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TECHNICAL DATASHEET

CRANE® - Cast Steel Valves

CRANE

Energy Flow Solutions

www.craneenergy.com

CRANE

Index

Crane also manufactures bronze ball valves, iron wafer and lug butterfly valves, bronze and iron gate globe and check valves, and alloy valves. Brochures and catalogs are available on request.

Figure Number Index

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How to Specify and Order the Correct Valves

Care should be taken to select the most suitable steel valve for your service(s). Exact specification of each valve should be made to avoid ambiguity when requesting quotations or ordering the product.

Size

Nominal size of the pipeline into which the valve will be placed must be determined. Comprehensive data on flow characteristic and pipe properties are contained in the Engineering Data Catalog.

Valve Material

The following facts should be considered in determining the correct valve material.

- The media to be controlled.
- The temperature of the media.
- The possible extraordinary stresses affecting the valve.
- Safety standards and/or piping codes.

Type of Valve

A few minutes spent in reading some simple valve facts on pages 4 will prove helpful.

Pressure/Temperature Rating

Please pay careful attention that the PRESSURE/TEMPERATURE RATINGS shown on pages 31-33 in this catalog are in keeping with the requirements of the service.

Valve End Connections

Considerations as to pipeline integrity, future maintenance, corrosion factors, field assembly, weight and safety should be given in determining the method of connecting the valve in the pipeline.

CAUTION: When servicing, disassembling or disposing of valves containing asbestos gaskets or packing, avoid breathing dust or fibers from these parts. Disposal of asbestos and asbestos related products should comply with local, state and federal laws and regulations.

Ordering Information

Designate the valve size and the complete catalog number, including prefix and suffix letters, when applicable, to identify regular cataloged items as described on the following pages.

Any special requirements such as Gear operation, Motor operation, Hydraulic or Pneumatic Cylinder operation, Anti-friction bearing yoke sleeve, By-Pass of drain, etc. must also be specified on purchase orders.

Examples

8" 33½ XU F 9 BP

- BP — Suffix denoting basic valve material – Page 4
- 9 — Suffix denoting basic valve material – Page 4
- F — Suffix denoting flexible disc
- XU — Suffix denoting trim material – Page 4
- 33½ — Basic catalog number defined on data pages
- 8" — Valve size

NOTE: In keeping with our policy of continuous product improvement, we reserve the right to institute changes in design, material, dimensions, and specifications without notice and without incurring any obligation to make such changes and modifications on the product previously or subsequently sold.

CRANE

Materials of Construction

Steel bolted bonnet valves described in this catalog are typically manufactured of carbon steel. When specified, the valves are available in the alloys shown below which are suitable for steam, water, oil, oil vapor, gas and general services. Please contact factory or customer service for availability and material breakdowns.

Body and Bonnet or Cap Materials

Part No. Suffix	ASTM Classification	Material Classification	Service Conditions
None	A216 WCB	Carbon Steel	For service up to 800°F (426°C) where corrosion and oxidation are not a factor. (1) (4) (5)
6	A217 WC6	1 ¼ CR, ½ Mo	For service up to 1000°F (537°C). (2) (3) (4) (5)
9	A217 WC9	2 ¼ CR, 1 Mo	For service up to 1100°F (593°C) where good creep strength is required. (2) (3) (4) (5)
5	A217 C5	5% CR, ½ Mo	For service up to 1200°F (649°C). Best corrosion and oxidation resistance plus high creep strength are required. (2)
12	A217 C12	9% CR, 1 Mo	For service up to 1200°F (649°C). Best corrosion and oxidation resistance than other grades. (2)
2	A352 LCC	Low Carbon Steel	For service from –20°F to 650°F (-33°C to 343°C). This material must be quenched and tempered to obtain tensile and impact properties needed at subzero temperatures.
8M	A351 CF8M	Stainless Steel (316)	For services up to 1000°F (537°C), where corrosion and oxidation resistance are desired.
8	A351 CF8	Stainless Steel (304)	For services up to 1000°F (537°C), where corrosion and oxidation resistance are desired, but lower costs then CF8M and slightly lower material strengths and corrosion resistance can be tolerated.

(1) Upon prolonged exposure to temperatures above 800°F (426°C), the carbide phase of carbon steel may be converted to graphite. Permissible, but not recommended for prolonged usage above 800°F (426°C).
(2) Flanged end valves rated to 1000°F (537°C).
(3) Considerations should be given to the possibility of excessive oxidation (scaling) when used above 1050°F (565°C).
(4) Product used within the jurisdiction of Section 1 Power Boilers of the ASME Boiler and Pressure Vessel code is subject to the same temperature limitations as specified in that document.
(5) Product used within the jurisdiction of Power Piping, ASME Code for Pressure Piping B31.1, is subject to the same maximum temperature limitations placed upon the material in paragraph 124.2.

Trim Material

Part No. Suffix	API Trim Number	Nominal Trim	Seating Surfaces	Stem Material	Temperature
X	1	F6 / F6 (1)	13 Cr ASTM A217 (CA15)	13 Cr (410)	1100°F (593°C)
UF*	5	HF / HF (2)	CoCra	13 Cr (410)	1200°F (649°C)
A	9	NiCu Alloy / NiCu Alloy	NiCu Alloy	NiCu Alloy	450°F (232°C)
L	10	316 / 316 (3)	316 SS	316 SS	850°F (454°C)
XUF*	8	F6 / HF (1) (2)	13 Cr ASTM A217 (CA 215) CoCra	13 Cr (410)	1100°F (593°C)
AUF*	11	NiCu Alloy / HF (2)	NiCu Alloy CoCra	NiCu Alloy	450°F (232°C)
LUF*	12	316 / HF (3) (2)	316 SS CoCra	316 SS	850°F (454°C)

(1) 13% Chromium AISI Type 410 Stainless Steel.
(2) Hard Facing CoCra is weld deposited Cobalt base alloy.
(3) Austenitic Stainless Steel is a Ni-Cr-Mo stainless steel in the AISI Type 316 category.

*F denotes Flex Wedge (only applies to Gate Valves).

Valve Modification Suffix Identification

S.I.	Description	S.I.	Description	S.I.	Description	S.I.	Description	
TD	Drain, Drill and Tap	ST	Special Trim	SP	Special Paint	OV	(1) Gear	(4) Pneumatic
BP	Bypass	BW	Special Butt-Weld End Prep	LD	Locking Device		(2) Chainwheel	(5) Hydraulic
PG	Special Packing and/or Gasket	RJ	Ring Joint	LR	Lantern Ring		(3) Electric	(6) Other

NiCu alloy commonly referred to as Monel® a registered trademark of Special Metals Corporation.

Installation, Marking and Identification

When purchasing valves, reference should also be made to MSS SP92 "Valve Users Guide." Inquiries relating specifically to Crane products may be referred to our factory or customer service department.

Marking and identification of Crane steel valves conforms to ASME B16.34 and MSS SP-25.

It is important to properly identify valves in service to allow for the ordering of replacement parts or address questions or concerns relating to our products. Body markings and information shown on the identification plate helps to properly identify valves, allowing timely and accurate responses to such inquiries.

Integrally cast body marking data includes the following information and helps to provide traceability:

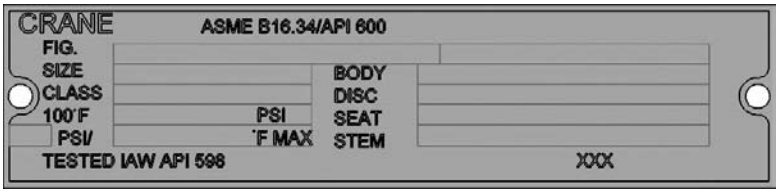
- Crane logo
- Pressure class
- Valve size
- "Steel" symbol for the grade of material (i.e., WCB for carbon steel)
- Heat number – on body and bonnet (cast or stamped)
- Individual serialization

The body markings are supplemented by an identification plate which, depending on valve type and size, is mounted in the most practicable position. Tag location for gate and globe valves is typically on the valve yoke or body/bonnet flange. Check valve tags are typically mounted on the rim of the cap.

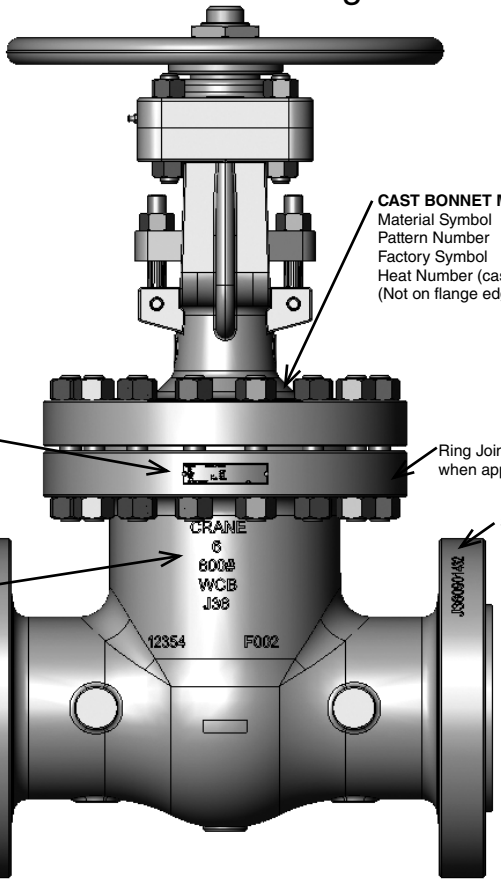
Identification plates bear the following information:

- Catalog number
- Valve size
- Body material
- Disc material
- Stem material
- Seat and trim material
- Pressure and temperature rating

I.D. Tag Marking Information



Product Marking



CAST BONNET MARKING:
Material Symbol
Pattern Number
Factory Symbol
Heat Number (cast or stamped)
(Not on flange edge unless recessed.)

ID TAG

Ring Joint Number (stamped) when applicable

Serial Number (stamped)

CAST BODY MARKING:
CRANE

Size	2, 2½, 3, 4...
Class	150, 300, 600, 900
Material	Material Grade Symbol
Factory ID	Manufacturer's Identification Symbol
Pattern No.	XXXXX (Optional)
Foundry Symbol	YYYY

NOTES:
Cast lettering to be raised Gothic type.
All stamped markings to be low stress.

Overview Class 150, 300 and 600 Gate Valves

Features

Flexible Wedge

- Compensates for deformation of body due to pipe stresses.
- Will not stick when valve is closed hot and allowed to cool.

Welded-in Seat Ring

- Seat ring is seal welded to eliminate leak path.

Standards

These valves comply with the applicable requirements of the following standards:

- API 600
- API 598
- ASME B16.34
- ASME B16.25
- ASME B16.10
- ASME B16.5

Inspection Policy for Crane Valves

Every Crane cast steel valve is subjected to a 100% pressure test according to API 598 requirements. Manufacturer's material test reports and Inspection and Test Certifications are available upon request. Some of the additional inspections and tests performed are:

- Random Radiograph Inspection of Body and Bonnet Castings to ASME B16.34 Appendix B
- Random Chemical Composition and Mechanical Properties Verification of Fasteners to ASTM A-193/A-194
- Liquid Penetrate Inspection of Seat Rings
- Visual Inspection of Casting to MSS SP-55 and MSS SP-112
- Receiving, In-Process, and Final Dimensional Inspections to Relevant Valve Standards

Other inspections or tests can be performed or evaluation criteria applied when specified by the customer.

Notes

- Standard material is ASTM A216 Grade WCB.
- Standard trim is XU (13% Cr to hardface) which is suitable for a wide range of applications.
- Butt weld end dimensions shall be in accordance with ASME B16.25 Figure 2a or Figure 3a (without backing ring) for standard pipe schedules, unless otherwise specified in the purchase order. Butt weld ends shall not be produced from flanged end castings unless specifically authorized in writing by CRANE Energy Flow Solutions.

Class	Schedule
150/300	Standard
600	Extra Strong
900/1500	Schedule 160

- See "Technical Data" section for locations of bypasses, taps and drains.

