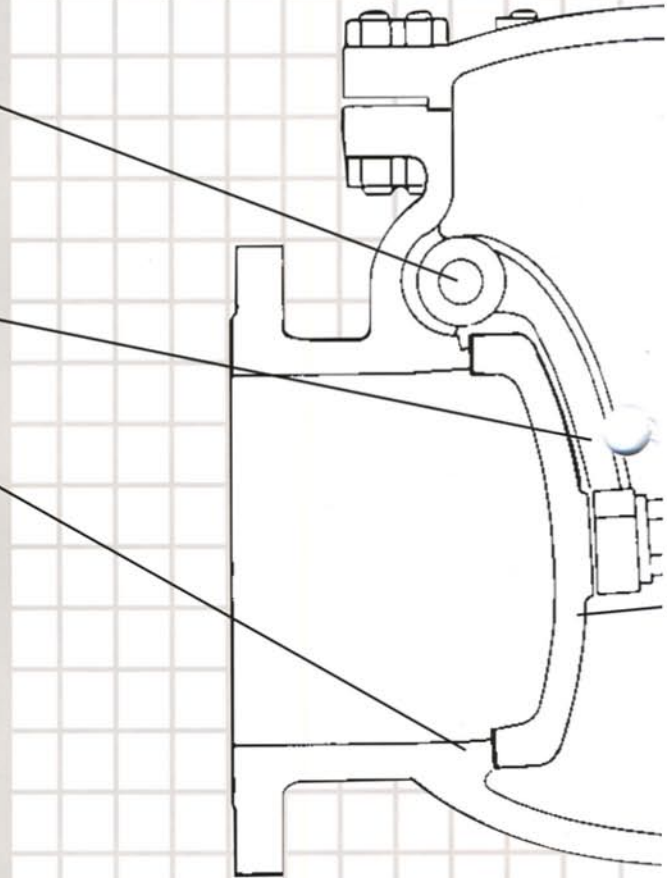
The hinge pin is part of the trim. It is forged stainless steel and is machined from round bar. The hinge pin is retained in the body by a threaded plug. The pin can be easily removed for maintenance of the valve.

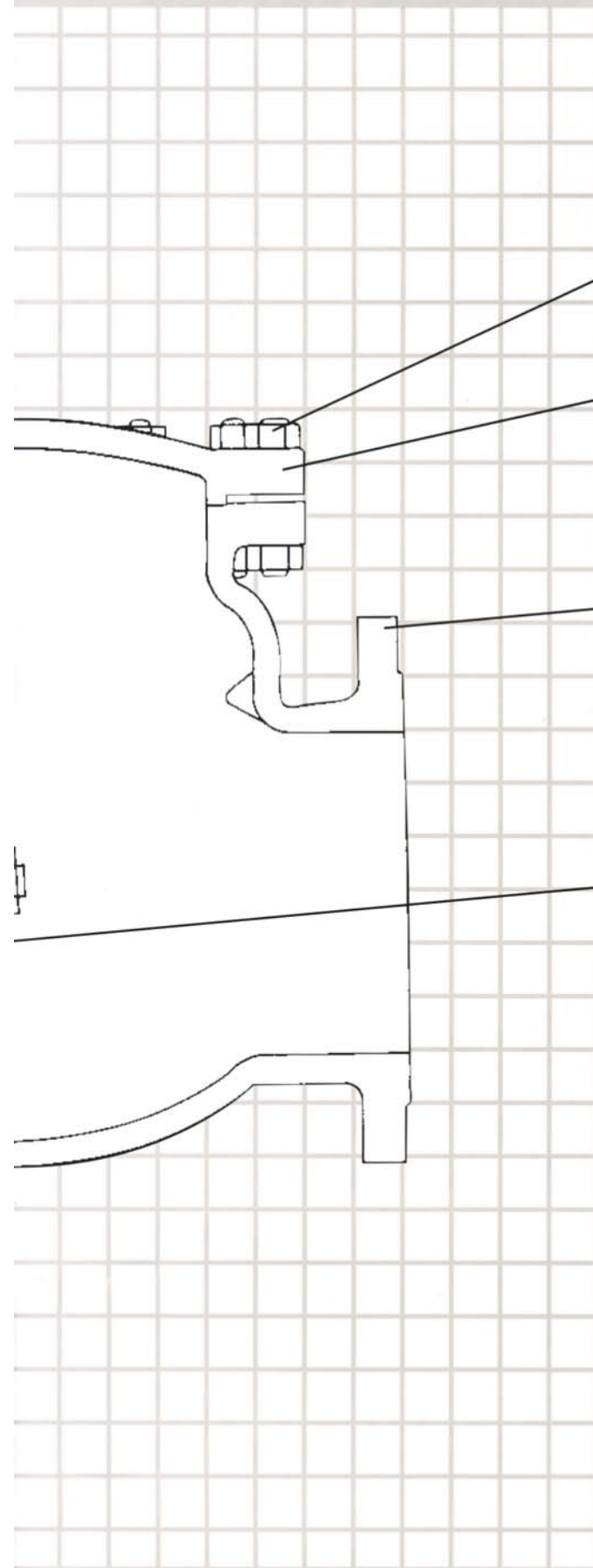
Hinge

The hinge is in forged stainless steel for small diameter and cast for valves 14" up.

Seat Ring (Integral)

The ring is cast integral to the body and is part of the trim. Special attention is given to the seating face which is ground and lapped, for a perfectly tight seal.





Cap Bolting

The cap studs and nuts are manufactured from stainless steel to the relevant ASTM standard.

Cap

The cap is cast stainless steel. The sealing surfaces for the connection to the body are flush in the 150-lb. class (sizes 1/2"-1") and recessed in the 150-lb. class (sizes 1 1/2" and up), 300-lb. class and 600-lb. class valves.

Body

The body is cast stainless steel, carefully designed to keep pressure drops to a minimum. A wide opening on top of the body permits easy inspection and maintenance. The basic dimensions, i.e. wall thickness, face to face and flanges, comply with the relevant API and ANSI standards. Bosses may be provided for drain taps or by-pass piping.

Disc

The disc is part of the trim. The back side has a threaded stud for attachment to the hinge with a stainless steel nut. To insure a strong connection the nut is secured to the threaded stud by spot welding. The seating face is ground and lapped, for a perfectly tight seal.



Stainless Steel Check Valves

Features

Cast stainless steel body and cap.
Swing type disc, integral seat ring, bolted cap.

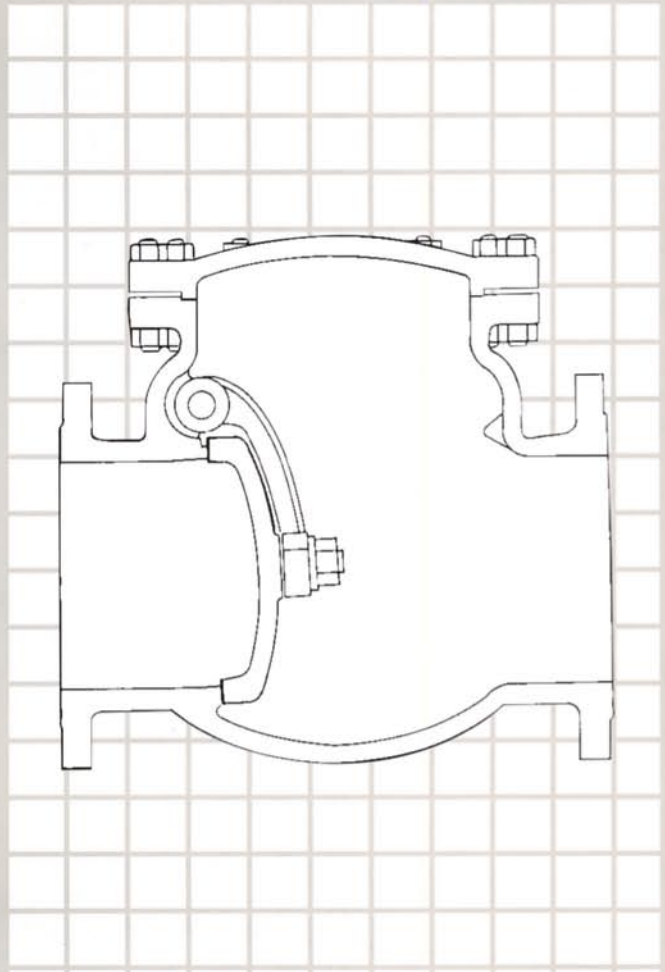
Material Specifications

Cap Bolt: A193-B8
Cap Nut: A194-8/8F
Cap: A351-CF8M
Cap Gasket: PTFE¹ or graphite²
Hinge Pin: A276-316
Body: A351-CF8M
Seat Rings: Integral
Hinge: A351-CF8M
Disc Nut: A194-8M
Disc Washer: A167-316
Disc: A351-CF8M
¹PTFE (Teflon), is a registered trademark of E.I. DuPont.
Temperature limit 400°F
²Graphite

Alloy 20, Hastelloy "B" and "C" also available upon request.

