



WILLIAMS VALVE

CAST STEEL VALVES



Introduction

For over seventy years William E. Williams Valve Corporation has been manufacturing quality valves. As with all our valves, the Williams Steel Valve Line is a reflection of a commitment to a standard of excellence and product innovation.

All Williams valves are designed, engineered, manufactured and tested to meet or exceed all applicable industry standards including ASTM, ANSI and API. In addition to quality, Williams takes pride in its customer service and delivery.

Williams is a flexible manufacturer and remains one of the few companies willing to help customers meet unique or special applications. Whether your needs are for standard products from our wellstocked inventories throughout the U.S. or custom modifications, remember to specify WILLIAMS.

Index

	Page
General Specifications	3
How to Order	4
Figure No. Prefix	
End Connection Code	
Trim Code Suffix	
Casting Chart	
Valve Comparison Charts	5
Figure Number Equivalents	
Trim Comparison Charts	
Gate Valves/150 Lb.	6
Gate Valves/300 Lb.	7
Gate Valves/600 Lb.	8
Gate Valves/900 Lb.-1500 Lb.	9
NRS Gate Valves/150 Lb.	10
NRS Gate Valves/300 Lb.	11
Globe & Angle Valves/150 Lb.	12
Globe & Angle Valves/300 Lb.	13
Globe Valves/600 Lb.	14
Globe Valves/900 Lb.-1500 Lb.	15
Swing Check Valves/150 Lb.	16
Swing Check Valves/300 Lb.	17
Swing Check Valves/600 Lb.	18
Swing Check Valves/900 Lb. 1500 Lb.	19
Reduced Port-Ball Valves/150 Lb.-300 Lb.	20
Full Port-Ball Valves/150 Lb.-300 Lb.	21
Pressure Temperature Ratings	22
Steel Pipe Schedule Chart	23
Conversion Data	23
Flange Dimensions	24
Inch to Millimeter	25
Temperature Conversion °C -°F	26
Valve Actuation, Accessories & Modifications	27
Bosses & Drain Tappings: Locations of Tapped Holes ...	27
Warranty	27

General Specifications

GATE VALVES are designed to offer minimum pressure drop in the fully open position. Not intended for throttling; they serve as efficient shut-off valves for flow in either direction. They are dependable for use in steam, water, oil, vapor and other high pressure services. Rising stem designs employ a tee-head stem connection to the one-piece flexible wedge. Position of the valve is readily visible. Non-rising stem design is offered for minimal space or buried services. In both cases the wedges are guided throughout their travel to assure true alignment and proper seating.

GLOBE VALVES are efficient for throttling when pressure drop is about 20% of inlet pressure. They are effective stop valves and are suitable for regulating the liquid flow. Our valves incorporate a bolted bonnet design with a rising stem and handwheel. Williams **GLOBE VALVES** can be supplied as screw-down stop checks. The stop check valve is installed with pressure under the disc. The disc is raised from its seat by the pressure of upward fluid flow. The disc is reseated by gravity when flow is stopped or reversed. Alignment of the disc is maintained through its travel by an extended disc nut and/or a guided seat ring.

ANGLE VALVES are essentially **GLOBE VALVES** with inlet and outlet connections at right angles. Like **GLOBE VALVES**, **ANGLES** are used for throttling service and offer less resistance to flow. The right-angle form of the body reduces pipe joints. These valves are also adaptable to stop check configuration.

SWING CHECKS are self-contained and prevent the reversal of flow through the line. The pressure of the flowing fluid opens the valve. The weight of the disc assembly and reversal of flow closes it. **SWING CHECK VALVES** are best used on services with low fluid velocities and where flow reversals are infrequent. **SWING CHECKS** are automatic in operation and offer minimum resistance to flow.

BALL VALVES are used mainly for on/off non-throttling services. WILLIAMS offers a **FULL PORT VALVE** with a split body configuration and a **REDUCED PORT VALVE** having a two piece, end entry design. The bore of **FULL PORT VALVES** is equal to the inside diameter of the pipe. In **REDUCED PORT VALVES** the bore is typically one size smaller than the nominal pipe size. Both styles offer reinforced teflon seats, 316 stainless steel stem and balls. In selecting **BALL VALVES** consideration is to be given to the temperature and pressure-resisting characteristics of the seat materials. The advantages of **BALL VALVES** are ease of operation, low maintenance, compact geometry and appreciable weight savings. They are readily adapted to automation using either pneumatic, hydraulic, or electric forms of operators.

SPECIAL NOTE: As product improvement is a continuous process at William E. Williams Valve Corp. specifications and dimensions are subject to change at anytime without notice.

How to Order

This Williams catalog has been published to give you an overview of our product. When transmitting orders or inquiries, it is important that complete specifications be given so the proper valve may be identified. Normally, information would include: quantity, size, type and figure number. Also, when other than standard conditions exist, it is desirable that working conditions be furnished; i.e., pressure and temperature ranges, nature of fluid to be handled, and any other unusual conditions such as: corrosion, shock or abrasion likely to be present.

For choosing appropriate figure number, select size, figure number prefix followed with end connection code letter and trim code suffix. Standard casting material is A216 WCB Carbon Steel, if other material is required add appropriate ASTM Spec. & Grade to valve figure number.

Example: Figure number 30F2 is a 300 lb. RF flanged carbon steel gate valve with 1/2 Hardfaced trim of A216 Gr WCB construction.

Figure Number Prefix

VALVE TYPE	CLASS 150 LB.	CLASS 300 LB.	CLASS 600 LB.	CLASS 900 LB.	CLASS 1500 LB.
Gate	15	30	60	90	150
Globe	152	302	602	902	1502
Angle	153	303	603	903	1503
Check	151	301	601	901	1501
Ball (Reduced Port)	C16	C36	—	—	—
Ball (Full Port)	C17	C37	—	—	—

End Connection Code

The letter that follows above figure number indicates end connection type:
F: Flanged, W: Butt weld, RTJ: Ring Type Joint

Trim Code Suffix

TRIM, FIG. NO. SUFFIX	SEATING SURFACES	STEM MATERIAL	SERVICE RECOMMENDATIONS/LIMITATIONS
1	13% Chromium (A)	13% CR (A)	For unrefined oil to 850° F. For oil, oil vapor or steam to 1100° F. Steam service limited to Globe, Angle and Check Valves: Not recommended for Gate or Ball valves. Limited to maximum operating conditions per ANSI pressure class.
2	13% Chromium (A) To Hard Facing (B) (1/2 HF)	13% CR (A)	For steam, gas and general service: to 1000° F. Limited to maximum operating conditions per ANSI pressure class, an excellent universal trim.
3	Hardfacing (B) (HF)	13% CR (A)	For severe service: to 1200° F., including corrosion and erosive steam, oil, or oil vapor to 1100° F. Limited to maximum operating conditions per ANSI pressure class.
4	Bronze	Brass	For water, oil or gas: up to 400° F. Excellent for brine and seawater service. Limited to maximum operating conditions per ANSI pressure class.
5	Monel	Monel	For corrosive service: Acids, alkalies, salt solutions, etc. to 450° F. maximum. Limited to maximum operating conditions per ANSI pressure class.
6	316 SS	316 SS	For corrosive service: Acids, etc. to 850° F. maximum and corrosive oils at high and low temperatures. Limited to maximum operating conditions per ANSI pressure class.
7	TFE Seat	-NA-	For extremely tight shutoff, to 400° F. maximum. TFE soft seat is used in conjunction with other trims, i.e., trim 7/6: TFE/316SS
8	13% Chromium (A) To Monel	13% CR (A)	For steam, water, gas and other non-corrosive fluids: to 850° F. maximum. Limited to maximum operating conditions per ANSI pressure class.

NOTES: (A) 13% chromium is 410 SST (B) Hardfacing is weld deposited Cobalt based alloy.

Casting Chart

MAT'L. CLASS.	ASTM SPEC.	C	Mn	P	S	Si	Cr	Mo	Ni	SERVICE RECOMMENDATIONS/LIMITATIONS	NOTES
Carbon Steel	A216 WCB	0.30	1.00	0.04	.045	0.60	0.40	0.25	0.50	Steam, water, oil, oil vapor, gas and general services at temps. -20° to 1000° F.	(1) (4)
1 1/4 CR-1/2 MO.	A217 WC6	0.20	0.50-0.80	0.04	.045	0.60	1.00-1.50	0.45-0.65	0.50	Steam, water, oil, oil vapor, gas & general services at temps. -20° to 1100° F.	(3) (4)
2 1/4 CR-1 MO.	A217 WC9	0.18	0.40-0.70	0.04	.045	0.60	2.00-2.75	0.90-1.20	0.50	Steam, water, oil, oil vapor, gas & general services at temps. -20° to 1100° F.	(3) (4)
5 CR-1/2 MO.	A217 WC5	0.20	0.40-0.70	0.04	.045	0.75	4.00-6.50	0.45-0.65	0.50	Corrosive & Erosive refinery service at -20° F. to 1000° F.	(2) (4)
Low Carbon Steel	A352 LCB	0.30	1.00	0.04	.045	0.60	—	—	—	Low temperature service to -50° F. not for use above 650° F.	(4)

NOTES:

(1) Permissible, but not recommended for prolonged usage above 800° F. (3) Not to be used over 1100° F. Flanged end ratings terminate at 1000° F. (2) Not to be used over 1050° F. Flanged end ratings terminate at 1000° F. (4) All values for elements shown above are maximum.

Valve Comparison Charts

Figure Number Equivalents

Gate Valves								
PRESSURE CL	WILLIAMS	CRANE	WALWORTH	POWELL	VELAN	PACIFIC	STOCKHAM	LUNKENHEIMER
150#	15F	47	5202F	1503	F*-0-054C-02	150	150F	1512**
300#	30F	33	5206F	3003	F*-1-054C-02	350	300F	3012**
600#	60F	76	5232F	6003	F*-2-054C-02	650	600F	6012**
900#	90F	83	5247F	9003	F*-7-054C-02	950	—	—
1500#	150F	87	5262F	1303	F*-3-054C-02	1550	—	—
Globe Valves								
150#	152F	143	5275F	1531	F*-0-074C-02	160	15G	1532**
300#	302F	151	5281F	3031	F*-1-074C-02	360	30G	3032**
600#	602F	171	5295F	6031	F*-2-074C-02	660	—	6032**
900#	902F	183	5301F	9031	F*-7-074C-02	—	—	—
1500#	1502F	189	5308F	1331	F*-3-074C-02	—	—	—
Angle Valves								
150#	153F	145	5278F	1533	F*-0-075C-02	170	15A	1552**
300#	303F	153	5283F	3033	F*-1-075C-02	370	30A	3052**
600#	603F	173	5297F	6033	F*-2-075C-02	—	—	6052**
900#	903F	185	5303F	9033	F*-7-075C-02	—	—	—
1500#	1503F	190	5310F	1333	F*-3-075C-02	—	—	—
Check Valves								
150#	151F	147	5341F	1561	F*-0-114C-02	180	155F	1572**
300#	301F	169	5344F	3061	F*-1-114C-02	380	305F	3072**
600#	601F	175	5350F	6061	F*-2-114C-02	680	605F	6072**
900#	901F	187	5353F	9061	F*-7-114C-02	—	—	—
1500#	1501F	199	5356F	1361	F*-3-114C-02	—	—	—

*MFR'S SIZE CODE. **AVAILABLE ONLY IN TRIM EQUAL TO WILLIAMS NO. 2 TRIM.

Trim Comparison Chart

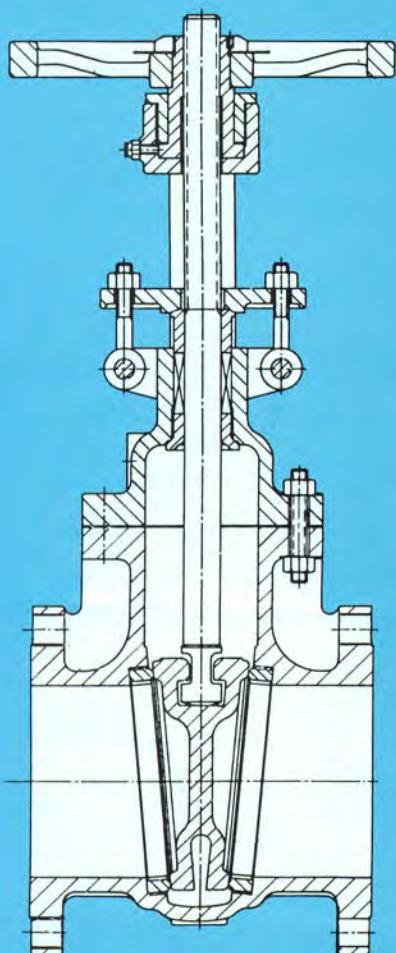
MATERIALS			WILLIAMS	CRANE	WALWORTH	POWELL	VELAN	PACIFIC	STOCKHAM
SEAT	DISC	STEM							
CR 13	CR 13	CR 13	1	X	AA	P-140	—	1	1
HARD FACED	CR 13	CR 13	2	XU	UT	P-140-15	TY	2	U OR 11
HARD FACED	HARD FACED	CR 13	3	U	HF	P-100	TS (316SS STEM)*	7	11
BRONZE	BRONZE	BRONZE	4	H	H	P87	—	5	6
MONEL	MONEL	MONEL	5	A	A	P168	XY (HF SEAT)*	8	8
316SS	316SS	316SS	6	L	18-8M	P173	SX	12	12
TEFLON RINGS	CR 13	CR 13	7	—	—	—	—	BLOCK & BLEED	—
CR 13	MONEL	CR 13	8	XR	AAA	—	XY (MONEL STEM)*	3	4

EXAMPLE: CRANE 47XU, WALWORTH 5202FUT, POWELL 1505-P140, VELAN F*-0-054C-02TY, PACIFIC 150-2, STOCKHAM 150F-U or 11 and LUNKENHEIMER 1512 ARE EQUAL TO WILLIAMS FIGURE No. 15F2.