Class 150 • Outside Screw & Yoke • Flexible Wedge Disc

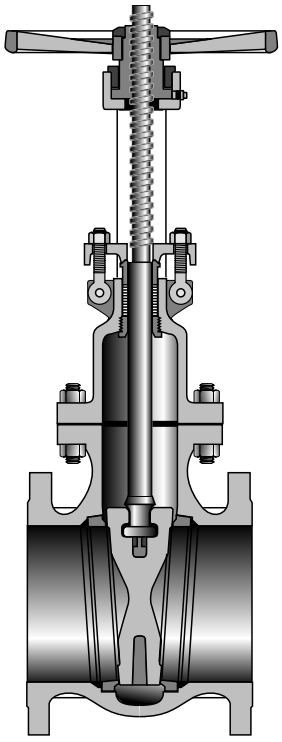
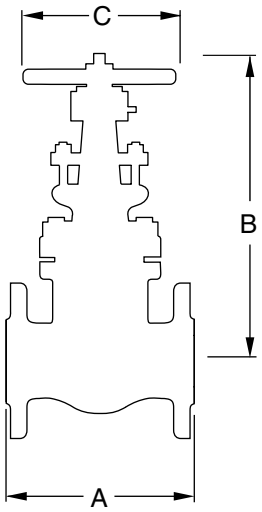


Figure 47
Gate, Flanged

Figure 47½
Gate, Butt Weld

Size Range:
2 through 24 inches
(50 - 600 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
285 psi @ -20°F to 100°F
(20 bar @ -28°C to 37°C)



Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Basic Design	API 600
Testing	API 598

Material of Construction*

Description	Material
Body	WCB
Bonnet	WCB
Seat Rings	Hardfaced
Disc	CA-15 or 13% CR Overlay
Stem	410 SS
Packing	Graphite
Bonnet Gasket	Corrugated Soft Steel or Steel/ Stainless Steel w/Graphite
Back Seat	410 SS
Yoke Sleeve	D2 Ni-Resist
Retaining Nut	Malleable or Steel
Gland	Steel
Gland Flange	Steel
Eye Bolt	Steel
Eye Bolt Nuts	Steel
Pins	Steel
Bonnet Studs	A193 Gr. B7
Bonnet Nuts	A194 Gr. 2H
Handwheel	Malleable, Ductile or Steel
Handwheel Nut	Ductile or Steel
I.D. Tags	SS
I.D. Pins	Steel
Spacer	Steel
Grease Fittings	Steel

NOTES:
*Standard construction: WCB-Trim 8, other options are available. Crane recommends the use of manual or powered gear assistance for sizes 10" and larger.

Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)
A (47)	7.00 (178)	7.50 (191)	8.00 (203)	9.00 (229)	10.50 (267)	11.50 (292)	13.00 (330)	14.00 (356)	15.00 (381)	16.00 (406)	17.00 (432)	18.00 (457)	20.00 (508)
A (47½)	8.50 (216)	9.50 (241)	11.12 (282)	12.00 (305)	15.88 (403)	16.50 (419)	18.00 (457)	19.75 (502)	22.50 (572)	24.00 (610)	26.00 (660)	28.00 (711)	32.00 (813)
B (Open)	17 (432)	17 (432)	19 (483)	23 (584)	31 (787)	39 (990)	47 (1193)	55 (1397)	61 (1549)	71 (1803)	78 (1981)	90 (2286)	99 (2515)
C	8 (203)	8 (203)	9 (229)	10 (254)	12 (305)	14 (356)	16 (406)	18 (457)	22 (559)	24 (610)	25 (635)	27 (686)	30 (762)
Wt. (47)	49 (22)	55 (25)	74 (33)	110 (50)	192 (87)	300 (136)	420 (190)	630 (285)	905 (410)	1260 (571)	1590 (721)	2580 (1170)	3240 (1469)
Wt. (47½)	45 (20)	48 (21)	67 (30)	98 (44)	180 (81)	290 (131)	430 (195)	625 (283)	910 (412)	1260 (571)	1590 (721)	2580 (1170)	3250 (1474)

Class 300 • Outside Screw & Yoke • Flexible Wedge Disc

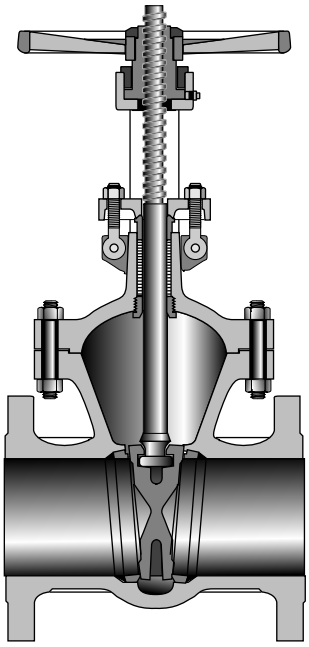


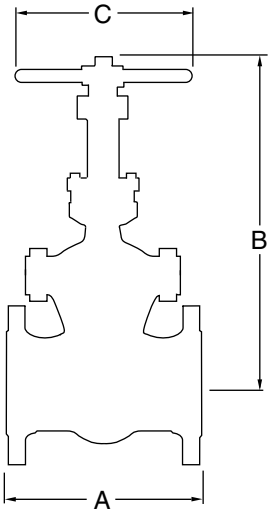
Figure 33
Gate, Flanged

Figure 33½
Gate, Butt Weld

Size Range:

2 through 24 inches
(50 - 600 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
740 psi @ -20°F to 100°F
(51 bar @ -28°C to 37°C)



Material of Construction*

Description	Material
Body	WCB
Bonnet	WCB
Seat Rings	Hardfaced
Disc	CA-15 or 13% CR Overlay
Stem	410 SS
Packing	Graphite
Bonnet Gasket	Stainless Steel spiral wound Graphite
Back Seat	410 SS
Yoke Sleeve	D2 Ni-Resist
Retaining Nut	Malleable or Steel
Gland	Steel
Gland Flange	Steel
Eye Bolt	Steel
Eye Bolt Nuts	Steel
Pins	Steel
Bonnet Studs	A193 Gr. B7
Bonnet Nuts	A194 Gr. 2H
Handwheel	Malleable, Ductile or Steel
Handwheel Nut	Ductile or Steel
I.D. Tags	SS
I.D. Pins	Steel
Spacer	Steel
Grease Fittings	Steel

NOTES:
*Standard construction: WCB-Trim 8, other options are available. Crane recommends the use of manual or powered gear assistance for sizes 8" and larger.

Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Basic Design	API 600
Testing	API 598

Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)
A	8.50 (216)	9.50 (241)	11.12 (282)	12.00 (305)	15.88 (403)	16.50 (419)	18.00 (457)	19.75 (502)	30.00 (762)	33.00 (838)	36.00 (914)	39.00 (990)	45.00 (1143)
B (Open)	18 (457)	18 (457)	21 (533)	24 (609)	33 (838)	42 (1066)	50 (1270)	58 (1473)	62 (1574)	71 (1803)	79 (2006)	85 (2154)	100 (2540)
C	8 (203)	8 (203)	9 (229)	10 (254)	14 (356)	16 (406)	18 (457)	20 (508)	22 (559)	24 (610)	25 (635)	30 (762)	30 (762)
Wt. (33)	69 (31)	77 (34)	112 (50)	165 (74)	310 (140)	500 (226)	760 (344)	1050 (476)	1530 (693)	2380 (1079)	2722 (1234)	3650 (1655)	5115 (2320)
Wt. (33½)	57 (25)	64 (29)	92 (41)	132 (59)	256 (116)	410 (185)	650 (294)	880 (399)	1530 (693)	2380 (1079)	2000 (907)	3370 (1528)	4675 (2120)

Class 600 • Outside Screw & Yoke • Flexible Wedge Disc

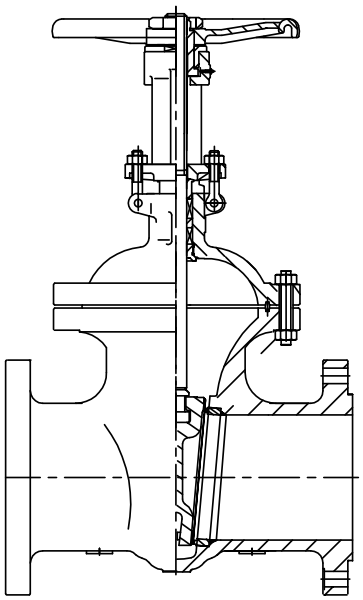


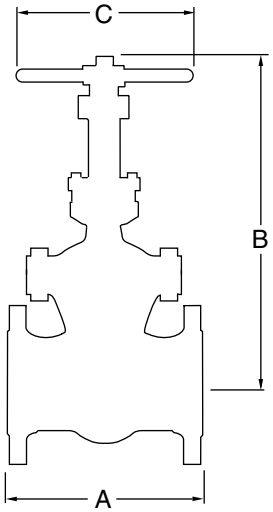
Figure 76
Gate, Flanged

Figure 76½
Gate, Butt Weld

Size Range:

2 through 12 inches
(50 - 300 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
1480 psi @ -20°F to 100°F
(102 bar @ -28°C to 37°C)



Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Basic Design	API 600
Testing	API 598

Material of Construction*

Description	Material
Body	WCB
Bonnet	WCB
Seat Ring	A105 + Hardfaced
Disc	A216 WCB + 13% CR Overlay
Stem	A182 F6A
Packing	Graphite
Bonnet Gasket	Ring Type Soft Iron
Yoke	WCB
Yoke Sleeve	D2 Ni-Resist
Retaining Nut	Carbon Steel
Gland	Steel
Gland Flange	Steel
Eye Bolt	Steel
Eye Bolt Nuts	Steel
Pins	Steel
Bonnet Studs	A193 Gr. B7
Bonnet Nuts	A194 Gr. 2H
Bonnet Bushing	A276 410
Handwheel	Malleable, Ductile or Steel
Handwheel Nut	Carbon Steel
Grease Nipple	Carbon Steel
Yoke Pan Bolt Nuts	A194 Gr. 2H
Yoke Pan Bolts	A193 Gr. B7
Bearing	Steel

NOTES:
*Standard construction: WCB-Trim 8, other options are available. Crane recommends the use of manual or powered gear assistance for sizes 6" and larger.

Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
A	11.50 (292)	13.00 (330)	14.00 (355)	17.00 (431)	22.00 (558)	26.00 (660)	31.00 (787)	33.00 (838)
B (Open)	17 (422)	19 (482)	23 (573)	27 (688)	36 (915)	42 (1068)	51 (1300)	58 (1483)
C	10 (250)	10 (250)	12 (300)	14 (350)	18 (450)	20 (500)	25 (640)	25 (680)
Wt. (76)	99 (45)	121 (55)	167 (76)	280 (127)	611 (277)	1070 (485)	1660 (754)	2063 (936)
Wt. (76½)	85 (38)	110 (49)	167 (75)	280 (127)	610 (276)	1070 (485)	1670 (757)	2070 (938)

NACE Trim Specialty Steel Valves

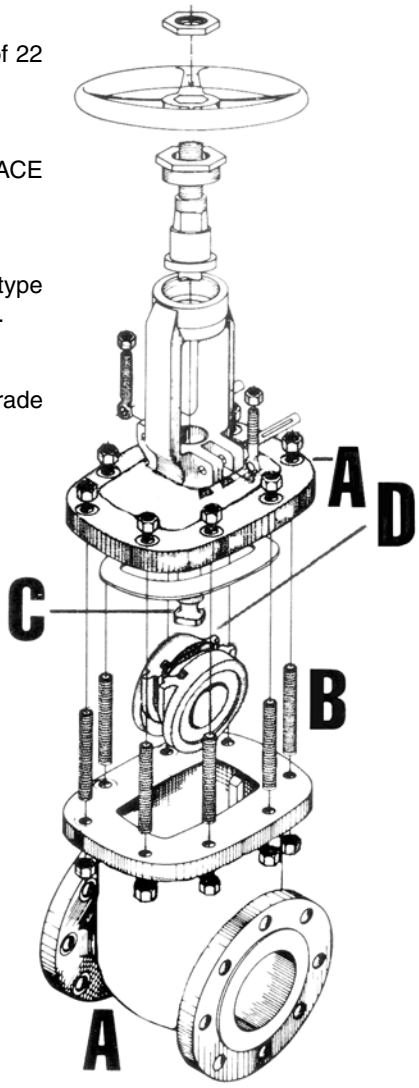
For servicing sour environments of Hydrogen Sulfide (H_2S) bearing hydrocarbons, Crane offers NACE valves made of component materials specially heat-treated and hardness-controlled in compliance with NACE standard MR0103. Typical NACE material configurations are shown below for Crane cast steel gate valves.

A Body & Bonnet – Most NACE requirements for heat treatment and maximum hardness of 22 HRC. Standard material is ASTM A216 Grade WCB.

B Bolting – ASTM A193 Grade B7M bolts and ASTM A194 Grade 2HM nuts meet both NACE Classes I and II.

C Stem – Offering superior resistance to stress corrosion cracking, standard NACE stem is type 316 stainless steel in conformance with NACE hardness and heat treatment requirements.