Pressure/Temperature Ratings

Per ASME B16.34-1996
Seat Test: 303 PSI (Hydrostatic)
100 PSI (Air)
Shell Test: 425 PSI (Hydrostatic)



°F	PSI	°F	PSI	°F	PSI
100	275	400	195	700	110
				750	95
200	240	500	170	800	80
				850	65
300	215	600	140	900	50
				1000	20

150-Lb.

Fig. No. S153₁

Fig. No. S153G₂

Dimensions

Design and dimensions in accordance with ASME B16.34 1/2"-24"
Flanged ends according to ASME B 16.5-raised face type
Face-to-face dimensions to ASME B 16.10

SIZE	1/2	3/4	1	1 1/2	2	2 1/2	3	4	6	8	10	12	14*
FACE TO FACE (FLG)	4 1/4	4 5/8	5	6 1/2	8	8 1/2	9 1/2	11 1/2	14	19 1/2	24 1/2	27 1/2	31
CENTER TO TOP-OPEN	2 5/8	3 1/8	3 3/8	3 3/4	4 1/2	4 7/8	5 5/8	6 1/4	8 9/10	10 1/8	11 3/16	12 15/16	14 3/4

*Other sizes available upon request
*This size not normally stocked



Stainless Steel Check Valves

Features

Cast stainless steel body and cap.
Swing type disc, integral seat ring, bolted cap.

Material Specifications

Cap Bolt: A193-B8
Cap Nut: A194-8/8F
Cap: A351-CF8M
Cap Gasket: PTFE¹ or graphite²
Hinge Pin: A276-316
Body: A351-CF8M
Seat Rings: Integral
Hinge: A351-CF8M
Disc Nut: A194-8M
Disc Washer: A167-316
Disc: A351-CF8M

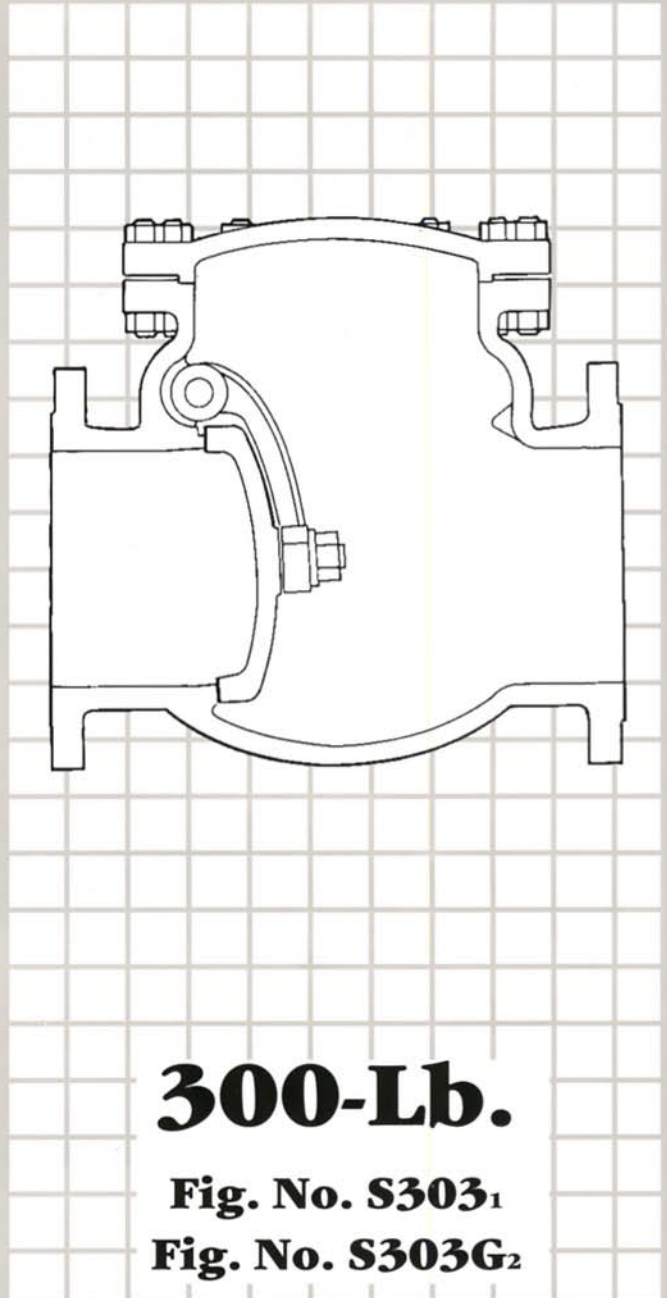
¹PTFE (Teflon), is a registered trademark of E.I. DuPont.
Temperature limit 400°F

²Graphite

Alloy 20, Hastelloy "B" and "C" also available upon request.

Pressure/Temperature Ratings

Per ASME B16.34-1996
Seat Test: 792 PSI (Hydrostatic)
100 PSI (Air)
Shell Test: 1100 PSI (Hydrostatic)



°F	PSI	°F	PSI	°F	PSI	°F	PSI
100	720	400	515	700	430	1000	365
				750	425		
200	620	500	480	800	415		
				850	405		
300	560	600	450	900	395		
				950	385		

Dimensions

Design and dimensions in accordance with ASME B16.34 1/2"-24"

Flanged ends according to ASME B 16.5-raised face type

Face-to-face dimensions to ASME B 16.10

SIZE	1 1/2	2	2 1/2	3	4	6	8	10	12	14*
FACE TO FACE (FLG)	9 1/2	10 1/2	11 1/2	12 1/2	14	17 1/2	21	24 1/2	28	33
CENTER TO TOP-OPEN	4 5/8	5 1/4	5 5/8	6 1/2	7 5/16	9 3/8	11 3/8	13 1/4	15	20 5/16

*Other sizes available upon request

*This size not normally stocked



Stainless Steel Check Valves

Features

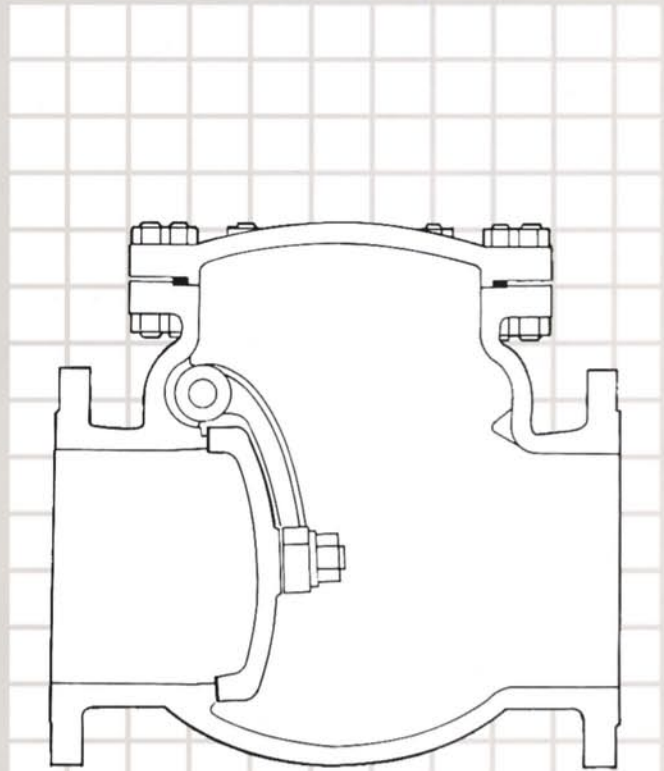
Cast stainless steel body and cap.
Swing type disc, integral seat ring, bottled cap.