Cast Steel Gate Valves

FIG. No. 15F-FLANGED
FIG. No. 15W-BUTTWELD

CLASS
150 Lb



FEATURES

- Rising stem—OS&Y, Bolted Bonnet
- Solid wedge (Plain or flexible)
- Renewable seat rings (Threaded or welded)
- Back seat bushing allows repacking under pressure
- Bosses for taps, drains, bypass
- Ground wedges, fully guided

DIMENSIONS

SIZES	FACE TO FACE in.	END TO END(BW) in.	CENTER TO TOP OPEN in.	DIA HAND-WHEEL in.
1½"	6½	—	13	7
2"	7	8½	14½	8
2½"	7½	9½	17	8
3"	8	11½	18	8½
3½"	8½	—	18½	8½
4"	9	12	22	11
5"	10	15	26	12½
6"	10½	15½	30	14
8"	11½	16½	38½	14
10"	13	18	46	18
12"	14	19¾	55¼	20
14"	15	22½	60	21½
16"	16	24	74¾	24
18"	17	26	79	27
20"	18	28	87½	28
24"	20	32	105	31½
30"	24	38	130	43
36"	28	44	162	51

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
BONNET	ASTM A216 GR WCB
WEDGE	SEE TRIM CHART*
SEAT RING	SEE TRIM CHART*
GLAND FLANGE	ASTM A105
PACKING GLAND	STEEL CHROME PLATED
STEM	SEE TRIM CHART*
STEM NUT	ASTM A439 GR D2C OR ALUMINUM BRONZE
BACKSEAT BUSHING	ASTM A182 GR F6
YOKE NUT	ASTM A47 GR 32510
HANDWHEEL NUT	ASTM A47 GR 32510
BONNET NUT	ASTM A194 GR2H
BONNET STUD	ASTM A193 GRB7
HANDWHEEL	ASTM A197 OR ASTM A216 GR WCB
EYEBOLT	ASTM A307 GR B
EYE	ASTM A307 GR B
EYEBOLT PIN	STEEL
PACKING	NON-ASBESTOS
GASKET	SOFT IRON
SET SCREW	STEEL
GREASE NIPPLE	STEEL

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

Applicable Standards

Steel Gate Valves, API 600 (1½"-24")
Steel Valves, ANSI B16.34, Std. CL.
Face-to-Face, End-to-End, ANSI B16.10
End Flanges, ANSI B16.5
End Flanges (30" and 36"), MSS-SP-44
Weld Ends, ANSI B16.25

Tests

API 598
Shell: 450 PSIG Hydrostatic
Seat: 315 PSIG Hydrostatic
80 PSIG Air
Other testing available upon request.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG

TEMPERATURE IN DEGREES F	150 LB. CLASS
-20 TO 100	285 PSIG
200	260
300	230
400	200
500	170
600	140
650	125
700	110
750	95
800	80
850	65
900	50
950	35
1000	20

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.



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Cast Steel Gate Valves

FIG. No. 30F – FLANGED
FIG. No. 30W – BUTTWELDED

CLASS
300 LB

FEATURES

- Rising stem—OS&Y, Bolted Bonnet
- Solid wedge (Plain or flexible)
- Renewable seat rings (Threaded or welded)
- Back seat bushing allows repacking under pressure
- Bosses for taps, drains, bypass
- Ground wedges, fully guided

DIMENSIONS

SIZES	FACE TO FACE in.	CENTER TO TOP OPEN in.	DIA HAND-WHEEL in.
2"	8½	16	7⅞
2½"	9½	17⅞	7⅞
3"	11⅞	19¾	8⅞
4"	12	23¾	9⅞
5"	15	27¾	12½
6"	15⅞	32⅞	14
8"	16½	41	15¾
10"	18	48¾	17¾
12"	19¾	57	20
14"	30	62½	22
16"	33	69	25
18"	36	80½	28
20"	39	91	35½
24"	45	120½	43
30"	55	143	51
36"	68	163	63

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
BONNET	ASTM A216 GR WCB
WEDGE	SEE TRIM CHART*
SEAT RING	SEE TRIM CHART*
GLAND FLANGE	ASTM A105
PACKING GLAND	STEEL CHROME PLATED
STEM	SEE TRIM CHART*
STEM NUT	ASTM A439 GR D2C OR ALUMINUM BRONZE
BACKSEAT BUSHING	ASTM A182 GR F6
YOKE NUT	ASTM A47 GR 32510
HANDWHEEL NUT	ASTM A47 GR 32510
BONNET NUT	ASTM A194 GR2H
BONNET STUD	ASTM A193 GRB7
HANDWHEEL	ASTM A197 OR ASTM A216 GR WCB
EYEBOLT	ASTM A307 GR B
EYE	ASTM A307 GR B
EYEBOLT PIN	STEEL
PACKING	NON-ASBESTOS
GASKET	SOFT IRON
SET SCREW	STEEL
GREASE NIPPLE	STEEL

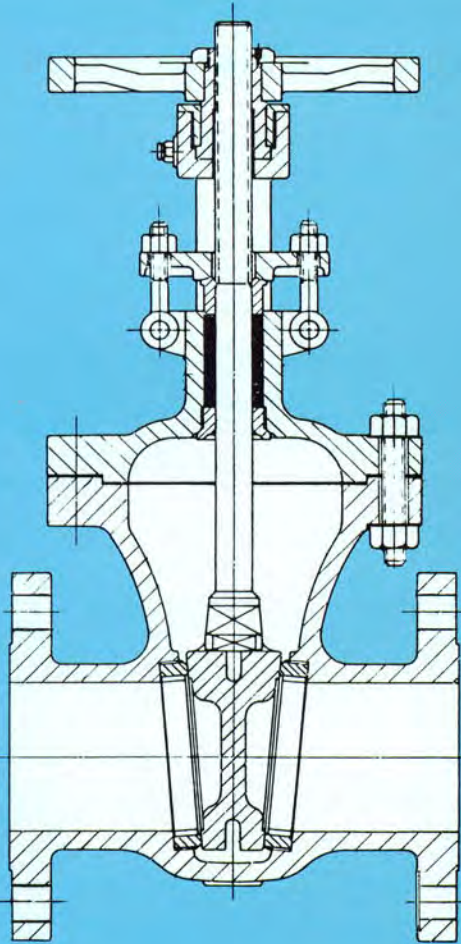
* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG

TEMPERATURE IN DEGREES F	300 LB. CLASS
-20 TO 100	740 PSIG
200	675
300	655
400	635
500	600
600	550
650	535
700	535
750	505
800	410
850	270
900	170
950	105
1000	50

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.



Applicable Standards

Steel Gate Valves, API 600 (2"-24")
Steel Valves, ANSI B16.34, Std. CL.
Face-to-Face, End-to-End, ANSI B16.10
End Flanges, ANSI B16.5
End Flanges (30" and 36"), MSS-SP-44
Weld Ends, ANSI B16.25

Tests

API 598
Shell: 815 PSIG Hydrostatic
Seat: 1125 PSIG Hydrostatic
80 PSIG Air
Other testing available upon request.



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Cast Steel Gate Valves

FIG. No. 60F-FLANGED
FIG. No. 60W-BUTTWELD

CLASS
600 Lb

FEATURES

- Rising stem—OS&Y, Bolted Bonnet
- Solid wedge (Plain or flexible)
- Renewable seat rings (Threaded or welded)
- Back seat bushing allows repacking under pressure
- Bosses for taps, drains, bypass
- Ground wedges, fully guided

DIMENSIONS

SIZES	FACE TO FACE in.	CENTER TO TOP OPEN in.	DIA HAND-WHEEL in.
2"	11½	16½	7⅞
2½"	13	18	8⅞
3"	14	20⅞	9⅞
4"	17	25	14
5"	20	30½	15¾
6"	22	33%	17¾
8"	26	42%	20
10"	31	49	25
12"	33	68½	27
14"	35	69	31½
16"	39	74	35½
18"	43	84¼	43
20"	47	93½	51
24"	55	110	51
30"	65	140	—
36"	77	170	—

MATERIAL SPECIFICATIONS

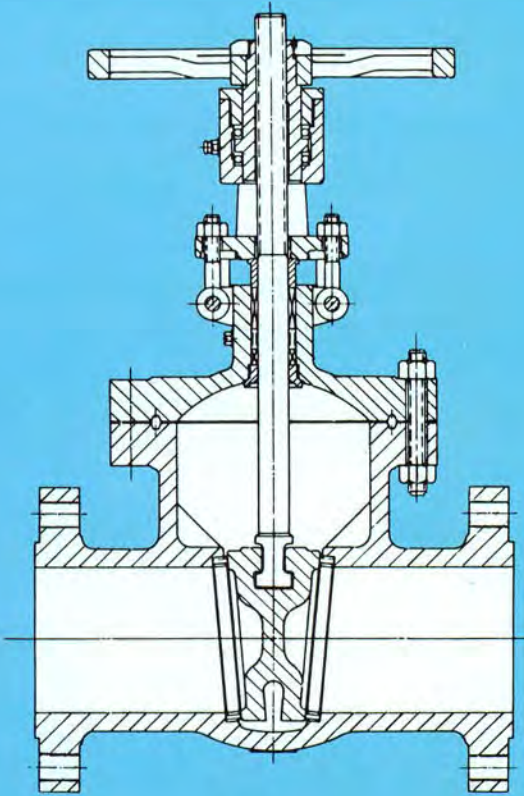
PART	MATERIAL
BODY	ASTM A216 GR WCB
BONNET	ASTM A216 GR WCB
WEDGE	SEE TRIM CHART*
SEAT RING	SEE TRIM CHART*
GLAND FLANGE	ASTM A105
PACKING GLAND	STEEL CHROME PLATED
STEM	SEE TRIM CHART*
STEM NUT	ASTM A439 GR D2C OR ALUMINUM BRONZE
BACKSEAT BUSHING	ASTM A182 GR F6
YOKE NUT	ASTM A47 GR 32510
HANDWHEEL NUT	ASTM A47 GR 32510
BONNET NUT	ASTM A194 GR2H
BONNET STUD	ASTM A193 GRB7
HANDWHEEL	ASTM A197 OR ASTM A216 GR WCB
EYEBOLT	ASTM A307 GR B
EYE	ASTM A307 GR B
EYEBOLT PIN	STEEL
PACKING	NON-ASBESTOS
GASKET	RING JOINT-IRON
SET SCREW	STEEL
GREASE NIPPLE	STEEL
BEARINGS	STEEL

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG	
TEMPERATURE IN DEGREES F	600 LB. CLASS
-20 TO 100	1480 PSIG
200	1350
300	1315
400	1270
500	1200
600	1095
650	1075
700	1965
750	1010
800	825
850	535
900	345
950	205
1000	105

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.



Applicable Standards

Steel Gate Valves, API 600 (2"-24")
Steel Valves, ANSI B16.34, Std. CL.
Face-to-Face, End-to-End, ANSI B16.10
End Flanges, ANSI B16.5
End Flanges (30" and 36"), MSS-SP-44
Weld Ends, ANSI B16.25

Tests

API 598
Shell: 2250 PSIG Hydrostatic
Seat: 1630 PSIG Hydrostatic
80 PSIG Air
Other testing available upon request.



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Cast Steel Gate Valves

FLANGED: FIG. No. 90F CLASS 900 Lb | **FIG. No. 150F CLASS 1500 Lb**
BUTTWELD: FIG. No. 90W 900 Lb | **FIG. No. 150W 1500 Lb**

FEATURES

- Rising stem—OS&Y, Bolted Bonnet
- Solid wedge (Plain or flexible)
- Renewable seat rings (Threaded or welded)
- Back seat bushing allows repacking under pressure
- Bosses for taps, drains, bypass
- Ground wedges, fully guided

DIMENSIONS

900 PSI CAST STEEL GATE VALVES

SIZES	FACE TO FACE in.	CENTER TO TOP OPEN in.	DIA HAND-WHEEL in.
3"	15	26 $\frac{3}{8}$	11 $\frac{1}{2}$
4"	18	30	14
6"	24	40 $\frac{3}{4}$	20
8"	29	51	24
10"	33	61	27
12"	38	69 $\frac{1}{2}$	31 $\frac{1}{2}$
14"	40 $\frac{1}{2}$	77	35 $\frac{1}{2}$
16"	44 $\frac{1}{2}$	82 $\frac{3}{4}$	43

1500 PSI CAST STEEL GATE VALVES

SIZES	FACE TO FACE in.	CENTER TO TOP OPEN in.	DIA HAND-WHEEL in.
2"	14 $\frac{1}{2}$	21 $\frac{1}{2}$	11 $\frac{1}{2}$
3"	18 $\frac{1}{2}$	27 $\frac{3}{8}$	14
4"	21 $\frac{1}{2}$	31 $\frac{1}{2}$	20
6"	27 $\frac{3}{4}$	45	24
8"	32 $\frac{3}{4}$	53 $\frac{1}{2}$	27
10"	39	65	35 $\frac{1}{2}$
12"	44 $\frac{1}{2}$	74	43
14"	39 $\frac{1}{2}$	83 $\frac{1}{2}$	51
16"	54 $\frac{1}{2}$	88	63

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
BONNET	ASTM A216 GR WCB
WEDGE	SEE TRIM CHART*
SEAT RING	SEE TRIM CHART*
GLAND FLANGE	ASTM A105
PACKING GLAND	ASTM A182 GR F6
STEM	SEE TRIM CHART*
STEM NUT	ASTM B148 GR 9D
BACK SEAT BUSHING	ASTM A182 GR F6
YOKE NUT	CARBON STEEL
HANDWHEEL NUT	CARBON STEEL
BONNET NUT	ASTM A194 GR2H
BONNET STUD	ASTM A193 GR B7
HANDWHEEL	CARBON STEEL OR NODULAR IRON
GLAND EYE BOLT	ASTM A307 GR B
GLAND EYE BOLT NUT	ASTM A307 GR B
PACKING	NON ASBESTOS
GASKET	ARMCO IRON
SET SCREW	STEEL
GREESE NIPPLE	STEEL
BEARINGS	STEEL

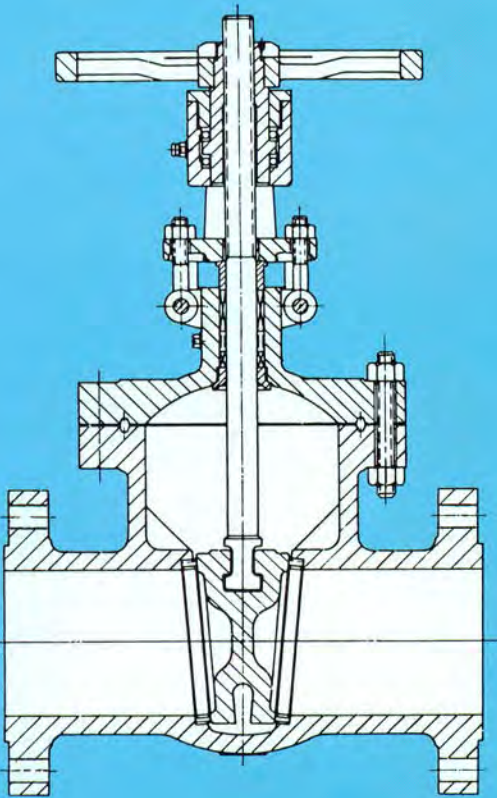
* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG

TEMPERATURE IN DEGREES F	900 LB. CLASS	1500 LB. CLASS
-20 TO 100	2220 PSIG	3705 PSIG
200	2025	3375
300	1970	3280
400	1900	3170
500	1795	2995
600	1640	2735
650	1610	2685
700	1600	2665
750	1510	2520
800	1235	2060
850	805	1340
900	515	860
950	310	515
1000	155	260

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.