D Disc – Standard disc is one piece flexible wedge with overlay hardface of ASTM A351 Grade CF8M, type 316 stainless steel in conformance with NACE hardness and heat treatment requirements.



NACE Valves Compared to API 600 Valves			
Valve Parts	**API and Hardness**	**LF Trim NACE**	**LUF Trim NACE**
Body/Bonnet	ASTM A216 Grade WCB	ASTM A216 Grade WCB; ≤22HRC	ASTM A216 Grade WCB; ≤22HRC
Disc – Solid Metal	ASTM A217 Grade CA15; 250 min.	Base metal with trim overlay of ASTM A351 Grade CF8M; ≤22HRC	Base metal with trim overlay of ASTM A351 Grade CF8M; ≤22HRC
Seat Ring	CoCra Overlayed; Overlay ≥350 HB	316L Overlayed; Base Metal ≤22 HRC	CoCra Overlayed; Base Metal ≤22 HRC
Gland	Steel Zinc Plated	Steel Zinc Plated; Base Metal ≤22 HRC	Steel Zinc Plated; Base Metal ≤22 HRC
Stem	13Cr; 200-275 HB	ASTM A182 Grade F316; ≤22HRC	ASTM A182 Grade F316; ≤22HRC
Backseat Bushing	13Cr; 250 HB min.	ASTM 479 Grade T316; ≤22 HRC	ASTM 479 Grade T316; ≤22HRC
Body/Bonnet Studs	ASTM A193 Grade 2H	ASTM A193 Grade B7M	ASTM A193 Grade B7M
Body/Bonnet Nuts	ASTM A194 Grade 2H	ASTM A194 Grade 2HM	ASTM A194 Grade 2HM

Overview Class 150, 300 and 600 Globe Valves

Features

Welded-in Seat Ring

- Seat ring is seal welded to eliminate leak path.

Basic Standards

These valves comply with the applicable requirements of the following standards:

- API 598
- ASME B16.34
- ASME B16.25
- ASME B16.10
- ASME B16.5

Notes

- Standard material is ASTM A216 Grade WCB.
- Standard trim is XU (13% Cr to hardface) which is suitable for a wide range of applications.
- Butt weld end dimensions shall be in accordance with ASME B16.25 Figure 2a or Figure 3a (without backing ring) for standard pipe schedules, unless otherwise specified in the purchase order. Butt weld ends shall not be produced from flanged end castings unless specifically authorized in writing by CRANE Energy Flow Solutions.

Class	Schedule
150/300	Standard
600	Extra Strong
900/1500	Schedule 160

- See "Technical Data" section for locations of bypasses, taps and drains.

Class 150 • Outside Screw & Yoke • Bolted Bonnet

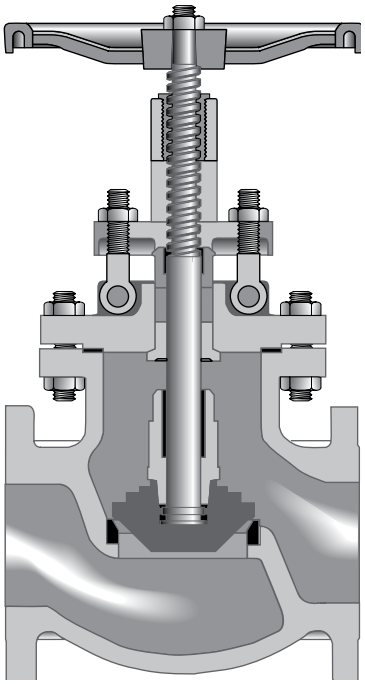
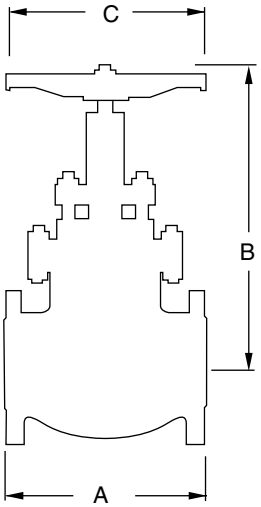


Figure 143
Globe, Flanged

Figure 143½
Globe, Butt Weld

Size Range:
2 through 12 inches
(50 - 300 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
285 psi @ -20°F to 100°F
(20 bar @ -28°C to 37°C)



Material of Construction*

Description	Material
Body	WCB
Bonnet	WCB
Seat Rings	Hardfaced
Disc	13% CR Overlay
Stem	410 SS
Packing	Graphite
Bonnet Gasket	Corrugated Soft Steel or Steel/ Stainless Steel w/Graphite
Back Seat	410 SS
Disc Stem Nut	410 SS
Disc Washer	Carbon Steel
Gland	410 SS
Gland Flange	WCB
Eye Bolt	Steel
Eye Bolt Nuts	A563 Gr. A or O
Pins	_
Bonnet Studs	A193 Gr. B7
Bonnet Nuts	A194 Gr. 2H
Handwheel	WCB
Handwheel Nut	A194 Gr. 2H
I.D. Tags	SS
I.D. Pins	Steel

NOTES:
*Standard construction: WCB-Trim 8, other options are available. Crane recommends the use of manual or powered gear assistance for sizes 6" and larger.

Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Testing	API 598

Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
A	8.00 (203)	8.50 (216)	9.50 (241)	11.50 (292)	16.00 (406)	19.50 (495)	24.50 (622)	27.50 (698)
B (Open)	14 (356)	16 (406)	16 (406)	19 (482)	21 (533)	24 (610)	29 (736)	40 (1016)
C	8 (203)	8 (203)	10 (254)	12 (304)	14 (355)	18 (457)	20 (508)	24 (610)
Wt. (143)	48 (21)	70 (31)	92 (41)	132 (59)	223 (101)	355 (161)	640 (290)	1100 (498)
Wt. (143½)	49 (22)	60 (27)	84 (38)	137 (62)	230 (104)	350 (158)	680 (308)	1190 (539)

Class 300 • Outside Screw & Yoke • Bolted Bonnet

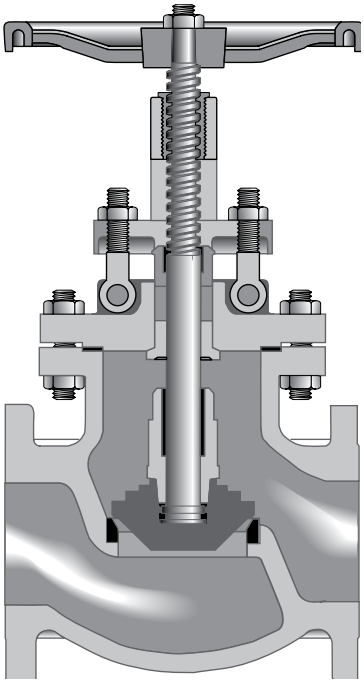
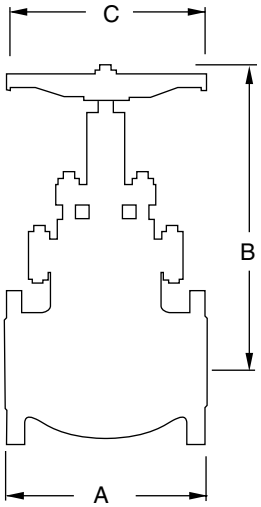


Figure 151
Globe, Flanged

Figure 151½
Globe, Butt Weld

Size Range:
2 through 12 inches
(50 - 300 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
740 psi @ -20°F to 100°F
(51 bar @ -28°C to 37°C)



Material of Construction*

Description	Material
Body	WCB
Bonnet	WCB
Seat Rings	Hardfaced
Disc	13% CR Overlay
Stem	410 SS
Packing	Graphite
Bonnet Gasket	Stainless Steel spiral wound Graphite
Back Seat	410 SS
Disc Stem Nut	410 SS
Disc Washer	Carbon Steel
Gland	410 SS
Gland Flange	WCB
Eye Bolt	Steel
Eye Bolt Nuts	A563 Gr. A or O
Pins	–
Bonnet Studs	A193 Gr. B7
Bonnet Nuts	A194 Gr. 2H
Handwheel	WCB
Handwheel Nut	A194 Gr. 2H
I.D. Tags	SS
I.D. Pins	Steel

NOTES:
*Standard construction: WCB-Trim 8, other options are available. Crane recommends the use of manual or powered gear assistance for sizes 6" and larger.

Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Testing	API 598

Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
A	10.50 (267)	11.50 (292)	12.50 (317)	14.00 (356)	17.50 (444)	22.00 (558)	24.50 (622)	28.00 (711)
B (Open)	15 (381)	18 (457)	18 (457)	21 (533)	25 (635)	36 (914)	41 (1041)	51 (1295)
C	8 (203)	10 (254)	10 (254)	14 (355)	18 (457)	22 (559)	24 (610)	25 (635)
Wt. (151)	69 (31)	99 (44)	128 (58)	190 (86)	330 (149)	330 (149)	700 (317)	1360 (616)
Wt. (151½)	62 (28)	73 (33)	124 (56)	181 (82)	340 (154)	530 (240)	710 (322)	1400 (635)

Class 600 • Outside Screw & Yoke • Bolted Bonnet

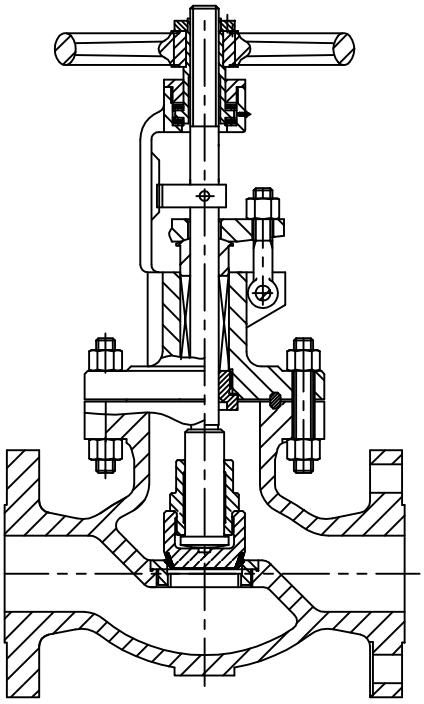
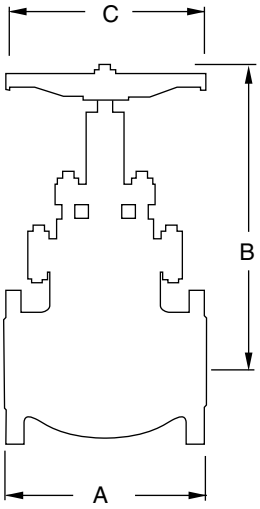


Figure 171
Globe, Flanged

Figure 171½
Globe, Butt Weld

Size Range:
2 through 8 inches
(50 - 200 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
1480 psi @ -20°F to 100°F
(102 bar @ -28°C to 37°C)



Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Testing	API 598

Material of Construction*

Description	Material
Body	WCB
Bonnet	WCB
Seat Ring	A182 Hardfaced
Disc	A182 13% CR Overlay
Stem	A182 Gr. F6
Packing	Graphite
Bonnet Gasket	Ring Type Soft Iron
Bonnet Bushing	410 SS
Disc Stem Nut	410 SS
Disc Thrust Plate	420 SS
Gland	410 SS
Gland Flange	WCB
Eye Bolt Bolts	A307 Gr. B
Eye Bolt Nuts	A194 Gr. 2H
Anti-Rotating Block	Carbon Steel
Pin	410 SS
Eye Bolt Pin	Carbon Steel
Bonnet Bolts	A193 Gr. B7
Bonnet Bolt Nuts	A194 Gr. 2H
Handwheel	Malleable Iron
Handwheel Nut	A194 Gr. 2H
Grease Nipple	Carbon Steel
Shock Block	Carbon Steel
Screws	Carbon Steel
Backing Ring	Carbon Steel
Yoke Sleeve	A439 Gr. D-2
Retaining Nut	Carbon Steel
Bearing	Groupware

NOTES:
*Standard construction: WCB-Trim 8, other options are available. Crane recommends the use of manual or powered gear assistance for sizes 4" and larger.

Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)
A	11.50 (292)	13.00 (330)	14.00 (356)	17.00 (432)	22.00 (559)	26.00 (660)
B (Open)	18 (460)	21 (528)	23 (570)	27 (672)	33 (823)	36 (899)
C	10 (250)	10 (250)	14 (350)	18 (450)	20 (500)	26 (640)
Wt. (171)	126 (57)	154 (70)	188 (85)	271 (123)	890 (404)	992 (450)
Wt. (171½)	79 (35)	100 (45)	187 (84)	271 (122)	890 (403)	990 (449)

Overview Class 150, 300 and 600 Check Valves

Features

Disc Type

- For class 600 valves, a ring joint bonnet gasket assures positive seal against leakage and accurate alignment of moving parts

Welded-in Seat Ring

- Seat ring is seal welded to eliminate leak path.