Material Specifications

Cap Stud: A193-B8
Cap Nut: A194-8/8F
Cap: A351-CF8M
Cap Gasket: A182-F316 graphite
Hinge Pin: A276-316
Body: A351-CF8M
Seat Rings: Integral
Hinge: A351-CF8M
Disc Nut: A194-8M
Disc Washer: A167-316
Disc: A351-CF8M
Alloy 20, Hastelloy "B" and "C" also available upon request.

Pressure/Temperature Ratings

Per ASME B16.34-1996
Seat Test: 1584 PSI (Hydrostatic)
100 PSI (Air)
Shell Test: 2175 PSI (Hydrostatic)



°F	PSI	°F	PSI	°F	PSI	°F	PSI
100	1440	400	1030	700	865	1000	725
				750	845		
200	1240	500	955	800	830		
				850	810		
300	1120	600	905	900	790		
				950	775		

600-Lb.

Fig. No. S603₁

Fig. No. S603G₂

Dimensions

Design and dimensions in accordance with ASME B16.34
Flanged ends according to ASME B16.5-raised face type
Face-to-face dimensions to ASME B16.10

SIZE	1 1/2	2	2 1/2	3	4	6	8	10	12*
FACE TO FACE (FLG)	9 1/2	11 1/2	13	14	17	22	26	31	33
CENTER TO TOP-OPEN	6	6 1/8	7 5/8	7 5/8	9 3/8	11 13/16	13 1/2	16 1/2	19

*Other sizes available upon request
*This size not normally stocked

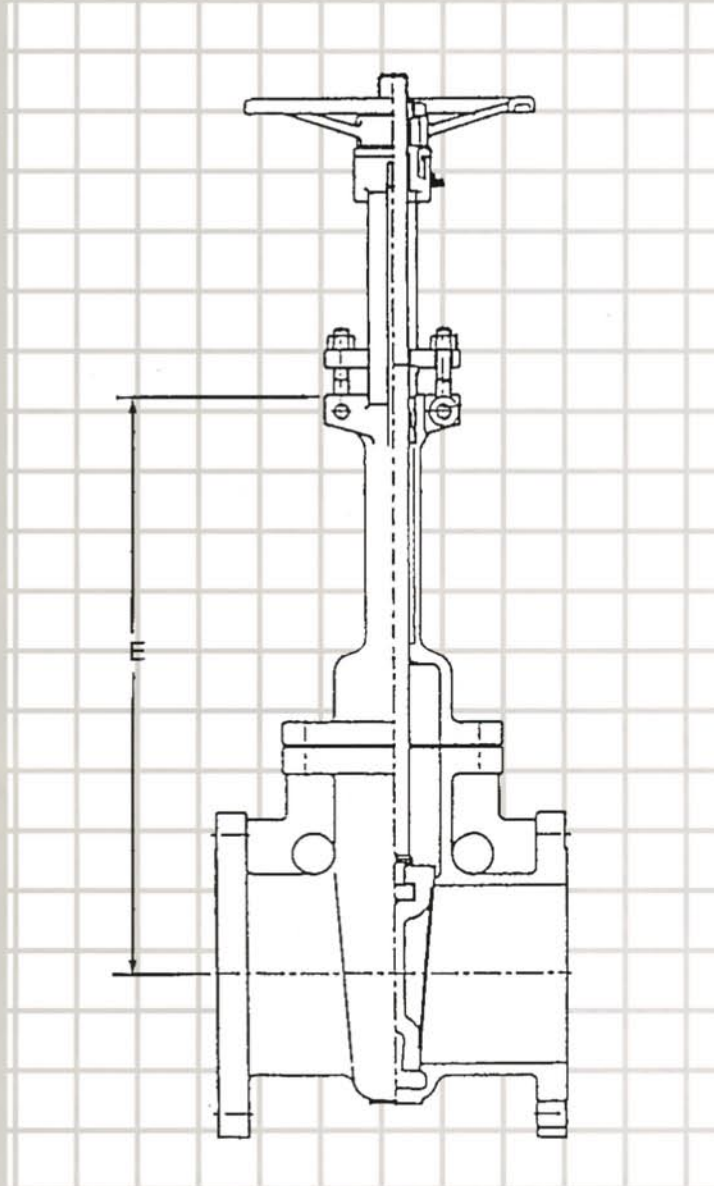


Stainless Steel Valves

Gate/Globe Check

Special Applications

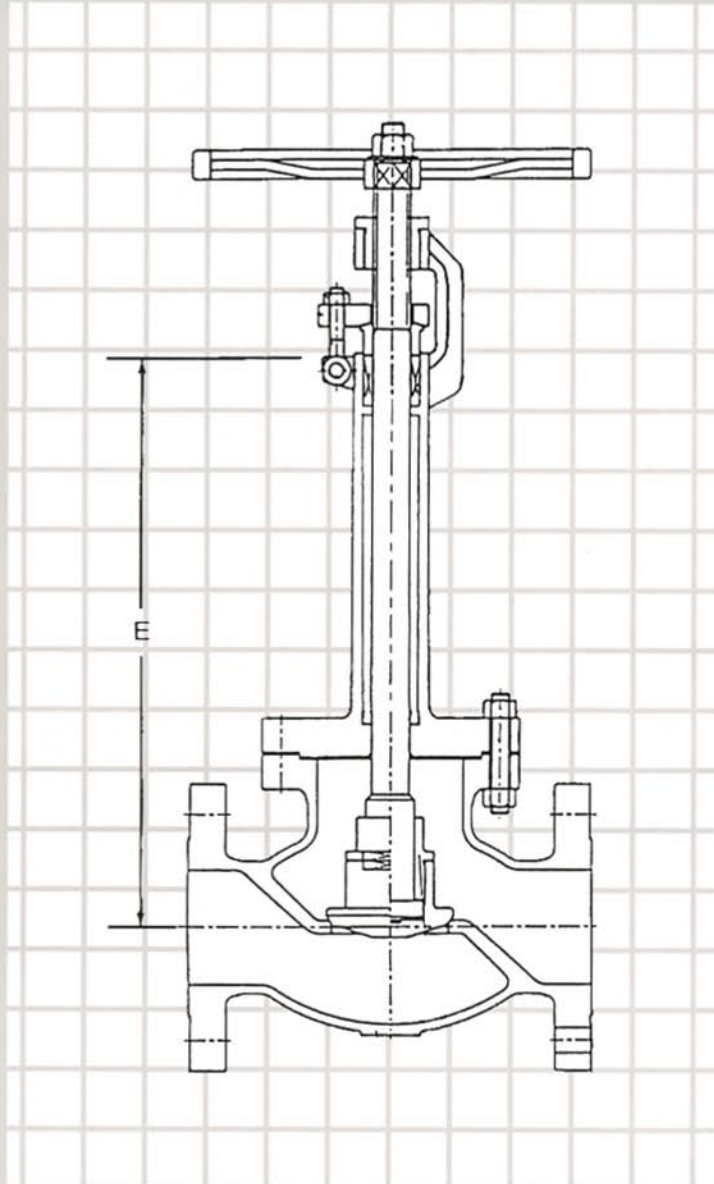
Special Applications/Gate Valves



Special designs for cryogenic.

“E” Dimension shown below is standard minimum length in inches.