Applicable Standards

Steel Gate Valves, API 600 (2"-24")
 Steel Valves, ANSI B16.34, Std. CL.
 Face-to-Face, End-to-End, ANSI B16.10
 End Flanges, ANSI B16.5
 Weld Ends, ANSI B16.25

Tests

API 598
 Class 900 Lb. Class 1500 Lb.
 Shell: 3350 PSIG Shell: 5575 PSIG (Hydrostatic)
 Seat: 2450 PSIG 4080 PSIG (Hydrostatic)
 80 PSIG 80 PSIG (Air)

Other testing available upon request.

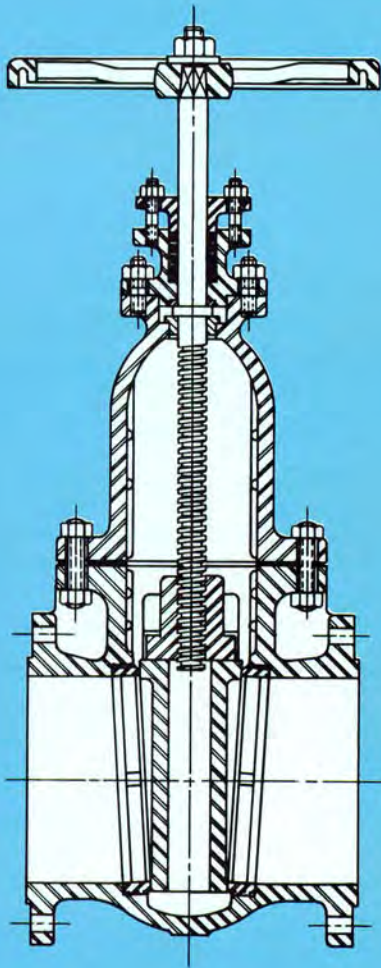


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Cast Steel **NRS Gate Valves**

FIG. No. N15F-FLANGED
FIG. No. N15W-BUTTWELD

CLASS
150 Lb



FEATURES

- Non-Rising Stem-NRS
- Solid wedge renewable seat rings
- Bosses for drains or bypasses
- Operating nuts available

DIMENSIONS

SIZES	FACE TO FACE in.	CENTER TO TOP in.	DIA HAND-WHEEL in.
2"	7	12 $\frac{3}{4}$	7
2 $\frac{1}{2}$ "	7 $\frac{1}{2}$	13 $\frac{1}{2}$	7
3"	8	15	7 $\frac{7}{8}$
4"	9	17 $\frac{1}{4}$	8 $\frac{3}{8}$
6"	10 $\frac{1}{2}$	23	12 $\frac{1}{2}$
8"	11 $\frac{1}{2}$	27	12 $\frac{1}{2}$
10"	13	31 $\frac{5}{8}$	14
12"	14	35 $\frac{5}{8}$	15 $\frac{3}{4}$
14"	15	41	17 $\frac{3}{4}$
16"	16	43 $\frac{3}{8}$	19 $\frac{3}{4}$
18"	17	47 $\frac{1}{2}$	22
20"	18	52	24 $\frac{3}{8}$

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
WEDGE	SEE TRIM CHART*
SEAT RING	SEE TRIM CHART*
BONNET	ASTM A216 GR WCB
STEM	SEE TRIM CHART*
PACKER BOX	ASTM A216 GR WCB
GLAND FLANGE	ASTM A216 GR WCB
HANDWHEEL	CARBON STEEL OR NODULAR IRON
WASHER	CARBON STEEL
HANDWHEEL NUT	CARBON STEEL
GLAND BOLT	BRASS
PACKER BOX BOLT	ASTM A307 GR B
GLAND BOLT NUTS	BRASS
PACKER BOX BOLT NUTS	BRASS
STUDS	ASTM A307 GR B
NUTS	ASTM A194 GR 2H
GASKET	SOFT IRON
BEARING	BRONZE
PACKING	NON-ASBESTOS
GLAND	BRASS
WEDGE NUT	BRONZE

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

Applicable Standards

Steel Valves, ANSI B16.34, Std. CL.
Face-to-Face, End-to-End, ANSI B16.10
End Flanges, ANSI B16.5
Weld Ends, ANSI B16.25

Tests

API 598
Shell: 450 PSIG Hydrostatic
Seat: 315 PSIG Hydrostatic
80 PSIG Air
Other testing available upon request.



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MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG	
TEMPERATURE IN DEGREES F	150 LB. CLASS
-20 TO 100	285 PSIG
200	260
300	230
400	200
500	170
600	140
650	125
700	110
750	95
800	80
850	65
900	50
950	35
1000	20

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.

Cast Steel **NRS Gate Valves**

FIG. No. N30F-FLANGED
FIG. No. N30W-BUTTWELD

CLASS
300 LB

FEATURES

- Non-Rising Stem-NRS
- Solid wedge
- Square operating nuts
- Handwheels available if required

DIMENSIONS

SIZES	FACE TO FACE in.	CENTER TO TOP in.
2"	8½	13
3"	11½	14¾
3½-4"	12	17¼
6"	15½	21¼
8"	16½	26½
10"	18	32
12"	19¾	36
14"	30	42
16"	33	46
18"	36	51
20"	39	53

NOTES:

1. VALVES CAN BE SUPPLIED WITH HANDWHEELS OR SQUARE OPERATING NUTS.
2. VALVES CAN BE SUPPLIED WITH BUTTWELD ENDS.

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
BONNET	ASTM A216 GR WCB
WEDGE	SEE TRIM CHART*
STEM	SEE TRIM CHART*
GLAND FOLLOWER	ASTM B62
BUSHING	ASTM A182 GR F6
THRUSH WASHER	ASTM B124
GLAND FLANGE	ASTM B148 GR 955
PACKING	TEFLON CHEVRON
GLAND BOLTS	ASTM B124
GLAND NUTS	ASTM B124
SQUARE NUT	MALLEABLE CAST IRON
WASHER	STEEL
NUT	ASTM A194 GR 2H
NUTS	ASTM A194 GR 2H
STEM BUSHING	STEM ASTM B148 GR 955
GASKET	SOFT-IRON
STUDS	ASTM A193 GR B7
NUTS	ASTM A19 GR 2H
BUSHING	ASTM B62

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

Applicable Standards

Steel Valves, ANSI B16.34, Std. CL.
Face-to-Face, End-to-End, ANSI B16.10
End Flanges, ANSI B16.5
Weld Ends, ANSI B16.25

Tests

API 598
Shell: 815 PSIG Hydrostatic
Seat: 1125 PSIG Hydrostatic
80 PSIG Air
Other testing available upon request.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG

TEMPERATURE IN DEGREES F	300 LB. CLASS
-20 TO 100	740 PSIG
200	675
300	655
400	635
500	600
600	550
650	535
700	535
750	505
800	410
850	270
900	170
950	105
1000	50

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.



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Cast Steel **Globe & Angle Valves**

GLOBE
FIG. No. 152F-FLANGED
FIG. No. 152W-BUTTWELD

ANGLE
FIG. No. 153F-FLANGED
FIG. No. 153W-BUTTWELD

CLASS
150Lb

FEATURES

- Rising Handwheel, Bolted Bonnet-OS&Y
- Renewable seat rings (Threaded or welded)
- Back seat bushing allows repacking under pressure
- Bossed for bypass
- Stop-check design—optional

DIMENSIONS

SIZES	FACE TO FACE in.	CENTER TO FACE (angles) in.	CENTER TO TOP OPEN in.	DIA HAND-WHEEL in.
2"	8	4	13 $\frac{3}{8}$	8 $\frac{7}{8}$
2 $\frac{1}{2}$ "	8 $\frac{1}{2}$	4 $\frac{1}{4}$	14 $\frac{1}{2}$	8 $\frac{7}{8}$
3"	9 $\frac{1}{2}$	4 $\frac{3}{4}$	16 $\frac{1}{2}$	11 $\frac{7}{8}$
3 $\frac{1}{2}$ "	10 $\frac{1}{2}$	5 $\frac{1}{4}$	17 $\frac{3}{8}$	11 $\frac{7}{8}$
4"	11 $\frac{1}{2}$	5 $\frac{3}{4}$	19	12 $\frac{3}{4}$
5"	14	7	24	12 $\frac{3}{4}$
6"	16	8	24	17 $\frac{3}{4}$
8"	19 $\frac{1}{2}$	9 $\frac{3}{4}$	26 $\frac{3}{4}$	21 $\frac{1}{8}$
10"	24 $\frac{1}{2}$	12 $\frac{1}{4}$	30	30
12"	27 $\frac{1}{2}$	13 $\frac{3}{4}$	33 $\frac{3}{8}$	30
14"	31	15 $\frac{1}{2}$	56	31 $\frac{1}{2}$
16"	36	18	64	35 $\frac{1}{2}$

MATERIAL SPECIFICATIONS

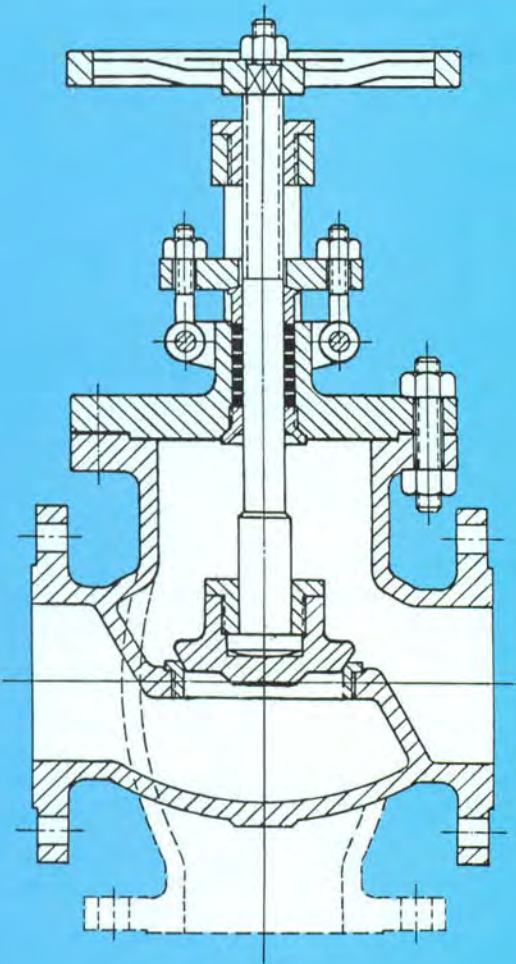
PART	MATERIAL
BODY	ASTM A216 GR WCB
BONNET	ASTM A216 GR WCB
DISC	SEE TRIM CHART*
STEM	SEE TRIM CHART*
HANDWHEEL	ASTM A197
SEAT RING	SEE TRIM CHART*
BACKSEAT BUSHING	ASTM A479-410
PACKING GLAND	STEEL CHROME PLATED
GLAND FLANGE	ASTM A105
YOKE BUSHING	ASTM A439 GR D2C or ALUMINUM BRONZE
BONNET BOLT	ASTM A193 GRB7
BONNET NUT	ASTM A194 GR2H
HINGE BOLT	ASTM A307 GR B
HINGE NUT	ASTM A307 GR B
HINGE PIN	STEEL CHROME PLATED
LOCK NUT	ASTM A479-410
WASHER	STEEL
HANDLE NUT	ASTM A307 GR B
PACKING	NON-ASBESTOS
GASKET	SOFT IRON

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG	
TEMPERATURE IN DEGREES F	150 LB. CLASS
-20 TO 100	285 PSIG
200	260
300	230
400	200
500	170
600	140
650	125
700	110
750	95
800	80
850	65
900	50
950	35
1000	20

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.



Applicable Standards

Steel Valves, ANSI B16.34, Std. CL.
Face-to-Face, End-to-End, ANSI B16.10
End Flanges, ANSI B16.5
Weld Ends, ANSI B16.25

Tests

API 598
Shell: 450 PSIG Hydrostatic
Seat: 315 PSIG Hydrostatic
80 PSIG Air
Other testing available upon request.