Basic Standards

These valves comply with the applicable requirements of the following standards:

- API 598
- ASME B16.34
- ASME B16.25
- ASME B16.10
- ASME B16.5

Notes

- Standard material is ASTM A216 Grade WCB.
- Standard trim is XU (13% Cr to hardface) which is suitable for a wide range of applications.
- Butt weld end dimensions shall be in accordance with ASME B16.25 Figure 2a or Figure 3a (without backing ring) for standard pipe schedules, unless otherwise specified in the purchase order. Butt weld ends shall not be produced from flanged end castings unless specifically authorized in writing by CRANE Energy Flow Solutions.

Class	Schedule
150/300	Standard
600	Extra Strong
900/1500	Schedule 160

- See "Technical Data" section for locations of bypasses, taps and drains.

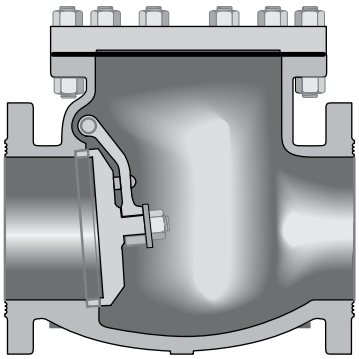


Figure 147
Swing Check, Flanged

Figure 147½
Swing Check, Butt Weld

Size Range:
2 through 24 inches
(50 - 600 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
285 psi @ -20°F to 100°F
(20 bar @ -28°C to 37°C)

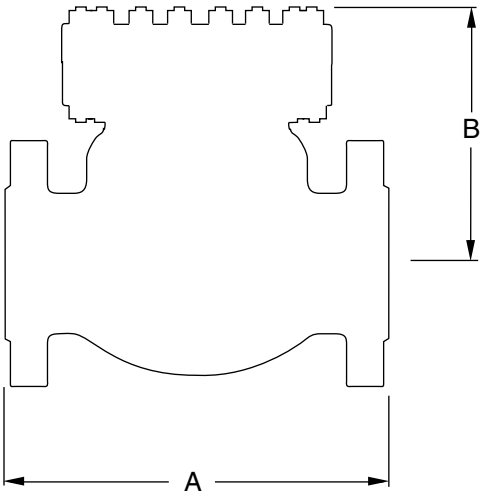
Material of Construction*

Description	Material
Body	WCB
Cap	WCB
Seat Ring	Hardfaced
Disc	13% CR Overlay
Hinge	WCB
Pins, Hinge	410 SS
Disc Washer	Steel
Cap Screw	A307 Gr. B
Cap Gasket	Corrugated Soft Steel or Steel/ Stainless Steel w/Graphite
Cap Studs	A193 Gr. B7
Cap Nuts	A194 Gr. 2H
I.D. Tags	SS
I.D. Pins	Steel

NOTE:
*Standard construction: WCB-Trim 8, other options are available.

Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Testing	API 598



Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)
A	8.00 (203)	8.50 (216)	9.50 (241)	11.50 (292)	14.00 (356)	19.50 (495)	24.50 (622)	27.50 (698)	31.00 (787)	34.00 (863)	38.50 (977)	38.50 (977)	51.00 (1295)
B (Open)	9 (229)	7 (178)	7 (178)	9 (229)	11 (279)	13 (330)	15 (381)	17 (432)	15 (381)	17 (432)	18 (457)	19 (482)	22 (558)
Wt. (147)	41 (18)	57 (25)	64 (29)	101 (45)	170 (77)	360 (163)	485 (219)	765 (346)	950 (430)	1225 (555)	1700 (771)	1850 (839)	2600 (1179)
Wt. (147½)	42 (19)	57 (25)	64 (29)	101 (45)	170 (77)	360 (163)	485 (219)	807 (366)	950 (430)	1225 (555)	1700 (771)	1850 (839)	2600 (1179)

Class 300 • Bolted Cap

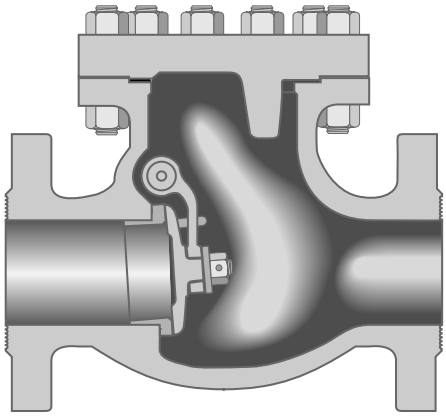


Figure 159
Swing Check, Flanged

Figure 159½
Swing Check, Butt Weld

Size Range:
2 through 24 inches
(50 - 600 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
740 psi @ -20°F to 100°F
(51 bar @ -28°C to 37°C)

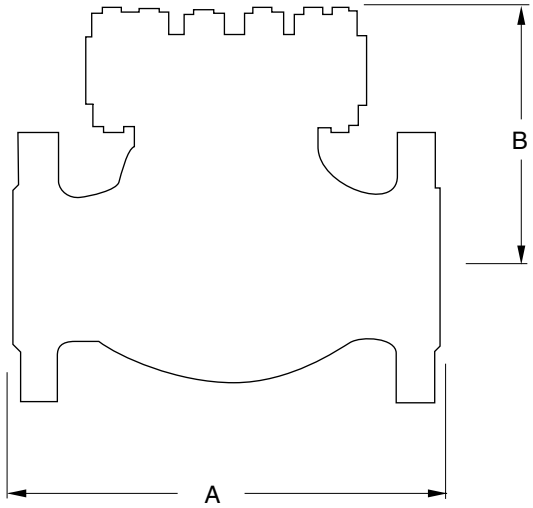
Material of Construction*

Description	Material
Body	WCB
Cap	WCB
Seat Ring	Hardfaced
Disc	13% CR Overlay
Hinge	WCB
Pins, Hinge	410 SS
Disc Washer	Steel
Cap Screw	A307 Gr. B
Cap Gasket	Stainless Steel spiral wound Graphite
Cap Studs	A193 Gr. B7
Cap Nuts	A194 Gr. 2H
I.D. Tags	SS
I.D. Pins	Steel

NOTE:
*Standard construction: WCB-Trim 8, other options are available.

Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Testing	API 598



Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)
A	10.50 (266)	11.50 (292)	12.50 (317)	14.00 (356)	17.50 (444)	21.00 (533)	24.50 (622)	28.00 (711)	33.00 (838)	34.00 (863)	38.50 (977)	40.00 (1016)	53.00 (1346)
B (Open)	7 (178)	8 (203)	8 (203)	9 (229)	11 (279)	14 (355)	16 (406)	19 (482)	19 (482)	22 (558)	23 (584)	25 (635)	30 (762)
Wt. (159)	46 (20)	66 (29)	86 (39)	154 (69)	276 (125)	460 (208)	675 (306)	860 (390)	1500 (680)	1850 (839)	2250 (1020)	2900 (1315)	4350 (1973)
Wt. (159½)	33 (14)	49 (22)	86 (39)	97 (43)	276 (125)	460 (208)	677 (307)	992 (449)	1500 (680)	1850 (839)	2250 (1020)	2900 (1315)	4350 (1973)

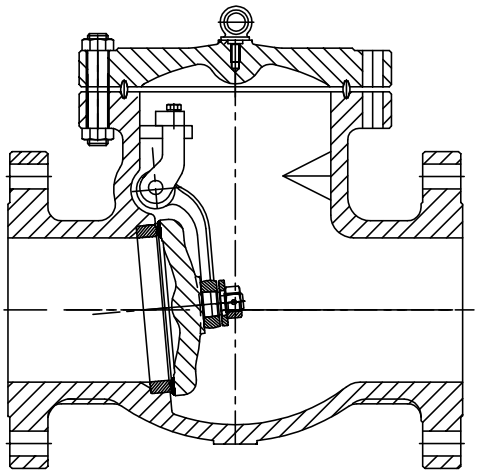


Figure 175
Swing Check, Flanged

Figure 175½
Swing Check, Butt Weld

Size Range:
2 through 12 inches
(50 - 300 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
1480 psi @ -20°F to 100°F
(102 bar @ -28°C to 37°C)

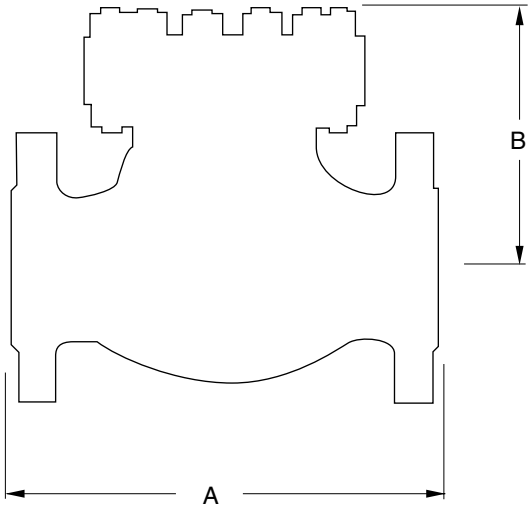
Material of Construction*

Description	Material
Body	WCB
Seat Ring	A105 Hardfaced
Disc	WCB 13% CR Overlay
Disc Washer	410 SS
Disc Nut Pin	SS
Disc Nut	SS
Hinge	WCB
Pins, Hinge	410 SS
Bearing Bracket	WCB
Spring Washer	Carbon Steel
Hex Bolt	Carbon Steel
Gasket	Ring Type Soft Iron
Cover Bolt	A193 Gr. B7
Cover Bolt Nut	A194 Gr. 2H
Cover	WCB
Eye Bolt	A181

NOTE:
*Standard construction: WCB-Trim 8, other options are available.

Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Testing	API 598



Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
A	11.50 (292)	13.00 (330)	14.00 (356)	17.00 (432)	22.00 (559)	26.00 (660)	31.00 (787)	33.00 (838)
B (Open)	7 (180)	8 (203)	9 (225)	11 (278)	13 (330)	15.5 (395)	19 (475)	21 (528)
Wt. (175)	115 (52)	145 (65)	161 (73)	284 (129)	500 (227)	1025 (465)	1385 (628)	1929 (875)
Wt. (175½)	100 (45)	125 (56)	154 (69)	250 (113)	450 (204)	850 (385)	1300 (589)	1800 (816)

Overview Class 150, 300 and 600 Tilting Disc Check Valves

Features

- Reduced maintenance is assured because the disc is the only moving part and is designed to minimize flutter in the closed position, thus reducing wear on the pivot pin, disc, and seat.
- Loss of head is minimized by the balanced disc and its “aerofoil” design. Streamlined body without pockets contributes to straight-through flow.
- Short distance of travel, combined with a balanced disc allows rapid closure while minimizing slamming.
- Drop tight seating is accomplished over the full pressure range because a slight clearance at the pivot pin assures complete seating between the disc ring and body ring.
- Pivot pins are constructed of stainless steel.

Standards

These valves comply with the applicable requirements of the following standards:

- ASME B16.34
- ASME B16.10
- ASME B16.5

Notes

- Valves under 4" (100 mm) are typically supplied with “X” trim.
- Valves 4" (100 mm) and larger are supplied with “XU” trim.
- Butt weld end dimensions shall be in accordance with ASME B16.25 Figure 2a or Figure 3a (without backing ring) for standard pipe schedules, unless otherwise specified in the purchase order. Butt weld ends shall not be produced from flanged end castings unless specifically authorized in writing by CRANE Energy Flow Solutions.