Pressure	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24
150	13 1/2	13 1/2	15 1/4	18	18 1/2	18 1/2	20 3/8	24	30 5/8	35 5/8	40 3/8	44	47 3/4	51 3/4	55 1/4	63
300	NOT MADE		15 1/4	18	18 1/2	21 7/8	24	30 5/8	34 5/8	ON REQUEST						
600	NOT MADE			16 5/8	17 1/8	23 7/8	27	30 1/8	43	49 3/8	51	ON REQUEST				

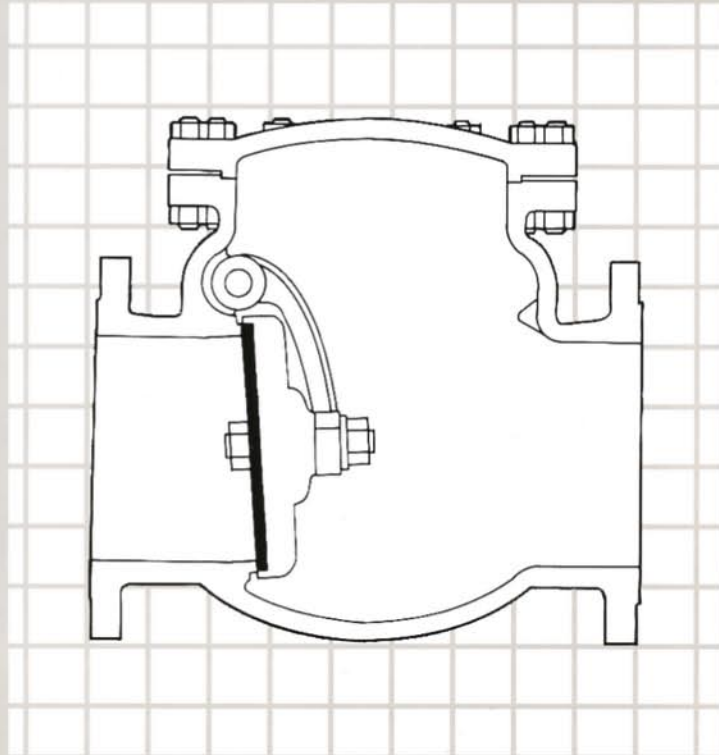


Special designs for cryogenic service.

“E” Dimension shown below is standard minimum length in inches.

Pressure	1/2	3/4	1	1 1/2	2	3	4	6
150	13 1/2	13 1/2	15 1/4	18	18 1/2	19	19	20 1/4
300	NOT MADE			18	18 1/2	21 1/8	22 1/4	25 7/8

Special Applications/Check Valves



Special designs for cryogenic. service

- **Renewable Discs**
- **Special Gaskets**



Cast Stainless Steel Valves

Gate/Globe Check

Technical Data Section

Pressure-Temperature Ratings

MATERIALS: A351-CF8, A351-CF3, A182-F304

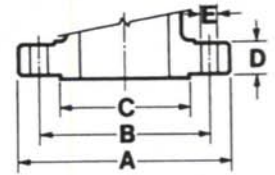
VALVE CLASS	150	300	400	600	900	1500	2500
TEMPERATURE IN °F							
WORKING PRESSURES IN PSI							
-20 TO 100	275	720	960	1440	2160	3600	6000
200	235	600	800	1200	1800	3000	5000
300	205	530	705	1055	1585	2640	4400
400	180	470	630	940	1410	2350	3920
500	170	435	585	875	1310	2185	3640
600	140	415	555	830	1245	2075	3460
650	125	410	545	815	1225	2040	3400
700	110	405	540	805	1210	2015	3360
750	95	400	530	795	1195	1990	3320
800	80	395	525	790	1180	1970	3280
850	65	390	520	780	1165	1945	3240
900	50	385	510	770	1150	1920	3200
950	35	375	500	750	1125	1870	3120
1000	20	325	430	645	965	1610	2685
1050	20	310	410	620	925	1545	2570
1100	20	260	345	515	770	1285	2145
1150	20	195	260	390	585	980	1630
1200	20	155	205	310	465	770	1285
1250	20	110	145	220	330	550	915
1300	20	85	110	165	245	410	685
1350	20	60	85	125	185	310	515
1400	20	50	65	95	145	240	400
1450	15	35	45	70	205	170	285
1500	10	25	30	50	70	120	200
HYDROSTATIC TEST PRESSURES IN POUNDS PER SQUARE INCH GAGE (psig)							
SHELL	375	925	1250	1875	2775	4650	7725
SEAT	260	675	905	1360	2035	3395	5660

MATERIALS: A351-CF8M, A351-CF3M, A182-F316

VALVE CLASS	150	300	400	600	900	1500	2500
TEMPERATURE IN °F							
WORKING PRESSURES IN PSI							
- 20 TO 100	275	720	960	1440	2160	3600	6000
200	240	620	825	1240	1660	3095	5160
300	215	560	745	1120	1680	2795	4660
400	195	515	685	1030	1540	2570	4280
500	170	480	635	955	1435	2390	3980
600	140	450	600	905	1355	2255	3760
650	125	445	590	890	1330	2220	3700
700	110	430	575	865	1295	2160	3600
750	95	425	565	845	1270	2110	3520
800	80	415	555	830	1245	2075	3460
850	65	405	540	810	1215	2030	3320
900	50	395	525	790	1180	1970	3280
950	30	385	515	775	1160	1930	3220
1000	20	365	485	725	1090	1820	3030
1050	20	360	480	720	1080	1800	3000
1100	20	325	430	645	965	1610	2685
1150	20	275	365	550	825	1370	2285
1200	20	205	275	410	620	1030	1715
1250	20	180	245	365	545	910	1515
1300	20	140	185	275	410	685	1145
1350	20	105	140	205	310	515	860
1400	20	75	100	150	225	380	630
1450	20	60	80	115	175	290	485
1500	10	40	55	85	125	205	345
HYDROSTATIC TEST PRESSURES IN POUNDS PER SQUARE INCH GAGE (psig)							
SHELL	425	1100	1250	2175	3250	5400	7725
SEAT	303	792	905	1584	2376	3960	5660

Steel Pipe Flange

ANSI B16.5 Class 150



UNIT: INCH

Nominal Size (In Inches)	A	B	C	D	E	Bolt	
						NUMBER	DIAM.
1/2	3.50	2.38	1.38	0.44	0.62	4	0.50
3/4	3.88	2.75	1.69	0.50(0.44)	0.62	4	0.50
1	4.25	3.12	2.00	0.56(0.44)	0.62	4	0.50
1 1/2	5.00	3.88	2.88	0.69(0.56)	0.62	4	0.50
2	6.00	4.75	3.62	0.75(0.62)	0.75	4	0.63
2 1/2	7.00	5.50	4.12	0.88(0.69)	0.75	4	0.63
3	7.50	6.00	5.00	0.94(0.75)	0.75	4	0.63
4	9.00	7.50	6.19	0.94	0.75	8	0.63
5	10.00	8.50	7.31	0.94	0.88	8	0.75
6	11.00	9.50	8.50	1.00	0.88	8	0.75
8	13.50	11.75	10.62	1.12	0.88	8	0.75
10	16.00	14.25	12.75	1.19	1.00	12	0.88
12	19.00	17.00	15.00	1.25	1.00	12	0.88
14	21.00	18.75	16.25	1.38	1.12	12	1.00
16	23.50	21.25	18.50	1.44	1.12	16	1.00
18	25.00	22.75	21.00	1.56	1.25	16	1.13
20	27.50	25.00	23.00	1.69	1.25	20	1.13
24	32.00	29.50	27.25	1.88	1.38	20	1.25

Includes 1/16 raised face.

Dimensions in () are for valve flanges.