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Cast Steel **Globe & Angle Valves**

GLOBE
FIG. No. 302F-FLANGED
FIG. No. 302W-BUTTWELD

ANGLE
FIG. No. 303F-FLANGED
FIG. No. 303W-BUTTWELD

CLASS
300 Lb

FEATURES

- Rising Handwheel, Bolted Bonnet-OS&Y
- Renewable seat rings (Threaded or welded)
- Back seat bushing allows repacking under pressure
- Bossed for bypass
- Stop-check design—optional

DIMENSIONS

SIZES	FACE TO FACE in.	CENTER TO FACE TO (angles) in.	CENTER TO TOP OPEN in.	DIA HAND-WHEEL in.
2"	10½	5¼	13¾	9
2½"	11½	5¾	15¾	9
3"	12½	6¼	16½	13
4"	14	7	19¾	14
5"	15¼	7¾	21½	15¼
6"	17½	8¾	24¾	17¾
8"	22	11	31¼	22
10"	24½	12¼	*	*
12"	28	14	*	*
14"	31	15½	*	*
16"	34	17	*	*

*GEAR ACTUATOR RECOMMENDED

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
BONNET	ASTM A216 GR WCB
DISC	SEE TRIM CHART*
STEM	SEE TRIM CHART*
HANDWHEEL	ASTM A197
SEAT RING	SEE TRIM CHART*
BACKSEAT BUSHING	ASTM A479-410
PACKING GLAND	STEEL CHROME PLATED
GLAND FLANGE	ASTM A105
YOKE BUSHING	ASTM A439 GR D2C or ALUMINUM BRONZE
BONNET BOLT	ASTM A193 GRB7
BONNET NUT	ASTM A194 GR2H
HINGE BOLT	ASTM A307 GR B
HINGE NUT	ASTM A307 GR B
HINGE PIN	STEEL CHROME PLATED
LOCK NUT	ASTM A479-410
WASHER	STEEL
HANDLE NUT	ASTM A307 GR B
PACKING	NON-ASBESTOS
GASKET	SOFT IRON

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

Applicable Standards

Steel Valves, ANSI B16.34, Std. CL
Face-to-Face, End-to-End, ANSI B16.10
End Flanges, ANSI B16.5
Weld Ends, ANSI B16.25

Tests

API 598
Shell: 1125 PSIG Hydrostatic
Seat: 815 PSIG Hydrostatic
80 PSIG Air
Other testing available upon request.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG

TEMPERATURE IN DEGREES F	300 LB. CLASS
-20 TO 100	740 PSIG
200	675
300	655
400	635
500	600
600	550
650	535
700	535
750	505
800	410
850	270
900	170
950	105
1000	50

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.



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Cast Steel **Globe Valves**

FIG. No. 602F-FLANGED
FIG. No. 602W-BUTTWELD

CLASS
600 Lb

FEATURES

- Rising Handwheel, Bolted Bonnet-OS&Y
- Renewable seat rings (Threaded or welded)
- Back seat bushing allows repacking under pressure
- Bossed for bypass
- Stop-check design—optional

DIMENSIONS

SIZES	FACE TO FACE in.	CENTER TO TOP OPEN in.	DIA HAND-WHEEL in.
2"	11½	15½	9½
2½"	13	17	11
3"	14	19	13
4"	17	21	14
5"	20	25	15¼
6"	22	26⅞	20
8"	26	*	*
10"	31	*	*
12"	33	*	*

*GEAR ACTUATOR RECOMMENDED

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
BONNET	ASTM A216 GR WCB
DISC	SEE TRIM CHART*
STEM	SEE TRIM CHART*
HANDWHEEL	ASTM A197
SEAT RING	SEE TRIM CHART*
BACKSEAT BUSHING	ASTM A479-410
PACKING GLAND	STEEL CHROME PLATED
GLAND FLANGE	ASTM A105
YOKE BUSHING	ASTM A439 GR D2C OR ALUMINUM BRONZE
BONNET BOLT	ASTM A193 GRB7
BONNET NUT	ASTM A194 GR2H
HINGE BOLT	ASTM A307 GR B
HINGE NUT	ASTM A307 GR B
HINGE PIN	STEEL CHROME PLATED
LOCK NUT	ASTM A479-410
WASHER	STEEL
HANDLE NUT	ASTM A307 GR B
PACKING	NON-ASBESTOS
GASKET	RING JOINT-IRON

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

Applicable Standards

Steel Valves, ANSI B16.34, Std. CL.
Face-to-Face, End-to-End, ANSI B16.10
End Flanges, ANSI B16.5
Weld Ends, ANSI B16.25

Tests

API 598
Shell: 2250 PSIG Hydrostatic
Seat: 1630 PSIG Hydrostatic
80 PSIG Air
Other testing available upon request.



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MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG

TEMPERATURE IN DEGREES F	600 LB. CLASS
-20 TO 100	1480 PSIG
200	1350
300	1315
400	1270
500	1200
600	1095
650	1075
700	1965
750	1010
800	825
850	535
900	345
950	205
1000	105

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.

Cast Steel **Globe Valves**

FLANGED: FIG. No. 902F CLASS | **FIG. No. 1502F CLASS**
BUTTWELD: FIG. No. 902W 900 Lb | **FIG. No. 1502W 1500 Lb**

FEATURES

- Rising Handwheel, Bolted Bonnet-OS&Y
- Renewable seat rings (Threaded or welded)
- Back seat bushing allows repacking under pressure
- Bossed for bypass
- Stop-check design—optional

DIMENSIONS

900 PSI CAST STEEL GLOBE VALVES

SIZES	FACE TO FACE in.	CENTER TO TOP OPEN in.	DIA HAND-WHEEL in.
3"	15	22¾	14
4"	18	26½	21½
6"	24	36	20*

*HAMMERBLOW WHEEL

1500 PSI CAST STEEL GLOBE VALVES

SIZES	FACE TO FACE in.	CENTER TO TOP OPEN in.	DIA HAND-WHEEL in.
2"	14½	24	11½
3"	18½	26	18
4"	21½	28	26
6"	27¾	37½	20*

*HAMMERBLOW WHEEL

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
SEAT RING	SEE TRIM CHART*
DISC	SEE TRIM CHART*
STEM	SEE TRIM CHART*
BONNET STUD	ASTM A193 GR B7
BONNET NUT	ASTM A194 GR2H
BONNET GASKET	ARMCO IRON
BONNET	ASTM A216 GR WCB
BACK SEAT BUSHING	ASTM A182 GR F6
STEM PACKING	NON-ASBESTOS
GLAND EYE BOLT	ASTM A307 GR B
GLAND	ASTM A182 GR F6
GLAND FLANGE	ASTM A105
GLAND EYE BOLT NUT	ASTM A307 GR B
STEM NUT	ASTM B148 GR 9D
HANDWHEEL	CARBON STEEL OR NODULAR IRON
HANDWHEEL NUT	CARBON STEEL

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

Applicable Standards

Steel Valves, ANSI B16.34, Std. CL.
 Face-to-Face, End-to-End, ANSI B16.10
 End Flanges, ANSI B16.5
 Weld Ends, ANSI B16.25

Tests

API 598
 Class 900 Lb. Class 1500 Lb.
 Shell: 3350 PSIG Shell: 5575 PSIG (Hydrostatic)
 Seat: 2450 PSIG 4080 PSIG (Hydrostatic)
 80 PSIG 80 PSIG (Air)

Other testing available upon request.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG

TEMPERATURE IN DEGREES F	900 LB. CLASS	1500 LB. CLASS
-20 TO 100	2220 PSIG	3705 PSIG
200	2025	3375
300	1970	3280
400	1900	3170
500	1795	2995
600	1640	2735
650	1610	2685
700	1600	2665
750	1510	2520
800	1235	2060
850	805	1340
900	515	860
950	310	515
1000	155	260

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.



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Cast Steel **Swing Check Valves**

FIG. No. 151F-FLANGED
FIG. No. 151W-BUTTWELD

CLASS
150 Lb

FEATURES

- Renewable seat rings (Threaded or welded)
- Bolted cover
- Optional lever and weight or spring
- Bosses for bypass

DIMENSIONS

SIZES	FACE TO FACE in.	CENTER TO TOP in.
2"	8	5½
2½"	8½	6¼
3"	9½	6⅞
4"	11½	8⅞
5"	13	9
6"	14	9⅞
8"	19½	11⅞
10"	24½	13
12"	27½	14⅞
14"	31	15⅞
16"	34	18¼
18"	38½	22
20"	38½	24
24"	51	28½
30"	60	32
36"	77	34

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
COVER	ASTM A216 GR WCB
DISC	SEE TRIM CHART*
SEAT RING	SEE TRIM CHART*
HANGER	ASTM A216 GR WCB
DISC NUT	ASTM A307 GR B
WASHER	STEEL
SPLIT PIN	ASTM A580 GR 304
COVER STUD	ASTM A193 GRB7
COVER NUT	ASTM A194 GR2H
HINGE PIN	ASTM A479 410
GASKET	SOFT IRON
SIDE PLUG	ASTM A307 GR B

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG	
TEMPERATURE IN DEGREES F	150 LB. CLASS
-20 TO 100	285 PSIG
200	260
300	230
400	200
500	170
600	140
650	125
700	110
750	95
800	80
850	65
900	50
950	35
1000	20

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.

Applicable Standards

Steel Valves, ANSI B16.34, Std. CL.
 Face-to-Face, End-to-End, ANSI B16.10
 End Flanges, ANSI B16.5
 End Flanges (30" and 36"), MSS-SP-44
 Weld Ends, ANSI B16.25

Tests

API 598
 Shell: 450 PSIG Hydrostatic
 Seat: 315 PSIG Hydrostatic
 80 PSIG Air
 Other testing available upon request.



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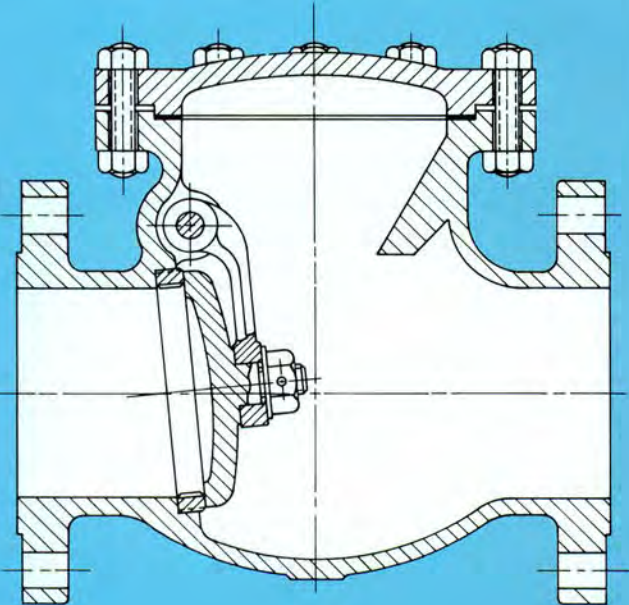
Cast Steel **Swing Check Valves**

FIG. No. 301F-FLANGED
FIG. No. 301W-BUTTWELD

CLASS
300 Lb

FEATURES

- Renewable seat rings (Threaded or welded)
- Bolted cover
- Optional lever and weight or spring
- Bosses for bypass



DIMENSIONS

SIZES	FACE TO FACE in.	CENTER TO TOP in.
2"	10½	6¾
2½"	11½	7½
3"	12½	7¾
4"	14	9
6"	17½	11
8"	21	12¾
10"	24½	15
12"	28	17½
14"	33	20
16"	34	20½
18"	38½	22½
20"	40	25
24"	53	29

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
COVER	ASTM A216 GR WCB
DISC	SEE TRIM CHART*
SEAT RING	SEE TRIM CHART*
HANGER	ASTM A216 GR WCB
DISC NUT	ASTM A307 GR B
WASHER	STEEL
SPLIT PIN	ASTM A580 GR 304
COVER STUD	ASTM A193 GRB7
COVER NUT	ASTM A194 GR2H
HINGE PIN	ASTM A479 410
GASKET	SOFT IRON
SIDE PLUG	ASTM A307 GR B

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

Applicable Standards

Steel Valves, ANSI B16.34, Std. CL.
 Face-to-Face, End-to-End, ANSI B16.10
 End Flanges, ANSI B16.5
 Weld Ends, ANSI B16.25

Tests

API 598
 Shell: 1125 PSIG Hydrostatic
 Seat: 815 PSIG Hydrostatic
 80 PSIG Air
 Other testing available upon request.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG

TEMPERATURE IN DEGREES F	300 LB. CLASS
-20 TO 100	740 PSIG
200	675
300	655
400	635
500	600
600	550
650	535
700	535
750	505
800	410
850	270
900	170
950	105
1000	50

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.



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Cast Steel **Swing Check Valves**

FIG. No. 601F-FLANGED
FIG. No. 601W-BUTTWELD

CLASS
600 Lb

FEATURES

- Bolted cover
- Renewable seat rings (threaded or welded)
- Bosses for drains or bypasses
- Outside lever and weight or spring available

DIMENSIONS

SIZES	FACE TO FACE in.	CENTER TO TOP in.
2"	11½	7¾
2½"	13	7⅞
3"	14	8¼
4"	17	10¼
6"	22	13
8"	26	17
10"	31	19
12"	33	20
14"	35	22½
16"	39	26
18"	43	28
20"	47	31
24"	55	34

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
COVER	ASTM A216 GR WCB
DISC	SEE TRIM CHART*
SEAT RING	SEE TRIM CHART*
HANGER	ASTM A216 GR WCB
DISC NUT	ASTM A307 GR B
WASHER	STEEL
SPLIT PIN	ASTM A580 GR 304
COVER STUD	ASTM A193 GR B7
COVER NUT	ASTM A194 GR 2H
HINGE PIN	ASTM A479 410
GASKET	RING JOINT-IRON
SIDE PLUG	ASTM A307 GR B

* SEE TRIM NOTES ON PAGE 4 FOR OPTIONAL TRIM MATERIALS.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG

TEMPERATURE IN DEGREES F	600 LB. CLASS
-20 TO 100	1480 PSIG
200	1350
300	1315
400	1270
500	1200
600	1095
650	1075
700	1965
750	1010
800	825
850	535
900	345
950	205
1000	105

(A)-Permissible, but not recommended for prolonged usage above approximately 800°F.