Class	Schedule
150/300	Standard
600	Extra Strong
900/1500	Schedule 160

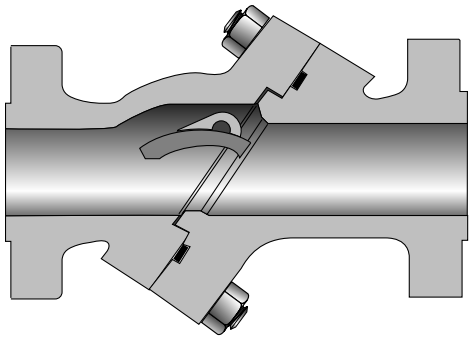


Figure 123
Tilting Disc Check, Flanged

Figure 123½
Tilting Disc Check, Butt Weld

Size Range:
2 through 36 inches
(50 - 900 mm)

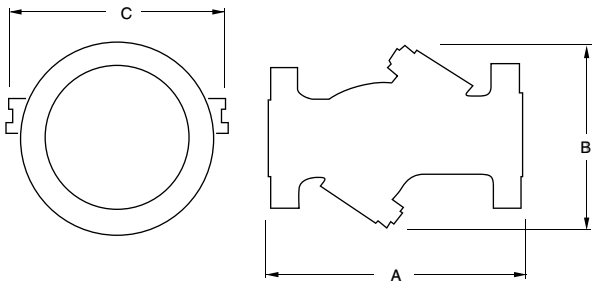
Pressure Temp. Rating
Carbon Steel
ASTM A216 Grade WCB
285 psi @ -20°F to 100°F
(20 bar @ -28°C to 37°C)

Material of Construction*

Description	Material
Inlet Body	ASTM A216 WCB
Outlet Body	ASTM A216 WCB
Disc	13% CR Overlay
Pivot Pin	SS
Body Gasket	Stainless Steel spiral wound Graphite
Body Studs	ASTM A193 B7
Body Nuts	ASTM A194 2H
Bearing Cap	Carbon Steel
Bearing Cap Gaskets	Soft Steel
Bearing Cap Studs	ASTM A193 B7
Bearing Cap Nuts	ASTM A194 2H
Dowel Pins	Carbon Steel

NOTE:
*Standard construction: WCB-Trim 8, other options are available.

Industry Standards
All materials comply with ASME B16.34



Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	5 (125)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)	30 (750)	36 (900)
A	8.00 (203)	8.50 (216)	9.50 (241)	11.50 (292)	13.00 (330)	19.50 (495)	24.50 (622)	27.50 (698)	31.00 (787)	30.00 (762)	33.00 (838)	32.50 (825)	38.00 (965)	49.50 (1257)	59.50 (1511)
B	7 (177)	9 (229)	9 (229)	10 (254)	11 (279)	16 (406)	19 (482)	21 (533)	22 (558)	25 (635)	28 (711)	31 (787)	36 (914)	44 (1117)	50 (1270)
C	8 (203)	9 (229)	9 (229)	13 (330)	16 (406)	21 (533)	25 (635)	28 (711)	29 (736)	34 (863)	36 (914)	39 (990)	45 (1143)	54 (1371)	60 (1524)
Wt. (123)	38 (17)	51 (23)	59 (26)	102 (46)	139 (63)	293 (132)	488 (221)	690 (312)	823 (373)	1070 (485)	1435 (650)	1825 (827)	2887 (1309)	4790 (2172)	6795 (3082)
Wt. (123½)	22 (9)	38 (17)	42 (19)	75 (34)	108 (48)	240 (108)	400 (181)	570 (258)	690 (312)	885 (401)	1213 (550)	1760 (798)	2265 (1027)	4025 (1825)	5755 (2610)

Class 300 • Bolted Cap

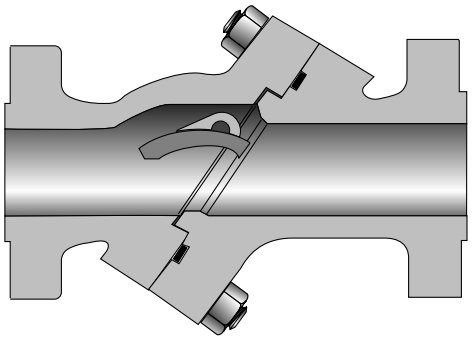


Figure 323
Tilting Disc Check, Flanged

Figure 323½
Tilting Disc Check, Butt Weld

Size Range:
2 through 36 inches
(50 - 900 mm)

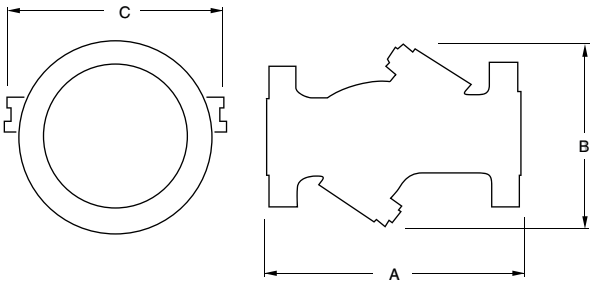
Pressure Temp. Rating
Carbon Steel
ASTM A216 Grade WCB
740 psi @ -20°F to 100°F
(51 bar @ -28°C to 37°C)

Material of Construction*

Description	Material
Inlet Body	ASTM A216 WCB
Outlet Body	ASTM A216 WCB
Disc	13% CR Overlay
Pivot Pin	SS
Body Gasket	Stainless Steel spiral wound Graphite
Body Studs	ASTM A193 B7
Body Nuts	ASTM A194 2H
Bearing Cap	Carbon Steel
Bearing Cap Gaskets	Soft Steel
Bearing Cap Studs	ASTM A193 B7
Bearing Cap Nuts	ASTM A194 2H
Dowel Pins	Carbon Steel

NOTE:
*Standard construction: WCB-Trim 8, other options are available.

Industry Standards
All materials comply with ASME B16.34



Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	5 (125)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)	30 (750)	36 (900)
A	10.50 (266)	11.50 (292)	12.50 (317)	14.00 (355)	15.75 (400)	21.00 (533)	24.50 (622)	28.00 (711)	30.00 (762)	33.00 (838)	36.00 (914)	39.00 (990)	45.00 (1143)	54.00 (1371)	60.00 (1524)
B	8 (203)	10 (254)	10 (254)	11 (279)	13 (330)	17 (431)	20 (508)	24 (609)	25 (635)	28 (711)	31 (787)	33 (838)	38 (965)	45 (1143)	57 (1447)
C	9 (229)	10 (254)	10 (254)	14 (355)	16 (406)	22 (558)	25 (635)	30 (762)	30 (762)	36 (914)	40 (1016)	41 (1041)	45 (1143)	54 (1371)	68 (1727)
Wt. (323)	38 (17)	51 (23)	59 (26)	102 (46)	139 (63)	293 (132)	488 (221)	690 (312)	823 (373)	1070 (485)	1435 (650)	1825 (827)	2887 (1309)	4790 (2172)	6795 (3082)
Wt. (323½)	22 (9)	38 (17)	42 (19)	75 (34)	108 (48)	240 (108)	400 (181)	570 (258)	690 (312)	885 (401)	1213 (550)	1760 (798)	2265 (1027)	4025 (1825)	5755 (2610)

Class 600 • Bolted Cap

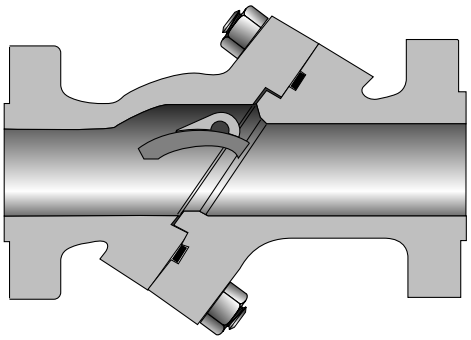


Figure 623
Tilting Disc Check, Flanged

Figure 623½
Tilting Disc Check, Butt Weld

Size Range:
2 through 30 inches
(50 - 750 mm)

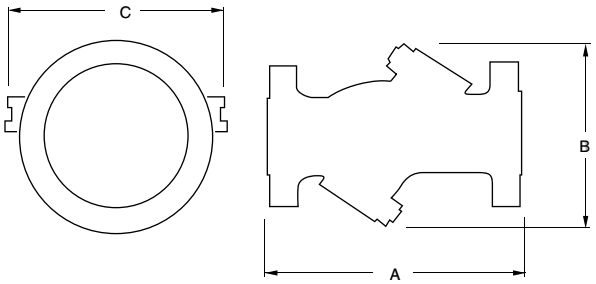
Pressure Temp. Rating
Carbon Steel
ASTM A216 Grade WCB
1480 psi @ -20°F to 100°F
(102 bar @ -28°C to 37°C)

Material of Construction*

Description	Material
Inlet Body	ASTM A216 WCB
Outlet Body	ASTM A216 WCB
Disc	13% CR Overlay
Pivot Pin	SS
Body Gasket	Stainless Steel spiral wound Graphite
Body Studs	ASTM A193 B7
Body Nuts	ASTM A194 2H
Bearing Cap	Carbon Steel
Bearing Cap Gaskets	Soft Steel
Bearing Cap Studs	ASTM A193 B7
Bearing Cap Nuts	ASTM A194 2H
Dowel Pins	Carbon Steel

NOTE:
*Standard construction: WCB-Trim 8, other options are available.

Industry Standards
All materials comply with ASME B16.34



Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)	30 (750)
A	11.50 (292)	13.00 (330)	14.00 (355)	17.00 (431)	20.00 (508)	22.00 (558)	26.00 (660)	31.00 (787)	33.00 (838)	35.00 (889)	39.00 (990)	43.00 (1092)	47.00 (1193)	55.00 (1397)	59.00 (1498)
B	8 (203)	10 (254)	10 (254)	13 (330)	15 (381)	16 (406)	19 (482)	22 (558)	26 (660)	27 (685)	30 (762)	34 (863)	38 (965)	44 (1117)	49 (1244)
C	9 (229)	10 (254)	10 (254)	16 (406)	19 (482)	20 (508)	24 (609)	28 (711)	31 (787)	33 (838)	36 (914)	43 (1092)	46 (1168)	53 (1346)	60 (1524)
Wt. (623)	68 (30)	110 (49)	115 (52)	222 (100)	327 (148)	432 (195)	725 (328)	1035 (469)	1470 (666)	1830 (830)	2550 (1156)	3570 (1619)	4805 (2179)	7190 (3261)	6925 (3141)
Wt. (623½)	60 (27)	70 (31)	85 (38)	164 (74)	267 (121)	295 (133)	435 (197)	820 (371)	1055 (478)	1335 (605)	1965 (891)	2010 (911)	4545 (2061)	5850 (2653)	7715 (3499)

Class 900 • Bolted Cap

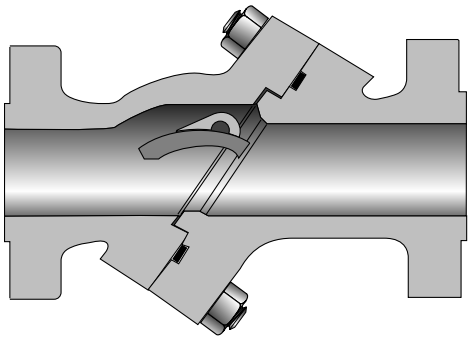


Figure 923
Tilting Disc Check, Flanged

Figure 923½
Tilting Disc Check, Butt Weld

Size Range:
3 through 18 inches
(80 - 450 mm)

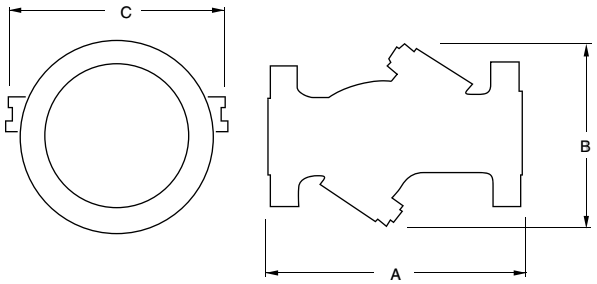
Pressure Temp. Rating
Carbon Steel
ASTM A216 Grade WCB
2220 psi @ -20°F to 100°F
(153 bar @ -28°C to 37°C)

Material of Construction*

Description	Material
Inlet Body	ASTM A216 WCB
Outlet Body	ASTM A216 WCB
Disc	13% CR Overlay
Pivot Pin	SS
Body Gasket	Stainless Steel spiral wound Graphite
Body Studs	ASTM A193 B7
Body Nuts	ASTM A194 2H
Bearing Cap	Carbon Steel
Bearing Cap Gaskets	Soft Steel
Bearing Cap Studs	ASTM A193 B7
Bearing Cap Nuts	ASTM A194 2H
Dowel Pins	Carbon Steel

NOTE:
*Standard construction: WCB-Trim 8, other options are available.