UNIT: MM

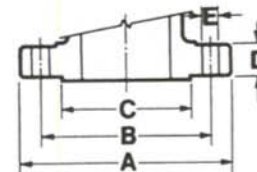
Nominal Size (In Inches)	A	B	C	D	E	Bolt	
						NUMBER	DIAM.
1/2	88.9	60.5	35.1	11.2	15.8	4	1/2
3/4	98.6	69.9	42.9	12.7(11.2)	15.8	4	1/2
1	108.0	79.2	50.8	14.3(11.2)	15.8	4	1/2
1 1/2	127.0	98.6	73.2	17.6(14.3)	15.8	4	1/2
2	152.4	120.7	91.9	19.1(15.8)	19.1	4	5/8
2 1/2	177.8	139.7	104.6	22.4(17.6)	19.1	4	5/8
3	190.5	152.4	127.0	23.9(19.1)	19.1	4	5/8
4	228.6	190.5	157.2	23.9	19.1	8	5/8
5	254.0	215.9	185.7	23.9	22.4	8	3/4
6	279.4	241.3	215.9	25.4	22.4	8	3/4
8	342.9	298.5	269.7	28.5	22.4	8	3/4
10	406.4	362.0	323.9	30.3	25.4	12	7/8
12	482.6	431.8	381.0	31.8	25.4	12	7/8
14	553.4	476.3	412.8	35.1	28.4	12	1
16	596.9	539.8	469.9	36.6	28.4	16	1
18	635.0	577.9	533.4	39.7	31.8	16	1 1/8
20	698.5	635.0	584.2	43.0	31.8	20	1 1/8
24	812.8	749.3	692.2	47.8	35.1	20	1 1/4

Includes 1/16 raised face.

Dimensions in () are for valve flanges.

Steel Pipe Flange

ANSI B16.5 Class 300



UNIT: INCH

Nominal Size (In Inches)	A	B	C	D	E	Bolt	
						NUMBER	DIAM.
1/2	3.75	2.62	1.38	0.56	0.62	4	0.50
3/4	4.62	3.25	1.69	0.62	0.75	4	0.63
1	4.88	3.50	2.00	0.69	0.75	4	0.63
1 1/2	6.12	4.50	2.88	0.81	0.88	4	0.75
2	6.50	5.00	3.62	0.88	0.75	8	0.63
2 1/2	7.50	5.88	4.12	1.00	0.88	8	0.75
3	8.25	6.62	4.00	1.12	0.88	8	0.75
4	10.00	7.88	6.19	1.25	0.88	8	0.75
5	11.00	9.25	7.31	1.38	0.88	8	0.75
6	12.50	10.62	8.50	1.44	0.88	12	0.75
8	15.00	13.00	10.62	1.62	1.00	12	0.88
10	17.50	15.25	12.75	1.88	1.12	16	1.00
12	20.50	17.75	15.00	2.00	1.25	16	1.13
14	23.00	20.25	16.25	2.12	1.25	20	1.13
16	25.50	22.50	18.50	2.25	1.38	20	1.25
18	28.00	24.75	21.00	2.38	1.38	24	1.25
20	30.50	27.00	23.00	2.50	1.38	24	1.25
24	36.00	32.00	27.25	2.75	1.62	24	1.50

Includes 1/16 raised face.

UNIT: MM

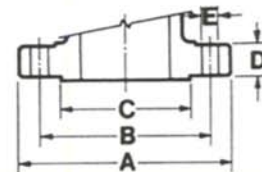
Nominal Size (In Inches)	A	B	C	D	E	Bolt	
						NUMBER	DIAM.
1/2	95.3	66.5	35.1	14.3	15.8	4	1/2
3/4	117.3	82.6	42.9	15.8	19.1	4	5/8
1	124.0	88.9	50.8	17.6	19.1	4	5/8
1 1/2	155.4	114.3	73.2	20.6	22.4	4	3/4
2	165.1	127.0	91.9	22.4	19.1	8	5/8
2 1/2	190.5	149.4	104.6	25.4	22.4	8	3/4
3	209.6	168.1	127.0	28.5	22.4	8	3/4
4	254.0	200.2	157.2	31.8	22.4	8	3/4
5	279.4	235.0	185.7	35.1	22.4	8	3/4
6	317.5	269.7	215.9	36.6	22.4	12	3/4
8	381.0	330.2	269.7	41.2	25.4	12	7/8
10	444.5	387.4	323.9	47.8	28.4	16	1
12	520.7	450.9	381.0	50.8	31.8	16	1 1/8
14	584.2	514.4	412.8	53.9	31.8	20	1 1/8
16	647.7	571.5	469.9	57.2	35.1	20	1 1/4
18	711.2	628.7	533.4	60.5	35.1	24	1 1/4
20	774.7	685.8	584.2	63.5	35.1	24	1 1/4
24	914.4	812.8	692.2	69.9	41.2	24	1 1/2

Includes 1/16 raised face.

"This information is furnished as a convenience to the users of this catalog however governing standards and codes of current edition should be the official sources for this information."

Steel Pipe Flange

ANSI B16.5 Class 600



UNIT: INCH

Nominal Size (In Inches)	A	B	C	D	E	Bolt	
						NUMBER	DIAM.
1/2	3.75	2.62	1.75	0.56	0.62	4	0.50
3/4	4.62	3.25	2.06	0.62	0.75	4	0.63
1	4.88	3.50	2.25	0.69	0.75	4	0.63
1 1/2	6.12	4.50	2.88	0.88	0.88	4	.075
2	6.50	5.00	3.62	1.00	0.75	8	0.63
2 1/2	7.50	5.88	4.12	1.12	0.88	8	0.75
3	8.25	6.62	5.00	1.25	0.88	8	0.75
4	10.75	8.50	6.19	1.50	1.00	8	0.88
5	13.00	10.50	7.31	1.75	1.12	8	1.00
6	14.00	11.50	8.50	1.88	1.12	12	1.00
8	16.50	13.75	10.62	2.19	1.25	12	1.13
10	20.00	17.00	12.75	2.50	1.38	16	1.25
12	22.00	19.25	15.00	2.62	1.38	20	1.25
14	23.75	20.75	16.25	2.75	1.50	20	1.38
16	27.00	23.75	18.50	3.00	1.62	20	1.50
18	29.25	25.75	21.00	3.25	1.75	20	1.63
20	32.00	28.50	23.00	3.50	1.75	24	1.63
24	37.00	33.00	27.25	4.00	2.00	24	1.88

1/2 raised face not included

UNIT: MM

Nominal Size (In Inches)	A	B	C	D	E	Bolt	
						NUMBER	DIAM.
1/2	95.3	66.5	44.5	14.3	15.8	4	1/2
3/4	117.3	82.6	52.3	15.8	19.1	4	5/8
1	124.0	88.9	57.2	17.6	19.1	4	5/8
1 1/2	115.4	114.3	73.2	22.4	22.4	4	3/4
2	165.1	127.0	91.9	25.4	19.1	8	5/8
2 1/2	190.5	149.4	104.6	28.5	22.4	8	3/4
3	209.6	168.1	127.0	31.8	22.4	8	3/4
4	273.1	215.9	157.2	38.1	25.4	8	7/8
5	330.2	266.7	185.7	44.5	28.4	8	1
6	355.6	292.1	215.9	47.8	28.4	12	1
8	419.1	349.3	269.7	55.7	31.8	12	1 1/8
10	508.0	431.8	323.9	63.5	35.1	16	1 1/4
12	558.8	489.0	381.0	66.6	35.1	20	1 1/4
14	603.3	527.1	412.8	69.9	38.1	20	1 3/8
16	685.8	603.3	469.9	76.2	41.2	20	1 1/2
18	743.0	654.1	533.4	82.6	44.5	20	1 5/8
20	812.8	723.9	584.2	88.9	44.5	24	1 5/8
24	939.8	838.2	692.2	101.6	50.8	24	1 7/8