(B)-Chart depicts ratings for ASTM, A216 Gr WCB, for other materials refer to Pressure Temperature Chart on page 22.

Applicable Standards

Steel Valves, ANSI B16.34, Std. CL.
 Face-to-Face, End-to-End, ANSI B16.10
 End Flanges, ANSI B16.5
 Weld Ends, ANSI B16.25

Tests

API 598
 Shell: 2250 PSIG Hydrostatic
 Seat: 1630 PSIG Hydrostatic
 80 PSIG Air

Other testing available upon request.



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Cast Steel **Reduced Port Ball Valves**

FLANGED: CLASS | **FLANGED: CLASS**
FIG. No. C16F6RT 150 Lb | **FIG. No. C36F6RT 300 Lb**

FEATURES

- Blow-out proof stem
- Anti-static grounding
- 10" and 12" valves are trunion mounted design

DIMENSIONS

150 PSI CAST STEEL REDUCED PORT BALL VALVES

SIZES	FACE TO FACE in.	CENTER TO TOP in.	LENGTH OF LEVER in.
2"	7	4½	9
2½"	7½	4¾	11
3"	8	5¼	14
4"	9	6¼	16
6"	10½	7¾	20
8"	11½	11	24
10"	13	12¾	30
12"	14	15½	36

300 PSI CAST STEEL REDUCED PORT BALL VALVES

SIZES	FACE TO FACE in.	CENTER TO TOP in.	LENGTH OF LEVER in.
2"	8½	4½	6
2½"	9½	4¾	11
3"	11½	5¼	14
4"	12	6¼	16
6"	15½	7¾	20
8"	16½	11	24
10"	18	12¾	30
12"	19¾	15½	36

MATERIAL SPECIFICATIONS

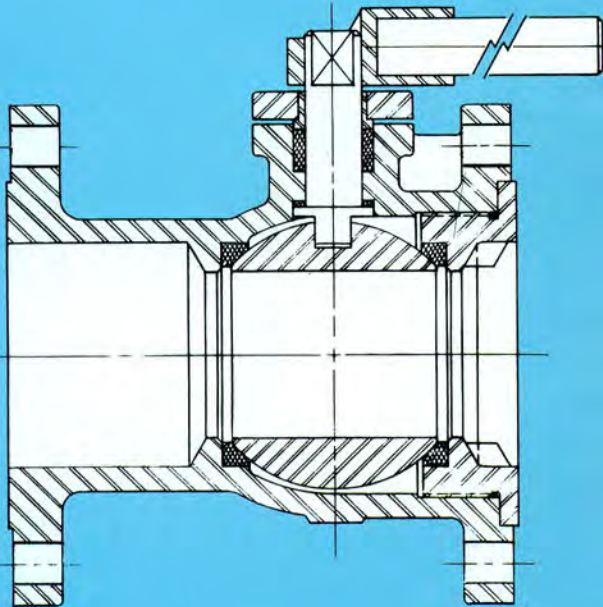
PART	MATERIAL
BODY	ASTM A216 GR WCB
RETAINER	ASTM A216 GR WCB
BALL	ASTM A351 GR CF8M
STEM	ASTM A182 GR F316
COVER	ASTM A216 GR WCB
LEVER BOSS	ASTM A351 GR CF8M
LEVER	ASTM A120 (PIPE)*
SEAT	REINFORCED TEFLON
GLAND RING	ASTM A182 GR F316
GLAND BOLT	ASTM A276 GR F316
JOINT BOLT	ASTM A276 GR F316
WASHER	ASTM A276 GR F316
WASHER	TEFLON
PACKING	TEFLON
GASKET	TEFLON
SPRING	STAINLESS STEEL

*GEAR OPERATORS ARE RECOMMENDED FOR SIZES 8" AND LARGER.

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG

TEMPERATURE IN DEGREES F	150 LB. CLASS	300 LB. CLASS
-20 TO 100	285 PSIG	740 PSIG
200	260	675
300	230	655
400	200	635

(A)-Temperature limited to maximum rating for TFE and PTFE materials.



Applicable Standards

Shell & Wall Thickness: ANSI B16.34, Std. CL.
 Face-to-Face: ANSI B16.10
 Flange Dimensions: ANSI B16.5

Tests

API 598
 Class 150 Lb. Class 300 Lb.
 Shell: 450 PSIG Shell: 1125 PSIG (Hydrostatic)
 Seat: 80 PSIG Seat: 80 PSIG (Air)

Optional high pressure test per 598 available upon request.



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Cast Steel Full Port Ball Valves

FLANGED: CLASS | **FLANGED: CLASS**
FIG. No. C17F6RT 150 Lb | **Fig. No. C37F6RT 300 Lb**

FEATURES

- Blow-out proof stem
- Anti-static grounding
- 10" and 12" valves are trunion mounted design

MATERIAL SPECIFICATIONS

PART	MATERIAL
BODY	ASTM A216 GR WCB
BONNET	ASTM A216 GR WCB
BALL	ASTM A351 GR CF8M
YOKE	ASTM A216 GR WCB
STEM	ASTM A182 GR F316
LEVER	ASTM A216 GR WCB*
GLAND FLANGE	ASTM A216 GR WCB
GLAND RING	ASTM A182 GR F316
STOPPER	STAINLESS STEEL
BALL SEAT	REINFORCED TEFLON
THRUST WASHER	VIRGIN TEFLON
BONNET STUD	ASTM A193 GR B7
BONNET NUT	ASTM A194 GR 2H
SNAP RING	STEEL CHROME PLATED
PACKING	TEFLON
GASKET	TEFLON
SPRING	STAINLESS STEEL

*GEAR OPERATORS ARE RECOMMENDED FOR SIZES 6" AND LARGER.

DIMENSIONS 150 PSI CAST STEEL FULL PORT BALL VALVES

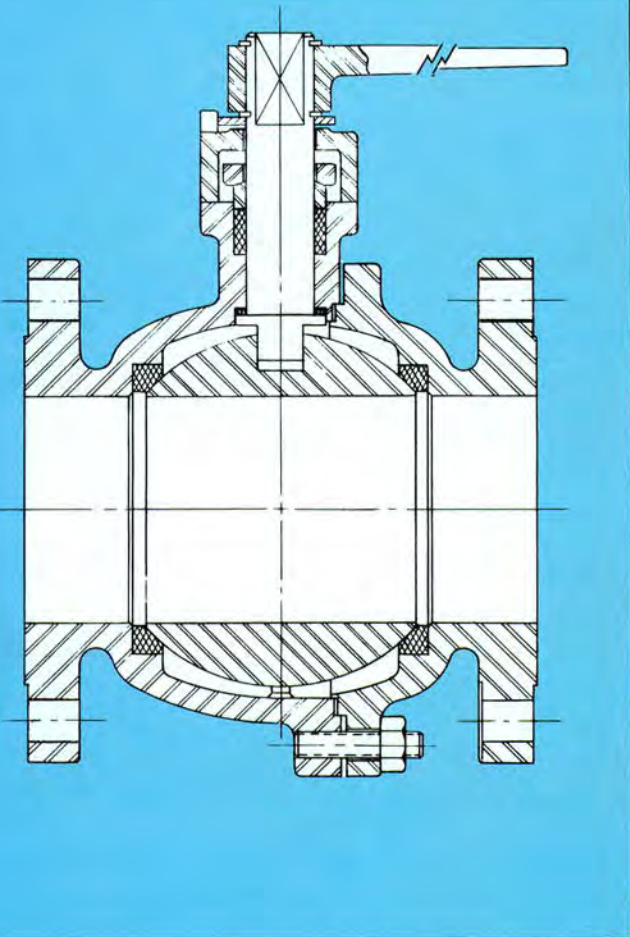
SIZES	FACE TO FACE in.	CENTER TO TOP in.	LENGTH OF LEVER in.
1/2"	4 1/4	3	5
3/4"	4 5/8	3 1/8	5
1"	5	3 3/8	6 1/8
1 1/2"	6 1/2	4 1/8	9
2"	7	4 3/8	11
2 1/2"	7 1/2	5 1/4	14
3"	8	7 3/8	16
4"	9	8 1/2	18
6"	15 1/2	12 7/8	24
8"	18	15 3/8	30
10"	21	17 1/8	40
12"	24	18 3/4	48

300 PSI CAST STEEL FULL PORT BALL VALVES

SIZES	FACE TO FACE in.	CENTER TO TOP in.	LENGTH OF LEVER in.
1/2"	5 1/2	3	5
3/4"	6	3 1/8	5
1"	6 1/2	3 3/8	6
1 1/2"	7 1/2	4 1/8	6
2"	8 1/2	4 3/8	11
2 1/2"	9 1/2	5 1/4	14
3"	11 1/8	7 3/8	16
4"	12	8 1/2	18
6"	15 7/8	12 7/8	24
8"	19 3/4	15 3/8	30
10"	22 3/8	17 1/8	40
12"	25 1/2	18 3/4	48

MAXIMUM ALLOWABLE NON-SHOCK WORKING PRESSURE IN PSIG		
TEMPERATURE IN DEGREES F	150 LB. CLASS	300 LB. CLASS
-20 TO 100	285 PSIG	740 PSIG
200	260	675
300	230	655
400	200	635

(A)-Temperature limited to maximum rating for TFE and PTFE materials.



Applicable Standards

Shell & Wall Thickness: ANSI B16.34, Std. CL.
 Face-to-Face: ANSI B16.10
 Flange Dimensions: ANSI B16.5

Tests

API 598
 Class 150 Lb. Class 300 Lb.
 Shell: 450 PSIG Shell: 1125 PSIG (Hydrostatic)
 Seat: 80 PSIG 80 PSIG (Air)

Optional high pressure test per 598 available upon request.



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Pressure Temperature Ratings

(COMPLY WITH ANSI B16.34—1981—STD CLASS VALVES)

WORKING PRESSURE (PSIG)

CLASS	TEMP °F	(1) A216 WCB	(2) A217 C5	(3) A217 WC6	(3) A217 WC9	(4) A352 LCB	(4) A352 LC3	
150	-20 to 100	285	290	290	290	265	290	
	200	260	260	260	260	250	260	
	300	230	230	230	230	230	230	
	400	200	200	200	200	200	200	
	500	170	170	170	170	170	170	
	600	140	140	140	140	140	140	
	650	125	125	125	125	125	125	
	700	110	110	110	110	—	—	
	750	95	95	95	95	—	—	
	800	80	80	80	80	—	—	
300	850	65	65	65	65	—	—	
	900	50	50	50	50	—	—	
	950	35	35	35	35	—	—	
	1000	20	20	20	20	—	—	
	-20 to 300	740	750	750	750	695	750	
	200	675	750	710	715	655	750	
	300	655	730	675	675	640	730	
	400	635	705	660	650	620	705	
	500	600	665	640	640	585	665	
	600	550	605	605	605	535	605	
600	650	535	590	590	590	525	590	
	700	535	570	570	570	—	—	
	750	505	530	530	530	—	—	
	800	410	500	510	510	—	—	
	850	270	440	485	485	—	—	
	900	170	355	450	450	—	—	
	950	105	260	380	380	—	—	
	1000	50	190	225	270	—	—	
	600	-20 to 600	1480	1500	1500	1500	1390	1500
		200	1350	1500	1425	1430	1315	1500
300		1315	1455	1345	1355	1275	1455	
400		1270	1410	1315	1295	1235	1410	
500		1200	1330	1285	1280	1165	1330	
600		1095	1210	1210	1210	1065	1210	
650		1075	1175	1175	1175	1045	1175	

WORKING PRESSURE (PSIG)

CLASS	TEMP °F	(1) A216 WCB	(2) A217 C5	(3) A217 WC6	(3) A217 WC9	(4) A352 LCB	(4) A352 LC3
600	700	1065	1135	1135	1135	—	—
	750	1010	1065	1065	1065	—	—
	800	825	995	1015	1015	—	—
	850	535	880	975	975	—	—
	900	345	705	900	900	—	—
	950	205	520	755	755	—	—
	1000	105	385	445	535	—	—
	900	-20 to 100	2200	2250	2250	2250	2085
200		2025	2250	2135	2150	1970	2250
300		1970	2185	2020	2030	1915	2185
400		1900	2115	1975	1945	1850	2115
500		1840	1995	1925	1920	1745	1995
600		1640	1815	1815	1815	1600	1815
650		1610	1765	1765	1765	1570	1765
700		1600	1705	1705	1705	—	—
750		1510	1595	1595	1595	—	—
800		1235	1490	1525	1525	—	—
850		805	1315	1460	1460	—	—
900		510	1060	1350	1350	—	—
1500	950	310	780	1130	1130	—	—
	1000	155	575	670	805	—	—
	-20 to 100	3705	3750	3750	3750	3470	3750
	200	3375	3750	3560	3580	3280	3750
	300	3280	3640	3365	3385	3190	3640
	400	3170	3530	3290	3240	3085	3530
	500	2995	3325	3210	3200	2910	3325
	600	2735	3025	3025	3025	2665	3025
	650	2685	2940	2940	2940	2615	2940
	700	2665	2840	2840	2840	—	—
	750	2520	2660	2660	2660	—	—
	800	2060	2485	2540	2540	—	—
850	1340	2195	2435	2435	—	—	
900	860	1765	2245	2245	—	—	
950	515	1305	1885	1885	—	—	
1000	260	960	1115	1340	—	—	

NOTES:

- (1) PERMISSIBLE, BUT NOT RECOMMENDED FOR PROLONGED USAGE ABOVE ABOUT 800° F.
- (2) NOT TO BE USED OVER 1050° F. FLANGED END RATINGS TERMINATE AT 1000° F.
- (3) NOT TO BE USED OVER 1100° F. FLANGED END RATINGS TERMINATE AT 1000° F.
- (4) NOT TO BE USED OVER 650° F.