Industry Standards
All materials comply with ASME B16.34



Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	3 (80)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)
A	15.00 (381)	18.00 (457)	22.00 (558)	24.00 (609)	29.00 (736)	33.00 (838)	38.00 (965)	40.50 (1028)	44.50 (1130)	48.00 (1219)
B	11 (279)	12 (304)	14 (355)	16 (406)	20 (508)	25 (635)	28 (711)	31 (787)	37 (939)	41 (1041)
C	16 (406)	19 (482)	22 (558)	24 (609)	28 (711)	35 (889)	35 (889)	42 (1066)	45 (1143)	50 (1270)
Wt. (923)	177 (80)	273 (123)	438 (198)	604 (273)	1050 (476)	1770 (802)	2415 (1095)	- -	- -	- -
Wt. (923½)	107 (48)	164 (74)	286 (129)	464 (210)	760 (344)	1440 (653)	1610 (730)	2010 (911)	2260 (1025)	2515 (1140)

Class 1500 • Bolted Cap

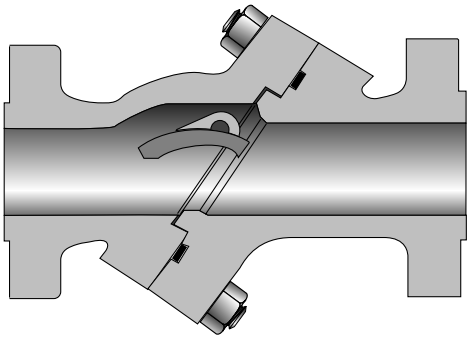


Figure 1523
Tilting Disc Check, Flanged

Figure 1523½
Tilting Disc Check, Butt Weld

Size Range:
2 through 10 inches
(50 - 250 mm)

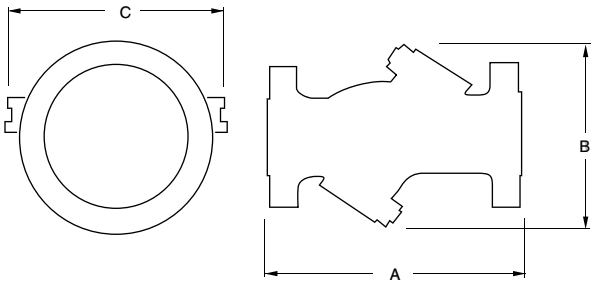
Pressure Temp. Rating
Carbon Steel
ASTM A216 Grade WCB
3705 psi @ -20°F to 100°F
(256 bar @ -28°C to 37°C)

Material of Construction*

Description	Material
Inlet Body	ASTM A216 WCB
Outlet Body	ASTM A216 WCB
Disc	13% CR Overlay
Pivot Pin	SS
Body Gasket	Stainless Steel spiral wound Graphite
Body Studs	ASTM A193 B7
Body Nuts	ASTM A194 2H
Bearing Cap	Carbon Steel
Bearing Cap Gaskets	Soft Steel
Bearing Cap Studs	ASTM A193 B7
Bearing Cap Nuts	ASTM A194 2H
Dowel Pins	Carbon Steel

NOTE:
*Standard construction: WCB-Trim 8, other options are available.

Industry Standards
All materials comply with ASME B16.34



Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)
A	14.50 (368)	16.50 (419)	18.50 (469)	21.50 (546)	27.75 (704)	32.75 (831)	39.00 (990)
B	12 (304)	12 (304)	12 (304)	15 (381)	19 (482)	22 (558)	29 (736)
C	17 (431)	17 (431)	17 (431)	21 (533)	24 (609)	30 (762)	38 (965)
Wt. (1523)	177 (80)	273 (123)	438 (198)	604 (273)	1050 (476)	1770 (802)	2415 (1095)
Wt. (1523½)	107 (48)	164 (74)	286 (129)	464 (210)	760 (344)	1440 (653)	1610 (730)

Stop Check Valve Information

Stop Check Valves are as essential to safe operation of a boiler plant as safety valves or other safety devices attached to the boiler.

When more than one boiler is connected to the main steam header, a stop check valve should be installed in the pipeline between each boiler and the header.

The valve should always be placed so that the pressure in the boiler is under the disc. Straightway valves may be used in horizontal or vertical lines for upward flow. Angle valves may be used for upward horizontal or horizontal downward flow.

Features

Valve designed for steam application that operate between 100 psi (9 bar) and 375 psi (26 bar).

The Stop Check feature of this valve requires a minimum of 50 psi (3.5 bar) pressure differential between the piping system and the boiler to operate correctly.

For installation between boilers suppling the same steam header, and positioned with pressure under the disc. Straightway is for horizontal or vertical line with upward flow. Angle valves are for "horizontal-downward" or "upward-horizontal" flow.

These valves will perform the four following important functions:

1. Act as an automatic-non return valve applied as a containment device to prevent gross backflow of steam from main header to boiler in case the boiler fails.
2. Assist in cutting out boiler, when ceasing to fire and boiler is blown down. In this case, valve disc automatically closes to restrict backflow of steam to the boiler.
3. Assist in returning boiler after a shutdown.
4. Restricts backflow of steam from header into boiler which has been shut down and opened or suffered a pressure containment blowout. The check valve feature should not be relied upon for primary shut-off.

Cylindrical shaped disc is the only pressure-actuated part, light in weight with ample guiding surface. It is specially designed to produce a maximum lift at minimum velocities. There are no wing guides to cause "spinning" with resultant rapid wear.

Notes

Cylindrical-Shaped Disc is the only moving part. It is especially designed to produce maximum lift at minimum velocities. There are no wing guides to cause “spinning” with resultant rapid wear.

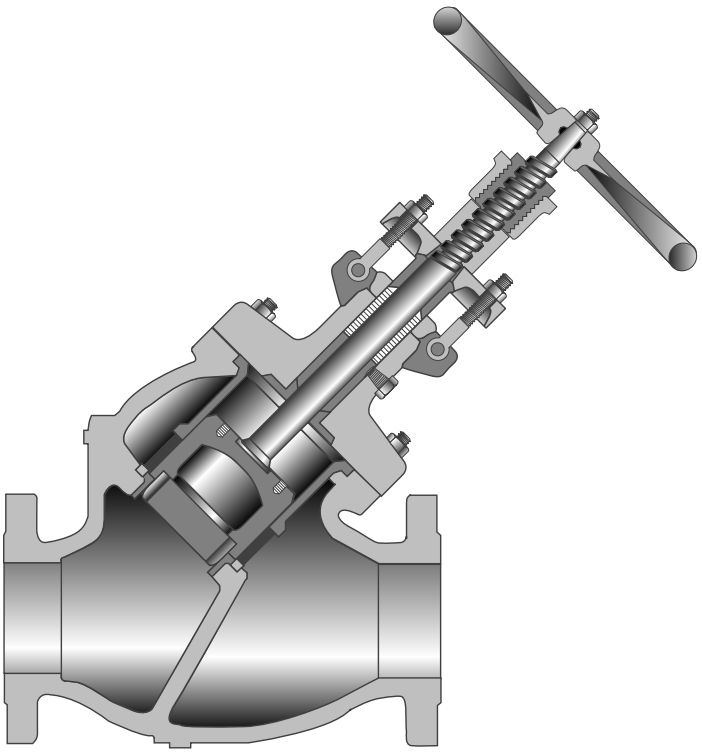
Long Throttling Lip on the disc retards flow when seating position is approached. Disc chattering is prevented, and wiredrawing of seating surfaces is reduced.

Removable Liner guides the disc throughout the full travel. Being entirely independent of the body, it is not subject to distortion by expansion strains.

Piston Ring adds to dashpot's ability to avoid rapid disc movement and where pulsations are extremely severe, two piston rings can be installed.

Easy Regrinding Tap Bosses on top of the disc permit inserting nipples or eye bolts to facilitate quick removal of the disc for grinding.

Large Port Areas in the liner produce only a minimum of pressure drop through the valve and assure unrestricted movement of the disc.



Class 300 • Outside Screw & Yoke • Bolted Bonnet

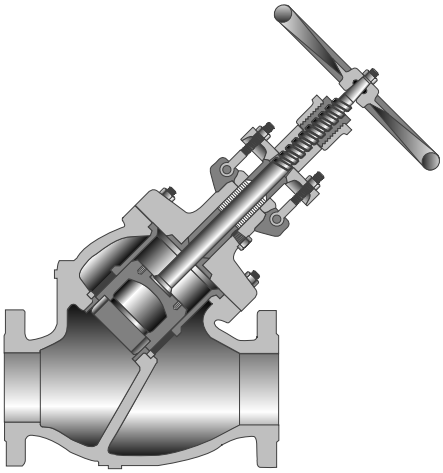


Figure 28
Stop Check, Flanged

Figure 28½
Stop Check, Butt Weld

Size Range:
3 through 10 inches
(80 - 250 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
740 psi @ -20°F to 100°F
(51 bar @ -28°C to 37°C)

Notes

- Butt weld ends on valves 10" (250 mm) and smaller are bored to match standard pipe unless otherwise specified. For larger valves, diameter (I.D. of pipe) of bore must be specified.
- Sizes 8" and 10" (200 mm & 250 mm), Class 300 are equipped with a hammer-blow handwheel.

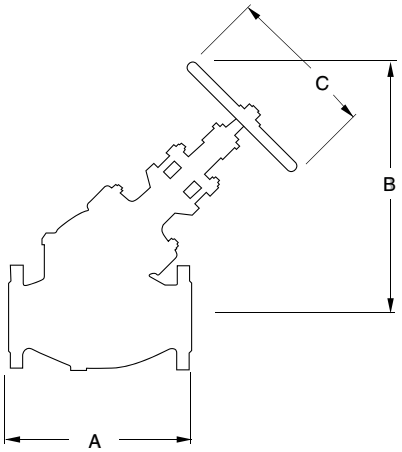
Material of Construction*

Description	Material
Body	ASTM A216 WCB
Bonnet	ASTM A216 WCB
Disc	Hardfaced
Stem	13% Chrome
Body Gasket	Soft Steel
Body Studs	ASTM A194 B7
Body Nuts	ASTM A194 2H
Eyebolts	Carbon Steel
Groove Pins	Carbon Steel
Liner	13% Chrome
Seat	13% Chrome
Gland	13% Chrome
Gland Flange	Carbon Steel
Handwheel	Ductile Iron
Yokesleeve	Bronze

NOTE:
*Standard construction: WCB-Trim 8, other options are available.

Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Testing	API 598



Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)
A	14.75 (374)	17.00 (431)	21.50 (546)	26.00 (660)	30.00 (762)
B	22 (558)	27 (685)	34 (863)	41 (1041)	48 (1219)
C	10 (254)	14 (355)	18 (457)	20 (508)	30 (762)
Wt. (28)	140 (63)	260 (117)	430 (195)	770 (349)	1320 (598)
Wt. (28½)	125 (56)	225 (102)	395 (179)	755 (342)	1265 (573)

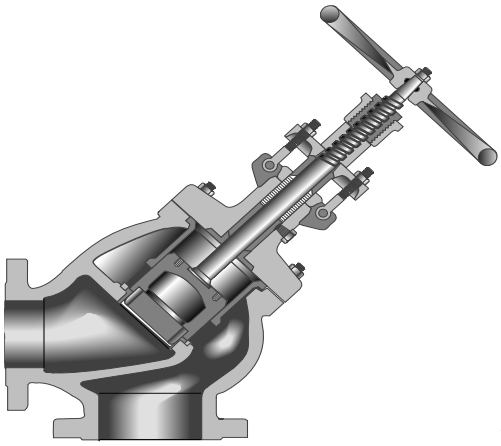


Figure 30
Stop Check, Flanged

Figure 30½
Stop Check, Butt Weld

Size Range:
3 through 10 inches
(80 - 250 mm)

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
740 psi @ -20°F to 100°F
(51 bar @ -28°C to 37°C)

Material of Construction*

Description	Material
Body	ASTM A216 WCB
Bonnet	ASTM A216 WCB
Disc	Hardfaced
Stem	13% Chrome
Body Gasket	Soft Steel
Body Studs	ASTM A194 B7
Body Nuts	ASTM A194 2H
Eyebolts	Carbon Steel
Groove Pins	Carbon Steel
Liner	13% Chrome
Seat	13% Chrome
Gland	13% Chrome
Gland Flange	Carbon Steel
Handwheel	Ductile Iron
Yokesleeve	Bronze

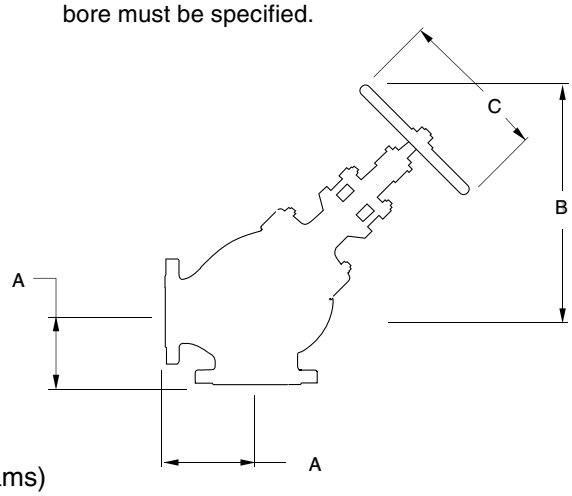
NOTE:
*Standard construction: WCB-Trim 8, other options are available.