6/4 raised face not Included

Valve Inside Diameter Dimension

UNIT: INCH

NOMINAL Pipe Size	FULL BORE						REDUCED BORE
	150#	300#	600#	900#	1500#	2500#	150#, 300#, 600#
1/2	0.50	0.50	0.50	0.50	0.50	0.44	0.38
3/4	0.75	0.75	0.75	0.69	0.69	0.56	0.50
1	1.00	1.00	1.00	0.87	0.87	0.75	0.67
1 1/4	1.25	1.25	1.25	1.12	1.12	1.00	0.94
1 1/2	1.50	1.50	1.50	1.37	1.37	1.12	1.18
2	2.00	2.00	2.00	1.87	1.87	1.50	1.44
2 1/2	2.50	2.50	2.50	2.25	2.25	1.87	2.00
3	3.00	3.00	3.00	2.87	2.75	2.25	2.28
4	4.00	4.00	4.00	3.87	3.62	2.87	3.00
5	5.00	5.00	5.00	4.75	4.37	3.62	3.75
6	6.00	6.00	6.00	5.75	5.37	4.37	4.38
8	8.00	8.00	7.87	7.50	7.00	5.75	5.63
10	10.00	10.00	9.75	9.37	8.75	7.25	7.38
12	12.00	12.00	11.75	11.12	10.37	8.62	9.50
14	13.25	13.25	12.87	12.25	11.37	9.50	10.50
16	15.25	15.25	14.75	14.00	13.00	10.87	12.00
18	17.25	17.00	16.50	15.75	14.62	12.25	-
20	19.25	19.00	18.25	17.50	16.37	13.50	-
22	21.25	21.00	20.12	19.25	18.00	14.87	-
24	23.25	23.00	22.00	21.00	19.62	16.25	-
26	25.25	25.00	23.75	22.75	21.25	17.62	-
28	27.25	27.00	25.50	24.50	23.00	19.00	-
30	29.25	29.00	27.37	26.25	24.62	20.37	-

UNIT: MM

NOMINAL Pipe Size	FULL BORE						REDUCED BORE
	150#	300#	600#	900#	1500#	2500#	150#, 300#, 600#
1/2	13	13	13	13	13	11	09.5
3/4	19	19	19	17	17	14	12.5
1	25	25	25	22	22	19	17.0
1 1/4	32	32	32	28	28	25	24.0
1 1/2	38	38	38	35	35	28	30.0
2	51	51	51	47	47	38	36.5
2 1/2	64	64	64	57	57	47	51.0
3	76	76	76	73	70	57	58.0
4	102	102	102	98	92	73	76.0
5	127	127	127	121	111	92	95.0
6	152	152	152	146	136	111	111.0
8	203	203	200	190	178	146	144.0
10	254	254	248	238	222	184	187.0
12	305	305	298	282	263	219	241.0
14	337	337	327	311	289	241	267.0
16	387	387	375	356	330	276	305.0
18	438	432	419	400	371	311	-
20	489	483	464	444	416	343	-
22	540	533	511	489	457	378	-
24	591	584	559	533	498	413	-
26	641	635	603	578	540	448	-
28	692	686	648	622	584	483	-
30	743	737	695	667	625	517	-

Valve Weights

GATE VALVES

UNIT: LBS.

GATES

Nominal Size (in inches)	150 lbs.	300 lbs.	600 lbs.
1/2	6.54	12.0	-
3/4	7.24	17.0	-
1	9.66	22.0	-
1 1/2	20.0	35.0	59.0
2	32.0	46.0	86.0
2 1/2	42.0	66.0	141.0
3	53.0	90.0	161.0
4	88.0	134.0	257.0
6	143.0	249.0	475.0
8	222.0	418.0	799.0
10	337.0	451.0	1408.0
12	484.0	946.0	1976.0
14	642.0	1342.0	-
16	770.0	1705.0	-
18	1463.0	-	-
20	1940.0	-	-
24	2495.0	-	-

GLOBE VALVES

UNIT: LBS.

GLOBES

Nominal Size (in inches)	150 lbs.	300 lbs.	600 lbs.
1/2	6.5	12.0	-
3/4	7.0	17.0	-
1	9.0	22.0	-
1 1/2	26.0	40.0	-
2	32.0	51.0	83.0
2 1/2	46.0	77.0	125.0
3	68.0	120.0	142.0
4	97.0	147.0	323.0
6	172.0	297.0	726.0
8	277.0	508.0	1118.0
10	429.0	-	1795.0
12	647.0	-	2504.0
14	-	-	-
16	-	-	-
18	-	-	-
20	-	-	-
24	-	-	-

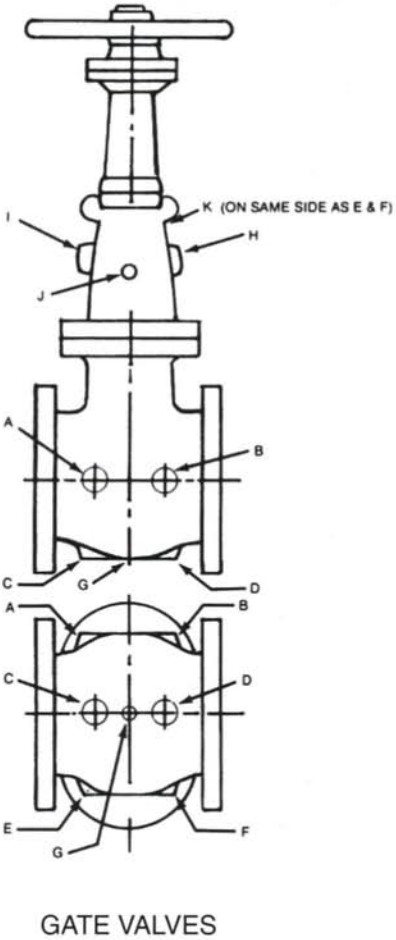
CHECK VALVES

UNIT: LBS.

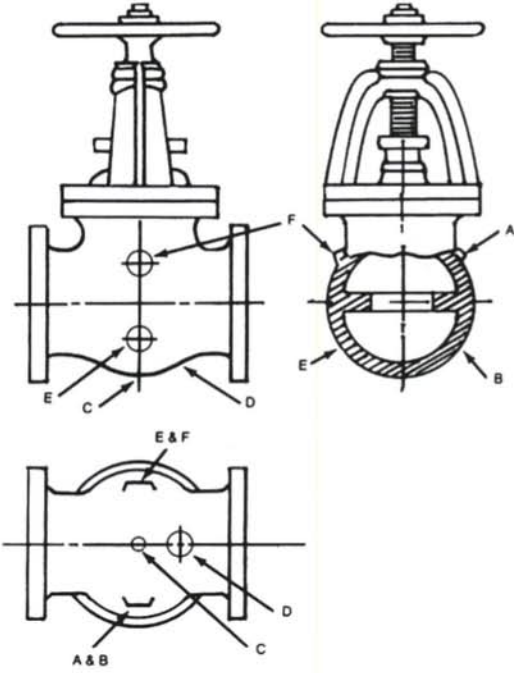
CHECKS

Nominal Size (in inches)	150 lbs.	300 lbs.	600 lbs.
1/2	4.4	11.0	-
3/4	6.2	15.0	-
1	7.0	24.0	-
1 1/2	15.0	29.0	-
2	24.0	35.0	62.0
2 1/2	33.0	53.0	99.0
3	46.0	75.0	180.0
4	73.0	117.0	222.0
6	134.0	222.0	449.0
8	233.0	337.0	704.0
10	343.0	552.0	1177.0
12	504.0	834.0	1595.0
14	642.0	-	-
16	1247.0	-	-
18	1555.0	-	-
20	2200.0	-	-
24	2677.0	-	-

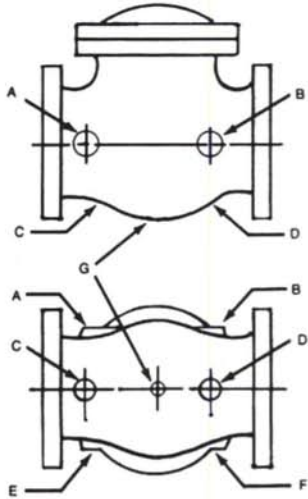
By-Pass & Drains



GATE VALVES



GLOBE VALVES



CHECK VALVES

VALVE SIZE	2"-4"	5"-8"	10"-24"
DRAIN AND BY-PASS SIZE	1/2"	3/4"	1"