WILLIAM E.



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VALVE CORPORATION

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Steel Pipe Schedule Chart

Carbon and Alloy Steel Pipe Dimensions in Inches

Nominal Pipe Size	Outside Dia.	NOMINAL WALL THICKNESS												
		Sch. 10	Sch. 20	Sch. 30	Std. Wall	Sch. 40	Sch. 60	Extra Strong	Sch. 80	Sch. 100	Sch. 120	Sch. 140	Sch. 160	XX Strong
2	2.375	—	—	—	0.154	0.154	—	0.218	0.218	—	—	—	0.343	0.436
2½	2.875	—	—	—	0.203	0.203	—	0.270	0.270	—	—	—	0.375	0.552
3	3.500	—	—	—	0.216	0.216	—	0.300	0.300	—	—	—	0.438	0.600
3½	4.000	—	—	—	0.226	0.226	—	0.318	0.318	—	—	—	—	0.636
4	4.500	—	—	—	0.237	0.237	—	0.337	0.337	—	0.438	—	0.531	0.674
5	5.563	—	—	—	0.258	0.258	—	0.375	0.375	—	0.500	—	0.625	0.750
6	6.625	—	—	—	0.280	0.280	—	0.432	0.432	—	0.562	—	0.718	0.864
8	8.625	—	0.250	0.277	0.322	0.322	0.406	0.500	0.500	0.593	0.719	0.812	0.906	0.875
10	10.750	—	0.250	0.307	0.365	0.365	0.500	0.500	0.593	0.718	0.844	1.000	1.125	—
12	12.750	—	0.250	0.330	0.375	0.406	0.562	0.500	0.687	0.843	1.000	1.125	1.312	—
14	14.000	0.250	0.312	0.375	0.375	0.438	0.593	0.500	0.750	0.937	1.094	1.250	1.406	—
16	16.000	0.250	0.312	0.375	0.375	0.500	0.656	0.500	0.848	1.031	1.219	1.438	1.593	—
18	18.000	0.250	0.312	0.438	0.375	0.562	0.750	0.500	0.937	1.156	1.375	1.562	1.781	—
20	20.000	0.250	0.375	0.500	0.375	0.593	0.812	0.500	1.031	1.281	1.500	1.750	1.968	—
24	24.000	0.250	0.375	0.562	0.375	0.688	0.968	0.500	1.218	1.531	1.812	2.062	2.343	—
30	30.000	0.312	0.500	0.625	0.375	—	—	0.500	—	—	—	—	—	—
36	—	0.312	0.500	0.625	0.375	0.750	—	0.500	—	—	—	—	—	—

Conversion Data

Power

1 horsepower = 33,000 ft. lb. per min.
 1 horsepower = 550 ft. lb. per sec.
 1 horsepower = 2,546.5 B.T.U. per hr.
 1 horsepower = 745.7 watts
 1 watt = 0.00134 horsepower
 1 watt = 44.26 ft. lbs. per min.

Flow

1 cu. ft. per sec. = 448.83 gal. per min.
 1 cu. ft. per sec. = 1699.3 liters per min.
 1 U.S. gal. per min. = 0.002228 cu. ft. per sec.
 1 U.S. gal. per min. = 0.06308 liters per sec.
 1 cu. cm. per sec. = 0.0021186 cu. ft. per min.

Weight

1 ounce av. = 28.35 g.
 1 lb. av. = 453.59 g.
 1 gram = 0.03527 oz. av.
 1 kg. = 2.205 lb. av.
 1 cu. ft. of water = 62.425 lb.
 1 U.S. gal. of water = 8.33 lb.
 1 cu. in. of water = 0.0361 lb.
 1 British gal. of water = 10.04 lb.
 1 cu. ft. of air at 32°F. & 1 atm = 0.080728 lb.

Heat Transfer

1 B.T.U. per sq. ft. = .2712 g. cal. per sq. cm.
 1 g. calorie per sq. cm. = 3.687 B.T.U. per sq. ft.
 1 B.T.U. per hr. per sq. ft. per °F. = 4.88 kg. cal. per hr. per sq. m. per °C
 1 kg. cal. per hr. per sq. m. per °C. = .205 B.T.U. per hr. per sq. ft. per °F
 1 Boiler Horsepower = 33479 B.T.U. per hr.

Pressure

1 in. of water = 0.03613 lb. per sq. in.
 1 in. of water = 0.07355 in. of Hg.
 1 ft. of water = 0.4335 lb. per sq. in.
 1 ft. of water = 0.88265 in. of Hg.
 1 in. of mercury = 0.49116 lb. per sq. in.
 1 in. of mercury = 13.596 in. of water
 1 in. of mercury = 1.13299 ft. of water
 1 atmosphere = 14.696 lb. per sq. in.
 1 atmosphere = 760 mm. of Hg.
 1 atmosphere = 29.921 in. of Hg.
 1 atmosphere (metric/kg/C°) = 14.22 P.S.I.
 1 atmosphere = 33,899 ft. of water
 1 lb. per sq. in. = 27.70 in. of water
 1 lb. per sq. in. = 2.036 in. of Hg.
 1 lb. per sq. in. = .0703066 kg. per sq. cm.
 1 kg per sq. cm. = 14.233 lb. per sq. in.
 1 dyne per sq. cm. = .0000145 lb. per sq. in.
 1 micron = .00001943 lb. per sq. in.

Velocity

1 ft. per sec. = 30.48 cm. per sec.
 1 cm. per sec. = .032808 ft. per sec.

Viscosity

1 Centipoise = .000672 lb. per ft. sec.
 1 Centistoke = .00001076 sq. ft. per sec.

Density

1 lb. per cu. ft. = 16.018 kg. per cu. meter
 1 lb. per cu. ft. = .0005787 lb. per cu. in.
 1 kg. per cu. meter = 0.06243 lb. per cu. ft.
 1 g. per cu. cm. = 0.03613 lb. per cu. in.

Energy

1 B.T.U. = 777.97 ft. lbs.
 1 erg = 9.4805 x 10⁻¹¹ B.T.U.
 1 erg = 7.3756 x 10⁻⁸ ft. lbs.
 1 kilowatt hour = 2.655 x 10⁶ ft. lbs.
 1 kilowatt hour = 1.3410 h.p. hr.
 1 kg. calorie = 3.968 B.T.U.

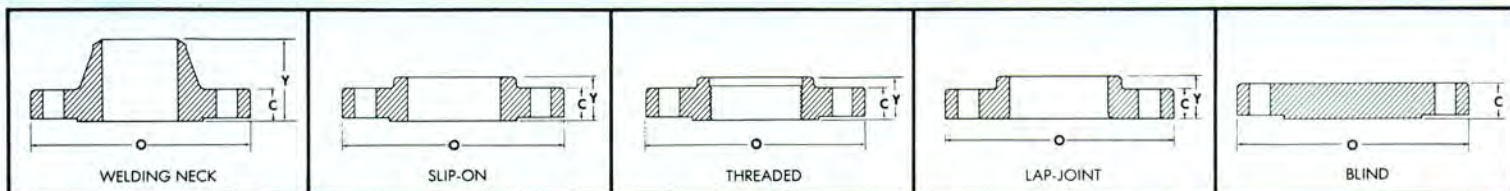
Volume

1 cu. in. = 16.387 cu. cm.
 1 cu. ft. = 1728 cu. in.
 1 cu. ft. = 7.4805 U.S. gal.
 1 cu. ft. = 6.229 British gal.
 1 cu. ft. = 28.317 liters
 1 U.S. gal. = 0.1337 cu. ft.
 1 U.S. gal. = 231 cu. in.
 1 U.S. gal. = 3.785 liters
 1 British gal. = 1.20094 U.S. gal.
 1 British gal. = 277.3 cu. in.
 1 British gal. = 4.546 liters
 1 liter = 61.023 cu. in.
 1 liter = 0.03531 cu. ft.
 1 liter = 0.2642 U.S. gal.

Temperature

Temperature Fahrenheit (F) = 9/5 Centigrade (C) + 32 = 9/4 Re + 32
 Temperature Centigrade (C) = 5/9 (Fahrenheit (F) - 32) = 5/4 Re
 Temperature Reaumur (Re) = 4/9 (Fahrenheit (F) - 32) = 4/5 C
 Absolute Temperature Centigrade or Kelvin (K) = Degrees C + 273.16
 Absolute Temperature Fahrenheit or Rankine (R) = Degrees F + 459.69