Notes

Butt weld ends on valves 10" (250 mm) and smaller are bored to match standard pipe unless otherwise specified. For larger valves, diameter (I.D. of pipe) of bore must be specified.

Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Testing	API 598



Dimensions and Weights
Inches (millimeters) - pounds (kilograms)

Valves	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)
A	6.25 (158)	7.00 (177)	8.75 (222)	10.50 (266)	12.25 (311)
B	17 (431)	21 (533)	27 (685)	32 (812)	38 (965)
C	10 (254)	14 (355)	18 (457)	20 (508)	30 (762)
Wt. (30)	120 (54)	200 (90)	370 (167)	680 (308)	1120 (508)
Wt. (30½)	90 (40)	160 (72)	320 (145)	570 (258)	970 (439)

Selecting the Proper Size – Determining Pressure Drop

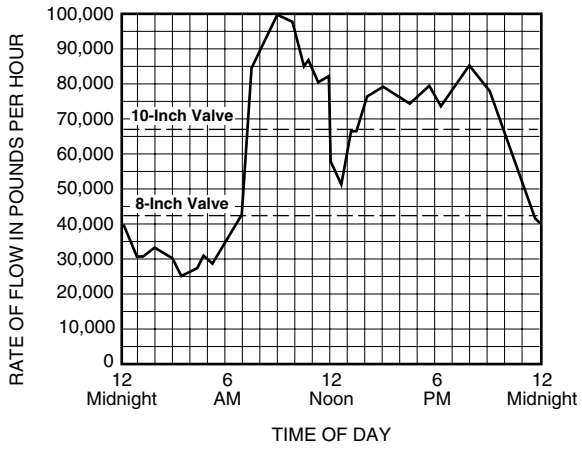
Since stop-check valves have a floating disc member, it is important the valve be sized to provide full disc lift under flow conditions prevailing during the major portion of the service life. If the valve is too large, the disc will float in a partially open position and may cause fluttering of the disc and rapid wear. Conversely, if the valve is too small, pressure drop will be excessive.

The chart on the opposite page is a graphic representation of flow data determined by test. Its use offers a simple method of determining the best size of stop-check valve, as well as the pressure drop under varying conditions of flow, without any computation.

How to Use the Chart Shown on the Opposite Page

Given: Steam pressure-Temperature...300 psig 750°F
Flow Rate...Typical Daily Demand Curve

Typical Daily Load-Demand Curve



Find: Valve Catalog No. and the best size for above installation.

Solution: Reference to the pressure-temperature ratings on page 31 and 33 indicates a Class 300 valve will be required. Therefore, the following valves may be used:

Globe...No. 28 XU, Flanged or No. 28½ XU, Butt-Welding

Angle...No. 30 XU, Flanged or No. 30½ XU, Butt-Welding

1. Enter the Temperature chart at 750°F (399°C). Move vertically upward to the curved line for 300 psi (21 bar), then horizontally to the right to establish a point on the specific volume scale. From this point, draw a line through the flow rate being investigated (100,000 Lb/H) and establish a point on Index 1.

2. From that point, draw another line through the valve size, for example the 8-inch (200 mm) size, and establish a point on Index 2. Now move horizontally to the diagonal pressure drop line on the right side. Where these lines intersect, the pressure drop is 9 psi (.62 bar) for the 8-inch (200 mm), Class 300 globe valve and 10 psi (.69 bar) for the 8-inch (200 mm), Class 300 angle valve.

Chart solutions resulting in a point on Index 2 that falls below the Line A-A for Class 300 valves or below Line B-B for class 600 valves indicate the disc will not be fully lifted under the flow conditions used. Operation under such conditions is not recommended but, at times, must be tolerated for short periods during the low loads.

3. Enter the chart where Line A-A intersects Index 2 for Class 300 valves or below the Line B-B for Class 600 valves. Move diagonally upward through the size being investigated 8-inch (200 mm) and establish a second point on Index 1. From this point, extend a line to the specific volume established in Step 1 and at its intersection with the flow rate line, read 42,000 Lb/H as the minimum flow rate at which the disc will be in the fully lifted position. The pressure drop at this flow rate is 1.9 psi (.13 bar) for globe and 2.1 psi (.14 bar) for angle valves.

4. Repeat Steps 2 and 3 for other possible valve sizes, tabulate results, and make size selection on basis of pressure drop and duration of partial disc lift considerations.

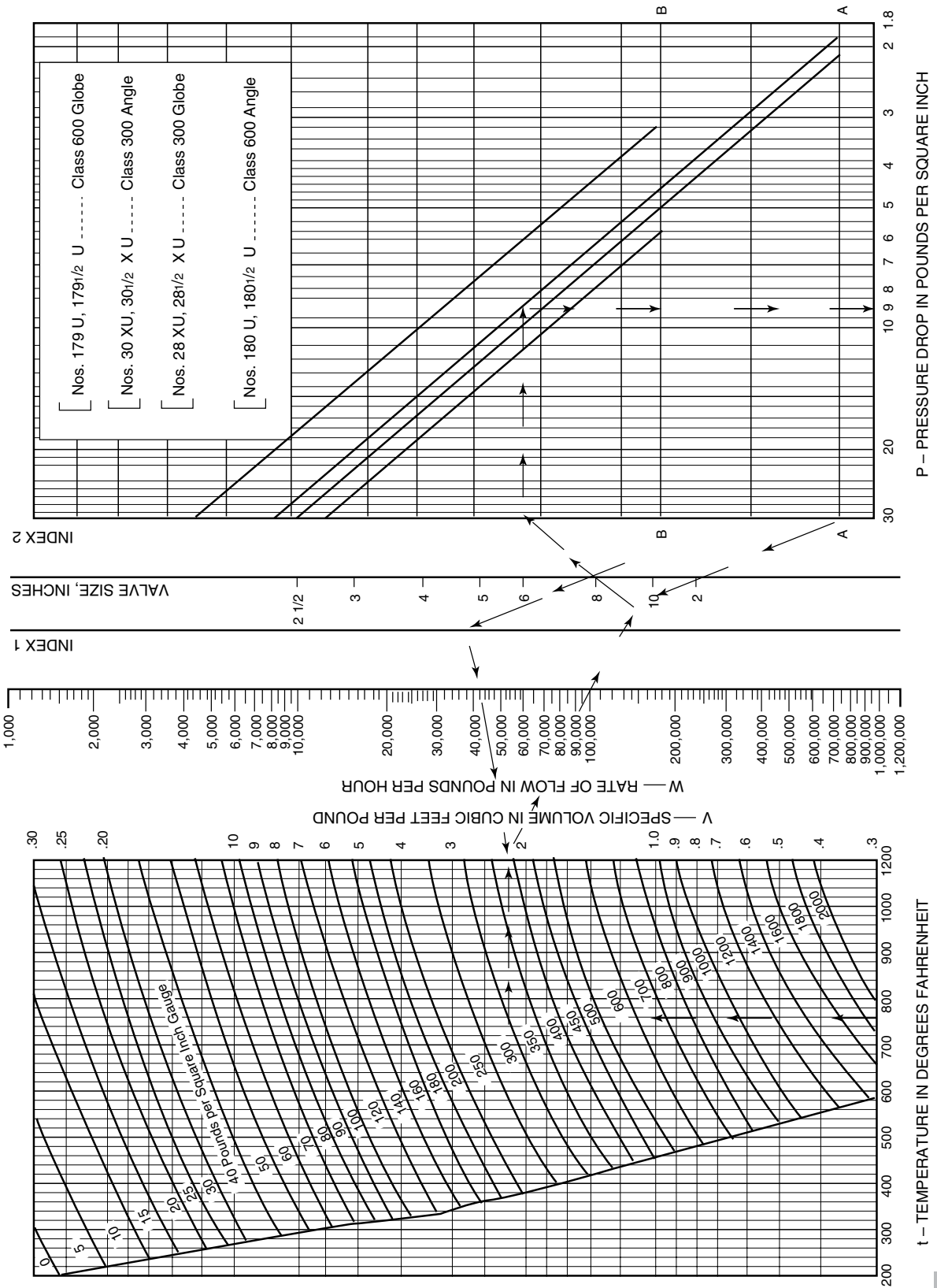
Valve Size	Press Drop @max. min. flow rate (100,000 #/Hr.), psi (bar)		Flow rate for wide open valve #/Hr.
	Globe	Angle	
6" (150 mm)	24.0 (1.65)	26.0 (1.79)	24,000
8" (200 mm)	9.0 (.62)	10.0 (.68)	42,000
10" (250 mm)	3.8 (.26)	4.2 (.28)	68,000
12" (300 mm)	2.1 (.14)	2.3 (.15)	95,000

Dotted lines on Demand Curve indicate minimum flow rates for wide open 8" and 10" (200 mm and 250 mm) valves.

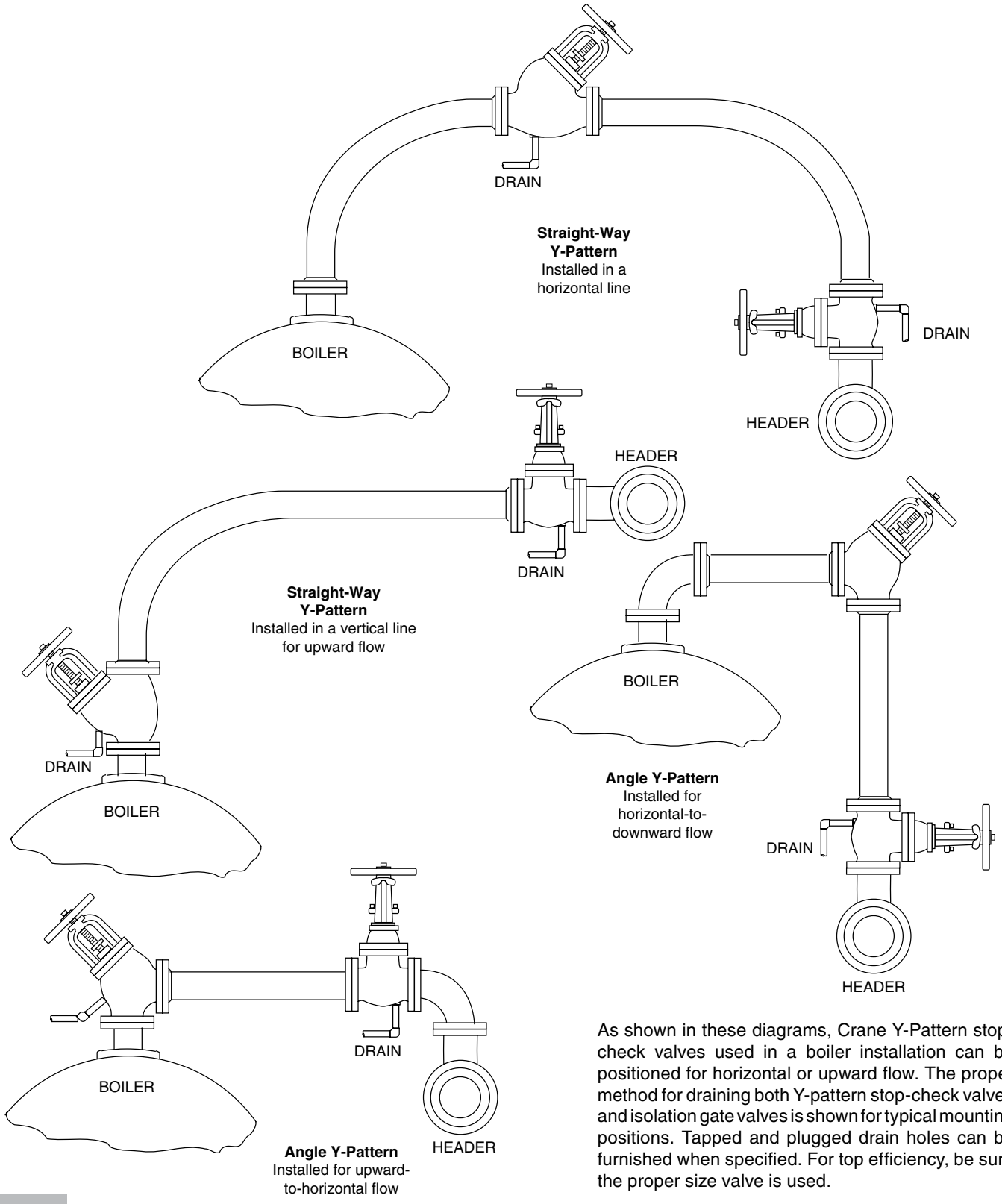
5. The best choice for this example would be the 10" (250 mm) size because pressure drop is much lower and duration of partially lifted disc is only slightly greater than for the 8" (200 mm) size.