Table of Temperature Conversion

C	F	C	F	C	F	C	F	C	F	C	F	C	F		
-273	-459.4			-17.2	1	33.8	16.1	61	141.8	149	300	572	482	900	1652
-268	-450			-16.7	2	35.6	16.7	62	143.6	154	310	590	488	910	1670
-262	-440			-16.1	3	37.4	17.2	63	145.4	160	320	608	493	920	1688
-257	-430			-15.6	4	39.2	17.8	64	147.2	166	330	626	499	930	1706
-251	-420			-15.0	5	41.0	18.3	65	149.0	171	340	644	504	940	1724
-246	-410			-14.4	6	42.8	18.9	66	150.8	177	350	662	510	950	1742
-240	-400			-13.9	7	44.6	19.4	67	152.6	182	360	680	516	960	1760
-234	-390			-13.3	8	46.4	20.0	68	154.4	188	370	698	521	970	1778
-229	-380			-12.8	9	48.2	20.6	69	156.2	193	380	716	526	980	1796
-223	-370			-12.2	10	50.0	21.1	70	158.0	199	390	734	532	990	1814
-218	-360			-11.7	11	51.8	21.7	71	159.8	204	400	752	538	1000	1832
-212	-350			-11.1	12	53.6	22.2	72	161.6	210	410	770	549	1010	1868
-207	-340			-10.6	13	55.4	22.8	73	163.4	216	420	788	560	1040	1904
-201	-330			-10.0	14	57.2	23.3	74	165.2	221	430	806	571	1060	1940
-196	-320			-9.4	15	59.0	23.9	75	167.0	227	440	844	582	1080	1976
-190	-310			-8.9	16	60.8	24.4	76	168.8	232	450	842	593	1100	2012
-184	-300			-8.3	17	62.6	25.0	77	170.6	238	460	860	604	1120	2048
-179	-290			-7.8	18	64.4	25.6	78	172.4	243	470	878	616	1140	2084
-173	-280			-7.2	19	66.2	26.1	79	174.2	249	480	896	627	1160	2120
-169	-273	-459.4		-6.7	20	68.0	26.7	80	176.0	254	490	914	638	1180	2156
-168	-270	-454		-6.1	21	69.8	27.2	81	177.8	260	500	932	649	1200	2192
-162	-260	-436		-5.6	22	71.6	27.8	82	179.6	266	510	950	660	1220	2228
-157	-250	-418		-5.0	23	73.4	28.3	83	181.4	271	520	968	671	1240	2264
-151	-240	-400		-4.4	24	75.2	28.9	84	183.2	277	530	986	682	1260	2300
-146	-230	-382		-3.9	25	77.0	29.4	85	185.0	282	540	1004	693	1280	2336
-140	-220	-364		-3.3	25	78.8	30.0	86	185.0	288	550	1022	704	1300	2372
-134	-210	-346		-2.8	27	80.6	30.6	87	186.6	293	560	1040	732	1350	2462
-129	-200	-328		-2.2	28	82.4	31.1	88	190.4	299	570	1058	760	1400	2552
-123	-190	-310		-1.7	29	84.2	31.7	89	192.2	304	580	1076	788	1450	2642
-118	-180	-292		-1.1	30	86.0	32.2	90	194.0	310	590	1094	816	1500	2732
-112	-170	-274		-0.6	31	87.8	32.8	91	195.8	316	600	1112	843	1550	2822
-107	-160	-256		0.0	32	89.6	33.3	92	197.6	321	610	1130	871	1600	2912
-101	-150	-238		0.6	33	91.4	33.9	93	199.4	327	620	1148	899	1650	3002
-96	-140	-220		1.1	34	93.2	34.4	94	201.2	331	630	1166	927	1700	3092
-90	-130	-202		1.7	35	95.0	35.0	95	203.0	338	640	1184	954	1750	3182
-84	-120	-184		2.2	36	96.8	35.6	96	204.8	343	650	1202	982	1800	3272
-79	-110	-166		2.8	37	98.6	36.1	97	206.6	349	660	1220	1010	1850	3362
-73	-100	-148		3.3	38	100.4	36.7	98	208.4	354	670	1238	1038	1900	3452
-68	-90	-130		3.9	39	102.2	37.2	99	210.2	360	680	1256	1066	1950	3542
-62	-80	-112		4.4	40	104.0	37.8	100	212.0	366	690	1274	1093	2000	3632
-57	-70	-94		5.0	41	105.8	43	110	230	371	700	1292	1121	2050	3722
-51	-60	-76		5.6	42	107.6	49	120	248	377	710	1310	1149	2100	3812
-46	-50	-58		6.1	43	109.4	54	130	266	382	720	1328	1177	2150	3902
-40	-40	-40		6.7	44	111.2	60	140	284	388	730	1346	1204	2200	3992
-34	-30	-22		7.2	45	113.0	66	150	302	393	740	1364	1232	2250	4082
-29	-20	-4		7.8	46	114.8	71	160	320	399	750	1382	1260	2300	4172
-23	-10	14		8.3	47	116.6	77	170	338	404	760	1400	1288	2350	4262
-17.8	-0	32		8.9	48	118.4	82	180	356	410	770	1418	1316	2400	4352
				9.4	49	120.2	88	190	374	416	780	1436	1343	2450	4442
				10.0	50	122.0	93	200	392	421	790	1454	1371	2500	4532
				10.6	51	123.8	99	210	410	427	800	1472	1399	2550	4622
				11.1	52	125.6	100	212	414	432	810	1490	1427	2600	4712
				11.7	53	127.4	104	220	428	438	820	1508	1454	2650	4802
				12.2	54	129.2	110	230	446	443	830	1526	1482	2700	4892
				12.8	55	131.0	116	240	464	449	840	1544	1510	2750	4982
				13.3	56	132.8	121	250	482	454	850	1562	1538	2800	5072
				13.9	57	134.6	127	260	500	460	860	1580	1566	2850	5162
				14.4	58	136.4	132	270	518	466	870	1598	1593	2900	5252
				15.0	59	138.2	138	280	536	471	880	1616	1621	2950	5342
				15.6	60	140.0	143	290	554	477	890	1634	1649	3000	5432