Flange Dimensions



Nom. Pipe Size	150 LB. FLANGES								300 LB. FLANGES								400 LB. FLANGES								Nom. Pipe Size
	O	C ^①	Y ^①			Bolt Circle	No. and Size of Holes	O	C ^①	Y ^①			Bolt Circle	No. and Size of Holes	O	C ^①	Y ^①			Bolt Circle	No. and Size of Holes				
Weld Neck	Slip On Thrd.	Lap-Joint	Weld Neck	Slip On Thrd.	Lap-Joint			Weld Neck	Slip On Thrd.	Lap-Joint	Weld Neck	Slip On Thrd.			Lap-Joint	Weld Neck	Slip On Thrd.	Lap-Joint							
1/2	3 1/2	7/16	1 7/8	5/8	5/8	2 3/8	4-5/8	3 3/4	9/16	2 1/16	7/8	7/8	2 5/8	4-5/8	3 3/4	9/16	2 1/16	7/8	7/8	2 5/8	4-5/8	3 3/4	1/2		
3/4	3 3/8	1 1/2	2 1/16	5/8	5/8	2 3/4	4-5/8	4 1/8	5/8	2 1/4	1	1	3 3/4	4-3/4	4 1/8	5/8	2 1/4	1	1	3 3/4	4-3/4	4 1/8	3/4		
1	4 1/4	1 1/2	2 1/16	1 1/16	1 1/16	3 1/8	4-3/8	4 3/4	1 1/16	2 1/16	1 1/16	1 1/16	3 3/2	4-3/4	4 3/8	1 1/16	2 1/16	1 1/16	1 1/16	3 3/2	4-3/4	4 3/8	1		
1 1/4	4 5/8	1 5/8	2 1/4	1 1/4	1 1/4	3 1/2	4-3/8	5 1/4	1 1/4	2 1/4	1 1/4	1 1/4	3 3/2	4-3/4	5 1/4	1 1/4	2 1/4	1 1/4	1 1/4	3 3/2	4-3/4	4 3/8	1 1/4		
1 1/2	5	1 5/8	2 1/16	1 1/2	1 1/2	3 3/8	4-3/8	6 1/8	1 1/2	2 1/16	1 1/2	1 1/2	4 1/2	4-3/8	6 1/8	1 1/2	2 1/16	1 1/2	1 1/2	4 1/2	4-3/8	4 3/8	1 1/2		
2	6	2	1	1	1	4 1/4	4-3/4	6 1/2	1 3/4	2 3/4	1 3/4	1 3/4	5	8-3/4	6 1/2	1	2 3/4	1 3/4	1 3/4	5	8-3/4	6 1/2	2		
2 1/2	7	2 1/8	2 3/4	1 3/8	1 3/8	5 1/2	4-3/4	7 1/2	1 3/8	3	1 3/8	1 3/8	5 3/8	8-3/8	7 1/2	1 3/8	2 3/4	1 3/8	1 3/8	5 3/8	8-3/8	7 1/2	2 1/2		
3	7 1/2	2 1/2	2 3/4	1 3/4	1 3/4	6	4-3/4	8 1/4	1 3/4	3 3/8	1 3/4	1 3/4	6 3/8	8-7/8	8 1/4	1 3/4	2 3/4	1 3/4	1 3/4	6 3/8	8-7/8	8 1/4	3		
3 1/2	8 1/2	2 3/4	2 3/4	1 3/4	1 3/4	7	8-3/4	9	1 3/4	3 3/4	1 3/4	1 3/4	7 3/4	8-7/8	9	1 3/4	2 3/4	1 3/4	1 3/4	7 3/4	8-7/8	9	3 1/2		
4	9	3	3	1 3/4	1 3/4	7 1/2	8-3/4	10	1 3/4	3 3/8	1 3/8	1 3/8	7 3/8	8-7/8	10	1 3/8	2 3/2	2	2	7 3/8	8-7/8	10	4		
5	10	3 1/2	3 1/2	1 3/2	1 3/2	8 1/2	8-7/8	11	1 3/2	3 3/8	1 3/2	1 3/2	9 1/4	8-7/8	11	1 3/2	2 3/4	2 3/4	2 3/4	9 1/4	8-7/8	11	5		
6	11	4	3 1/2	1 3/2	1 3/2	9 1/2	8-7/8	12 1/2	1 3/2	3 3/8	1 3/2	1 3/2	10 3/4	12-1/2	11 1/2	1 3/2	2 3/4	2 3/4	10 3/4	10 3/4	12-1/2	11 1/2	6		
8	13 1/2	4 1/2	4	1 3/2	1 3/2	11 1/4	8-7/8	15	1 3/2	4 3/8	1 3/2	1 3/2	13	12-1/2	15	1 3/2	2 3/4	2 3/4	13	13	12-1 1/2	11 1/2	8		
10	16	5 1/4	4	1 3/2	1 3/2	14 1/4	12-1/2	17 1/2	1 3/2	4 3/8	1 3/2	1 3/2	15 1/4	16-1 1/2	17 1/2	1 3/2	2 3/4	2 3/4	15 1/4	15 1/4	16-1 1/2	11 1/2	10		
12	19	6 1/4	4 1/2	2 3/16	2 3/16	17	12-1/2	20 1/2	2	5 3/8	2 3/8	2 3/8	17 1/4	16-1 1/4	20 1/2	2	2 3/4	2 3/4	17 1/4	17 1/4	16-1 1/4	12	12		
14	21	7 1/8	5	2 1/4	3 3/8	18 3/4	12-1 1/8	23	2 3/8	5 3/8	3	4 3/8	20 1/4	20-1 1/4	23	2 3/8	3 3/8	4 3/8	20 1/4	20 1/4	20-1 1/4	14	14		
16	23 1/2	8 1/8	5	2 1/2	3 3/8	21 1/4	16-1 1/8	25 1/2	2 3/4	5 3/4	3 1/4	4 3/4	22 1/2	20-1 3/8	25 1/2	2 3/4	3 3/8	5	22 1/2	22 1/2	20-1 1/2	16	16		
18	25	9 1/8	5 1/2	2 1/2	3 3/8	22 3/4	16-1 1/4	28	2 3/4	6 1/4	3 1/2	5 1/2	24 1/4	24-1 3/8	28	2 3/4	3 3/8	5 1/2	24 1/4	24 1/4	24-1 1/2	18	18		
20	27 1/2	10 1/8	5 1/2	2 3/4	4 1/8	25	20-1 1/4	30 1/2	2 3/4	6 3/8	3 3/4	5 1/2	27	24-1 3/8	30 1/2	2 3/4	3 3/8	4	27	27	24-1 1/4	20	20		
24	32	11 1/8	6	3 1/4	4 3/8	29 1/2	20-1 3/8	36	2 3/4	6 3/8	4 3/16	6	32	24-1 3/8	36	3	3 3/8	4 1/2	32	32	24-1 1/4	24	24		
30	38 1/4	13 1/8	6 1/2	3 1/2	5 1/8	36	28-1 3/8	43	3 3/8	8 1/4	5 1/2	7 1/2	40 1/4	28-1 1/8	43	4	4 1/2	5 1/2	40 1/4	40 1/4	28-2 1/4	30	30		
36	46	15 1/8	7 1/2	4 1/4	6 1/8	42 1/4	32-1 3/8	50	4 3/8	9 1/2	6 1/2	8 1/2	46	32-2 3/8	50	4 1/2	5 1/2	6 1/8	46	46	32-2 3/8	36	36		
600 LB. FLANGES								900 LB. FLANGES								1500 LB. FLANGES									
1/2	3 3/4	9/16	2 1/16	7/8	7/8	2 5/8	4-5/8	4 3/4	7/8	2 3/8	1 1/4	1 1/4	3 3/4	4-7/8	4 3/4	7/8	2 3/8	1 1/4	1 1/4	3 3/4	4-7/8	4 3/4	1/2		
3/4	4 1/8	1 1/4	2 1/4	1	1	3 3/4	4-3/4	5 1/8	1	2 3/4	1 3/8	1 3/8	3 3/2	4-7/8	5 1/8	1 1/8	2 3/4	1 3/8	1 3/8	3 3/2	4-7/8	4 3/4	3/4		
1	4 7/8	1 1/2	2 1/4	1 1/16	1 1/16	3 3/2	4-3/4	5 3/8	1 1/8	2 3/4	1 3/8	1 3/8	4	4-1	5 3/8	1 1/8	2 3/8	1 3/8	4	4	4-1	4-1	1		
1 1/4	5 1/4	1 3/4	2 3/4	1 1/4	1 1/4	3 3/4	4-3/4	6 1/4	1 1/4	2 3/4	1 3/4	1 3/4	4 1/8	4-1 1/8	6 1/4	1 1/4	2 3/8	1 3/4	4 1/8	4 1/8	4-1 1/8	4-1 1/8	1 1/4		
1 1/2	6 1/8	1 5/8	2 3/4	1 1/4	1 1/4	4 1/2	4-7/8	7	1 1/4	3 1/4	1 3/4	1 3/4	4 3/8	4-1 1/8	7	1 1/4	3 3/4	1 3/4	4 3/8	4 3/8	4-1 1/8	4-1 1/8	1 1/2		
2	6 3/4	2	2 3/4	1 1/4	1 1/4	5	8-3/4	8 1/2	1 1/2	4	2 1/4	2 1/4	6 1/2	8-1	8 1/2	1 1/2	4	2 1/4	2 1/4	6 1/2	8-1	8-1	2		
2 1/2	7 1/2	2 1/8	3 3/8	1 1/2	1 1/2	5 1/2	8-7/8	9 3/8	1 1/2	4 3/8	2 1/2	2 1/2	7 1/2	8-1 1/8	9 3/8	1 1/2	4 1/8	2 1/2	2 1/2	7 1/2	8-1 1/8	8-1 1/8	2 1/2		
3	8 1/4	2 1/4	3 3/4	1 1/2	1 1/2	6 3/8	8-7/8	9 1/2	1 1/2	4	2 3/4	2 3/4	8-1	10 1/2	10 1/2	1 1/2	4 3/8	2 1/2	2 1/2	8	8-1 1/4	8-1 1/4	3		
3 1/2	9	2 3/4	3 3/4	1 1/2	1 1/2	7 1/4	8-1	10 1/2	1 1/2	4 1/2	2 3/4	2 3/4	9 1/4	8-1 1/4	10 1/2	1 1/2	4 3/8	2 1/2	2 1/2	9 1/2	8-1 1/2	8-1 1/2	3 1/2		
4	10 1/4	3	4	1 1/2	1 1/2	8 1/2	8-1	11 1/2	1 3/4	4 3/2	2 3/4	2 3/4	9 3/4	8-1 1/4	12 1/4	2 3/4	4 3/8	3 3/16	3 3/16	9 1/2	8-1 3/8	8-1 3/8	4		
5	13	3 1/4	4 1/2	2 3/8	2 3/8	10 1/2	8-1 1/8	13 3/4	2	5	3 3/8	3 3/8	11	8-1 3/8	14 3/4	2 3/4	4 3/8	4 3/8	11 1/2	11 1/2	8-1 3/8	8-1 3/8	5		
6	14	3 3/4	4 3/4	2 3/8	2 3/8	11 1/2	12-1 1/8	15	2 1/4	5 3/2	3 3/8	3 3/8	12 1/2	12-1 1/4	15 1/2	3 3/4	4 3/8	4 3/8	12 1/2	12 1/2	12-1 1/2	12-1 1/2	6		
8	16 1/2	4 1/2	5 1/4	3	3	13 3/4	12-1 1/4	18 1/2	2 3/4	6 3/4	4	4 1/2	15 1/2	12-1 1/2	19	3 3/8	5 3/8	5 3/8	15 1/2	15 1/2	12-1 3/4	12-1 3/4	8		
10	20	5 1/2	6	3 3/8	3 3/8	17	16-1 3/8	21 1/2	3 1/4	7 3/4	4 1/4	5	18 1/2	16-1 1/2	23	4 1/4	6 1/4	6 1/4	18 1/2	18 1/2	16-2 1/4	16-2 1/4	10		
12	22	6 1/4	6 1/2	3 3/4	3 3/4	19 1/4	20-1 3/8	24	3 3/8	8 3/4	4 3/4	5 3/8	21	20-1 1/2	26 1/2	4 3/4	7 3/8	7 3/8	21	21	16-2 3/8	16-2 3/8	12		
14	23 3/4	7 1/8	6 3/2	3 11/16	3 11/16	20 3/4	20-1 1/2	25 1/4	3 3/4	8 3/4	5 1/2	6 1/2	22	20-1 3/4	29 1/2	5 1/4	8 1/4	8 1/4	22	22	16-2 3/4	16-2 3/4	14		
16	27	8 1/8	7	4 1/16	4 1/16	23 3/4	20-1 3/8	27 3/4	3 3/2	8 3/2	5 3/4	6 3/2	24 1/4	20-1 3/4	32 1/2	5 3/4	12 1/4	12 1/4	24 1/4	24 1/4	16-2 3/4	16-2 3/4	16		
18	29 1/4	9 1/8	7 3/4	4 3/8	4 3/8	25 1/4	20-1 3/4	31	4	9	6	7 1/2	27	20-2	36	6 3/8	12 3/8	12 3/8	27	27	16-2 3/4	16-2 3/4	18		
20	32	10 1/8	8 1/2	5	5	28 1/2	24-1 3/4	33 3/4	4 1/4	9 3/4	6 3/4	8 1/4	29 1/2	20-2 1/4	38 3/4	7	14	14	29 1/2	29 1/2	16-3 3/8	16-3 3/8	20		
24	37	11 1/8	9 1/2	5 1/2	5 1/2	33	24-2	41	5 1/2	11 1/2	8	10 1/2	35 1/2	20-2 3/8	46	8	16	16	35 1/2	35 1/2	16-3 3/8	16-3 3/8	24		
30	44 1/2	13 1/8	10 3/4	6 1/4	6 1/4	40 1/4	28-2 1/8	48 1/2	6 1/4	12 1/4	12 1/4	14 1/4	42 1/4	20-3 3/8	50 1/2	10 1/2	18	18	42 1/4	42 1/4	20-3 3/8	20-3 3/8	30		
36	51 3/4	15 1/8	11 3/4	7 1/4	7 1/4	47	28-2 3/8	57 1/2	7 1/4	14 1/4	14 1/4	17 1/4	50 1/4	20-3 3/8	60 1/2	12 1/2	20	20	50 1/4	50 1/4	20-3 3/8	20-3 3/8	36		

Nom. Pipe Size	2500 LB. FLANGES						
	O	C ^①	Y ^①			Bolt Circle	No. and Size of Holes
Weld Neck	Slip On Thrd.	Lap-Joint	Weld Neck	Slip On Thrd.	Lap-Joint		
1/2	5 1/4	1 3/16	2 3/8	1 9/16	1 9/16	3 1/2	4-7/8
3/4	5 1/2	1 1/4	3 3/8	1 11/16	1 11/16	3 3/4	4-7/8
1	6 1/4	1 3/8	3 1/2	1 7/8	1 7/8	4	4-1
1 1/4	7 1/4	1 1/2	3 3/4	2 1/16	2 1/16	5	4-1 1/4
1 1/2	8	1 3/4	4 3/8	2 3/8	2 3/8	5 1/4	4-1 1/4
2	9 1/4	2	5	2 3/4	2 3/4	6 1/4	8-1 1/8
2 1/2	10 1/2	2 1/4	5 3/8	3 3/8	3 3/8	7 1/4	8-1 1/4
3	12	2 3/8	6 3/8	3 3/8	3 3/8	9	8-1 1/8
4	14	3	7 1/2	4 1/4	4 1/4	10 3/4	8-1 3/8
5	16 1/2	3 3/8	9	5 3/8	5 3/8	12 3/4	8-1 7/8
6	19	4 1/4	10 3/4	6	6	14 1/2	8-2 1/8
8	21 3/4	5	12 1/2	7	7	17 1/4	12-2 3/8
10	26 1/2	6 1/2	16 1/2	9	9	21 1/4	12-2 3/8
12	30	7 1/4	18 3/4	10	10	24 3/8	12-2 3/8

Inch to Millimeter

inch to millimeter (1 inch = 25,4 mm)