6. Pressure drop for any intermediate flow condition can be determined as outlined in Steps 1 and 2.

Selecting the Proper Size – Determining Pressure Drop



Y-Pattern Stop-Check and Isolation Gate Valves



Straight-Way Y-Pattern
Installed in a horizontal line

Straight-Way Y-Pattern
Installed in a vertical line for upward flow

Angle Y-Pattern
Installed for horizontal-to-downward flow

Angle Y-Pattern
Installed for upward-to-horizontal flow

As shown in these diagrams, Crane Y-Pattern stop-check valves used in a boiler installation can be positioned for horizontal or upward flow. The proper method for draining both Y-pattern stop-check valves and isolation gate valves is shown for typical mounting positions. Tapped and plugged drain holes can be furnished when specified. For top efficiency, be sure the proper size valve is used.

Pressure Temperature Ratings

ENGLISH UNITS

The following pressure-temperature charts are derived from ASME B16.34 – 2009 Version. They will cover the most commonly used body and bonnet materials in the industry. All Crane Valves are designed to operate through the pressure and temperature ranges shown in these charts for a particular ASME Class Rating and ASTM Material.

ASTM A216 GR WCB

°F	STANDARD CLASS B16.34 - 2009 MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG						SPECIAL CLASS B16.34 - 2009* MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG					
	150	300	600	900	1500	2500	150	300	600	900	1500	2500
-20 to 100	285	740	1480	2220	3705	6170	290	750	1500	2250	3750	6250
200	260	680	1360	2035	3395	5655	290	750	1500	2250	3750	6250
300	230	655	1310	1965	3270	5450	285	740	1480	2220	3700	6170
400	200	635	1265	1900	3170	5280	280	735	1465	2200	3665	6105
500	170	605	1205	1810	3015	5025	280	735	1465	2200	3665	6105
600	140	570	1135	1705	2840	4730	280	735	1465	2200	3665	6105
650	125	550	1100	1650	2745	4575	275	715	1430	2145	3575	5960
700	110	530	1060	1590	2665	4425	265	690	1380	2075	3455	5760
750	95	505	1015	1520	2535	4230	245	635	1270	1905	3170	5285
800	80	410	825	1235	2055	3430	195	515	1030	1545	2570	4285

NOTE: Upon prolonged exposure to temperatures above 800°F (426°C), the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged use above 800°F (426°C).

ASTM A352 GR LCB

°F	STANDARD CLASS B16.34 - 2009 MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG						SPECIAL CLASS B16.34 - 2009* MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG					
	150	300	600	900	1500	2500	150	300	600	900	1500	2500
-20 to 100	265	695	1395	2090	3480	5805	290	695	1395	2090	3480	5805
200	255	660	1320	1980	3300	5505	290	695	1395	2090	3480	5805
300	230	640	1275	1915	3190	5315	290	695	1395	2090	3480	5805
400	200	615	1230	1845	3075	5125	290	695	1395	2090	3480	5805
500	170	585	1175	1760	2930	4885	290	695	1395	2090	3480	5805
600	140	550	1105	1655	2755	4595	290	695	1395	2090	3480	5805
650	125	535	1065	1600	2665	4440	290	695	1390	2080	3470	5780

NOTE: Not to be used over 650°F (343°C).

ASTM A352 GR LCC & LC3

°F	STANDARD CLASS B16.34 - 2009 MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG						SPECIAL CLASS B16.34 - 2009* MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG					
	150	300	600	900	1500	2500	150	300	600	900	1500	2500
-20 to 100	290	750	1500	2250	3750	6250	290	750	1500	2250	3750	6250
200	260	750	1500	2250	3750	6250	290	750	1500	2250	3750	6250
300	230	730	1455	2185	3640	6070	290	750	1500	2250	3750	6250
400	200	705	1405	2110	3520	5865	290	750	1500	2250	3750	6250
500	170	665	1330	1995	3325	5540	290	750	1500	2250	3750	6250
600	140	605	1210	1815	3025	5040	290	750	1500	2250	3750	6250
650	125	590	1175	1765	2940	4905	290	750	1500	2250	3750	6250

NOTE: Not to be used over 650°F (343°C).

* "Special Class" applies to weld-end valves only and requires NDE testing in accordance with ASME B16.34 - 2009.

ASME Pressure Temperature Ratings

ENGLISH UNITS

ASTM A217 GR WC6

°F	STANDARD CLASS B16.34 - 2009 MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG						SPECIAL CLASS B16.34 - 2009* MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG					
	150	300	600	900	1500	2500	150	300	600	900	1500	2500
-20 to 100	290	750	1500	2250	3750	6250	290	750	1500	2250	3750	6250
200	260	750	1500	2250	3750	6250	290	750	1500	2250	3750	6250
300	230	720	1445	2165	3610	6015	290	750	1500	2250	3750	6250
400	200	695	1385	2080	3465	5775	290	750	1500	2250	3750	6250
500	170	665	1330	1995	3325	5540	290	750	1500	2250	3750	6250
600	140	605	1210	1815	3025	5040	290	750	1500	2250	3750	6250
650	125	590	1175	1765	2940	4905	290	750	1500	2250	3750	6250
700	110	570	1135	1705	2840	4730	280	735	1465	2200	3665	6110
750	95	530	1065	1595	2660	4430	280	730	1460	2185	3645	6070
800	80	510	1015	1525	2540	4230	275	720	1440	2160	3600	6000
850	65	485	975	1460	2435	4060	260	680	1355	2030	3385	5645
900	50	450	900	1350	2245	3745	225	585	1175	1760	2935	4895
950	35	320	640	955	1595	2655	155	400	795	1195	1995	3320
1000	20	215	430	650	1080	1800	105	270	540	810	1350	2250
1050	20(a)	145	290	430	720	1200	70	180	360	540	900	1500
1100	20(a)	95	190	290	480	800	45	120	240	360	600	1000

NOTE: Use normalized and tempered material only. Not to be used over 1100°F (593°C). The deliberate addition of any element not listed in ASTM A217, Table 1 is prohibited, except that Ca and Mg may be added for deoxidation.

(a) Flanged end valve ratings terminate at 1000°F (537°C).

ASTM A217 GR WC9

°F	STANDARD CLASS B16.34 - 2009 MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG						SPECIAL CLASS B16.34 - 2009* MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG					
	150	300	600	900	1500	2500	150	300	600	900	1500	2500
-20 to 100	290	750	1500	2250	3750	6250	290	750	1500	2250	3750	6250
200	260	750	1500	2250	3750	6250	290	750	1500	2250	3750	6250
300	230	730	1455	2185	3640	6070	285	740	1480	2220	3695	6160
400	200	705	1410	2115	3530	5880	280	730	1455	2185	3640	6065
500	170	665	1330	1995	3325	5540	280	725	1450	2175	3620	6035
600	140	605	1210	1815	3025	5040	275	720	1440	2165	3605	6010
650	125	590	1175	1765	2940	4905	275	715	1430	2145	3580	5965
700	110	570	1135	1705	2840	4730	270	705	1415	2120	3535	5895
750	95	530	1065	1595	2660	4430	270	705	1415	2120	3535	5895
800	80	510	1015	1525	2540	4230	270	705	1415	2120	3535	5895
850	65	485	975	1460	2435	4060	260	680	1355	2030	3385	5645
900	50	450	900	1350	2245	3745	230	600	1200	1800	3000	5000
950	35	385	755	1160	1930	3220	180	470	945	1415	2360	3930
1000	20	265	535	800	1335	2230	130	335	670	1005	1670	2785
1050	20(a)	175	350	525	875	1455	85	220	435	655	1095	1820
1100	20(a)	110	220	330	550	915	55	135	275	410	685	1145

NOTE: Use normalized and tempered material only. Not to be used over 1100°F (593°C). The deliberate addition of any element not listed in ASTM A217, Table 1 is prohibited, except that Ca and Mg may be added for deoxidation.

(a) Flanged end valve ratings terminate at 1000°F (537°C).

* “Special Class” applies to weld-end valves only and requires NDE testing in accordance with ASME B16.34 - 2009.

ASME Pressure Temperature Ratings

ENGLISH UNITS

ASTM A217 GR C5

°F	STANDARD CLASS B16.34 - 2009 MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG						SPECIAL CLASS B16.34 - 2009* MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG					
	150	300	600	900	1500	2500	150	300	600	900	1500	2500
-20 to 100	290	750	1500	2250	3750	6250	290	750	1500	2250	3750	6250
200	260	750	1500	2250	3750	6250	290	750	1500	2250	3750	6250
300	230	730	1445	2185	3640	6070	290	750	1500	2250	3750	6250
400	200	705	1410	2115	3530	5880	290	750	1500	2250	3750	6250
500	170	665	1330	1995	3325	5540	290	750	1500	2250	3750	6250
600	140	605	1210	1815	3025	5040	290	750	1500	2250	3750	6250
650	125	590	1175	1765	2940	4905	290	750	1500	2250	3750	6250
700	110	570	1135	1705	2840	4730	280	735	1465	2200	3665	6110
750	95	530	1065	1595	2660	4430	280	730	1460	2185	3645	6070
800	80	510	1015	1525	2540	4230	275	720	1440	2160	3600	6000
850	65	485	975	1460	2435	4060	260	615	1225	1840	3065	5105
900	50	375	745	1120	1870	3115	230	465	935	1400	2335	3895
950	35	275	550	825	1370	2285	170	345	685	1030	1715	2855
1000	20	200	400	595	995	1655	125	250	495	745	1245	2070
1050	20(a)	145	290	430	720	1200	90	180	360	540	900	1500
1100	20(a)	100	200	300	495	830	60	125	250	375	620	1035
1150	20(a)	60	125	185	310	515	40	75	155	230	385	645
1200	15(a)	35	70	105	170	285	20	45	85	130	215	355

NOTE: Use normalized and tempered material only. The deliberate addition of any element not listed in ASTM A217, Table 1 is prohibited, except that Ca and Mg may be added for deoxidation.
(a) Flanged end valve ratings terminate at 1000°F (537°C).

ASTM A217 GR C12

°F	STANDARD CLASS B16.34 - 2009 MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG						SPECIAL CLASS B16.34 - 2009* MAXIMUM NON-SHOCK WORKING PRESSURE, PSIG					
	150	300	600	900	1500	2500	150	300	600	900	1500	2500
-20 to 100	290	750	1500	2250	3750	6250	290	750	1500	2250	3750	6250
200	260	750	1500	2250	3750	6250	290	750	1500	2250	3750	6250
300	230	730	1455	2185	3640	6070	290	750	1500	2250	3750	6250
400	200	705	1410	2115	3530	5880	290	750	1500	2250	3750	6250
500	170	665	1330	1995	3325	5540	290	750	1500	2250	3750	6250
600	140	605	1210	1815	3025	5040	290	750	1500	2250	3750	6250
650	125	590	1175	1765	2940	4905	290	750	1500	2250	3750	6250
700	110	570	1135	1705	2840	4730	280	735	1465	2200	3665	6110
750	95	530	1065	1595	2660	4430	280	730	1460	2185	3645	6070
800	80	510	1015	1525	2540	4230	275	720	1440	2160	3600	6000
850	65	485	975	1460	2435	4060	260	680	1355	2030	3385	5646
900	50	450	900	1350	2245	3745	230	600	1200	1800	3000	5000
950	35	375	755	1130	1885	3145	180	470	945	1415	2355	3930
1000	20	255	505	760	1270	2115	120	315	635	950	1585	2645
1050	20(a)	170	345	515	855	1430	80	215	430	645	1070	1785
1100	20(a)	115	225	340	565	945	55	140	285	425	705	1180
1150	20(a)	75	150	225	375	630	35	95	190	285	470	785
1200	20(a)	50	105	155	255	430	25	65	130	195	320	535

NOTE: Use normalized and tempered material only. The deliberate addition of any element not listed in ASTM A217, Table 1 is prohibited, except that Ca and Mg may be added for deoxidation.
(a) Flanged end valve ratings terminate at 1000°F (537°C).

* "Special Class" applies to weld-end valves only and requires NDE testing in accordance with ASME B16.34 - 2009.

Notes

Notes

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