$$C = \frac{5}{9}(F - 32) \quad F = \frac{9}{5}(C) + 32$$

Comparison List for Casting & Forging

General Classification	Castings			Forging		
	ASTM	JIS	BS	ASTM	JIS	BS
Cast Iron	A126-Class A	G5501-FC20	1452-14	-	-	-
	-Class B	-FC25	-17	-	-	-
	-Class C	-FC30	-20	-	-	-
Malleable	A197	G5702-FCMB28	310-B18/6	-	-	-
	S 47-32510	-FCMB35	-B22/14	-	-	-
	-35018	-FCMB37	-	-	-	-
Ductile Iron	A395	G5502-FCD40	-	-	-	-
	-	-FCD45	-	-	-	-
	A536	-FCD55	-	-	-	-
Carbon Steel	A216-WCA	G5151-SCPH1	-	A105	G3201-SF45	1503-161B
	-	G5101-SC46	1504-161	-	-	-
	A216-WCB	G5151-SCPH2	-B	A105	G3201SF50	1503-161C
	-WCC	-	-	-	-	-
	G5101-SC55	-C	-	-	-	
Carbon-1/2Mo	A217-WC1	G5111-SCA41	1504-240	A182-F1	-	1503-240B
1/2Cr-1/2Mo-1/2Ni	-WC4	-	-	-	-	-
1Cr-1/2Mo-1/2Ni	-WC5	-	-	A182-F12	-	1503-620
11/4-1/2Mo	-WC6	G5111-SCA51	1504-621	-F11	-	-
21/4Cr-1Mo	-WC9	-	-622	-F22	-	1503-622
3Cr-1Mo	-	-	-	-F21	-	-
5Cr-1/2Mo(C 0.15)	-	-	-	-F5	-	-
5Cr-1/2Mo (C 0.25)	A217-C5	G5111-SCA82	1504-625	-F5a	-	1503-625
7Cr-1/2Mo	-	-	-	-F7	-	-
9Cr-1Mo	A217-C12	-	1504-629	-F9	-	-
Carbon Steel for Low Temp.	A352-LCB	-	4242-GRA	A350-LF1	-	-
Carbon-Si	-	-	-	-LF2	-	-
Carbon-1Mo for Low Temp	A352-LC1	-	-	-	-	-
21/2Ni	-LC2	-	-	-	-	-
31/2Ni	-LC3	-	-	A350-LF3	-	-
Cr-Ni-Cu-Al	-	-	-	-LF4	-	-
13Cr	A217-CA15	G5121-SCS1	-	A182-F6	G4303-SUS51B	1503-713
18Cr-8Ni(C 0.03)	A351-CF3	-	-	-F304L	-SUS28B	-
18Cr-8Ni(C 0.08)	-CF8	GS5121-SCS13	-	-F304	-SUS27B	1503-801
18Cr-8Ni(C 0.10)	-	-	1504-801	-F304H	-	-
18Cr-8Ni-2Mo(C 0.03)	A351-CF3M	G5121-SCS16	-	-F316L	G4303-SUS33B	-
18Cr-8Ni-2Mo(C 0.08)	-CF8M	-SCS14	1632-GRC	-F316	-SUS32B	1503-845B
18Cr-8Ni-2Mo(C 0.10)	-	-	-	-316H	-	-
18Cr-8Ni-Ti (C 0.08)	-	-	-	-F321	G4303-SUS29B	-
18Cr-8Ni-Ti(C 0.10)	-	-	1504-821Ti	-	-F321H	-1503-821Ti
18Cr-8Ni-Cb(0.08)	A351-CF8C	-	-	-F347	G4303-SUS43B	-821Nb
18Cr-8Ni-Cb(0.10)	-	-	1504-821Nb	-F347H	-	-
18Cr-8Ni-Ta-Cb(0.08)	-	-	-	-F348	-	-
18Cr-8Ni-Ta-Cb(C 0.10)	-	-	-	-348H	-	-
25Cr-20Ni (C 0.15)	-	-	-	-F310	-	-
22Cr-12Ni(C 0.08)	A351-CH18	-	-	-	-	-
22Cr-12Ni(C 0.10)	-CH10	-	-	-	-	-
22Cr-12Ni(C 0.20)	-CH20	-	-	-	-	-
23Cr-19Ni(C 0.20)	-CK20	-	-	-	-	-
23Cr-19Ni(C 0.35)	-HK30	-	-	-	-	-
23Cr-19Ni(C 0.45)	-HK40	-	-	-	-	-
13Cr-33Ni-Mo(C 0.35)	-HT30	-	-	-	-	-
15Cr-13Ni-2Mo-Cb(C 0.10)	CF10MC	-	-	-	-	-
19Cr-27Ni-2Mo-3Cu(C 0.07)	-CN7M	-	-	-	-	-
8Cr-20Ni(C 0.20)	-	-	-	A182-F10	-	-
HASTELLOY, B	A494-N-12MV	-	-	-	-	-

$$C = \frac{5}{9}(F-32) \quad F = \frac{9}{5}(C)+32$$

Chemical & Physical Properties

CASTING MATERIALS

CHEMICAL PROPERTIES

	Carbon Steel	CA-15	High Temp.	High Temp	304-S.S.	316-S.S.	HASTELLOY-B	304L-S.S.	316L-S.S.	Low Temp.	HIGH	LOW
ASTM Std	A-216	A-217	A-217	A-217	A-351	A-351	A-494	A-351	A-351	A-352	A-217	A-217
Grade	WCB	CA-15	WC6	WC9	CF8	CF8M	N-12MV	CF3	CF3M	LCB	C-5	C-12
C%Max.	0.30	0.15	0.20	0.18	0.08	0.08	0.12	0.03	0.03	0.30	0.20	0.020
Mn %	1.00Max.	1.00	0.50-0.80	0.40-0.70	1.50	1.50	1.00	1.50	1.50	1.00	0.40-0.70	0.35-0.65
P% Max.	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04
S% Max.	0.045	0.040	.045	0.045	0.04	0.04	0.030	0.04	0.04	0.06	0.045	0.045
Ni %	0.50	1.00	-	-	8.00	9.00	Bal	8.00-12.0	9.00-130	-	-	-
Cr%	0.40	11.5-14.0	1.00-1.50	2.00-2.75	18.0-21.0	18.0-21.0	1.00	178.0-21.0	17.0-21.0	-	4.0-6.50	8.00-10.00
Mo%	0.25	-	0.45-0.65	0.90-1.20	-	2.00-3.00	26.0-30.0	-	2.00-3.00	-	0.45-0.65	0.90-1.20
Cu	0.0	-	-	-	-	-	-	-	-	-	-	-
Si	0.30	1.50	0.60	0.60	2.00	2.00	1.00	2.00	1.50	0.60	0.75	1.00
Fe	-	-	-	-	-	-	4.0-6.0	-	-	-	-	-
V	-	-	-	-	-	-	0.20-0.60	-	-	-	-	-

PHYSICAL PROPERTIES

Tensile Strength Min. Kis MPa	70 485	90-115 621-793	70 485	70 485	70 485	70 485	76 525	70 485	70 485	65 450	90-115 621-793	90-115 621-793
Yield Point Min. Kis MPS	30 205	65 448	40 275	40 275	28 195	30 205	40 275	30 205	30 205	35 240	60 414	60 414
Elongation in 2 inch (50 mm) % Min	22	18	20	20	35	30	6	35	30	24	18	18
Reduction of Area % Min	35	30	35	35	-	-	-	-	-	35	35	35

WROUGHT MATERIALS

CHEMICAL PROPERTIES

	11-13% Cr	Ductile	Carbon Steel	B-8F	321-S.S.	304-S.S.	316-S.S.	304L-S.S.	316L-S.S.	Hard Facing	Bolts	Nuts
ASTM Std	A-182	A-439	ASTM	A-320	A-182	A-182	A-182	A-182	A-182	KLS	A-193	A-194
Grade	F6a	D2C	A-105	B-8F	F-321	F-304	F-316	F304L	F316L	HF-6R	B-7	2H
C% Max	0.15	0.29	0.22-0.35	0.15	0.08	0.08	0.08	0.035	0.035	1.05	0.38-0.48	0.40
Si% Max	1.00	1.00-3.00	0.35	1.00	1.00	1.00	1.00	1.00	1.11	0.15-0.35	-	-
Mn% Max.	1.00	1.80-2.40	0.60-1.05	2.00	2.00	2.00	2.00	2.00	2.00	-	0.75-1.00	-
P% Max.	0.04	0.08	0.04	0.20	0.30	0.04	0.04	0.040	0.040	-	0.04	0.04
S% Max.	0.03	-	0.05	0.150-0.350	0.030	0.03	0.03	0.030	-	0.04	0.05	-
Ni%	0.50	21.0-24.0	-	8.00-10.00	9.00-12.00	8.0-11.0	10.0-14.0	8.00-13.00	10.00-15.00	-	-	-
Cr%	11.5-14.5	0.50	-	17.00-19.00	17.00Min.	18.0-20.00	16.0-18.0	18.00-20.00	16.00-18.00	28.3	0.80-1.10	-
Mo%	-	-	-	-	-	-	2.00-3.00	-	2.00-3.00	-	0.15-.025	-
Ti%	-	-	-	-	C%x5-0.60	-	-	-	-	-	-	-
Fe%	Bal.	-	-	-	-	-	-	-	-	0.30	Bal.	Bal.
W%	-	-	-	-	-	-	-	-	-	4.20	-	-
Co%	-	-	-	-	-	-	-	-	-	Bal	-	-

PHYSICAL PROPERTIES

Tensile Strength Min. Kis MPa	85 386	58 400	70 483	75 517	75 517	75 517	75 517	70 483	70 483	-	125 862	175 -
Yield Point Min. Kis MPa	55 379	28 193	36 248	30 207	30 207	30 207	30 207	25 172	25 172	-	105 724	-
Elongation in 2 inch (50 mm) % Min.	18	20	22	35	45	30	30	30	30	-	16	-
Reduction of Area % Min.	35	45	30	50	50	50	50	50	50	-	50	-



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