Inch	0	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16
0	0.0	1.6	3.2	4.8	6.4	7.9	9.5	11.1	12.7	14.3	15.9	17.5	19.1	20.6	22.2	23.8
1	25.4	27.0	28.6	30.2	31.8	33.3	34.9	36.5	38.1	39.7	41.3	42.9	44.5	46.0	47.6	49.2
2	50.8	52.4	54.0	55.6	57.2	58.7	60.3	61.9	63.5	65.1	66.7	68.3	69.9	71.4	73.0	74.6
3	76.2	77.8	79.4	81.0	82.6	84.1	85.7	87.3	88.9	90.5	92.1	93.7	95.3	96.8	98.4	100.0
4	101.6	103.2	104.8	106.4	108.0	109.5	111.1	112.7	114.3	115.9	117.5	119.1	120.7	122.2	123.8	125.4
5	127.0	128.6	130.2	131.8	133.4	134.9	136.5	138.1	139.7	141.3	142.9	144.5	146.1	147.6	149.2	150.8
6	152.4	154.0	155.6	157.2	158.8	160.3	161.9	163.5	165.1	166.7	168.3	169.9	171.5	173.0	174.6	176.2
7	177.8	179.4	181.0	182.6	184.2	185.7	187.3	188.9	190.5	192.1	193.7	195.3	196.9	198.4	200.0	201.6
8	203.2	204.8	206.4	208.0	209.6	211.1	212.7	214.3	215.9	217.5	219.1	220.7	222.3	223.8	225.4	227.0
9	228.6	230.2	231.8	233.4	235.0	236.5	238.1	239.7	241.3	242.9	244.5	246.1	247.7	249.2	250.8	252.4
10	254.0	255.6	257.2	258.8	260.4	261.9	263.5	265.1	266.7	268.3	269.9	271.5	273.1	274.6	276.2	277.8
11	279.4	281.0	282.6	284.2	285.8	287.3	288.9	290.5	292.1	293.7	295.3	296.9	298.5	300.0	301.6	303.2
12	304.8	306.4	308.0	309.6	311.2	312.7	314.3	315.9	317.5	319.1	320.7	322.3	323.9	325.4	327.0	328.6
13	330.2	331.8	333.4	335.0	336.6	338.1	339.7	341.3	342.9	344.5	346.1	347.7	349.3	350.8	352.4	354.0
14	355.6	357.2	358.8	360.4	362.0	363.5	365.1	366.7	368.3	369.9	371.5	373.1	374.7	376.2	377.8	379.4
15	381.0	382.6	384.2	385.8	387.4	388.9	390.5	392.1	393.7	395.3	396.9	398.5	400.1	401.6	403.2	404.8
16	406.4	408.0	409.6	411.2	412.8	414.3	415.9	417.5	419.1	420.7	422.3	423.9	425.5	427.0	428.6	430.2
17	431.8	433.4	435.0	436.6	438.2	439.7	441.3	442.9	444.5	446.1	447.7	449.3	450.9	452.4	454.0	455.6
18	457.2	458.8	460.4	462.0	463.6	465.1	466.7	468.3	469.9	471.5	473.1	474.7	476.3	477.8	479.4	481.0
19	482.6	484.2	485.8	487.4	489.0	490.5	492.1	493.7	495.3	496.9	498.5	500.1	501.7	503.2	504.8	506.4
20	508.0	509.6	511.2	512.8	514.4	515.9	517.5	519.1	520.7	522.3	523.9	525.5	527.1	528.6	530.2	531.8
21	533.4	535.0	536.6	538.2	539.8	541.3	542.9	544.5	546.1	547.7	549.3	550.9	552.5	554.0	555.6	557.2
22	558.8	560.4	562.0	563.6	565.2	566.7	568.3	569.9	571.5	573.1	574.7	576.3	577.9	579.4	581.0	582.6
23	584.2	585.8	587.4	589.0	590.6	592.1	593.7	595.3	596.9	598.5	600.1	601.7	603.3	604.8	606.4	608.0
24	609.6	611.2	612.8	614.4	616.0	617.5	619.1	620.7	622.3	623.9	625.5	627.1	628.7	630.2	631.8	633.4
25	635.0	636.6	638.2	639.8	641.4	642.9	644.5	646.1	647.7	649.3	650.9	652.5	654.1	655.6	657.2	658.8
26	660.4	662.0	663.6	665.2	666.8	668.3	669.9	671.5	673.1	674.7	676.3	677.9	679.5	681.0	682.6	684.2
27	685.8	687.4	689.0	690.6	692.2	693.7	695.3	696.9	698.5	700.1	701.7	703.3	704.9	706.4	708.0	709.6
28	711.2	712.8	714.4	716.0	717.6	719.1	720.7	722.3	723.9	725.5	727.1	728.7	730.3	731.8	733.4	735.0
29	736.6	738.2	739.8	741.4	743.0	744.5	746.1	747.7	749.3	750.9	752.5	754.1	755.7	757.2	758.8	760.4
30	762.0	763.6	765.2	766.8	768.4	769.9	771.5	773.1	774.7	776.3	777.9	779.5	781.1	782.6	784.2	785.8
31	787.4	789.0	790.6	792.2	793.8	795.3	796.9	798.5	800.1	801.7	803.3	804.9	806.5	808.0	809.6	811.2
32	812.8	814.4	816.0	817.6	819.2	820.7	822.3	823.9	825.5	827.1	828.7	830.3	831.9	833.4	835.0	836.6
33	838.2	839.8	841.4	843.0	844.6	846.1	847.7	849.3	850.9	852.5	854.1	855.7	857.3	858.8	860.4	862.0
34	863.6	865.2	866.8	868.4	870.0	871.5	873.1	874.7	876.3	877.9	879.5	881.1	882.7	884.2	885.8	887.4
35	889.0	890.6	892.2	893.8	895.4	896.9	898.5	900.1	901.7	903.3	904.9	906.5	908.1	909.6	911.2	912.8
36	914.4	916.0	917.6	919.2	920.8	922.3	923.9	925.5	927.1	928.7	930.3	931.9	933.5	935.0	936.6	938.2
37	939.8	941.4	943.0	944.6	946.2	947.7	949.3	950.9	952.5	954.1	955.7	957.3	958.9	960.4	962.0	963.6
38	965.2	966.8	968.4	970.0	971.6	973.1	974.7	976.3	977.9	979.5	981.1	982.7	984.3	985.8	987.4	989.0
39	990.6	992.2	993.8	995.4	997.0	998.5	1000.1	1001.7	1003.3	1004.9	1006.5	1008.1	1009.7	1011.2	1012.8	1014.4
40	1016.0	1017.6	1019.2	1020.8	1022.4	1023.9	1025.5	1027.1	1028.7	1030.3	1031.9	1033.5	1035.1	1036.6	1038.2	1039.8
41	1041.4	1043.0	1044.6	1046.2	1047.8	1049.3	1050.9	1052.5	1054.1	1055.7	1057.3	1058.9	1060.5	1062.0	1063.6	1065.2
42	1066.8	1068.4	1070.0	1071.6	1073.2	1074.7	1076.3	1077.9	1079.5	1081.1	1082.7	1084.3	1085.9	1087.4	1089.0	1090.6
43	1092.2	1093.8	1095.4	1097.0	1098.6	1100.1	1101.7	1103.3	1104.9	1106.5	1108.1	1109.7	1111.3	1112.8	1114.4	1116.0
44	1117.6	1119.2	1120.8	1122.4	1124.0	1125.5	1127.1	1128.7	1130.3	1131.9	1133.5	1135.1	1136.7	1138.2	1139.8	1141.4
45	1143.0	1144.6	1146.2	1147.8	1149.4	1150.9	1152.5	1154.1	1155.7	1157.3	1158.9	1160.5	1162.1	1163.6	1165.2	1166.8
46	1168.4	1170.0	1171.6	1173.2	1174.8	1176.3	1177.9	1179.5	1181.1	1182.7	1184.3	1185.9	1187.5	1189.0	1190.6	1192.2
47	1193.8	1195.4	1197.0	1198.6	1200.2	1201.7	1203.3	1204.9	1206.5	1208.1	1209.7	1211.3	1212.9	1214.4	1216.0	1217.6
48	1219.2	1220.8	1222.4	1224.0	1225.6	1227.1	1228.7	1230.3	1231.9	1233.5	1235.1	1236.7	1238.3	1239.8	1241.4	1243.0
49	1244.6	1246.2	1247.8	1249.4	1251.0	1252.5	1254.1	1255.7	1257.3	1258.9	1260.5	1262.1	1263.7	1265.2	1266.8	1268.4
50	1270.0	1271.6	1273.2	1274.8	1276.4	1277.9	1279.5	1281.1	1282.7	1284.3	1285.9	1287.5	1289.1	1290.6	1292.2	1293.8



38-52 Review Avenue, Long Island City, NY 11101
 Telephone: 718-392-1660 1-800-221-1115 Fax: 718-729-5106

Temperature Conversion °C-°F

-495.4-0			1-60			61-290			300-890			900-3000		
C =	F C	= F	C =	FC	= F	C =	FC	= F	C =	FC	= F	C =	FC	= 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	527	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	1020	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	824	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	26	78.8	30.0	86	186.8	288	550	1022	704	1300	2372
-134	-210	-346	-2.8	27	80.6	30.6	87	188.6	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	.6	31	87.8	32.8	91	195.8	316	600	1112	843	1550	2822
-107	-160	-256	.0	32	89.6	33.3	92	197.6	321	610	1130	871	1600	2912
-101	-150	-238	.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	332	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	882	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	-90	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		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	413.6	442	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

READ DOWN CENTER COLUMN FOR REQUIRED TEMPERATURE
FIGURE TO LEFT = CENTIGRADE, FIGURE TO RIGHT = FAHRENHEIT.

Valve Actuation, Accessories & Modifications

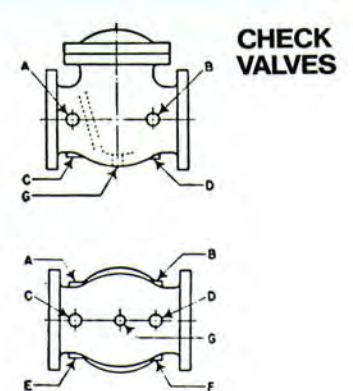
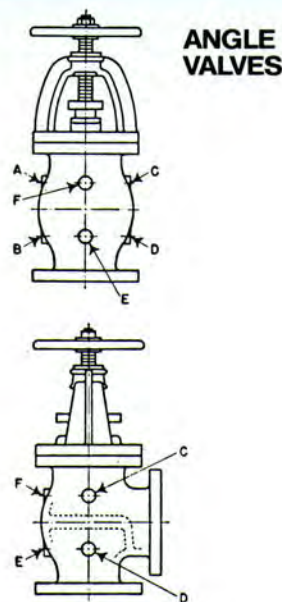
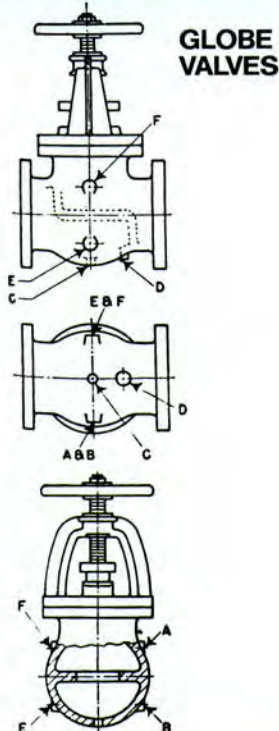
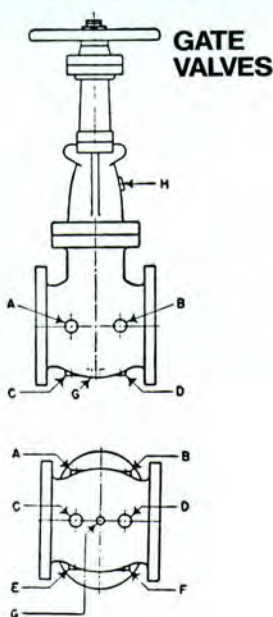
ACTUATION

- Electric Motor Operators
- Pneumatic Operators
- Air Motor Operators
- Cylinder Operators
- Bevel Gear Operators
- Spur Gear Operators
- Lever Operators
- Limit Switch Operators
- Chainwheel Operators
- Hammerblow Handwheels

ACCESSORIES/MODIFICATIONS

- TFE (Soft Seat)—Block & Bleed
- Bosses & Drain Tappings (See Below)
- Floorstands—Handwheel Extensions
- Optional Packing Materials:
 - TFE
 - Graphoil
 - Graphite Filament
 - Metallic
- Valves Manufactured IAW NACE MR-01-75
- Swing Check Valves with Lever & Spring or Weight
- Optional Gasket Materials:
 - Spiral Wound Graphoil
 - Metal Reinforced Graphoil
 - TFE

Bosses & Drain Tappings: Locations of Tapped Holes



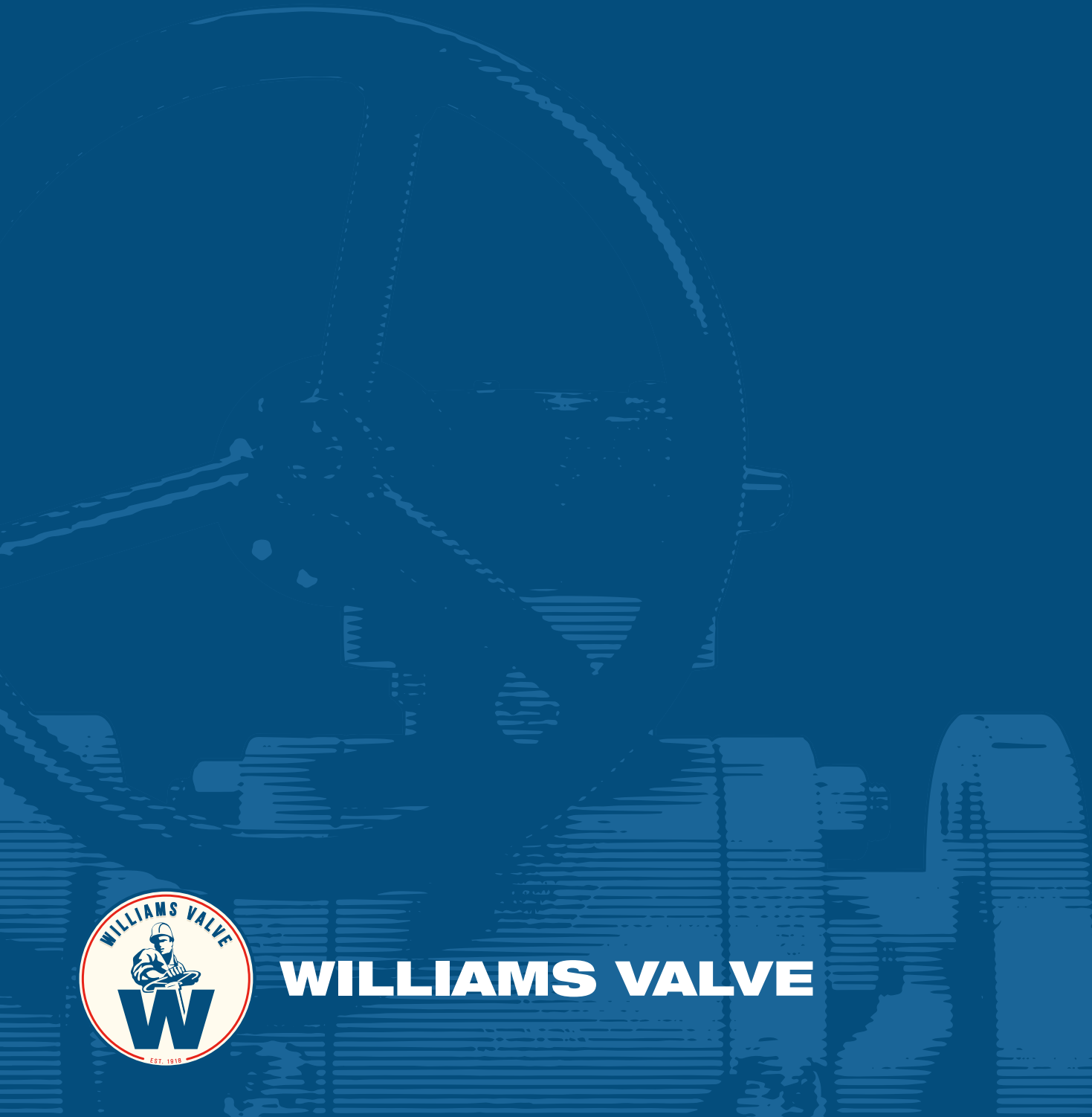
Warranty

Seller warrants the material to be free of defects in material and workmanship, under normal use and proper operation, for a period of one year from date of delivery to a common carrier for shipment to buyer. Seller's obligation is limited to: (1) Repair of the material, or (2) replacement of any part or parts proven defective in material or workmanship, or (3) refund of the purchase price. The choice of said remedies shall be determined by seller in its sole discretion.

All implied warranties, including the implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed and excluded. The within limited warranty is exclusive and in lieu of all other warranties, guarantees, agreements and similar obligations of seller. In no event shall seller be liable for consequential or incidental damages.



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